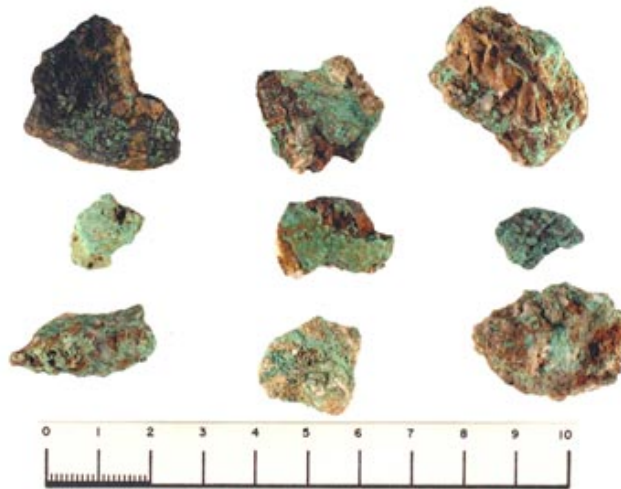


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Excavations at the Copper Smelting Site of El Manchon, Guerrero, México



Research Year: 2002

Culture: Uncertain

Chronology: Late Postclassic

Location: Guerrero, México

Site: El Manchon

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Abstract

The research money provided by FAMSI was used to excavate Las Fundiciones, the only unambiguously prehispanic copper smelting site yet identified in Mesoamerica. The site is located at 1400 meters above sea level in the Sierra Madre del Sur in Guerrero. In previous work, I had documented Mesoamerican copper fabrication methods, metals and alloys, the chronological sequencing of these developments, relations among South

American and Mesoamerican metallurgy, and the overall sumptuary emphasis of this technology. What we have lacked is evidence regarding metals production technology (smelting regimes, mining techniques, metals processing regimes, etc.) and the identity of the peoples responsible for these activities. We excavated the badly eroded remains of a furnace that consisted of worked stone, copper ore, slag, prehispanic potsherds, and two features that look like very small furnaces or crucibles. Subsequent work shows that the ore is malachite and cuprite in a quartz matrix. We also tested several structures in the habitation area (the surfaces of which had been badly disturbed by cattle and burros) two of which we investigated through horizontal excavations. Neither of these showed evidence of either domestic or craft activities, although we recovered two caches of potsherds. The analysis of the potsherds (which are highly eroded and fragmented) suggests that we are dealing with globular and other jar-shaped fragments, vases, cups with an annular base, and possible incense burners. Many present a white wash, paint, or slip, with red designs. This project will constitute a very long-term undertaking.

Resumen

La investigación apoyada por los fondos de FAMSI se ocupó en investigar Las Fundiciones, el único sitio definitivamente prehispánico de fundición de cobre que se haya hallado en Mesoamérica. Se localiza en la Sierra Madre del Sur en Guerrero a 1400 metros sobre el nivel del mar. En publicaciones previas ya se habían documentado las técnicas de fabricación del cobre y las aleaciones, el uso, la relación entre diseño, uso y materiales, la relación entre las metalurgias de Mesoamérica y las metalurgias de Sudamérica y el énfasis suntuario de esta tecnología. Faltaba evidencia de producción, y esa fue la meta de nuestra investigación en la temporada financiada por FAMSI. En cuanto a la excavación, investigamos los restos de un horno de fundición que consiste en un complejo revuelto de piedra, mineral de cobre, carbón, cuarzo (la roca matriz del mineral de cobre), escoria, tepalcates y dos elementos que parecen ser hornos o crisoles. El mineral de cobre es la malaquita y la cuprita. También probamos las estructuras en el área habitacional, dos de las cuales abrimos horizontalmente. Ninguno de los montículos presentaron datos estructurados que pudieran habernos revelado evidencias de actividades domésticas o de producción especializada, aunque en uno recuperamos dos depósitos de tepalcates. Las superficies de ambas estructuras han estado sujetas a décadas de perturbaciones provocadas por las vacas y burros que allí andan sueltos. Los análisis de los tepalcates –que están muy fragmentados y erosionados– nos pusieron ante la presencia de jarras, vasijas, copas de base anular, y coladores y posibles incensarios. Muchos presentan un fondo blanco con pintura roja. La investigación constituye un paso en lo que va a ser una investigación a muy largo plazo en la región.

