

Alabama Archaeological Society

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STONES & BONES NEWSLETTER

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SUMMER MEETING

The summer meeting and field exploration in Leighton produced some very promising observations even though in-situ cultural material was limited. A group of about 30 participants assembled at mid-day on Saturday, August 14. The group was led by a team of archaeologists from the University of Alabama - Office of Archaeological Research.

Trenching operations were started with a backhoe in areas where previous surface collecting had shown the greatest density of cultural material. Of course, we all hovered in anticipation of discovering an undisturbed strata containing Paleo material. As the trenching operation proceeded and profiles were cut, the history of the site could be more clearly postulated. It appears that at the higher elevations the soil erosion was sufficient to remove any evidence of original habitation. However, along the slopes of the site, and particularly in the region adjacent to Fennell Lane, it was apparent that a redeposited strata (approximately 30 cm in depth) existed below the plow zone and above a strata of dark soil (approximately 10 cm in depth). This lower strata could be readily hypothesized to be an original forest floor and provided the incentive to proceed with more careful exploration.

Two test pits were excavated - the first being one meter square and the second being approximately three meters square. Both pits were located adjacent to a test trench cut in an east/west direction and beginning on the west side of the ditch paralleling Fennell Lane. In both cases the plow zone overburden was removed and discarded. Subsequent excavation was by strata, with each level being carefully removed, screened, and cultural material retained. From more thorough examination of the strata, it was concluded that the redeposited zone was most probably a result of soil erosion from higher elevations and possibly from discard in cutting and side-ditching of the roadbed. There was also some evidence that the lower levels of the redeposited zone may have existed over some period of time and could also have provided a stable occupation zone. Excavation of these strata produced some charcoal and flint. In the lower strata of dark soil, several broken points were located, including a possible Kirk Serrated. Excavation was continued to a depth of 20 cm below the primary horizon with no significant evidence of cultural material.

On Saturday evening the group adjourned to the Executive Inn in Florence for a meal and informal discussion led by Carey Oakley and Laurence Alexander of the Office of Archaeological Research. The discussion was most stimulating, providing a direct interchange of ideas and opinions concerning our explorations of

Dwight C. ...
September 1982

the day. About 20 of the group reassembled on Sunday morning; studies were concluded by mid-afternoon and the pits refilled.

In summary, we all had an enjoyable weekend, found muscles that we didn't know existed, and discovered an undisturbed strata that holds great promise of providing the in-situ Paleo material we were seeking. With regard to the future, it is expected that a more detailed survey of the area will be conducted and reported along with an analysis of the surface material collected and the cultural material taken from the test pits. Although possibilities exist for further excavation, planning in this direction must necessarily await a more detailed study of the results to date.

Jim Lee
Huntsville

ANNUAL MEETING

Plans are progressing rapidly toward finalizing arrangements for the Annual Meeting. The meeting is now scheduled for November 20-21 at the Hilton in Huntsville. The agenda will start with a morning session on Saturday with invited papers on the subject of early man. The afternoon session will be devoted to reports of ongoing activities of the various organizations throughout the state. Most of the morning session has been confirmed; details of the afternoon session are in progress. A dinner meeting will be held Saturday evening, with Dr. Frances Roberts speaking on the Constitution Hall project. On Sunday we will have the opportunity to take a guided tour of Constitution Hall. In addition, provisions have been made for a display area. Particular emphasis will be placed on early cultural material.

Please make your plans now to attend the meeting. We should have an interesting program that will appeal to all. A more detailed agenda will appear in a future issue of Stones & Bones.

Jim Lee
Huntsville

PUBLICATIONS AVAILABLE

THE INDIAN TRIBES OF NORTH AMERICA - John R. Swanton. This classic handbook of the Indian tribes of North America was first published in 1952 as Bureau of American Ethnology Bulletin 145. Five detailed maps, each over 1½ by 2 feet, pinpoint the locations and settlements of the tribes in the text, which briefly sketches tribal histories. 726 pp; 5 fold-out maps; LC:52-61970. ISBN 179-3; cloth \$35.

