

CERAMIC INVESTIGATIONS AT LA PIANA (SIENA), AUGUST 1992

I. INTRODUCTION

This report describes the results of a small program of archaeological research carried out by the author during the period August 1-26, 1992 in connection with the Etruscan Foundation excavations at the site of La Piana (Comune of Sovicille, Province of Siena), Italy. The aims of this work were: 1) to establish a working fabric typology for the La Piana pottery assemblage; 2) to collect specimens of clay and temper from the area of the site so that it might be possible to evaluate the raw material sources and production techniques employed for the manufacture of the La Piana pottery; and 3) to select specimens of La Piana pottery and regional clay for chemical characterization by neutron activation analysis (NAA).

II. EXAMINATION OF THE LA PIANA POTTERY ASSEMBLAGE

The author's examination of the La Piana pottery assemblage was limited to the diagnostic sherds from the 1985, 1986, 1990, and 1991 field seasons and the vessels on display in the Etruscan Foundation museum at the Castello di Spannocchia. This work consisted of looking through the several locus bags for each field season with the aim of identifying and describing compositionally distinct fabrics, noting the forms represented in each. Observations were made with the aid of a 8x hand lens. The results of this work should be considered highly approximate and the fabric typology viewed as a working scheme for revision and further elaboration. Fabrics attested only in loci containing modern material were assumed to be post-Classical and are not included in the classification. In general, the La Piana pottery was in strikingly poor condition, heavily encrusted with dirt and with extremely worn surfaces. The latter condition prevailed even with materials recovered in primary occupational deposits sealed underneath tile falls associated with the destruction of the settlement, suggesting that it is most likely due to a combination of relatively soft ceramic fabrics and a harsh depositional environment rather than to abrasion caused by redeposition.

The following fabrics were identified:

Fabric 1: Very common. A fine fabric used for the manufacture of black-gloss tablewares. A soft, very fine-grained body ranging in color from light red to light gray, with considerable color variation frequently present within a single sherd. Finished with a good quality glossy slip, usually black, but in some pieces with brownish splotches, apparently due to uneven reduction conditions during firing; slip often poorly preserved, and in some instances missing entirely. Nearly all of the vessels attested in this fabric appear to be kylikes, skyphoi, and small bowls (The appropriate form numbers must still be tracked down in the Morel typology). A very limited number of closed forms are also attested (circular askos [kothon?]; small stamnos). Not infrequently, the open forms have combined roulette/palmette stamp decoration on the interior of the floor. Vessels identical to these are on display in the Museo Guarnacci at Volterra, and it seems very likely that the La Piana vessels are of Volterran manufacture. If this inference is correct, this fabric was probably manufactured using clay

deposited during the Plio-Pleistocene marine transgression (formation Pag), which outcrops extensively in the Volterra area. The vessels in this fabric are of extremely great significance in that they are likely to furnish the best dating evidence for the occupational history of the site. The forms attested at La Piana begin either during the late fourth or the first half of the third century B.C., and in some cases run as late as the mid or later second century B.C.

Fabric 2: Very common. A fine fabric used for the manufacture of small bowls, medium-sized bowls, and jars, and perhaps also unguentaria. It is likely that a more systematic study would record several more forms. A soft, fine-grained body ranging in color from light red to buff. On fresh breaks shows sparse small-medium voids and small shiny flecks (presumably mica). A few examples also show small rounded white bodies (presumably calcareous). A more detailed examination of the materials assigned to this fabric using a binocular microscope with up to circa 40x magnification might well reveal more than one distinct fabric subsumed under this class. Whatever the case, these materials are presumably of local origin. They were probably manufactured using a fine-grained clay with no temper added, although it cannot be excluded that they were produced with the fine fraction of a more coarse-grained clay subjected to levigation.

Fabric 3: Common. A fabric with sparse, medium/large non-plastics used for the manufacture of small bowls and perhaps other forms. A soft, fine-grained matrix ranging from light red to light gray, with sparse medium to large non-plastics, including what appear to be calcareous rock fragments and large flakes/books of mica. These materials, which often stud the surfaces of heavily worn sherds, appear to be very similar or identical to the non-plastics present in Fabric 4. Whether this fabric was manufactured using a fine-grained base clay with the addition of a small amount of medium-grained temper or a base clay with these characteristics is unclear. It is probably of local origin.

