Reading the Isotopic Clocks.

our research in age determination and stable isotopes requires reliable data and custom service. Teledyne Isotopes has the expertise and experience to meet these requirements.

We have been pioneers in the industry since 1955 and are the only commercial laboratory that offers all major age determination techniques.

These include:

Radiocarbon

Stable isotopes: ¹³C/¹²C • ¹⁸O/¹⁶O • H/D

K/Ar • Rb/Sr • U/Pb • Pb/Pb

We can assure you of reliable data because of well-staffed and well-equipped labs, intercalibration with major universities and government facilities, and through use of N.B.S. and international standards.

For the most reliable reading of the isotopic clocks, come to the experts.

TELEDYNE ISOTOPES

50 Van Buren Avenue Westwood, NJ 07675 201/664-7070



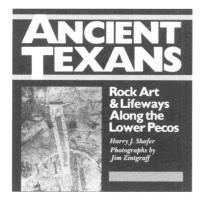
Join an Archaeological Expedition

Take your pick - looking for the Origins of Agriculture (Archaic and Early Man) near Las Cruces, New Mexico under the direction of Scotty MacNeish and Stead Upham; investigating the Maya Classic in Belize in a team headed by Leslie Shaw; digging up the Earliest Human Remains (10,000-30,000 years old) in Bolivia under more rugged conditions at Mizque near Cochabamba in conjunction with a field party directed by Donald Brockington. The digs are all exciting and the accompanying laboratory work is intriguing, involving the most up-to-date interdisciplinary techniques that the ANDOVER FOUNDATION FOR ARCHAEOLOGICAL RESEARCH and Scotty MacNeish are best known for!!!

We need

- 1. Aspiring archaeological professionals (about 20 **students**) to join us for 12 to 14 weeks. Some will make a tax-exempt contribution of \$2000 to the Foundation to cover their room and board. A limited number of students -perhaps 6- may be sponsored by the PATRONS of AFAR. Please send in your CVs now for consideration, indicating which field party you want to join and whether you can make a donation or want to be a sponsored student. Successful candidates will be selected 4 months before our respective field seasons begin.
- 2. **FRIENDS** of the Foundation who may join our expeditions for 2 weeks in New Mexico (\$1000), Belize (\$1200), or Bolivia (\$1500). For \$600 more you may join us for a month. Please send your application with preferred expedition, dates of participations and qualifications as we have scheduling and logistic problems and do not want to disappoint you! In fact, send it NOW!
- 3. **Sponsors** and **Patrons**, to provide for tax-deductible contributions to be used for our general research fund, interdisciplinary research, to pay for (or to be) equipment, to sponsor a student (all or part) and for defraying incidental expenses such as transportation, housing, food, etc. take your pick, but tell us.

APPLICATIONS AND REQUESTS FOR FURTHER INFORMATION SHOULD BE SENT TO: Dr. R.S. MacNeish, Box 83, Andover, MA 01810-0083 — Tel: 617-470-0840



\$29.95 cloth256 pages, 150 illustrations,
24 color photographs

The stark eroded lands and canyons between the lower reaches of the Pecos and Devils rivers have harbored human populations for at least nine thousand years. The canyon dwellers embellished the walls of rock shelters with mysterious, striking, and colorful imagery. World authorities on cave art place Lower Pecos rock paintings among the most important in the Western Hemisphere. *Ancient Texans* is a brilliant work, permitting an intimate, firsthand view.

ANCIENT TEXANS

Text by Dr. Harry J. Shafer Edited by Georg Zappler Photographs by Jim Zintgraff Illustrations by George Strickland Sponsored by the Witte Museum, San Antonio Museum Association

Available from

★ TexasMonthlyPress ★

Texas Monthly Press P.O. Box 1569 Austin, Texas 78767 Texas residents call TOLL FREE 1-800-252-4437

Please add \$2.00 postage

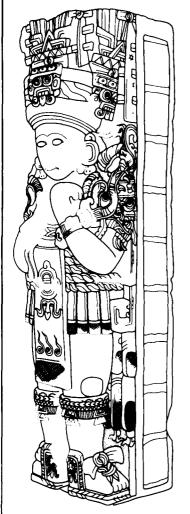
Texas residents add 5.125% tax

TIQ1

<u>addoladdagdagdagdagdagdagdagdagd</u>

New from Texas

Mesoamerican Studies



THE SOUTHEAST MAYA PERIPHERY

Edited by PATRICIA A. URBAN and EDWARD M. SCHORTMAN

A significant study, the first to deal with the Periphery as a coherent unit and the only up-to-date work on the area, with articles addressing such topics as epigraphy and iconology, architecture, site planning, settlement patterns, and ceramics as well as basic information on chronology. For the non-Maya zone, a variety of sites and subregions are explored: the Lower Motagua Valley in Guatemala; the Naco, Sula, and Comayagua valleys and the site of Playa de los Muertos in Honduras; and the Zapotitan Valley and the sites of Cihuatan and Santa Leticia in El Salvador. Heavily illustrated with 55 line drawings, 24 maps, 21 tables, 3 photographs. \$37.50 hardcover

