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ibrary of Congress Cataloging-in-Publication Data

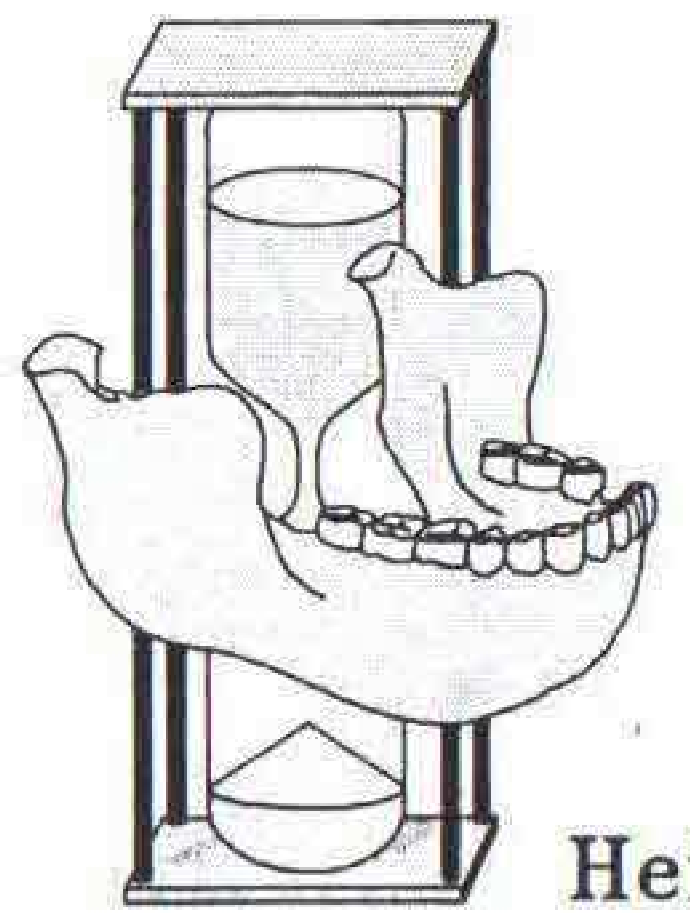
Archaeometry '90/edited by Ernst Pernicka, Günther A. Wagner.
'roceedings of the 27th Symposium on Archaeometry held in Heidelberg Apr. 2 – 6, 1990.
ncludes bibliographical references.
SBN 3-7643-2522-4 – ISBN 0-8176-2522-4
. Archaeometry-Congresses. I. Pernicka, Ernst. II. Wagner, Günther A. III. Symposium on
Archaeometry (27th: 1990: Heidelberg, Germany)
C75.7.A729 1991
930.1–dc20

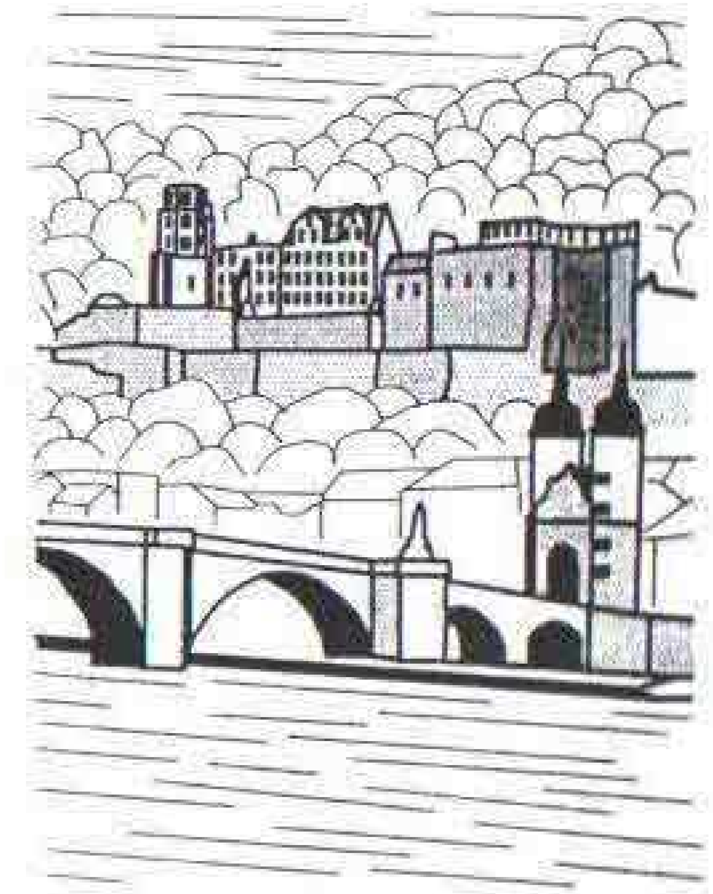
Deutsche Bibliothek Cataloging-in-Publication Data

