SAS
VOLUME 5 NUMBER 4 SPRING 1982
NEWSLETTER
SOCIETY FOR ARCHAEOLOGICAL SCIENCES

NEWS OF THE PROFESSION

REPORT: INTERNATIONAL CONFERENCE ON EARLY METALLURGY IN CHINA AND POSSIBLE EXTERNAL INFLUENCE

A unique conference took place in Beijing, China between October 12-15, 1981. It was entitled, "International Conference on Early Metallurgy in China and Possible External Influences." Participating in the conference were 12 scholars from outside China: 1 Australian, 1 Japanese, 1 Indian, 1 Canadian, 1 British, and 7 Americans. Six Chinese scholars also presented papers and more than 30 Chinese scholars were in attendance. This conference was the first such meeting of scholars concerned with archaeology and ancient metallurgy in China to be held on the mainland. The co-organizers were Dr. Robert Maddin, University Professor in Metallurgy and Materials Science at the University of Pennsylvania, and Dr. Tsun Ko, Professor of Metallurgy and Vice-President of Beijing University of Iron and Steel Technology. Both scholars have long standing research interests in the study of archaeology and ancient metallurgy. Participating in the sponsorship of the conference were the Chinese Society for Metals in conjunction with Academia Sinica of China and the National Science Foundation of the USA.

The research discussed in Beijing revealed much new information about the traditions from which the magnificent bronze ritual vessels of Shang (2nd millennium B.C.) and Chou (beginning of 1st millennium B.C.) Periods were to spring, as well as those traditions responsible for the origins of cast iron in China, known to have been the world's earliest. Among the most important revelations to come out of the conference proceedings were the following.

A. The excavation and analysis of what are now China's earliest copper and bronze artifacts, dating to pre-2000 B.C. These artifacts were excavated at several sites in Kansu Province in northwest China and predate previously known metal artifacts by several hundred years at a minimum. This is a development of great importance in the study of the evolution of metallurgical technology in China.

B. The excavation and analysis of two pre-2000 B.C. small brass rod fragments from a site in Shantung Province. They contained an average of 23% zinc. These present evidence of early metal-smelting in China and are very early brass in terms of world metallurgy.

C. A first millennium B.C. copper mine in Hubei Province found and excavated and in a surprisingly good state of preservation. Wood and metal artifacts, pottery, mine timbering, as well as a sophisticated winching system, have been discovered in the mine at Tonglushan.

D. New studies of southeast Asian metallurgy and the question of its origins in relation to those of China's metal working traditions. Questions of indigenous development of metallurgy versus those of the diffusion of technology from external culture areas were the source of much controversy and spirited discussion at the conference.

A number of other important studies was presented, including evidence and analysis of China's early cast-iron production. China's early, sophisticated manufacture of chime bells is being studied through the use of laser holography and through the casting of replicas which, along with the well-preserved originals, are playable. These bell replicas are now being reproduced for

sale to interested parties. The entire range of topics treated is too great to itemize here, and the above are among the most interesting.

A volume of all papers presented at the Conference is scheduled to be published in English by the Science Press of the Academica Sinica in late Spring 1982 under the joint editorship of Professors Maddin and Ko.

Following the conference a group of 11 American, Canadian, and Chinese scholars embarked on a tour of important ancient metallurgical sites and major provincial museum collections of bronze and cast-iron artifacts. The group focused the expertise of some of the most eminent specialists in the field of ancient China and its early metallurgy. The cities of Loyang, Xian, Zhenchou, Wuhan, and Quilin were visited. Among the important sites seen was the excavation of a Han Dynasty 2nd Century A.D. blast furnace excavated near Zhenchou. Besides furnace remains, 300 tons of sorted and sifted hematite ore, rammed earth walls and 9 enormous cast-iron masses known as "salamanders" weighing up to 23 tons and totaling about 100 tons in all, were excavated there. Near Wuhan the copper mine of Tonglushan was viewed. This ancient mine was discovered in the course of modern exploitation of the ore body there and is presently under excavation. These ancient shafts, galleries, etc., were mined at least 20 m. below the ancient original ground surface. Smelting furnaces, a rare and important discovery in the ancient world, were also excavated nearby. This ancient mine is certainly one of the best preserved ancient mines ever excavated.

