

Glazed Pottery Production at Ganos

Pamela Armstrong, Nergis Günsenin

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GLAZED POTTERY PRODUCTION AT GANOS

The mountain of Ganos, in the hinterland of the north western shore of the Sea of Marmara, was a monastic centre in the middle Byzantine period¹. Wine produced by its extensive estates was exported in amphorae manufactured along the littoral to the South East of the mountain². Settlements grew up around the harbour there, and the name of Ganos was transferred to them³. One of the amphora kilns, in danger of being destroyed by a new road, has been excavated, and subsequent magnetometer prospection revealed the existence of a large number of kilns across a wide area⁴. In September 1993 a surface survey was carried out with the purpose of establishing whether glazed pottery might also have been produced at Ganos. The fortuitous discovery of three glazed kiln wasters (84-86) indicated that this was the case. The sherds presented here, collected during the 1993 survey, give some idea of the chronology and range of production in advance of fuller investigation of the kilns.

There were three principal collection zones : in the area of the kilns, in the village of Hoşkøy, and in the fortified citadel at the highest point of that village⁵. All glazed sherds in the fields where kilns had been identified were collected. There was a large quantity of material from this area but only feature sherds are published here. A similarly large sample was collected

from the modern village, in particular from middens and from debris excavated during the construction of new houses⁶. Only diagnostic sherds were collected from the area around the castle. All the Byzantine ceramics (1-15) were found in the areas of the castle and the kilns, as were the sixteenth to eighteenth-century wares (16-26). The nineteenth-century products (27-79, 84-86) were found in all three areas.

The abundance of clay along the north west shores of the Sea of Marmara is part of the alluvial system associated principally with the rivers Evros/Meriç and Ergene. The Evros/Meriç runs North-South and is the modern border between Greece and Turkey while the Ergene flows East-West, its valley carrying the rail track from Europe to Istanbul, before joining the Evros/Meriç. These two rivers form the main frame amongst a network of tributaries feeding the quarter-nary alluvial deposits of Thrace. The clay used for pottery production at Didymoteichon is part of the same system⁷. Ganos clay is exceptionally pure and rich in minerals. Pottery is still produced at Hoşkøy, though on a much smaller scale than in the past, and today levigation is carried out simply by allowing the clay to wash into prepared holes in the ground while it is raining, and collecting the 'refined' version later⁸. It is likely that it has always been done in this fashion. The

1) For a history of the site and full references to the sources see Nergis Günsenin, 'Ganos, centre de production d'amphores à l'époque byzantine', *Anatolia Antiqua* II, Paris (1993), p. 193-195.

2) Amphora production in the region was established by Nergis Günsenin, in *Les amphores-byzantines (X^e-XIII^e siècles): typologie, production, circulation d'après les collections turques*, thèse de doctorat de l'Université Paris I (Panthéon-Sorbonne), Paris (1990), Atelier national de reproduction des thèses de Lille III. For the location of the kilns on the peripheries of Hoşkøy, see: Günsenin 1993 (*supra* n. 1), 193-201.

3) See A. Germidis, 'Τὰ Γανόχωρα τῆς Ανατολικῆς Θράκης', *Θρακικά* 46 (1972), 182-288.

4) Reported by Nergis Günsenin, 'Résultats des campagnes de 1992 et 1993', *Anatolia Antiqua* III, Paris (1994), p. 000-000.

5) Remnants of walls remain from a fortification for which there is no documentary evidence. It is known locally as 'the castle'; there is an oral tradition that there were once three monasteries inside the walls.

6) The authors would like to thank the children of Hoşkøy for their enthusiastic help in collecting pottery in their village.

7) Ch. Bakirtzis, 'Didymoteichon : un centre de céramique post-byzantine', *Balkan Studies* 21 (1980), p. 147-153; K. Tsouris, 'Ερευνα στην ὁδο Αθηνάς Διδυμοτείχου' *AAA* 20 (1987), p. 43-65.

8) Both glazed and unglazed ceramics are produced today.

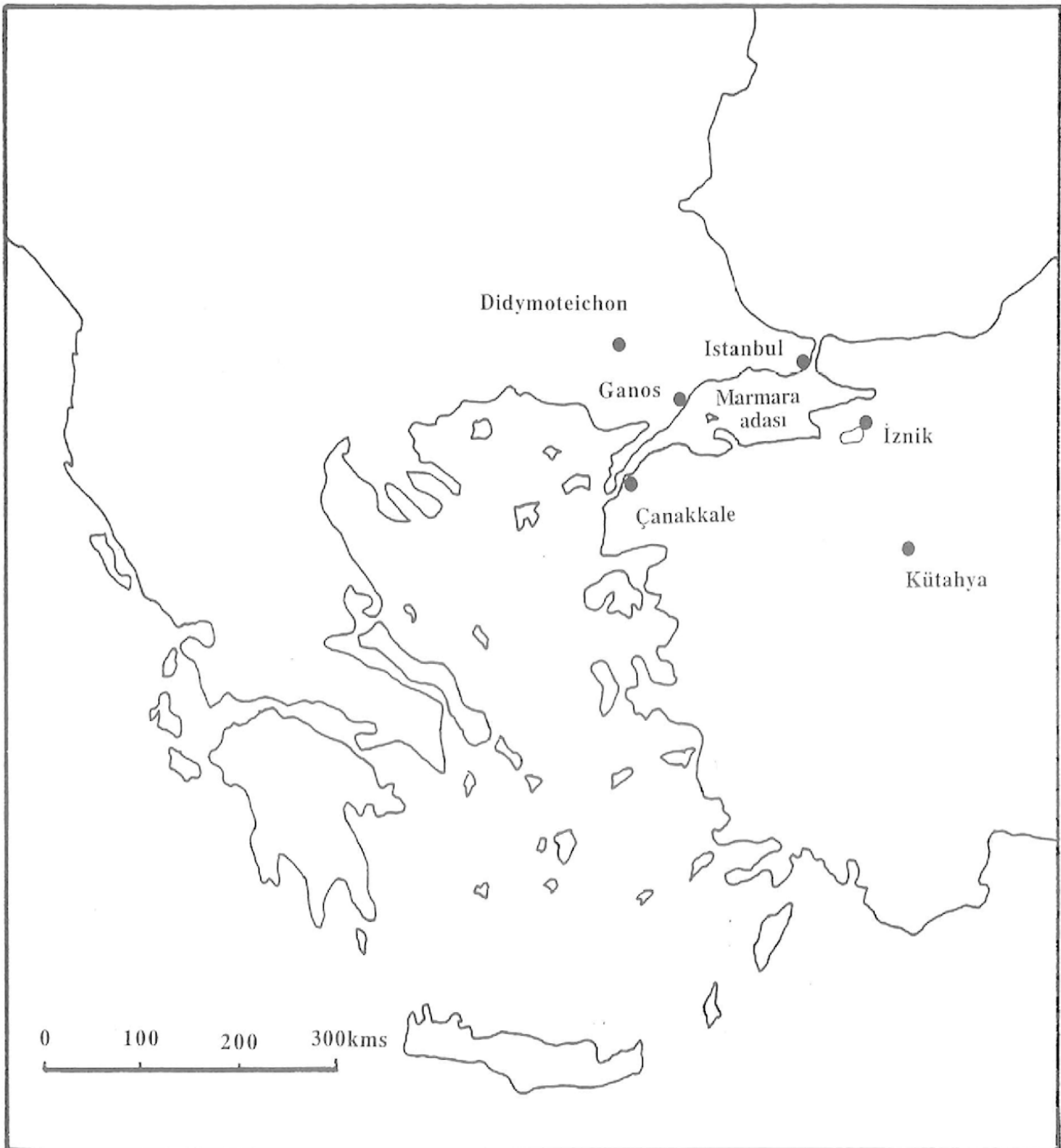


Fig. 1 : Map of Pottery Production Centers in the Environs of Istanbul.

resulting clay is easy to work and fires red-brown, with little variation in colour. It is reasonably hard with the only visible inclusions being occasional specks of lime.

Macroscopic examination indicates that 1-79 below have a common fabric. The kiln wasters 84-86 share the same fabric. However the kiln wasters are nineteenth-century products, and no evidence has been found of production before this. The argument for Ottoman production prior to 1800, and Byzantine manufacture of glazed ceramics at Ganos, rests on identification of their fabric.

THE POTTERY

The catalogue is arranged in chronological order, starting with the earliest material. As to be expected from pottery collected from the surface where there has been continuous occupation for hundreds of years, the earlier sherds are small and fragmentary, while more recent ones are preserved in larger pieces and in greater quantity. The relative sizes should not detract from the significance of the smaller sherds. The main chronological distinction is between Byzantine and late Ottoman, since there is a lacuna in the early Otto-

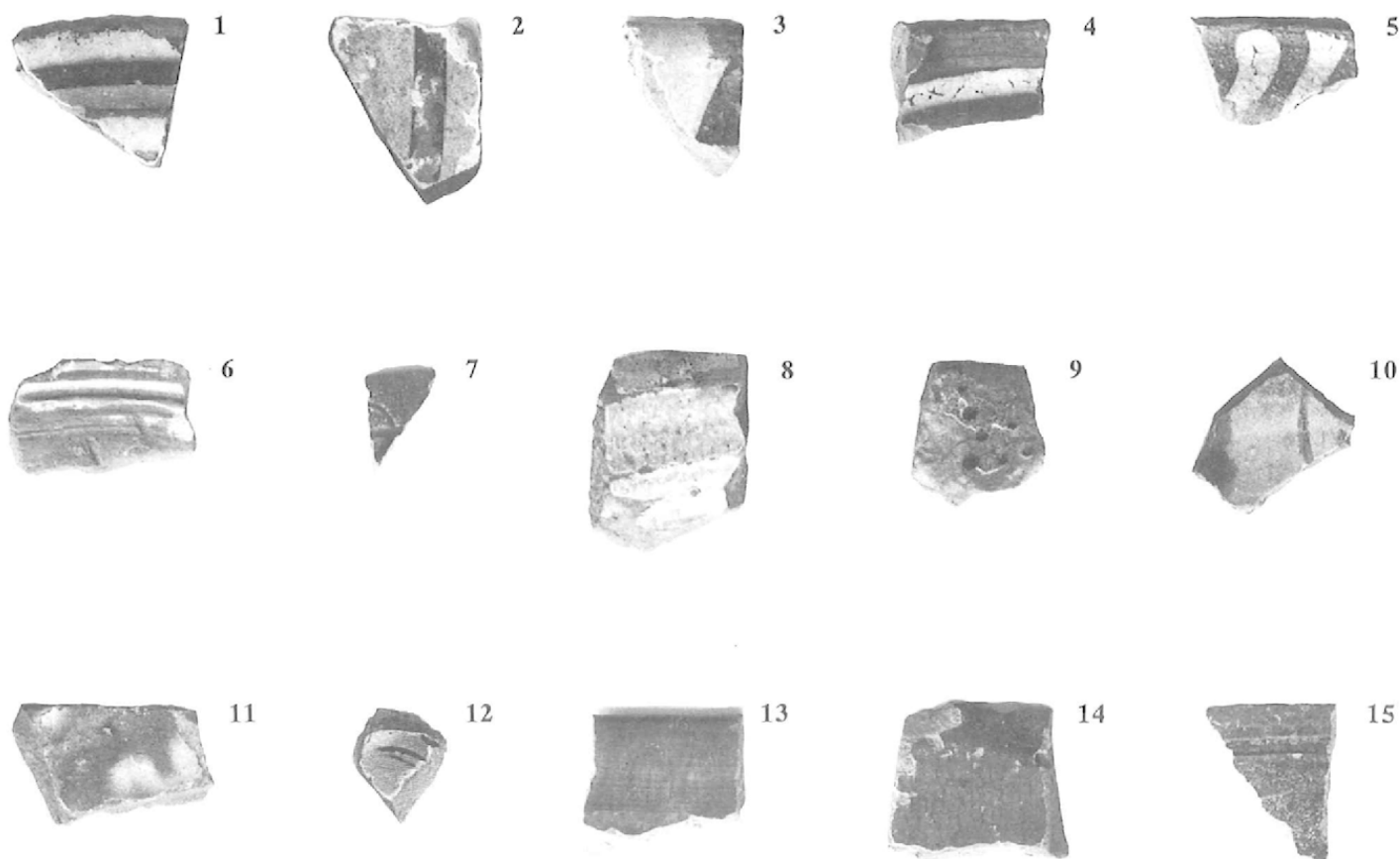


Fig. 2 : Various Byzantine Wares.

man period, reasons for which are suggested in the conclusion. The nineteenth-century wares have been separated from the rest of the late Ottoman material, as they form a coherent chronological group.

