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Research Notes

Wild Horses, Water Barons and
Chinese Sojourners:
Archaeology of Yema-Po, a
Chinese Construction Camp in
San Francisco's East Bay Hills

George Miller

Historical Background¹

In July, 1866 Anthony Chabot, California forty-niner, inventor of the hydraulic water cannon and the originator of the first piped water systems for the cities of Milwaukee, Wisconsin, Portland, Maine and San Francisco, California formed the Contra Costa Water Company in order to deliver potable water to the city of Oakland. By 1869 Chabot had constructed a dam on Temescal Creek, immediately to the northeast of the city and had created a 200,000,000 gallon reservoir. Local tradition has it that Chabot utilized Chinese laborers for this construction project but documentation is scant and no archaeological evidence for Chinese presence at the Temescal Dam has been found.

By 1873 it became clear that the burgeoning Oakland population would soon exhaust the Temescal water supply so Chabot and the Contra Costa Water Company set about acquiring the rights to a much larger watershed to the southeast of Oakland, along San Leandro Creek. In January, 1874 the Oakland City Council approved Chabot's plans for the San Leandro Dam Project, and by early in 1876 Oakland began receiving the first water from the new 5,000,000,000 gallon reservoir. This monumental construction project was estimated to cost approximately \$500,000 in materials and labor, and newspaper accounts of the day document that Chinese laborers

¹ The documentation for most of this historical reconstruction is found in a number of local newspaper accounts from the late 19th Century. In the interest of simplicity bibliographic references to three sources have been omitted in this paper. Full documentation can be found in *Yema-po: Historical Archaeology of the Overseas Chinese at the San Leandro Dam*, C.E. Smith Museum Occasional Papers No. 1, to be published in late 1983.

performed the bulk of the heavy construction as well as some of the skilled work such as masonry. During the peak of construction in 1874-75 as many as 800 Chinese may have been employed on the project, although this figure, based on newspaper accounts, is difficult to substantiate since Chabot's company left few employment records and no specific mention of Chinese laborers. The magnitude of the construction at the San Leandro Dam bears mute testimony, however, to the mammoth accomplishments of the Chinese workers.

The dam itself was 450 feet long, 28 feet wide at the crest, 900 feet at the base, 100 feet high and contained about a half million cubic yards of concrete and packed earth. Eyewitness reports of the day describe the Chinese laborers as excavating earth downstream from the dam, loading it into mule-drawn carts and assisting in the packing of puddled earth into the body of the dam. The majority of the compaction was accomplished by a herd of some 200 mustangs which Chabot had imported from Oregon and which were led back and forth across the sprinkled earth until it had achieved a near-concrete hardness.

The earthenwork dam and accompanying spillway and flume, however, were only the most visible of the Chinese achievements at Chabot Dam, as it is now called. Chinese laborers were also involved in clearing or grubbing of vegetation from some 340 acres of land scheduled for inundation behind the dam and beneath it. The clearing of this land is one of the few labor activities for which Chabot left any indication of the wages earned by the Chinese. The Contra Costa Water Company paid \$60 per acre for this service. Of course, the majority of this money probably went to the labor contractor and it is unlikely that Chinese laborers under Chabot's employ earned much more than the standard \$1.00/day paid to contemporary Chinese railroad laborers.

A stretch of approximately four miles of country roads also was flooded by the San Leandro reservoir. The Chinese mitigated this loss by constructing fifteen miles of roads, bridges and fencing to the south of the reservoir.

In terms of magnitude of achievement, however, it was the excavation and blasting of some 3100

feet of tunnels through the hillside that lifted labor at San Leandro into the realm of the monumental. During the initial period of dam construction in 1874-75 two tunnels were excavated through the hillside slightly to the north of the dam (Figure 1). Tunnel No. 1 ran almost 900 feet through the bedrock of the hill, measured approximately 7 by 8 feet in cross-section and required excavation crews to work day and night. A shaft was cut 157 feet down through the hill near the midpoint of the tunnel in order to provide for a pressure regulatory valve. Two Chinese laborers are reported to have died in a cave-in in Tunnel No. 1 in 1874.

