THIRTY-EIGHTH PLAINS CONFERENCE

NOVEMBER 5-8, 1980
IOWA CITY, IOWA

THIRTY-EIGHTH PLAINS CONFERENCE

November 5-8, 1980

IOWA CITY, IOWA

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CONFERENCE CHAIRMAN: Duane C. Anderson

COMMITTEES

PROGRAM: Holmes A. Semken, Joseph A. Tiffany

REGISTRATION: John O'Shea

INFORMATION: Deb Zieglowsky

TECHNICAL: Stephen Lensink

PUBLICATION SALES: Sara Behrman, Denice Renchen

ABSTRACTS EDITOR: Julianne Hoyer

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SPONSORING ORGANIZATIONS

Office of the State Archaeologist of Iowa

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Iowa Geological Survey

Iowa Archeological Society

Museum of Natural History, University of Iowa

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Reception and Registration. The pre-conference reception will be held the evening of November 5 from 8:00 until midnight in the Main Lounge at the Iowa Memorial Union. Free beer and a cash bar will be provided. The registration table will be open in the adjoining Terrace Lounge from 7:00 to 10:00 p.m. on the night of the reception. Registration will also be held from 8:00 to 12:00 and 1:00 to 5:00 on Thursday and 8:00 to 12:00 on Friday in the same area. Registration is required for attendance and participation in all conference activities.

Annual Dance. A country swing band called "Just Passin' Thru" has been hired to perform in the Coralville Room at the Ironmen Inn on the evening of November 6 from 8:00 until midnight. The dance will end at midnight, the bar will close at 12:30, but the area will be open for socializing until 2:00 a.m.

Banquet. The annual banquet will be held in the Main Lounge at the Iowa Memorial Union on November 7 from 7:00 to 9:30 p.m. Tickets for the banquet may be purchased as part of the pre-registration or at the registration desk on Wednesday evening or Thursday until 4:00 p.m. The cost will be $11 for wine, brouchet of tenderloin and the trimmings. Following the banquet, Dr. David Baerreis will introduce Dr. Robert Bell, University of Oklahoma, who will deliver the banquet address entitled REFLECTIONS ON SOUTHERN AND CENTRAL PLAINS PREHISTORY.

Business Meeting of the Plains Anthropologist will be held on Friday evening in the Main Lounge following the banquet address.

Publication Sales. Several publishers have been invited to set up exhibits and/or sales areas in the Lucas/Dodge Room on the second floor of the Iowa Memorial Union. A number of publishers are offering a discount for Plains Conference participants.

Parking on Campus. One hundred and fifty parking spaces have been reserved for Plains Conference participants at the parking ramp across the street from the Iowa Memorial Union. Parking is tight on campus generally, so plan to arrive early each day to avoid difficulty. Parking fee in the ramp is $2 per day.

Shuttle Bus. Some participants will find it convenient to ride the shuttle bus from motels to the Iowa Memorial Union. The schedule is as follows:

Mornings, November 6-7-8
7:00, 7:30 and 8:00 a.m. Motels (Ironmen, Cantebury, Carousel) to Union

Evenings, November 6-7
4:30, 5:00 and 5:30 p.m. Union to motels (Ironmen, Cantebury, Carousel)

Dance, November 6
7:00, 7:30 and 8:00 p.m. Union and motels (Cantebury, Carousel) to Ironmen
11:30, 12:00 and 12:30 a.m. Ironmen to motels and Union

Banquet, November 7
5:30, 6:00 and 6:30 p.m. Motels to Union
10:30 and 11:00 p.m. Union to motels

Abstracts. The Program and Abstracts booklet is provided at registration. Additional copies are available at the Registration Desk for $1 per copy and may be ordered prepaid from the Treasurer, Plains Anthropologist, 410 Wedgewood Drive, Lincoln, Nebraska 68508.

Workshops. Special workshop sessions will be held on the following topics: Magnetometer Survey, the Missouri National River Region, and Oneota. Consult the program for details as to time and place.

Exhibit. An exhibit of Mesquakie Indian photographs taken by Duren Ward in 1905 will be on display in the Registration area during the conference. The display is circulated by the State Historical Society of Iowa.

Poster Papers. Poster papers will be presented in the Ballroom on Friday from 3:30 to 4:30 p.m. This is a new offering at the Plains Conference designed to accommodate visual and hands-on presentations.

Book Prizes. Two books (PRE-COLUMBIAN SHELL ENGRAVINGS FROM THE CRAIG MOUND AT SPIRO, OKLAHOMA, and OSTEOLOGY FOR THE ARCHAEOLOGIST) will be awarded to the individual who gives the best paper at the conference, as judged by the program committee. The books were donated for this purpose by the Publications Department of the Peabody Museum of Archaeology and Ethnology. The recipient will be announced in a future issue of the Plains Anthropologist.

Information Booth. An information booth will be operated near the registration table throughout the conference (messages, placement information, maps, bus schedules, parking, area restaurants, and points of interests).

PROGRAM AT A GLANCE

Thursday Morning

1. Powder River Basin Symposium MAIN LOUNGE 8:00-10:00
2. Late Pleistocene/Holocene Environmental Symposium BALLROOM 8:15-10:30
3. Black Hills-Badlands-Tablelands Symposium MAIN LOUNGE 10:00-12:00
4. Oneota Studies in the '80s Symposium BALLROOM 10:45-11:45

Thursday Afternoon

1. Pryor Mountain Environmental Archaeology Symposium BALLROOM 1:00-3:00
2. Arikara Ethnohistory Symposium MAIN LOUNGE 1:15-3:00
3. General Session 1: Field Reports YALE ROOM 1:30-3:45
4. General Session 2: Site Survey BALLROOM 3:00-5:00
5. Southern Plains-Southwest-Southeast Relationships Symposium MAIN LOUNGE 3:15-5:00

Thursday Evening

1. Workshops YALE, HARVARD, and INDIANA ROOMS 7:00-8:00
2. Dance IRONMEN INN 8:00-12:00

Friday Morning

1. Carlyle S. Smith Symposium MAIN LOUNGE 8:20-11:40
2. Wyoming Cultural Resource Management Symposium BALLROOM 8:25-11:30
3. General Session 3: Cultural Anthropology YALE ROOM 8:30-10:00

Friday Afternoon

1. Woodland on the Prairie Peninsula Symposium BALLROOM 1:00-3:15
2. General Session 4: Geomorphology/Lithic Analysis MAIN LOUNGE 1:15-3:00
3. General Session 5: Physical Anthropology MAIN LOUNGE 3:15-4:15
4. Poster Papers BALLROOM 3:30-4:30
5. Special Presentation: W. Raymond Wood BALLROOM 4:30-5:00

Friday Evening

1. Reception MAIN LOUNGE 6:30-7:00
2. Banquet and Address MAIN LOUNGE 7:00-9:30
3. Business Meeting MAIN LOUNGE 9:30-10:30

Saturday Morning

1. General Session 6: Method and Theory ILLINOIS ROOM 8:30-11:30
2. General Session 7: Historical Archaeology YALE ROOM 8:30-10:30

THURSDAY

CURRENT RESEARCH IN THE POWDER RIVER BASIN OF WYOMING

Main Lounge, 8:00-10:00 a.m., Thursday, November 6
Chair: David Eckles and Charles A. Reher (University of Wyoming)

8:00 Paleo-Indian Occupation in the Powder River Basin (George C. Frison)
8:15 Geologic Factors Affecting Site Preservation and Distribution in the Central Powder River Basin, Wyoming (John Albanese)
8:30 Distinguishing Site Function of Open Lithic Scatters: An Example from the Coal Creek Area, Powder River Basin, Wyoming (Julie Francis)
8:45 Ecological Diversity and Site Patterning within the Central Powder River Basin, Wyoming (Jeffrey L. Hauff)
9:00 The Evidence for Sub-Regional Settlement Systems in the Eastern Powder River Basin (David Eckles)
9:15 Plains Indian Occupation of the Central Powder River Basin: the Wagensen Site, 48CA89 (Charles A. Reher)
9:30 The Wagensen Site: Vegetative Diversity and Density (William R. Latady)
9:45 Euroamerican Settlement System in Western Powder River Basin (Marcel Kornfeld)

LATE PLEISTOCENE/HOLOCENE ENVIRONMENTAL CHANGES IN THE HIGH PLAINS: THE VERTEBRATE RECORD

Ballroom

Ballroom, 8:15-10:30 a.m., Thursday, November 6
Chair: Russell W. Graham (Illinois State Museum)

8:15 Late Pleistocene/Holocene Environmental Changes in the Canadian Plains and Montana: the Mammalian Record (Michael Wilson)
8:30 Holocene Climatic Changes in the Northern Plains of the United States: the Mammalian Record (Holmes A. Semken, Jr. and Carl R. Falk)
8:45 Late Pleistocene/Holocene Environmental Changes in the Northeastern Plains of the United States and the Prairie-Forest Interface: the Mammalian Record (Bonnie W. Styles and James R. Purdue)
9:00 The Late Glacial/Pre-Boreal Vertebrate Fauna of Wyoming (Danny N. Walker)
9:15 The Late Pleistocene/Holocene Mammalian Record in the Northern Bighorn Mountains, Wyoming (Stephen A. Chomko and B. Miles Gilbert)
9:30 Late Pleistocene/Holocene Environmental Changes in the Central Plains of the United States: the Mammalian Record (L. Carson Davis)
9:45 Late Pleistocene/Holocene Environmental Changes in the Southwestern Plains of the United States: the Mammalian Record (Russell W. Graham)
10:00 Discussant: Evaluation of Climate Changes on the North American Great Plains (Wayne M. Wendland)
10:15 Discussant: Paleoenvironments and Archaeology: the Role of the Vertebrate Record (R. Bruce McMillan)

A SYMPOSIUM ON THE ARCHAEOLOGY OF THE BLACK HILLS, BADLANDS AND TABLELANDS OF WESTERN SOUTH DAKOTA

Main Lounge

Main Lounge, 10:00-12:00 a.m., Thursday, November 6
Chair: Robert Alex (State Archaeologist of South Dakota)

10:00 Getting Architecture from Stone Circle Remains: A Southern Black Hills Example (Alice M. Tratebas)
10:15 Preliminary Report on the Testing of 39PN375, a Possible Middle Plains Archaic Tipi Ring Site (David M. Hovde)
10:30 The View from Outside Ludlow (Carl Davis)
10:45 Cave Hills Rock Art: Northwestern South Dakota (James D. Keyser)
11:00 A Rock Art Chronology for the Southern Black Hills (Linea Sundstrom)
11:15 A Fortified Late Prehistoric Site in Western South Dakota (Lynn Marie Alex)

11:25 Chipped Stone from the Smiley-Evans Site (39BU2), South Dakota (Nicholas Chevance)
11:35 The Lange/Ferguson Site 39SH33 (L. Adrien Hannus)
11:45 Geologic History of the Landscape at the Archaeologic Site (39SH33), Shannon County, South Dakota (Everett M. White)

ONEOTA STUDIES IN THE '80s

Ballroom, 10:45-11:45 a.m., Thursday, November 6
Chair: Guy Gibbon (University of Minnesota)

10:45 Conceptions of Oneota and Their Implications for Anthropological Research (Amy E. Harvey)
11:00 Oneota Origins Revisited (Guy Gibbon)
11:15 The "Timing" of Oneota: Problems of Interrelationships" (Dale R. Henning)
11:30 Implications of Siouan Historical Linguistics for Archaeology (Stanley Witkowski and James Springer)

PRYOR MOUNTAIN ENVIRONMENTAL ARCHAEOLOGICAL RESEARCH PROJECT

Ballroom, 1:00-3:00 p.m., Thursday, November 6
Chair: Robson Bonnichsen (University of Maine)

1:00 Introduction to the Pryor Mountain Archaeological Research Project and Field School (Robson Bonnichsen)
1:15 The Role of Experimentation in the Pryor Mountain Project (David Young)
1:30 Perspectives on the Modern Vegetation, and the Potential for Reconstructing the Vegetational History of the Pryor Mountains (George L. Jacobson, Jr.)
1:45 Shield Trap: Taphonomy in a Closed Environment (James S. Oliver)
2:00 Excavations at Crystalsin Cave (1978-1980) (James McCormick)
2:15 Pleistocene-Holocene Paleo-Environmental Implications of the False Cougar Cave Local Fauna (R. W. Graham)
2:30 High-Altitude Adaptation at False Cougar Cave: A Preliminary Statement (Robson Bonnichsen)
2:45 Discussant: James D. Keyser

SOCIAL AND ECONOMIC CHANGE IN THE POST-CONTACT PERIOD: ARCHAEOLOGICAL CONTRIBUTIONS TO ARIKARA ETHNOHISTORY Main Lounge

Main Lounge, 1:15-3:00 p.m., Thursday, November 6
Chair: Charles Orser (Loyola University) and John O'Shea (University of Iowa)

1:15 "The Next Morning We Commenced Trading": Studying Socioeconomic Change Among the Arikara with Archaeological Data (Charles E. Orser)
1:30 The Quantitative Analysis of Trade Beads in Arikara Cemeteries: Economic Implications (Ed Lueck)
1:45 Post-Contact Arikara Technological Change: Now You See It, Now You Don't (Dennis Toom)
2:00 Too Many Chiefs Spoil the Broth: Changing Social Consensus and Its Effects on Arikara Mortuary Practices (John M. O'Shea)
2:15 Changing Stature Among the Arikara (P. Willey)
2:30 Cache Pits, Hoes and Rakes Do Not a Farmer Make: Village Hunters of the Eastern Plains (Alan J. Osborn)
2:45 Discussant: W. Raymond Wood

GENERAL SESSION 1: FIELD REPORTS

Yale Room, 1:30-3:45 p.m., Thursday, November 6
Chair: Richard Slattery (Iowa Archeological Society) Yale Room

1:30 Lower Salt Creek Valley Archaeology: Report on the Third Season's Investigations and General Overview (Kent J. Buehler)
1:45 Cultural Resources of the Little Beaver Creek Drainage, Kay County, Oklahoma (Alan J. Wormser)
2:00 Lithic Resource Reconnaissance in the Flint Hills Area of North-Central Oklahoma (Sheila J. Bobalik)
2:15 Preliminary Report on a Plains Village House Site in North-Central Oklahoma (Douglas Heffington)
2:30 Excavation of the Drumming Sauna Site (34WN29), Washington County, Oklahoma: A Late Woodland House Site in the Cross Timbers Region of the Central Plains (Marvin Kay)
2:45 A Late Woodland Lithic Workshop in Western Manitoba (C. T. Shay)
3:00 Test Excavations at the Knife River Indian Villages National Historic Site, 1980 (T. Weston)
3:15 An Illustrated Overview of Kansas/Missouri Archaeology of the 1930's (Richard G. Slattery)
3:30 Preliminary Results of Investigations at the George Reeves Site (1979-1980) (Dale L. McElrath)

GENERAL SESSION 2: SITE SURVEY Ballroom

Ballroom, 3:00-5:00 p.m., Thursday, November 6
Chair: Christian J. Zier (Metcalf-Zier Archaeologists, Inc.)

3:00 The Lake Calvin Area Paleo-Indian Survey (J. Sanderson Stevens)
3:15 New Information on Laurel and Blackduck Subsistence Patterns (Mona C. Thompson)
3:30 Archaeology and the Northern Border Pipeline: A Precedent for the Future (Marvin Keller)
3:45 Prehistoric Habitation in Northeastern South Dakota: Glimpses from Deuel and Hamlin Counties (Barbara Lass)
4:00 Prehistoric Utilization of the Arkansas River Valley: Archeological Survey in the John Martin Reservoir Project, Southeast Colorado (Frank W. Eddy and T. Reid Farmer)
4:15 Synopsis of Archaeological Survey and Excavation Conducted for the Copper Mountain Project in Central Wyoming (Anne H. Zier and Christian J. Zier)
4:30 Tipi Rings: A Re-Examination (William E. Davis)
4:45 A Possible Plains Woodland Foraging Station in the Mid-Canadian Area, New Mexico (Robert G. Campbell and Karl V. Winton)

SOUTHERN PLAINS SOCIETIES AND SOUTHWEST-SOUTHEAST INTERRELATIONSHIPS

Main Lounge, 3:15-5:00 p.m., Thursday, November 6
Chair: Timothy G. Baugh (University of Oklahoma)

3:15 Apacheans in Plains Culture History (David M. Brugge)
3:30 Archeological Testing at the Fifth Green Site, Randall County, Texas (Hank Kalokowski)
3:45 A Review of the Scott County, Kansas Pueblo Archeology (Tom Witty)
4:00 Late Prehistoric Hunter-Gatherer/Horticultural Exchange in the Southwest and Southern Plains (Katherine Spielmann)
4:15 A Study in Regional Exchange: Caddo, Pueblo, and Jumano Interrelationships (Timothy G. Baugh and Fern E. Swenson)
4:30 Discussant: A Southwestern Perspective (Curtis F. Schaafsma)
4:45 Discussant: A Plains Perspective (James H. Gunnerson)

THURSDAY EVENING WORKSHOPS

1. Magnetometer Workshop

   Yale Room, 7:00-8:00 p.m., Thursday, November 6
   Organizers: John Weymouth and Rob Huggins (University of Nebraska)

2. Problems and Potentials: Archaeology and Ethnohistory in the Region of the Missouri National River

   Harvard Room, 7:00-8:00 p.m., Thursday, November 6
   Organizers: John O'Shea (University of Iowa), John Ludwicksen (Nebraska State Historical Society), and Don Blakeslee (Wichita State University)

3. Oneota: Informal Discussion

   Indiana Room, 7:00-8:00 p.m., Thursday, November 6
   Organizer: Guy Gibbon (University of Minnesota)

supper at Iowa City Power Plant - excellent

ANNUAL DANCE

Ironmen Inn, 8:00-12:00 p.m., Coralville Room, Thursday, November 6 (Exit 242 on Interstate 80). Cash bar.

