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A Study of Early Classic Maya Ritual at Copán, Honduras

Research Year: 2002
Culture: Maya
Chronology: Early Classic
Location: Copán, Honduras
Site: Motmot Structure - Buried Beneath Marker

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Abstract

This project focused on the documentation, conservation, and analysis of artifacts and pigments from a series of Early Classic (ca. A.D. 400-600) ritual deposits at the Classic Maya site of Copán in western Honduras. These offerings were associated with a hieroglyphic monument and burial (field name, Motmot) found beneath the pyramid of the Hieroglyphic Stairway in the civic-ceremonial center of the site. The primary objectives of this project were to provide detailed documentation of the Motmot artifacts as well as to identify other material residues (primarily pigments) associated with the Motmot marker in order to yield additional data that could be correlated with known textual and contextual information. Two publications are currently in preparation that correlate these new data with epigraphic and archaeological evidence to create a more complete picture of the relationship between political events, religious beliefs, and ritual activities at Early Classic Copán.

Resumen

Este proyecto se concentró en la documentación, conservación, y análisis de los artefactos y de otros restos materiales provenientes de una serie de ofrendas rituales fechadas para el período Clásico Temprano (ca. 400-600 d.C.) en el sitio maya clásico de Copán, en el occidente de Honduras. Las ofrendas estaban asociadas con un monumento jeroglífico y un entierro (nombre de campo, Motmot) descubiertos bajo la pirámide de la Escalera Jeroglífica en el centro del sitio. Los depósitos incluyeron pigmentos y materiales orgánicos descubiertos encima del monumento jeroglífico, así como cerámica, jade, concha, y huesos de animales recuperados adentro de la cripta funeraria cuya ocupante era una mujer joven. Los objetivos principales de este proyecto fueron los de crear una documentación detallada de los artefactos, así como identificar los pigmentos recuperados encima del monumento. Dos publicaciones que actualmente están en preparación, proporcionan una correlación entre los nuevos datos revelados por este proyecto, y la información textual y contextual ya establecida, para mejor entender la relación entre los eventos políticos, las creencias religiosas, y las actividades rituales en Copán durante el período Clásico Temprano.

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Introduction

This project focused on the documentation, conservation, and analysis of artifacts and other material residues from a series of Early Classic (ca. A.D. 400-600) ritual deposits at the Classic Maya site of Copán in western Honduras. The Early Classic offerings in question were associated with a hieroglyphic monument and burial (field name, Motmot) found beneath the pyramid of the Hieroglyphic Stairway in the civic-ceremonial center of the site. The sequence of ritual deposits demonstrates a remarkable correspondence with events recounted in the hieroglyphic inscription on the monument that marks the location of the burial. The primary objective of this project was to provide detailed documentation of the Motmot artifacts as well as to identify other material residues (primarily pigments) associated with the Motmot marker in order to yield additional data that can be correlated with known textual and contextual information (Fash 2001; Fash and Stuart 1991). This work will allow us to identify patterns in the relationship between material culture and politico-ritual activity at Copán, and ultimately to investigate broader issues concerning the ritual behaviors that sustained institutionalized kingship in the Maya lowlands during the Early Classic (e.g., Davis-Salazar 2003; Demarest 1992; Fash *et al*. 2001; McAnany 1997).

The Motmot burial consists of a circular cobblestone cist located 3.5 m in front of a building adorned, in painted stucco, with large birds (Motmot Structure). The occupant of the cist was a young woman who was originally placed seated, in a cross-legged position, on a woven mat. The contents consisted of eleven ceramic vessels, fourteen pieces of carved jade, worked and unworked shell, a deer antler, coral, stingray spines, and mercury, as well as the skeletal remains of several different animal species and a decapitated human skull. The contents of the cist were significantly disturbed, suggesting that it had been re-entered sometime after the initial burial of the woman.