Archaeometry '90/ed. by Ernst Pernicka; Günther A. Wagner.
Basel; Boston; Berlin: Birkhäuser, 1991
ISBN 3-7643-2522-4 (Basel ...)
ISBN 0-8176-2522-4 (Boston)
NE: Pernicka, Ernst [Hrsg.]

'rinted in Germany on acid-free paper from the authors' camera-ready manuscripts
SBN 3-7643-2522-4
SBN 0-8176-2522-4

INTERNATIONAL SYMPOSIUM ON ARCHAEOMETRY





2–6 April 1990
Heidelberg, Germany

Archaeometry '90

ROMAN COARSE CERAMICS FROM ALBINTIMILIUM (VENTIMIGLIA, ITALY): AN EXAMPLE OF ARCHAEOMETRIC AND ARCHAEOLOGICAL STUDIES

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SUMMARY: The studies of coarse ceramics from Albintimilium, examined with X-ray fluorescence analysis and thin-section analysis, enable us to define a local (archaeological, chemical and mineralogical) reference group and to isolate some groups which were certainly imported.
From a methodological point of view this ceramic can be a useful source of information. Till now it has received little attention, chiefly because little information can be obtained by using established archaelogical methods.

INTRODUCTION

Albintimilium, an important Roman center on the west coast of Liguria, situated on the border between Italy and France, is of great significance in Italian archaeology. It was one of the first Roman towns in Italy to have been excavated by systematic stratigraphical observations (begun in the 1940s; excavation Lamboglia-Pallarès). The exact dating of the layers in Albintimilium offers important evidence for those involved with Roman ceramics (Lamboglia, 1950).

Coarse ceramics from one excavation zone (Cardine - 1st century B.C. and 6/7th centuries A.D.) have been the subject of recent archaelogical studies (Olcese 1990, preliminary report).

OBJECTIVES OF THE ARCHAEOMETRICAL STUDIES:

At present no consensus exists among archaelogists as to what constitutes a precise definition of "coarse ceramics", a great deal of which has been found in archaeological excavations. "Coarse ceramics" are understood to be items of pottery produced for practical rather than aesthetic purposes. They are mostly household utensils used in preparing and cooking food but may be tableware or used for storage. They are easily distinguishable from fine ware. However, in previous archaeological studies little attention has been paid to these ceramics since they were considered to be too coarse and insignificant to be able to provide any valuable archaeological evidence. Moreover the fact that some coarse ceramic productions were used for trade was often overlooked.

The archaeological study of coarse ceramics from Albintimilium has made it possible to identify different groups of pottery (Fig.1). Whereas the main group of vessels with common typological and macroscopical characteristics (including a few wasters) has been discovered in the late-Roman layers (4th-7th century A.D.), the coarse ceramics from late-republican and early-Roman layers (1st century B.C. - 1st century A.D.) vary as regards both type and body; they are frequently comparable with ceramic vessels from other Mediterranean sites (Ostia, Luni, Pollentia). Therefore it is necessary to find out if the chronologically differenciated groups from Albintimilium were produced locally or whether coarse ware vessels were imported.