Tunnel No. 2 was located to the south of Tunnel No. 1. It ran approximately 500 feet and required the excavation of a similar pressure regulatory valve shaft.

Although the main body of construction at the San Leandro Dam was completed in 1875 Chinese laborers were involved in additional improvements and maintenance throughout the late 70's, the 80's and possibly as late as 1892. Whether Chinese presence at Lake Chabot was constant or episodic during this period is unknown but it is clear that in 1888-89 the Contra Costa Water Company must have contracted a rather large crew of Chinese laborers for it is during this period that a third and largest tunnel was constructed. Tunnel No. 3 was the most ambitious of the three subterranean endeavors, running approximately 1500 feet through bedrock and requiring dressed masonry throughout its length. Stone for this tunnel was quarried about one half mile upstream on San Leandro Creek and transported on barges towed by a steam launch.

Chinese involvement in the construction of Tunnel No. 3 is documented in several newspaper reports including one which describes the accidental deaths of 4 Chinese workmen in an explosion of a giant powder cartridge at the tunnel's entrance.

In total, the Chinese worked for almost 20 years at Lake Chabot, performing monumental construction tasks and creating both Oakland's earliest water works and one of the area's most important recreational lakes. But as is the case with so many other nineteenth century Chinese accomplishments their role at Lake Chabot was all but forgotten

until 1980 when a modern crew from the Piombo Construction Company, involved in the reconstruction of the dam's spillway, exposed a portion of an archaeological site which proved to be the remains of a workmen's camp occupied by Piombo's predecessors of 100 years before.

Archaeological Context

The site is located on the southern bank of San Leandro Creek, some 150 meters west of the Lake Chabot spillway. The archaeological deposit occupies an area some 25 meters E/W by 20 meters N/S on the slope of the creek bank and the terrace above it.

The site's official designation is CA-Ala-423H but it is commonly known as "Yema-po", Cantonese for "Wild Horse Slope". This name refers to Chabot's alleged use of some 200 wild horses to trample the earth of the dam and was coined by Professor Lindy Li Mark of the Department of Anthropology, California State University, Hayward.

During the summer of 1980 and spring of 1981 the author and students from California State University, Hayward surveyed, mapped and conducted excavations at Yema-po with a mind toward salvaging the portion of it destroyed by heavy equipment and determining its functional nature and chronological lifespan. Excavation on the upper terrace revealed a shallow deposit of highly fragmented Chinese artifacts, metal construction materials and faunal remains within a rather compacted matrix which also contained number of *in situ* architectural remains such as mortared bricks and possible cobblestone paving. The clearest feature of this kind was found on the edge of the terrace and appears to represent the partial remains of a brick lined hearth which consisted of a concentration of mortared bricks, rocks, iron hardware and thermally altered soil. We have tentatively interpreted the terrace area as representing the original living surface of the Chinese workers camped at Yema-po and the hearth feature, although still somewhat enigmatic, as possibly the remains of an outdoor cooking stove over which communal meals were prepared.

The cultural constituents of the lower slope units, just as those on the

upper terrace, were dominated by metal construction materials, Overseas Chinese ceramics, other artifacts and faunal remains. The deposit in this area, however, proved to be much deeper, averaging about 70-80 cm and the degree of artifact fragmentation was much less. We believe the lower deposit to represent a secondary trash midden composed of materials discarded from the camp on the terrace above.

Survey of the area surrounding the Yema-po campsite has revealed at least two other sites dated to the period of the original dam construction in the 1870's and 1880's. Some 200 meters to the southwest of Yema-po and 50 meters up a steep slope another site covered with Chinese ceramics and other Euro-American artifacts has been found. To date this second site has been tested with only three excavation units but promises to be exceeding interesting because of the presence of a well-preserved brick over structure.