The following abbreviations are used : fr(s) = fragment(s), est. = estimated, D. = diameter, H. = height, pres. = preserved. Measurements are in centimetres. The term 'monochrome' is used to mean a single coloured glaze applied directly on to a white slip. All sherds are illustrated by photograph; those marked with an asterisk (*) are also drawn. Drawings are reproduced at 1:2.

BYZANTINE

1* Red painted and incised. Bowl. Rim. est. D. 19.0, pres. H. 1.6.

Everted horizontal rim offset from straight body. Thick white slip and pale yellow glaze on inner surface and under rim. Red painted line around rim, edge of another on upper body. Incised line around edge of rim and junction of rim and body.

2 Red painted. Jug. Body fr. pres. H. 3.0.

From large-sized vessel. Thick white slip and pale yellow glaze on exterior surface. Vertical red painted line.

3* Slip-painted. Bowl. Rim. est. D. 24.0, pres. H. 1.9.

Plain vertical rim. Edge of slip-painted motif under pale yellow glaze.

4* Slip-painted. Bowl. Rim. est. D. 20.0, pres. H. 1.6.

Slightly upturned plain rim on straight body. Edge of slip-painted circle just below rim under pale yellow glaze.

5* Slip-painted. Bowl. Rim. est. D. 20.0, pres. H. 1.1.

Slightly upturned plain rim on straight body. Two parallel diagonal slip-painted lines running from rim under pale-yellow glaze.

6 Incised. Bowl. Rim. est. D. 22.0, pres. H. 1.9.

Upturned plain rim on straight body. Thick white slip and yellow glaze in and just over rim. Two incised lines around rim.

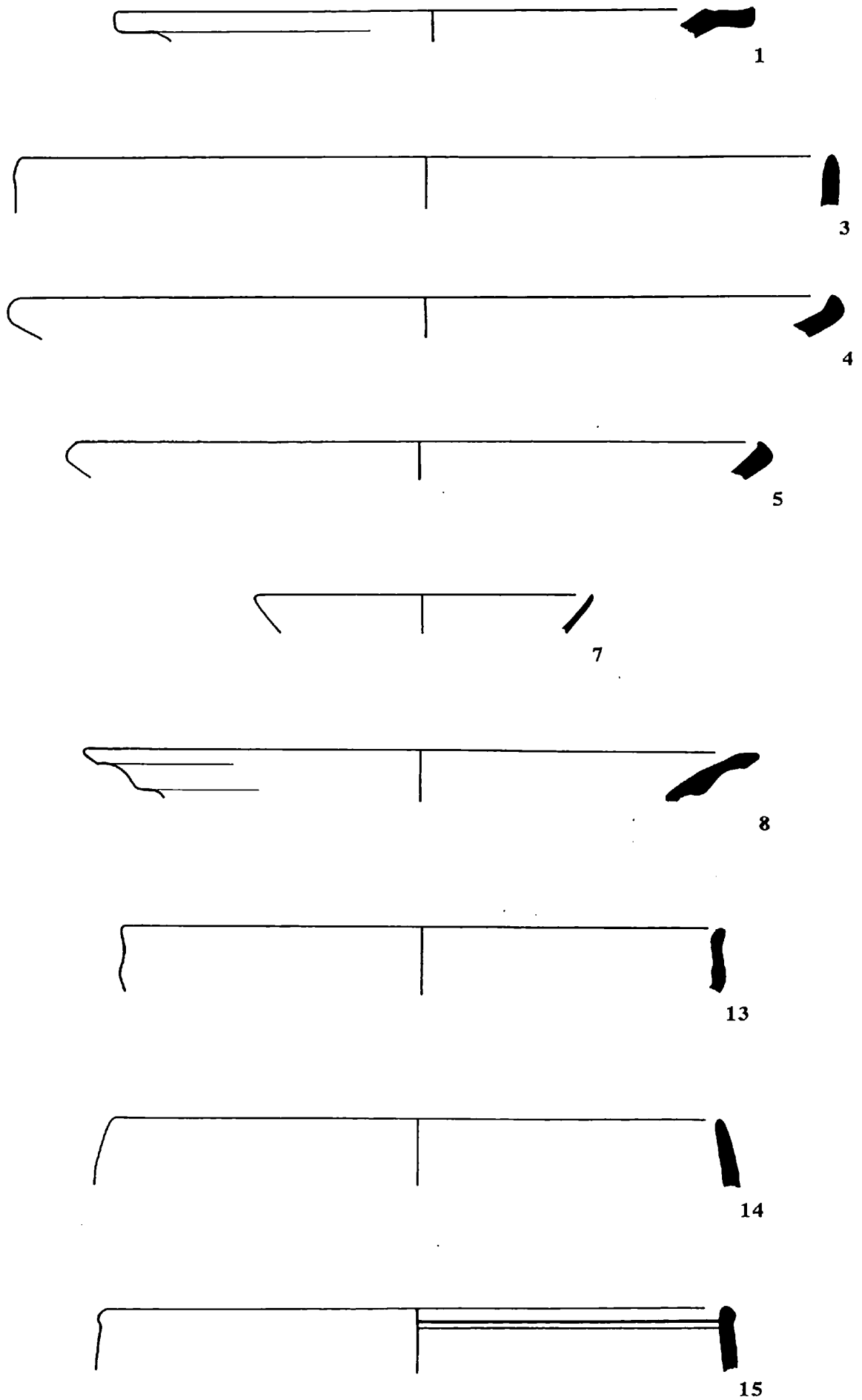


Fig. 3 : Rims of Byzantine Wares.

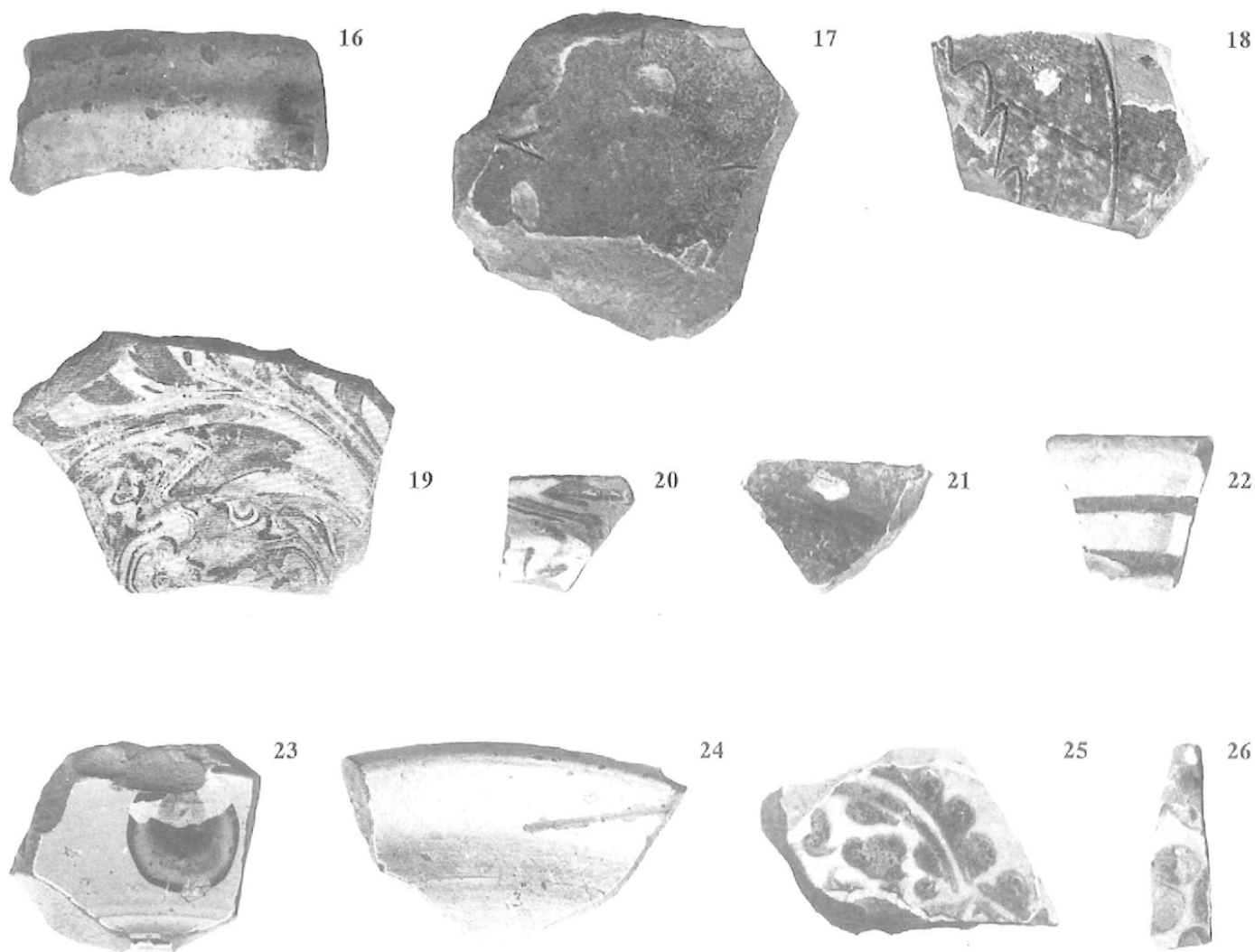


Fig. 4 : Various Ottoman Wares.

7* Incised. Bowl. Rim. est D. 10.0, pres. H. 1.9.

Plain rim on straight wall. White slip and dark green glaze on inner surface extending just over rim. Edge of incised circle crossed by horizontal line.

8* Incised. Bowl. Rim. est. D. 20.0, pres. H. 1.9.

Everted rim with plain edge; deep horizontal groove on exterior. Thick white slip and pale yellow glaze on inner surface, extending just over rim. Broad incised line around rim.

9 Incised. Bowl. Body fr., pres. H. 2.7.

From large vessel. Thick white slip and pale green glaze on inner surface. Decoration of series of incised dots.

10 Painted incised. Bowl. Body fr., pres. H. 2.7.

From large vessel. Thick white slip and pale yellow

glaze on inner surface. Incised line and patch of green and brown glaze colouring.

11 Painted (possibly painted incised). Bowl. Body fr., pres. H. 2.0.

Thick white slip and pale yellow glaze on inner surface. Patch of green glaze colouring.

12 Zeuxippus Derivative. Class IA. Bowl. Body fr., pres. H. 1.7.

From junction of rim and body of carinated bowl. Thick white slip and yellow glaze on inner surface. Incised lines around carination.

13* Zeuxippus Derivative. Class IB. Bowl. Rim. est. D. 17.6, pres. H. 2.2.

Slightly outturned plain rim. Thick white slip and dark orange-brown glaze on inner surface and just over rim. Glaze gathered thickly on edge of rim.