Finally, among the numerous metal artifact collections visited perhaps the contents of the tomb of the Marquis of Yi, now housed in Wuhan in Hubei Province, is the most striking. Dating to 433 B.C., the tomb was built of gigantic wood timbers and lined externally with 50 tons of charcoal. Inside the tomb, some 7000 artifacts were excavated, among which are some of the most elaborate bronze vessels and other artifacts known in China. The set of bells found there is astounding in its size, number and sophistication. Future analysis of this tomb's contents is bound to be of great interest.

Vincent Pigott, University of Pennsylvania

JOURNAL OF ARCHAEOLOGICAL SCIENCE: UPDATE

During the past three years an increasing number of first-quality manuscripts has been submitted to the *JAS* from North American researchers, and the contents of the journal have shown a dramatic shift in terms of problem focus and interest. Since almost half the submissions and over half the subscriptions for the *JAS* now are in North America, Academic Press has completely reorganized the submission and editorial process to speed up the publication of manuscripts through the Chicago office. The Chicago and London editorial offices will now operate independently, both responsible directly to Academic Press (London branch). American spelling will also be accepted.

Richard Klein joined Karl Butzer as North American editor in April 1981. The present members of the rotating editorial board are

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SAS RESEARCH REPORTS

NUMBER 1

SPRING 1982

SHELLS IN ANCIENT ECONOMIES

Patricia Turnbull
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Field Museum of Natural History
Chicago, Illinois

This paper was presented at the 4th International Congress of Archaeozoology, London, April 18-23, 1982.

As a paleomammalogist interested in early domestication, I nevertheless have much more than a casual approach to non-mammalian remains on archaeological sites. I do collect and preserve all organic evidence, both plant and animal, and this care was rewarded at the site known as Allahdino, 25 miles northeast of Karachi, Pakistan.

The site was dug in a brief period in the summer of 1974, under the direction of Dr. Walter A. Fairservis, American Museum of Natural History and Vassar College, with the active cooperation of the Department of Archaeology, Ministry of Education, Government of Pakistan. As the on-site paleozoologist I excavated, preserved, identified and am now studying all faunal remains.

Allahdino is an Harappan site, dated variously between 3600-4000 years B.P. (University of Pennsylvania; 5568 half-life). Dr. Alan Solem, Curator of Lower Invertebrates at Field Museum, and his then-assistant, Carol Jones, identified the gastropods and pelecypods. Thanks to both workers, a great deal of time was saved in the initial part of this study. It was with some surprise that we discovered at least 30 species, 26 genera, and 20 families were represented. Allahdino is a small village site, perhaps occupied by no more than a single extended family (Fairservis, 1976), and the excavation was limited to one meter in depth over the entire area; furthermore, these shells are not midden accumulations, but are randomly distributed throughout the site.

Among the classic works on the Indus Valley is that by Sewell and Guha (1931), who described the fauna from Mohenjo-Daro. They listed 3 pelecypod and 9 gastropod species, some quite abundant in this very large excavation. The authors noted uses to which the shell was put in making jewelry, inlay, utensils, and toys (Sewell and Guha, 1931, pl. CLVI). The specimens of marine shells would have had to be imported from the coast of Karachi or even further southeast or west. From the other major Harappan city, Harappa itself, Prashad (1936) identifed 4 species. In 1978, Meadow gave preliminary identification of 7 species from Balakot, a site in Las Bela district, ca. 90 km north northwest of Karachi, indicating other genera were also present. In 1977, Dales and Kenoyer described the shell bangle industry of the same site, Balakot, which centered on the pelecypod *Callista (=Meretrix) casti*, a local form, and to a lesser extent on the gastropod *Turbinella*, which had to be imported. No evidence for a bangle industry was found in Allahdino, it being merely a small agricultural village. Details on the distribution of the species from Allahdino and other sites may be found in Thiele (1935), Wenz (1944), and Zilch (1960).

