

Article

Gaming in Pre-Roman Italy: Characterization of Early Ligurian and Etruscan Small Pieces, Including Dice

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Featured Application: Several unusual small objects from the Villa del Foro archaeological excavation were characterized and interpreted either as gaming pieces or functional materials.

Abstract: An interesting assemblage of ancient ceramic materials connected or potentially connected with gaming activities has been characterized from the archaeometric point of view. The materials (washer-like pieces, small spheres, and cubic dice, with and without inscriptions) were found in the Villa del Foro excavation (Alessandria, Italy). They are related to the early Ligurian population of the site and their frequent contacts with Etruscan both in Etruria and in the Po Valley, in a period spanning the early VI century BC till the first half of the V century BC. Starting from the materials evidence, hypotheses are proposed concerning their possible use and cultural meaning. The studied cubic dice are discussed in the wider context of the pre-Roman diffusion of these objects.



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Keywords: dice; gaming pieces; Ligurian; Etruscan; clay spheres

1. Introduction

There is substantial knowledge on ancient games, especially on the use of board games in the ancient cultures of the Middle East (see for example: [1]), to the extent that for some of them, detailed rules for playing and general utilization are sufficiently well understood (Finkel 2007 [1], pag. 16–32), as is their role in social activities and cultural transmission [2,3]. However, investigations on ancient gaming materials in Europe are rather limited. Only in the last thirty years have several thematic exhibitions focused on the games in ancient times and the materials related to the games themselves [4–8].

The recent find of an unusual assemblage of small objects during the archaeological excavation at Villa del Foro (Alessandria, Italy) [9], possibly related to gaming practices in Pre-Roman cultures, has prompted an in depth characterization of the materials as an aid to the interpretation of their manufacturing and use [10,11]. The assemblage is composed of cubic dice, washer-like pieces, and small spheres. The archaeometric characterization of the objects is presented here, as well their interpretation based on the available knowledge of coeval similar objects.

2. Materials and Methods

The analyzed objects are listed in Table 1. They were found during the archaeological excavation in different locations of the site: about one-third are sporadic finds or were recovered on the surface, whereas two-thirds belong to specific stratigraphic units. The archaeological information related to the exact location and stratigraphy of the objects is discussed in detail in Paltineri [10]. Summarizing the results: one washer-like piece and one sphere were recovered from the arable layer; two washer-like pieces, one sphere and

five un-inscribed dice are from an alluvial deposit (area B, US 2010). Four un-inscribed dice were found in a combustion pit together with abundant ceramic sherds, spindles and animal remains (area E, US 1531); one un-inscribed dice and one sphere associated to dice with irregular numbers or signs (Figure 1d) were found in the two filling layers (US 1649 and US 1549) of the same combustion pit. In the same area (area E) other pieces were recovered: an un-inscribed dice from a filling layer (US 2122) of a second pit containing ceramic fragments; and an un-inscribed dice and a washer-like piece from a dumping (US 1505) possibly related to a production zone. The dumping material also yields spindles, large terracotta rings, numerous ceramic sherds, fragments of grindstones, and furnace remains. A different area of the site (area F) yielded three washer-like pieces from an ancient layer of the settlement (US 1501); a fired surface probably used for food preparation (US 1514) and a fired clay area with unknown function (US 1571) [10]. Even if there are no systematic association patterns between the different types of objects, at least in one case un-inscribed dice are in a secure connection with sphere and washer-like pieces.

Based on the ceramic types associated with the finds the proposed date for the un-inscribed dice is VI century BC; a washer-like piece and another un-inscribed dice are dated to the end of the VI-beginning of the V century BC, and another washer-like piece is dated to the first half of the V century BC. However, the occurrence and distribution of the objects indicate that they were in use during the whole life span of the site, that is between the early VI century BC till the first half of the V century BC [10]. The small objects of interest are mostly composed of fired ceramics, except one dice made out of bone, and they can be described by three principal shapes: (1) cylindrical washer-like discs, (2) small spheres, and (3) cubic dice (Figure 1).

All samples were initially weighed and dimensionally measured with a caliper. The results are reported in Table 1. In the case of irregular shapes, the minimum and maximum dimensions are listed.

Two coeval dice reported from the nearby site of Castello di Annone [12] are also listed in Table 1, they were included because they bear similarities with the Villa del Foro materials and because one of the two dice has specific Etruscan letters. No analytical data are available for these samples, except for the stereomicroscopy investigation of the surfaces. They are made of ceramics as well. One of the two dice is unmarked, whereas the other bears Etruscan letters on two sides, and a variable number of small incised dots (9–12–17–22) randomly distributed on the faces (Figure 2), plus several linear marks on the edges.