The third site is located across the canyon of San Leandro Creek and is composed of numerous concrete and brick foundations and refuse dumps containing 19th century Anglo ceramics and bottles. This site is clearly the remains of barns, houses and the mechanics' and blacksmiths' shops described in many of the newspaper accounts of the dam construction and illustrated in extant photographs of the period.

The Artifacts

All the materials recovered from the two seasons of excavation at Yema-po have been cataloged but to date only a portion of the approximately 60,000 artifacts and animal bones have been thoroughly analyzed. Hence, the following comments are intended merely to roughly characterize the nature of the assemblage, to highlight those artifacts that are believed to be exceptional and to outline the general direction of our research.

Ceramics

Tenmoku or *chien yao* dark brown glaze storage vessels dominate the ceramic inventory from Yema-po and practically all shapes reported in the "overseas Chinese literature" are represented at the site (see Figure 2, "Typology of Tenmoku Shapes"). Wine jars and soy

pots are the most frequently occurring of the tenmoku pots, and are represented by minimum numbers of 25 and 19, respectively.

Among the tableware ceramics three circles and longevity or Swatow rice bowls predominate. A minimum of 32 of these stoneware bowls have been identified along with a lone celadon rice bowl. As might be expected for a site with an initial occupation date of 1874, no bowls of the double happiness pattern nor straight-sided Swatow bowls were found (cf. Chace 1976).

In comparison to the abundant utilitarian storage vessels and rice bowls finer porcelain wares such as tea cups, wine cups, soup spoons and serving dishes are very rare in the collection. These shapes occur principally in celadon and four seasons color patterns, although several other unique designs were noted as well.

A comparatively small number of Euro-American ceramics were found intermixed with Overseas Chinese artifacts through all levels of the site. Ten inch plates predominate among these ironstone specimens but sherds of cups and saucers were found also. The four identifiable hallmarks found in the Euro-American assemblage are from British manufacturers and date between 1862 and 1884.

Opium Smoking Paraphernalia

The popularity of opium smoking among the Chinese laborers of Yema-po is attested to by the presence of numerous fragments of opium pipe bowls, shipping tins and several other pieces of opium smoking equipment. A minimum number of fifteen opium pipe bowls is represented in the collection by 52 sherds. They are manufactured of both earthenware and stoneware fabric but unlike the situation observed at other Overseas Chinese sites in the west gray stoneware bowls outnumber orange earthenware bowls, with minimum numbers of 9 and 6, respectively. Ten distinct pipe bowl shapes have been identified from Yema-po (see Figure 3, "Opium Pipe Bowl Typology"). Type 10, a circular, straightwall, stoneware type with circumferential, incised bands is the most common shape in the collection (N=4).

Two of the Yema-po stoneware pipe bowls appear to be exceptional to those reported from other Overseas Chinese

sites and warrant particular comment. The first is represented by almost one half of a gray stoneware pipe bowl (Type 7) impressed with a figure of a smiling lion, flanked on the left side by a column of Chinese characters meaning "Hall of the Lion" and on the right side by a block of indecipherable potter's seals (see Figure 4a). The second bowl is hexagonal in shape (Type 6) and manufactured of gray stoneware covered with a thin red-brown slip. It appears that each of the concave faces or panels of this pipe was adorned with a molded, relief design which was left unslipped and stood out from the darker background surface. The panel which remains intact is decorated with a sampan and a stand of reeds. The broken panel to the right contains the Chinese characters "Xiang Jiang" or Ziang River and the partial scene to the left seems to be a floral motif (see Figure 4b). Considering the labor camp context of Yema-po these two specimens are remarkably elegant. The quality of these pipe bowls is further accentuated when they are compared to the common varieties reported from other Overseas Chinese sites (Bente 1976; Hattori, *et. al* 1979; Wylie 1980; Pastron 1981).

