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EXPLORATORY SOIL MICROMORPHOLOGICAL ANALYSIS OF FLOOR CONSTRUCTIONS AT THE OMO TEMPLE COMPLEX, MOQUEGUA, PERU

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Funds from a 2013 Stahl grant were used to process archaeological soil micromorphology samples from the site of M10 (Omo) in the Osmore drainage of Moquegua, Peru. M10 has been investigated for over two decades by Professor Paul Goldstein and students from UC San Diego. It is dated to the Andean Middle Horizon period (600-1000CE) and stylistically affiliated with Tiwanaku settlements in the Titicaca Basin of Bolivia. An exploratory soil micromorphology study was carried out in summer 2012 by Archaeological Research Facility affiliate Erin Rodriguez (UC Berkeley Anthropology) during excavations at the Omo temple complex.

Soil micromorphology, the analysis of thin sections of undisturbed sediment samples, provides unparalleled detail about depositional, anthropogenic, and post-depositional processes which can lead to precise reconstructions of human activities and other site formation processes (Courty et. al. 1989). At Omo, soil micromorphology was used specifically for the analysis of occupation surfaces into order to investigate construction materials and potential activity traces (Boivin 2000, Gé et. al. 1993, Goldberg and Whitbread 1993, Matthews 1995, Matthews et. al. 1997).

Sample collection was undertaken by Erin Rodriguez of UC Berkeley on July 16th, 2012, with additional sample collection by Jason Kjolsing of UC San Diego in the weeks following. A total of nine undisturbed micromorphological sediment samples were collected from separate contexts. Only two samples were taken from the same room, limiting the potential for discussion of the use of space. However, the samples provide a broad overview of construction materials in use at the site. Given the limited time frame for sample collection a broad sampling strategy was considered the best approach to provide generalized information about the temple complex. As with micromorphology in general, and this study in particular due to the small sample size, analysis and interpretation will be greatly aided by incorporation of other lines of evidence.

Thin sectioning was done by Petrographic Services Inc. and funded by a Stahl grant from the UC Berkeley Archaeological Research Facility. Analysis was done by Erin Rodriguez in the UC Berkeley microscope laboratory with assistance from Professor Lisa Maher. While analysis is still ongoing, the results presented here represented preliminary conclusions and document the variety of construction materials and floor techniques used at the temple complex. Reference materials include: Perkins and Henke. 2004, Stoops et. al. 2004, Gé et. al. 1993.

Four distinct construction materials used in surface construction were identified in thin section, along with typical patterns for roofing materials. As apparently in the field, roofing generally consists of grass remains in parallel orientation to the ground surface. The grass is extremely well preserved, with plant tissue and articulated phytoliths apparent. Upper levels of the roofing material are often charred

and contain charcoal, but burnt material in lower levels is rare. Aeolian sediment is interspersed with the grass remains.

Consistently associated with roofing material are small, macroscopically visible orange pods identified in the field as possible termite excrement. Micromorphological analysis of these remains showed them to be of standardized sizes and shapes with fracturing and phosphatization common. These features suggest that, while the pods may be remnants of excrement (insect or rodent), they have undergone significant diagenetic alteration and may be of an entirely different origin. They resemble altered clay aggregates (although some of the standard shapes observed are unexpected) and could also be altered remains of a wattle and daub treatment of the roofing material. Analysis of these pods and their origins is ongoing.

Two samples contained intact levels of moro moro construction material as identified in the field (851528 and 851530). This material is a homogeneous clay with abundant quartz and instances of limestone and gypsum. The homogeneity of the material suggests that it was purposefully collected and processed for use in temple construction. In the examples observed it primarily occurs as a subsurface construction material.

The most commonly observed flooring material is a mixture of burned grass and sediment which is used as a trampled surface. Isolated instances of altered dung were also observed within this material. It is used as a surface in samples 851527, 851522, and potentially in 851529. A similar material occurs in 851528. It also occurs as a subsurface underlying a plaster floor in sample 851526. This lime plaster – composed of microcrystalline calcite likely mixed with ash – is only observed in sample 851526. Puddling in the mixture indicates application of the layer as a single instance and relates to the incorporation of clay components.

