

CHARRED AND UNCHARRED PLANT REMAINS FROM 1995 AND 1996 EXCAVATIONS AT MEZZOMIGLIO

BY KAREN ADAMS

INTRODUCTION

Charred and uncharred plant remains, primarily wood, have been recovered from the site of Mezzomiglio in Chianciano Terme, Italy. The charred remains appear to relate to accidental or intentional destruction of various structures by burning, while the uncharred materials have survived by virtue of being imbedded in a water-saturated grey clay layer that lies within a large ancient pool (the *vasca*) below the modern water table.

The materials described in this report were excavated in 1995 and 1996. The condition of the plant remains varied notably. Uncharred items buried with the grey clay were in nearly pristine condition. When initially removed, these items were spongy and very soft. Slow drying reduced shrinkage and cracking, though both occurred. Charred items in non water-logged sediments were often badly degraded, with clay having infiltrated each piece so that it was friable and its anatomy distorted. Small and medium sized roots had further damaged these specimens by growing through them. The collection of plant materials described in this report were identified by comparison to modern charred and uncharred woods in the author's comparative collection from the Mediterranean region, and to descriptions and photos in books (Schweingruber 1982; Pignatti 1982). A complete list of plant items is available in Appendix 1, and identification criteria and measurement data can be found in Appendix 2.

RESULTS

At least eight separate types of plant parts were recovered by archaeologists excavating within a number of areas (Table 1). One area included a set of buildings in the eastern portion of the site, perhaps originally administration buildings or small shops (Structures A and D). These early imperial Roman structures were destroyed by burning c. A.D. 360. There was also post-Roman occupation in this part of the site. The other major area excavated includes the *vasca* or large outdoor immersion pool surrounded by colonnades.

STRUCTURE A (Figs. 7:15-17)

Structure A had two rooms joined by a common wall (Wall E). Excavators uncovered a number of large charred logs mixed in with a layer of fallen roof tiles in one of the rooms. These logs were likely some of the construction beams that burned when the rooms were destroyed by intentional or accidental burning. Also, loose pieces of charcoal and charred log fragments were preserved from within the general destruction layer (Locus 105) of Structure A (Grids J49b and J49b/c), along with an oak column support 30cm in diameter immediately adjacent to a wall.

The charred wood record reveals a general preference for oak construction elements. In this area a small amount of *Corylus* (hazelnut) charcoal was recovered, and three pieces of *Fagus*

(beech) type charcoal were preserved on a lime-washed, packed earth floor.

Many charcoal pieces were also excavated from a massive layer of collapsed roof tiles within the second room of Structure A (Grid K49c). This destruction is thought to be contemporaneous with that of the other room. These charred items again indicate a preference for oak wood as construction material, with some use of Italian cypress wood.

STRUCTURE D (figs. 7:15, 16)

East of Structure A, separated by a small alley, stood Structure D. This structure seems also to have had a history similar to that of Structure A. Its burned layer included broken roof tiles, charred wood, and oxidized earth (Locus 115). Charred wood representing both roof support timbers and possibly the interior lattice work of a wattle and daub wall was preserved within Grids J50a and J50b.

The destruction layer in Grid J50a contained many pieces of charred wood, including *Fagus* (beech) type and *Quercus cerris* (oak) type. One concentration of charcoal (labeled Area A in the field) contained at least two separate pieces of *Fagus* type charred wood, which had collapsed and was preserved in a zig-zag pattern that may not have been its original arrangement (Fig. 7:16). It possibly represents the inside support structure of a wattle and daub wall. The two pieces each measured approximately 30cm in length by 6cm in diameter. These specimens were removed intact to the laboratory. Other charred wood fragments associated with these posts were too degraded to identify. Elsewhere in Grid J50a more oak and beech type charcoal was preserved, including some examples from the alley between the two buildings.