Glass Bottles

A minimum of 115 glass bottles of both American and Chinese manufacture have been identified from the site. The functional categories observed at Yema-po document that the Chinese employed on the San Leandro Dam Project made use of the same general categories of beverages, condiments, medicines, etc. as those reported from other Chinese sites such as Ventura and Lovelock. Only the emphasis on particular products and brand names differs from site to site. In an effort to achieve comparability the Yema-po bottles were tabulated according to the categories reported from Lovelock (Armstrong 1979). Table 1 compares the relative frequencies of bottle categories found at these two sites:

Bottle Category	Yema-po	Lovelock
Liquor	13.0%	17.7%
Wine/Champagne	17.3%	5.8%
Beer	13.0%	29.2%
Soda & Beverage	8.6%	5.8%
Household	6.9%	2.3%
Condiment	3.4%	8.0%
American Medicinal	13.0%	15.1%
Chinese Medicinal	21.7%	10.4%
Miscellaneous	2.6%	5.7%

Although the percentage of alcoholic beverage bottles is not statistically different between Yema-po and Lovelock (43.3% and 52.7%, respectively), it is interesting to note the contrasting preferences for wine/champagne versus beer between the two sites. Beer was much more popular at Lovelock (29.2%) than at Yema-po (13%), whereas the three major alcoholic beverage categories are found in approximately equal numbers at the San Leandro camp, with a slight preference for wine/champagne. The reasons for this differential consumption may be multiple, but future research will focus on chronological and geographical differences between the sites.

The second salient difference to emerge from Table 1 is that Chinese medicine bottles were found in twice the relative quantity at Yema-po as at Lovelock. This difference most certainly emanates from the later date of the Lovelock assemblage and the high degree of acculturation noted in the material culture there.

The bottles provided the most secure barometer of the chronology of the Yema-po occupation. Although it was originally assumed that the site represented only the original 1874-75 construction camp, the twenty-two bottles with embossed lettering or other chronologically diagnostic features provided a mean bottle date of 1882.6. It is impossible to explain this date as a produce of post-occupational contamination of the upper levels of the site by Euro-American activity because only 10 of the bottles have initial manufacture dates that fell before or within the historically documented years of construction. It is much more probable that Yema-po represents a continuous occupation dating from 1874 until around 1889 or 1890.

Miscellaneous

In the interest of time it will be impossible to discuss here the many additional artifact categories excavated at Yema-po. Suffice it to say that numerous buttons, overall fasteners, Chinese and American coins, cartridges and faunal remains as well as a large collection of brass and iron construction hardware were found.

Conclusions

Preliminary analysis of artifacts excavated from Yema-po, CA-Ala-423H, has documented that the site was occupied by Overseas Chinese laborers engaged in the construction and improvement of the San Leandro Dam from 1874 until 1889-90. Whether occupation was continuous or episodic during this period is still unclear.

The nature of Yema-po, as a "temporary labor camp" yet within close proximity to a major metropolitan area would seem unique in the archaeological literature of the Overseas Chinese. Once analysis of the entire artifact assemblage is complete, it is hoped that Yema-po will provide important insights into the history of the Chinese in nineteenth century America.