FRIDAY

METHOD AND THEORY IN PLAINS ARCHAEOLOGY: A SYMPOSIUM DEDICATED TO CARLYLE S. SMITH

Main Lounge, 8:20-11:40 a.m., Friday, November 7
Chair: Alfred E. Johnson (University of Kansas)

8:20 Thirty Years of Historic Sites Archaeology in South Dakota (Larry Bradley)
8:40 Testing a Model of Culture Drift: Lower Missouri Hopewell Data (Paul E. Brockington, Jr.)
9:00 Recent Advances in Interdisciplinary Anthropology (B. Miles Gilbert)
9:20 Some Recent Advances in Central Plains Archaeology (Roger Grange)
9:40 Federal Involvement in Great Plains Archaeology (Roger Grosser)
10:00 The Type Tycoon: Carlyle S. Smith and the Inferential Structure of Ceramic Analysis in Middle Missouri Prehistory (Richard A. Krause)
10:20 The Distribution and Identification of Pennsylvanian Cherts in the Western Midwest (Kenneth Reid)
10:40 Trends and Possibilities for Computer Simulation in Plains Archaeological Research (Larry Zimmerman)
11:00 Discussant: W. Raymond Wood
11:20 Discussant: David M. Gradwohl

ARCHAEOLOGICAL RESEARCH AND CULTURAL RESOURCE MANAGEMENT: A WYOMING PERSPECTIVE

Ballroom, 8:25-11:30 a.m., Friday, November 7
Chair: Stephen A. Chomko (Office of the Federal Inspector)

8:25 Research Goals, Management Objectives, and Energy Development (Stephen A. Chomko)
8:30 The Wyoming State Historic Preservation Plan (John Carlson)
8:45 Cultural Resource Reports: SHPO Review (Rhoda O. Lewis)
9:00 Cultural Resource Management in Wyoming: the Bureau of Land Management Perspective (John Lytle)
9:15 The Forest Service's Cultural Resource Program in Wyoming (Steve Sigstad)

9:30 Cultural Resource Management: A Contractor's Viewpoint (Ronald E. Kainer)
9:45 The Overland Planning Unit Survey (Thomas K. Larson)
10:00 A Remote Sensing Project at South Pass City State Historic Site, Wyoming (William B. Fawcett and Thomas K. Larson)
10:10 Archaeological Excavations at 48CR341: A Sand Dune Site in South Central Wyoming (Michael D. Metcalf)
10:20 The Nidiwh Site, 48CR1113: A Multicomponent Site in South Central Wyoming (Scott T. McKern)
10:30 The Military Creek Rockshelter Project (William L. Tibesar)
10:40 Settlement Pattern Studies of the Hanna Basin, Wyoming (David Reiss)
10:50 Discussant: George C. Frison
11:05 Discussant: Charles M. McKinney

GENERAL SESSION 3: CULTURAL ANTHROPOLOGY

Yale Room, 8:30-10:00 a.m., Friday, November 7
Chair: Mary Jane Schneider (University of North Dakota)

8:30 Contributions to the Prehistory of Plains Indian Women (Mary Jane Schneider)
8:45 Acculturation as a State of Mind (Janet Goldenstein Ahler)
9:00 Ethnic Identity and the Boarding School Experience of West-Central Oklahoma Native Americans (Sally McBeth)
9:15 Reconstructing Osage Social Organization (Dan Swan)
9:30 The BBB Motor Site Figurines and Middle Mississippian Fertility Symbolism (Thomas E. Emerson)
9:45 Play and Games as Social Boundary Maintaining Mechanisms in Plains Indian Societies (Steven J. Fox)

THE WOODLAND PERIODS ON THE PRAIRIE PENINSULA

Ballroom, 1:00-3:15 p.m., Friday, November 7
Chair: David Benn (Luther College)

1:00 Holocene Alluvial Fills in the Prairie Peninsula: Proposed Correlations and Implications for Archaeology (E. Arthur Bettis III)
1:15 Mammals Associated with the Middle Woodland Held Creek Component at the MAD Sites, Crawford County, Iowa (Katherine B. Pyle)
1:30 Late Woodland Pottery in Northeastern Iowa as Seen from the Hartley Fort (Joseph A. Tiffany)
1:45 Modified Clamshell from the Rainbow Site (David M. Hovde)
2:00 From Woodland, Whence? (Dale R. Henning)
2:15 A Discussion on the Sterns Creek Complex and the Late Woodland Period in the Central Plains (Daniel R. Haas)
2:30 Diffusion and Acculturation in Woodland Cultures on the Western Prairie Peninsula (David W. Benn)
2:45 Discussant: Wilfred D. Logan
3:00 Discussant: James A. Brown

GENERAL SESSION 4: GEOMORPHOLOGY/LITHIC ANALYSIS

Main Lounge, 1:15-3:00 p.m., Friday, November 7
Chair: Dean Thompson (Soil Conservation Service)

1:15 Soil-Geomorphic Evidence for Widespread Movement of Dune Sand on the Central Great Plains During the Altithermal (Daniel R. Muhs and Richard F. Madole)
1:30 Soil Stratigraphy and Late Holocene Environments of the Upper Walnut River Basin, Kansas Flint Hills (Joe Alan Artz)
1:45 Interpretation of Climatic Change at the Pleistocene-Holocene Boundary Using Soils Associated with Paleo-Indian Cultural Levels at the Sheaman and Agate Basin (Brewster) Sites in Eastern Wyoming (Richard G. Reider)

2:00 Prehistoric Steatite Sources, Procurement Methods, and Use (George C. Frison)
2:15 Chipped Stone Raw Materials at the Overhead Site (Toby Morrow)
2:30 Lithic Resources in the Overthrust Belt, Wyoming (Barbara J. Hickman)
2:45 Fire-Cracked Rock Tools at the White Buffalo Robe Site, North Dakota (Steven K. Lovick)

GENERAL SESSION 5: PHYSICAL ANTHROPOLOGY AND ARCHAEOLOGY

Main Lounge, 3:15-4:15 p.m., Friday, November 7
Chair: A. K. Fisher (University of Iowa)

3:15 The Archaeology of the Crow Creek Site Massacre (Thomas E. Emerson)
3:30 Craniometric Evidence on Mandan Origins (Douglas W. Owsley, Darcy F. Morey and William B. Turner)
3:45 Intrasite Variation in Arikara Crania from the Mobridge Site (39WW1): Evidence for Microevolutionary Change (Douglas W. Owsley)
4:00 Hominid Brain Evolution: Gradual, Autocatalytic and Punctuational Models (Laurie Godfrey, Kenneth Jacobs, and John R. Cole)

POSTER PAPERS

Ballroom, 3:30-4:30 p.m., Friday, November 7

Pryor Mountain Archaeological Research Project (Robson Bonnichsen)

A Wetter First Millennium AD; Pollen and Land Snail Records from Oklahoma (Stephen A. Hall)

Early Cucurbits in the Midwest (Frances B. King)

Osteometrics on a Modern Sample of Odocoileus virginianus (James R. Purdue)

Magnetic Surveying of Archaeological Sites (John Weymouth and Rob Huggins)

Kimmswick: Clovis-Mastodon Association Revisited (R. W. Graham and M. M. Kay)

A White Tail Deer Dental Eruption Sequence--Time Correlation and Seasonal Inferences for Prehistoric Populations (Joseph B. Meder)

Archaeological Applications for Close-Range Stereo-Photogrammetry and Electronic Distance Measuring Units (Sarah Dennett and Hans Muessig)

Midwestern Lithic Resources (Toby Morrow)

SPECIAL PRESENTATION

Ballroom, 4:30-5:00 p.m., Friday, November 7

After Maximilian and Bodmer on the Upper Missouri River: A Travelogue (W. Raymond Wood)

RECEPTION

Main Lounge, 6:30-7:00 p.m., Friday, November 7
Chair: Cash bar

BANQUET AND ADDRESS

Main Lounge, 7:00-9:30 p.m., Friday, November 7

Bill of Fare: Wine; brouchet of tenderloin; trimmings

Speaker: Dr. Robert Bell, University of Oklahoma, to be introduced by Dr. David Baerreis, University of Wisconsin

Topic: Reflections on Southern and Central Plains Prehistory

BUSINESS MEETING - PLAINS ANTHROPOLOGIST

Main Lounge, 9:30-10:30 p.m., Friday, November 7

SATURDAY

GENERAL SESSION 6: METHOD AND THEORY

Illinois Room, 8:30-11:30 a.m., Saturday, November 8
Chair: Lise S. Tatum (Grinnell College)

8:30 Modified Bone and Chronology: An Experimental Study (Joan T. Richtsmeier and Christopher P. Schoen)

8:45 Procurement Strategy, Utilization, Disposal and Attrition as Evidenced by Mammal Bone from 14BU9 (Butler County, Kansas) (Chérie E. Haury)

9:00 Utilizing Dental Annuli as an Indicator of Age and Seasonality for Archeological Vertebrate Fauna (Susan M. Monk and John R. Bozell)

9:15 Organizational Change on the Northwestern Plains (Gary M. Brown)

9:30 Stone Rings: An Analysis of Selected Assemblages from the Northern Montana Plains (Sara Alicia Scott)

9:45 Fire Pit Sites and Subsistence Strategy on the Northwestern Plains (George Zeimens)

10:15 A Magnetometer Survey of Big Hidatsa, Knife River Indian Villages National Historic Site (Randy V. Bellomo)

10:30 A Proton Magnetometer Search for the Rock Creek Station on the Oregon Trail, Nebraska (John Weymouth)

10:45 An Archeological Examination of Rock Creek Station State Historical Park, Nebraska (Gayle F. Carlson)

11:00 Sampling Methodology and Site Predictors, Salt Wells Resource Area, Southwest Wyoming (Pat Treat and Russel Tanner)

11:15 Computer Data Management of Site and Artifact Information from Harry S. Truman Reservoir Project (Carol V. Berg and Michael J. Reagan)

GENERAL SESSION 7: HISTORICAL ARCHAEOLOGY

Yale Room, 8:30-10:30 a.m., Saturday, November 8
Chair: Thomas Charlton (University of Iowa)

8:30 Research Methods and Findings of an Historic Site Survey of 121,000 Acres in Central North Dakota's Garrison Dam Diversion Project (Dennis J. Starr)

8:45 Homesteading and Historic Settlement Patterns in the Arkansas River Valley: Historical Research and Historic Sites Archeology in the John Martin Reservoir Project (Paul D. Friedman)

9:00 Excavations at 5MF605: An Early Historic Site in Northwestern Colorado (T. Reid Farmer and Paul D. Friedman)

9:15 Skidi Pawnee Astronomy and Archaeology--A Predictive Link? (Bryce Little)

9:30 Preliminary Archaeological Investigations at Buxton (13MO10), An Early 20th Century, Multi-Ethnic, Coal Mining Town in Southern Iowa (David M. Gradwohl and Nancy M. Osborn)

9:45 The Bairoil "Tipi Ring" Site (48SW2369), Sweetwater County, Wyoming (Edward W. Jess)

10:00 Euro-American Archaeology at Plum Grove, Iowa City, 1974-1980 (Thomas H. Charlton, Stephen C. Lensink, and James A. Sartain)

10:15 Measuring Native American Cultural Change in the Early Historic Period--Sakakawea Village, North Dakota (Stanley A. Ahler)

ABSTRACTS

Ahler, Janet Goldenstein (University of North Dakota) ACCULTURATION AS A STATE OF MIND.

Indicators and degrees of acculturation among indigenous people have been of interest to cultural anthropologists for some time. The methods of investigating the acculturation phenomenon have been varied. The indicators or identifiers of acculturation chosen by anthropologists have focused primarily on material culture. These indicators are becoming less and less useful as discriminatory items among Native Americans. It may be necessary to focus more on identifying acculturation on the basis of a group's cognitive and affective affiliation.

Ahler, Stanley A. (University of North Dakota) MEASURING NATIVE AMERICAN CULTURAL CHANGE IN THE EARLY HISTORIC PERIOD--SAKAKAWEA VILLAGE, NORTH DAKOTA.

The Sakakawea Village is one of three major earthlodge village sites occupied by the Hidatsa during the first third of the nineteenth century A.D. This period is predicted to be a time of rapid change in Hidatsa culture due to the progressively greater influence from the expanding Euro-American trade system. Test excavations at the site in 1976 and 1977 provide well controlled artifact samples from more than a meter of well-stratified midden deposits, yielding data useful for quantitative assessment of both the nature and magnitude of cultural change as reflected in material culture. Analysis of stratigraphic artifact frequency and density data reveals several predictable changes in the occurrence of ceramics, chipped stone materials, and certain types of trade items, as well as unanticipated results concerning changes in Native stone technology. This study provides an important data base and methodological framework for future investigations of cultural change, a major research objective of the ongoing archeological program at the Knife River Indian Villages National Historic Site.

Albanese, John (Casper, Wyoming) GEOLOGIC FACTORS AFFECTING SITE PRESERVATION AND DISTRIBUTION IN THE CENTRAL POWDER RIVER BASIN, WYOMING.

Archeological surveys in the central grasslands portion of the Powder River Basin indicate that approximately two-thirds of the open non-stratified sites occur in drainage divide areas where thin, surficial deposits of colluvium overlay tertiary bedrock. Late Prehistoric sites appear to be the most common, and constitute 50% or more of the dateable open sites. This apparent predominance of Late Prehistoric sites may result from the progressive destruction of sites through time by erosion. At least seven major periods of erosion have occurred since the beginning of Holocene time. In contrast to the occurrence of hundreds of open non-stratified sites, only fourteen stratified, buried sites have been reported to date in the central portion of the basin. These stratified sites are mainly bison kill sites that range in age from Paleo-Indian through Late Prehistoric periods. They generally occur in minor tributary drainages of fourth order or less. These buried sites are preserved because of

rare and fortuitous combinations of hydraulic and sedimentary events. They are rare because of geologic factors. Cultural activity involving bison kills may have been more common than indicated by the preserved record.

Alex, Lynn Marie (South Dakota School of Mines and Technology) A FORTIFIED LATE PREHISTORIC SITE IN WESTERN SOUTH DAKOTA.
Two seasons of excavation at the Smiley-Evans (39BU2) Site, on the Belle Fourche River in western South Dakota, have revealed the presence of an intensively utilized fortified campsite of the Late Prehistoric Period. The site's physical characteristics, particularly its location and fortification system consisting of ditch and stockade, as well as artifacts recovered in the original test excavations, suggested the possibility of site-unit intrusion from a component belonging to the Initial Variant of the Middle Missouri Tradition. In order to test this hypothesis, as well as gain some idea of the variability present at the site, a stratified sampling design was selected to guide the 1980 excavation. Such a strategy took into consideration the results of a proton magnetometer survey of the area on the interior side of the fortification as well as initial findings at the site. A preliminary account of the results of this work is presented.

Artz, Joe Alan (University of Kansas) SOIL STRATIGRAPHY AND LATE HOLOCENE ENVIRONMENTS OF THE UPPER WALNUT RIVER BASIN, KANSAS FLINT HILLS.
A study of alluvial soils in the upper Walnut River Basin of the Southern Flint Hills of Kansas documents ca. 4000 years of changing fluvial environments. Radiocarbon dates from Late Archaic occupations preserved in a buried paleosol suggest the upper Walnut Valley was slowly aggrading between ca. 4000 and 2000 B.P. Soon after 2000 B.P., renewed channel activity led to a series of localized depositional events, ending by ca. 1500-1000 B.P. At this time, most valley surfaces were stabilized at present levels, as area streams began entrenching to form narrow, deeply incised floodplains. This chronology, interpreted as the Walnut Basin's response to climatic change, correlates with biotic and stratigraphic records from other localities on the southeast margin of the Central Plains and further supports the general regional synchroneity of late Holocene paleoenvironmental events in the area.

Baugh, Timothy G. and Fern E. Swenson (University of Oklahoma/Oklahoma Archaeological Survey) A STUDY IN REGIONAL EXCHANGE: CADDO, PUEBLO, AND JUMANO INTERRELATIONSHIPS.
The Edwards I (34BK2) and Taylor (34GR8) sites in southwestern Oklahoma contain materials which can be assigned to the Wheeler Complex (A.D. 1500-1750). On the basis of our ceramic analysis, this complex appears to be a local development out of the Washita River Phase (A.D. 1100-1450). However, there are also a number of Southwestern and Southeastern pottery traditions represented at these sites. This paper will focus on these trade ceramics and their implications for a regional exchange system. From this information we will suggest a macrosystem model for a structural examination of this far-reaching social system. In addition to the archaeological data, we will briefly present ethnohistoric data which substantiate the macrosystem model. On the basis of these data, we submit that the Jumano played a key role in the interaction between Hasinai villages and Pecos Pueblo.

Bellomo, Randy V. (Florida State University) A MAGNETOMETER SURVEY OF BIG HIDATSA, KNIFE RIVER INDIAN VILLAGES NATIONAL HISTORIC SITE.
Big Hidatsa, which is part of the Knife River Indian Villages National Historic Site, is situated along the Knife River approximately three miles from its confluence with the Missouri River in Mercer County, North Dakota. To date, two magnetic surveys have been completed at Big Hidatsa: one during the summer of 1978 and one during the summer of 1980. This paper discusses the brief history of the site, the principles of magnetic surveying, and the analysis and interpretation of magnetic data collected from areas of the site which were surveyed during the 1980 field season and later excavated.

Benn, David W. (Luther College) DIFFUSION AND ACCULTURATION IN WOODLAND CULTURES ON THE WESTERN PRAIRIE PENINSULA.
This paper examines the role of diffusion in the relationships between Woodland cultures of the Midwest and Plains. The premises to be investigated are: either Woodland Culture was extraordinarily persuasive and influenced prairie peoples to undergo extensive culture change, or cultural evolution was roughly parallel in the Midwest, Prairie Peninsula, and Plains and acculturation of common technologies and symbols was the result of similar cultural systems absorbing similar patterns to reinforce their ideologies and productive base. The evidence for Early, Middle, and Late Woodland culture periods and Plains Villagers is discussed. It is concluded that the latter premise is a more realistic characterization of culture history.

Berg, Carol V. and Michael J. Reagan (University of Missouri) COMPUTER DATA MANAGEMENT OF SITE AND ARTIFACT INFORMATION FROM HARRY S. TRUMAN RESERVOIR PROJECT.
A systematic approach to data collection and management is illustrated by the artifact and site catalogue information from survey and mitigation. The Smithsonian SELf-GEnerating Master (SELGEM) software package was the principal tool. Large SELGEM data files were accumulated, manipulated, and restructured; query searches generated subfiles and plain text reports for specific research needs; and maximum flexibility was retained since records of variable lengths could be added or deleted without disturbing the integrity of the system. Features of the system discussed include: data definition, entry, maintenance and storage; master file creation and correction; report writing routines and interface with SPSS; and computer and operator costs.