Submitted 12/22/2003 by:
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Interim Report

This report summarizes activities carried out during the funding period. We were able to accomplish the majority of the objectives set out in the research proposal (the second season of fieldwork at El Manchon, Guerrero). The principal activity was to map and to complete excavations of the large smelting furnace in Zone 2 and to trench into, and begin horizontal exposures in the structures in Zone 1. We also were able to begin construction of field facilities in the hamlet of El Manchon.

One major effort was to complete excavating the feature we have designated as a smelting furnace located in Zone 2 of the site. This feature is an assemblage consisting of one to two courses of jumbled stones (approximately 3 x 4 m area) at the edge of an arroyo. A large slag accumulation appears immediately to the north of the assemblage. Slag, charcoal, and pieces of copper ore were recovered in excavations to 60 cm below the surface in the furnace during the previous field season. We completed excavating the furnace and produced two detailed maps of it including several cross sections. The assemblage appears to consist of four to five small furnaces that may have been in use simultaneously, and these consist of burned areas, charcoal, slag, and pieces of copper ore. We recovered a significant sample of thick, undiagnostic pottery in these excavations and a number of potsherds that are types also recovered in the habitation area. We were able to collect at least 50 radiocarbon samples from the furnace. We also recovered some 70 to 100 samples of quartz, some of which contain copper ore. The copper ore was closely associated with quartz. We have yet to locate that copper deposit.

We also trenched up to and through two of the rectangular structures in the habitation area and began horizontal exposure (to 70 cm) of one of them (Structure G). Cultural material is sparse, but we did locate and recover two potsherd caches within one of the structures (Structure G) at 40-50 cm. Soil color changes, charcoal, other organic remains suggest that this is a midden. Pottery types are the same as those recovered in the surface collections. We reached 1 m in two pits in this structure where we identified a stone alignment (.40 m x .30 m) whose orientation does not conform to that of the structure and which could represent an earlier construction phase. We recovered numerous charcoal samples throughout this structure. We also trenched through a second structure in Zone 1, where we recovered very little cultural material. We plan to continue excavating both structures in the next field season. We also began to construct the field station (we made the adobe bricks and built an outhouse) but early rains put a stop to that activity.



Figure 1. Furnace (horno b).



Figure 2. Furnace (horno c).