Fabric 4: Very common. A coarse to very coarse fabric used for the manufacture of cooking vessels (olla, lid or cooking dome, bowl?), dolia, and roof tiles (pan, cover). Only one or two of the sherds of cooking vessels appeared to have been thrown on a wheel, and the bulk of these were probably hand-formed, perhaps using a turntable. This is not surprising, since a paste of this degree of coarseness would likely injure a potter's hands if used on a wheel. A fairly friable red matrix with very abundant medium to very large non-plastics. Cooking vessels are frequently dark gray due to soot deposition. Non-plastics show considerable variation from specimen to specimen and class may admit subdivision with more careful study. Some variants include: a) abundant rounded to angular fragments of limestone and grains of calcite, and, in some cases, rare fragments of sedimentary rock or chamotte, b) as preceding, but with addition of sparse to abundant large flakes and books of what appears to be mica, and c) abundant highly rounded fragments of limestone (?) and/or voids presumably produced by disaggregation of weathered limestone fragments. It is unclear whether this fabric was manufactured by adding large amounts of coarse temper to a base clay or by employing an unusually coarse base clay. The materials in this fabric were presumably manufactured either at the site or somewhere in its immediate environs.

Fabric 5: Rare. A coarse fabric used for the manufacture of bowls and medium to large closed forms (storage or water jars?). A white to light red matrix with abundant fine to medium rounded colorless

grains (probably quartz), sparse small to medium rounded red bodies (fragments of sandstone or argillite?), and, in some cases, perhaps some mica and/or calcareous bodies. It is unclear whether this fabric was manufactured locally or is an import.

As noted, this classification should be viewed as a first approximation of the true situation and will no doubt require modification. It may prove difficult, for example, to sustain the distinction between Fabrics 2 and 3, or between the subdivisions tentatively suggested for Fabric 4, all of which may grade into one another rather than presenting distinct discontinuities. Similarly, as noted, Fabric 2 may well permit some subdivision. A few sherds of apparent Hellenistic date that do not correspond to any of these classes were also noted. These included one sherd of color-coat or low quality black-gloss ware with a slightly gritty reddish fabric, and a couple of sherds of pottery in a gritty reddish fabric somewhat reminiscent of that employed for the manufacture of internal red-slip cookware in northern Etruria. Several sherds in a hard, fine to slightly gritty, white fabric were assumed to be post-classical. The author observed no sherds that he could classify as necessarily Roman or Medieval, and the site would appear to have been effectively abandoned from the Hellenistic through modern periods.

Since these materials were examined without the aid of detailed notes on the stratigraphic sequence at the site and without a copy of Morel's black gloss ware typology in hand, it is difficult to draw chronological conclusions about the occupational history of the site in anything more than a very tentative fashion. The black gloss ware appears to suggest occupation during the later 4th and the 3rd centuries BC. The absence of any examples of so-called "Volterranean pre-sigillata" may, however, be important for the dating of the destruction of the site. This class of fine tableware appears to have been manufactured at Volterra over an as-yet poorly defined period of time falling within the second half of the 3rd and the first half of the 2nd century BC, and it is abundantly attested at sites of this period in the Senese, including (to the author's knowledge) Malignano, Poggio Pinci, Colle San Martino, and Cetamura del Chianti. Its apparent absence from the La Piana pottery assemblage would thus appear to point to a destruction of the settlement at some point well before circa 150 BC at the very latest, possibly as early as the first half of the 3rd century. While somewhat less compelling, the absence of internal red-slip cookware (Pompeian red-ware) from the La Piana assemblage also tends to corroborate this inference, since it is attested in some abundance in 2nd century occupational deposits at Cetamura del Chianti. It is unclear whether a destruction of the settlement at La Piana at such an early date is best attributed to some purely local circumstance (e.g. the expansion of the pre-Roman settlement at Siena) or extra-local factors (e.g. the Gallic incursion of 225 BC, Carthaginian depredations during the Second Punic War). In order to clarify the situation with respect to the destruction of the site it will be necessary to re-examine the black gloss ware from the assemblage, in order to establish 1) the form unambiguously attested beneath the destruction level with the latest beginning date (this will provide a *terminus post quem*), and 2) the earliest black gloss forms widely attested in occupational deposits (not just tomb groups) in the Senese, which are absent from contexts beneath the destruction level (this will suggest a *terminus post quem non*).