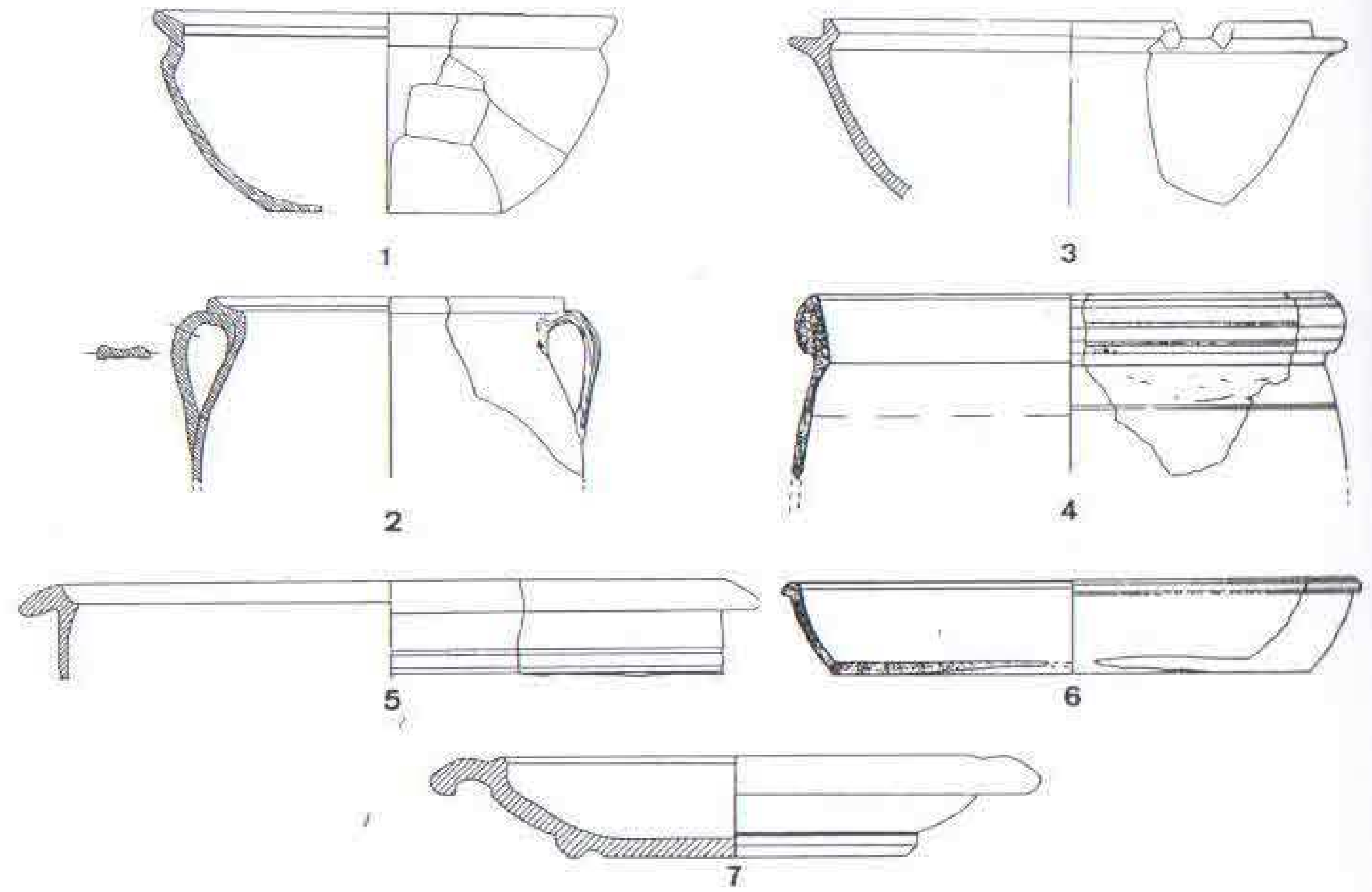

Fig.1: Coarse ceramics from Albintimilium. 1,2,3: types from the later roman layers. 4,5,6: cooking pots (1st century B.C. - 1st century A.D.). 7: mortarium (1st century A.D.)