INDIANS OF THE SOUTHEASTERN UNITED STATES - John R. Swanton. First published in 1946 as Bureau of American Ethnology Bulletin 137, this massive ethnohistoric classic provides a general overview of the Southeast, followed by

concise descriptions of the 174 different Indian tribes for which written accounts exist, and a section with detailed description of every facet of the way of life of these Indian groups. 943 pp; 112 b&w illus.; 13 maps. ISBN 895-X; paper \$19.95.

Both of the above books are available from the Smithsonian Institution Press; P. O. Box 1579; Washington, D. C. 20013. Use the ISBN number, along with the title and price, when ordering.

MEETING

The Fall Meeting of the Society for Georgia Archaeology will be held on October 23, 1982, at Ocmulgee National Monument in Macon, Georgia. Papers will be presented beginning at 10:30 a.m.

The Editors

CHAPTER NEWS

Huntsville Chapter

Mr. Tom Moebes of Decatur spoke on "Cave Spring Revisited" at the August 17 meeting. Mr. Moebes was one of the principals involved in this exploration near Decatur and published an article on it in the Journal of Alabama Archaeology.

The Huntsville Chapter meets the third Tuesday of each month at 7 p.m. in the Arts Council Conference Room, Von Braun Civic Center. The next meeting will feature Mr. John Dowd as speaker; the "Point-of-the-Month" discussion will focus on uniface scrapers.

NEW PUBLICATION

THE AMERICAN INDIAN IN TENNESSEE: AN ARCHAEOLOGICAL PERSPECTIVE; by Jefferson Chapman, 48 pages, 83 figures. Cost: \$5 plus \$1 postage and handling. Available from the Frank H. McClung Museum; The University of Tennessee; Knoxville, Tennessee 37996-3200.

This booklet, produced in conjunction with the Museum exhibit of the same title, presents for the layman an overview of the 12,000-year culture history of the Indian in the state. The text addresses the discipline and history of archaeology, characterizes each of the culture periods from Paleo-Indian to the historic Cherokee, and ends with the Indian Removal of 1838. Numerous photographs and line drawings supplement the text. A list of suggested readings is provided.

The Editors

EARTHWATCH

EARTHWATCH is a national volunteer organization offering members of the public the opportunity to join research expeditions to help noted university and museum faculty accomplish their field work.

Founded in 1971 to serve as a bridge between the public and the scientific community, the organization to date has involved more than 5,000 men and women of all ages in research expeditions in 30 states and 55 countries. More than 450 scholars in the earth, marine and life sciences, and the humanities, have been assisted by EARTHWATCH volunteers.

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Since 1971, EARTHWATCH has raised over \$3 million in private funds to support research worldwide. Over half a million hours of labor have been donated by EARTHWATCH volunteers. For more information, write to: EARTHWATCH; 10 Juniper Road, Box 127; Belmont, Massachusetts 02178.

The Editors

BATAN GRANDE:

A PREHISTORIC METALLURGICAL CENTER IN PERU

Since 1978, as part of a long-term investigation into the unique Batan Grande Archaeological Complex, situated in the small La Leche Valley on the north coast of Peru, a team of researchers has been studying a major interlinked prehistoric mining and metallurgical complex at Cerro Blanco and Cerro de los Cementerios. The numerous elaborate tombs in Batan Grande are widely known for the immense quantity, variety, and beauty of their metal funerary objects. In fact, most of the spectacular prehistoric gold objects attributed to Peruvian sources and now in museums around the world were most likely looted from tombs there. We had thus suspected a long metallurgical tradition in the Batan Grande region.

The Leche and Lambayeque rivers flow through a region of unusual geologic complexity. Outcrops within a 50-kilometer radius of Batan Grande vary from Precambrian metamorphics to Tertiary volcanics. Quaternary alluvium has been deposited at the base of the Andes Mountains, creating a broad coastal

plain that obscures structural relationships between the relatively wide continental shelf and Paleozoic sediments of the foothills sector.