I have attempted to understand the importance of these shells to the people living at the site 3500 years ago, and I will discuss certain points. Some of the shells such as *Lamellaxis* and *Zootecus* are land snails, living on vegetation in and around the village and fields (cf. Voight, 1975). Too small to be a food source, they co-existed with man. *Melanoides* and *Indoplanorbis* inhabit swamps and fresh water; *Melanoides* is edible, but also carries fluke parasites.

Edible molluscs must have been among the

most important in the economy of the Indus Valley or other Bronze Age sites. *Lamellidens* and *Parreysia* are edible fresh water mussels. Possessing a brilliant internal nacre, these molluscs would also be useful as inlay and ornaments. Also Prashad (1936) noted the use of *Lamellidens* for peeling green mangoes. *Terebralia*, the edible river horn shell, occurs in estuarine mud flats, salt marshes and brackish water generally and would have been found in the lower reaches of the Malir River. Marine shells such as edible oysters and Venus clams would be eaten along the coast where they were found, and the shells returned to the village for further use, as was also the case for the clams *Arca* and *Scapharca*.

Conch shells were useful for making bangles as several can be manufactured from each large shell, whereas only one can be made from each venerid (i.e. *Callista*) shell; however, no direct evidence for bangle making at this site was found, but many broken bangles were present. Some of the cowries make pretty beads and toggles, and the murex *Thais carinifera* contains a purple dye, prized by many ancient people. Still other shells were useful as utensils--scoops and ladles. A specimen of *Hemifusus* had cut and smoothed edges quite like the specimen figured by Sewell and Guha (1931, Pl. CLVI). Shells such as *Lamellidens* and *Ostrea* possess brilliant internal nacre when fresh, and are used today for pearl buttons and as cultured pearl "seed." And some shells perhaps were kept by the Bronze Age folk for their intrinsic beauty--our only evidence is the presence of the shells.

Raikes (1965) has suggested convincingly that the flood plain of the Indus in the vicinity just south of Amri was uplifted due to strike-slip faulting and linear and volcanic mud extrusion (Snead 1964). Therefore the mouth of the Indus would have been closer to Allahdino; estuarine water may well have been local (see also Fairbridge, 1975, p. 543). All the mollusc specimens would have been obtainable in the area; none were more than a few hours journey from the site. Rainfall and climate were essentially the same as that prevailing today.

As to the numbers of shells present, I cannot be very exact; I was able to bring home for study only a small portion of the total fauna and I selected all the shells that I thought were identifiable or that included every species present. The land snails, *Lamellaxis* and *Zootecus* are represented by dozens of specimens. There are 14 shells of *Turbo coronatus*. There are 7 *Lamellidens* and 7 *Terebralia palustris* shells. All the rest are represented by from 1 to 5 shells. Many times these numbers of broken, fragmentary shells are stored in the Department of Archaeology in Karachi, awaiting further work some day.

From consideration of this collection of shells, it is apparent that this group of Bronze Age people had a far more varied diet available than meat from domestic and wild mammals and crop foods: they valued sea food in several forms, particularly molluscs. Eustatic conditions were such that the coast line was closer to the village than it is today. The lower reaches of the Malir River were brackish, suitable for salt marsh and mangrove. Even the present day distance to the sea from Allahdino is not too far for fishermen to venture and their efforts were always well rewarded. Knowledge about the shells gives to anthropologists greater insight into the daily activities of people, even though, as in the present case for instance, no direct evidence of any industry was found. The Bronze Age Harappans made use, in an impressive way, of all the raw materials at hand in their environment: wood, stone, clay, shell, bone, and metal.

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Curt Beck (Vassar), Bill Farrand (Michigan), Jim King (Illinois State Museum), and Bob Stuckenrath (Smithsonian). Manuscripts should be submitted in triplicate (reduced-size copies if possible) with copies (not originals) of artwork at reduced scale (page format), with a self-addressed, return envelope. All correspondence should be submitted to: Professor R. G. Klein, Department of Anthropology, University of Chicago, 1126 East 59th Street, Chicago, IL 60637.