The final construction material observed is a dark colored, organic rich layer with evidence for crusting at the surface. The sharp boundaries of this layer are similar to those seen in the lime plaster of 851526, but it is composed of entirely different material. This dark plaster overlies a layer of moro moro which is cut off by the edge of the slide. The accumulation of material above this layer suggests that this may have been an outdoor floor space. A similar material is observed in sample 851528. In this sample however, the layer does not constitute a well formed surface (although a surface may have been present).

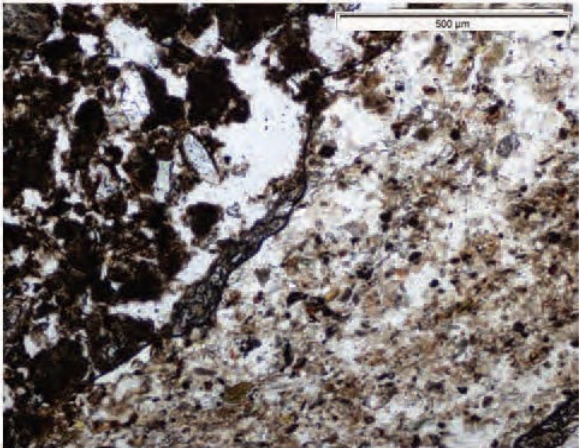
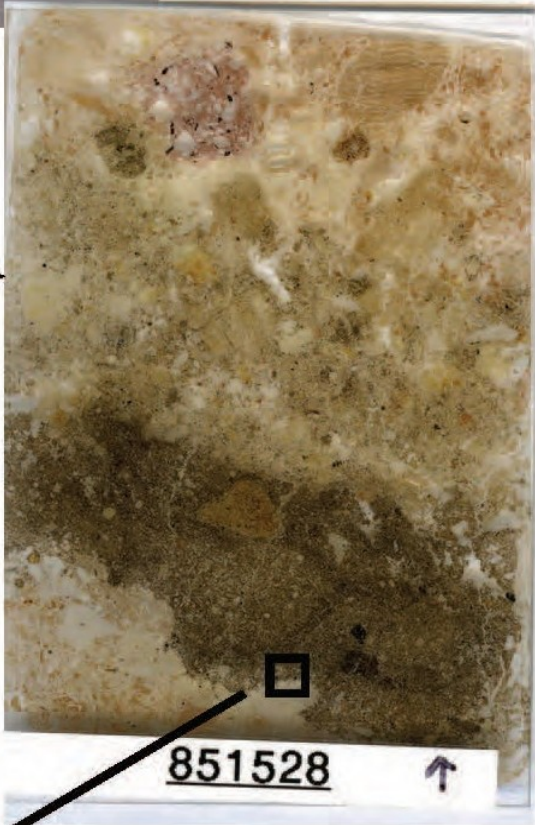
This report has presented descriptions and preliminary interpretations for micromorphological samples collected during field season 2012 at the Omo temple complex in Moquegua, Peru. These samples comprise a broad, exploratory study which shows a variety of purposefully prepared construction materials in use at the site. While aspects of this study are still ongoing, these results show that different rooms at the site were purposefully constructed with different flooring types. Future directions for this research include integrating excavation and micromorphological data along with considerations for constructed space and ritual use of space at the Omo temple.