The same fallen roof destruction layer just described for J50a was also encountered in Grid J50b. One especially well-preserved series of charred beams (labeled Area B in the field) was uncovered. These included three *Quercus cerris* (oak) type logs and one small *Fagus* (beech) type twig, all burned. Two of the oak logs measured 30 cm in length by 8 cm diameter (B-1) and 75cm in length by 5cm diameter. The remaining oak piece (B-4) was quite thin and degraded. The beech twig (B-3) was small, approximately 1.5cm in diameter, but appeared to have some bark still clinging, suggesting it was mostly intact. It measured less than 5cm in length.

Another area of Grid J50b (labeled Area C in the field) preserved a large burned log of *Quercus cerris* (oak) type that measured 40cm in length by 10cm in diameter. This was one of the larger pieces of burned wood preserved at the entire site. Finally, an area labeled Area D preserved only fragmented pieces of *Quercus cerris* (oak) type wood. Excavators also recovered various burned pieces of oak scattered throughout the destruction layer. Nearby, a layer used as a *statumen*

(foundation) for a *coccio pesto* basin preserved some charred pieces of both oak and beech type wood.

THE VASCA

One of the more dramatic structures at Mezzomiglio is the *vasca* or large open air immersion pool, which includes an apparent natural spring. Preserved in the upper part of the *vasca* in Locus 201, which is a mixture of sand and clay with modern root disturbance and historic episodes of plowing, were 5 *Fagus* (beech) type charcoal fragments and charcoal too small to identify.

A thick layer of laminated *argilla impermeabile* or grey clay (Locus 202) at least a 50cm thick lay directly on top of the floor paved with inverted pan tiles. The stamps on the tiles suggest the floor was laid in A.D. 114; therefore the entry of any organic items into the clay on top of the floor must post-date this period, and probably dates from the time of abandonment of the structure.

Within this clay layer a number of plant materials have been preserved, primarily within Locus 202 (Grid K45c) datable c. AD 380. These include *Cupressus sempervirens* (Italian cypress) cone segments and loose scales, a *Ficus carica* (fig) branch in three pieces, a *Pinus* (pine) cone with mature nuts, 3 husk fragments and 2 nutshell fragments from a *Juglans* (walnut), and a large (73 x 25 x 2 cm) wooden plank hewn from *Quercus cerris* (oak) type wood. Other currently unidentified wood types were fashioned into a number of "stakes" shaved at one end, or became a piece of cut or added wood with evidence of nail holes. Adjacent Locus 213 preserved 1 *Cupressus/Juniperus* (Italian cypress/cedar) type wood fragment, possibly cut on both ends. All these items were unburned and in relatively pristine condition, having survived by virtue of being submerged in the oxygen-excluding clay sediment. Since the grey clay is below the current water table, the items have probably been wet since their deposition into the *vasca*.

The nearly pure nature of the laminated grey clay layer suggests it accumulated while there was water in the *vasca*. A constant influx of water through leaks in the west wall and/or a change in the course of the spring could have carried with it fine clay particles that simply accumulated over time. All uncharred organic materials recovered from the clay rested either directly on the floor or were within 10cm of its surface. The organic remains are so diverse that they appear to represent a mixture of naturally-available plant parts and culturally-worked items that all came to rest in the clay.

As the pan tiles were removed one by one from the floor of the *vasca* during the excavation, two partially preserved leaves were found beneath one of them, impressed in the clay. Presumably they had blown into the structure as the floor was being laid in A.D. 114. They are currently unidentified as dicotyledon leaves with smooth edges. A piece of uncharred *Cupressus/Juniperus* (Italian cypress) wood was found wedged underneath another tile (#48).

In the north area of the *vasca* in Grid L46d was preserved a limited amount of charcoal. Below the topsoil, in a disturbed layer (Locus 032) were 4 small pieces of *Quercus cerris* (oak) type. Lower, in fill between two collapsed layers (Locus 035)

with pottery fragments representing the fifth century A.D., there was another thin, charred piece of *Quercus cerris*. The same grey clay layer (Locus 039) that formed Locus 202 over the tile floor was also present, preserving a sturdy uncharred plank fragment of *Quercus cerris* (oak), appearing roughly hewn on the top and the bottom and revealing gouge marks resulting from use of an adze or axe.