Based on macroscopic observations, the major differences between objects are (1) the overall size, (2) the presence or absence of finishing pigmentation on the surface, and (3) the presence or absence of incised decorations and/or inscriptions.

All samples were further characterized by X-ray powder diffraction (XRPD) and Raman spectroscopy, in order to control the composition of the ceramics, the degree of firing, and the composition and application technique of the surface pigments.

The XRPD measurements were made on minute quantities of material using a PANalytical X'Pert Pro goniometer operated in θ - θ Bragg–Brentano geometry and equipped with a Pixcel RTMS detector. Measuring conditions were: Cobalt $K\alpha$ radiation, 40 kV and 40 mA power, angular range 3–85° 2θ , virtual steps of 0.02° 2θ . Because of the very small amount of material extracted from the objects, the signal was optimized by using a rotating zero-background sample holder. The diffraction spectra were analyzed using the X'Pert HighScore Plus software 3.0 of PANalytical.

Micro-Raman analyses were performed with a DXR Thermo Scientific instrument, equipped with a 532 nm laser and a 50× LWD (Long Working Distance) objective. The working condition selected for the analyses is acquisition time 3 s, 32 scans, 5 mW and a 25 μ m pinhole. The spectra were processed with the Omnic 9 software (Thermo Scientific, Waltham, MA, USA) and compared with reference spectra recovered from the online RRUFF database (<http://rruff.info>) and from our internal database of minerals and pigments.