The site is located southeast of the modern village of Batan Grande and roughly 3 kilometers north of the Cerro Blanco mine. The fact that a relatively straight, ancient road 2 to 2.5 meters wide links these places suggests their contemporaneity and functional interdependence. Near the mine, the road is partially dug into the hillside, and the outer edge is built up with fieldstones used to maintain a level surface. Prehistoric ceramics with paddle-stamped designs were found embedded in the road surface and downslope.

The ceramics associated with the smelting areas in Sector III investigated thus far are predominantly Chimu-Inca and, to a lesser degree, Chimu and Provincial Inca. The presence of intrusive burials with Chimu pottery in groups of interlinked, well-built rectangular rooms buried within platform mounds and in their immediate vicinity attests to pre-Chimu occupation in Sector III.

Sector III is ideally suited for smelting: the wind direction is constant, and the wind blows predictably every afternoon. It would have dispersed noxious smelting fumes and increased draft for the furnaces.

The Cerro de los Cementerios occupies a "central place" among the various communication routes, fuel sources, and prehistoric mines thus far identified within the valley. Within 10 kilometers from the Cerro, there are five mines, four on the northern margin and one (Cerro Blanco) on the southern margin. All the mines yielded copper ore, although the Cerro Blanco mine is disproportionately larger than the others. The contemporaneity of these mines has not yet been established, but the inferred longevity of the Cerro de los Cementerios occupation allows for some temporal overlap. The Cerro also has direct access to all areas of the valley as well as two major side valleys that lead to the adjoining Lambayeque Valley to the south. The major north-south road that Pizarro and his men followed on their way to Cajamarca passes slightly west of the Cerro.

Experiments have shown that the amount of fuel consumed in primitive copper smelting is several times greater than the amount of ore consumed. This suggests that proximity to fuel may have taken precedence over proximity to ore in determining the location of a smelting operation. The dense and extensive (some 70 square kilometers) subtropical thorn forest just north and west of the site may well have supplied much of the charcoal fuel.

The limited excavation at Batan Grande in 1980 and more extensive excavation in 1981 focused on Sector III, the suspected center of industrial-scale smelting. Thus far we have excavated, partially or in entirety, 24 smelting furnaces in Sector III. Most furnaces were located on the basis of surface indications, including slag and heat-discolored mud used for the construction of the smelter, and examination of looters' pits, which often cut through furnaces and

their associated features. On the basis of the first ten or so furnaces discovered, we established a set of criteria for predicting the location of furnaces. For example, with a few exceptions, furnaces are organized in rows of three or four, which are aligned north-south. Typically, adjacent furnaces are separated by about 1 meter.

We estimate that there are upwards of 100 furnaces remaining within this sector, despite the heavy toll taken by modern looting. Air photos taken in 1949, before the onset of modern looting, showed various rectangular compounds with regular divisions that are now difficult to discern. In light of this evidence, we can speak confidently of an industrial-scale smelting operation in Sector III.

The 24 excavated furnaces show definite morphological unity despite varying stratigraphic levels (about A.D. 1200 to 1532). A typical example may be described as follows. Seen from above, the furnace is pear-shaped. The narrow end is built up to form a primitive chimney and lies deeper than the wide end, which forms a shallow, flaring apron. The chimney is formed by setting the narrow end into a low terrace step, the riser of which is steeply angled, running from the widest part of the furnace's wide end up to the point of inflection at the pear's waist.

The relatively small size and peculiar shape of the furnace appear to have been based on the constraints of lung-powered draft, the necessity for a reducing atmosphere for smelting, efficient ventilation (including perhaps amplification of wind draft) and heat retention. The physical strain of an individual's having to blow air continuously and forcefully without the benefit of bellows underlies the difficulties associated with attaining and sustaining sufficiently high temperatures for efficient smelting (typically 1100° to 1200°C).