DISCUSSION

COMMENTS ON WOOD USE

Oak (*Quercus cerris*) and beech *Fagus* type) wood seems to have been preferred for dwelling construction by the occupants of Structures A and D. Oak was chosen for main roof supports, and oak and beech for the interior lattice work of wattle and daub walls. The sizes chosen varied according to the need. A potential large column of oak measuring at least 30cm indiameter may have been incorporated inside a wattle and daub wall of Structure A as a major structural support for the roof. Burned logs lying within collapsed and broken roof tiles in both Structures A and D of oak measure at least 8cm in diameter, though most pieces are badly degraded and may once have been larger. It seems reasonable that two sizes of timbers were used to support the heavy pan and cover tiles of the roofs, based on historic roofing methods and techniques. Finally, the interior lattice work of wattle and daub walls appears to have been made of smaller oak and beech branches measuring up to 6cm in diameter, and possibly interwoven in some way. One bent piece of oak suggests that it was not necessary that these construction elements be absolutely straight.

RADIOCARBON AND DENDROCHRONOLOGICAL DATING

The general chronology of site construction and use may be confirmed via two independent dating techniques of organic remains: radiocarbon and dendrochronology. A small twig of charred *Fagus* (beech) type wood associated with wall fall from Structure D has been selected for radiocarbon dating due to its relatively short life. An uncharred *Pinus* (pine) type cone with nuts, buried in the grey clay layer (Locus 202) of the *vasca*, had to have entered after the Romans tiled the floor with inverted roof tiles stamped in A.D. 114. The results of these tests are given in the site report in Chapter 7.

Mediterranean tree-ring chronologies now extend back thousands of years, and four charred wood specimens from Mezzomiglio were submitted for dendrochronological assessment. Three were burned *Quercus* (oak) type logs from Structures A and D. The fourth specimen is an unburned piece of worked wood from the grey clay layer in the *vasca*. Although this piece is of an unidentified wood type, it appears complete around its circumference and has been both cut or adzed in two directions, and contains two nail holes. Peter Kuniholm of Cornell University analyzed the pieces but found them lacking in sufficient numbers of rings and unsuitable for further analysis.

CURRENT VEGETATION AROUND THE SITE

Mezzomiglio sits in an area of open land surrounded by the town of Chianciano Terme. Currently the entire area is heavily

modified by building, landscaping, and agriculture. Near the site are fields of grains (wheat) and fava beans, orchards of olive trees, vineyards of grape vines, and trees clearly planted in rows. The entire city area has been cut from a forest consisting of oaks, pines, Italian cypress, and firs; it is quite possible this present forest has been heavily modified by humans.

Plant species observed in the immediate area of the site include oak trees (*Quercus cerris*) planted olive trees (*Olea europaea*), cottonwood (*Populus*) and willow (*Salix*) trees, fig trees (*Ficus carica*) and elderberry bushes (*Sambucus*). Raspberry bushes (*Rubus*) thrive along with various grasses and dock (*Rhumex*). Oats (*Avena*) coming from agricultural fields are mixed with other annual members of the mallow, mustard and sunflower families. Red poppies (*Papaver rheas*) provide dramatic color. Wetter areas of the site near natural springs support cattails (*Typha*) and horsetails (*Equisetum*).

PAST VEGETATION IN THE AREA OF MEZZOMIGLIO

The archaeological record provides some perspective on past vegetation in the vicinity of the site. It is clear that oak (*Quercus cerris*) trees were commonly available as they fulfilled a number of construction needs. Other species in the area whose wood has preserved included Italian cypress/cedar (*Cupressus/Juniperus* type), fig (*Ficus carica*), hazelnut (*Corylus*), and some currently unidentified trees or shrubs. Plants that contributed reproductive parts included pines (*Pinus*), Italian cypress (*Cupressus/Juniperus*) and a currently unidentified nut-producing species.