The burial was marked by a carved limestone monument (Motmot marker) equal in diameter to the cylindrical cist, and .5 m directly above the cist. The marker was set in the stucco plaza floor of Motmot Structure. Carved on the marker, two individuals sit facing one another, separated by a double-column inscription. The figures are identified as K'inich Yax K'uk' Mo', the founder of the Copán dynasty, and his son, Ruler 2. The hieroglyphic text bears the date of 9.0.0.0.0., or A.D. 435. On top of the marker, debris relating to the ritual termination of the marker (and the associated architectural complex), which appears to have included some kind of smoking or burning, produced over 500 samples of pigments, feathers, carbon, squash seeds, and other materials within a 5-8 cm layer (Figure 1). This layer was capped by an arrangement, in the center, of three stones, a Spondylus shell, and feathers, as well as four large jade earflares, each placed at one of the four cardinal points.

Figure 1. Debris from the termination ritual on top of the Motmot marker.

Documentation and Conservation

Due to the extensive collection of artifacts found in the multi-layered deposits, the first step in this project was to compile a catalog of the material culture associated with the deposits. This included photographs (e.g., Figure 2) and illustrations (e.g., Figure 3). The information, entered into a database, includes links to the photographs and illustrations. This will allow specific questions to be posed concerning the frequency and distribution of the various materials identified and artifacts recovered, while also easily storing data in a condensed and manageable fashion. Much of the material recovered from the tomb is currently on display in the Copán Museum. The remaining material has been housed in custom-fitted storage containers in the Regional Center of Archaeological Investigations in Copán (e.g., Figure 4).

Figure 2. Vessel 5 found in the cist.

Analysis

The many pigments and macrobotanical remains found in the deposits suggests that perishable objects were an integral component of the activities performed in this area. In order to begin the process of identifying the materials used in the manufacture of those objects, 59 pigment samples taken from the material on top of the hieroglyphic marker were transported to the U.S. for macroscopic, microscopic, and chemical analyses. Optical microscopy (Figure 5), X-ray defraction (Figure 6), and to a lesser extent, scanning-electron microscopy (Figure 7), conducted by Dr. Hamdallah Béarat of the Center for Solid State Science at Arizona State University, were used to identify major and minor elements and some trace elements in pigment samples. Once complete, photos were taken of all the pigment samples and their color designations were identified using Munsell Color designations. The results of the pigment analysis are summarized in Table 1.