The apparent dominance of the high quality tableware market at La Piana by Volterranean potters during the 4th/3rd century BC is by no means surprising. Perhaps worth noting, however, is the limited range of forms attested, and, in particular, the scarcity of closed forms (which do not travel

well since they cannot be nested for transport). On-site production at La Piana (i.e., the Fabric 4 materials) appears to be distinctly modest, with all or nearly all cookwares made by hand. It would be of some interest to establish whether the tablewares produced in Fabrics 2, 3, and 5 are of on-site origin or were manufactured elsewhere. If it can be established that these moderate-quality wheel-made vessels were manufactured elsewhere, then it might be argued that pottery manufacture at la Piana, was in the hands of part-time, casual potters rather than full-time craft specialists. It should be noted that Fabrics 4c and 5 bear superficial resemblance to the standard cookware and storage/serving ware fabrics, respectively, in 3rd/2nd century BC contexts at Cetamura del Chianti. This should not be interpreted to mean that these materials have the same origin (particularly in the case of Fabric 4c), but rather that they were produced by potters employing similar raw materials in similar ways to achieve the same ends.

III. GEOLOGIC INVESTIGATIONS IN THE LA PIANA AREA

A brief program of geologic investigation was carried out in association with the study of the La Piana pottery. The aim of this work was to evaluate the possible sources of the clays and tempers employed for the production of ceramics presumably manufactured at La Piana and/or in the general La Piana area. Specimens of these materials were also collected for eventual comparative compositional analysis.

This work was rendered difficult by the author's inability to obtain a copy of the map sheet for the La Piana area in the Servizio Geologico d'Italia series of 1/100,000 geologic maps (Foglio 120 "Siena"). The author did have at his disposition the "Note Illustrative" for this map (a booklet that expands on the map key, describing the various formations represented), the Servizio Geologico d'Italia 1/500,000 geologic map for the area (Foglio 2), and the Istituto Geografico Militare 1/25,000 topographic map for the area (Foglio 120, Tavoleta I N.O. "Sovicille").

Clay and coarse sediment specimens were taken in a haphazard fashion due to the limited amount of time and equipment available and the modest size of the program of compositional analysis slated for completion in connection with this project. Where appropriate, an effort was made to recover three different clay specimens from each outcrop visited, obtaining these from points located as far away from each other as possible in a vertical sense in the exposed segment of stratigraphic column. While far from an adequate sampling technique, this approach will at least permit some initial observations to be made about a source's overall compositional characteristics and the degree of heterogeneity present within it. Where clay specimens were obtained from other contexts (plowed fields, drainage ditches, etc.), an effort was made simply to obtain specimens from locations as remote from one another as possible. Specimens were taken by removing the weathered face of the outcrop (or clod of plowed up material) with a hoe, gouging out cobble-sized clods of unweathered clay, placing these in a plastic sample bag, and labeling the bag with a Sharpie marker. In most cases, roughly 500 grams of material were taken. For coarse sediment specimens, a small amount of loose material was simply scooped up off the ground with a trowel, placed in a sample bag, and the bag labeled. All clay and coarse sediment specimens (15 clay specimens, 3 coarse sediment specimens) have been transported to Rome and are in the possession of the author.

A. The La Piana/Pian allo Spino Area

At the outset of the geologic investigation, it was decided to concentrate the prospection for raw material sources on the south-facing slope of the limestone ("calcare cavernoso") hill at the crest of which La Piana is located (henceforth the "site hill") and in the small basin immediately to the south of this slope known as Pian allo Spino. These areas are within convenient walking distance of the settlement and it was thought that there might either be beds of clay overlain by the limestone exposed near the foot of the slope (for possibly analogous situations in the Causa/Frosini areas see below) or deposits of recent alluvial clay in the valley bottom. A similar geologic situation would appear to prevail in the Pian del Lago area on the northern side of the site hill, but travel to this area would have required a substantially longer trek over rough ground.