The aim of this study is to attempt to answer the following questions:

1. Is it possible to verify using scientific methods the various groups of ceramics determined by archaelogical and macroscopical criteria (Schneider, 1989)?
2. Did a local production of coarse ware exist in Albintimilium and, if so, how does it differ from the other chemical and mineralogical groups? Have the wasters found in Albintimilium the same chemical composition as this and as the ceramics from later strata?
3. Do all isolated groups correspond from the mineralogical point of view to the geological formations in the environment around Albintimilium?
4. What kind of connection does exist between local and imported coarse ware?

MATERIALS AND METHODS

Altogether 200 sherds have been analyzed as representative of the various types of ceramics and clays from different chronological periods from Albintimilium. Only 91 of the available sherds have been taken into consideration because only four archaeological groups will be regarded here: the late-Roman group (clay 1,2,3 - cooking pots and tableware) and two groups of imports, which were found in the layers dating from the first century B.C. and early first century A.D. (clay 11,14 - cooking pots and lids; "orlo bifido" cooking pots and "pompeian red ware"; "mortaria" and basins). For comparison, four sherds from Ostia have also been included. All sherds have been examined by using X-ray fluorescence analysis (Philips PW 1400) and 16 have been subjected to thin-section examinations (polarization microscope).

The starting point of the archaeometrical analysis was the large number of wasters, found in the late-Roman layers of the town (4th-7th century A.D.), since they were most certainly produced locally; they allow us to define a reference group for Albintimilium and to characterize the ceramic production of local manufacture in late antiquity. The other groups, determined by means of typological and macroscopical classification have been compared step by step with the reference group.

RESULTS

1) The evaluation of the data, determined by the above cited methods, shows that a number of different chemical and mineralogical groups are to be found among the coarse ceramics from Albintimilium (Table I and Fig.2).