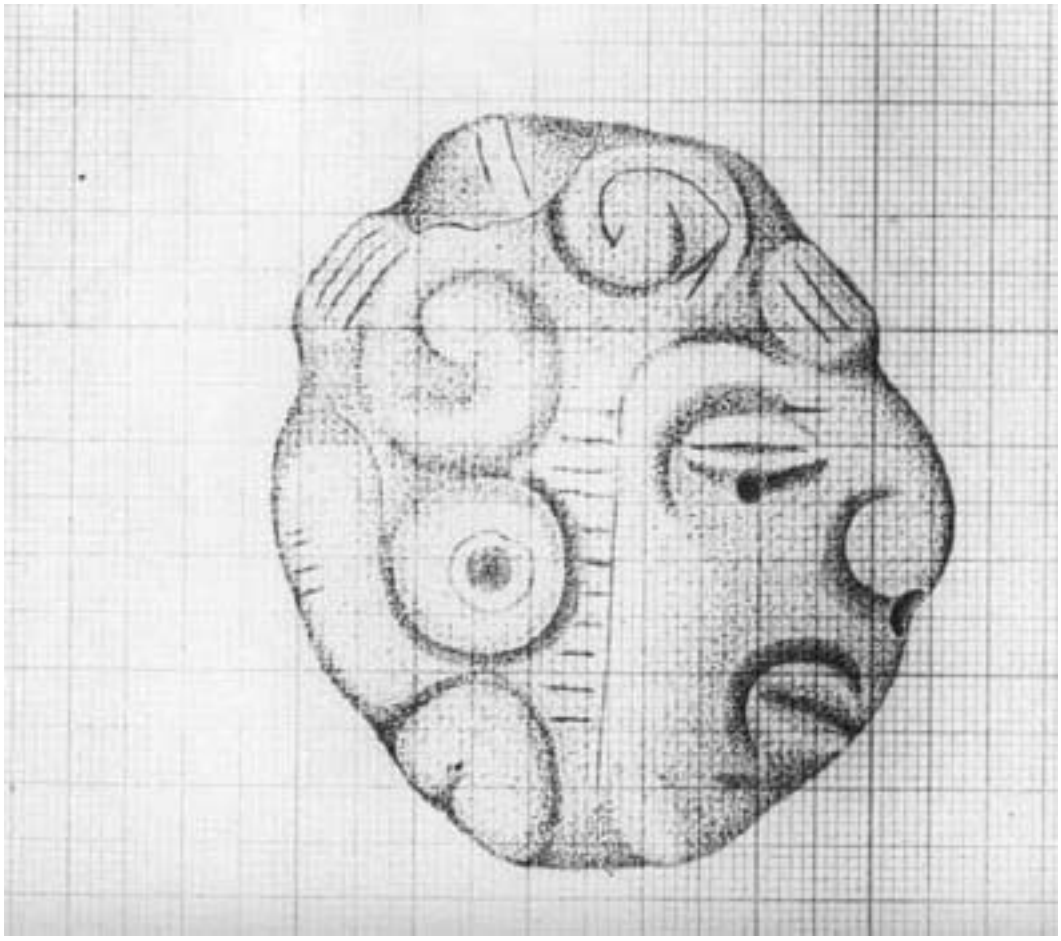

Figure 3. Illustration of one of the jades from the cist.

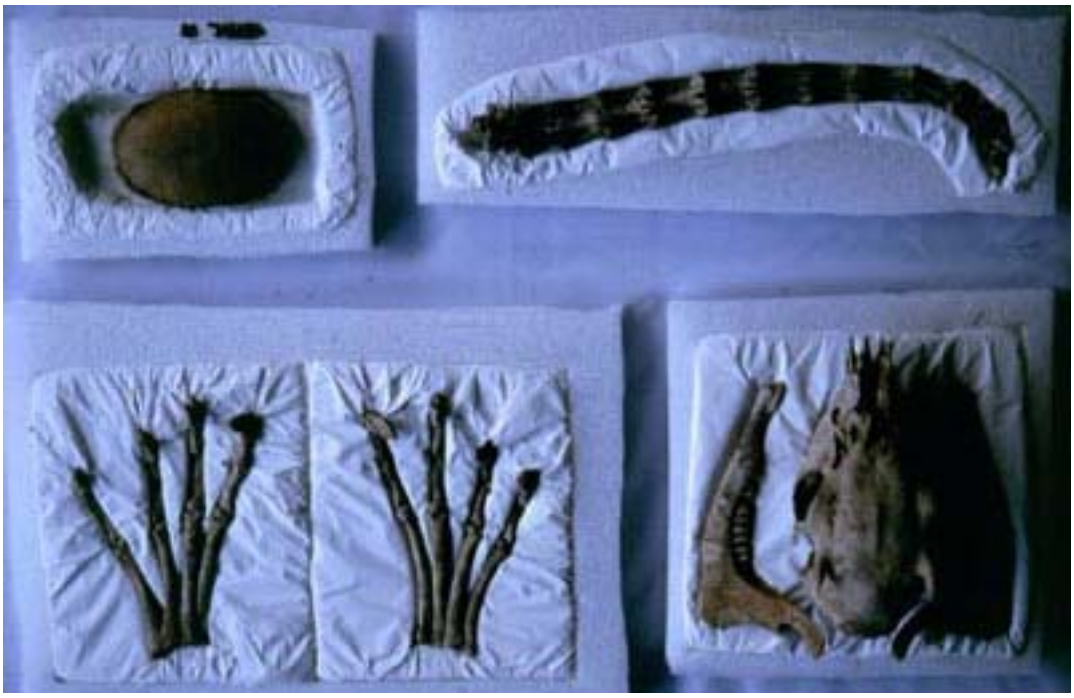

Figure 4. An assortment of faunal material found in the cist.

Figure 5. Hamdallah Béarat using optical microscopy.

Figure 6. X-ray defraction.