To assure quality control and prompt processing the editors need a larger pool of potential referees in the many different subfields of archaeological science--referees willing to read and return papers within three weeks. If you are interested and able to help in the peer review procedure, please fill out the enclosed form and return it to Professor Klein.

The members of the Society for Archaeological Sciences are uniquely privileged in having a special SAS member price of $35 for the 1982 issues (instead of $68). In placing your subscription to Academic Press *JAS*, (Academic Press Inc., 111 Fifth Avenue, New York, NY 10003) please be sure to note that you are an SAS member and request the special SAS rate.

Karl Butzer, University of Chicago

CONFERENCE REPORT ON C-14 DATING IN ARCHAEOLOGY AVAILABLE

On June 10-12, 1981 a conference on "Radiocarbon Dating in Archaeology: Needs and Priorities in the 1980's" was held in Washington, D.C. at the National Science Foundation. The need for this conference grew out of consultations among members and officers of the Society for American Archaeology (SAA), the Society for Archaeological Sciences (SAS), and directors of various radiocarbon laboratories involved in archaeological and paleoenvironmental studies. For several years there had been a growing consensus that severe problems were seriously eroding the ability of the laboratories to effectively and efficiently support the archaeological community in the United States. Representatives of the professional archaeological community, as well as laboratory directors of a number of the nation's major radiocarbon laboratories, met together to formulate recommendations to the National Science Foundation. In addition to the SAA and SAS, the Archaeological Institute of America (AIA) was represented at the conference.

The participants included Dr. R.E.W. Adams (University of Texas/San Antonio), Dr. Rainer Berger (University of California/Los Angeles), Dr. E. Mott Davis (University of Texas, Austin), Dr. Jeffrey Dean (University of Arizona), Dr. Jonathon Ericson (Harvard University), Dr. James Griffin (University of Michigan), Dr. H.E. Gove (University of Rochester), Dr. Herbert Haas (Southern Methodist University), Dr. Vance Haynes (University of Arizona), Dr. Cynthia Irwin-Williams (Eastern New Mexico University), Dr. Austin Long (University of Arizona), Barbara Lawn (University of Pennsylvania), Dr. Jerry Stipp (University of Miami), Dr. Robert Stuckenrath (Smithsonian Institution), Dr. Eugene Sterud (A.I.A.), Dr. Hans Suess (University of California/San Diego), Dr. R.E. Taylor (University of California/Riverside), and Dr. Fred Wendorf (Southern Methodist University).

The 42 page report on the conference contains a four-point set of recommendations and discussions concerning the background to the current problems, the relationships between university and commercial laboratories in the United States, the projected impact of direct or ion counting on radiocarbon dating, and the results of a survey of both the archaeological community and radiocarbon laboratories in the United States. The report is available free of charge. Send a self-addressed 9" x 12" envelope with your request to the Office of the General Secretary of the SAS. For those outside the United States, please send the equivalent of U.S. $1.20 for airmail delivery.

R. E. Taylor, University of California, Riverside

AMERICAN SOCIETY OF PHOTOGRAMMETRY

Dr. James Grady (Western Cultural Resource Management, Inc., Boulder, Colorado) has recently been named as Second Deputy of the American Society of Photogrammetry's Archaeology and Anthropology Committee. The Committee coordinates and promotes the participation of archaeologists, anthropologists, and other cultural resource scientists and managers in Society activities, including the application of aerial photography, photogrammetry, and other remote sensing methods in these fields. Other Committee members for 1982 are Dwight L. Drager (National Park Service, Albuquerque), Chairman; and Francis P.

Conant (Anthropology, Hunter College, New York City), First Deputy. James I. Ebert, former Chairman, stepped down this year.

James I. Ebert, National Park Service, Albuquerque.

REQUESTS FOR COOPERATION

Soils Analysis

Joseph Schuldenrein (Commonwealth Associates, Michigan) needs to know of scientists or institutions capable of performing sedimentological analysis and thin-section preparations of soil samples. He is especially interested in facilities for running atomic absorption tests for trace element analysis. He is also looking for a publisher for his upcoming Ph.D. thesis on Near Eastern prehistory and environmental change. Address: 209 E. Washington, Jackson, MI 49201.