Although the list of plant species preserved in Mezzomiglio deposits is not long, undoubtedly there were many additional plants available to the ancient people that lived here. The heavy reliance on oak suggests the landscape may have been somewhat cleared, as oaks often prefer to grow in sunny locations. It seems reasonable to assume that the region immediately around the site was heavily impacted by the activities of humans in antiquity, much like it is today.

Comments on past climates are difficult to make when plant records are sparse. However, the plant remains that have been preserved in Mezzomiglio are basically some of the same ones observed in the local area today. A conservative interpretation would be that the climate of both the present and Etrusco-Roman periods of Mezzomiglio occupation have much in common, with few major differences. Other researchers suggest that the Mediterranean climate has remained relatively stable since Classical times, and that it is humans that have had the greatest effects on the land through the ages (Butzer 1961; Thirgood 1981).

REFERENCES

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- Phillips, Roger, *Trees of North America and Europe* (New York, 1978).
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TABLE 1:

DIFFERENT TYPES OF PLANT REMAINS IDENTIFIED FROM 1995 AND 1996 EXCAVATIONS AT MEZZOMIGLIO

Taxon	Part	Condition
<i>Corylus</i> type (hazelnut)	charcoal	charred
<i>Cupressus/Juniperus</i> (cypress/juniper)	charcoal wood fragment	charred uncharred
<i>Cupressus sempervirens</i> (Italian cypress)	cone segment	uncharred
Dicotyledon	leaf fragment wood "stakes" worked wood	uncharred uncharred uncharred
<i>Fagus</i> type (beech)	charcoal charred	
<i>Ficus carica</i> type (fig)	wood fragment	uncharred
<i>Juglans regia</i> (walnut)	hull Nutshell	uncharred uncharred
<i>Pinus</i> (pine)	cone with nuts	uncharred
<i>Quercus cerris</i> type (oak)	charcoal worked wood	charred uncharred
Unidentified	charcoal fruit husk nutshell wood	charred uncharred uncharred uncharred

APPENDIX 1:

PLANT PARTS RECOVERED FROM THE 1995 - 1996 EXCAVATIONS AT MEZZOMIGLIO, BY GRID, LOCUS AND BASKET

GRID	LOCUS	BASKET	TAXON	PART	CONDITION	AMT	COMMENT
J45a	201	2001	Unidentified	Charcoal	Charred		Too small or degraded
J45a	201	2002	Unidentified	Charcoal	Charred		Too small or degraded
J45a	201	2003	<i>Fagus</i> type	Charcoal	Charred	5	
J49a	019	0047	<i>Corylus</i> type	Charcoal	Charred	6	
J49a	0019	0047	<i>Fagus</i> type	Charcoal	Charred	3	On lime washed floor
J49b	012	1112	<i>Quercus cerris</i>	Charcoal	Charred	5	A-E, segments from column? Support column?
J49b	012	1127	<i>Quercus cerris</i>	Charcoal column	Charred	1	Support column?
J49b/c	012	0030	Unidentified	Charcoal	Charred		Too small or degraded
J49b/c	012	0042	Unidentified	Charcoal	Charred		In Chiusi Museum - not seen
J49b/c	012	0046	<i>Quercus cerris</i>	Charcoal	Charred	4	Destruction layer
J49b/c	012	0046	Unidentified	Charcoal	Charred	1	Too small or degraded
J50a	100	1055	<i>Quercus cerris</i>	Charcoal	Charred	5	Up to 20 rings
J50a	100	1057	Unidentified diffuse	Charcoal	Charred	5	Lonicera? Item A
J50a	115	1069	<i>Fagus</i> type	Charcoal	Charred	13	From tile collapse, Wall F
J50a	115	1070	<i>Fagus</i> type	Charcoal	Charred	2	Fewer than 20 rings
J50a	115	1070	<i>Quercus cerris</i>	Charcoal	Charred	10	
J50a	115	1076	<i>Quercus cerris</i>	Charcoal	Charred	3	
J50a	115	1106	<i>Quercus cerris</i>	Charcoal	Charred	20	
J50a	115	1107	<i>Fagus</i> type	Charcoal	Charred	12	
J50a	115	1107	<i>Quercus cerris</i>	Charcoal	Charred	5	
J50a	115	1113	<i>Fagus</i> type	Charcoal "bean"	Charred	2	Area A, 30cm x 6cm diameter
J50a	117	1077	<i>Quercus cerris</i>	Charcoal	Charred	7	
J50a	120	1080	<i>Fagus</i> type	Charcoal	Charred	1	