Figure 7. Hamdallah Béarat at the scanning-electron microscope.

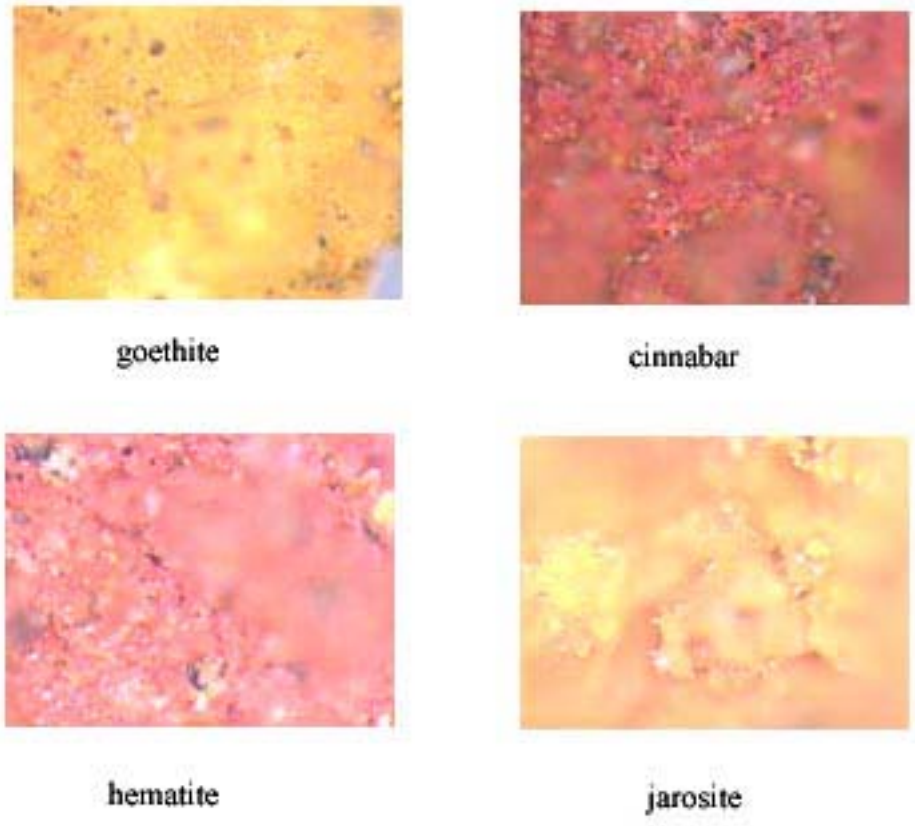

Figure 8. Images of pigments taken using optical microscopy.

A total of seven pigments were identified: two reds (cinnabar and hematite), two yellows (jarosite and goethite), one green (chlorite), one white (calcite), and one black (carbon) (Figure 8). Quartz, montmorillonite (a clay mineral), and plagioclase feldspar were also identified in the samples. The carbon likely resulted from the fire that seems to have occurred on top of the monument during the termination ritual, as evidenced by the ash and carbon visible in the debris during excavation. The calcite may derive from the stucco floor into which the monument was set. Most interesting, however, is the fact that, if there had been any kind of burning on top of the monument, there would have been no evidence of jarosite and goethite (the yellow pigments). With fire, jarosite and goethite change chemical composition and color (Goffer 1980). So the burning noted during excavation on top of the marker either would have had to have occurred before those pigments were placed there or whatever was burned would have had to have been burned elsewhere and then placed on top of the marker.

Discussion

The macroscopic, microscopic, and chemical analyses funded by FAMSI suggest three important points, which have significant implications not only for the interpretation of data related specifically to the Copán deposits but also for future research carried out at Copán and other Maya sites. First, these analyses, which indicated the presence of two minerals (jarosite and goethite) not normally found under conditions of extreme heat, have elucidated possible additional steps in the deposition of objects during the termination ritual on top of the Motmot marker and hence in the behaviors that produced the archaeological record. This will be considered in the on-going analysis of the sequence of Motmot deposits as a whole.