Use-Wear on Bone Tools

Douglas V. Campana (Archaeologist, Mid-Atlantic Regional Office, National Park Service) is currently studying Natufian bone tools from Hayonim Cave, Israel. He would like to hear from anyone who is currently engaged in research on the experimental manufacture and use of bone tools or the study of manufacture and use-wear patterns on bone artifacts. Address: 1213 N. Palethorp Street, Philadelphia, PA 19122.

Faunal Remains

Pam Jean Crabtree (MASCA, University of Pennsylvania) is studying the animal bone remains from the Early Anglo-Saxon site of West Stow, Suffolk. She would be interested in hearing from anyone working on historic sites faunal analysis. Address: 1213 N. Palethorp Street, Philadelphia, PA 19122.

RESEARCH NOTES

Robert C. Eidt (Director, State Soils Lab, University of Wisconsin, Milwaukee) is under contract with the Museo del Oro, Bogota, Colombia, to analyze raised field anthrosols in Colombia, S.A. The emphasis is on soil phosphate fractionation, a difficult chemical procedure for identifying feature function of archaeological soils and interpreting land use. He remarks that their laboratory is probably the only one in the country doing this work for archaeologists on a contract basis. They have just finished a contract for California, and are engaged in another for the Colombian government and a third for the University of London Institute of Archaeology.

In cooperation with a graduate student and geologists from the Institute of Oceanographic and Fisheries Research in Greece, **John C. Kraft** (Department of Geology, University of Delaware) is constructing a three-dimensional model of Holocene Epoch sedimentation in the Acheloos River delta in Archarnania. Present indications suggest that the delta of the Acheloos had bypassed some of the easterly-most islands of the Echinades Group in the Ionian Sea. Thus Oiniadai was a fortified island-harbor-city in Classical times. Similarly, Pleuron, high on a mountain north of Messolongi, was located along the edge of the Ionian Sea of several thousand years ago.

In Hawaii, he is making a paleo-reconstruction of the Kawainui Marsh on O'ahu. Here a coastal marsh and barrier accretion plain have formed adjacent to a coraline algal-coral reef tract. By means of a drill hole study, a three-dimensional model of the evolution of the Kawainui marsh has been made. The area of the Marsh and barrier accretion at Kawainui was a coraline algal-coral reef embayment 2000 to 4000 years B.P. Thus, the earliest known (to date) archaeological site in Hawaii can be identified to be located on the shoreline of a clear water embayment in the third to fourth century A.D. near the major Heiau (religious site) Ulu Po, of a much later date.

Dr. Michael Wilson (Department of Geology/Geophysics, University of Calgary, Canada) has a number of projects underway. He is studying the Holocene evolution of genus *Bison;* the Quaternary stratigraphy and the alluvial chronology of the Bow River Valley, Alberta; the geoarchaeology of the "Taber Child" Site (Stalker Site), Alberta (an early man site); the Holocene paleoenvironments of the Northern Plains; and Northern Plains archaeology, especially boulder structures.

Dr. G.W.A. Newton (Chemistry Department, Manchester University, England) is involved in neutron activation analysis of pottery: Iron Age Red-on Black from the Levant; Roman coarse ware from North Africa; and Greek Bronze Age pottery from Apulia and Athens.

NEWS OF SOCIETY

SAS WORKS TO FACILITATE US PARTICIPATION IN ICAZ

In recent years archaeology has become increasingly concerned with elucidating the economy and ecology of past societies. One crucial part of this movement, the analysis and interpretation of the faunal remains from archaeological sites, has risen from being a comparatively minor and obscure pursuit to becoming a major contributor to archaeological research. The gathering momentum of this research movement has been reflected by the establishment and steady growth of an international scientific forum for the discussion of faunal analysis. This has been provided by the International Council for Archaeozoology, the principal function of which has been the convening of periodic, international conferences. The fourth such conference was held at the Institute of Archaeology in London this year from April 18-23. The program was entitled "The Contribution of Faunal Analysis to the Study of Man." The meeting was attended by hundreds of scientists from all over the world and many important interchanges occurred regarding both methods and the interpretation of economic and ecological patterns of the past.