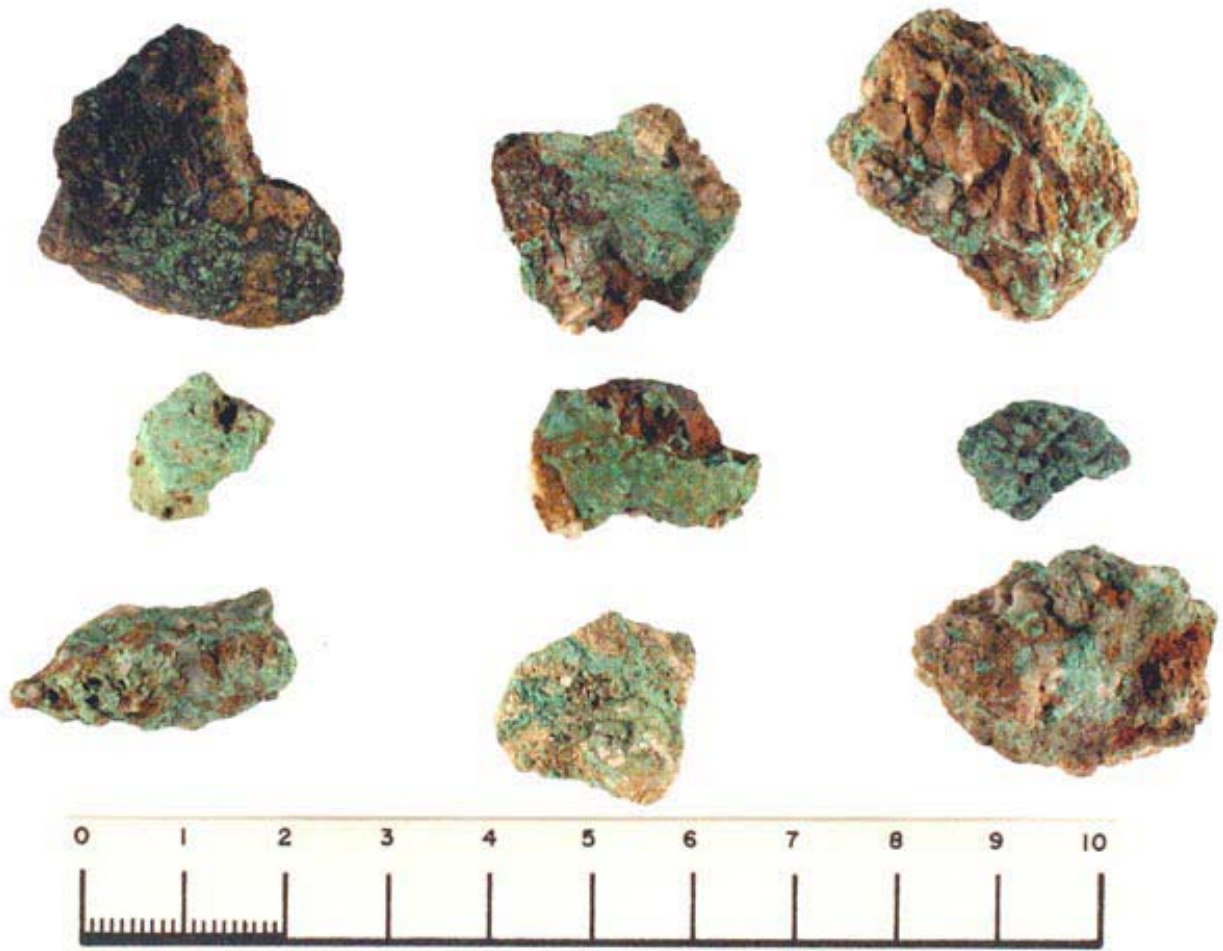


Figure 3. Copper ore from the site of El Manchon, Guerrero.



Figure 4. Quartz from the site of El Manchon, Guerrero.

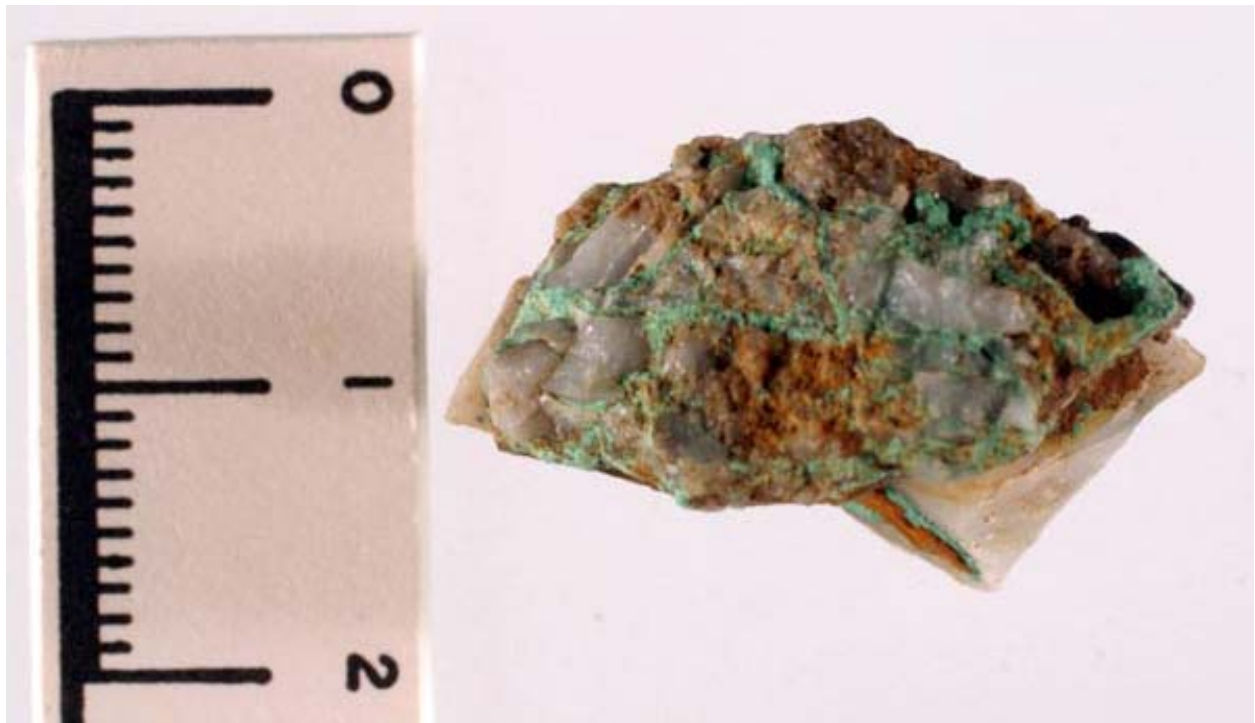


Figure 5. Copper ore and quartz from the site of El Manchon, Guerrero.