APPENDIX 1: CONTINUED

PLANT PARTS RECOVERED FROM THE 1995 - 1996 EXCAVATIONS AT MEZZOMIGLIO, BY GRID, LOCUS AND BASKET

GRID	LOCUS	BASKET	TAXON	PART	CONDITION	AMT	COMMENT
J50b	115	1079	<i>Quercus cerris</i>	Charcoal	Charred	6	
J50b	115	1088	<i>Quercus cerris</i>	Charcoal	Charred	10	
J50b	115	1096	<i>Quercus cerris</i>	Charcoal	Charred	20	Area D
J50b	115	1110	<i>Fagus</i> type	Charcoal twig	Charred	1	Log B-3, 5cm x 1.5cm diameter
J50b	115	1110	<i>Quercus cerris</i>	Charcoal	Charred	1	Log B-4, very thin
J50b	115	1110	<i>Quercus cerris</i>	Charcoal "beam"	Charred	1	Log B-1, 30cm x 8cm diameter
J50b	115	1110	<i>Quercus cerris</i>	Charcoal "beam"	Charred	1	Log B-2, 75cm x 5cm diameter
J50b	115	1111	<i>Quercus cerris</i>	Charcoal "beam"	Charred	1	Area C, 40cm x 10cm diameter
K45c	201	2105	Unidentified	Charcoal	Charred		Too small or degraded
K45c	202	2059	Dicotyledon	Wood "stakes"	Uncharred	16	Some shaved one end
K45c	22	2059	<i>Quercus cerris</i>	Wood (worked)	Uncharred	1	Hewn plank, 73cm x 25cm x 2cm
K45c	202	2059	Unidentified diffuse A	Wood	Uncharred	1	In 3 pieces
K45c	202	2066	<i>Pinus</i>	Cone with nuts	Uncharred	1	Mature, scales closed
K45c	202	2073	<i>Cupressus sempervirens</i>	Cone segment	Uncharred	1	2cm x 2.5cm x 1.5cm, 3 loose scales
K45c	202	2074	<i>Cupressus sempervirens</i>	Cone segment	Uncharred	3	3 loose scales
K45c	202	2075	Unidentified	Wood knot	Uncharred	1	
K45c	202	2076	Unidentified	Wood slivers	Uncharred	30	None shaved, see bskt 2059
K45c	202	2079	Dicotyledon	Wood (worked)	Uncharred	1	Sawn/adzed?, 2 nail holes
K45c	202	2095	Unidentified	Fruit husk fragments	Uncharred	3	Smooth exterior
K45c	202	2095	Unidentified	Nutshell fragments	Uncharred	2	Patterned exterior
K45c	202	2103	Unidentified	Bark?	Uncharred	1	11.5cm x 6cm x 1.3cm
K45c	202	2108	<i>Ficus carica</i>	Wood fragments	Uncharred	1	3 pieces, 26cm x 2cm diameter
K45c	202	2109	Unidentified diffuse A	Wood (branch)	Uncharred	1	25cm x 4cm, no bark, 3 pieces
K45c	202	2109	Unidentified diffuse A	Wood (branch)	Uncharred	1	7cm x 5cm, side limb cut off
K45c	202	2143	Unidentified ring - porous	Wood	Uncharred	1	20 rings, 10cm x 5cm x 2cm
K45c	213	2102	<i>Cupressus/ Juniperus</i>	Wood fragment	Uncharred	1	Cut both ends? 22cm x 2cm x 1.2cm
K45c	216	2119	Dicotyledon	Leaf fragment	Uncharred	2	In clay under tile 16
K45c	216	2182	<i>Cupressus/ Juniperus</i>	Wood fragment	Uncharred	1	Wedge beneath tile 48
K46d	201	2005	Unidentified	Charcoal	Charred		Too small or degraded
K49c	105	1026	Unidentified	Ash and soil	Charred		Too small or degraded
K49c	105	1027	<i>Cupressus/ Juniperus</i>	Wood fragment	Charred	5	Item H
K49c	105	1027	<i>Quercus cerris</i>	Charcoal	Charred	23	Item H
K49c	6	1029	<i>Quercus cerris</i>	Charcoal	Charred	6	Items K and J
K49c	105	1030	<i>Cupressus/Juniperus</i>	Charcoal	Charred	5	Item J