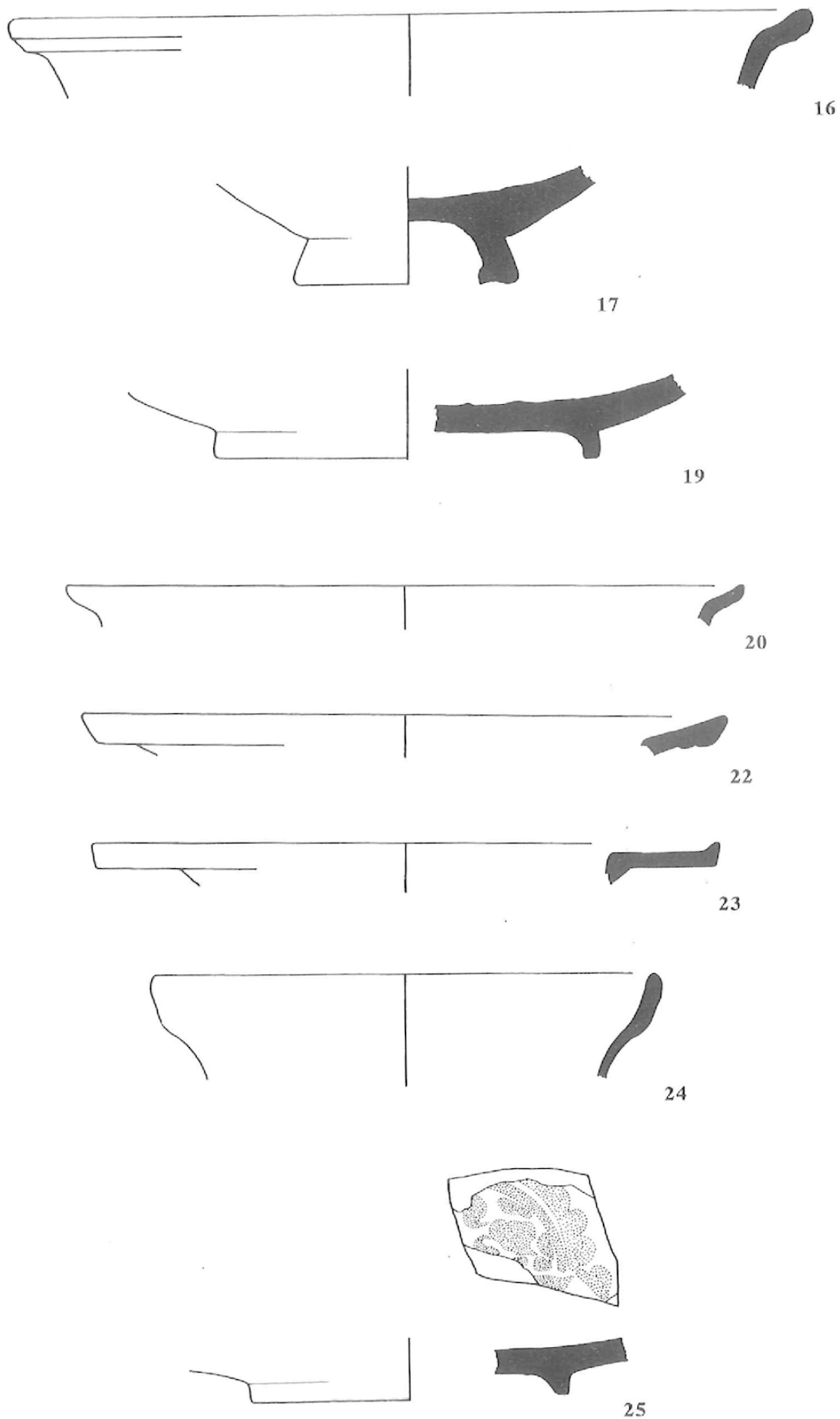


Fig. 5 : Various Ottoman Wares.

14* Zeuxippus Derivative. Class IB. Bowl. Rim. est. D. 17.8, pres. H. 2.5.

Almost vertical plain rim. Thick white slip and dark orange-brown glaze on inner surface and just over rim. Glaze gathered thickly on edge of rim.

15* Zeuxippus Derivative. Class IC. Bowl. Rim. est. D. 18.2, pres. H. 2.3.

Rounded plain rim; shallow groove around outer face. Thick white slip and dark green glaze on inner surface extending just over rim. Incised line around rim.

LATE OTTOMAN, BEFORE A.D. 1800

16* Glaze-painted. Bowl. Rim. D. 24.5, pres. H. 3.1.

Slightly hollowed everted rim with plain edge offset from deep body. Thick white slip and bright yellow glaze in and just over rim. Random patch of dark green.

17* Incised. Bowl. Base. D. 6.3, pres. H. 4.3.

High ring foot with ledge around inner resting surface. Thick white slip and dark yellow glaze on inner surface. Ends of three incised lines running from floor towards rim. Three marks from tripod firing stilt.

18 Incised. Bowl. Body fr. pres. H. 5.5.

From large vessel. Thick white slip and green glaze on inner surface. Part of incised wavy line above diagonal straight line.

19* Marbled Ware. Bowl. Base. D. 11.3, pres. H. 3.1.

Small ring foot supporting shallow vessel. Thick white slip and bright green glaze on inner and outer surfaces down to top of footplate; interior marbled in red and black.

20* Marbled Ware. Bowl. Rim. est. D. 21.0, pres. H. 2.3.

Horizontal rim with plain edge sharply offset from body. White slip and pale green glaze on inner and outer surfaces; interior marbled in green and dark brown.

21 Marbled Ware. Bowl. Body fr., pres. H. 2.7.

Everted rim sharply offset from shallow body; edge of rim broken. White slip and bright green glaze on inner and outer surfaces; interior marbled in green and red.

22* Painted. Bowl. Rim. est. D. 20.0, pres. H. 1.2.

Flat-topped almost horizontal rim sharply offset from body. White slip and colourless glaze on inner surface and under rim. Two horizontal brown painted lines around rim.

23* Painted. Bowl. Rim. D. 19.3, pres. H. 1.8.

Horizontal rim with upturned edge sharply offset from body. Thick white slip and yellow glaze on inner surface to edge of rim. Two horizontal brown painted lines around rim enclosing red painted solid circle and concentric ring.

24* Monochrome. Bowl. Rim. D. 15.3, pres. H. 3.4.

Plain rounded rim offset from curved body. White slip and colourless glaze on inner and outer surfaces.

25* Painted. Base. D. 9.6, pres. H. 2.1.

Ring foot supporting shallow wall. White slip and colourless glaze on inner and outer surfaces, extending under base. Blue painted floral decoration on floor.

26 Painted. Jug. Body fr. Pres. H. 3.5.

From medium-sized vessel. White slip and clear glaze on outer surface. Four blue, two red painted circular motives.

LATE OTTOMAN, NINETEENTH-CENTURY WARES

27* Monochrome. Bowl. Rim. D. 24.0, pres. H. 3.9.

Everted rim with plain edge offset from shallow body. Thick white slip on inner and outer surfaces; green glaze on interior to edge of rim.

28 Monochrome. Bowl. Rim. D. 20.6, pres. H. 2.8.

Everted rim with plain edge offset from shallow body. Thick white slip on inner and outer surfaces; green glaze on interior to edge of rim.

29* Monochrome. Bowl. Complete profile. D. rim 15.8, D. base 4.9, H. 4.7.

Slightly hollowed everted rim with notched edge sharply offset from carinated body; ring foot. Wet-smoothed exterior. Thick white slip and green glaze on inner surface and just over rim. Glaze gathered thickly on rim. Marks of tripod firing stilt on floor.

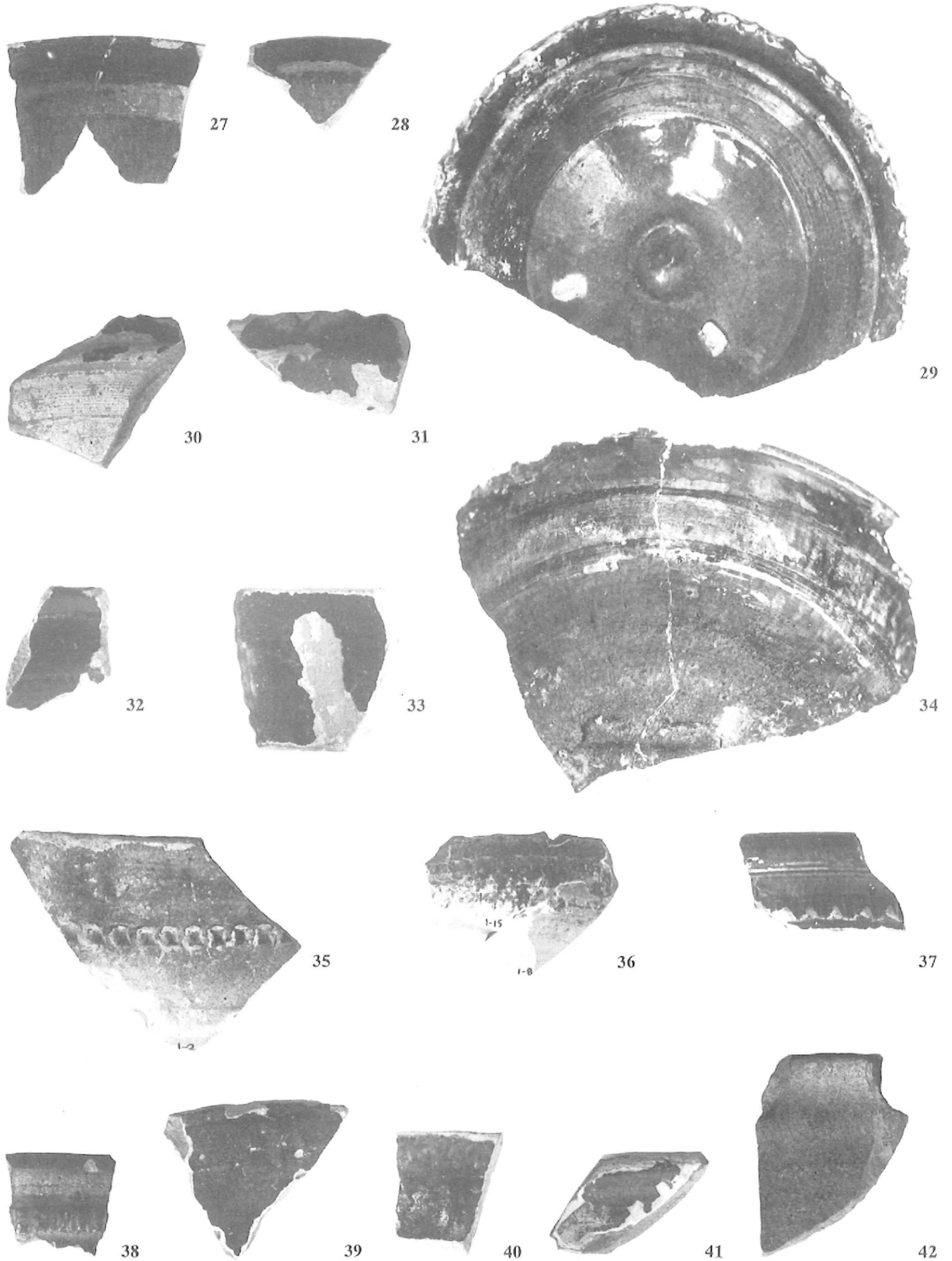


Fig. 6 : Nineteenth-Century Monochrome Rims.