A reconnaissance of these areas revealed no such formations, and from discussions with farmers resident in the neighboring hamlets of Valli and Toiano, it would appear that no clay has been dug and no ceramics of any sort manufactured in this area in recent times, and that there is no suitable potting clay present. These men were aware of the suitability for ceramic manufacture of the Plio-Pleistocene clays of the "Le Crete" area a few kilometers to the east, mentioning San Rocco a Pilli as a place where brick and tile were manufactured. A brief tour around the Pian allo Spino revealed little use of brick in houses of pre-World War II date, re-enforcing the conclusion that this area has not been a center for the manufacture of architectural ceramics in recent times.

The entire area of the Pian allo Spino basin appears to be blanketed with a thick deposit of terrarossa mixed with limestone pebbles and cobbles derived from the weathering of the surrounding heights. One of the farmers interviewed indicated that excavation to considerable depth anywhere in the plain will produce the same material, except for occasional beds of gravel laid down in areas adjacent to the course of the Fosso Arnano during floods in the period before its canalization. An area of silty clay with a moderate degree of plasticity was noted at a bend in the paved road immediately to the west of Caldana (UTM 815 968), but the owner of this land stated that this material had only recently been trucked in from excavations being carried out at the site of the new "Sede Bancario" at Sovicille. The identification of this formation is not known to the author. Exploration around the lower portion of the calcare cavernoso limestone formation at the base of the trail up to the site of La Piana revealed the presence of no exposures of any underlying formations. This was a rather cursory effort, however, and a more intensive investigation of the lower slopes of the site hill further to the east and west of the trail might pay dividends. A layer of sandy yellowish soil with rounded pebbles and cobbles of calcare cavernoso was observed in the cut along to unpaved Toiano-Piaggiarella road 400 m SE of Toiano. This appears to have a contact with the terrarossa downhill across the road to the SW in a vineyard.

B. The Le Crete Area

South and east of Siena (and outcropping in a more discontinuous fashion in other parts of the Senese) is a vast area of Plio-Pleistocene marine clay (formation Pag) known as "Le Crete". This exposure runs from the line of the SS 73/SS 223 eastward to the area of Rapolano, and in recent

historical times this clay has been widely employed for the production of architectural ceramics and fineware pottery. This is the same formation that outcrops in the vicinity of Volterra, and in several other point of west-central Italy (e.g. Montelupo, Orvieto, Rome/Gianicolo, etc.), where it has also been widely exploited for ceramic production. While the precise western boundary of this exposure is not known to the author, at one point, near Costalpino, it lies only 5 to 5.5 km to the ESE of La Piana, and it is by no means unreasonable to suggest that potters at La Piana and other settlements in the La Piana vicinity may have used this clay on a regular basis for the production of fine-bodied ceramics. Other isolated exposures of this formation occur along the Valley of the Elsa as far upstream as the area of Carpigioni, roughly 10 km to the NW of La Piana.

A reconnaissance was made along the western fringes of the Le Crete exposure, from San Rocco a Pilli in the south to Costalpino in the north. The topographic map shows the presence of five "fornaci" (kilns) in this general area, and even though it was assumed that most of these establishments would no longer be active, it was thought that they might provide good locations for the extraction of clay specimens.

At San Rocco a Pilli a 15 minute interview was held with a woman whose family had formerly operated the brick kiln appearing on the topographic map 500 m east of the town (UTM 860 920). She indicated that the kiln had been operated by her family for three generations, from roughly 1885-1948, making only brick. Clay was dug on the spot from "the higher portion of field, close to road." At the time of the visit, a block of houses was being constructed on the site of the abandoned kiln, which had been destroyed. There were clear exposures of Pag clay over much of the vicinity, and three specimens were taken from the weathered scarp of the cutting made for the construction of the houses, immediately to the SW of these structures. The three specimens were taken from a segment of roughly 1.5 m of the stratigraphic column, the highest situated about 3-4 m below current ground level.