APPENDIX 1: CONTINUED

PLANT PARTS RECOVERED FROM THE 1995 - 1996 EXCAVATIONS AT MEZZOMIGLIO, BY GRID, LOCUS AND BASKET

GRID	LOCUS	BASKET	TAXON	PART	CONDITION	AMT	COMMENT
K49c	105	1030	<i>Quercus cerris</i>	Charcoal	Charred	4	Item J
K49c	105	1031	<i>Quercus cerris</i>	Charcoal	Charred	5	Item M
K49c	105	1033	<i>Quercus cerris</i>	Charcoal	Charred	20	Stem C, fewer than 20 rings
K49c	105	1034	<i>Quercus cerris</i>	Charcoal	Charred	3	Item B
K49c	105	1036	<i>Quercus cerris</i>	Charcoal	Charred	15	Item G
K49c	105	1071	<i>Quercus cerris</i>	Charcoal	Charred	3	
K49c	105	1071	<i>Quercus cerris</i>	Charcoal "beam"	Charred	1	43.5cm x 3.1cm x 8cm diameter, Item E
K49c	105	1073	<i>Quercus cerris</i>	Charcoal "beam"	Charred	5	Item A, 38cm x 3.5cm x 9cm diameter
K50d	125	1093	<i>Fagus</i> type	Charcoal	Charred	1	Found under 119
K50d	125	1093	<i>Quercus cerris</i>	Charcoal	Charred	9	Found under 119
L46d	032	0073	<i>Quercus cerris</i>	Charcoal	Charred	4	
L46d	034	0088	<i>Quercus cerris</i>	Charcoal	Charred	1	
L46d	039	0110	<i>Quercus cerris</i>	Wood plank	Uncharred	1	Hewn 2 sides, 22cm x 18cm x 2.5cm

APPENDIX 2:

IDENTIFICATION CRITERIA AND DESCRIPTIONS OF PRESERVED PLANT MATERIALS

***CORYLUS*TYPE**

Charcoal. Transverse view. Diffuse porous, small vessel multiples in scattered radial pore files; rays not obvious.

***CUPRESSUS/JUNIPERUS*TYPE**

Charcoal, wood. Transverse view. Vessels absent, resin canals absent. This description also fits *Abies* (fir) wood.

CUPRESSUS SEMPERVIRENS

Cone segment. The grey clay of the *Vasca* preserved at least 4 uncharred segments of Italian cypress cones (Grid K45c, Locus 202, Baskets 2073 and 2074. Two with open scales averaged 2.5cm in length x 2.75cm in width x 2.0cm in thickness. Two with unopened scales were slightly smaller, measuring 1.75cm in length x 2.5cm in width x 1.75cm in thickness. Accompanying these specimens were at least 6 loose scales that had detached from the cones.

DICOTYLEDON

Leaf fragment. Two uncharred leaves were impressed in the dark grey clay beneath tile #16 in the *Vasca* (Grid K45c, Locus 202, Basket 2119). They were tissue paper thin and could not be removed. Both are dicotyledon leaves with reticulate veining. They have smooth edges, and are slightly asymmetrical at the base. They taper at top and bottom, and are widest in the middle. The larger leaf measures 3.5cm at mid-section and is at least 6.0cm in length. The smaller leaf measures at least 2.0cm at mid-section, and 4.0cm in length. The complete, rounded top measures 3.0mm across. The base and petiole of both leaves is missing.