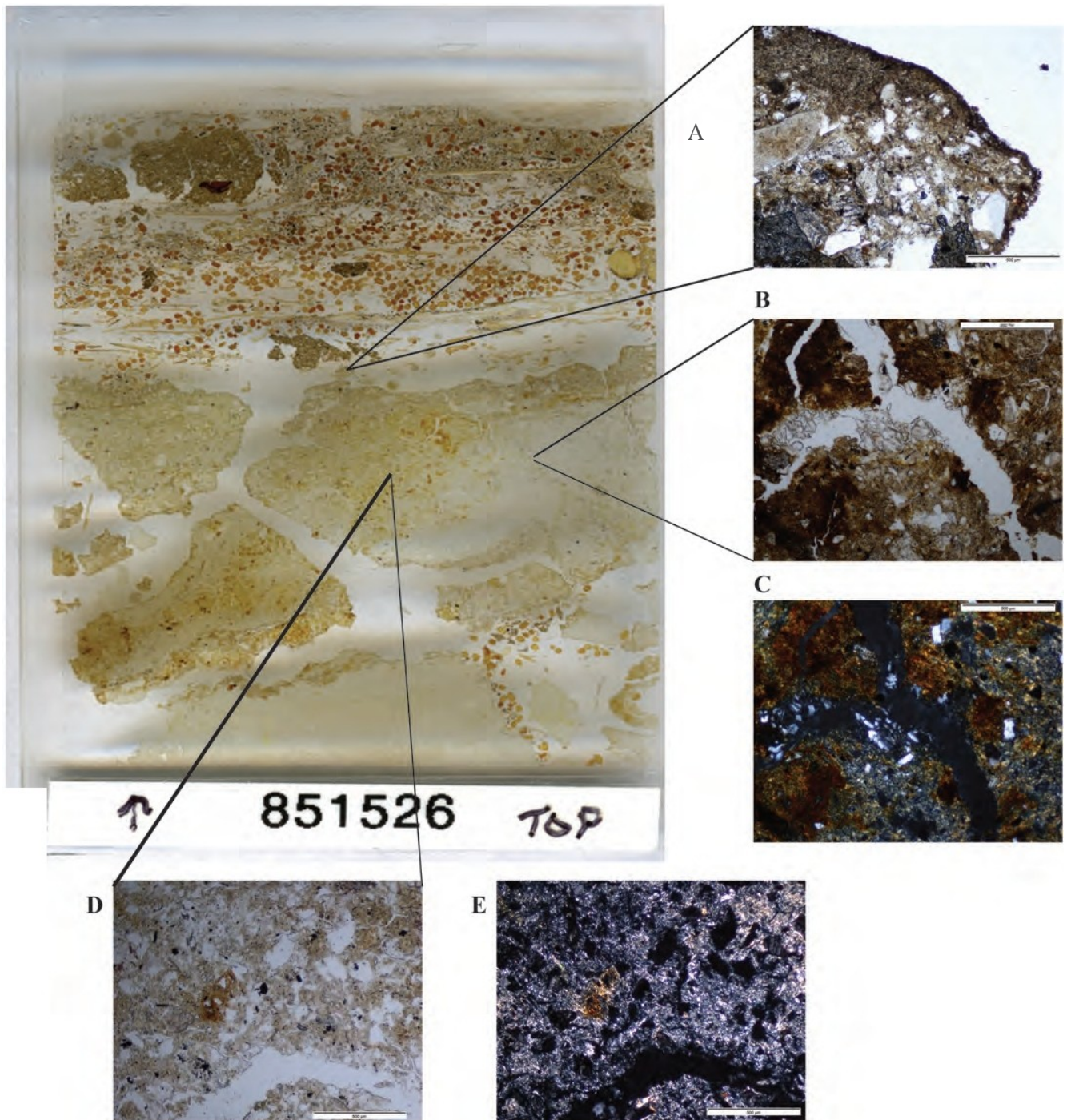
Table 1: Context Information for Micromorphological Samples

ID	Section #	Sample #	Cuarto	Unidad	Nivel/es	Temple North (m)	Temple East (m)	Depth (cm)
851522	4	4	25	226	9	9.5	26	112 Below Oliver
851523	3	3	15	265	?	26.4	20	46 Below Yazmín
851524	7	7	22	289AC	?	32.6	39	95 Below Datum
851525	2	2	8	265	?	24	23	97 Below Yazmín
851526	6	6	24	215b,d	7+	7.7	22.65	104 Below Oliver
851527	5	5	11	225	Rasgo AR220	8.75	22.1	105 Below Oliver
851528	1	1	-	342	Rasgo AR175	57	9	51 Below Darum
851529	4	8	25	226B	9+	9.45	26.43	68 Below Zazu
851530	9	9	31	237	8,9,10	12.70	29.43	78 Below Zazu