Bettis, E. Arthur (Iowa State University) HOLOCENE ALLUVIAL FILLS IN THE PRAIRIE PENINSULA: PROPOSED CORRELATIONS AND IMPLICATIONS FOR ARCHAEOLOGY.
Rates of erosion and deposition of sediments in streams and accumulation of sediments in bogs have varied in an episodic fashion during the Holocene on the Prairie Peninsula. It is inferred that climate change is the principal cause of the observed episodes of fluvial activity. Other factors such as vegetation changes and complex response have also affected the fluvial system and caused variations in alluvial fill sequences across the region. Division of Holocene alluvial deposits into four major depositional units allows for regional correlation of several sequences: (1) deposits accumulating between 10,500 and 8,000 years ago; (2) deposits accumulating between 7,500 and 3,000 years ago; (3) deposits accumulating between 3,000 years ago and Euro-American settlement; (4) postsettlement deposits. Two minor episodes are recognized in unit 3 which are of significance in the archaeology of Woodland and later prehistoric cultures. Recognition of these alluvial fill units and their distributional pattern within the valley landscape allows assessment of the preservation potential of archaeological sites from a given time period of the Holocene. This permits concentration of site location techniques in areas where they are likely to be most productive and has resulted in greater success in locating buried Woodland sites in western Iowa than more traditional methodologies have to date.

Bobalik, Sheila J. (University of Oklahoma) LITHIC RESOURCE RECONNAISSANCE IN THE FLINT HILLS AREA OF NORTH-CENTRAL OKLAHOMA.
An archaeological survey of the limestone cuesta plains in Kay and Osage counties of north-central Oklahoma was conducted by the University of Oklahoma during the summer of 1980. These investigations focused on the identification of lithic resource locales. A Wreford chert quarry and nine Kay County chert quarries were recorded for this area. Preliminary analysis indicates an emphasis on extraction and initial reduction activities with little evidence of on-site thermal alteration.

Bonnichsen, Robson (University of Maine/Institute for Quaternary Studies) HIGH-ALTITUDE ADAPTATION AT FALSE COUGAR CAVE: A PRELIMINARY STATEMENT.
False Cougar Cave is located at approximately 2590 m (8,535 ft.) a.s.l. on East Pryor Mountain in south-central Montana. This small but deeply stratified limestone cave-rockshelter contains a long stratigraphic sequence bracketing the Holocene and late Pleistocene epoch. The objective of the paper will be to discuss the geological, faunal, and archaeological records excavated between 1978-1980. Faunal remains collected suggest that man's primary response to this high-altitude environment has been the procurement of small mammals and birds. The implications of these new data will be discussed in light of other regional high-altitude adaptation models.

Bonnichsen, Robson (University of Maine/Institute for Quaternary Studies) PRYOR MOUNTAIN ENVIRONMENTAL ARCHAEOLOGICAL RESEARCH PROJECT. Poster Paper.

Bozell, John R. (see Monk, Susan M.)

Bradley, Larry (University of South Dakota) THIRTY YEARS OF HISTORIC SITES ARCHAEOLOGY IN SOUTH DAKOTA. No abstract.

Brockington, Paul E., Jr. (University of Kansas) TESTING A MODEL OF CULTURAL DRIFT: LOWER MISSOURI HOPEWELL DATA. No abstract.

Brown, Gary M. (Arizona State University) ORGANIZATIONAL CHANGE ON THE NORTHWESTERN PLAINS.
The process of organizational change on the Northwestern Plains can best be described as one of intensification of one among several pre-existing strategies for human subsistence. Although communal bison hunting can be traced back to Folsom times on the Plains, the regular occurrence of highly organized and ritualized cooperative hunts appears to characterize the Late Plains Archaic, while the use of drive lines and jumps accelerates markedly during the Late Prehistoric period. A continual increase in the number of human inhabitants can also be inferred. When viewed in structural terms, this pattern of intensification bears important similarities to the process of agricultural intensification observed elsewhere in North America toward the end of the Archaic. The paper examines alternative explanations for intensification on the Northwestern Plains in an effort to determine whether ethnohistorically described Plains tribal societies had developed primarily as part of an evolutionary process or whether they are largely the product of changes brought about by the introduction of the horse. Although the latter hypothesis has great appeal, the alternative can be supported using archeological data. The implications of this issue to models of prehistoric social organization are also considered.

Brugge, David M. (National Park Service) APACHEANS IN PLAINS CULTURE HISTORY.
Recognition of linguistic and sociopolitical entities in archeological data remains a major obstacle in the reconstruction of High Plains culture history. In dealing with the sparse remains of nomadic hunters, definition of tribal and linguistic groups is extremely difficult. The late introduction of pottery, agriculture, rock art motifs, and other complexes by Pueblo refugees from Spanish rule aids in tracing Apachean distributions in the seventeenth and eighteenth centuries, but obscures earlier evidence of occupation by Athabaskans. Later sites of Comanches and other tribes who displaced the Apaches further complicate the problems of identification. The questions of when the first Apacheans appear on the High Plains and whether they came directly from the north or out of the foothills of the Rockies still lack conclusive answers. While detailed analyses of projectile points and other single artifact types will assist in attacking the problem, only the fullest description possible of total lifeways, based on large numbers of sites, will permit any assurance that the remains of any ethnic group have been isolated from the remains of peoples with similar adaptations to the same environment.

Buehler, Kent J. (University of Oklahoma) LOWER SALT CREEK VALLEY ARCHAEOLOGY: REPORT ON THE THIRD SEASON'S INVESTIGATIONS AND GENERAL OVERVIEW.
The University of Oklahoma continued its cultural resource inventory of the lower Salt Creek valley in north-central Oklahoma. This year's research consisted of test excavations at four sites as well as additional site survey. Results of the preliminary analysis of these activities and a general overview of the prehistory of the lower valley are presented.

Campbell, Robert G. and Karl V. Winton (Texas Tech University) A POSSIBLE PLAINS WOODLAND FORAGING STATION IN THE MID-CANADIAN AREA, NEW MEXICO.
Archaeological survey and excavation were conducted in conjunction with a Texas Tech University field training program during the summer 1980 along Ute Creek and its tributaries located on the border of the Mid-Canadian and southern Las Vegas Plateau. The research was designed to first determine the existence, temporal extent, and nature of prehistoric occupation in the area and second to detect the presence or absence of early Neo-Indian period utilization of the area. The research in the selected zone, Ventana Mesa, an elongated north-south Mesa extension of the Las Vegas escarpment overlooking the wide Canadian plain, resulted in the recovery of much lithic debris at open encampments, rock shelters, and possible crude circular structures. The lack of ceramics made it difficult to determine cultural relationships since the area lies intermediate between Anasazi to the west, Plains Woodland-Panhandle to the north and east, and Jornada to the south. But the style of projectile points and absence of ceramics suggest that utilization was most likely by Plains Woodland peoples. The large amount of lithic debris, lack of other materials, and presence of quarries indicate lithic procurement activities were of primary importance. Seasonal hunting also occurred, but evidence for plant gathering and horticultural activities is minimal or absent.

Carlson, Gayle F. (Nebraska State Historical Society) AN ARCHAEOLOGICAL EXAMINATION OF ROCK CREEK STATION STATE HISTORICAL PARK, NEBRASKA.
During the period June-September 1980, archaeological investigations were carried out at Rock Creek Station State Historical Park, located about six miles southeast of Fairbury in southeastern Nebraska. The work at this site, made famous by the James Butler "Wild Bill" Hickok-David McCanles incident, in which McCanles and two other men were killed, was conducted under the author's supervision as a cooperative project between the Nebraska State Historical Society and the Nebraska Game and Parks Commission, to provide information for reconstruction purposes. This site, which consisted of two stations or ranches alongside the Oregon Trail on opposite banks of Rock Creek, was operated between about 1856 and the late 1860's. Archaeological investigations were preceded by a magnetometer survey (Physics Department, University of Nebraska-Lincoln), and were also assisted by aerial infrared photography (Geography Department, University of Nebraska-Omaha), as well as early conventional photographs, maps, drawings, and written descriptions. Excavations at the west ranch uncovered the remains of the house and attached store, which had been at least partially destroyed by fire. Work at the east ranch was less successful because of damage from plowing. Further work will be necessary to determine the extent of this damage.

Carlson, John (Wyoming Recreation Commission) THE WYOMING STATE HISTORIC PRESERVATION PLAN.
This paper presents the goals and philosophy of the Wyoming State Historical Preservation Office as they relate to the identification and management of the state's cultural resources. The past few years have seen tension created by the needs for both development and conservation of the state's resources. Although the SHPO's staff is committed to the preservation of Wyoming's cultural resources, it has also been its policy to strive for a balance between the two needs. We see development as part of the historical process, but development which needs evaluation for

its effect upon the cultural environment. A basic element in the approach taken by the SHPO and staff has been to encourage the people of the state to help themselves preserve their own heritage. The impact associated with the development of the state's resources has vastly increased the workload of the Wyoming preservation staff. The most important objective of the program's management component is to secure and organize the personnel needed to handle that increased workload. Due to the lack of staff, the stance of Wyoming's preservation program has to a large degree been defensive. The recent reorganization of the Wyoming Recreation Commission and the addition of staff members has allowed us the opportunity to take a limited offensive. The addition of staff members has allowed the SHPO to conduct surveys of historical, archaeological, and recreational sites throughout the state. Thus, the state of Wyoming is entering a new era of cultural preservation while allowing development to proceed.

Charlton, Thomas H., Stephen C. Lensink, and James A. Sartain (University of Iowa) EURO-AMERICAN ARCHAEOLOGY AT PLUM GROVE, IOWA CITY, 1974-1980.

Four field seasons of excavations and survey (1974, 1978, 1979, 1980) at the Lucas house and remaining grounds, coupled with documentary studies and oral history, have provided a new perspective on the social and economic integration of a farm residential unit into a developing urban area in the last half of the nineteenth century and the first four decades of the twentieth century. Research design, data recovery techniques, and laboratory analyses have been developed to treat late Euro-American occupations in Iowa.

Chevance, Nicholas (University of Nebraska) CHIPPED STONE FROM THE SMILEY-EVANS SITE (39BU2), SOUTH DAKOTA.

The problem of a fortified habitation site in the northern Black Hills is addressed by analysis of the chipped stone material. Based on this analysis, a site function is inferred. In addition, probable lithic source areas suggest trade and/or migration routes and cultural affiliations. quartzites (fine & coarse), (cobble) cherts, chalcedonies (KRF4), glass,

Chomko, Stephen A. (Office of the Federal Inspector) and B. Miles Gilbert (University of Kansas) THE LATE PLEISTOCENE-HOLOCENE MAMMALIAN RECORD IN THE NORTHERN BIGHORN MOUNTAINS, WYOMING.

Paleontological and archaeological studies at Natural Trap Cave and a series of rockshelters on the Little Mountain Plateau, Wyoming, have provided a faunal sequence beginning before 27,000 ya to present. Interpretation of the faunal data indicates that a steppe-boreal forest community was replaced by a steppe community with tundra elements by ca. 14,000 ya. This community persisted until about 10,000 ya at which time modern species begin to appear in the record. During the Holocene there is evidence for Pleistocene relict populations and some fluctuations in the composition of the faunal communities on the Plateau.

Chomko, Stephen A. (Office of the Federal Inspector) RESEARCH GOALS, MANAGEMENT OBJECTIVES, AND ENERGY DEVELOPMENT.

Ideally there should be no difference between archaeological research and cultural resource management. However, at present, Wyoming exemplifies the very real differences between the two approaches to the same data base. The energy industry is accelerating the exploitation of the vast reserves of oil, gas, coal, and uranium on federal, state, and private lands. Almost every project requires federal involvement, thus requiring compliance with federal legislation, mandates, and directives. The sheer volume of the work to be done poses severe problems to the archaeologist: how to satisfy the research goals of the discipline? how to meet the objectives of the land manager? how to meet the demands of the energy industry? This symposium will explore the federal and state cultural resource programs and then focus on some of the research which has developed in response to cultural resource management needs and obligations.

Chomko, Stephen A. (see McKern, Scott T.)

Cole, John R. (see Godfrey, Laurie)

Davis, Carl (Custer National Forest) THE VIEW FROM OUTSIDE LUDLOW CAVE. Some 170 archaeological sites were recorded during the course of a two-year cultural resource inventory of the North Cave Hills in the extreme northwestern corner of South Dakota. The project was sponsored by the United States Forest Service. The range of site types includes rock art, lithic scatters, tipi ring sites, and a deeply buried stratified Archaic period campsite. The stratified, multicomponent Archaic/Late Prehistoric period campsite--Lightning Springs--was test excavated as part of the project. Dug to a depth of 11 feet, the site yielded 12 discrete occupational levels associated with numerous fire hearths and basins. Sequential McKean floors at the lowest levels yielded points and blades, a mano and milling slab, and numerous ungulate and small mammal remains, all of which demonstrate a classic Archaic pattern of exploitation in this area.

Davis, Leo Carson (Doane College) LATE PLEISTOCENE/HOLOCENE ENVIRONMENTAL CHANGES IN THE CENTRAL PLAINS OF THE UNITED STATES: THE MAMMALIAN RECORD.
The Jones local fauna of Meade County, Kansas, is both the oldest (26,700 to 29,000 years B.P.) and most diverse fauna in the late Pleistocene of Kansas and Oklahoma. Its vertebrate remains suggest a cooler, drier climate than that of the present. Cool conditions persisted until 11,100 years B.P. as indicated by the Robert local fauna of Kansas and the Domebo mammoth kill site of Oklahoma. By the time the Coffey site was occupied (5200 years B.P.), the modern fauna of the Central Plains had been established. Evidence exists that certain species may have arrived later (pronghorn antelope, A.D. 1000; jackrabbit, A.D. 1100), and the bison may have expanded into and withdrawn from this area twice in the last 6000 years.

Davis, William E. (Northern Arizona University) TIPI RINGS: A RE-EXAMINATION.
Stone circles are often concluded to be the remains of tipis. This is often based upon an inadequate knowledge of the characteristics and limitations of the actual structures. Further, this traditional explanation of stone circles is often accepted without question and new ideas are constructed upon uninformed inferences. Re-examination of the logic used in traditional explanations and a comparison with data from the Copper Mountain Stone Circle Study, Shoshoni, Wyoming, suggest that these traditional concepts are often inadequate.

Dennett, Sarah and Hans Muessig (Dennett, Muessig & Associates, Limited) ARCHAEOLOGICAL APPLICATIONS FOR CLOSE-RANGE STEREOPHOTOGRAMMETRY AND ELECTRONIC DISTANCE MEASURING UNITS. Poster Paper.
The techniques of close-range stereophotogrammetry and electronic distance measuring (EDM) offer important alternatives to traditional methods of recording archaeological sites and features. These techniques can be used to document and map in a variety of situations. Products resulting from the use of stereophotogrammetry include contour maps, scaled drawings and cross sections of great precision and accuracy. The photographic images are made on glass plates, thus serving as permanent records for future study and analysis. Close-range stereophotogrammetry and EDM may be used as alternatives to, or in conjunction with, traditional recording methods. In certain circumstances they can result in significant savings of both time and labor. Use of stereophotogrammetry to document rock art surmounts difficulties often associated with the traditional recording methods of tracing and sketching. The field work is rapid, and does not require physical contact with the rock surface or the figures. The technique permits documentation of the context, as well as the dimensions and spatial orientation of the rock art. Exfoliation and natural deterioration of the rock

surface may be examined using contour maps and cross-sections produced from stereophotogrammetric images, or by using the images themselves. Finally, the drawings, inked on mylar, are easily reproduced, durable and easy to store. In circumstances involving surface scatters or excavations, close-range stereophotogrammetry can be used to produce precise measurements, detailed mapping, cross-sections, and a three-dimensional photographic record of selected, or all, features. In certain cases it can be decidedly faster, and require less labor, than traditional methods--a factor that may be crucial in mitigation situations. At sites where stereophotogrammetry is not practical, use of an EDM unit may be used to map surface features and contour intervals, the result being both a base map and a pedestrian survey of the site.

Eckles, David (University of Wyoming/Office of the Wyoming State Archeologist) THE EVIDENCE FOR SUB-REGIONAL SETTLEMENT SYSTEMS IN THE EASTERN POWDER RIVER BASIN.

It has been suggested that there may have been subregional settlement systems in the Eastern Powder River Basin during the later time periods, from Middle Archaic through Late Prehistoric times. The goal of this paper is to determine if there were two such systems in the Eastern Powder River Basin, one cycling from the Laramie Mountain Range/Hartville Uplift area, and one cycling from the Black Hills and pine ridge area of northeastern Wyoming. Data from cultural resource surveys will be the primary source used. Analysis of lithic raw materials, including source analysis, tool use, and debitage production, will be presented. The implications of subregional settlement systems on prehistoric socio-cultural development will be noted.

Eddy, Frank W. (University of Colorado) and T. Reid Farmer (Science Applications Inc.) PREHISTORIC UTILIZATION OF THE ARKANSAS RIVER VALLEY: ARCHEOLOGICAL SURVEY IN THE JOHN MARTIN RESERVOIR PROJECT, SOUTHEAST COLORADO.

In the summer of 1980, Science Applications Inc. conducted an archeological survey of 25,000 acres around John Martin Reservoir in the Arkansas River Valley of southeastern Colorado for the U.S. Army Corps of Engineers, Albuquerque District. The high site density encountered indicates an intensive prehistoric use of the project area. Unfortunately, there is a dearth of chronologically sensitive artifacts on the sites discovered, which has restricted the ability to model diachronic change in the area. However, models are presented for site types that show differential utilization of the various resource zones available on the terraces bordering the Arkansas River.

Emerson, Thomas E. (University of Illinois) THE BBB MOTOR SITE FIGURINES AND MIDDLE MISSISSIPPIAN FERTILITY SYMBOLISM.

Two bauxite effigy figurines were recently recovered during University of Illinois, Urbana FAI-270 excavations at the BBB Motor Site near Cahokia in the American Bottom, Illinois. This work is being sponsored by the Illinois Department of Transportation as part of a highway salvage program. Ceramic evidence and radiocarbon assays indicate the site is assignable to the Stirling Phase of the Middle Mississippian and dates to about A.D. 1200. Both figurines display clear thematic associations with agricultural fertility. The portrayed symbolism of the carving, the associated botanical remains, and the placement of the figurines within the site all suggest the existence of ritual activity reminiscent of Green Corn ceremonialism. On a general level, similarities of Middle Mississippian symbolism to that of historic southeastern and prairie aboriginal groups is discussed.