THE LOWLAND MAYA POSTCLASSIC

Edited by ARLEN F. CHASE and PRUDENCE M. RICE

"A turning point in the study of an area and a time that are crucial to our knowledge of the Maya before and during the conquest."

—GEORGE STUART, National Geographic Society

The Lowland Maya Postclassic presents an entirely updated picture of Postclassic Maya civilization in the Southern Lowlands. The predominant focus is on the traditional heartland of the Classic Maya, but the areas that border this region are also considered in order to place the Postclassic Maya into a broader context. These studies emphasize the vibrant and changing quality of Postclassic Maya society prior to the onset of Spanish domination. They also exemplify the new research directions and problems that are being investigated within the Maya discipline. \$32.50 hardcover

ALSO OF INTEREST . . .

HEAVEN BORN MERIDA AND ITS DESTINY

The Book of Chilam Balam of Chumayel Translated and annotated by Munro S. Edmonson

"... a prodigious effort in translation, innovative arrangement of text into couplets, informative corpus of notes and commentaries, and a truly revolutionary thesis presented in the introduction....

This is an important book."

—ROBERT CARMACK

An all new English translation, extensively annotated, of a book important to all Mayanists. \$37.50 hardcover

Write for a catalog of books on archaeology and anthropology.



New from Cambridge

Prehistoric Adaptation in the American South-West Rosalind L. Hunter-Anderson

This book offers both a general theoretical framework for interpreting the archaeological record of the American South-West and a persuasive evolutionary model for the shift from a hunter-gatherer economy to horticulture at the Mogollon/Anasazi interface.

New Studies in Archaeology

About \$39.50

Hunters in Transition

Mesolithic Societies of Temperate Eurasia and their Transition to Farming *Marek Zvelebil*, *Editor*

An analysis of the emergence of postglacial hunter-gatherer communities and farming. Drawing on extensive research in eastern Europe and temperate Asia, the book argues persuasively for the essential unity of all postglacial adaptations whether leading to the dispersal of farming or the retention and elaboration of existing hunter-gatherer strategies.

New Directions in Archaeology

About \$34.50

Peruvian Prehistory

Richard W. Keatinge

Offers an authoritative survey of the cultural evolution of Peru from the appearance of the first inhabitants around 10,000 B.C. to the arrival of the Spanish in 1534. It is the first collective assessment of Peruvian archaeology for a generation.

Cloth about \$39.50 Paper about \$11.95

Now in paperback . . .

Ceramic Theory and Cultural Process Dean E. Arnold

Drawing on theoretical perspectives of systems theory, cybernetics, and cultural ecology, the author develops cross-cultural generalizations to explain the origins of the craft of pottery making and suggests that these processes are organized into a series of feedback mechanisms which limit or stimulate the initial production of pottery and its transition from a part- to full-time specialized activity.

New Studies in Archaeology

About \$12.95

Peer Polity Interaction and Socio-Political Change Colin Renfrew, John Cherry, Editors

The common aim of the thirteen contributors to this book is to explain the remarkable formal similarities that exist among institutions, ideologies and material remains in a variety of cultures characterized by independent political centers yet to be brought under the control of a single, unified jurisdiction. A statement of the conceptual approach is followed by ten case studies from a wide varieties of times and places.

New Directions in Archaeology

\$42.50

At Bookstores or from

CAMBRIDGE UNIVERSITY PRESS

32 East 57th Street, New York, NY 10022

LaRamie Soils Service

P.O. Box 255 Laramie, Wyo 82070 (307) 742-4185 Inquiries welcomed

Serving Archaeologists since 1980

Field and Laboratory Investigations in

Geoarchaeology, Geomorphology, Pedology

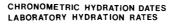
COMPETITIVELY PRICED

Physical, Chemical & Mineral Analyses

NEW MEXICO STATE UNIVERSITY

OBSIDIAN HYDRATION DATING LABORATORY

A Full-service Laboratory



MAJOR ELEMENT ANALYSIS TRACE ELEMENT ANALYSIS

SOIL TEMPERATURE MEASUREMENT INTRINSIC WATER CONTENT





CHRISTOPHER M. STEVENSON, Ph.D. BOX 5700
NEW MEXICO STATE UNIVERSITY LAS CRUCES, NM 88003

[505]-646-4132/-1447

society for american archaeology



ARCHAEOLOGY AND THE FEDERAL GOVERNMENT PUBLICATION SERIES

Vol.1 THE BRIEFING BOOK ON ARCHAEOLOGY ISSUES The foremost authority on current archaeological issues at the federal level. Current issues cover six broad areas: appropriations, cultural properties/looting, land management, government organization, research and public outreach. Yearly subscription with 10 updates. \$150.