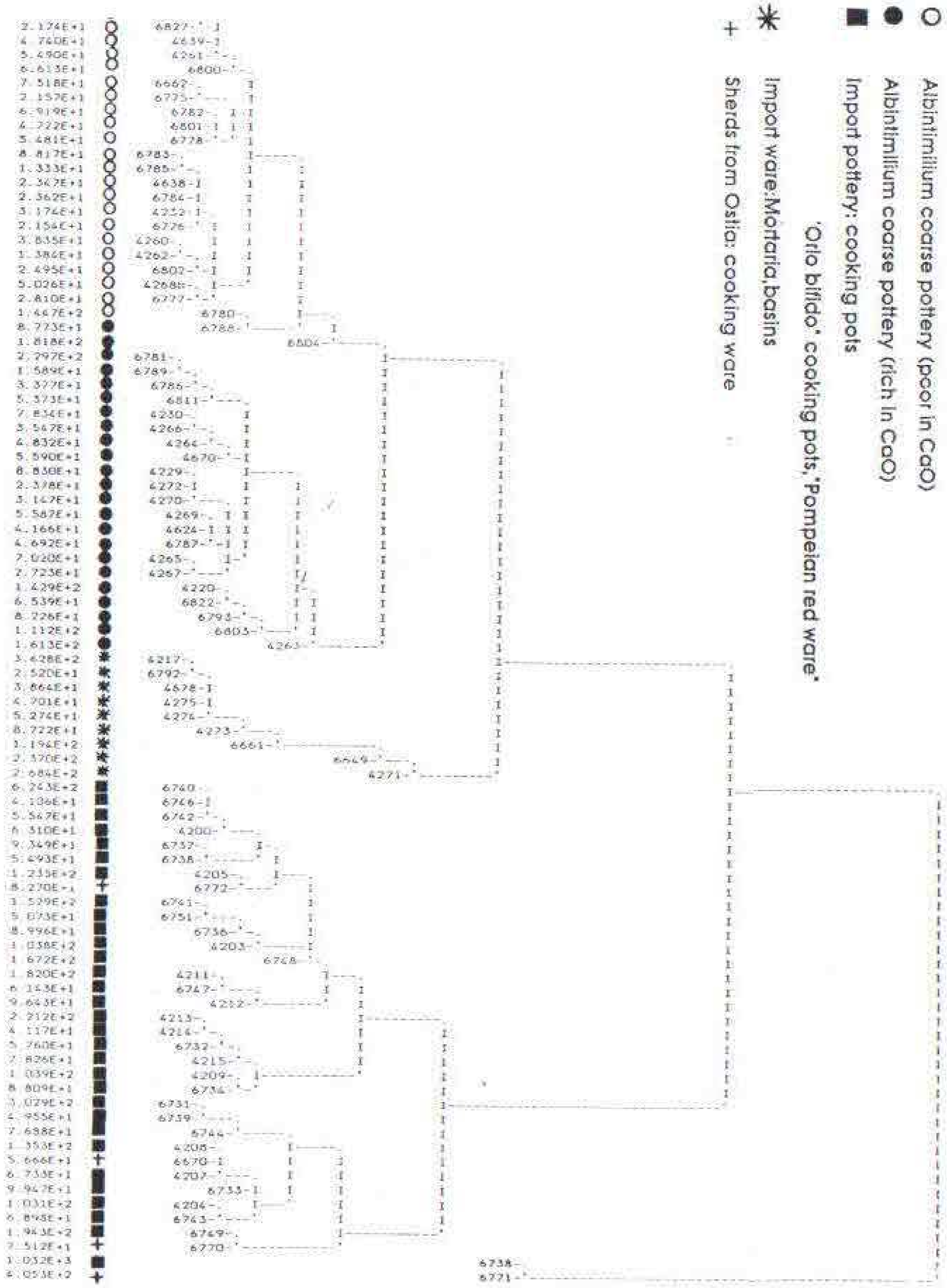

Fig.2: Cluster analysis of coarse ceramics from Albintimilium (realized with SiO_2, TiO_2, Al_2O_3, Fe_2O_3, MnO, MgO, CaO, Na_2O, K_2O, Cr, Ni, Rb, Sr, Zr, Ba)

LOCAL POTTERY (LATE ROMAN WARES)

	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	V	Cr	Ni	Zn	Rb	Sr	Zr	Ba	(Ce)	L.I.
Wasters (rich in CaO)																				
n = 5																				
V.Med	62.58	0.629	15.07	5.72	0.041	1.69	10.55	1.12	2.48	0.123	104	81	38	75	128	321	182	36	66	.26
± Dev	2.25	0.048	0.78	0.63	0.014	0.55	0.77	0.15	0.31	0.034	9	6	2	19	7	31	23	8	7	.14
Local coarse pottery (rich in CaO)																				
n = 18											13			13					13	16
V.Med	65.02	0.631	15.55	5.24	0.038	1.56	8.05	1.16	2.56	0.181	97	84	42	88	144	297	203	406	62	3.40
± Dev	1.88	0.062	0.96	0.53	0.015	0.17	1.79	0.26	0.20	0.060	10	12	9	14	18	60	31	38	20	1.83
Local clay samples																				
n = 2																				
V.Med	59.52	0.637	14.68	4.24	0.064	1.93	14.31	1.11	2.79	0.132	99	77	41	81	144	348	184	346	56	14.73
Wasters (poor in CaO)																				
n = 7											6			6					6	5
V.Med	71.11	0.681	16.01	5.74	0.026	1.08	1.55	1.32	2.41	0.080	96	88	41	72	136	99	232	343	73	0.63
± Dev	1.46	0.086	0.93	0.19	0.011	0.16	0.35	0.20	0.31	0.034	9	7	10	18	20	12	18	32	15	0.66
Local coarse pottery (poor in CaO)																				
n = 17											14			14					14	15
V.Med	72.63	0.582	15.26	5.12	0.022	0.97	1.76	1.18	2.38	0.085	89	84	37	67	135	116	204	359	60	1.16
± Dev	1.48	0.081	0.78	0.71	0.018	0.14	0.83	0.23	0.19	0.036	12	13	10	13	14	29	28	44	23	0.79