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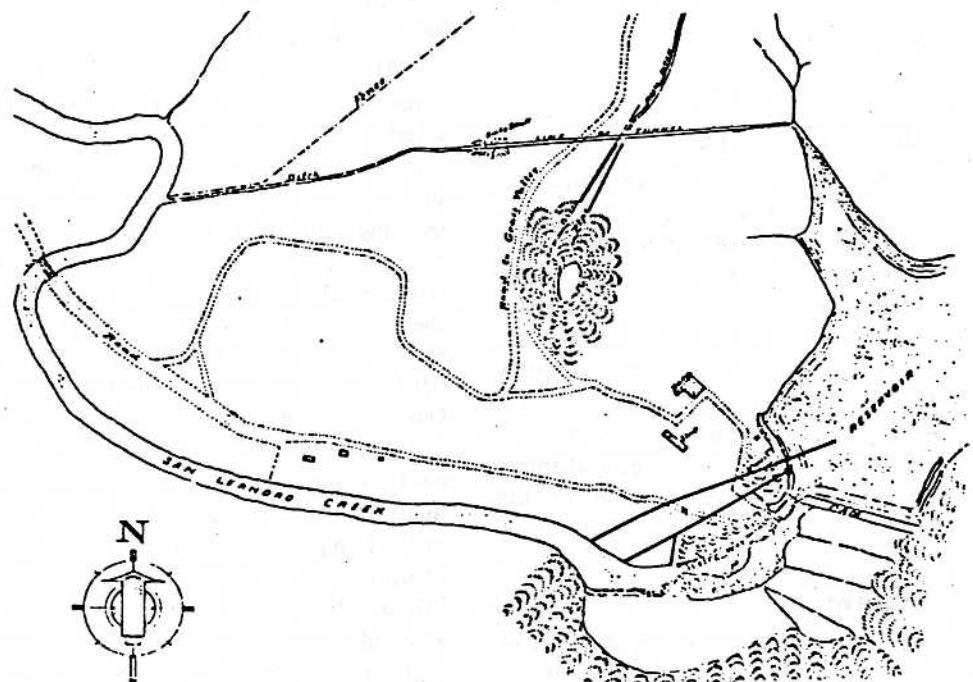