Once the meeting had been announced it became apparent that a considerable contingent of scientists from the USA wished to attend (and indeed were needed at the conference). Richard Meadow and Jonathon Ericson proposed that SAS should become involved in seeking NSF support to assist in covering travel expenses. Richard Meadow collected information from prospective participants and submitted a joint proposal with Jonathon Ericson to the International Travel Grant Program at NSF. The sum of estimated air travel costs and the postage and clerical costs came to $26,800. The proposal was submitted under the aegis of SAS, with an adjudicating committee consisting of Jonathon Ericson, Glynn Isaac, and Richard Meadow.

While the proposal was under consideration, Federal Funds were drastically cut for the division of NSF concerned. However, a commitment to support the proposal had already been obtained, so that after considerable delay a grant of about half of the sum requested was announced. The Selection Committee thus had to devise ways of apportioning funds fairly and effectively. This task was made slightly easier than it might have been by the fact that some prospective participants withdrew. The committee then worked to find a formula for offering sufficient funds to make attendance feasible to as many as possible. Some 30 scientists were offered either the sum they specified as the minimum necessary or a flat uniform percentage of their original Apex or excursion fare estimates.

In going through the applications, the Committee was gratified to find that the abstracts of papers covered a vigorous and interesting variety of topics. It also became apparent that this is a new field of enquiry: about half of the applications were from workers who are still graduate students or are within a few years of taking their Ph.D.'s. Applications came from all over the USA, but regional clusters emerged in the northeast and in the southeast.

The diversity of the coverage can be best indicated by including the titles of the sessions into which the conference was divided:

1. Types of early hominid activity as indicated by biological and archaeological evidence.
2. Hunter-gatherers, ancient and modern.
3. The impetus for domestication.
4. Studies in modern pastoralism and the interpretation of the management of animals in prehistory.
5. Middens, molluscs, and the exploitation of wild birds and aquatic resources.
6. Quantitative assessments of food resources made available by animals.
7. Correlation between faunal analyses and pictorial and written records.
8. Archaeozoology in historical periods.

Glynn Isaac, University of California, Berkeley

SAS Research Reports is a new *Newsletter* supplement designed to facilitate communication of current research and interim reports of data and analysis from long-term projects. Manuscripts should be submitted to the *Newsletter* Editor for consideration. Send 1 original and 1 copy. Reports must be limited to approximately 5 manuscript pages, double spaced, including tables and illustrations.

MEETING NOTES

ZOOARCHAEOLOGY SESSIONS

Two sessions on zooarchaeology are planned for the 1982 AAA Meetings in Washington, D.C. 1) Approaches to Palaeoeconomy in Historic Sites Faunal Analysis (Pam Crabtree, organizer). 2) Archaeozoology and Palaeoeconomy: The Reconstruction of Prehistoric Subsistence (Haskel Greenfield, CUNY Graduate Center, organizer).

The recent SHA meeting in Philadelphia included a session on bones and seeds entitled "Faunal, Floral, and Human Skeletal Analyses in Historical Archaeology."

Pam Crabtree, MASCA, University of Pennsylvania

CONGRÈS INTERNATIONAL DE PALÉONTOLOGIE HUMAINE

The first international congress on human paleontology is scheduled to be held October 16-21, 1982 in Nice, France at the Palais des Expositions. Papers will be presented in 7 sections: 1)Non-human primates; 2)*Australopithecus* and *Homo habilis*; 3) *Homo erectus*; 4) *Homo sapiens neandertalensis*; 5)*Homo sapiens sapiens* of the Upper Paleolithic and Mesolithic; 6) *Homo sapiens sapiens* of the Neolithic and Metal Ages; 7)Modern populations.

In addition, Marie-Antoinette de Lumley of the Centre National de la Recherche Scientifique will chair a symposium entitled "*Homo erectus* and the Position of Tautavel Man Amongst the Fossil Hominids."

For further information, contact the Secretary of the Congress:

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