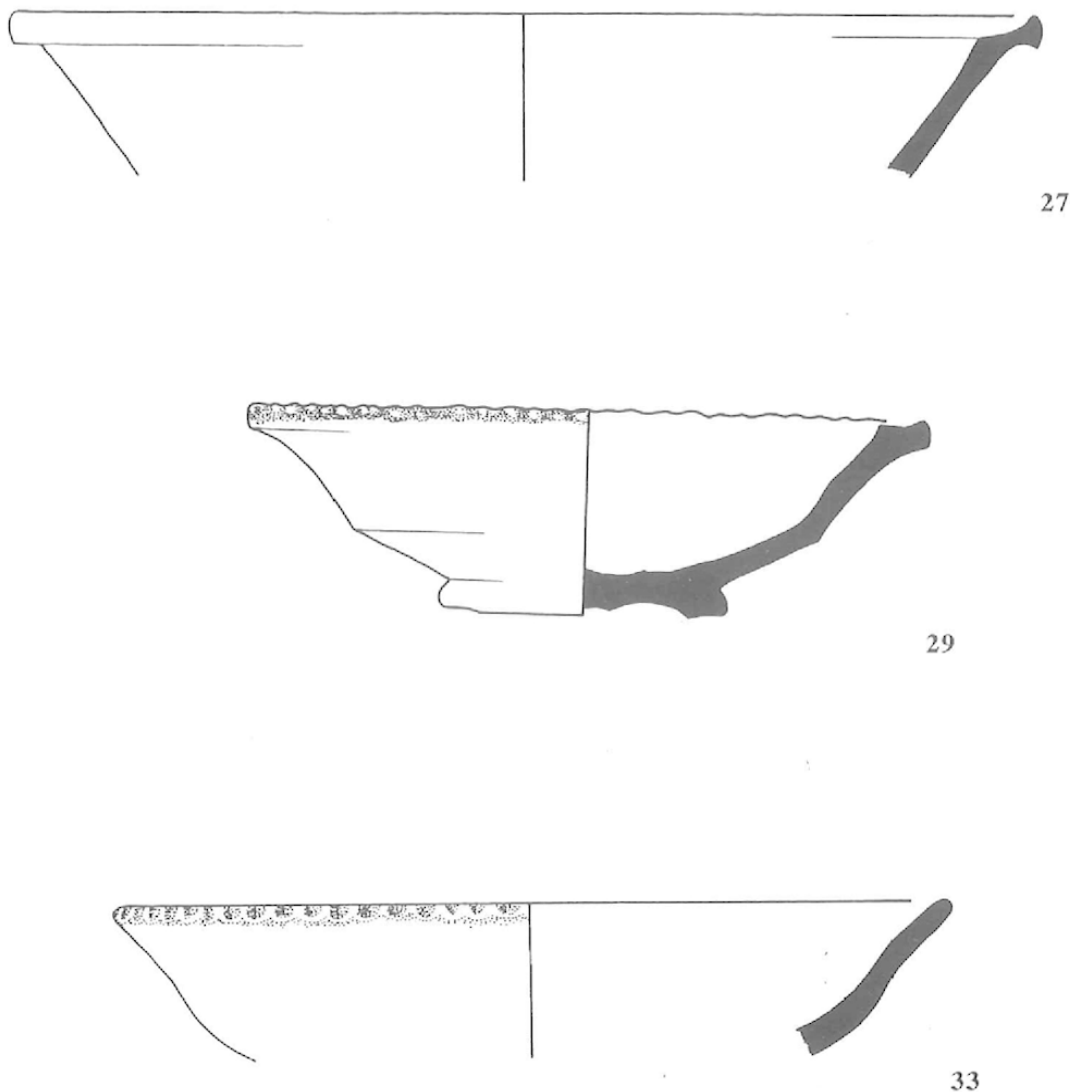


Fig. 7 : Everted Monochrome Rims.

30 Monochrome. Bowl. Rim. est. D. 14.0, pres. H. 4.1.

Slightly hollowed everted rim with notched edge sharply offset from carinated body. Thick white slip and green glaze on inner surface and just over rim.

31 Monochrome. Bowl. Rim. est. D. 18.0, pres. H. 3.3.

Slightly hollowed everted rim with notched edge sharply offset from body. Thick white slip and green glaze on inner surface to edge of rim.

32 Monochrome. Bowl. Rim. est. D. 18.0, pres. H. 3.8.

Everted rim with notched edge sharply offset from body. Thick white slip and green glaze on inner surface and just over rim.

33* Monochrome. Bowl. Rim. est. D. 19.5, pres. H. 3.7.

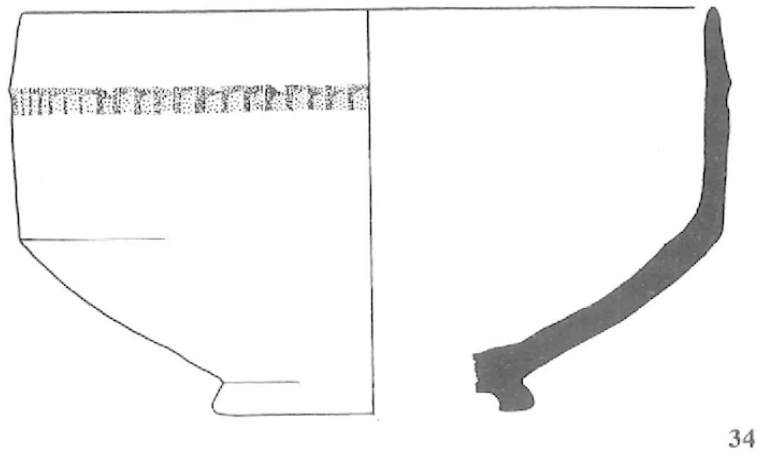
Plain rim with notched edge gently offset from curving body. Thick white slip on inner surface and just over rim; green glaze to edge of rim.

34* Monochrome. Bowl. Almost complete profile. D. rim 16.5. D. base 6.9. H. 9.3.

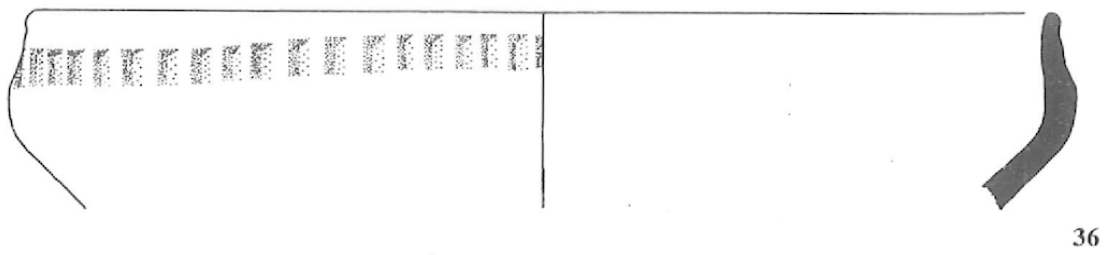
Plain vertical rim sharply offset from body; ring foot. Horizontal rouletted band on exterior of rim. Thick white slip on inner surface and on exterior of rim; green glaze on interior to edge of rim. Mark of firing stilt on floor.

35 Monochrome. Bowl. Rim. est. D. 18.0, pres. H. 6.7.

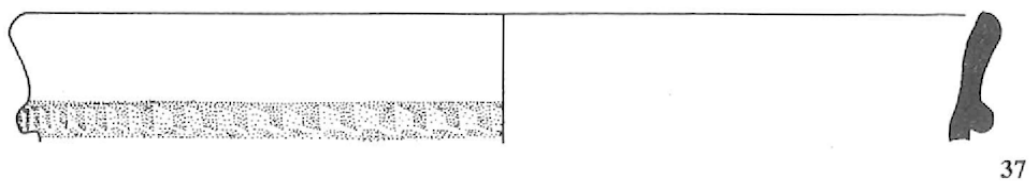
Plain vertical rim sharply offset from body. Horizontal rouletted band around exterior of rim.



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Fig. 8 : Vertical Monochrome Rims.

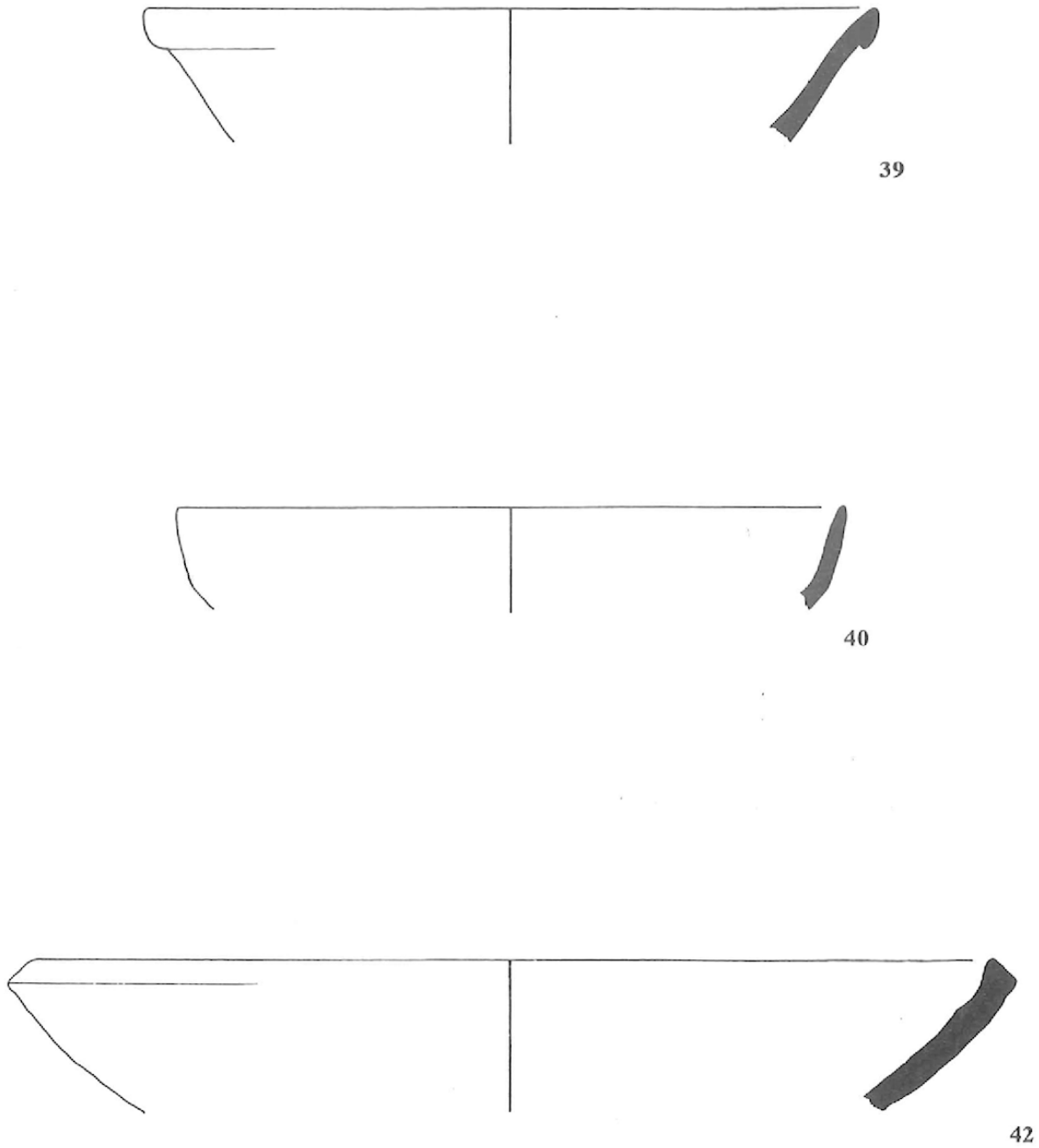


Fig. 9 : Various Monochrome Rims.