Emerson, Thomas E. (University of Illinois) THE ARCHAEOLOGY OF THE CROW CREEK SITE MASSACRE.

The remains of about 500 men, women, and children were recovered during archaeological salvage excavations conducted in the outer fortification ditch of the Crow Creek Site (11BF11) near Chamberlain, South Dakota. The remains showed evidence of violent death and mutilation. Ceramics

associated with the skeletal material were types associated with the Campbell Creek and Talking Crow Ware groups. A single radiocarbon date run on charcoal collected from the bone bed matrix yielded a corrected date of A.D. 1325±62 (WIS-1074). Based on the available evidence the massacre victims appear to be the inhabitants of the Wolf Creek component at Crow Creek which is affiliated with the Initial Coalescent. These new excavations give additional support to those who have suggested that the initial intrusion of Central Plains influence into South Dakota took place as early as the late 1200's and that large fortified villages were present by the mid-1300's.

Falk, Carl R. (see Semken, Holmes A., Jr.)

Farmer, T. Reid (see Eddy, Frank W.)

Farmer, T. Reid and Paul D. Friedman (Science Applications Inc.) EXCAVATIONS AT 5MF605: AN EARLY HISTORIC SITE IN NORTHWESTERN COLORADO.

In June of 1980, Science Applications Inc. conducted salvage excavations (funded by the U.S. Fish and Wildlife Service) to save portions of site 5MF605 that were to be destroyed by construction activities. This site is located on the east bank of the Green River in Brown's Park, Colorado, and is believed to be the remains of Ft. Davy Crockett, a fur trade post that was occupied from 1832 to 1842. Artifacts recovered from the excavations seem to generally fit this time period, but no structural remains of any sort were located. Artifacts and features are described, documentary evidence reviewed, and alternative explanations for the historical identity of the site are presented.

Fawcett, William B. (Wyoming Recreation Commission) and Thomas K. Larson (Larson-Tibesar Associates) A REMOTE SENSING PROJECT AT SOUTH PASS CITY STATE HISTORIC SITE, WYOMING.

During the summer of 1980, the Wyoming Recreation Commission conducted a remote sensing project at the nineteenth century gold mining town of South Pass City. The object of the project was to gather information on the applicability of different techniques for locating subsurface features such as foundations, cellars, and privies. A proton magnetometer survey of selected areas was conducted utilizing a 1 meter grid system; portions of the same areas were subjected to ground penetration radar study. Photogrammetric work using early historic and recent photographic images was also done in order to gather accurate information on building dimensions and locations. These data will be incorporated into a multistage archaeological research design for future investigations at the town site and surrounding locale.

Fox, Steven J. (North Dakota State University) PLAY AND GAMES AS SOCIAL BOUNDARY MAINTAINING MECHANISMS IN PLAINS INDIANS SOCIETIES.

Play and gaming behaviors are often important and effective media for structuring inter- and intra-group interaction. These activities are manifest in all human societies, gaining expression in both the secular and nonsecular domains of culture. Within the tribal-level societies of the Plains a broad spectrum of cultural settings exist for which play and gaming activities have situational salience. In addition to kinship networks as bases for defining and maintaining boundaries of relational spheres in tribes, there are a variety of structural alternatives. Nonkin-based social structural alignments are important in egalitarian societies, where members of descent groups are dispersed throughout numerous semiautonomous bands or villages that comprise a greater sociopolitical entity. Pan-tribal associations, such as the military "societies" of Plains cultures, are notable examples. The integration of, and cooperative interaction between, nonkin groups within tribes are essential to the maintenance of cohesive social organizations. Play and games are important vehicles for maintaining inter- and intra-group boundaries at the band, village, and tribal levels of Plains Indian societies.

Francis, Julie (University of Wyoming/Office of the Wyoming State Archeologist) DISTINGUISHING SITE FUNCTION OF OPEN LITHIC SCATTERS: AN EXAMPLE FROM THE COAL CREEK AREA, POWDER RIVER BASIN, WYOMING.

For many years, Plains archeologists have indiscriminantly used the terms 'lithic scatter,' 'occupation site,' 'open campsite,' etc. to describe surface artifact scatters. Occasionally, such sites may also have features such as firehearths or a few stone circles. Nevertheless, such sites have often been lumped into one category and there have been few attempts at either systematic description or examination of variation in this broad class of sites. This paper examines open artifact scatters using data from the ARCO Coal Creek Mine in the eastern Powder River Basin of Wyoming in order to arrive at a site typology based upon functional differences between sites. All artifactual remains (including both debitage and utilized materials) are analyzed with regard to energy extractive activities. This includes core reduction, manufacture and maintenance of tools, and generalized tool function. Several variables are abstracted from this data, and following Reher (1979), frequency histograms are used for initial discrimination between habitation and limited activity sites. Bivariate plots and other variables are then examined in order to arrive at more specific subgroupings. Using these procedures, two types of habitation and three types of limited activity sites within the class of open lithic scatters are suggested.

Friedman, Paul D. (see Farmer, T. Reid)

Friedman, Paul D. (Science Applications Inc.) HOMESTEADING AND HISTORIC SETTLEMENT PATTERNS IN THE ARKANSAS RIVER VALLEY: HISTORICAL RESEARCH AND HISTORIC SITES ARCHEOLOGY IN THE JOHN MARTIN RESERVOIR PROJECT.

Science Applications Inc. is currently undertaking the survey of cultural resources in the John Martin Reservoir Project Area for the U.S. Army Corps of Engineers, Albuquerque District. The research design for the project calls for the interpretation and evaluation of historic archeological sites using archival research methods. It has been the case that the information uncovered through historical research, combined with the data acquired during the survey from on-the-ground physical remains and associated material culture, allows for a better understanding of the historic Euro-American settlement patterns in the Arkansas River Valley of southeastern Colorado. A number of sites encountered during the survey are historic Euro-American farmsteads. The on-the-ground physical remains follow a similar pattern and include sandstone house foundations, concrete cisterns, out-buildings, and associated trash scatters. The artifacts in the trash scatter indicate a period of occupation from circa 1860 to 1940. However, the actual dates of occupation as derived from the remains of material culture are not tight enough to clearly define the patterns of historic settlement for the area. Archival research has helped to answer some of the questions raised about these historic sites and to fill in gaps in the data base. Sources include local public records such as deeds and assessment rolls, federal documents like the U.S. manuscript population census, oral history, and secondary works. The historical research has shown that the majority of the Euro-American farmsteads in the project area were established relatively late, usually sometime between 1900 and 1930. These tended to be simple family operated ranches with associated small scale domestic agriculture. Many of the homesteaders came from the Midwest or the neighboring states of Kansas, Nebraska, and Missouri. Almost all of the land in the project area was locally owned. Once the survey is completed all the historical data will be gathered together and analyzed using quantitative techniques. It is hoped that such factors as ethnic groupings, socioeconomic status, and land use can be examined in this manner.

Frison, George C. (University of Wyoming/Smithsonian Institution) PREHISTORIC STEATITE SOURCES, PROCUREMENT METHODS AND USE.
Steatite is known by a variety of terms including soapstone, amphibold, talc, and asbestos. It occurs in Precambrian rock in many locations in Wyoming, generally at higher elevations. Its cultural use in the form of carved vessels is the concern of this paper. Steatite is found exposed at the surface in blocks of sizes up to several hundred kilograms or as bedded material and most known exposures of this nature have been utilized prehistorically. In other cases, actual quarrying of the material was practiced and the material recovered from underground is easier to shape than that from above ground. Pieces were modified to the desired size and shape although vessel forms were often severely limited by the shape of the raw material. The material was reduced to the final shape by scraping, pecking, chopping, and grinding. The tool assemblage is simple and manufactured usually of local materials. Shaping was done at the source and the hollowing of the center was progressive and rarely are vessels at the early stages of the manufacture found at great distances from sources. The final product was a stylized vessel form, relatively heavy, and structurally poor. They were, however, able to withstand high temperatures.

Frison, George C. (University of Wyoming/Smithsonian Institution) PALEO-INDIAN OCCUPATION IN THE POWDER RIVER BASIN.
Few Paleo-Indian sites have been discovered in the Powder River Basin to date. The exception is the Carter/Kerr-McGee site with in situ Clovis, Folsom, Agate Basin-Hell Gap, and Alberta-Eden components. The site is only a remnant and still in place only through an accident of preservation. Using this site data and in addition that from nearby sites such as Agate Basin, Hell Gap, Casper, Colby, and Horner, evidence for a long-term, widespread Paleo-Indian occupation of the Powder River Basin and adjoining basins can be proposed. The Big Horn Mountains to the west on the upper drainages of Powder River demonstrate other late Paleo-Indian occupations that appear separate geographically from those in the Powder River Basin and these seem to be oriented toward a more hunting and gathering economy. Relationships and ecological barriers between the two are still poorly understood and present a major problem for future research.

Gibbon, Guy (University of Minnesota) ONEOTA ORIGINS REVISITED.
Models of Oneota origins are reviewed. None is found to be sufficiently confirmed to accept as an approximation to past reality. Suggestions are made for building more viable models.

Gilbert, B. Miles (University of Kansas) RECENT ADVANCES IN INTERDISCIPLINARY ANTHROPOLOGY.
The truth of Carlyle Smith's LAW, "it is seldom necessary to invent," is seen in the value of the interdisciplinary approach to anthropology. Needing information in a wide variety of natural and biological sciences, the ever eclectic anthropologist has benefited from working closely with colleagues in these complementary disciplines.

Gilbert, B. Miles (see Chomko, Stephen A.)

Godfrey, Laurie (University of Massachusetts), Kenneth Jacobs (University of Frankfort), and John R. Cole (University of Northern Iowa) HOMINID BRAIN EVOLUTION: GRADUAL, AUTOCATALYTIC AND PUNCTUATIONAL MODELS.
The tempo and pattern of macroevolutionary change have bearing on current controversies concerning the processes of macroevolutionary change. In this paper we reexamine the evidence for increase in cranial capacity in light of traditional arguments and interpretations, paying special attention to methodological problems inherent in data transformations and manipulations which can result from the applications of statistical

techniques divorced from explicit theory. Despite a large volume of descriptive material published on the subject, there has been relatively little attention paid to testing competing hypotheses of processes of macroevolutionary change (punctuational, gradual, autocatalytic); the descriptions which have emerged often reflect unstated and, perhaps, unconscious a priori assumptions made by researchers. Log-log transformations of cranial capacity data versus time are misleading and inappropriate. A uniform pattern of gradual change in hominid cranial capacity is less obvious than generally assumed.

Gradwohl, David M. and Nancy M. Osborn (Iowa State University) PRELIMINARY ACHAEOLOGICAL INVESTIGATIONS AT BUXTON (13MO10), AN EARLY 20TH CENTURY, MULTI-ETHNIC, COAL MINING TOWN IN SOUTHERN IOWA. During the summer of 1980 preliminary achaeological investigations were initiated at Buxton, Iowa, as a supplement to the studies being conducted in the oral history and archival history pertaining to that now-abandoned coal mining town once composed of several ethnic groups. Aerial photographs taken by the U.S.D.A. in 1937 and 1977 are being studied in an attempt to correlate surface features with the settlement plan of the town as indicated on a 1919 plat map. Photographs and information from former residents of Buxton are assisting in verifying the locations of buildings such as the company store, hotel, and YMCA, portions of which appear today as ruins at the site. A small, controlled, surface collection of artifacts was made in a cultivated field which was previously a portion of the residential area of the town. The investigations at Buxton are aimed at identifying material remains reflecting different aspects of the cultural system: domestic residential, commercial, industrial, recreational, religious, and educational. Social organizational factors will also be studied: the identification of several ethnic groups, the exploration of intra-ethnic group social stratification, and the investigation of economic differentiation between management personnel, individuals engaged in business, and mine workers.

Graham, Russell W. (Illinois State Museum) PLEISTOCENE-HOLOCENE PALEOENVIRONMENTAL IMPLICATIONS OF THE FALSE COUGAR CAVE LOCAL FAUNA. The False Cougar Cave local fauna is from a horizontal cave-shelter located at 2,590 m (8,535 ft.) a.s.l. in the Pryor Mountains of south central Montana. Many of the late Pleistocene and Holocene species in this local fauna were utilized by prehistoric occupants of the cave. Furthermore, change in the faunal composition of the megafauna demonstrates the late Pleistocene extinction of species of Bison sp. and Camelops sp. However, the late Pleistocene microfaunal communities do not reflect the magnitude of environmental changes that have been recorded in surrounding areas. Instead, changes in species composition of the microfaunal communities can best be explained by an individualistic model and local vegetational shifts.

Graham, Russell W. (Illinois State Museum) LATE PLEISTOCENE/HOLOCENE ENVIRONMENTAL CHANGES IN THE SOUTHWESTERN PLAINS OF THE UNITED STATES: THE MAMMALIAN RECORD. Vertebrate faunas from archeological/paleontological sites provide a record of environmental change in the southwestern Great Plains for the last 20,000 years. Pre-Clovis faunas (20,000-12,000 yrs. BP) reflect an open grassland environment with very few trees but the microfaunas suggest a climate with greater effective moisture than present. Clovis age (12,000-11,000 yrs. BP) faunas indicate an increase in effective moisture and a climate without severe seasonal extremes. However, the southwestern plains region was still primarily grassland at this time. By late Paleo-Indian times (11,000-8,000 yrs. BP), the climate continued to become moister with a peak during Folsom times (10,500-10,000 yrs. BP) and large areas of the southwestern plains were wooded. The climate became warmer and drier in post-Paleoindian times (8,000 yrs. BP-present) and the vertebrate communities were more like modern ones. Though fluctuations in effective moisture continued to occur throughout the Holocene,

the magnitude of these fluctuations was never as great as those of the late Pleistocene/early Holocene. These environmental changes have continuously affected the flora and fauna of the southwestern plains. As a result of these biotic changes, human adaptive strategies in procurement and utilization of the natural fauna have also been modified. Feedback between climatic and human modification of the environment has provided a complex evolutionary system for vertebrate communities of the Great Plains.

Graham, Russell W. (Illinois State Museum) and Marvin Kay (University of Arkansas) KIMMSWICK: CLOVIS-MASTODON ASSOCIATION REVISITED. Poster Paper. Excavations at Kimmswick, Missouri, for the last two years, 1979 and 1980, have demonstrated the association of the Llano Complex and the American mastodon, Mammut americanum. Two distinctly different stratigraphic units have yielded fluted artifacts, other stone tools, waste flakes, mastodon bones, and other extinct fauna. Preliminary investigations suggest that the Clovis-mastodon association represents a potential kill with processing and limited occupation. This poster details the geology, archeology, and paleontology of the Kimmswick site.

Grange, Roger T. (University of South Florida) SOME RECENT ADVANCES IN CENTRAL PLAINS ARCHAEOLOGY.
A discussion of the application of ceramic formula dating in the Central Plains and an experimental application of the method to the Arikara ceramic tradition.

Grosser, Roger (Corps of Engineers) FEDERAL INVOLVEMENT IN GREAT PLAINS ARCHAEOLOGY. No abstract.

Haas, Daniel R. (University of Missouri) A DISCUSSION ON THE STERNS CREEK COMPLEX AND THE LATE WOODLAND PERIOD IN THE CENTRAL PLAINS. The 1968 excavation at the Walker Gilmore site (25CC28) located in Cass County, eastern Nebraska, provided new information on late Woodland developments in the Central Plains. Five sequential occupations containing Sterns Creek pottery were defined below a Nebraska variant component. Radiocarbon dates from the second Woodland component ranged from the early twelfth century A.D. to the middle thirteenth century A.D. Site activities were relatively similar prior to the terminal Woodland excavation, representing semi-permanent habitations engaged in diverse hunting-gathering activities and limited horticulture. These earlier occupations displayed clusters of possible storage or drying structures associated with pits and hearths, a diverse tool assemblage and food remains including mammals, birds, amphibians, reptiles, fish, freswhater molluscs, tubers, nuts, bottle gourd, and squash. The terminal Woodland occupation reflected important changes in settlement structure and cultural content possibly representing shifts of settlement strategy. Analysis of the Sterns Creek complex at Walker Gilmore generated broader implications related to the Loseke Creek complex and the transition from late Woodland to the Central Plains tradition in the Central Plains.

Hall, Stephen A. (North Texas State University) A WETTER FIRST MILLENNIUM A.D.: POLLEN AND LAND LAND SNAIL RECORDS FROM OKLAHOMA. Poster Paper.

Hannus, L. Adrien (South Dakota State University) THE LANGE/FERGUSON SITE (39SH33).
A suspected Clovis mammoth kill site--southwestern Badlands, South Dakota. Preliminary test excavation results and geomorphological circumstance at 39SH33.

Harvey, Amy (Stevens College) CONCEPTIONS OF ONEOTA AND THEIR IMPLICATIONS FOR ANTHROPOLOGICAL RESEARCH.
Definitions of terms like Hopewell, Mississippian, and Archaic clearly affect the orientation of archaeological research. Defining Oneota as a "pottery culture" constrains, for example, the comparison of Oneota settlement-subsistence systems. In this paper the implications for anthropologically oriented research of this and other definitions of Oneota are discussed.

Hauff, Jeffrey L. (University of Wyoming/Office of the Wyoming State Archeologist) ECOLOGICAL DIVERSITY AND SITE PATTERNING WITHIN THE CENTRAL POWDER RIVER BASIN, WYOMING.
Due to recent energy development in the Powder River Basin, numerous portions of the Basin have received intensive cultural resource inventories. Several ecozones within the ecosystem have been traversed during these surveys. This paper explores the relationship of archeological sites and corresponding ecozones in which they occur. The concept of site density is also critically reviewed.

Haury, Chérie E. (University of Kansas) PROCUREMENT STRATEGY, DISPOSAL, AND ATTRITION AS EVIDENCED BY MAMMAL BONE FROM 14BU9 (BUTLER COUNTY, KANSAS).
This analysis of mammalian faunal remains from the middle Archaic component at the Snyder Site (14BU9) is directed toward the consideration of food procurement strategy, bone utilization, disposal, and attrition. Examination of evidence for disturbance and deterioration of bone elements suggests that: (a) there was an intensive utilization of bone by-products which resulted in considerable destruction of bone elements; and (b) bone waste was systematically disposed of or otherwise rapidly cut off from extensive exposure to weathering. Despite these factors, some artiodactyl bone elements which are large and dense enough to have had a good probability of surviving attrition processes are consistently absent from the assemblage. The observed patterns suggest a single kill, heavy butchering strategy may have been used in the procurement of these animals.