Vol.2 THE POLITICS OF ARCHAEOLOGY

Contains essential information on how the system works, who is spending the money for what and how you can increase your influence and the political power of archaeology in Washington, D.C. (Revised edition) \$15.00

Vol.3 THE PROCUREMENT OF ARCHAEOLOGY

A primer for those interested in obtaining federal funding. Provides information on procurement laws and proposal preparation, and contains appendix of federal agencies funding archaeology. \$15.00 (Revised edition)

REFERENCE GUIDE - A Supplement to Vols. 2 & 3 Yearly updates on lists of Members of Congress,

their staff, committee assignments, major federal agencies funding archaeology and many politically active historic preservation groups.

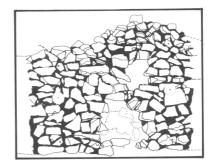
Vol.4 New in the Series! FEDERAL ARCHAEOLOGY LEGISLATION: A COMPENDIUM A compilation of federal laws pertaining to archaeology and historic preservation. \$20.00

For information, write or call: (202)833-2322 SAA, Office of Public Affairs 2000 P Street, NW Suite 305 Washington, D.C.

CLOSE-RANGE TERRESTRIAL • AERIAL ANALYTICAL PHOTOGRAMMETRY for **ARCHAEOLOGICAL APPLICATIONS**







A COMPLETE MEASUREMENT PROJECTS:

Consultation, planning & design ● Control ● Photography ● Contour, planimetric, profile, x-section, area and volumetric data collection • Digital data • Maps & drawings • Training in imagery acquisition • PhD-level staff archaeologist

A APPLICATIONS:

Site mapping • Profiles • Erosion, damage, vandalism & stability monitoring • Detailing site features & artifacts • Complete excavation recording • Measurement of fragile/oddly-shaped/ inaccessible features or artifacts • Microscopic artifact analysis • Complete HABS-HAER documentation • Spatial analysis • Predictive modeling • Database generation for statistical analysis



EQUIPMENT & SOFTWARE:

Kern DSR-II Analytical Stereocompiler with digital layering features ● HP 24 x 36 drum plotter • Analytical aerotriangulation • Kogo • Close Range Image Set-up package for metric or non-metric imagery • MAPS 300 Interactive Graphics Package ● DEC, IBM & HP formats ● Disk, tape, modem, or hardcopy outputs.



Andrews Atherton, Inc. 6747 North Black Canyon Phoenix, Arizona 85015-1029

(602)242-6229

ARCHAEOLOGY

FROM SMITHSONIAN INSTITUTION PRESS

FALL 1986

American Archaeology Past and Future

A Celebration of the Society for American Archaeology, 1935–1985

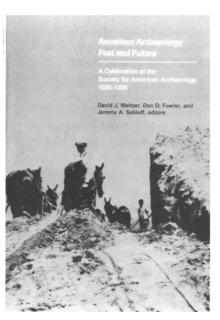
David J. Meltzer, Don D. Fowler, and Jeremy A. Sabloff, editors

"A rich and diverse synthesis, full of perceptive analysis, ardent self-criticism, and a delightful tone of almost boisterous optimism, which is thoroughly refreshing. . . . As an assessment of American archaeology today, this book is without peer."

—Brian M. Fagan, Antiquity

32 figs. 480 pp.

Cloth: ISBN 0-87474-692-2 \$35.00 MEAA Paper: ISBN 0-87474-693-0 \$19.95 MEAAP



The Archaeology of Western Iran

Settlement and Society from Prehistory to the Islamic Conquest

Frank Hole, editor First in the Smithsonian Series in Archaeological Inquiry

Western Iran, with Mesopotamia, Palestine, and Egypt, was one of the great germination sites of world civilization. This volume, written by nine leading scholars of the region, reviews its archaeology over "nine thousand years of social change."

96 tables and line drawings 406 pp. Cloth: ISBN 0-87474-526-8 \$49.95 HOAW Available April 1987

Handbook of North American Indians

Volume 11: Great Basin

William C. Sturtevant, general editor Warren L. d'Azevedo, volume editor

The HANDBOOK series, called "one of the glories of twentieth-century American scholarship" by Frank H. Stewart, presents in its latest volume forty-five chapters by experts on the prehistory, history, culture, and environment of the Great Basin tribes.