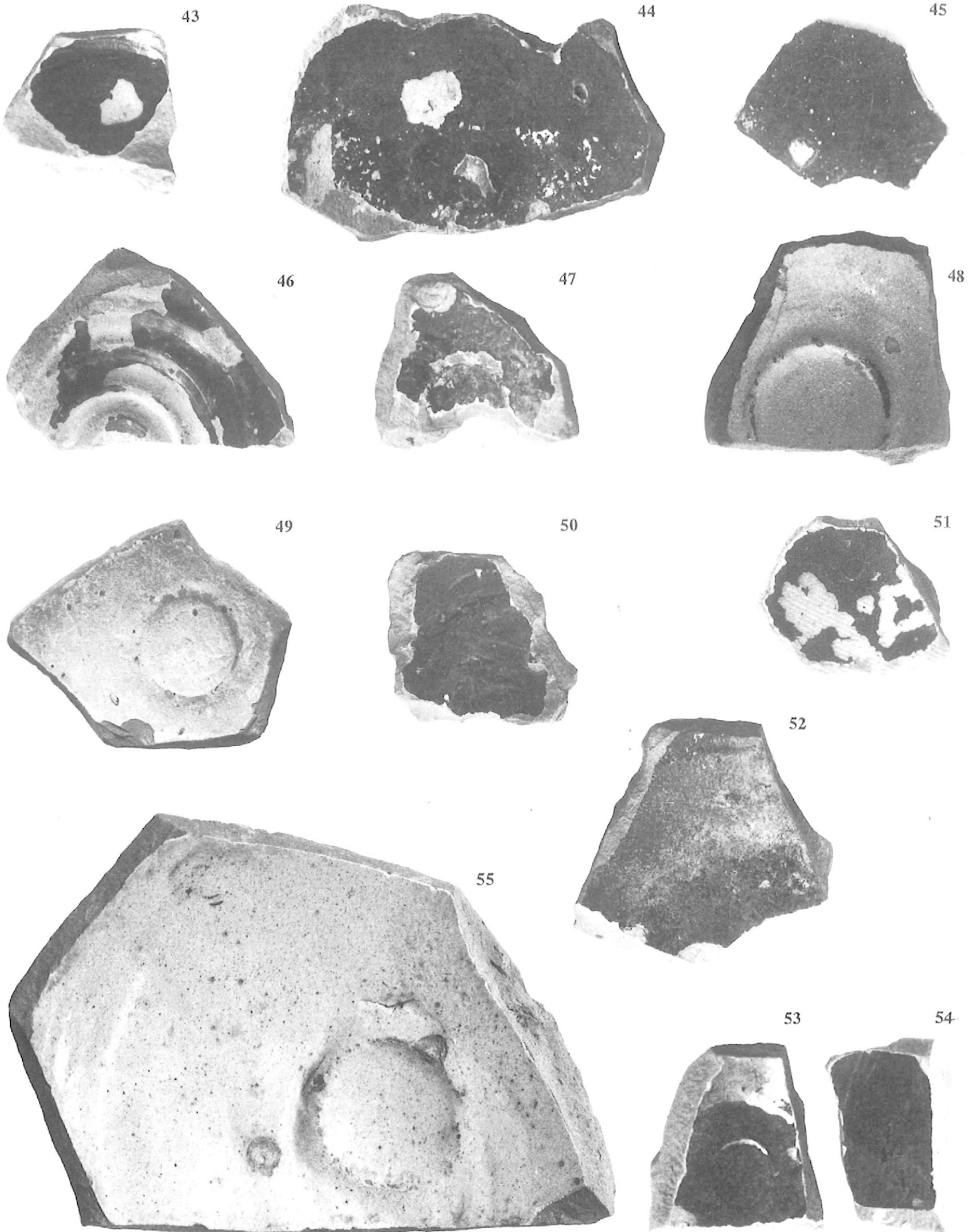
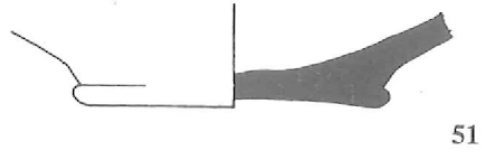


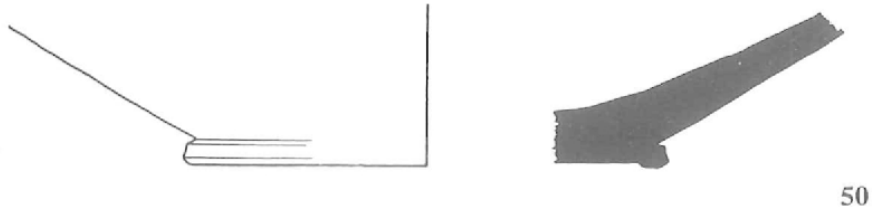
Fig. 10 : Monochrome Bases.



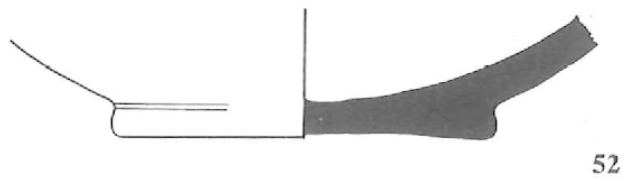
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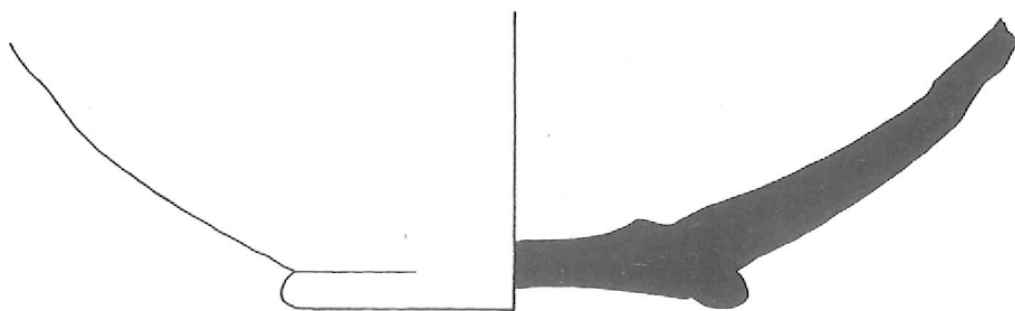
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Fig. 11 : Monochrome Bases.

- Thick white slip and green glaze on interior surface and exterior of rim.
- 36*** Monochrome. Bowl. Rim. D. 24.5, pres. H. 4.7.
Plain vertical rim sharply offset from body. Two horizontal rouletted bands around exterior of rim. Thick white slip and green glaze on interior surface and exterior of rim.
- 37*** Monochrome. Bowl. Rim. D. 22.9, pres. H. 3.0.
Plain vertical rim sharply offset from body. Applied horizontal rouletted band on exterior of rim. Thick white slip and green glaze on interior and exterior surfaces.
- 38** Monochrome. Bowl. Rim. est. D. 24.0, pres. H. 3.4.
Plain vertical rim sharply offset from body. Applied horizontal rouletted band on exterior of rim. Thick white slip and green glaze on interior and exterior of rim. Thick white slip and green glaze on interior and exterior surfaces.
- 39*** Monochrome. Bowl. Rim. D. 19.8, pres. H. 3.7.
Downturned rim with plain edge and ridge around exterior. Thick white slip and green glaze on inner surface and just over rim.
- 40*** Monochrome. Bowl. Rim. D. 18.0, pres. H. 2.9.
Almost vertical plain rim offset from straight body. White slip on inner and outer surfaces; green glaze on inner surface only.
- 41** Monochrome. Bowl. Rim. est. D. 28.0, pres. H. 2.7.
Almost vertical plain rim offset from straight body. Thick white slip and green glaze on inner surface and just over rim.
- 42*** Monochrome. Bowl. Rim. est. D. 26.0, pres. H. 4.2.
Plain rim with bevelled edge on thick shallow body. White slip and green glaze on inner surface and just over rim.
- 43*** Monochrome. Bowl. Base. D. 5.1, pres. H. 3.1.
Ringfoot of small deep bowl. Thick white slip and green glaze on inner surface and half way down on exterior, vertical tongues of slip extending further down.
- 44** Monochrome. Bowl. Base. D. 8.4, pres. H. 2.9.
Ringfoot of large deep vessel. Thick white slip and green glaze on inner surface. Mark of firing stilt on floor.
- 45** Monochrome. Bowl. Base. D. 6.8, pres. H. 1.9.
Ringfoot. Thick white slip and green glaze on inner surface. Mark of firing stilt on floor.
- 46** Monochrome. Bowl. Base. D. 5.1, pres. H. 2.3.
Ringfoot. Thick white slip and green glaze on inner surface. Prominent concentric ridges and mark of firing stilt on floor.
- 47** Monochrome. Bowl. Base. D. 5.2, pres. H. 2.3.
Ringfoot; tondo outlined by small ridge. Thick white slip and green glaze on inner surface.
- 48** Monochrome. Bowl. Base. D. 5.3, pres. H. 1.9.
Ringfoot. Tondo defined by small ridge. White slip and pale yellow glaze on inner surface. Floor marked by tripod foot.
- 49** Monochrome. Bowl. Base. D. 6.0, pres. H. 2.4.
Ringfoot. Tondo defined by small ridge. White slip and pale yellow glaze on inner surface. Floor marked by tripod foot.
- 50*** Monochrome. Bowl. Base. D. 10.6, pres. H. 3.8.
Flat base of large deep vessel. Thick white slip and green glaze on inner surface.
- 51*** Monochrome. Bowl. Base. D. 6.9, pres. H. 2.6.
Flat base. Thick white slip and green glaze on inner surface.
- 52*** Monochrome. Bowl. Base. D. 8.7, pres. H. 3.1.
Flat base of large deep vessel. Thick white slip and green glaze on inner surface.
- 53** Monochrome. Bowl. Base. D. 4.8, pres. H. 2.1.
Flat base ; tondo outlined by small ridge. Thick white slip and green glaze on inner surface. Mark of firing stilt on floor.
- 54** Monochrome. Bowl. Base. D. 6.7, pres. H. 3.3.
Flat base supporting carinated body. Thick white slip and green glaze on inner surface. Mark of firing stilt on floor.
- 55*** Monochrome. Bowl. Base. D. 9.1, pres. H. 6.8.
Almost flat base supporting large, deep vessel. Tondo defined by small ridge. Wet-smoothed exterior. Thick white slip and pale yellow glaze, speckled with dark yellow pigments on inner surface. Floor marked by tripod feet.

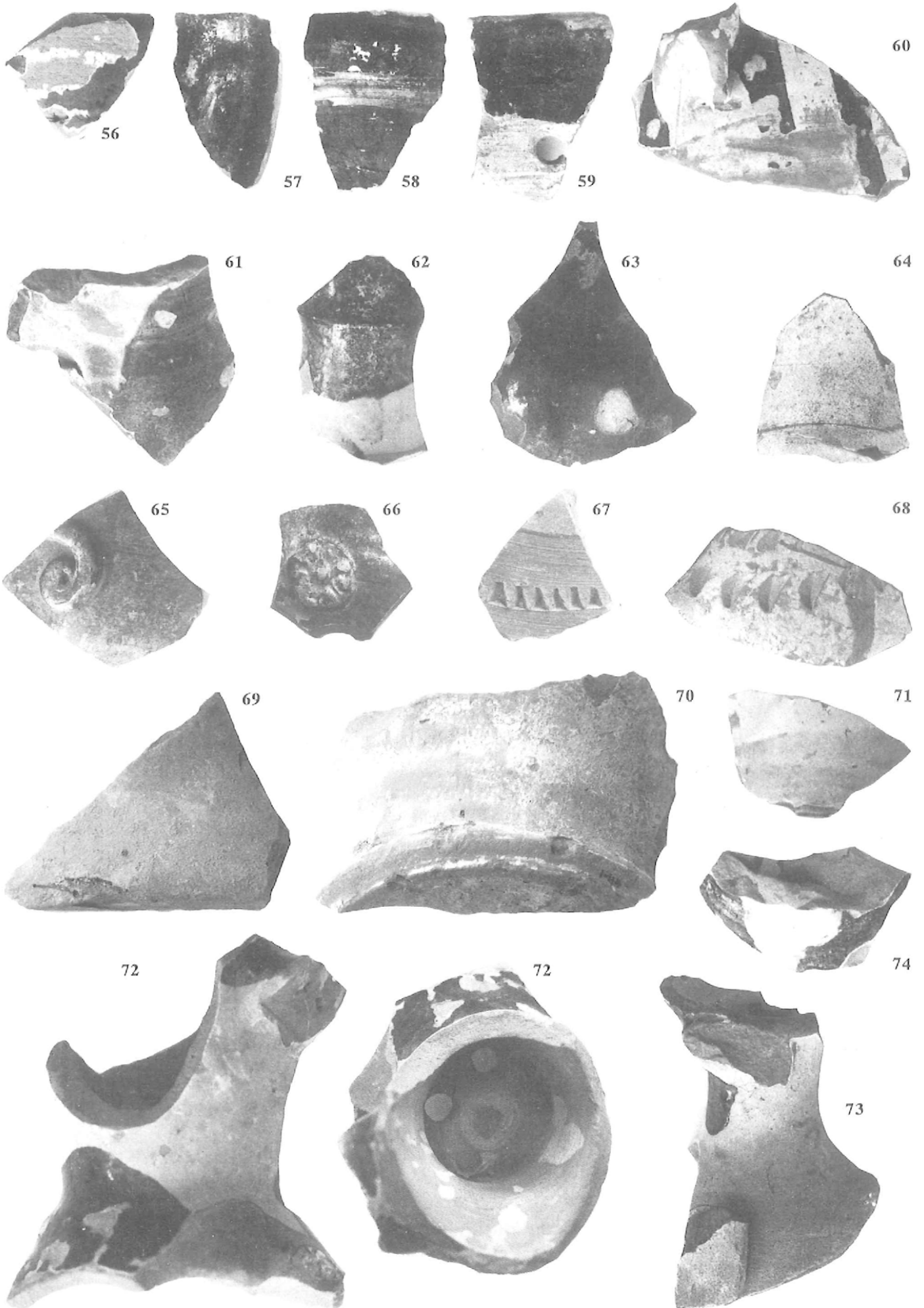


Fig. 12 : Various Nineteenth-Century Closed Forms.