Figure 6. Adobe brick-making.

Final Report

The work described here and funded by FAMSI, addresses one of the most significant gaps in our understanding of the copper-based metallurgy that developed in ancient Mesoamerica. Until our excavations of El Manchón, we had scant archaeological evidence of metal production—smelting, and processing, and where those activities were located—although we do possess ample documentation of fabrication methods, alloys used, (copper-tin, copper-arsenic bronze, and copper-silver alloys) the relationships with South America, and the overall sumptuary emphasis of this technology. El Manchón is one of several copper smelting sites I located in the Balsas drainage of Guerrero in a 1997 survey. El Manchón is thus far the only such smelting site reported in Mesoamerica. The site is situated at 1400 meters above sea level in the *Sierra Madre del Sur* of Guerrero and consists of two physically distinct habitation areas characterized by long, low rectangular mounds measuring from 12 to 22 m in length, 2.5 m in width, and about 2 m in height. There also is a large smelting area between these two areas delimited by two seasonal streams. The smelting area is covered with a glassy-like slag and disturbed furnace remains. The site itself stretches across approximately 1 km, is crosscut by deep barrancas and arroyos, and is highly eroded.

With the support of FAMSI, we completed one field season at the site which is discussed in the [Interim Report](#). We also constructed a rudimentary base camp. The investigations of the smelting area consisted of complete excavation and mapping of one of the furnaces. We recovered volumes of slag and numerous samples of copper ore, and a number of potsherds. This particular furnace had been badly disturbed by tree roots, making the original configuration nearly impossible to determine. We also tested several of the mounds in the storage/habitation areas and opened two of them horizontally. We were able to recover caches of potsherds (that look like a midden) and to collect a number of obsidian and quartz samples from within these mounds, but found no structured evidence of domestic or craft activities (cooking or other). We likewise were unable to identify postholes that might have supported a wooden or thatch superstructure. We so far are unable to definitively identify the function or use of these long rectangular structures, but plan to explore this problem further in the next field season.

During June of 2002 and June of 2003, we undertook preliminary analysis of the pottery as well as the copper ores and slags that we recovered from the furnace. We were able to identify plates, jars, shallow bowls, a cup with a pedestal base, and numerous fragments of either incense burners or large ladles. All of these are highly eroded, but many consist of red decorative elements on a white slip. The red paint has been applied before firing. Our studies show that the copper ore is malachite and cuprite, associated with iron oxide in a quartz matrix. Experimental work shows that the ore is self fluxing, which lowers the melting point of the copper. Our work on this aspect of the smelting technology continues. We plan to source the obsidian (which includes green, grey, and black) and to submit a number of carbon samples for analysis (we collected approximately 100 samples). The results of these and other on-going laboratory studies, in conjunction with further excavations, will amplify our interpretation of this smelting technology and this site.



Figure 7. Research station.



Figure 8. Structure repair.



Figure 9. Green obsidian from the site of El Manchon, Guerrero.