Heffington, Douglas (University of Oklahoma) PRELIMINARY REPORT ON A PLAINS VILLAGE HOUSE SITE IN NORTH-CENTRAL OKLAHOMA.
A generalized synopsis will be provided concerning 1979 excavations of a Plains Village house at the Uncas Site (34KA172) in Kay County, Oklahoma. In turn, a preliminary discussion will be presented involving a second structure excavated in the summer of 1980 at the same time. A comparison of the two houses will include considerations of temporal affiliation, architecture, and artifact assemblage.

Henning, Dale R. (Luther College) FROM WOODLAND, WHENCE?
The past decade has produced much new information pertinent to Woodland occupations in the northwest quadrant of Iowa and the states adjoining. Much larger populations and greater cultural diversity have been revealed. We now have cultural-demographic data suitable for construction of testable models pertaining to the evolution of the Initial Middle Missouri tradition. The potential for development of a Woodland-Great Oasis evolutionary model is considered.

Henning, Dale R. (Luther College) THE "TIMING" OF ONEOTA: PROBLEMS OF INTERRELATIONSHIPS.
Two decades ago, the Oneota cultural manifestation was generally regarded as protohistoric, easily assigned to one or another named Indian group, and offering little time depth. With application of radiocarbon assays to samples from Oneota sites, we find that several regional manifestations began as early as A.D. 1000 and, perhaps,

before. Oneota peoples were thus suddenly placed as contemporaries to other groups once regarded as antecedent to them. Given acceptance of the earlier dates, we must re-examine our thinking, placing Oneota into four to seven hundred year long cultural traditions which we must "fit" systematically into an evolving midwestern world. Some suggestions for evaluation and integration of several Oneota "group continuities" into the midwestern world of A.D. 1000-1700 are offered.

Hickman, Barbara J. (Western Wyoming College) LITHIC RESOURCES IN THE OVERTHRUST BELT, WYOMING.
In the fall of 1979, Archaeological Services of Western Wyoming College conducted a 2% inventory of 21,419 acres in the Overthrust Belt region of southwestern Wyoming for the Bureau of Land Management, Rock Springs District. Based on analysis of the modified lithic materials observed on prehistoric sites, certain conclusions may be drawn regarding material procurement and secondary lithic resource areas in the region. These secondary sources are discussed within a geological framework. Given this new information, it may now be possible to more accurately plot material distribution in this portion of the state.

Hovde, David M. (South Dakota Archaeological Research Center) MODIFIED CLAMSHELL FROM THE RAINBOW SITE.
Shell artifacts from the Rainbow site near Sioux City, Iowa, are described in categories of scrapers and projectile points. Ethnographic information concerning the use of shell gives precedence and lends support for the interpretations of the functions of these tools. The shell artifacts also are shown to complement the entire artifact assemblage and the style of life of the Rainbow, Woodland peoples.

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✓Hovde, David M. (South Dakota Archaeological Research Center) PRELIMINARY REPORT ON THE TESTING OF 39PN375, A POSSIBLE MIDDLE PLAINS ARCHAIC TIPI RING SITE.
This report summarizes the results of the survey and testing of the Hermosa Tipi Ring site during the summer of 1980. The site was found to consist of thirty stone rings averaging five meters across. The diagnostic material indicates the site was occupied from at least the Middle Plains Archaic.

3 groups rings
hearths on exterior
3 cultural layers

Jacobs, Kenneth (see Godfrey, Laurie)

Jacobson, George L., Jr. (University of Maine/Institute for Quaternary Studies) PERSPECTIVES ON THE MODERN VEGETATION AND THE POTENTIAL FOR RECONSTRUCTING THE VEGETATIONAL HISTORY OF THE PRYOR MOUNTAINS.
Present-day vegetation of the Pryor Mountains has a complex mosaic pattern that results from differences in the slope, aspect, soils, and moisture of the various habitats of the hillsides and canyons. Between ca. 1850 m and 2450 m the most common tree species is Douglas fir (Pseudotsuga menziesii), with scattered limber pine (Pinus flexilis) and Rocky Mountain juniper (Juniperus scopulorum). Dry south- and west-facing slopes at the same altitudes tend to be sage- (Artemisia tridentata) dominated grasslands, while moist stream bottoms have species such as aspen (Populus tremuloides), willows (Salix spp.), dogwood (Cornus stolonifera), and other mesic taxa. A parkland with scattered clumps of subalpine fir (Abies lasiocarpa) and Engelman spruce (Picea engelmanii) occurs above ca. 2450 m on limestone tablelands that have shallow, rocky soils. Local variation throughout the altitudinal transition is quite extreme, with very moist sites occurring within 100 m of the driest sage-dominated slopes. Lodgepole pine (Pinus contorta) occurs only rarely and in small stands, and other fire-adapted species are also rather uncommon; this and other evidence suggests that fire may not have had a major role in the vegetation dynamics in the Pryors for at least the last few centuries. Reconstruction of the vegetational history of the Pryor

Mountains should be possible, despite the absence of natural lakes whose sediments could be used for pollen studies. A number of the limestone caves contain thick accumulations of pack rat (Neotoma) middens that could be used as point samples in time of the vegetation that grew near the caves when the individual middens were built. In addition, the sediments of Shield Trap Cave and other dry sinkholes may provide palynological evidence for more regional vegetational changes.

Jess, Edward W. (Archeological Services) THE BAIROIL "TIPI RING" SITE (48SW2369), SWEETWATER COUNTY, WYOMING.
This extensive site consists of over 180 stone circles and appears to date to the Late Archaic and/or Late Prehistoric Period. Its importance lies in its size, complexity, and degree of preservation. Intra-ring features include hearths, fire pits, internal partitions, possible doorways, and various alcoves in the rings. Features such as fire pits also occur outside the rings.

Kainer, Ronald E. (Western Wyoming College) CULTURAL RESOURCE MANAGEMENT: A CONTRACTOR'S VIEWPOINT.
The frenzy of development currently gripping the energy and mineral related industries within this nation is most obviously expressed in many areas of the western United States. The resulting impact on cultural resources is tremendous. The problems faced by the individuals contracted by these industries to assess impact on cultural resources are directly related to the speed and method with which the natural resources are being developed. These problems range from the immediate and obvious, such as breakdowns in communication between the contractor and client or client and federal agency, to the more abstract and long range, such as the quest for synthesis of data from a multitude of sources (small technical reports from numerous contractors). Facing such rapid development the cultural resource contractor assumes a fence sitting posture. The framework of the fence is composed of the federal mandates which are designed to protect and manage cultural resources. In one direction, the contractor must make decisions which uphold the ideals and goals of the discipline and in the other direction must face the realities imposed by industries which are attempting to meet the needs of a panic stricken consumer society.

Kalokowski, Hank (West Texas State University) ARCHEOLOGICAL TESTING AT THE FIFTH GREEN SITE, RANDALL COUNTY, TEXAS.
During the summer of 1979 a crew of CETA workers from West Texas State University tested a probable Apache camp (Site A1363) at the Canyon Country Club in Randall County, Texas. The area tested borders the west side of the fifth green which is located on a low terrace in the Palo Duro Creek valley. Plans by the club to plow the area for planting grass made investigation of this site imperative. Laboratory analyses and report preparation are still in progress. Features encountered at the site include clusters of burned and unburned caliche rocks associated with numerous bison bone fragments and a fair amount of lithic and ceramic material. An unusual feature in one area was a scattering of five bison limb bone fragments buried vertically with the sharp broken ends downward. These may have been shims for posts. More than half of the specimens recovered are unworked bison bone fragments. Artifacts include distinctive triangular arrowpoints, large end scrapers, and pottery resembling Perdido Plain. An iron awl may be associated with the occupation. Preliminary indications are that the site may be a Faraon Apache bison-processing camp dating in the 1500s.

Kay, Marvin (University of Arkansas) 1980 EXCAVATION OF THE DRUMMING SAUNA SITE (34WN29), WASHINGTON COUNTY, OKLAHOMA: A LATE WOODLAND HOUSE SITE IN THE CROSS TIMBERS REGION OF THE CENTRAL PLAINS.
Investigations conducted under a U.S. Army Corps of Engineers, Tulsa District mitigation contract with the University of Tulsa resulted in the complete excavation of a roughly circular pit house dated about

1100 B.P. by radiocarbon and the exposure of portions of other similar structures as well as extramural hearths and pits. Botanical remains included carbonized seeds associated with this Late Woodland component. The most diagnostic and numerous artifact is Scallorn arrow points. This Late Woodland unit is at the base of the Copan paleosol and, seemingly, indicates a much later date for the development of this soil which previously had been estimated to have developed from about 1900 to 900 B.P. Beneath the copan paleosol is at least one other component defined by pits, post molds and hearths and tentatively dated to about 1600 B.P. Additional excavation of this site has been recommended to the Tulsa District.

Kay, Marvin M. (see Graham, Russell W.)

Keller, Marvin (Ecology and Environment, Inc.) ARCHAEOLOGY AND THE NORTHERN BORDER PIPELINE: A PRECEDENT FOR THE FUTURE.
In the spring of 1980 archaeological surveys began on the Northern Border Pipeline which crosses the states of Montana, North Dakota, South Dakota, Minnesota, and Iowa. As in other energy related projects, the pipeline is requiring archaeologists to mobilize and respond quickly to industry requests. The effectiveness of archaeologists in handling this project may set a precedent for all future work on other major pipelines and energy related activities. This paper will briefly outline the constraints archaeologists must work under, identify problems encountered, and summarize the archaeological work that has been conducted.

Keyser, James D. (Custer National Forest) CAVE HILLS ROCK ART: NORTHWESTERN SOUTH DAKOTA.
During the past two summers the United States Forest Service sponsored a cultural resource inventory of the North Cave Hills in northwestern South Dakota. During the course of this project, we recorded 41 rock art sites ranging from single motifs to extensive panels containing hundreds of glyphs. Preliminary analysis indicates the presence of three rock art styles: the Shield bearer/V-neck human style, a hoof-print style, and an Historic period biographic art style. Superimpositions and associations with historic trade items provide a tentative chronology which indicates that the artists responsible for the shield bearers and V-neck humans and those that made the hoofprint petroglyphs visited the Cave Hills region intermittently throughout the Late Prehistoric period. The biographic art style is similar to the hide paintings of recent Historic tribes in this area, and can probably be attributed to the Sioux, Crow, or Cheyenne who occupied this region after A.D. 1700.

King, Frances B. (Illinois State Museum) EARLY CUCURBITS IN THE MIDWEST. Poster Paper.
The cultivated cucurbits Cucurbita pepo (pepo squash) and Lagenaria siceraria (bottle gourd) have been present in eastern North America since at least 4300 B.P. and have been relatively common since about 3000 B.P. In early material, there is a tendency towards increasing rind thickness and greater seed size through time in both species, the result of either natural or human selection. Most archaeological pepo is represented by relatively small broad seeds and thick rind, similar to that of the historic cultivated variety "Mandan." However, seed characters are conservative, changing less rapidly than some other plant and fruit characters, and may to some extent be inherited independently of such characters as warty vs. smooth rind or flesh thickness. As a result, more differences may exist between modern and early cucurbits than are apparent from the scanty archaeological record.

Kopsick, Paul R. (Environmental Systems Analysis, Inc.) GEOARCHAEOLOGY OF HOLOCENE ALLUVIAL DEPOSITS IN KANSAS AND MISSOURI.
A radiocarbon dated alluvial chronology for over 8000 years of floodplain deposition in the Little Blue River valley near Kansas City has produced

a model for locating buried sites in floodplains of the Midwest. In high order drainage basins that flow into the Kansas or Missouri rivers, there are at least two distinct topographic surfaces or terraces visible. The number of surfaces and ages of these surfaces vary depending upon geographic position within the valley. In general, where there is a modern floodplain (T-0) and a single step up to a terrace surface (T-1), the T-1 surface dates to about 2000 years BP. The T-0 deposits are therefore about 2000 years old at their base and become progressively younger towards the surface. Radiocarbon dates within the T-1 deposits reveal that seven meters of sediment were deposited in the valley between 8000 and 2000 years ago. Using other C-14 dates within this time interval, the completed alluvial chronology indicates that the apparent absence of certain pre-2000 year old cultural remains from the floodplains may be due to not knowing how deep particular age sediments are buried.

Kornfeld, Marcel (University of Wyoming) EUROAMERICAN SETTLEMENT SYSTEM IN WESTERN POWDER RIVER BASIN.
Euroamerican population has constituted the major cultural element in the Powder River Basin for slightly over a century. The main economic base of this population has been the stock industry, although farming, coal mining, and oil production constitute other important economic activities. Like the previous occupants, the Euroamericans have left a distinctive archeological record. A recent survey of Western Powder River Basin gathered information on forty Euroamerican archeological sites, all a record of the rural activities in this area. A great deal of variability is visible in this archeological record, some of which can be interpreted with historic and ethnographic information. This record is used as a data base for a study of the Eurcamerican settlement system in this area.

Krause, Richard A. (University of Alabama) THE TYPE TYCOON: CARLYLE S. SMITH AND THE INFERENTIAL STRUCTURE OF CERAMIC ANALYSIS IN MIDDLE MISSOURI PREHISTORY. No abstract.

Larson, Thomas K. (Larson-Tibesar Associates) THE OVERLAND PLANNING UNIT SURVEY.
During the summer of 1979, the Wyoming Recreation Commission conducted a 27,000 acre Class II cultural resource inventory of the Overland Planning Unit in southcentral Wyoming. This inventory was conducted for the Rawlins District, Bureau of Land Management in order to generate a predictive model for use as a management tool. Besides standard archaeological and historical site data, several other categories of information were collected in order to generate the model and compare this study with others which have been conducted on the High Plains. The rationale, methodologies, preliminary results, and problems with this type of study are discussed in this paper.

Larson, Thomas K. (see Fawcett, William B.)

Lass, Barbara (University of Minnesota) PREHISTORIC HABITATION IN NORTHEASTERN SOUTH DAKOTA: GLIMPSES FROM DEUEL AND HAMLIN COUNTIES.
An archaeological survey of two counties within the Coteau Des Prairies region of northeastern South Dakota was conducted during the summer of 1979, and ten major habitation sites were recorded. It had conventionally been assumed that Woodland adaptation had persisted in the prairie-lake region throughout the late prehistoric period and was not succeeded by the agricultural Plains Village adaptation found along neighboring river valleys. Data gathered on the 1979 survey seemed to indicate, however, that Plains Villagers did occupy the Coteau, and seasonal use of the Tall Grass Prairie by riverine agriculturalists is proposed.

Latady, William R. (University of Wyoming) THE WAGENSEN SITE: VEGETATIVE DIVERSITY AND DENSITY.
Vegetative resources surrounding the Wagensen Site, 48CA89, a Late Prehistoric Period tipi ring site, in Campbell County, Wyoming are examined. Vegetative communities and associations were defined by utilizing aerial photographs and field reconnaissance. The ecological concepts of density and diversity are utilized to describe and examine the plant resources currently existing within a three mile radius of the site. Specific information on frequencies of edible plants as well as inferences on seasonality of site occupation are documented.

Lensink, Stephen C. (see Charlton, Thomas C.)

Lewis, Rhoda O. (Metcalf-Zier Archaeologists, Inc.) CULTURAL RESOURCE REPORTS: SHPO REVIEW.
Within the past year, the Wyoming Recreation Commission and the Wyoming SHPO's office have developed a computerized method for recordation of sites and cultural resource inventories conducted in the state. This program has not only been beneficial in the implementation of more accurate file search information but has also enabled the state to maintain updated records of inventories in an area where the number of these is increasing dramatically each year.

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Little, Bryce (University of North Dakota) SKIDI PAWNEE ASTRONOMY AND ARCHAEOLOGY--A PREDICTIVE LINK?
This paper represents a preliminary attempt to link a tantalizing fragment of ethnographic data with a substantial body of archaeological evidence. The ancestors of the present Skidi Pawnee are believed archaeologically to have moved about the late thirteenth century A.D. into the lower Loup River valley of eastern Nebraska, then establishing small scattered settlements along the river terraces. Roughly about 1500 the series of much larger villages known collectively as the Lower Loup Phase appeared, apparently coincident with the conjectured arrival of the other Pawnee groups from the south. A complex tale known as the 'Closed-Man story' was collected from the Skidis by James Owen Dorsey at the turn of the century, which appears to describe this meeting of the peoples, the teaching of ceremonies and the establishment of new villages according to a highly rigid cosmological patterning. Additional evidence of Skidi astronomical planning is also available. From these two evidence lines are proposed a series of identifications of known Lower Loup sites with villages mentioned in 'Closed-Man,' and the original patterning is shown to have retained its religious, political, and geographical significance despite the drastic decimation and compaction of the Skidi population until removal from the area in 1873.

Lovick, Steven K. (University of North Dakota) FIRE-CRACKED ROCK TOOLS AT THE WHITE BUFFALO ROBE SITE, NORTH DAKOTA.
Within the last ten years, lithic studies have focused intensively on chipped stone, particularly biface reduction procedures. Recent analysis of lithic materials from a Middle Missouri village site (32ME7) in North Dakota revealed the necessity for intensively examining another artifact class, fire-cracked rock. A considerable quantity of fire-cracked

basaltic and granitic stones exhibited one or more wear patterns suggesting that the rocks are not expedient tools or recycled debris, but instead deliberately fractured rocks intended for specific tasks. This paper describes and discusses in detail both the wear patterns observed and the distribution of the implements. In addition, a number of functions are suggested although replication experiments have not been conducted.

Lueck, Ed (University of Nebraska) THE QUANTITATIVE ANALYSIS OF TRADE BEADS IN ARIKARA CEMETERIES: ECONOMIC IMPLICATIONS.
This paper will attempt to identify the processes responsible for the differing patterns of distribution of Euroamerican trade beads in two noncontemporary Arikara cemeteries. Two hypotheses which model divergent patterns of bead procurement and distribution are evaluated. The first summarizes the effect of a short, restricted pathway of bead access of a kind likely in the Proto-Historic period, while the second models the effect of several extended distribution pathways as documented from historic sources. It is suggested that the excessive quantities of beads found as grave goods, particularly those associated with subadults or individuals whose status is least clearly defined, can be explained by an increasing supply of beads produced by the multiple procurement pathways which came into operation in the Historic period.