Second, while the use of cinnabar and hematite as red-colored pigments is not uncommon or unknown at Classic Maya sites (e.g., Chase and Chase 1998; Fash 2001; Vázquez and Velázquez 1996; Wells *et al*. 2000), the detection, by chemical analysis, of both minerals in a single deposit suggests that there may have been different uses for the two minerals. Whether these different uses pertain to differences in the hues and tones of the two colors produced by the minerals or in other physical properties and/or meanings attached to the minerals remains to be determined.

Third, the results of the analyses point to the importance of interdisciplinary research that balances archaeological observation with material science techniques. Specifically, the detailed and meticulous excavation of the termination debris on top of the Motmot marker performed by Barbara Fash and colleagues revealed numerous areas of color concentrations visible to the naked eye. However, chemical analysis of these sampled areas often indicated a different, dominant pigment, primarily cinnabar. For example, a yellowish (goethite) area on the ground was revealed chemically to be composed primarily of (red) cinnabar. By the same token, chlorite green, which was not visible during excavation, turned up in the chemical analysis.

The new data revealed by this FAMSI-funded project contributes to the comprehensive study of the structural form and depositional history of the Copán materials. Two publications currently in preparation by the grantee correlate these new data with epigraphic and archaeological evidence to create a more complete picture of the relationship between political events, religious beliefs, and ritual activities at Copán. Our understanding of Classic Maya kingship has been greatly expanded by an appreciation for the role of ritual and religion in the political legitimation of ancient sovereigns. Through epigraphic, iconographic, ethnographic, and archaeological research, scholars now have a general idea of the religious concepts and beliefs underlying Classic Maya political structure as well as of historically contingent symbols and meanings particular to different city-states. In the case of the Motmot ritual assemblages in Copán, we have an opportunity to explore both specific politico-religious practices of Copanec kings and broader behavioral patterns related to the legitimation of Maya political authority.

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Figure 6. X-ray defraction.

Figure 7. Hamdallah Béarat at the scanning-electron microscope.

Figure 8. Images of pigments taken using optical microscopy.

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Appendix: Table 1. Pigments

Table 1. Pigments							
#	**Section**	**Level**	**Munsell**	**Color**		**Mineral** [1, 2]	**Notes** [3]
1	A1	M1	10YR 6/8	brownish yellow		quartz + jarosite (possibly feldspar)	yellow pigment: translucent material occasionally containing large elongated crystals. The material contains some red crystals (cinnabar) as well as black-green grains. It also contains large amount of white and transparent grains.
2	A1	M2	10R 5/8	red		cinnabar + quartz + jarosite	(same as sample 1).
3	A1	M3	10R 4/8	red		**cinnabar** >>> jarosite	sample is basically composed of red (cinnabar) but contains also some yellow pigment and white material; the red is sometimes altered in surface (blackening) but large red crystals are almost intact.
4	A1	M4	5YR 5/6	yellowish red		**cinnabar** >>> (quartz + calcite) > jarosite	Brown: composed of red, yellow, white, and black. It contains transparent accicular crystals as well as fibers. The latter are coated with pigments. Very fine fibers are also observed in the pigment mix.
5	A2	M1	5YR 5/8	yellowish red		**cinnabar** >>> jarosite + quartz	yellow pigment: almost pure and fine; mix of pigments: yellow, red, white, etc: red is cinnabar; yellow has rod-shaped crystals.
6	A2	M2	10R 5/8	red		**cinnabar** >>> quartz > jarosite (possibly feldspar & goethite)	a mix of several pigments. Some granules are composed of single pigment (yellow or red), some others are composed of 2 or more pigments (red + white), yellow + white, etc.
7	A2	M3	5YR 5/8	yellowish red		**cinnabar** >>> goethite + quartz > jarosite	This is a mix of pigments. Some grains are large-layered grains: red -> yellow -> white. Porous yellow grain (granule) contains rod-like crystals. At interface between red and yellow layers, there are round and shiny black grains.
8	A3	M2	10R 5/8	red		**cinnabar** >>> jarosite + quartz	composed of light color granules (red + white + yellow or white and red and yellow) in the dark granules: red is dominant.
9	A3	M4	10YR 6/8	brownish yellow		quartz >> jarosite + calcite + cinnabar	pigment is predominantly yellow with very little of red, black and white colors.