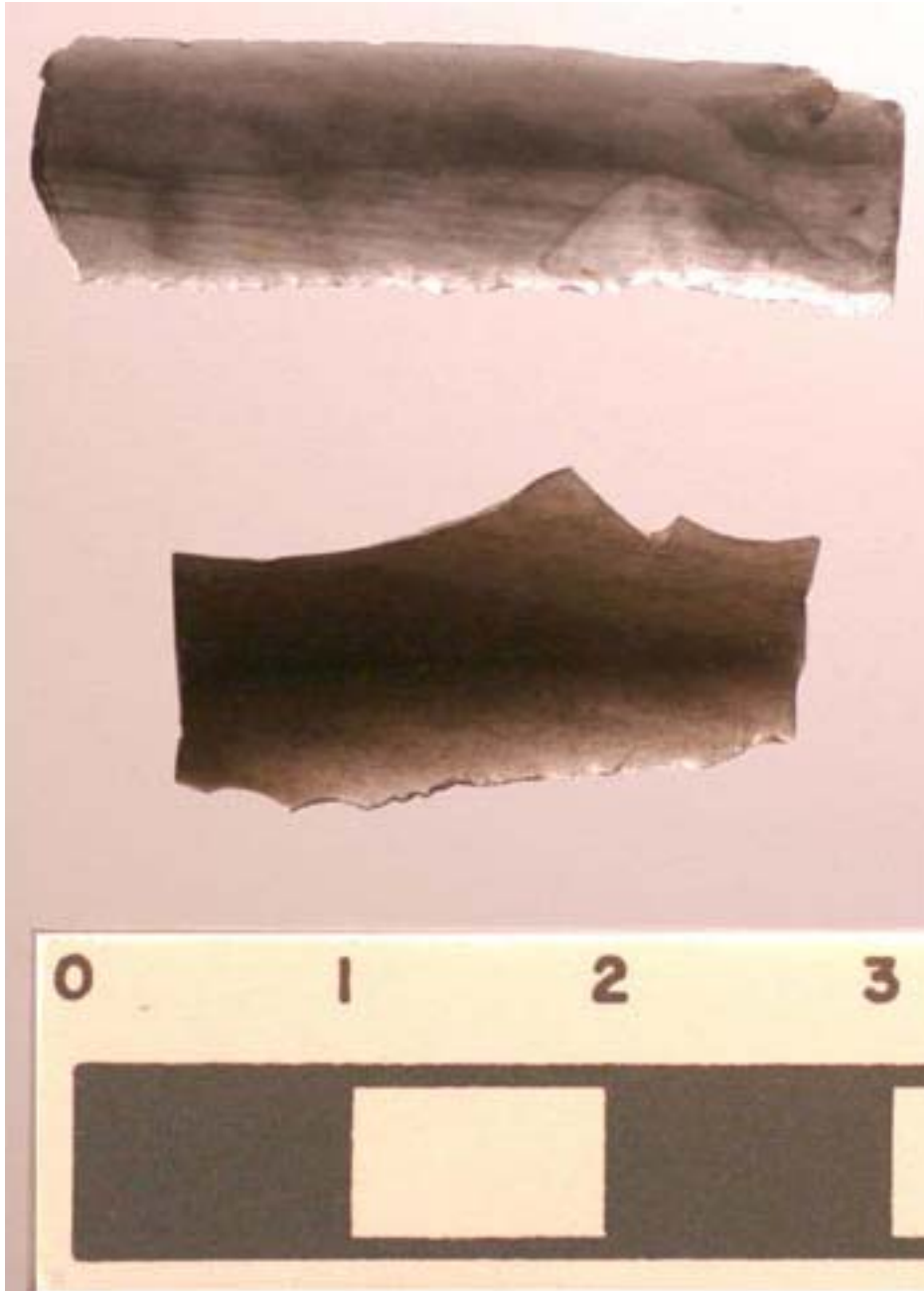


Figure 10. Grey obsidian from the site of El Manchon, Guerrero.



Figure 11. Black obsidian from the site of El Manchon, Guerrero.