A visit was next made to the site of the kiln indicated on the topographic map immediately to the east of SS 223 between La Razzia and La Palazzina (near km 7) (UTM 863 944). A farm had since been built on the spot, obliterating all traces of the kiln. A 15 minute interview was held with the man resident at the farm, who indicated that the kiln had been an estate kiln that made brick. He indicated that clay was dug on the spot at a point immediately to the east of the SS 223, the cutting having been filled in with earth bulldozed down from above at the time that the farmhouse was constructed. No useful clay exposures were noted, and, accordingly, no specimens were collected.

Next a visit was made to the site of the kiln shown on the topographic map 500 m to the SE of Montecchio (UTM 872 946). While the location of this kiln could not be established with complete certainty, some remains (a curved terracing wall, or, less likely, the remains of the lower portion of a kiln) that are very likely to be those of this establishment were identified at the crest of a southwestward projecting bluff. Further down the bluff was a weathered scarp exposing the contact between the upper portion of the Pag clay and the overlying Ps sand. Three clay specimens were taken from this exposure over a segment of roughly 2 m of the stratigraphic column. In the hand specimen, these appeared somewhat on the silty side and showed sparse fragments of shell.

Due to time constraints, no effort was made to visit the site of the kiln indicated on the topographic map at a point 1.6 km ESE of Montecchio.

The final locale visited was the site of the kiln indicated on the map 400 m to the NE of Costalpino (UTM 874 964). This is the still active Fornaci Cialfi. A 30 minute interview was held with the company president, Giordano Checchi, who provided much useful information and presented the author with a copy of the recently published book "Fornaci e mattoni a Siena: dal XII secolo all'azienda Cialfi" (Sovicille, 1991). Checchi indicated that documentary records attest brick production on the spot of the Cialfi kiln as early as the 1350s. Until recently, clay was dug from an enormous pit cut into the bed of Pag clay exposed along the hill slope immediately to the east of the factory. The advance of the scarp came to threaten houses located atop the hill, however, and in recent years the concern has extracted clay at another location a short distance to the south and east. For solid brick, a combination of 65 percent "creta" (i.e. Pag clay) and 35 percent "tufo" (i.e. Ps sand) was normally employed.

Three specimens of clay were taken from the lower portion of the weathered face of the abandoned clay pit over a segment of roughly 2 m of the stratigraphic column.

C. The Montagnola Senese

A brief reconnaissance was also carried out in limited areas of the Montagnola Senese, roughly 6 km to the SE [read "SW" – JTP 1/10/2012] of La Piana. While this area, being somewhat distant, is of questionable relevance for the site itself, it was convenient of access, appeared to have a different geology that might furnish informative comparative data, and promised to provide information that might complement the results of other archaeological projects (e.g. the Montarrenti excavations and survey, the Castiglion che Dio Sol Sa excavations).

A visit was made to a bed of light gray clay eroding out of a hill slope at the edge of the SS 73, 200 m east of Frosini (UTM coordinates not available). Capping the clay bed at the top of the slope and eroding down over it was a layer of limestone breccia (?). Clay specimens were taken from three different points on the erosion slope. These specimens, which were taken over a segment of roughly 10 m of the stratigraphic column, showed considerable color differences one from the next. The identification of the formation to which these belong is not known to the author, nor is there any indication that this exposure was ever exploited for ceramic production.

A visit was then made to the site of an abandoned brick kiln shown on the topographic map (although not identified as a kiln) at a locale identified as Villanova, 900 m NE of Frosini. The kiln facility is still standing and in reasonably good condition. A five minute interview was held with an elderly man engaged in plowing the field in which the kiln is located. He stated that the kiln remained active until a few years after the end of the Second World War. He also indicated that the clay for this establishment's production was dug on the premises, pointing out two locations in the field where there were different qualities of clay, as judged by their color. The plowed portion of the field, immediately to the west, north, and east of the kiln, showed a complex zoning of soils, with some dark organic areas, some sandy areas, and some more or less argillaceous areas. The

identification of this formation is not known to the author. One specimen was taken from each of two argillaceous areas, one located roughly 20 m east of the kiln, and the other roughly 100 m NE of it. The latter area appeared to be roughly 5 m higher in elevation than the former. Six small specimens of brick, some over-fired, were also collected in the environs of the kiln, and are presumed to be kiln products.