10	A4	M1	10YR 7/8	yellow		quartz >> plagioclase > jarosite + goethite	light grains = mix of white and yellow; yellow is pure pigment. But some greyish granules have red, yellow, white, and some black or brown.
11	A4	M2	10R 5/8	red		**cinnabar** >>> quartz + jarosite (goethite?? metacinnabar??)	light grains: mix of white and yellow and red. Yellow: inhomogeneous yellow and white and red. Grey-reddish: red with some yellow and white.
12	A4	M3	10YR 7/4	very pale brown		**jarosite + cinnabar** >> goethite + quartz > calcite + clay	granules of color: (1) light: mix of white with red and yellow; (2) orange: a mix of very fine pigments (yellow and red) very little cinnabar; (3) yellow: light yellow and porous with some white and red.
13	A4	M4	5YR 4/6	yellowish red		quartz + cinnabar + hematite + clay (montmorillanite) + jarosite	a fine homogeneous mix of red and yellow.
14	A5	M1	10YR 6/8	brownish yellow		**quartz** >> goethite > jarosite > clay (Mo)	yellow: homogeneous and fine with very little of red, black and white. white light: white pigment with yellow. light grey: white and red and yellow.
15	A5	M2	10R 5/8	red		**cinnabar** >> quartz + goethite + jarosite	orange: mixtures of red and yellow. Dark grey: red and yellow and white and dark brown (black). The black may be due to blackening of cinnabar. Light yellow: white and yellow and red.
16	A5	M3	5YR 5/6	yellowish red		**cinnabar** >> quartz + calcite + jarosite + goethite	light color: mix of white, yellow and red. Yellow: fine and homogenous yellow with some red. Dark greyish red: mix of red, yellow and black.
17	A6	M1	10R 4/4	weak red		**cinnabar** (+ trace of quartz & jarosite)	orange: red and yellow (and black). Dark red: blackened red (HgS).
17	A6	M1				**calcite**	grey (fine and coarse): mix of clay and charcoal.
18	A6	M2	2.5YR 6/8	light red		**cinnabar** >> quartz > calcite > jarosite	light color: white and yellow. Yellow: fine yellow pigment (little red). Orange: inhomogeneous (red and yellow and black).
19	A6	M3	5YR 5/6	yellowish red		**cinnabar** >> goethite + jarosite + quartz + calcite	white: homogeneous and pure white. Red: homogenous red.
20	A7	M1	10YR 7/8	yellow		**quartz** >> Pl + KF + Go + Mo	yellow contains some red, black, and transparent grains. Light yellow: mix of white and yellow.
21	A7	M2	10YR 7/6	yellow		**quartz** >> Pl + Mo + Ja + He + Ci	orange: mix of yellow and red. Yellow: contains some red and white and acicular XHg. Grey.