Wooden "stakes". Sixteen long, thin pieces of uncharred wood preserved on the pan tile flooring in the grey clay layer of the *Vasca* (Grid K45c, Locus 202, Basket 2059). These were quite variable in length (ranging from 2.5-13.5cm, with a mean of 8.5cm), but much more constant in width (ranging from 1.1-1.8cm, with a mean of 1.4cm) and thickness (ranging from 0.3-1.0cm, with a mean of 0.6cm). They seem to have been fashioned from a small branch having up to 5-6 annual growth rings present. Seven of the pieces appear to have been cut or shaved diagonally at one end. These "stakes" appear debarked. The wood is ring porous, with vessels most obvious at the ring boundaries. These "stakes" were accompanied by a number of broken pieces similar in nature.

Worked wood. Again in the grey clay of the *vasca* (Grid K45c, Locus 202, Basket 2079) an uncharred piece of worked wood survived. This item was sawed or cut in cross section, and then diagonally as well. There appeared to be two adze or axe marks along the diagonal cut. The piece is round and measures 8.0cm in length and 5.0cm in diameter. It seems to be a sturdy branch that has had the bark removed. Evidence of at least 30 complete tree rings can be seen. Two "nail holes" 2.0mm in diameter are connected across the piece, one at either end.

***FAGUS*TYPE**

Charcoal. Transverse view. Diffuse porous wood/semi- ring porous wood with very large rays. Vessels are numerous.

APPENDIX 1: CONTINUED

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K49c	105	1033	<i>Quercus cerris</i>	Charcoal	Charred	20	Stem C, fewer than 20 rings
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K49c	105	1036	<i>Quercus cerris</i>	Charcoal	Charred	15	Item G
K49c	105	1071	<i>Quercus cerris</i>	Charcoal	Charred	3	
K49c	105	1071	<i>Quercus cerris</i>	Charcoal "beam"	Charred	1	43.5cm x 3.1cm x 8cm diameter, Item E
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K50d	125	1093	<i>Quercus cerris</i>	Charcoal	Charred	9	Found under 119
L46d	032	0073	<i>Quercus cerris</i>	Charcoal	Charred	4	
L46d	034	0088	<i>Quercus cerris</i>	Charcoal	Charred	1	
L46d	039	0110	<i>Quercus cerris</i>	Wood plank	Uncharred	1	Hewn 2 sides, 22cm x 18cm x 2.5cm

APPENDIX 2:

IDENTIFICATION CRITERIA AND DESCRIPTIONS OF PRESERVED PLANT MATERIALS

CORYLUS TYPE

Charcoal. Transverse view. Diffuse porous, small vessel multiples in scattered radial pore files; rays not obvious.

CUPRESSUS/JUNIPERUS TYPE

Charcoal, wood. Transverse view. Vessels absent, resin canals absent. This description also fits *Abies* (fir) wood.

CUPRESSUS SEMPERVIRENS

Cone segment. The grey clay of the *Vasca* preserved at least 4 uncharred segments of Italian cypress cones (Grid K45c, Locus 202, Baskets 2073 and 2074. Two with open scales averaged 2.5cm in length x 2.75cm in width x 2.0cm in thickness. Two with unopened scales were slightly smaller, measuring 1.75cm in length x 2.5cm in width x 1.75cm in thickness. Accompanying these specimens were at least 6 loose scales that had detached from the cones.

DICOTYLEDON

Leaf fragment. Two uncharred leaves were impressed in the dark grey clay beneath tile #16 in the *Vasca* (Grid K45c, Locus 202, Basket 2119). They were tissue paper thin and could not be removed. Both are dicotyledon leaves with reticulate veining. They have smooth edges, and are slightly asymmetrical at the base. They taper at top and bottom, and are widest in the middle. The larger leaf measures 3.5cm at mid-section and is at least 6.0cm in length. The smaller leaf measures at least 2.0cm at mid-section, and 4.0cm in length. The complete, rounded top measures 3.0mm across. The base and petiole of both leaves is missing.