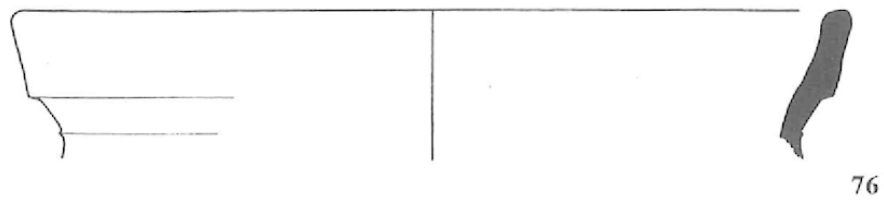
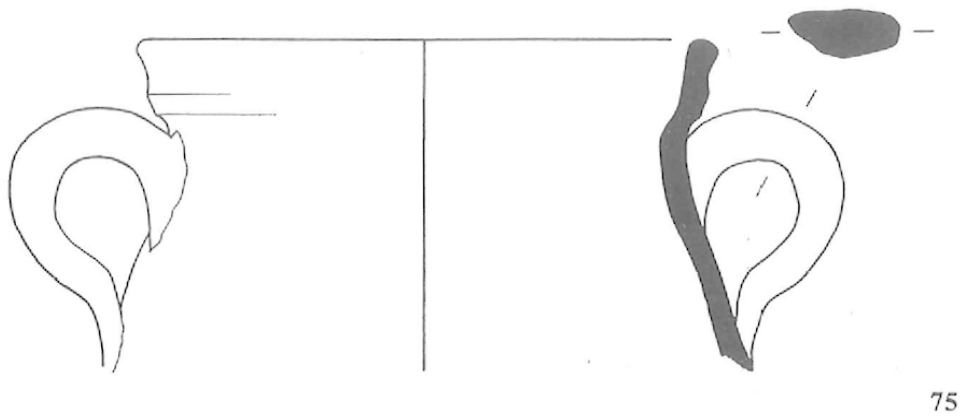
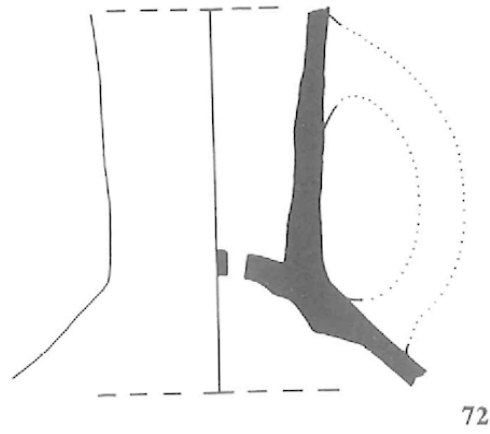


Fig. 13 : Jug with Strainer; Cooking Pots.

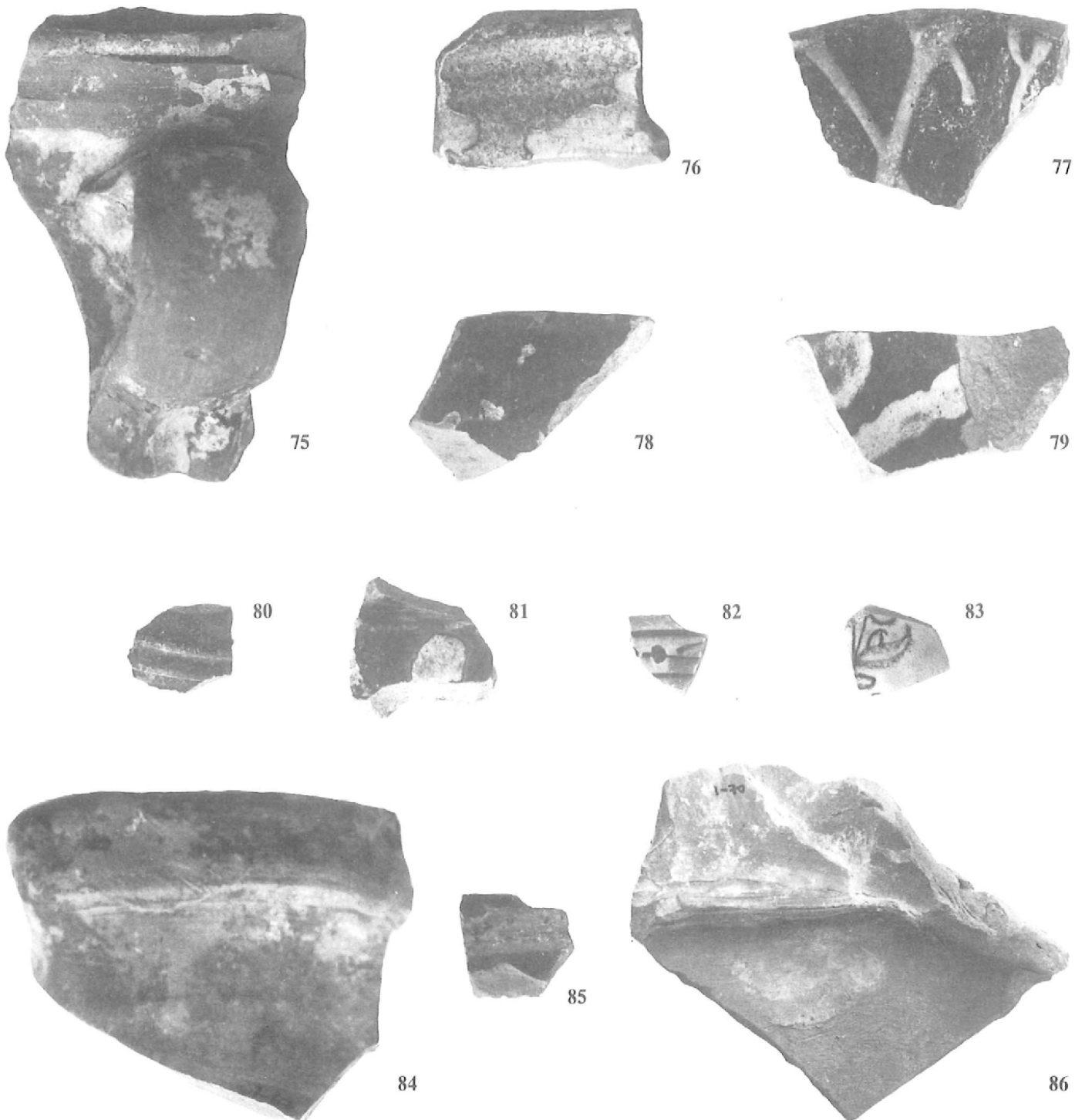


Fig. 14 : Various Nineteenth-Century Wares; Imported Wares; Kiln Wasters.

56 Monochrome. Jug. Rim. pres. H. 3.1.

Plain rim on outturned wall; trefoil mouth. Thick white slip and green glaze on outer surface and just over rim.

57 Monochrome. Jug. Rim. pres. H. 2.7.

Outturned plain rim offset from vertical wall; trefoil mouth. Thick white slip and green glaze on outer surface and just over rim.

58 Monochrome. Jug. Rim. pres. H. 4.2.

Plain vertical rim offset from curved wall; trefoil mouth. Ridge around exterior below rim. Thick white slip and green glaze on outer surface and just over rim.

59 Monochrome. Jug. Rim. pres. H. 4.4.

Plain vertical rim offset from curved wall; trefoil mouth. Hole pierced through neck. Ridge around

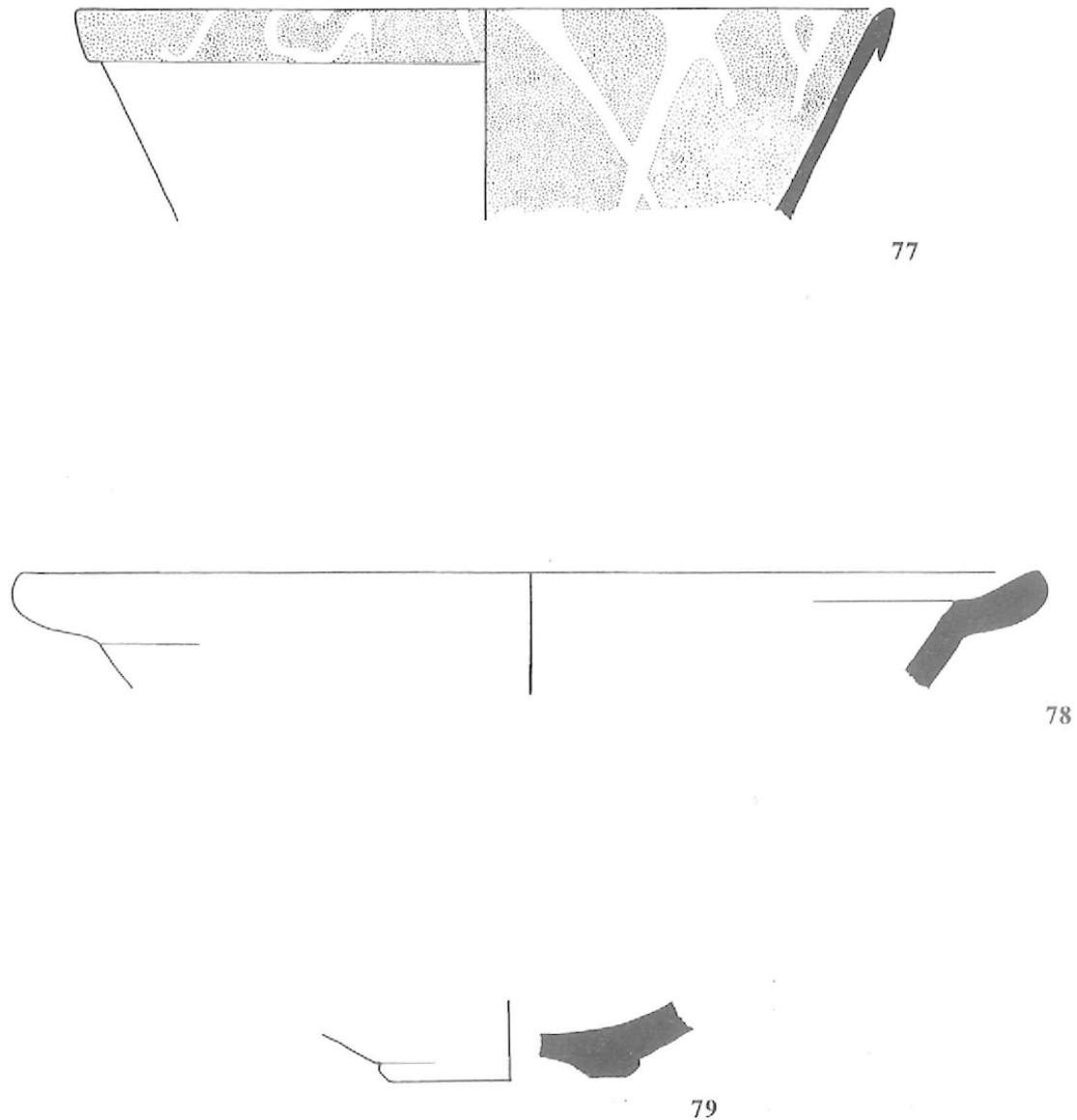


Fig. 15 : Nineteenth-Century Slip-Painted Wares.

exterior below rim. Thick white slip and green glaze on outer surface and just over rim.