A visit was also made to the abandoned kiln indicated on the topographic map 300 m SW of Podere Causa. This was the estate kiln of Spannocchia, and a 15 minute interview with the inhabitant of the farmhouse adjacent to Causa indicated that it had operated until circa 1945, with the clay dug on the premises. The workshop structures were in fairly poor condition. Drainage was evidently poor along the bottom of the draw situated immediately to the west of the kiln, and closer investigation revealed that the soil in this area was argillaceous. No good outcrops of this formation were in evidence, but a poor exposure was located along the drainage ditch at the edge of the abandoned dirt road passing by the kiln, 100 m to the west of the establishment on the far side of the draw. A single specimen of clay was taken from this area. The clay bed contained weathered limestone cobbles and boulders, and overlay what may have been limestone bedrock. The identification of this formation is not known to the author.

D. Overview

With more time visits would have been made to several other locales. As previously mentioned, there are outcrops of Pag clay along the upper reaches of the Elsa, and these warrant visits and the collection of specimens. Note should be taken, in particular, of the presence of a "Casale le Fornaci" indicated on the Foglio 113 geologic map east of Collalto (and also a "Podere Fornace" to the east of the Montarrenti/Colle Val d'Elsa road along the upper reaches of the Rosia that is indicated on the topographic map). Visits should also be made to some locales to the NE of La Piana, including a "Casale la Fornace" indicated on the topographic map 1.6 km NW of Marciano (UTM 851 002), and "Fornacelle," a suburb on the northern side of Siena. The geology of these locales is not known to the author, but they suggest that clay suitable for ceramic production likely exists in this area.

The results of this portion of the project are thus mixed. Several clay and coarse sediment specimens were collected, some of which are likely to be of some utility for efforts to understand the selection of raw materials employed by potters at La Piana and/or elsewhere in the La Piana area. In particular, it may be possible to demonstrate some degree of compositional similarity between the various clay specimens collected and vessels in Fabric 2. At the same time, the sources of clay and/or temper exploited for the manufacture of the materials in Fabric 4 - by far the most common local fabric - remain enigmatic, and it is not, in fact, clear to the author where materials with the mineralogy observed for this fabric (specifically with regard to the presence of mica in one of the subgroups) might occur in the La Piana area. A more intensive study of the site hill and the acquisition of the geologic map for the area will be required if progress is to be made in this connection.

IV. SELECTION OF MATERIALS FOR NEUTRON ACTIVATION ANALYSIS

Approximately 30 specimens of pottery were selected from among the La Piana diagnostic sherds for export to the United States for chemical characterization by NAA at the Cornell University Ward Nuclear Laboratory. These materials were consigned to Prof. Jane Whitehead for transport to the United States. The aim of this work is to distinguish distinct compositional groups among the fine-bodied ceramics from the site and, where possible, determine the probable origins of these groups through matches with suspected source clays and/or other ceramics of known origin. The specimens selected were roughly evenly divided among sherds belonging to Fabric 1 (black gloss) and Fabric 2 (unslipped fineware tablewares). The analysis of these pieces should provide a useful initial overview of chemical variability within these two fabric classes and suggest some possible compositional similarities with materials previously analyzed by the author. These include Pag clays from the Volterra and Castelnuovo Berardenga Scalo areas, lacustrine clay from the Arezzo area, Miocene marine clay from the Chianti mountains, and black gloss, "pre-sigillata", and Italian sigillata finewares from the site of Cetamura del Chianti.

Following analysis of the ceramic specimens, it would be useful to undertake analysis of some or all of the clay specimens collected. It is anticipated that this work will be carried out by the author upon his return to the United States during the summer of 1993. The following preparations will be undertaken for each of these specimens: a small amount of clay (circa 10 g) will be hydrated with distilled water, the hydrated mass will be formed into a small pellet, the pellet will be allowed to air dry for 24 hours, the dried pellet will be fired in an electric kiln at 900 degrees C for two hours, and circa 5 g of fired pellet will be reduced to powder by crushing in an agate mortar and placed in a gelatin capsule for storage/transport to the laboratory. The pulverizing of fired specimen by tungsten carbide drill bit will be avoided since this produces cobalt contamination.