The Importance of
Context for
Micromorphological
Interpretation





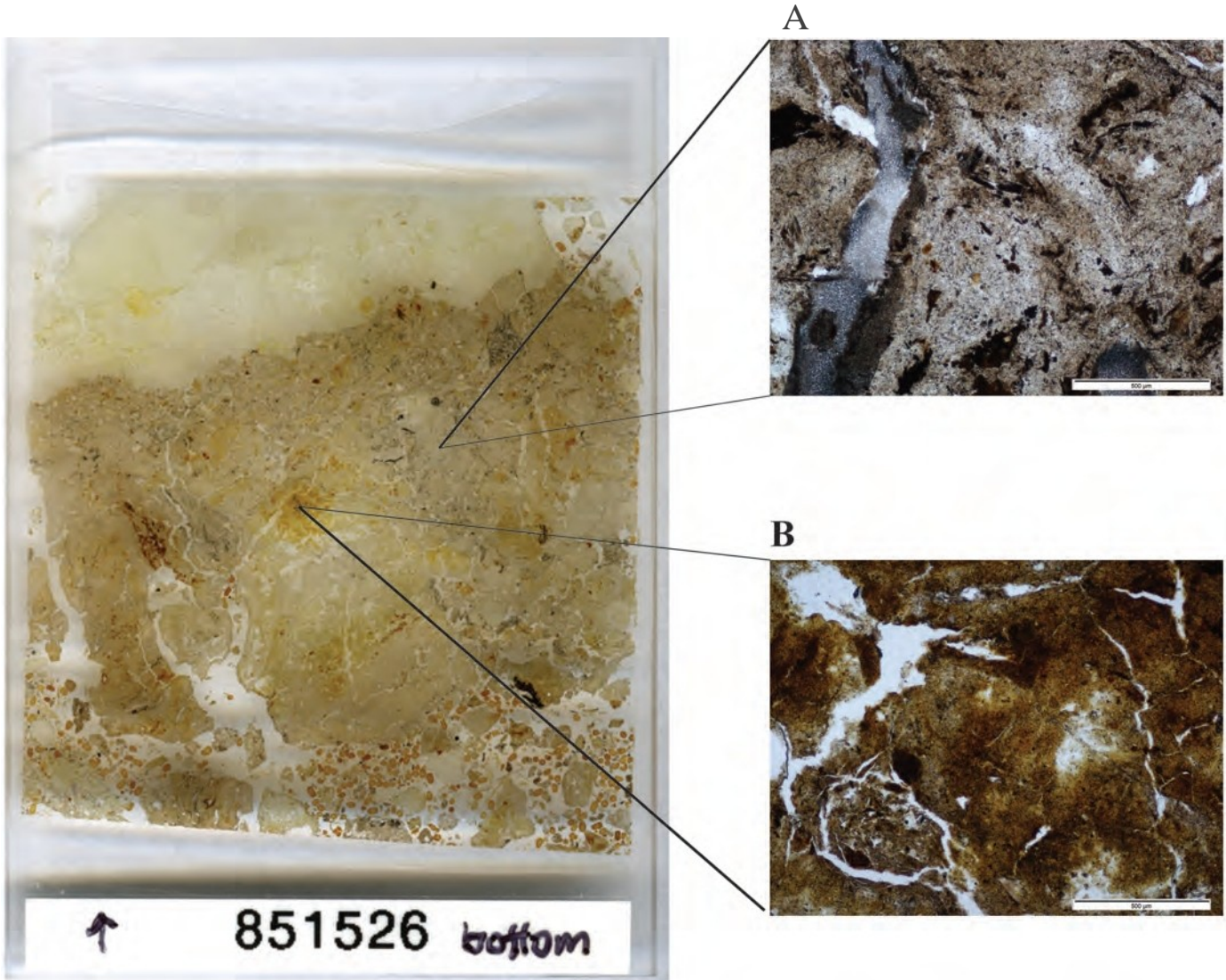
A. Upper boundary of unit 2 with Fe staining along ped boundary.

B. Secondary crystal growths in unit 2.

C. B at crossed polars.

D. Unit 2 Fabric with minimal alteration.

E. D at crossed polars.



A. Ashy and charcoal clay mixture in unit 4.
B. Fe staining and organic remains in unit 4.

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