IMPORTED POTTERY (EARLY ROMAN WARES)

	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	V	Cr	Ni	Zn	Rb	Sr	Zr	Ba	(Ce)	L.I.
'Orlo bifido' and other cooking pots; 'pompejanische rote Platten'.																				
n = 31											20			20					20	26
Mittl	61.21	0.854	20.12	7.11	0.146	1.81	3.35	1.64	3.51	0.254	135	89	41	91	236	425	385	951	194	1.98
± dev.	2.33	0.083	1.09	0.73	0.051	0.53	1.48	0.42	0.52	0.104	16	22	12	7	42	68	49	142	65	1.13
Ceramics from Ostia (cooking pots)																				
n = 3																				
mean	63.37	0.933	19.94	8.01	0.226	1.25	2.05	1.10	2.96	0.164	145	106	55	98	242	376	415	1218	236	2.49
± dev.	1.32	0.017	1.20	0.34	0.182	0.20	0.43	0.11	0.56	0.068	13	2	7	20	35	110	16	485	72	1.31
Ceramic from Ostia (import from Campania ?)																				
6670	56.71	0.913	22.21	7.78	0.109	2.65	4.45	1.57	3.39	0.225	158	105	41	97	230	381	388	713	124	1.29
Mortaria and basins																				
n = 9											10			10					10	10
mean	57.55	0.734	16.57	6.24	0.102	2.75	10.96	1.41	3.26	0.431	109	120	71	119	178	439	189	592	89	3.76
± dev.	1.72	0.019	0.42	0.48	0.022	0.48	1.19	0.58	0.41	0.127	12	21	19	18	15	62	36	73	25	1.03

Table I: Mean composition of some chemical groups from Albintimilium. Oxide concentrations are given in % by weight, normalized to 100 %, trace element concentrations in ppm. L.I = loss in ignition

The diagram Ce/Zr shows the separation between the local ceramics from Albintimilium of late-Roman layers and some imported ceramics from early-Roman times (Fig.3); one imported group seems similar to the local group, but differs for other elements and for mineral components (Table I and Fig. 2).