22	A7	M3	2.5YR 5/8	red		quartz + jarosite + Mo + He	red pigment is fine, homogeneous and contains some yellow and white.
23	A7	M4	5YR 5/8	yellowish red		**cinnabar** >> quartz + jarosite + calcite	yellow is inhomogeneous and contains some impurities (fibers, black, transparent).
24	A8	M1	10YR 6/8	brownish yellow		quartz + Pl + Fk + Ca + Mo + Ja + Ci	yellowish brown.
25	A8	M2	5YR 5/4	reddish brown		**cinnabar** >> jarosite + quartz	dark grey granules are mixtures of red and charcoals and white and some yellow. Black granules are red in core with broken.
26	A8	M3	7.5YR 6/8	reddish yellow		**quartz** >> pl + Ca + Ci + Mo + Go	yellow pigment is fine, homogeneous and contains some transparent (glassy) crystals. White contains some yellow as well as some acicular and rod-shaped XHg. Red: fine, homogenous and contains some yellow and transparent grains and acicular XHg.
27	A8	M4	7.5YR 5/8	strong brown		cinnabar + goethite + jarosite + quartz + montmorillonite	contains blackened red and fibers and charcoal mix of white, yellow and red pigments.
28	A9	M1	10YR 6/6	brownish yellow		**quartz** >> Ca + Ci + Pl + Go + Ja + Mo	brown is a mix of yellow and red. Large greenish white.
29	A9	M2	10R 4/4	weak red		**cinnabar** with traces of: Qz, Ja & Go (aluminum)	contains blackened HgS and red and yellow and white. Gave dark red color after grinding.
30	A9	M3	10R 6/8	light red		**cinnabar** with traces of: Qz, Ja & aluminum goethite	light cream color that contains large red granules; red in color. White: homogeneous and fine. Red: very fine and homogeneous; gave nice vermilion color after grinding.
31a	A9	M4	7.5YR 5/6	strong brown		**cinnabar** >> jarosite + goethite + Mo + Qz + Ca	fine brown powder gave yellowish brown color. Dark yellow contains large granules of red color (blackened HgS) that contain yellow, red and black.
31b	A9	M4				**calcite** >> Qz + Mo + traces of Pl & KF	Beige (cream-pink) white of very fine grains that contain some brown translucent crystals.
32a	A10	M1	7.5YR 6/8	reddish yellow		**quartz** >> Ca + Pl + Mo + Ci + He(?)	brown yellow: mix of yellow and ?
32c	A10	M1				**quartz** >> Ca + Pl + KF + Mo + Il + He(?)	large rusty grains.
32d	A10	M1				**calcite** with traces of quartz	white/pinkish.

33	A10	M2	7.5YR 6/8	reddish yellow		**quartz** >> Ca + Ci + Mo + Go + Pl + KF + Ja	same as 32.
34	A10	M3	2.5YR 5/8	red		**cinnabar** >> Pl + Qz + Ja	contains red and blackened red; yellow (pure and rod-shape); white. Pure light grey gave dark red color.
35	A10	M4	7.5YR 5/6	strong brown		**cinnabar** >> Pl + Ca + Qz + Mo + Ja + He	same as 32.
36	A10	M5	7.5YR 5/8	strong brown		**cinnabar** >> qz + Ja + Mo + He(?) + Ca + Go(?)	same as 32.
37	A11	M1	10YR 6/8	brownish yellow		**quartz** >> Pl + Ci + Ja + Mo + (He + Go)?	yellow color contains some red, black and white. Rod shaped yellow crystals are present.
38	A11	M2	2.5YR 6/6	light red		**cinnabar** >> Qz + Go(?) + Ja	contains red, yellow, dark yellow and grey. Red is mainly HgS but with some yellow and white. Yellow contains some red. Dark yellow is almost pure yellow. Grey contains red (and blackened red), black, yellow and transparent.
39	A11	M3	7.5YR 6/8	reddish yellow		Go + Qz + Mo	contains yellow, light yellow, pink and brown grains. Red pigment is present in trace quantity in the yellow. Red is present in the pink with white and yellow. Brown grain gave yellow.
40	A11	M4	10YR 6/8	brownish yellow		Qz + Go + Pl + Mo	same as 39.
41	A11	M5	2.5YR 5/8	red		**cinnabar** >> Ja + Mo + Qz + He	contains mainly orange (mix of red and yellow fine pigments) and some dark grey. Large red grain gave vermilion (very fine pigment).
42	A12	M1	10YR 7/8	yellow		**quartz** > Go + Pl + Mo + Ja	contains mainly pure yellow pigment but some grains have some red.
43	A12	M2	2.5YR 5/6	red		**cinnabar** >> Ja + Qz + Go(?) + metacinnabar(?)	contains mainly greyish pink large chunks that has red, black, white, yellow and some large fragment of transparent material. Some of the latter has zonation with the outer part porous. Brown-orange is composed of red and yellow with some black. Whitish grey large grains show red color when broken.
44	A12	M3	10R 6/8	light red		**cinnabar** >> Go(?) > Qz + Ja	same as 43.