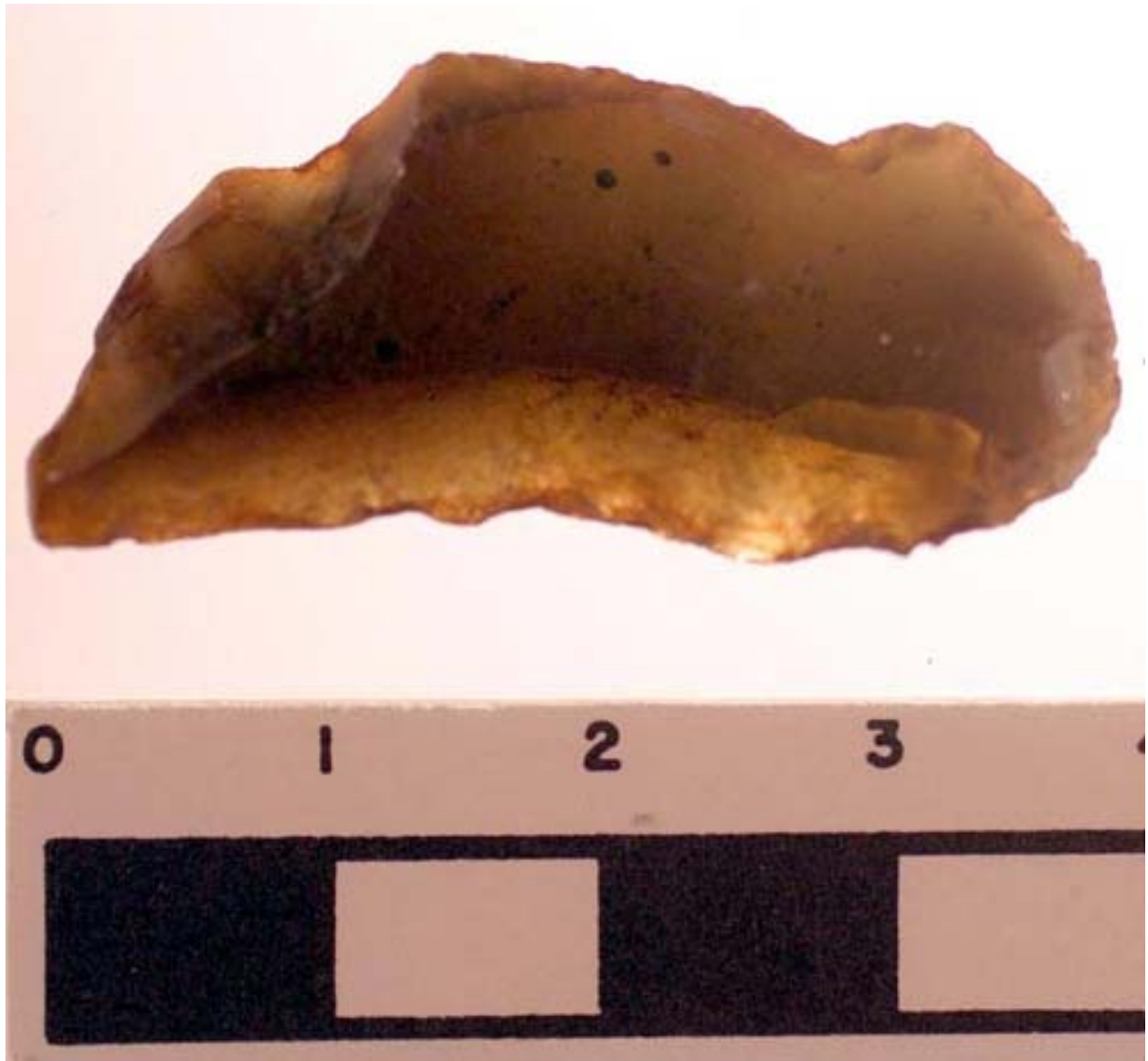


Figure 12. Green-brown obsidian from the site of El Manchon, Guerrero.



Figure 13. Annular base cup.



Figure 14. Annular base cup base.

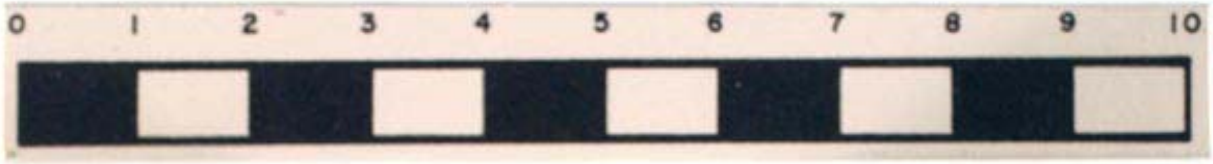


Figure 15. Colander pot interior.



Figure 16. Footed bowl with red paint.



Figure 17. Footed bowl with red paint, profile.



Figure 18. Miniature bowl, profile.



Figure 19. Pedestal bowl.



Figure 20. Foot of shallow bowl.