Figure 1 - Map of the Area Surrounding the San Leandro Dam ca. 1890

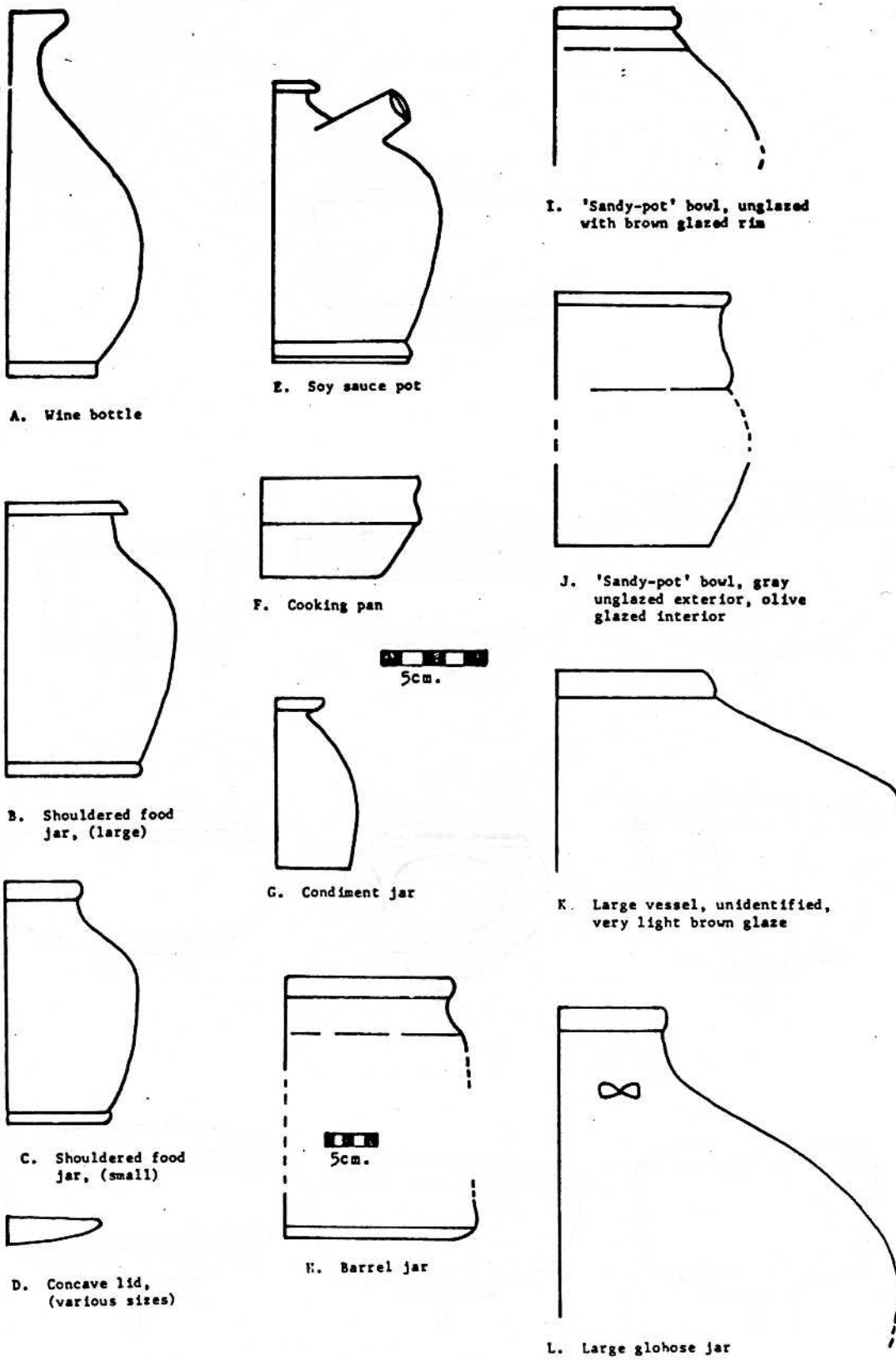


Figure 2 Typology of Tenmoku Shapes

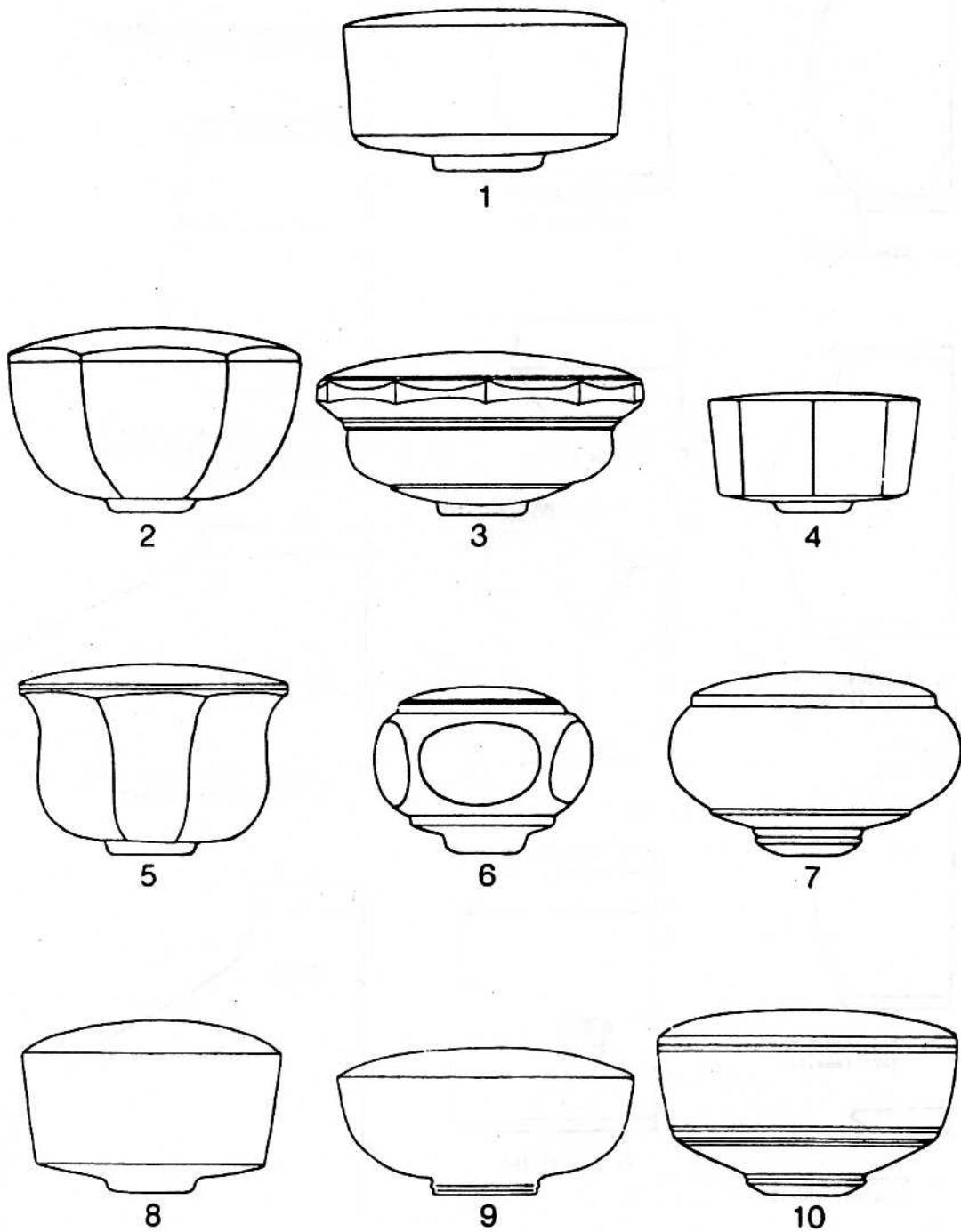
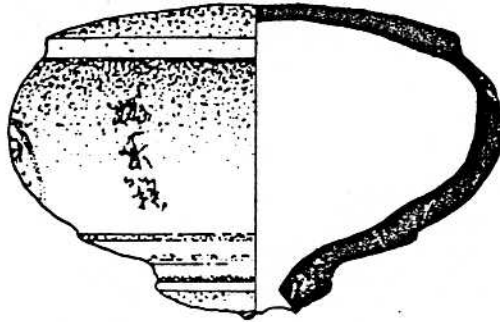
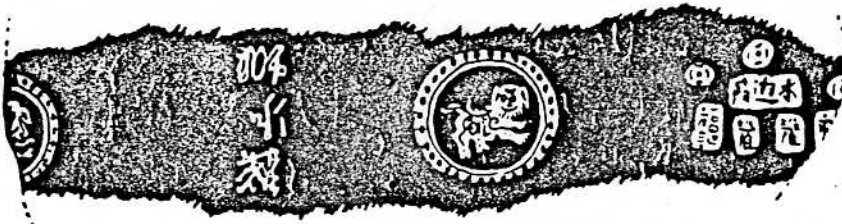


Figure 3 Typology of Opium Bowl Shapes

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A

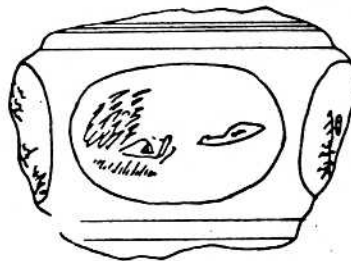
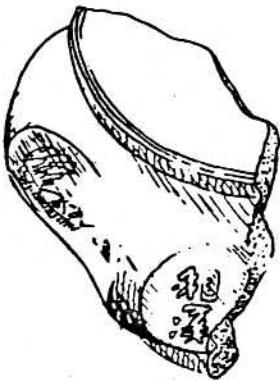
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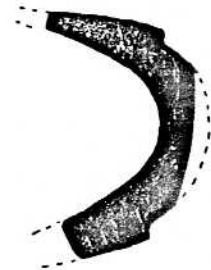


Figure 4 Exceptional Opium Pipe Bowls: A - "Hall of the Lion" pipe;
B - "Xiang River" pipe