Madole, Richard F. (see Muhs, Daniel R.)

Lytle, John (Bureau of Land Management) CULTURAL RESOURCE MANAGEMENT IN WYOMING: THE BUREAU OF LAND MANAGEMENT PERSPECTIVE.
The Bureau of Land Management in Wyoming administers 17 million acres within the states of Wyoming, Kansas, and Nebraska. The management of cultural resources began with the addition of a professionally qualified archaeologist to the state staff in 1974. Since that time, the bureau has added an archaeologist to the staff in each district and two in the state office. As with any new development, this program has not been without its problems. These problems have resulted from the magnitude of oil, gas, and coal development and from the lack of guidance, manuals, and procedures. After a few rough years, BLM cultural resource personnel have begun to work closely with the Wyoming Recreation Commission and the Wyoming State Archeologist to recognize and develop its role in cultural resource management.

McBeth, Sally (North Dakota State University) ETHNIC IDENTITY AND THE BOARDING SCHOOL EXPERIENCE OF WEST-CENTRAL OKLAHOMA NATIVE AMERICANS.
Ethnicity and the processes of group and individual identity in the modern Native American community are elusive and complex concepts to define or analyze. The formation of a dynamic ethnic identity incorporates innumerable variables; forces within the group (self perception and individual identity) as well as from outside the group (others' sense of that particular identity) influence its development. This paper will explore one variable of this process, the early education of Native American youth in the mission and government boarding schools in west-central Oklahoma. The data presented are based on current research consisting of extensive interviews and social interaction with former students of Indian boarding schools from 1900 to the present. It is the writer's view that the boarding school experience was (and continues to be) an important factor in the formation of an Indian ethnic identity, despite its formerly stated purpose to "civilize" and eventually assimilate Native American people.

McCormick, James (McGill University) EXCAVATIONS AT CRYSTALSIN CAVE (1978-1980).
Crystalsin Cave is a multi-component cave site in the Pryor Mountains at an elevation of 1810 m (6,000 feet) a.s.l. An occupation level

approximately 2,000 years old contains the remains of bighorn sheep. An area of $6m^2$ has produced several thousand well-preserved bone fragments of at least four individuals. Associated with the sheep bones are a corner-tanged knife and several corner-notched points made out of a fine-grained red chert. This occupation is the focus of doctoral research which will focus on synthesizing zoological, ethnographic, and archaeological literature on sheep exploitation in North America. Detailed faunal analyses of the material is planned for the purpose of integrating various types of physical analyses as well as the more common morphological identification. The goal of the research is to supply a basis for further work on bighorn sheep exploitation in other parts of North America. In addition, the contributions of Old World scholars to sheep studies will be examined for potential methods of study or areas of common interest (e.g. age/sex structure of hunted populations in the faunal record). A further season of excavation is planned for Crystalsin Cave which will concentrate on recovery of larger faunal samples.

McElrath, Dale L. (University of Illinois) PRELIMINARY RESULTS OF INVESTIGATIONS AT THE GEORGE REEVES SITE (1979-1980).
The construction of Federal Aid Interstate 270 around greater St. Louis has resulted in the excavation of several sites located within the highway right of way or inspected as the result of the need for dirt fill to be placed under the highway. This work is being sponsored by the Illinois Department of Transportation and supported by the construction contractors (in this case, Luhr Bros.). The archaeological investigations are being conducted by the University of Illinois at Urbana-Champaign. The George Reeves site is a large, multicomponent site located on the bluff overlooking the American Bottom near the Monroe-St. Clair County line in southwestern Illinois. The 1979-1980 investigations at this site have yielded significant new data on the Late Woodland-Mississippian transition for the immediate area outlying the Lunsford-Pulcher and Cahokia sites. The present paper will outline the nature of the investigations undertaken at the site thus far and present preliminary results.

McKern, Scott T. (Austin, Texas) and Stephen A. Chomko (Office of the Federal Inspector) THE NIDIWH SITE, 48CR1113: A MULTICOMPONENT SITE IN SOUTH CENTRAL WYOMING.
The Nidiwh site was located during a survey for a proposed coal exploration program in the Hanna Basin, Wyoming. The site consists of a complex association of stone circles, rockshelters, and lithic scatters. One spatial component, a dunal area adjacent to a sandstone outcrop, was being actively deflated by wind erosion, exposing ceramics, lithics, and hearths. Personnel with the Bureau of Land Management conducted a series of test excavations to salvage the ceramic component and evaluate the site.

Meder, Joseph B. (University of Iowa) A WHITE TAIL DEER DENTAL ERUPTION SEQUENCE-TIME CORRELATION AND SEASONAL INFERENCES FOR PREHISTORIC POPULATIONS. Poster Paper.
Modern samples of erupting mandibular teeth of white tail deer (Odocoileus virginianus) have been used to interpret seasonality from osteoarcheological remains. Questions have been raised as to the validity of a direct application of this data to a prehistoric sample. Many identified ecological factors affecting these correlations have been ignored, resulting in a less accurate prediction of the time of death. The eruption sequence-time correlation presented in this paper was collected from the current Iowa population. Identification of recent changes in the factors affecting the time of eruption has shown that modern and prehistoric populations are not directly comparable. A significant change in diet from woody browse to cultivated crops has altered the reproductive age structure of the herd. Increased hunting pressure was also a major contributing factor. Traditionally, gum line measurements have been used to measure crown height. Alveolus to tooth crest measurements were used here to facilitate direct

archeological comparisons as the gum line is frequently obscured in prehistoric samples. Tooth heights plotted against time show a linear progression of development consistent with earlier studies by Severinghaus. The third cusp of M_3 was found to be the least reliable indicator of age. The extent of variation for each stage of eruption was directly related to the length of the fawning period.

Metcalf, Michael D. (Metcalf-Zier Archaeologists, Inc.) ARCHAEOLOGICAL EXCAVATIONS AT 48CR341: A SAND DUNE SITE IN SOUTHCENTRAL WYOMING. 48CR341 is a complex prehistoric habitation situated in an aeolean sand deposit on the lee slope of a low ridge in southcentral Wyoming. Discovered during earthmoving for construction of a natural gas well pad, the site was partially excavated in an attempt to evaluate the site's importance and, if possible, recover enough data so that construction could proceed. The project is an example of close cooperation between industry, government, and archaeologists. Excavations revealed the presence of three or four occupations. The more recent uses of the site center around a complex of deep basin-shaped fire pits. There is considerable diversity in fire pit placement and fill contents among the 11 excavated features. Material culture is relatively sparse, consisting of a small amount of chipped and ground stone. The single projectile point, recovered from hearth fill, is a small triangular corner-notched specimen, a typical occurrence in sites dating from the early Late Prehistoric Period. Analysis of the site is aimed at functional interpretation of the fire pits.

Monk, Susan M. and John R. Bozell (University of Nebraska) UTILIZING DENTAL ANNULI AS AN INDICATOR OF AGE AND SEASONALITY FOR ARCHEOLOGICAL VERTEBRATE FAUNA.
Evidence has been generated by wildlife biologists indicating the appearance of incremental growth structures in the teeth and bones of mammals. This research was conducted in an effort to evaluate techniques utilizing dental annuli for the determination of the age and season of death in vertebrate fauna recovered from the White Buffalo Robe site (32ME7) in central North Dakota. These samples include incisors, premolars, and molars from bison (Bison bison) and deer (Odocoileus sp.). Various histological techniques utilizing decalcification, thin sectioning with a microtome, and staining methods are tested and discussed with respect to annulations in the cementum that are referable to age. Specimens were first aged by conventional methods of tooth eruption and wear schedules. These data were then compared to the analysis of dental annuli. Efficiency, feasibility, and problems that may be unique to archeological remains are assessed.

Morley, Darcy F. (see Owsley, Douglas W.)

Morrow, Toby (University of Iowa) MIDWESTERN LITHIC RESOURCES. Poster Paper.

Morrow, Toby (University of Iowa) CHIPPED STONE RAW MATERIALS AT THE OVERHEAD SITE.
A project tracing the chipped stone materials recovered from the Overhead Site, a multi-component site near La Crosse, Wisconsin, to known source areas in the Midwest was undertaken this past summer as part of a multi-discipline study made possible by a grant from the National Science Foundation and held in conjunction with the 1980 University of Wisconsin-La Crosse archaeological field school. Lithic materials from a wide variety of Midwestern sources were obtained by direct collection from bedrock exposures and through correspondence with other archaeologists. Some of the stone samples were experimentally heat treated to produce features characteristic of many of the archaeological materials found at the site. These samples were then visually compared to pieces recovered through the Overhead Site excavations. Results of the study

indicate that the majority of the stone for chipped stone tool manufacture was obtained locally or regionally. However, as much as 5% of the stone examined was determined to be of exotic origin and materials like Knife River chalcedony (North Dakota), Burlington chert (southwest Iowa and western Illinois), Moline chert (western Illinois), and Upper Mercer flint (eastern Ohio) found their way to the site.

Muessig, Hans (see Dennett, Sarah)

Muhs, Daniel R. (University of Wisconsin) and Richard F. Madole (U.S. Geological Survey) SOIL-GEOMORPHIC EVIDENCE FOR WIDESPREAD MOVEMENT OF DUNE SAND ON THE CENTRAL GREAT PLAINS DURING THE ALTITHERMAL.
Stabilized sand dunes in the Nebraska Sand Hills, western Kansas and eastern Colorado were mapped using LANDSAT imagery. Radiocarbon ages from several localities (Sears, 1961; Brice, 1964; Maroney and Swinehart, 1978; Swinehart and Madole, in prep.) suggest that most of the stabilized dunes in Nebraska are of Altithermal age (ca. 8000-5000 yr BP). Soils developed on the dunes in localities where ^{14}C ages have been obtained are Ustipsamments that have 10YR hues, thin (<40 cm) sola, and A/AC/C profiles. Field observations of soils formed in dunes along a 500 km transect from central Nebraska to the Front Range reveal a similar degree of profile development in most places; soils are either Ustipsamments or Torripsamments. Published soil surveys indicate that soils on stabilized dunes along the Cimarron and Arkansas Rivers in western Kansas are Ustipsamments similar to those examined along the transect. This similar degree of soil development suggests that dune fields in eastern Colorado, western Kansas, and the Nebraska Sand Hills are approximately the same age and were last active during the mid-Holocene. Contemporaneous dune activity over such a large area suggests regional aridity and supports Benedict's (1979) hypothesis of human migration from the Great Plains to mountain refugia during droughts of the Altithermal.

Oliver, James S. (University of Maine/Institute for Quaternary Studies) SHIELD TRAP: TAPHONOMY IN A CLOSED ENVIRONMENT.
Shield Trap is a small, bell-shaped limestone solution cavern in the Pryor Mountains, Montana (elevation 2550 m a.s.l.) whose floor is a mat of large and small mammal bones. The 1980 field investigation was directed towards the recovery of data to aid in the definition of the taphonomic processes that resulted in the accumulation, distribution, and general morphology of the bones found in the trap. Small traps such as this are well suited to taphonomic study because bones that enter the system may leave only by chemical decomposition. Thus, it is a closed system where processes such as human and carnivore modification of bone, long distance transport, and redeposition which may result in incomplete and biased samples in other depositional environments, have an assumed low probability of occurrence. Current research aims to define the taphonomic processes at work in the trap, to explain how these processes may bias samples taken from two different stratigraphic facies in the trap, and to compare these results with results from experimental studies on carnivore and human modification of bone. This location promises to contain a rich taphonomic and paleontological record which can be used for a paleoecological reconstruction of the high altitude area of the Pryor Mountains. Moreover, this would enable a comparison to be made with a culturally filtered faunal assemblage from Cougar Cave, 300m to the east.

Orser, Charles E., Jr. (Loyola University/Mid-American Research Center) "THE NEXT MORNING WE COMMENCED TRADING": STUDYING SOCIOECONOMIC CHANGE AMONG THE ARIKARA WITH ARCHAEOLOGICAL DATA.
The effects of the Euroamerican fur trade on Arikara social position is considered and the question of whether Arikara males gained considerable wealth and prestige through time is specifically discussed. The data

used to test this hypothesis derive from mortuary information from the Mobridge, Sully, and Leavenworth sites in South Dakota. Historical information, such as fur trade goods price lists, are used to establish a price index which, when combined with the archaeological evidence, can be central to resolving the hypothesis. The price index is further used to establish discrete "price groups" among the Arikara mortuary population. These "price groups" are then viewed as representing distinct groups in the living society. While the results are tentative, they imply that Arikara males did indeed gain wealth and prestige through time.

Osborn, Alan J. (University of Nebraska) CACHE PITS, BONE "HOES," AND ANTLER RAKES DO NOT A VILLAGE FARMER MAKE: VILLAGE HUNTERS OF THE EASTERN PLAINS.

Anthropologists and archaeologists working in the North American Great Plains have relied extensively on ethnohistorical literature and direct material referents, e.g., subfloor cache pits, bison scapular "hoes," antler rakes, and domesticated plants' remains to support the view that semi-sedentary horticulturalists dominated the eastern Plains for more than 1,000 years. This paper proposes that aboriginal house floor area may be utilized by archaeologists to assess the relative dependence of eastern Plains peoples on intensive maize horticulture. Causal linkages between horticultural labor demands, aboriginal household size, and climatic stress are outlined and evaluated using archaeological and climatological data from the Missouri River trench. The results of this study suggest that existing reconstructions of aboriginal lifeways in the eastern Plains are inadequate.

Osborn, Nancy M. (see Gradwohl, David M.)

O'Shea, John M. (University of Iowa) TOO MANY CHIEFS SPOIL THE BROTH: CHANGING SOCIAL CONSENSUS AND ITS EFFECTS ON ARIKARA MORTUARY PRACTICES.

Among the disruptive influences which visited the Arikara during the Post-Contact period was the agglomeration of autonomous villages and bands forced by depopulation and warfare, which saw the number of distinct villages reduced from as many as 43 in 1717 to the 3 observed by Lewis and Clark. Village merger, on this scale, must have had a destabilizing effect on Arikara rank structure and social organization. This paper attempts to document change in the level of social consensus among the Arikara through the evaluation of variation in Arikara mortuary custom. Cemeteries from the Proto-historic and Historic periods are considered, with the sites of Leavenworth and Larson being evaluated in detail. These results show a lowered level of consensus with respect to mortuary treatment and symbolism during the Historic period. It is suggested that the traditional Arikara bands were more distinct and autonomous than is usually assumed, and that the Arikara villages of the Historic period represent an amalgam of traditional Arikara cultures. These results are in agreement with recent linguistic evidence, and suggest that future studies of Arikara archaeology and biology must be more cognizant of the variation inherent in "Arikara" culture prior to the Historic period.

Owsley, Douglas W. (Louisiana State University) INTRASITE VARIATION IN ARIKARA CRANIA FROM THE MOBRIDGE SITE (39WW1): EVIDENCE FOR MICRO-EVOLUTIONARY CHANGE.

Multivariate analysis is used to examine intercemetery variation in cranial morphology in the Mobridge site Arikara skeletal collection. The site included three spatially distinct burial areas. The burial areas (features) are defined according to geographic location: Feature 1 is a small hill west of the village; Feature 2 is a large, long hill two to three hundred yards south of the village; Feature 3 is a small knoll one hundred yards south of Feature 1. The internal chronology of Mobridge has not been established with precision, but some order has been postulated

based on archaeological data. Previous researchers have considered area 2 to be later than areas 1 and 3. Significant morphological heterogeneity exists between areas. These differences are accountable if the cemeteries were used by different occupations of temporally distinct populations. The archaeologically proposed temporal ordering of the cemeteries is supported by osteological evidence.

Owsley, Douglas W. (Louisiana State University), Darcy F. Morey and William B. Turner (University of Tennessee) CRANIOMETRIC EVIDENCE ON MANDAN ORIGINS.

Carniometric data are used to compare available human crania from Mill Creek and early Middle Missouri Tradition sites with a pooled Mandan sample and Coalescent Tradition samples from Crow Creek, Mobridge and Rygh (inferred proto-Arikara). Discriminant functions are computed for the reference samples, and test cases are classified according to their proximity to each population centroid. With one exception, early Middle Missouri Tradition site crania compare most favorably with Mandan. Mill Creek site specimens are unlike the Mandan, most closely resembling early Coalescent samples.

Purdue, James R. (Illinois State Museum) OSTEOMETRICS ON A MODERN SAMPLE OF ODOCOILEUS VIRGINIANUS. Poster Paper.

As studies of prehistoric bone become more sophisticated, the lack of appropriate analyses on modern species is apparent. The materials on display depict preliminary results of osteometrics on a large sample of modern Odocoileus virginianus from Illinois and Missouri. The mandible, metacarpal, and metatarsal of JoDaviess County, Illinois, deer were compared. All three elements were sexually dimorphic. The mandible changed most with age. The metacarpal varied clinally throughout the two-state region. The other elements are untested for clinal variation, but similar patterns are expected.

Purdue, James R. (see Styles, Bonnie W.)

Reagan, Michael J. (see Berg, Carol V.)

Pyle, Katherine B. (University of Iowa) MAMMALS ASSOCIATED WITH THE MIDDLE WOODLAND HELD CREEK COMPONENT AT THE MAD SITES, CRAWFORD COUNTY, IOWA.

Faunal remains from the Held Creek component of the MAD sites (13CF101 and 13CF102), approximately 1400-1800 RCYPB, came from 26 cache pits, midden deposits, and five levels of short-term occupation. As expected, bison and deer are the preferred food animals. They are found together in only five pits while 10 contain only bison and six only deer. Approximately 57% of the identifiable bison sample is comprised of teeth and feet, suggesting that the animals were killed nearby. The large amount of bone fragments and small number of identifiable specimens indicate heavy utilization. Three fetal bison bones suggest some of the animals were killed in winter. Held Creek component deer are also represented by a high proportion of foot bones. Antler bases are still attached to skull fragments, indicating late summer, fall or winter kills. Recovered adult limb elements fall into three size ranges; the sexual diamorphs of white-tail deer and a smaller, prong-horn sized deer. The presence of an extensive grassland is indicated by Geomys bursarius, Peromyscus sp., Microtus pennsylvanicus, Pedomys orthogaster, and Reithrodontomys sp. The eastern chipmunk (Tamias striatus) and deer (Odocoileus) also confirm a well-developed gallery forest during SubAtlantic time. The shape and size of two canid mandibles recovered indicates domesticity. Two disarticulated canid teeth have been artificially flattened. Two isolated human molars of a 4½ year old child (Alton Fisher, personal communication) recovered from one level suggest that the short-term occupations were by family units rather than all male hunting parties.