60 Monochrome. Jug. Body fr. pres. H. 6.5.

Upper belly of medium sized vessel with stump of small strap handle. Thick white slip and tongues of green glaze on outer surface.

61 Monochrome. Jug. Body fr. pres. H. 5.1.

Vertical neck offset from broad shoulder. Thick white slip and green glaze on outer surface.

62 Monochrome. Jug. Body fr. pres. H. 6.7.

Narrow vertical neck. Thick white slip on outer

surface; green glaze in upper area only.

63 Monochrome. Jug. Body fr. pres. H. 10.1.

From shoulder of large jug. Thick white slip and green glaze on outer surface.

64 Monochrome. Jug. Body fr. pres. H. 5.9.

Almost vertical neck sharply offset from body. White slip and pale yellow glaze on exterior.

65 Monochrome. Jug. Body fr. pres. H. 4.5.

From shoulder of large jug. Decorative applied spiral band on exterior under thick white slip and green glaze.

66 Monochrome. Jug. Body fr. pres. H. 4.3.
From shoulder of large jug. Decorative applied rosette on exterior under thick white slip and green glaze.

67 Monochrome. Jug. Body fr. pres. H. 4.3.
From shoulder of large jug. Horizontal band of triangular rouletting around exterior; white slip and green glaze on interior.

68 Monochrome. Jug. Body fr. pres. H. 3.3.
From shoulder of large jug. Two horizontal bands of rouletting around exterior under white slip; small trace of green glaze.

69 Monochrome (probably). Jug. Base. D. 8.4, pres. H. 7.3.
Flat base.

70 Monochrome. Jug. Base. D. 8.2, pres. H. 7.2.
Flat base with external ledge at junction with body. White slip and splashes of green glaze on exterior surface.

71 Monochrome. Jug. Base. D. 6.4, pres. H. 4.2.
Flat base. Wet-smoothed exterior. Thick white slip almost to base on outer surface, splashes of pale yellow glaze.

72* Monochrome. Jug with strainer. Body fr. D. neck 5.0, pres. H. 8.9.
Neck, upper shoulder and handle strumps of medium sized vessel. Five-holed colander inside lower neck. Thick white slip on upper two-thirds of exterior body; green glaze only around rim.

73 Monochrome. Jug with strainer. Body fr. pres. H. 6.5.
Neck, upper shoulder and handle stumps of medium sized vessel. Thick white slip on upper two-thirds of exterior body; green glaze around rim and streaked vertically onto body.

74 Monochrome. Jug with strainer. Body fr. pres. H. 2.6.
Lower neck and upper shoulder of medium sized vessel. Thick white slip and green glaze on exterior surface. Two holes preserved from colander inside lower neck.

75* Monochrome. Cooking pot. Rim and handle. D. 13.4, pres. H. 8.9.

Plain, rounded rim offset from outcurving body; horizontal ridge around external face. Small strap handle springs just below rim to belly. Thick white slip on inner surface and traces on outer; green glaze in to edge of rim. Glaze gathered thickly on edge of rim.

76* Monochrome. Cooking pot. Rim. D. 19.8, pres. H. 3.3.

Plain, rounded rim offset from outcurving body; sharp ridge around upper body. White slip and green glaze on inner surface to edge of rim.

77* Slip-painted. Bowl. Rim. D. 20.8, pres. H. 5.2.

Downturned rim with plain edge and ridge around exterior on deep wall. Slip-painted decoration, possibly rough cross-hatching, on interior and on exterior of rim under green glaze.

78* Slip-painted. Bowl. Rim. D. 25.8, pres. H. 2.9.

Slightly hollowed outturned plain rim sharply offset from straight wall. Edge of slip-painted motif on inner surface under green glaze.

79* Slip-painted. Base. D. 6.1, pres. H. 2.0.

Flat base. Part of slip-painted line and edge of circle under pale yellow glaze on inner surface.

IMPORTS

80 Constantinopolitan White Ware. Jug. Body fr. pres. H. 2.2.

From small vessel. Pale pink fabric flecked with orange. Thick green glaze on outer surface.

81 Constantinopolitan White Ware. Jug. Body fr. pres. H. 2.9.

From medium sized vessel. Pale pink fabric flecked with orange. Thick green glaze on outer surface.

82 Kütahya. Cup. Rim. pres. H. 2.2.

Thin-walled plain rim. White frit fabric. Decorated inside and out with fine black painted lines, two horizontal, others apparently random, and slightly raised thick red dots. Clear glaze in and out.

83 İznik. Bowl. Body fr. pres. H. 2.9.

From small vessel. White frit fabric. Turquoise glaze inside and out; black painted floral on outer surface.

KILN WASTERS

84 Jug. Rim. pres. H. 6.2.

Plain vertical rim offset from curved wall; misformed trefoil mouth. Ridge around exterior below rim. White slip and green glaze on interior to edge of rim.

85 Bowl. Rim. pres. H. 2.5.

Slightly hollowed everted rim, with notched edges, misformed, sharply offset from body. Thick white slip and green glaze on inner surface and under rim.

86 Pithos. Body fr. pres. H. 10.7.

Badly misformed. Probably from the central zone of a large storage vessel. Ridge around exterior. Patchily applied green glaze on interior.

CHRONOLOGY

1 and 2 are the earliest Ganos-produced wares amongst this collection. They are late-eleventh, or early twelfth century⁹. 3, 4 and 5 should be dated to the first quarter of the twelfth century¹⁰. 6, 7, 8 and 9 are slightly later, from the second half of the twelfth and

early thirteenth centuries¹¹. The irregular application of the green colour suggests that 10 and 11 should be dated to the middle of the thirteenth century¹². Zeuxippus derivatives (12-15) belong to the late thirteenth century¹³. 17 and 18 are probably products of the sixteenth century¹⁴. Marbled wares had their *floruit* in the seventeenth century, where 19, 20 and 21 should be placed¹⁵. 22 and 23 are possibly products of the eighteenth to nineteenth centuries¹⁶. 24, 25 and 26 should be assigned to the eighteenth or early nineteenth centuries¹⁷. The nineteenth-century date given to 27-76 is based on a comparison with similar wares mainly from Saraçhane, and some from Didymoteichon¹⁸. 77-79 are linked with the preceding monochrome wares because 39 and 77 have the same form¹⁹. The white wares from Constantinople (80-81), Hayes' Glazed White Ware Class II, are dated to the tenth century²⁰. 82 is a seventeenth-century product of Kütahya²¹. 83 is probably of a similar date to 82 but was manufactured at İznik²².

PRODUCTION TECHNIQUES AND WARES

The earliest glazed wares collected in this survey (80-81) are contemporaneous with the earliest written references to the monasteries of Ganos²³. The monas-

9) The dates assigned independently to red painted wares by Morgan and Stevenson are remarkably similar: R.B.K. Stevenson, 'Byzantine Glazed Pottery', in *The Great Palace of The Byzantine Emperors First Report*, Oxford (1947), p. 51; C.H. Morgan, *Corinth Volume 11, The Byzantine Pottery*, Harvard (1942), p. 90, p. 95.

10) The unfussy decoration and the profiles point to this date: for the decoration see Morgan 1942 (*supra* n. 9), p. 100; for the profile of 3, p. 99, fig. 75 a; for the profiles of 4 and 5, which are found in contemporary green and brown painted rather than slip-painted wares, see p. 76, fig. 55 c.

11) Morgan 1942 (*supra* n. 9), p. 140; for the profile of 6 see p. 137, fig. 111c (=no. 1302); for 7 see p. 137, fig. 111i (= no. 1348) which has incised circles under a green glaze; and for 8 see p. 137, fig. 111k (= no. 1352) which also has horizontal incised lines under a yellow glaze.

12) Morgan 1942, (*supra* n. 9) p. 142-3, n.b. 'green is the favourite colour'.

13) The evidence for their chronology has been assembled by Pamela Armstrong, 'Zeuxippus Derivative Bowls from Sparta', in *Φιλολόγων. Lakonian Studies in Honour of Hector Catling*, ed. J.M. Sanders, Oxford (1992), p. 9.

14) A. Frantz, 'Turkish Pottery from the Agora' *Hesperia* 9 (1942), p. 26, no. 2 (= 17), no. 7 (= 18), where it is suggested that they may be dated to the seventeenth century; Ch. Bakirtzis, 1980, (*supra* n. 7), p. 148-149.

15) G. Daux, *BCH* 92 (1968), p. 1003-4, fig. 2, publishes marbled wares found in a seventeenth-century deposit at Argos in Greece; I. Ge-relyes, 'Adatok a tabáni török díszkerámia keletkezéséhez és etnikai háttéréhez', *Folia Archaeologica* 36 Budapest (1985), p. 234-237, figs. 8-11, publishes a group of complete marbled ware bowls from a pit dated to the first decade of the eighteenth century while K. Tsouris, *AAA* 20 (1987), *supra* n. 7 p. 51, fig. 10, found marbled ware fragments in an early nineteenth-century deposit.

16) By the association of 22 with 24-26; see below.

17) For 25 see M. Hahn, 'Byzantine and Postbyzantine Pottery from the Greek-Swedish Excavations at Khania, Crete' in *Recherches sur la Céramique Byzantine. BCH Supplément* 18, Paris (1989), edd. V. Déroches, J.-M. Spieser, p. 228, fig. 1, text p. 229; chronology p. 227.

18) They correspond to his Turkish Coarse Ware P: J.W. Hayes, *Excavations at Saraçhane in Istanbul. Volume 2, The Pottery*, Princeton (1992), p. 276; on p. 337-338, deposit 97, a well with one dumped fill, is dated to the third quarter of the nineteenth century; for Didymoteichon see Tsouris 1987 (*supra* n. 7), p. 51, figs. 10 and 11.

19) The downturned rim of 39, a monochrome bowl, can also be found on 77, a slip-painted bowl whose decoration is closely paralleled on a similar bowl with downturned rim from Athens: Frantz 1942 (*supra* n. 14), p. 12, fig. 23 no. 2; the rim is described on p. 24.

20) Hayes 1992 (*supra* n. 18), p. 19 for the chronology and p. 29, where he notes that the closed form are mostly green glazed.

21) Gyöző Gerö, 'Anatolian Pottery from İznik and Kütahya in Hungary in the Sixteenth and Seventeenth Centuries', *First International Congress on Turkish Tiles and Ceramics*, Istanbul (1989), p. 151, fig. 7.

22) See O. Aslanapa, Ş. Yetkin, A. Altun, *The İznik Tile Kiln Excavations (The Second Round: 1981-1988)*, Istanbul (1989), p. 60, right-hand sherd on top left photograph.