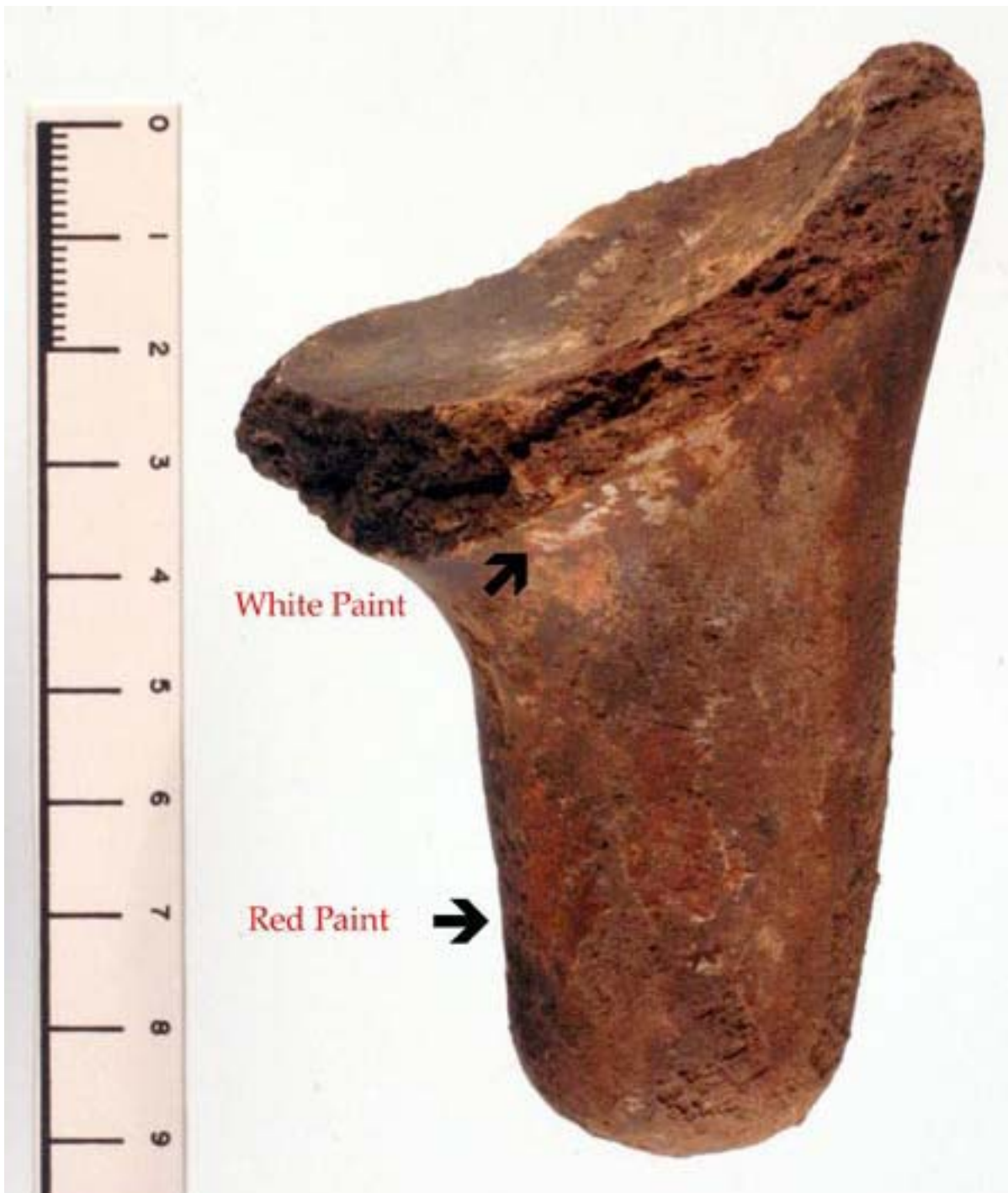


Figure 21. Foot of shallow bowl. Arrows indicate red and white wash.



Figure 22. Support attachment site with red and white paint (a).



Figure 23. Support attachment site with red and white paint (b).



Figure 24. Loop support foot with red and white paint.

Comments

This research project will constitute a long-term undertaking, in part because we are working in an area that is virtually unknown archaeologically. The location of El Manchon, as well as the material remains (pottery, architecture) suggests that this was not a metal production site dominated by any of the well-documented contemporary social groups (Tarascan, Matlatzinca, Mexico). We do have two preliminary dates that cluster around 1300 A.D., but these should be considered very approximate. We do not yet know the ethnic affiliations of the people living in this mountainous area of Guerrero. These data will begin to emerge as we continue the analysis of the pottery, in further excavations and in comparative studies. We also do not know where the copper ingots were processed following smelting. We may yet recover them at the site of El Manchon itself, or alternatively, several sites lie within close proximity of El Manchon, and at least one of these is characterized by monumental architecture. Local people report that they have recovered copper rings from that site and this area may be appropriate to explore in future work.

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