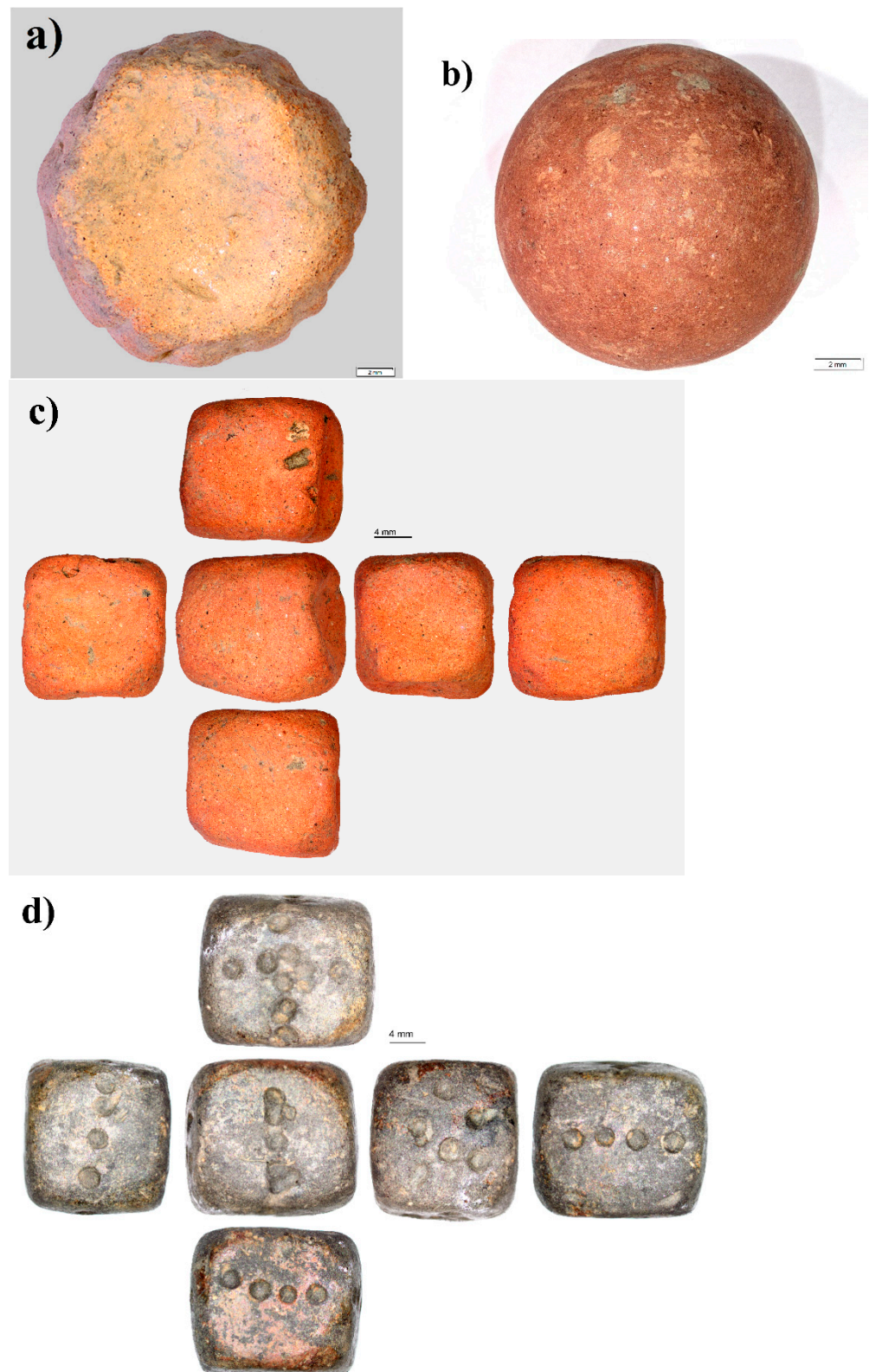


Figure 1. Representative shapes of the investigated objects from Villa del Foro: (a) washer-like disc, with indented borders (VF91.157/E1); (b) small ceramic sphere with a red colored surface (VFRS111); (c) cubic dice with no inscriptions and red-pigmented surface (VF14.SP384D); (d) cubic dice with numbers or other signs (VF90.1549/E32). The scale bars are (a,b) 2 mm, and (c,d) 4 mm.

Table 1. List of investigated materials from Villa del Foro (Alessandria, Italy).

| Id. | Catalog n. | Location | Material | Description | Dimensions (cm) | Weight (g) |
|--------------------------|--------------------|----------------------------|-----------------|---|---|-------------------|
| Washer-like discs | | | | | | |
| 1 | VF86.1000.12 | area A, S5E10 g7, US 1000 | fired ceramics | Irregular clay disc, with rough reeded edge | ø max 2.7; ø min 2.4; h. 0.8 (ø mean 2.5) | 5.50 |
| 2 | VF86.1210.1076 | area B, US 1210 | fired ceramics | Roughly modeled clay disc, irregular circle shape, flat section | ø max 2.9; ø min 2.8; h. 0.6 (ø mean 2.85) | 6.52 |
| 3 | VF86.1210.917 | area B, S6E10, US 1210 | fired ceramics | Rough clay incomplete semi-circle, flat section, nail marks on one surface | ø max 5.8; ø min 3.7; h. 1.1 (ø mean 4.85) | 23.46 |
| 4 | VF88.1501.E39 | area E, US 1501 | fired ceramics | Irregular clay disc, flat asymmetric section | ø max 2.9; ø min 2.5; h. 0.9 (ø mean 2.75) | 6.99 |
| 5 | VF91.1571.E41 | area E, US 1571 | fired ceramics | Flat circular clay disc, with one slightly concave surface, vertical nail marks on the edge | ø max 2; ø min 1.9; h. 1 (ø mean 1.95) | 19.50 |
| 6 | VF.SP244 | stray find | fired ceramics | Irregular flat clay disc | ø max 2.9; ø min 2.8; h. 0.7 (ø mean 2.85) | 5.68 |
| 7 | VF.SP251 | stray find | fired ceramics | Irregular clay oval disc, carved out of a pot fragment | ø max 6.4; ø min 5.5; h. 1 (ø mean 5.98) | 49.90 |
| 8 | VF.SP187 | stray find | fired ceramics | Roughly modelled fragmented clay emi-sphere | ø max 1.8; ø min 1.6; h. 1.4 (ø mean 1.70) | 3.82 |
| 9 | VF90.1514.E40 | area E, US 1514, [US 1530] | fired ceramics | Irregular clay circular disc with eleven engraved lines on a side | ø max 5.6; ø min 5.4; h. 0.7 | 5.50 |
| Spheres | | | | | | |
| 10 | VF89.1210-VIII.B24 | area B, US 1210 VIII tg. | fired ceramics | Irregular clay sphere | ø max 1.9; ø min 1.7 (ø mean 1.80) | 6.02 |
| 11 | VF90.1549.E33 | area E, US 1549 [US 1531] | fired ceramics | Irregular clay sphere | ø max 1.4; ø min 1.3 (ø mean 1.35) | 2.98 |
| 12 | VF.RS111 | area C, surface find | fired ceramics | Irregular clay sphere, surface pigmented in red | ø max 1.4; ø min 1.4 (ø mean 1.40) | 2.81 |
| 13 | VF.SP247 | part. 199 | fired ceramics | Irregular clay sphere | ø max 1.9; ø min 1.7 (ø mean 1.80) | 4.86 |
| 14 | VF14.SP385D | stray find | fired ceramics | Irregular clay sphere | ø max 1.4; ø min 1.2 (ø mean 1.30) | 1.94 |