Reher, Charles A. (University of Wyoming) PLAINS INDIAN OCCUPATION OF THE CENTRAL POWDER RIVER BASIN: THE WAGENSEN SITE, 48CA89.
Although the culture of the historic Plains Indian of the Powder River Basin is well known, the same is not true for the archeology of the few centuries just prior to Eurcamerican expansion. The Wagensen Site, 48CA89, a large village site in northeastern Wyoming, presents one of the more complete archaeological records for this era. Close to 100 stone circles (with a large but unknown number removed by ranching operations) evidence a number of reoccupations during the seventeenth century of an area with diverse game and plant resources. The main village area and foraging and processing areas on adjacent talus slopes and stream terraces have artifacts scattered over several hundred thousand square meters. Most scatters consist of the "collapsed," shallow, but relatively rich stratigraphy of overlapping reoccupations. Recent excavations revealed a processing area sealed in place when alluvial fans from an arroyo system covered an area of stream terrace deposits. It appears to represent an organized episode of processing several bison by meat stripping, marrow extraction, and boiling for bone grease. Various aspects of the site archeology are discussed, including inferences about settlement pattern, subsistence strategies, and the organization of butchering task forces.

Reid, Kenneth C. (University of Tulsa) THE DISTRIBUTION AND IDENTIFICATION OF PENNSYLVANIAN CHERTS IN THE WESTERN MIDWEST.
Outcropping or shallowly buried regolithic cherts from Upper Pennsylvanian System formations in the four-state area of northwestern Missouri, southwestern Iowa, southeastern Nebraska, and northeastern Kansas are identified and described in terms of their spatial distributions and macroscopically visible characteristics. The availability of chert in this area is contrasted with the "Desmoinesian gap" separating the Upper Pennsylvanian from Mississippian System cherts in central Missouri and Iowa, and the relationships between bedrock exposures and Pleistocene drift in northwestern Missouri are examined. The widespread occurrence of exotic Mississippian System (Burlington) chert artifacts in northwestern Missouri and southwestern Iowa suggests that the Grand River valley has been a favored corridor into this area since at least 2000 B.C.

Reider, Richard G. (University of Wyoming) INTERPRETATION OF CLIMATIC CHANGE AT THE PLEISTOCENE-HOLOCENE BOUNDARY USING SOILS ASSOCIATED WITH PALEOINDIAN CULTURAL LEVELS AT THE SHEAMAN AND AGATE BASIN (BREWSTER) SITES IN EASTERN WYOMING.
The soil of Clovis age at the Sheaman and Agate Basin sites, Niobrara County, is a Humic Gley (Wiesenboden or Haplaquoll) which indicates impeded drainage and high water table along arroyo bottoms in late Pleistocene time. This soil probably formed under grasses, sedges, and some woodland and no longer forms in the area. The nearest known modern soil counterparts are at elevations exceeding 5600 feet on floodplains in extreme western Wyoming (where frost-free seasons are 30 to 50 days) as well as in poorly drained areas of the upper Midwest. Soils associated with Folsom, Agate Basin, and Hell Gap levels at the Agate Basin site appear to be alluvial soils (Fluvents) which suggest improved drainage along arroyo bottoms, a drop in the water table accompanied by local shifts in stream axes, as well as erosion alternately followed by weak sedimentation. Ultimately, the alluvial sequence containing Paleo-Indian materials is cut by a major unconformity produced by arroyo incision following Hell Gap occupation. The sterile and sandy sediments overlying this unconformity contain weak calcareous alluvial and colluvial soils (Fluvents) and strong composite calcareous soils (Calciustolls or Haplustolls) at the surface. The unconformity in combination with overlying soils and sediments suggests a significant drop in the water table and a marked drying of the climate near the Pleistocene-Holocene boundary, here considered to be about 8500 years B.P.

Reiss, David (University of Wyoming) SETTLEMENT PATTERN STUDIES OF THE HANNA BASIN, WYOMING.
An attempt was made to examine prehistoric settlement patterns within a portion of the Hanna Basin, Wyoming, using information from several cultural resource management projects. The study concentrated on environmental factors which may have influenced settlement locations. This paper focuses on the problems involved in the application of cultural resource management studies in a research program.

Richtsmeier, Joan T. (Northwestern University) and Christopher P. Schoen (University of Nebraska) MODIFIED BONE AND CHRONOLOGY: AN EXPERIMENTAL STUDY.
Lack of dateable specimens and consistent recovery techniques from the post-contact Coalescent occupation of the H. P. Thomas site (39ST12) precluded the temporal ordering of areas within the site by conventional methods. It was reasoned that due to increased accessibility of European derived goods in general, and metal tools in particular, during the post-contact variant of the Coalescent tradition, the bone tools from those proveniences occurring later in time would show a greater percentage of modification by metal. Close examination of the bone tool assemblage from the H. P. Thomas site and others exposed the authors' inability to distinguish bone modified with metal tools from bone modified with stone. A pilot experimental study was conducted in an attempt to define those criteria characteristic of specific types of modification of bone. Techniques used in the pilot study are discussed and results, in terms of identifiable criteria, are presented.

Sartain, James A. (see Charlton, Thomas C.)

Schneider, Mary Jane (University of North Dakota) CONTRIBUTIONS TO THE PREHISTORY OF PLAINS INDIAN WOMEN.
This paper demonstrates the kinds of data available for studying the pre- and proto-history of Plains Indian women. The current interest in Indian women has resulted in numerous restudies of the historic and ethnographic data, but little attention has been paid to the possibility of learning about prehistoric Indian women. Using data from archaeology, art, and winter counts, inferences about status, role, physical appearance, and health of pre- and proto-historic Plains Indian women are made.

Schoen, Christopher P. (see Richtsmeier, Joan T.)

Scott, Sara Alicia (Montana Office of Historic Preservation) STONE RINGS: AN ANALYSIS OF SELECTED ASSEMBLAGES FROM THE NORTHERN MONTANA PLAINS.
Stone rings, formerly referred to as tipi rings, increasingly intrigue Plains archaeologists. Although they occur ubiquitously on the northern Montana plains, they are by far the least understood site type. Eighty-six sites with stone rings were analyzed with the following two questions in mind: First, what types of prehistoric activities can be inferred from the material culture found at these sites? Second, does the presence of artifacts on the surface reliably predict the presence of subsurface cultural materials? Results suggest that the types of artifact assemblages found at these sites reflect short term domestic/residential activities. Furthermore, the presence of subsurface cultural materials cannot be reliably predicted by the presence or absence of artifacts found on the surface.

Semken, Holmes A., Jr. (University of Iowa) and Carl R. Falk (University of Nebraska) HOLOCENE CLIMATIC CHANGES IN THE NORTHERN PLAINS OF THE UNITED STATES: THE MAMMALIAN RECORD.
Each of fifty-nine northern plains faunal assemblages, collected from 51 Atlantic-Neo-Boreal (8400 RCYBP-present) archaeological and paleontological sites contain at least 11 associated mammalian species. The 13 sites

occupied during Scandic or earlier episodes are buried. Forty-three of 44 post-Scandic sites exhibit surface expression. This supports the contention that the paucity of pre-Neo-Atlantic archaeological sites on the plains is in part a function of past geomorphological processes rather than human abandonment. Data from waterscreened sites indicate that Atlantic time was characterized by progressive desiccation around Cherokee, Iowa, which culminated circa 6350 RCYPB. At that time the Mud Creek fauna of eastern Iowa reflects greater effective precipitation than at present. This resulted in a stronger climatic gradient than presently exists. The Sub-Boreal Garrett Farm shows a reduction in this gradient because forest species reappeared in the Missouri Valley. The eastern Iowa woodland-meadow-prairie association typical of today apparently developed during this episode and continued with variations until present if the Willard, Hadfield, Schmidt, and Lane faunas are representative. In Iowa the Rainbow A (Sub-Atlantic) fauna suggest that effective moisture was greater than during the Atlantic. This likely permitted gallery forest expansion which lasted through the Scandic (Rainbow C); however, a tall-grass prairie predominated around Pleasant Ridge in southwestern Iowa. Effective moisture increased to present levels during the Neo-Atlantic at Travis I, Helb, and Mitchell. Reversal to drier conditions appears within Pacific I time at Lower Grand and Wittrock and became more intense during Pacific II around Walth Bay in South Dakota. Desiccation in the form of reduced summer rain in North Dakota (Nailati, Heart River, and Knife River components of the White Buffalo Robe site) apparently progressed into the Neo-Boreal episode.

Shay, C. T. (St. Paul's College) A LATE WOODLAND LITHIC WORKSHOP IN WESTERN MANITOBA.

Excavations over three seasons have uncovered several lithic concentrations in an upland forest clearing adjacent to the Bell River valley. The site (designated FdMg-5) lies at the foot of the Porcupine Hills, the northernmost upland of the Manitoba escarpment. Our aim is to study both the technological and spatial aspects of stone tool production. Following initial tests, artifact-bearing areas were expanded and to date, 100 m^2 have been dug. Material was concentrated in the upper 15 cm and included two Late Woodland rim sherds, several triangular side-notched points, scraping, cutting, pounding, and grinding implements, and a few mammal bone fragments. All stages of stone tool production are represented including nodules, cores, decortication and platform flakes together with quantities of shatter flakes and blocks. The predominant raw material is Swan River chert, a silicified sediment that varies widely in colour and texture. It is abundant in local stream gravels. Tools and debitage are intermingled, implying that production and use areas overlapped. In the northern part of the excavated area five large nodules of Swan River chert were apparently reduced. Fragments from one of those display a typical "broadcast" pattern of scatter extending over 3 m^2 although pieces of the other four were concentrated in two adjacent shallow pits and the immediately surrounding squares. Several worn polishing tools of the same stone were found in the same area.

Sigstad, Steve (USDA Forest Service) THE FOREST SERVICE'S CULTURAL RESOURCE PROGRAM IN WYOMING.

The USDA Forest Service administers vast tracts of forest and grassland in Wyoming, and these tracts contain large numbers of cultural resources. The management of these resources is addressed by the youngest federal program in the state, with the exception of the Tennessee Valley Authority. The program has evolved, basically since 1974, in close cooperation and consultation with the Wyoming Recreation Commission and Wyoming State Archeologist. Professional archeologists have been employed by the Forest Service only since 1976 and the first Forest Archeologist to be employed exclusively by a Wyoming Forest on a full time basis was only hired this year. The program's growth and development has not been without rough spots and difficulties and these not without controversy. As the Forest Service learns to interact with the archeological community, better understanding by both sides should be achieved.

Slattery, Richard G. (Davenport, Iowa) AN ILLUSTRATED OVERVIEW OF KANSAS/MISSOURI ARCHAEOLOGY OF THE 1930'S.
A slide presentation of black and white photos of the U.S. Smithsonian archaeological field expeditions to Platte and Clay Counties, Missouri, and to diverse locations in Kansas. The slides include four field investigations of three months each during the summers of 1937-1940. Each field expedition was directed by Dr. Waldo R. Wedel and the work constituted the basis for his publications: "Archeological Investigations in Platte and Clay Counties, Missouri," U.S. National Museum Bulletin 183, 1943; "Introduction to Kansas Archeology," Smithsonian Institution, Bulletin 174, 1959.

Spielmann, Katherine (University of Michigan) LATE PREHISTORIC HUNTER-GATHERER/HORTICULTURAL EXCHANGE IN THE SOUTHWEST AND SOUTHERN PLAINS.
The paper discusses the archaeological evidence for prehistoric exchange between Southern Plains hunter-gatherers of the Texas Panhandle and the Puebloan horticulturalists of central New Mexico during the Late Prehistoric to Protohistoric periods (ca. A.D. 1400-1600). Puebloan trade materials, such as ceramics, obsidian, and turquoise, which have been obtained through excavations at two sites on the Texas Panhandle this past summer, as well as through previous archaeological survey and surface collecting at a number of other sites, are presented. The distribution of these sites is discussed. Finally, a brief evaluation of the implications of exchange for the hunter-gatherer and horticultural subsistence systems is presented.

Springer, James Warren (see Witkowski, Stanley R.)

Starr, Dennis J. (Esca-tech Corp.) RESEARCH METHODS AND FINDINGS OF A HISTORIC SITE SURVEY OF 121,000 ACRES IN CENTRAL NORTH DAKOTA'S GARRISON DAM PROJECT.
This paper discusses the usefulness and drawbacks of various archival sources as a means of identifying, enumerating, and locating historic sites in a rural-agricultural area prior to the commencement of field work. The paper will demonstrate the value of extensive archival research for both the field work and writing stages, despite limitations peculiar to each archival source. The archival sources discussed include tract book records, survey plats, aerial photographs, county atlases, and the existing literature of the area: state and county histories and previous archaeological studies. The chief advantages of extensive archival research lie in determining the maximum number of sites as well as their nature and approximate location. This is important for making the most efficient use of labor in the field. Other benefits include understanding the nature, pattern, and chronology of land settlement, and the possession of specific knowledge that impresses and thereby elicits the cooperation of the local people. The major drawback of archival sources, aside from the issue of reliability, is their incompleteness, inaccessibility, and limited chronological coverage. The paper will also summarize the results of the historic site survey and illustrate with slides several of the most noteworthy of the folk structures.

Stevens, J. Sanderson (Centuries Research, Inc.) THE LAKE CALVIN AREA PALEO-INDIAN SURVEY.
For years Paleo-Indian specialists have ignored eastern Iowa as a viable field of study. However, the occurrence of Paleo-Indian projectile points from the Lake Calvin Basin, located in extreme southeastern Iowa, suggested this area would be an appropriate place to look for evidence of Paleo-Indian occupations. Because the Lake Calvin Paleo-Indian Survey was to include geomorphic surfaces of late Pleistocene and early Holocene times, it was decided that a geological description of the project area should be conducted. The preliminary results of ongoing geological investigations in the Lake Calvin area indicate this supposed late Pleistocene lake bed was

actually formed by a complex series of geomorphic processes during late Wisconsin through early Holocene times. Thus, not all the landforms within the study area were available for occupation during the Paleo-Indian period, and conversely, many landforms which were available for occupation during the time span in question have subsequently become buried. The results of the archaeological survey support the following conclusions: (1) Paleo-Indian sites are prevalent in the area and are usually located on bluff summits adjacent to outcrops of high quality chert; (2) the procurement of high quality chert was an important determinant in local Paleo-Indian subsistence and settlement activities; (3) sites in upland situations have been disturbed through mixing with later cultural remains, modern agricultural practices, and unauthorized collecting activities; and (4) the absence of surface indications of Paleo-Indian occupation in lowland situations is the result of recent geological processes such as colluviation and alluviation. A research strategy for future work in the area is proposed.

Styles, Bonnie W. and James R. Purdue (Illinois State Museum) LATE PLEISTOCENE/HOLOCENE ENVIRONMENTAL CHANGES IN THE NORTHEASTERN PLAINS OF THE UNITED STATES AND THE PRAIRIE-FOREST INTERFACE: THE MAMMALIAN RECORD.

Probably no region in the United States has a longer history of faunal studies than does Illinois and Missouri. Unfortunately, much of the work was conducted before sophisticated excavation and recovery techniques, strict stratigraphic control, and accessible reports were fully appreciated. Further difficulties with the data derive from the overriding influence of differeing depositional processes operating in cave, spring, and archaeological sites. The resulting data base largely defies quantification and thus, in a sense, makes this study premature. Nonetheless, we examined changes in faunal composition from the late Pleistocene to the present for the central area, i.e., the lower and central Illinois and adjacent Mississippi river valleys, of the two-state region. Other geographic areas within this region had fewer analyzed sites and poorer temporal coverage. They provided meaningful data when compared to the central area. The most dramatic changes occurred, not surprisingly, at the end of the Pleistocene, presumed to be 11,000-12,000 YBP, but not actually well dated. Several large species became extinct and other small forms shifted ranges northward. Early man was associated with at least one Pleistocene species: mastodon. The majority of mammalian species, however, were present before and after the close of the Ice Age. Range shifts in the Holocene were more subtle. During the mid-Holocene a few western forms were encountered in middle Archaic levels in western Missouri. There were simultaneous shifts in human subsistence in that area and time that may be related to a more xeric environment. Changes in body size of species associated with the eastern deciduous forest also support the case for a change in climate in western Missouri at 6,000-8,000 YBP. The geographic diversity within the two-state region was readily apparent throughout the Holocene. For example, bison was present west, but not east, of the Mississippi River until Historic and near-Historic times. Mississippian sites of southeastern Missouri show a southeastern character not replicated in sites of the central area. An issue which confuses both archaeologists and zoologists is the distribution of the rice rat. It is commonly recovered from Woodland and Mississippian sites in the region, yet today is not associated with human environs and is found only in the Southeast. One other significant range change was that of the opossum which moved northward from southern Illinois and Missouri in Historic times. The last 20,000 years, as in the other regions of the Great Plains, was one of great change. The most dramatic time was the interface of the Pleistocene and Holocene, but adjustments to oscillating glacial movements within the Wisconsinan no doubt occurred prior to the interface. Unfortunately, the record is currently inadequate to document these responses. The last 10,000 years was marked by more subtle, yet significant, adaptations to climatic and ecological disruptions and increasing perturbations due to human activities.

Sundstrom, Linea (South Dakota Archaeological Research Center) A ROCK ART CHRONOLOGY FOR THE SOUTHERN BLACK HILLS.
A relative chronology is suggested for several petroglyph styles identified from the southern Black Hills. The petroglyphs may range in age from Late Middle Prehistoric to Protohistoric, based on subject matter, relative weathering, relative patination, and superimposition.

Swan, Dan (University of Oklahoma) RECONSTRUCTING OSAGE SOCIAL ORGANIZATION.
Data obtained from Osage census, annuity, and allotment records were submitted to nearest neighbor discriminant analysis and hierarchical cluster analysis. The results of these analyses provide a quantitative base for the discussion of residence and marriage patterns. This paper compares our results with accounts of traditional Osage social organization (Dorsey, LaFlesche) and with oral histories collected from tribal elders.

Swenson, Fern E. (see Baugh, Timothy G.)