V. OTHER ACTIVITIES

During the period in question the author also undertook several other activities in connection with this research project. These included a talk on NAA given to the La Piana crew, visits to collections of archaeological ceramics in several regional museums (Vescovado di Murlo, Populonia, Montelupo Fiorentino, Volterra) and visits to archaeological sites (Poggio Civitate, Cetamura del Chianti, Accesa, Populonia).

VI. RECOMMENDATIONS FOR FURTHER WORK

The following recommendations can be made for further work in relation to this research project:

1. Acquire the Foglio 120 "Siena" 1/100,000 geologic map (try Libreria dello Stato, Via Cavour, Florence or Istituto Poligrafico dello Stato, Piazza G. Verdi, Rome).

2. Prepare a stratigraphic summary or (preferably) a Harris matrix for the excavated portion of La Piana so that it will be possible to undertake a more informed selection of ceramic specimens for NAA.
3. Undertake a more careful study of the geology of the site hill with a view to locating potential source clays.
4. Produce thin sections for 3-5 specimens for each of the ceramic fabrics identified so as to have more detailed information regarding their mineralogical composition.

VII. SUMMARY OF MAJOR POINTS

The results of this research may be briefly summed up as follows:

1. A rapid review of the La Piana pottery assemblage revealed the presence of at least five distinct ceramic fabrics of the Hellenistic period.
2. The black gloss pottery from the site suggests a destruction date as early as ca. 250 and no later than ca. 150 BC.
3. A study was made of the geology in the La Piana area and a number of clay and coarse sediment specimens collected from raw material sources that might have been exploited by ancient potters working in the area.
4. Circa 30 specimens of La Piana Fabrics 1 and 2 were selected for NAA at Cornell University.

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APPENDIX A: LIST OF CLAY AND COARSE SEDIMENT SPECIMENS COLLECTED

1. Coarse sediment: Weathered calcare cavernoso sands and granules collected on surface near car park for La Piana site (UTM 819 968; ca. 260 m a.s.l.).
2. Coarse sediment: Terrarossa soil collected in vineyard, 200 m west of Toianao (UTM 820 963 ca. 225 m a.s.l.).
3. Coarse sediment: Yellow sandy soil collected from road cut, 400 m SE of Toiano (UTM 959 824; ca. 230 m a.s.l.).
4. Clay: Three specimens of Pag Plio-Pleistocene marine clay (4A, 4B, 4C) from weathered scarp of construction trench on spot of former brick kiln, 500 m east of San Rocco a Pilli (UTM 860 920; ca. 250 m a.s.l.)
5. Clay: Three specimens of Pag Plio-Pleistocene marine clay (5A, 5B, 5C) from weathered scarp of hill slope near probable location of former brick kiln, 500 m SE of Montecchio (UTM 872 946; ca. 230 m a.s.l.). Silty and with shell; from near top of formation.
6. Clay: Three specimens of Pag Plio-Pleistocene marine clay (6A, 6B, 6C) from weathered face of Fornaci Cialfi clay pit, 400 m NE of Costalpino (UTM 874 964; ca. 235 m a.s.l.).
7. Clay: Three specimens of unidentified clay (7A, 7B, 7C) from erosion surface on hill slope, 200 m east of Frosini (UTM coordinates not available; ca. 325 m a.s.l.)
8. Clay: Two specimens of unidentified clay (8A, 8B) taken from clods plowed up in field adjacent to abandoned Villanova kiln, 900 m NE of Frosini (UTM coordinates not available; ca. 400 m a.s.l.). 8A is from 20 m east of kiln, 8B from 100 m NE of kiln.
9. Clay: One specimen of unidentified clay taken from weathered edge of drainage ditch near abandoned kiln, 300 m west of Podere Causa (UTM coordinates not available; ca. 390 m a.s.l.).