Wooden "stakes". Sixteen long, thin pieces of uncharred wood preserved on the pan tile flooring in the grey clay layer of the *Vasca* (Grid K45c, Locus 202, Basket 2059). These were quite variable in length (ranging from 2.5-13.5cm, with a mean of 8.5cm), but much more constant in width (ranging from 1.1-1.8cm, with a mean of 1.4cm) and thickness (ranging from 0.3-1.0cm, with a mean of 0.6cm). They seem to have been fashioned from a small branch having up to 5-6 annual growth rings present. Seven of the pieces appear to have been cut or shaved diagonally at one end. These "stakes" appear debarked. The wood is ring porous, with vessels most obvious at the ring boundaries. These "stakes" were accompanied by a number of broken pieces similar in nature.

Worked wood. Again in the grey clay of the *vasca* (Grid K45c, Locus 202, Basket 2079) an uncharred piece of worked wood survived. This item was sawed or cut in cross section, and then diagonally as well. There appeared to be two adze or axe marks along the diagonal cut. The piece is round and measures 8.0cm in length and 5.0cm in diameter. It seems to be a sturdy branch that has had the bark removed. Evidence of at least 30 complete tree rings can be seen. Two "nail holes" 2.0mm in diameter are connected across the piece, one at either end.

FAGUS TYPE

Charcoal. Transverse view. Diffuse porous wood/semi- ring porous wood with very large rays. Vessels are numerous.

***FICUS CARICA* TYPE**

Wood. Transverse view. Wood has larger vessels scattered throughout the ring, with some vessel multiples (pairs, triplets), and some wavy background patterning visible.

***PINUS* TYPE**

Cone segment with nuts. An unburned *Pinus* type cone segment, complete with mature nuts, preserved in the grey clay of the *Vasca* (Grid K45c, Locus 202, Basket 2066). The cone was lying directly on top of the pan tile flooring of the *Vasca*, adjacent to a hewn plank of oak (*Quercus*). The cone segment measures 5.0cm in length x 7.0cm in width and 4.0cm in thickness. The prickle-free scales had not yet opened to release the nuts. Each scale, measuring up to 4.5cm in length x 2.5cm in width, held two fully mature nuts inside. A total of 12 medium brown nuts measured 1.6 cm in length (range = 1.5-1.7cm) and 0.65cm in width (range = 0.5-0.9cm). Possibly this cone came from an Italian stone pine (*Pinus pinea*), known for its edible large nuts. The cones of this pine remain closed until picked and placed in the sun to force the scales to open (Phillips 1978:160).

***QUERCUS CERRIS* TYPE**

Charcoal. Vessels obvious, wood distinctly ring porous; a single ring of large early wood vessels form a clear band in the early wood; the remaining vessels are smaller, and form flamelike bands throughout the remainder of the ring; very wide rays.

UNIDENTIFIED

Diffuse porous wood. Transverse view. Some unidentified diffuse porous wood (Grid J50a, Locus 100, Basket 1057) had very thin rays and minute pores scattered throughout the ring; it compared generally to *Lonicera* type wood in the comparative collection. Diffuse porous A type wood also had minute vessels densely-scattered throughout the ring, with no change in vessel size or arrangement at the ring boundaries.

Ring porous wood. Transverse view. More than one example of unidentified ring porous wood was recovered from Mezzomiglio. One piece from the *vasca* (Grid K45c, Locus 202, Basket 2143) was clearly ring porous, had no obvious rays and minute vessels difficult to see.

Hull fragment, walnut shell fragment. Three uncharred hull fragments have warped upon drying (Grid K45c, Locus 202, Basket 2095). They have a smooth exterior and a rough interior with exposed fibers. The largest measures 3.5cm x 3cm x 0.2cm in thickness. These were accompanied by three uncharred walnut fragments with a patterned exterior. The largest walnut shell fragment measures 1.5cm x 1.0cm x 0.1cm in thickness