505 b&w illus. 868 pp.

Cloth: ISBN 0-87474-191-2 \$27.00 AZII



Order by ALPHA code from

SMITHSONIAN INSTITUTION PRESS

P.O. Box 4866, Hampden Station • Baltimore, MD 21211

New from the Society for American Archaeology . . .

SAA Papers No. 3:

THE STRUCTURE OF MATERIAL SYSTEMS: ETHNOARCHAEOLOGY IN THE MAYA HIGHLANDS

by Brian Hayden and Audrey Cannon

SAA Members: \$17.95 Non-members: \$24.95

Also Available:

SAA Papers No. 1

MODELS AND METHODS IN REGIONAL EXCHANGE

edited by Robert E. Fry

SAA Members: \$5.95

Non-members: \$7.95

SAA Papers No. 2

MAN AND ENVIRONMENT IN THE GREAT BASIN

edited by David B. Madsen and James F. O'Connell

SAA Members: \$10.95

Non-members: \$14.95

Include payment with order to: Society for American Archaeology 1511 K St., N.W., Suite 716 Washington, D.C. 20005

DISTINGUISHED SERVICE AWARD NOMINATIONS SOLICITED

The Distinguished Service Award established by the Society for American Archaeology is presented annually to a member for specific accomplishments of extraordinary quality. Recognition can be granted in a wide range of areas relating to archaeology including, for example, teaching (academic as well as public education), research (theory, method, application of new technology, analysis, etc.), and conservation of archaeological data (curatorial, legal, managerial), as long as two basic criteria are met. First, the contribution must be truly extraordinary in nature (not expected in the normal course of events) and must be widely recognized as such, and second, it must be of a positive and lasting quality.

The Society is accepting nominations from members for the 1987 Award, which will be presented at its Annual Meeting in May 1987, in Toronto, Ontario. Each recommendation should be supported by a statement documenting concisely and thoroughly the achievements of the nominee. Mail by November 28, 1986, to Dr. Charles L. Redman, Chair, DSA Committee, Department of Anthropology, Arizona State University, Tempe, AZ 85287.

52nd ANNUAL MEETING SOCIETY FOR AMERICAN ARCHAEOLOGY

Royal York Hotel Toronto, Ontario, Canada

Wednesday, May 6-Sunday, May 10, 1987

Annual Meeting Chair: Timothy Kaiser, Department of Anthropology, University of Toronto, Toronto, Ontario, M5S 1A1 Canada

See the April 1986 issue of American Antiquity for full details of the 1987 Annual Meeting.

CONTENTS

The Institutional Organization of Mississippian	Varnou İamas Kright Iv	675
Religion The Exotic Origins of Fishes Depicted on Prehistoric	Vernon James Knight, Jr.	6/3
Mimbres Pottery from New Mexico Old Bottle, New Wine: The Function of Chultuns in the Maya Lowlands The Optimal Design of Hunting Weapons: Maintainability or Reliability	Stephen C. Jett and Peter B. Moyle	688
	Bruce H. Dahlin and William J. Litzinger	721
	Peter Bleed	737
The Agricultural Foundations of the Tiwanaku State: A View from the Heartland	Alan L. Kolata	748
ANNUAL REVIEW OF OLD WORLD ARCHAEOLOGY	, coordinated by Peter S. Wells	
Neolithic, Chalcolithic, and Early Bronze in West		
Mediterranean Europe	David S. Geddes	763
Selective Survey of Archaeological Research in Eastern Europe	Sarunas Milisauskas	779
REPORTS		
Contextual and Nutritional Analysis of Freshwater Gastropods from Middle Archaic Deposits at the Hayes Site, Middle Tennessee	Walter E. Klippel and Darcy F. Morey	799
Duck Decoys from Lovelock Cave, Nevada, Dated by		
¹⁴ C Accelerator Mass Spectrometry	Donald R. Tuohy and L. Kyle Napton	813 816
The Ecology of Lucayan Arawak Fishing Practices Radiocarbon Dating of Corn	William F. Keegan Darrell Creel and Austin Long	826
Recent Research on Obsidian from Iowa	Darren Creek and Masters Doing	020
Archaeological Sites	Duane C. Anderson, Joseph A. Tiffany, and Fred W. Nelson	837
CURRENT RESEARCH, edited by Lynne Goldstein		
Central America, Southeast, Greater Southwest		853
REVIEWS AND BOOK NOTES, edited by Jerald T. Milanich		871
INDEX TO VOLUME 51		884