Tanner, Russel (see Treat, Pat)

Thompson, Mona C. (Midwest Archaeological Center) NEW INFORMATION ON LAUREL AND BLACKDUCK SUBSISTENCE PATTERNS.
Over the past five years the National Park Service has sponsored a program of archeological survey and site evaluation within Voyageurs National Park. Analyses of faunal, phytolith, and lake sediment samples provide an opportunity to evaluate subsistence and settlement patterns for Middle and Late Woodland complexes of northcentral Minnesota. Present constructs suggest that Middle Woodland populations (Laurel) emphasized harvesting of fish during summer months while Late Woodland groups (Blackduck) harvested wild rice during fall months. Preliminary results of work within the park area suggest a greater range of subsistence pursuits than previously described for each complex and may provide an opportunity to expand our understanding of these adaptive systems.

Tibesar, William L. (Larson-Tibesar Associates) THE MILITARY CREEK ROCKSHELTER PROJECT.
During the years 1977-1978, a series of small sandstone overhangs located on the western flank of the Bighorn Mountains were extensively vandalized. This looting activity, which occurred on public lands administered by the Bureau of Land Management, was ultimately detected by Bureau personnel and the two individuals involved in the looting have since been prosecuted under provisions of the Antiquities Act of 1906. Although these acts of vandalism were detected, the nature and extent of vandalism and the significance of archeological sites in question were never fully investigated. To perform all necessary investigations and in an attempt to set a precedent for any future cases brought before a court of law, a federal contract was issued by the Bureau of Land Management to Larson-Tibesar Associates. This presentation describes the series of events leading up to the courtroom hearing, results of the trial, and subsequent events concerning the individuals involved. In addition, the methods of follow-up investigations utilized by the archeological contracting firm and preliminary results obtained from their investigations are discussed.

Tiffany, Joseph A. (University of Iowa/Office of the State Archaeologist) LATE WOODLAND POTTERY IN NORTHEASTERN IOWA AS SEEN FROM THE HARTLEY FORT.
As an assemblage, Hartley Fort ceramics show a blending of ceramic traits commonly associated with well-established pottery types of the Tri-State area and with early Plains Village complexes such as Cambria and Mill Creek. These features along with trade pottery suggest the

existence of a culture contact-culture change situation among Late Woodland groups of eastern Iowa, Plains Village farmers, and developmental Mississippian cultures with the Hartley phase. These data are reviewed with respect to several established Late Woodland pottery types in northeastern Iowa. Emphasis is placed upon developmental trends in vessel form and decoration among these types. Study results indicate that various formal and decorative elements which comprise the Hartley Fort ceramic assemblage were present as individual types or components of types in earlier ceramic phases in the region. These diverse ceramic styles coalesced in eastern Iowa circa A.D. 900 into a cohesive assemblage as a result of the same formative processes that led to the development of Plains Village ceramic assemblages.

Poom, Dennis L. (University of North Dakota) POST-CONTACT ARIKARA TECHNOLOGICAL CHANGE: NOW YOU SEE IT, NOW YOU DON'T.

The replacement of traditional Arikara chipped stone technology by Euroamerican derived metal technology is examined using quantitative techniques. The results of this analysis indicate that the replacement of chipped stone tools by metal tools was significant during both the Proto-Historic and Historic periods; however, direct archaeological evidence of metal tool utilization is largely lacking in Proto-Historic assemblages. In fact, when post-contact Arikara site assemblages are examined in a cursory manner, technological change is largely invisible protohistorically, but highly visible historically. This anomalous situation is the result of differing formation processes of the protohistoric and historic Arikara archaeological records regarding Euroamerican manufactured goods. Finally, given the link between technology and other cultural subsystems, it is suggested that post-contact Arikara culture as a whole may have been undergoing rapid and significant change as a result of direct and indirect Euroamerican contact.

Tratebas, Alice M. (South Dakota Archaeological Research Center) GETTING ARCHITECTURE FROM STONE CIRCLE REMAINS: A SOUTHERN BLACK HILLS EXAMPLE.

Test excavation of a stone circle in the southern Black Hills revealed a charcoal stained living floor and a deep central hearth of the type frequently called a roasting pit. Wood charcoal in the hearth gives a date of 1030±60 B.P. Indirect evidence points to a winter occupation. Architectural features include a shallowly excavated living floor, hearth apparently designed for heating as well as cooking, probable south facing door, and inner stone circle interpreted as tipi liner weights. A date of at least 1000 years is therefore suggested for the fully developed Plains tipi complete with liner.

Treat, Pat and Russel Tanner (Western Wyoming College) SAMPLING METHODOLOGY AND SITE PREDICTORS, SALT WELLS RESOURCE AREA, SOUTHWEST WYOMING.

A class II cultural resource inventory was conducted on 23,000 acres of BLM administered lands in the Salt Wells area, an elevated cold steppe desert in southwest Wyoming, during the 1980 field season. The prime objectives of the study are (1) to provide a data base for making an objective estimate of the nature and distribution of historic and prehistoric sites within the defined area, and (2) to derive a predictive model which can be used for land management purposes. A transect sampling scheme compatible with the geographic diversity, "checkerboard" landownership pattern, and expansive nature of the project area proved to be an effective inventory methodology. Based on the results, such variables as water proximity, vegetation association, geologic substrate, and site aspect are offered as site location predictors. While the relationships among sites and variables are not yet fully understood, the prediction of site densities and locations should provide a useful tool for land planning purposes.

Turner, William B. (see Owsley, Douglas W.)

Walker, Danny N. (University of Wyoming) THE LATE GLACIAL/PRE-BOREAL VERTEBRATE FAUNA OF WYOMING.
The Late glacial/Pre-Boreal (13,000-9,100 RCYBP) mammalian fauna of Wyoming are presently known from 66 localities and consist of fifteen extinct taxa, five taxa whose modern ranges are found only to the north of Wyoming, and five taxa whose Late glacial/Pre-Boreal distribution in Wyoming was more widespread than at present. Fifty additional taxa have been recorded from this time period that are still extant in the state, apparently with little or no range changes. Recent paleoenvironmental data based on specimens from nine major localities indicate an open arctic grassland/tundra environment similar to that proposed for Beringia was present during the Full glacial period. This changed to a more grassland-like condition between 14,000 and 11,000 RCYBP, indicated by a reduction in tundra species at Natural Trap Cave. After 11,000 RCYBP, the extinction of the megafauna and the loss of the northern micromammals indicate conditions began to approach those present in the state today but locally habitats were more mesic than found today.

Weston, T. (University of North Dakota) TEST EXCAVATIONS AT THE KNIFE RIVER INDIAN VILLAGES NATIONAL HISTORIC SITE, 1980.
As part of ongoing research at the Knife River Indian Villages National Historic Site near Stanton, North Dakota, limited problem oriented test excavations were conducted at the Big Hidatsa site (32ME12) during a 13-week period from June 1 to August 28. Big Hidatsa is one of the major villages within the Park and is part of the Coalescent Tradition, with components assigned to the Heart River Phase, A.D. 1675-1780, and the Knife River Phase, A.D. 1780-1861. Two test trenches were excavated across one of the six low linear mounds radiating out from the village, and it was found to be a cultural feature. A total of thirteen 1m x 2m excavation units were located so as to investigate four topographically distinct areas within the site as well as a peripheral area to the southwest. The excavations revealed deeply stratified midden deposits and complex within-house stratigraphy. Two excavation units were placed within 32ME383, a possible winter village on the floodplain below Big Hidatsa. The tests revealed a zone of sparse cultural materials contemporaneous with those at Big Hidatsa, and several small pit features.

Weymouth, John and Rob Huggins (University of Nebraska-Lincoln) MAGNETIC SURVEYING OF ARCHAEOLOGICAL SITES. Poster Paper.

Weymouth, John (University of Nebraska) A PROTON MAGNETOMETER SEARCH FOR THE ROCK CREEK STATION ON THE OREGON TRAIL, NEBRASKA.
The Rock Creek Station, consisting of several buildings both east and west of Rock Creek near Fairbury, Nebraska, was a way station on the Oregon trail and the site of the famed shooting of McCanles by Wild Bill Hickok. As part of a program to develop the site into a State Historical Park a magnetometer survey was conducted over areas where historical evidence suggested the location of buildings. Because of the sizable area in which these could be located, the survey was carried out using a 2 m grid spacing. A total of 0.9 hectares (2.3 acres) were covered in three days. The magnetic map of the west region clearly showed part of the Oregon Trail as well as a few isolated anomalies, the most prominent of which was the starting point for an excavation which resulted in locating a house, lean-to and deep pit belonging to the station. The magnetic maps of the east region were complicated by many anomalies caused by recent debris. Excavation on this side has been more limited but has already revealed part of a significant structure.

White, Everett M. (South Dakota State University) GEOLOGIC HISTORY OF THE LANDSCAPE AT THE ARCHAEOLOGIC SITE (39SH33), SHANNON COUNTY, SOUTH DAKOTA.

The site area has small butte remnants of late Wisconsin and Holocene calcareous, shell-bearing alluvium deposited by an intermittent stream that flows three miles to the White River. The darkened sediment zone with the mammoth bones slopes to the upland. It is underlain by alluvium about a meter thick that has a grayish, iron-oxide splotched color usually associated with poor soil drainage. The zone above the mammoth bones is about 5 m thick and extends nearly to the top of the butte. It and the lower zones have been dissected by a channel in the Holocene; this channel was refilled rapidly. The more recent valley fill has been nearly eroded from the area to leave the butte remnants. The lower two sediment zones, in contrast to the upper areas, accumulated slowly and stratification was nearly destroyed by soil formation. The site had a relatively stable landscape at the time the mammoth bones were deposited. A perch water table developed to cause the deoxidized material and may have caused a spring or marshy area to develop downslope. The more recent degradation and aggradation sequence may be related to climatic changes associated with the initiation and cessation of the Altithermal.

Willey, P. (University of Tennessee) CHANGING STATURE AMONG THE ARIKARA. Historic accounts frequently mention harsh conditions among the Arikara--especially nutritional and disease stress and social disintegration. Although it is generally assumed that the Precontact situation was more favorable, there is evidence that in fact the Postcontact Period was as favorable or more favorable than the Precontact. All things being equal, stature is a good measure of a group's overall well-being during childhood and adolescent growth. Femur length, the singlemost accurate bony indicator of stature, is used to study change in Arikara stature from Precontact to Historic times. While male femur length remains relatively constant, females become progressively larger through time. These results conflict with the implications of some historic accounts.

Wilson, Michael (University of Calgary) LATE PLEISTOCENE/HOLOCENE ENVIRONMENTAL CHANGES IN THE CANADIAN PLAINS AND MONTANA: THE MAMMALIAN RECORD.

The postglacial vertebrate fauna of the Canadian Plains and Montana include at least eight taxa that became extinct by 10,000 yr B.P. The Bighill Creek Formation (11,000 yr B.P.) along the Bow River in Alberta yields bones of Mammuthus sp., Camelops cf. hesternus, Equus conversidens, Bison bison cf. antiquus, Cervus elaphus, Ovis cf. canadensis, and Rangifer tarandus. Bison underwent progressive reduction in size from this time onward; and by 9,600 yr B.P. B. bison occidentalis was dominant. Mid-Holocene bison were significantly larger than the modern plains subspecies, and there is no clear evidence that the Altithermal Interval affected the rate of dwarfing. Vertebrates other than bison from early post-Altithermal times have a decidedly modern appearance, and most occupy their modern ranges. The Cactus Flower Local Fauna (4,000-3,000 yr B.P.) from southeastern Alberta include several characteristic dry plains forms, and Neotoma cinerea is north of its modern plains range. This could suggest conditions at least as warm/dry as today. Also included is a large catfish (Ictalurus sp.), a fish not present in the South Saskatchewan River today. Finds from the Hitching Post Ranch Site, near Bottrell, Alberta, indicate the presence of Odocoileus virginianus by about 3,600 yr B.P. in the foothills. Of the more than 40 species of vertebrates from the Schmitt Chert mine in southern Montana (ca. 3,000-2,000 yr B.P.), none are extralimital to modern ranges. Modern range adjustments are occurring, as with the yellow-bellied marmot (Marmota flaviventris), which moved north into Alberta only a few decades ago. Dipodomys ordii was only recently discovered in Alberta, but a mandible fragment from the Cactus Flower Local Fauna seems to be referable

to this species and suggestive of its long standing in the province. The paucity of vertebrate faunas from the critical early Holocene period makes inference of environmental changes difficult, but it would seem that relatively little adjustment of ranges has occurred since the close of the Altithermal.

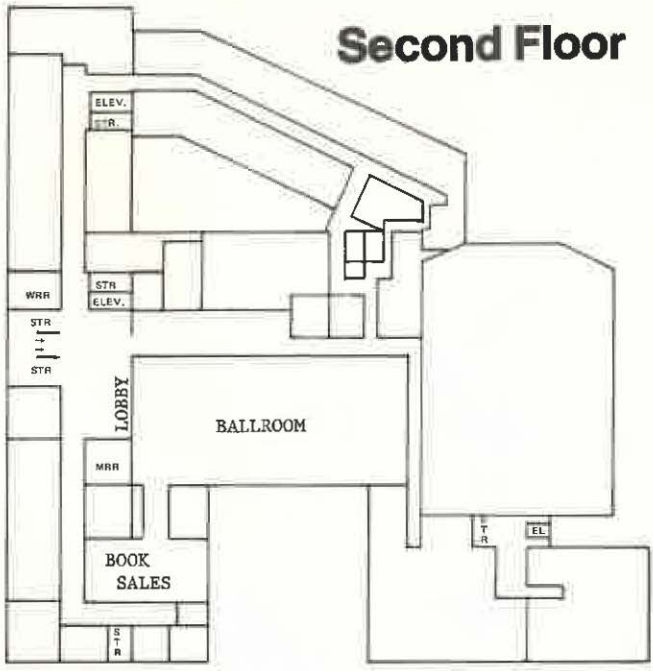
Winton, Karl V. (see Campbell, Robert G.)

Witkowski, Stanley R. and James Warren Springer (Northern Illinois University) IMPLICATIONS OF SIOUAN HISTORICAL LINGUISTICS FOR ARCHAEOLOGY.
The genetic relationships between the various languages of the Siouan family are discussed based on shared phonological innovations (sound shifts) and quantitative measures of shared vocabulary (lexicostatistics). Subgroups within Siouan are proposed and the geographical location and time of divergence of these subgroups are estimated. Widespread borrowing between certain Siouan subgroups is suggested, which provides further evidence of prehistoric language distribution and culture contact.

Witty, Tom (Kansas State Historical Society) A REVIEW OF THE SCOTT COUNTY, KANSAS, PUEBLO ARCHEOLOGY.
Initially discovered and dug over 80 years ago, the site historically has been identified with fugitive Pueblo Indians in the late seventeenth and early eighteenth centuries. Puebloan presence and/or influence is demonstrable by the ruins of a stone based pueblo-like structure having at least seven rooms and nearby dug irrigation canals. However, Puebloan artifacts were quite limited. The presence of the Dismal River archeological culture was identified by Waldo Wedel in 1939 and James Gunnerson in 1965 on the basis of extensive artifact materials and nearby habitational remains. In 1970, the writer re-excavated the Pueblo site and intensely investigated the adjacent area to collect data and materials for an interpretive development. Regional archeology has been limited and spotty, but while other Dismal River sites have been identified, the finding of associated stone based structures has not been duplicated.

Wood, W. Raymond (University of Missouri) AFTER MAXIMILIAN AND BODMER ON THE UPPER MISSOURI RIVER: A TRAVELOGUE.
When Prince Maximilian left St. Louis for the upper Missouri River in 1833, he was accompanied by a talented young Swiss artist, Karl Bodmer. Bodmer produced many watercolor illustrations of both Indians and landscapes along the Missouri River valley as far upriver as Fort McKenzie, in present day Montana. Much of the country he painted has been severely modified by human--as well as natural--agencies, but some areas in Montana, now designated a national wild and scenic river, remain virtually the same as they were more than 150 years ago. An especially scenic sector of the river valley, lying between the mouth of Little Sandy Creek and that of the Judith River, is known as the "Stone Walls of the Upper Missouri." The Missouri River here flows through a narrow, post-glacial canyon which contains many striking erosional features. Using two slide projectors, some of Bodmer's watercolors and aquatints of this part of the Missouri valley (now in the Joslyn Art Museum, Omaha) are compared with color transparencies taken in 1979 and 1980. Paired slides will illustrate his accuracy and some of the techniques he used to produce his paintings, including evidence suggesting that he used a telescope in painting some of his landscapes.

Wormser, Alan J. (University of Oklahoma) CULTURAL RESOURCES OF THE LITTLE BEAVER CREEK DRAINAGE, KAY COUNTY, OKLAHOMA.
In the summer of 1980, the University of Oklahoma conducted a survey of Little Beaver Creek in north-central Oklahoma as part of a long-term cultural-ecological study. As a result of this survey, surface collections were obtained from about fifty archaeological sites dating from the Archaic to the Late Prehistoric period. In this paper, the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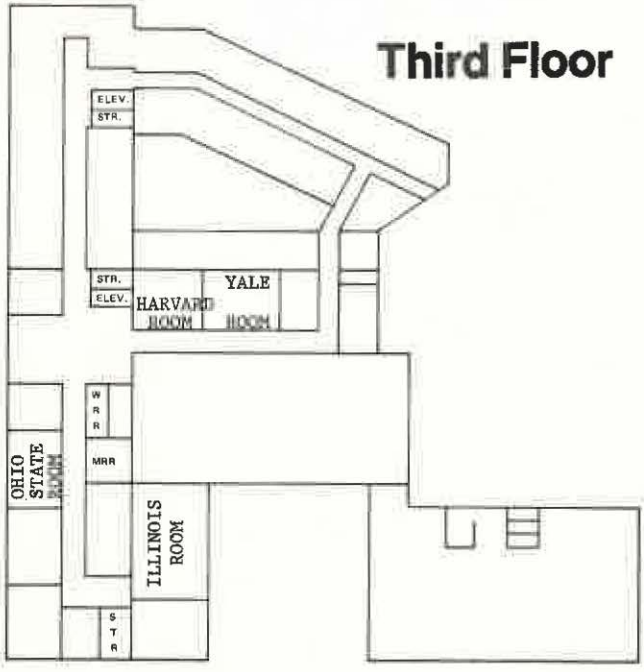
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COVER: The dancer on the cover of this booklet was drawn by Charles Push-e-to-ne-qua, a member of the Mesquakie Tribe. The artwork was prepared with the support of the Iowa Arts Council and The University of Iowa.