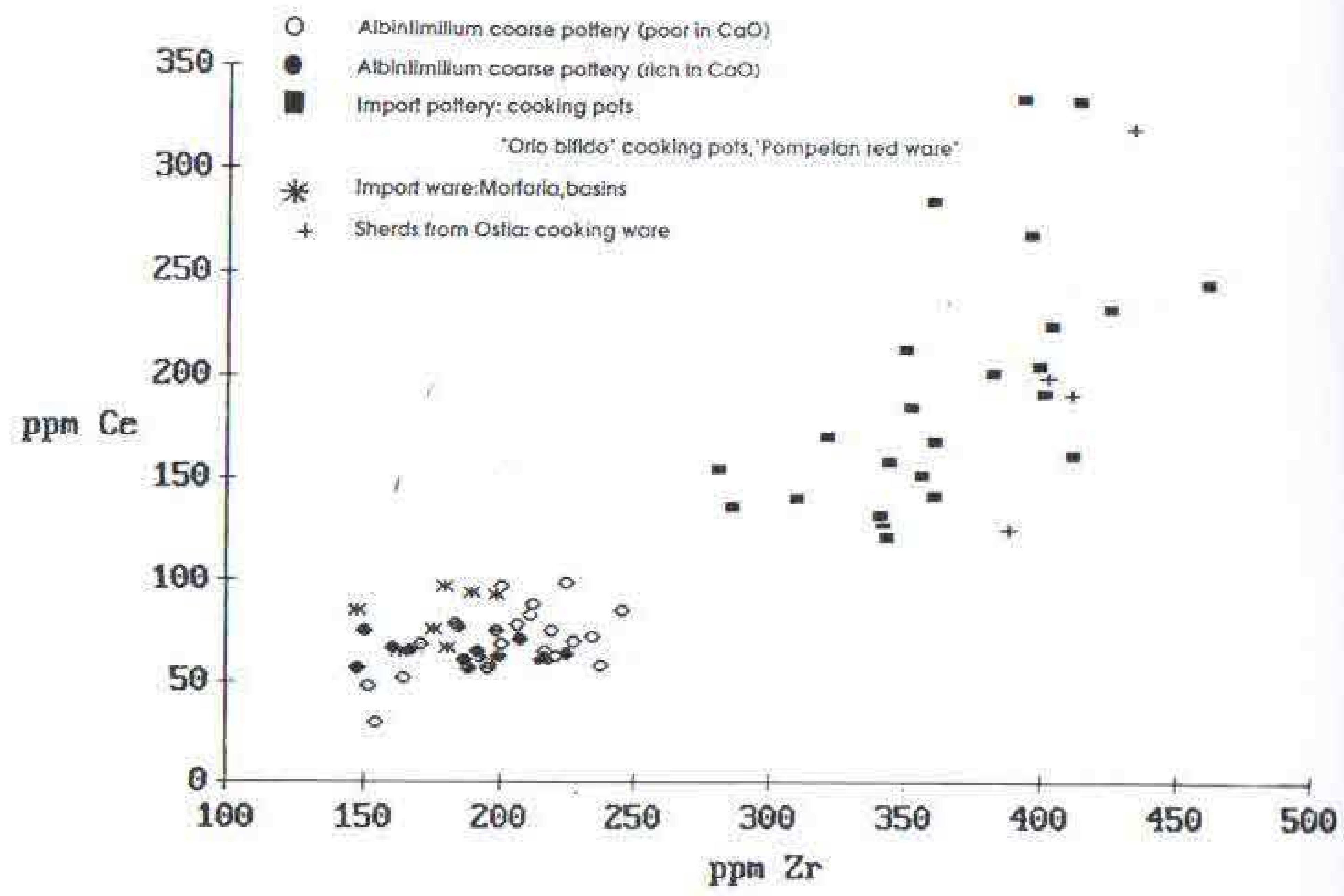

Fig.3: Correlation diagram between Ce and Zr.

2) The largest group was produced locally (4th-7th century A.D.) (Fig.1, types 1,2,3). The chemical and mineralogical composition of the wasters correspond with that of the coarse-ware vessels found in the same layers (Table I). There are two sub-groups of late-Roman local production, similar in many elements and overlapping in some diagrams (Fig.3) but having different values of CaO (Table I). This difference can also be seen through the microscop and is not due to any secondary compositional changes.

The raw materials could derive from either of two different clay pits in the surrounding area (the valley of the stream

Nervia with clay poor in CaO or the valley of the brook Roja with clay rich in CaO). The two clay samples, taken from clay pits which are still used by potters working near Ventimiglia are chemically similar to the pottery group rich in CaO (Table I).

The mineralogical characteristic of Albintimilium ceramics is the presence of quartz, feldspar, fragments of metamorfic cristalline schist and limestone. This is in accordance with the geological characteristics of the area around Albintimilium .

The use of different types of clay is probably due to technical reasons. From the analysis it appears that one group of vessels, all flanged bowls and table wares, appertaining to the group with a high CaO concentration (Type 3), whereas other coarse ceramics, in particular cooking vessels, are poor in CaO (Type 1,2). Together with a high tempering (SiO_2) this seems to give a better thermal shock resistance (Table I).