45	A12	M4	5YR 5/8	yellowish red		**cinnabar** >> Pl + Go + Qz + Ja	mainly contains yellow with minor quantities of red, white, and black (charcoal). The yellow is coarse and translucent with some elongated grains crystals.
46	CN	M1	10YR 5/6	yellowish brown		**cinnabar** > Qz + Ja + Go + Mo	pure yellow, trace of red and black.
47	CN	M2	5YR 6/4	light reddish brown		**cinnabar** > Qz > Ja + Mo + Ca	Dark grey grains contain red, black, yellow and white. Orange chunks are mix of red and yellow. White chunks contain fine and porous material as well as undecomposed transparent grains. The white has yellow, red and black.
47	CN	M2	2.5YR 4/4	reddish brown		**cinnabar** > Qz > Ja > He + Mo + Ca	
47	CN	M2				cinnabar > Ja + Qz	
48	CN	M4	2.5YR 5/8	red		jarosite + hematite + Qz + Mo	mainly contains orange, but also some white (porous with residual transparent) very soft and fine material.
49	CS	M1	10R 3/2	dusky red		**cinnabar** >>> Ja + Qz + Mo + Go (? aluminian)	contains a lot of black (charcoal), red (and blackened red), yellow and transparent. Large red grain gave red color.
50	CS	M2	2.5YR 5/6	red		**cinnabar** >> Ja + He (disordered) + Qz	contains yellow, black, white, and some red. Fine grey gave dark red color when ground.
51	CS	M3	2.5YR 5/8	red		**cinnabar** >> Ja + He + Qz + Mo	contains orange, white, and black chunks.
52	CS	M4	7.5YR 5/6	strong brown		**cinnabar** >> Ja + Qz + Mo + Go (?) + He (?)	contains chunks of orange, yellow, white and brown/grey. Orange is a fine mixture of yellow and red. Yellow is very fine with some red in it and black.
53	CE	M1	10YR 7/8	yellow		jarosite + Qz + Go + Mo + Il	a second quality yellow (brown) is mixed with white and contains some brown grains.
54	CE	M2	2.5YR 5/6	red		**cinnabar** >> Ja + Qz + Go + Mo	contains white, orange chunks. Fine fraction contains all colors. White is a mix of fine transparent, yellow, and brown. Orange is mix of yellow and red. Fine and xl grains gave brownish orange.
55	CE	M3	10R 6/8	light red		**cinnabar** >> Go(?) + Qz + Ja	same as 54. Large grains of grey gave red.

56	CO	M1	7.5YR 6/8	reddish yellow		**cinnabar** >> Ja + Qz + Mo	has yellow and white chunks. Fine fraction contains translucent yellow grains some red and black (charcoal). Fine yellow gave dark yellow color.
57	CO	M2	10R 5/8	red		**cinnabar** >> Ja + Qz + Go(?)	fine fraction contains red and yellow plus some black and transparent (porous and undecomposed). Fine grey gave red when ground.
58	CO	M3	5YR 5/8	yellowish red		**cinnabar** >> Qz + Ja + Go + Mo	fine fraction contains: orange, red, yellow, white and black. Orange is a mix of red, yellow and white. White chunks is a mix of white, yellow and brown. Fine brown gave brownish red.
59	CO	M4	2.5YR 6/8	light red		**cinnabar** >> Ja + Qz + He + Mo	Orange chunk is a mix of red, yellow and white and brown. Fine fraction contains all sorts of grains (but major colors are red and black). White chunk composed of fine white, yellow and brown. Large red grains gave orange.

Endnotes:

1. The major component of the sample is in bold. The symbols >, >>, and >>> are semi-quantitative measures of a particular phase, such that a phase before >>> is the major component of a sample (>60%); before >>, a minor component (10-20%); before >, an accessory component (5-10%), and after >, a trace (<5%).
2. Ja = jarosite, Ci = cinnabar, Qz = quartz, Go = goethite, Mo = montmorillonite, He = hematite, Pl = plagioclase, Ca = calcite.
3. Notes are based on observations made during preparation for XRD by Dr. Hamdallah Béarat.