The interior surfaces of the furnaces were lined with highly refractory gritty mud with a melting point of over 1300°C. Some furnaces had been relined up to three times, a strong testimony to their prolonged and intense use. The linings of all furnaces were heat-reddened to a depth of 5 to 10 centimeters. Some furnaces, after their use was discontinued, were intentionally filled with stones and earth. One had been cut in half by a later furnace. Pieces of furnace lining were used in the construction of basins associated with later furnaces.

It is apparent that smelting generated considerable debris. For example, close to Furnace 1 we found a deposit best described as an industrial midden, which contained numerous 1-centimeter pieces of hematite and various sized limonitic concretions (a dense, iron-rich ore, partially heat-altered with adhering flecks of charcoal, slag, and powdery yellow limonite). These iron compounds are commonly found associated with furnaces and are clear evidence of fluxing (to facilitate the separation of metal and slag).

A number of preliminary observations can be made pertaining to the labor force involved in the metallurgical activities in Sector III. The smelting operation was a multifaceted activity that entailed carrying ore, fuel, and flux, keeping furnaces going; preparing charges; raking out the resultant products and

cleaning the furnaces; transporting slag to grinding areas to be crushed; and extracting copper prills (droplets). Rows of three or four furnaces could have been tended by individual work units consisting of perhaps six to eight persons; this arrangement would allow two persons to provide air blasts with blowtubes at each furnace, if we assume the simultaneous use of all furnaces. The flaring apron of each furnace would allow two or possibly three blowtubes to be used simultaneously. We must also consider the possibility of sequential or staggered use of the furnaces. Although continuously supplying air with only human lung power is taxing and may have required a rotation of laborers, we may be underestimating the capacity of ancient metalworkers. A modeled Moche vessel shows four men blowing air into a circular furnace using long blowtubes. Each worker holds the blowtube to one side of his mouth as if he were inhaling air from the other side.

Data from our fieldwork have made possible a preliminary reconstruction of a prill-extraction copper and copper alloy smelting technique heretofore undocumented in the New World and its large-scale application during the late pre-Hispanic occupation of Cerro de los Cementerios. The pear shape of the furnace, with its primitive chimney, the refractory mud that lined the furnace and allowed for its repeated use, the thorough grinding of slag by batanes, and the efficient recovery of prills represent a unique set of solutions to the physical and behavioral constraints that all copper industries must contend with. Various lines of evidence indicate that this newly-documented technology evolved locally from at least A.D. 800 to 900. The organization of the furnaces and associated features, including their architectural setting, argues for production by the masses, with a battery of smelters, each producing small quantities of copper and copper alloy products at a time. The great number of furnaces, however, suggests that the total production was quite large.

Future research objectives at the site include the study of ore sources, smelting charges, and the ingot and artifact distribution through trace element analysis.

Footnote: A considerable amount of camelid remains was recovered from our excavations in Sector III. We suspect that large male llamas, which are known to carry burdens weighing up to 45 kilograms, were used for ore transport. A large empty rectangular stone enclosure beside the road near the Cerro Blanco mine may have been used as a llama corral.

(From an article by Izumi Shimada, Stephen Epstein and Alan K. Craig, SCIENCE, Vol. 216, May 28, 1982)

The Editors

PUBLICATIONS AVAILABLE

Available issues of <i>Journal of Alabama Archaeology</i> Vol. 13-18	\$1.00 pp
Vol. 20-24 (\$2.50 to Members)	\$4.00 pp
<i>Stanfield-Worley Bluff Shelter Excavations</i> (Journal of Alabama Archaeology) Vol. VIII Nos. 1 & 2-Reprint	\$5.00 pp
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<i>Handbook of Alabama Archaeology Part 1, Point Types</i>	\$7.35 pp
Lively, Long, Josselyn - <i>Pebble Tool Paper</i>	\$3.00 pp
<i>Investigations in Russell Cave</i> , published by the National Park Service	\$5.00 pp
<i>Exploring Prehistoric Alabama through Archaeology</i> (Juvenile)	\$7.00 pp

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