3) Some of the groups, isolated by way of macroscopical and typological criteria, have a mineralogical composition which does not correspond with the geological characteristics of the area. At least pottery which has been excavated from the layers of the 1st century B.C. to the 1st century A.D. contains, as mineralogical analysis has shown, volcanic material (augite and sanidine) (Fig.1, Type 4,5,6,7). The widespread West-Mediterranean distribution (especially in central and southern Italy) and the close petrological correspondence of these groups with known Italian products argues strongly in favour of a central/southern Italian source (south Etruria, Latium and Campania) (Peacock 1977; Peacock & Williams, 1986). The chemical analysis of the material found in Albintimilium, but which was probably imported from central/southern Italy, enables us to establish at least pottery groups.

The first group comprises cooking ware of high quality, pots, lids, plates and pans ("orlo bifido" cooking pots) (Fig.1, Type 4,5,6) and some fragments of the "Pompeian Red Ware". Vessels of this type were widely used in the West-Mediterranean area and

have also been found in Albintimilium; they date from the 1st century B.C. to the 1st century A.D. The mean concentration of this group shows a similarity with that of the analysed comparative material from Ostia, which represents the typical cooking ware of the region around Rome and of central Italy (Table I and Fig.2).

Under the microscope this group is characterised by grains of green augite, sanidine, quartz, grains of plagioclase feldspar, biotite, and sometimes rock fragments which display a trachytic texture and volcanic glass.

The second group is comprised of mortaria (Hartley, type 1), basins and table ceramics excavated from late 1st century B.C. layers (Fig.1, Type 7). The vessels from this group are also attested in other Mediterranean sites. The second group has higher values of CaO and MgO than the first (Table I). From a mineralogical point of view, the analysed pottery of this group has a finer matrix and less inclusions (augite and mica schist).

For the present, a more precise chemical grouping and technological discussion of the central/southern Italian coarse pottery is impossible, due to the low number of analyses and the lack of reference groups.

CONCLUSION: From the results of the analysis, combined with the archaeological data, it is possible to conclude that coarse ceramics in Albintimilium between the 1st century B.C. and the 1st century A.D. are heterogeneous and have various origins (the materials from central Italy have been clearly isolated).

From the 4th to 7th centuries A.D. an intensive local production covered not only the local needs for coarse ceramics but was a source of exports to the surrounding area. In this period few ceramics were imported.

These results indicate that some coarse ceramic products were trade objects and demonstrate the need for more up-to-date studies of this type of ceramic, so as to define and characterize the coarse vessels exported across local and regional frontiers. The reason behind the transport and trade of this simple coarse pottery was probably an economical one: it was an extra-cargo to fill-in the empty spaces in the ships carrying food and amphorae, as has been proven by the excavations of Roman wrecks (Tchernia et al., 1978). But it was also the high technical standard of this purely functional ceramic which contributed to its success.

Acknowledgements: I wish to thank Dr. F. Pallarès Salvador, Director of "Istituto Internazionale di Studi Liguri" for having suggested the study of the coarse ceramics from Albintimilium and for giving me every encouragement and Prof.Dr. W.-D. Heilmeyer (Seminar für Klassische Archäologie, FU Berlin), who has agreed to supervise my Ph.D thesis, for his help and support too.
Special gratitude is due to Dr. B. Hoffmann and Priv. Doz. Dr. G. Schneider (Arbeitsgruppe Archäometrie, FU Berlin) for their continuous aid and advice in archaeometrical questions. Moreover the members of the "Arbeitsgruppe Archäometrie, FU Berlin" (G. Schuchardt, U. Eckertz-Popp, A. Pape, Y. Lira-Lopez, E. Werner, E. Wirz) have supported the work. Finally, many thanks to the "Soprintendenza Archeologica della Liguria", who authorized the analyses, to Dr. C. Coletti for giving me sherds from Ostia to analyse and to Prof. T. Mannoni and Dr. M. Picon for providing a lot of helpful information.

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Archaeometry '90