23) J. Darrouzes, A.A., *Le Patriarcat Byzantin, Les Regestes des actes du Patriarcat de Constantinople*, Vol. I. Paris (1981), nos. 839, 893, 2110, 2119, 2290, 2434, 2529, 2530.

tery prospered in the early eleventh century, and this coincides with the beginning of amphorae production in the area²⁴. At the end of the eleventh century glazed ceramics also began to be produced, a time when glazed wares start to appear throughout the Byzantine world in places where they had not been known previously. It is difficult to understand the reasons for the origins of the production of glazed pottery at Ganos. One factor may have been demand: viniculture is labour intensive and the expanding estates of the monastery may be associated with an increase in the local population, employed in agricultural labour. Another factor is a change in glazing technology²⁵. The major flux of the glazes on the pottery presented here is lead²⁶. As lead becomes volatile at about 1,150°C, the firing temperatures of lead glazes are relatively low, 800°C being sufficient for them to fuse. This may cause problems for some types of fabrics, such as stonewares or frits or porcelains, and they may then require two firings, the first to a high temperature for the body, and a second lower temperature firing to fix the glaze²⁷. But the clay from the region of Ganos, like most earthenware bodies, is ready for glaze firing after baking leather hard in the sun²⁸. The 'imported' wares, 80 and 81, which preceded glazed pottery production at Ganos, have alkaline glazes²⁹. The principal flux of their glaze was also lead, but its relative proportion to the silica content of the glaze was smaller³⁰. Alkaline glazes fuse at high temperatures between 1,100 and 1,200°C, and therefore require a rather different and more sophisticated kiln technology than so-called 'lead' glazes³¹. During the period when alkaline glazes

were normal in Byzantine pottery production, the proportion of glazed pottery produced to unglazed was small, presumably because of the technology required. But when lead glazes became common currency, in the second half of the eleventh century, and could be fired in the same kilns with unglazed wares, the proportions of glazed to unglazed wares changed drastically, and glazed pottery suddenly appeared in many places and was manufactured at many places, where it had not been before, Ganos being one of them³². A combination of demand and new technology probably contributed to the origins of glazed pottery production at Ganos.

Ganos products of the Byzantine period are varied, both in form and in decorative styles³³. The decorative red on 1 and 2 is a thick slip which creates a slightly raised profile on the surface of the vessel. There are parallels from the Great Palace at Constantinople, and from the city of Sparta in the Peloponnese³⁴. The white slip painting of 3 to 5 is of a similar texture. None of the Ganos painted or slip-painted or incised wares employ the kufesque motives which are so common amongst their contemporary wares. The Ganos products have simple linear designs (as 1, 4, 10) or even dots (9)³⁵. Pigmented glazes, such as the green on 10 and 11, gradually replaced coloured slips for decoration in pottery production in the eastern Mediterranean, and while this seems to be generally true at Ganos, red-coloured slips (as on 19, 21 and 23) continued in use along side the coloured glazes (as on 16)³⁶. Zeuxippus derivatives were common in the late Byzan-

24) Günsenin 1990, (*supra* n. 2) and Günsenin 1993 (*supra* n. 1).

25) For detailed information on lead glazes and their applications see D. Green, *Understanding Pottery Glazes*, London (1963).

26) Powdered lead oxides can be easily tamped on to a damp clay body, or suspended in water and either brushed on to the vessel or the vessel dipped into it. Dipping does not seem to have been used on any of the Ganos products because they would be coated on the exterior either right down to the foot, or even on the foot and under the base as well. The way the glaze has gathered thickly around the rims of some bowls (as 29, 31) or run in tongues on the outside of some jugs (as 60) indicates that a solution of lead, and not powdered lead, was used.

27) For the relation between bodies and glazes see D. Rhodes, *Clay and Glazes for the Potter*, London (1958).

28) As is practiced there today.

29) Alkaline and lead glazes are indistinguishable by eye. Alkaline glazes react even to weak solutions of acid, producing an opaque film on their surface, while there is no reaction at all between lead glazes and acid.

30) For the results of tests of firing temperatures necessary to fuse glazes containing varied proportions of lead oxide and silica, see D. Hamilton, *Pottery and Ceramics*, London (1974), p. 127.

31) Technically all the glazes here are lead: 'alkaline' is not in opposition to 'lead'.

32) A.H.S. Megaw and R.E. Jones, 'Byzantine and Allied Pottery: A Contribution by Chemical Analysis to Problems of Origin and Distribution', *BSA* 78 (1983), 235-263, proved the existence of several production centres *contra* Morgan (*supra* n. 9), p. 2, who thought that they must all have been produced at one location.

33) The Byzantine fragments are so small it is difficult to draw any conclusions about the forms.

34) Stevenson 1947 (*supra* n. 9), p. 47: 'often streaked with horizontal bands of dull red paint'; at Corinth Morgan has a classification 'red-painted', which seems to correspond to our 1 and 2, but they do not correspond to his subdivisions of that class (into Imitation Lustre Ware and Measles Ware): Morgan 1942 (*supra* n. 9), p. 86. The profile of 1 may however be found amongst Measles Ware: p. 91 fig. 68f. The same ware has been found at Sparta: publication by Armstrong is forthcoming.

35) The incised dots of 9 are unusual, and must have been time-consuming to produce.

36) This may simply be because of the ample supply of fine clay near at hand to produce the slips.

tine world, and produced at many places³⁷. The rim forms of 12-15 correspond to the standard forms of the thirteenth century³⁸.

The heavily-potted vessels, their carelessly-executed incision and the poor quality glazes of 17 and 18 are characteristic of a particular class of Ottoman incised wares³⁹. Marbled wares (as 19-21) are produced with more care. The vessels are smaller and their rims are distinctive and carefully formed. In order to achieve the marbling effect, patches of coloured slips were arranged around the rim, and then the vessel spun on the wheel, letting the different colours run into each other. The decorative techniques of 22 and 23 seem idiosyncratic to Ganos. The same dark brown coloured slip is used in both to paint lines; 23 has an unusual decoration in red slip of a solid circle enclosed by a circular line. The pale yellow glaze of 23 is like some of the Byzantine wares (1-6), but the colourless glaze of 22 links it to 24-26. The painted decoration on 25 is strikingly similar to a larger fragment found at Chania in Crete, and attributed to Çanakkale production⁴⁰. However the Chania bowl is painted in the dark brown of Ganos 22 and 23, though there are other blue painted bowls from the same deposit at Chania⁴¹.

In the nineteenth century green was the prevalent glaze colour, achieved by the addition of copper oxide, with a lesser number of yellow glazed bowls and jugs⁴². The glaze was of good quality, and generally thick and lustrous. It seems always to have been applied over a thick white slip, also of good quality. Although the majority of vessels are monochrome, there are a small number of slip-painted wares (77-79). The shapes are limited in number: bowls (27-55), jugs (56-74) — which may have strainers in their necks (72-74) — and cooking pots (75-76). The sizes within each shape vary greatly. Bowls have two basic rim forms: everted and horizontal (27-33) or vertical (34-38, 40-41). These may be plain (27-28, 40-41) or have simple notched (29-33) or rouletted (34-38) decoration. Hayes' obser-

vation about the rouletting on similar bowls found at Saraçhane is also true for the Ganos style of rouletting⁴³. 37 and 38 appear to be unique in that the rouletting is on an applied horizontal band of clay, so that it stands out in relief. The most distinctive feature of nineteenth-century bowls from Ganos is flat bases (50-55). These are not commonly known elsewhere. They are not always completely flat (as 50, 51, 55). They have been formed by hand on the wheel, and therefore are slightly hollowed underneath; flat bases are usually produced by being cut from the potter's wheel with string. Bowls may also have ringfeet (as 43-49). Jugs with applied decoration (65, 66), also found at Didymoteichon and Çanakkale, seem to have been common currency in the last century⁴⁴. The external rouletting of 67 and 68 is also known from Didymoteichon⁴⁵. The function of the strainers in the necks of some of the jugs (72-74) is not immediately clear, as the holes are large enough (c. 4 mm) to let many things pass through. The cooking pots (75-76) are unusual in that they have a coating of slip underneath their glaze⁴⁶.

The kiln wasters 84 and 85 correspond closely to nineteenth-century forms: 84 to 56-59; 85 to 29-33. The large storage vessel represented by 86 is not otherwise known.

CONCLUSIONS

Our material suggests that the production of glazed wares at Ganos began during the reign of Alexios Komnenos (1081-1118), and about two generations after the start of amphora production. Though it is dangerous to base conclusions on such a small sample of small fragments, it would seem that the principal decorative techniques of the eleventh and twelfth centuries were employed at Ganos, but that the designs did not have an 'international' character (kufesque motifs which were rendered in many mediums). The Ganos products then were probably not intended for export, but for local circulation. The thirty-odd years

37) See Armstrong 1992 (*supra* n. 13), p. 7-8, for a list of known places of production in the eastern Mediterranean.

38) See Armstrong 1992 (*supra* n. 13), p. 7, for the rim forms.

39) J.W. Hayes, 'The Excavated Pottery from the Bodrum Camii', in C.L. Striker, *The Myrelaion (Bodrum Camii) in Istanbul*, Princeton (1981), Ware E, p. 37.

40) Hahn 1989, (*supra* n. 17), p. 228-9.

41) They are not illustrated.

42) There are 48 green-glazed and 5 yellow-glazed amongst the randomly sampled nineteenth-century wares.

43) Hayes 1992 (*supra* n. 18), p. 389, fig. 147 no. 5 (=34); p. 277, where he describes the rouletting as 'cogged'.

44) Didymoteichon: Bakirtzis 1980 (*supra* n. 7), p. 149, figs. 20-21; Çanakkale: Gönül Öney, 'Çanakkale seramikleri' in *Türk Çini ve Seramikleri*, Sadberk Hanım Müzesi, Istanbul (1991) p. 121, fig. 17; p. 123, fig. 26; p. 127, fig. 37.

45) Bakirtzis 1980 (*supra* n. 7), pl. 4, no. 5; Tsouris (*supra* n. 7), p. 51, fig. 10a.

46) They have also been fired upside down, as the glaze has gathered particularly thickly on the rim of 75.

of Venetian control, from 1204 to 1235 does not seem to have brought about any interruption to production. At the same time late Byzantine wares were also being produced at İznik and at another centre on the Troad⁴⁷. There appears to be a gap at the end of the Byzantine period. This may be attributed initially to the Catalan excesses in the region around 1300⁴⁸. The hiatus continued in the early period of Ottoman rule, possibly because the symbiosis between village and monastery had broken down, and although wine production continued, it was on a much smaller scale, in turn depressing demand for other wares⁴⁹. In the late Ottoman period there are a number of well-known ceramic production centres in the environs of İstanbul: İznik, Kü-

tahya, Çanakkale and Didymoteichon (illustrated on Fig. 15). The addition of Ganos to these, as well as the island of Marmara, alters our understanding of the pattern of production and consumption around the capital⁵⁰. Fine wares hitherto identified as Çanakkale may be from Ganos. Similarly many of the finds from the Saraçhane excavations in İstanbul attributed to Didymoteichon are probably from Ganos⁵¹. In the nineteenth century glazed pottery production at Ganos was flourishing, with many of its products taking the short sea voyage to the capital and the markets there, and others travelling further afield.

P.A.-N.G.

47) For production at İznik see Armstrong 1992 (*supra* n. 13), p. 8, n. 12; knowledge of the site on the Troad is personal communication from Dr. J. Hayes; publication by him is forthcoming in *Studia Troica*.

48) For the activities of the Catalans in the north eastern Aegean at this time see: Theodoulos Magistros, *Anecdota Graeca*, ed. J. Fr. Boissonade, II, Paris (1830), 188-228; George Pachymeres, *de Andronico*, VII, Bonn Corpus; and especially the Catalan Ramón Muntaner, *Chronica*, trans. Lady Goodenough, London (1920-21), who, explaining their departure from Gallipoli, wrote 'We had lived there on the land, and there was nothing left. And likewise we had depopulated all that district.... in every direction; we had destroyed all the people, so that nothing could be gathered there. Therefore, we were obliged to abandon that country'.

49) That amphora production continued in Ottoman times, though for a local market, see Günsenin 1993, p. 196.

50) In the summer of 1994 Byzantine amphorae and Byzantine-Ottoman glazed ceramic kilns were discovered on the island of Marmara; see Günsenin; '1994 Yılı Marmara Adası Sualtı Araştırmaları', *XII. Araştırma Sonuçları Toplantısı*, (sous-*presse*).

51) The description of the fabric of Ware P from Saraçhane could apply to Ganos fabric: Hayes 1992 (*supra* n. 18), p. 276.