Table 1. Cont.

| Id. | Catalog n. | Location | Material | Description | Dimensions (cm) | Weight (g) |
|---|-------------------|----------------------------|----------------|--|-----------------------------------|------------|
| Dice with no marks or inscriptions | | | | | | |
| 15 | VF88.1210-X.B22 | area B, US 1210 X tg. | fired ceramics | Irregular clay cube, rounded edges | 1.19; 1.15; 1.14 (side mean 1.16) | 1.84 |
| 16 | VF88.1210-II.B23 | area B, US 1210 II tg. | fired ceramics | Irregular clay cube, rounded edges | 1.36; 1.33; 1.32 (side mean 1.33) | 2.06 |
| 17 | VF87.1210-III.267 | area B, US 1210 III tg. | fired ceramics | Irregular clay cube, rounded edges | 1.37; 1.33; 1.24 (side mean 1.31) | 3.69 |
| 18 | VF87.1210-V.49 | area B, US 1210 V tg. | fired ceramics | Irregular clay cube, rounded edges | 1.63; 1.56; 1.54 (side mean 1.57) | 6.34 |
| 19 | VF87.1210-V.B3 | area B, US 1210 V tg. | fired ceramics | Fragmented irregular clay cube, rounded edges | 1.28; 1.21; 1.05 (side mean 1.18) | 2.01 |
| 20 | VF07.2122.1D | area M, US 2122 [2080] | fired ceramics | Irregular clay cube | 0.99; 0.98; 0.96 (side mean 0.97) | 1.53 |
| 21 | VF90.1000.E36 | area E, US 1000 | fired ceramics | Irregular clay cube, rounded edges | 1.30; 1.31; 1.42 (side mean 1.34) | 3.05 |
| 22 | VF88.1505.E37 | area E, US 1505 | fired ceramics | Irregular clay cube, rounded edges, blackened surface | 1.61; 1.59; 1.58 (side mean 1.59) | 6.94 |
| 23 | VF90.1549.E34 | area E, US 1549 [US 1531] | fired ceramics | Irregular clay cube, rounded edges | 1.46; 1.44; 1.43 (side mean 1.44) | 4.53 |
| 24 | VF91.1531.E38 | area E [US 1531] | fired ceramics | Irregular clay cube, rounded edges, surface pigmented in white | 1.84; 1.82; 1.80 (side mean 1.82) | 8.60 |
| 25 | VF90.1649.E35 | area E, US 1649 [US 1531] | fired ceramics | Irregular clay parallelepiped, concave surfaces | 1.26; 1.23; 0.87 (side mean 1.12) | 1.56 |
| 26 | VF.RS236 | surface find N11W1 | fired ceramics | Irregular clay cube, rounded edges, surfaces pigmented in red | 1.65; 1.60; 1.41 (side mean 1.55) | 5.17 |
| 27 | VF.RS237 | surface find N11W9 | fired ceramics | Irregular clay cube, rounded edges | 1.60; 1.55; 1.43 (side mean 1.52) | 5.79 |
| 28 | VF.SP237 | stray find | fired ceramics | Irregular clay cube, rounded edges | 1.49; 1.48; 1.42 (side mean 1.46) | 3.91 |
| 29 | VF.SP285bis | stray find | fired ceramics | Irregular clay cube, concave surfaces | 1.38; 1.33; 1.24 (side mean 1.31) | 3.16 |
| 30 | VF14.SP284D | stray find | fired ceramics | Irregular clay cube, rounded edges, surfaces pigmented in red | 1.59; 1.54; 1.52 (side mean 1.55) | 5.20 |
| 31 | CDA95-C45-F06 | Castello di Annone cum. 45 | fired ceramics | Irregular clay cube | 1.60; 1.51; 1.48 (side mean 1.53) | 5.38 |
| Dice with numbers or inscriptions | | | | | | |
| 32 | VF90.1549.E32 | area E, US 1549 [US 1531] | fired ceramics | Irregular clay cube, rounded edges, incised with aligned series of dot impressions | 1.92; 1.70; 1.67 (side mean 1.76) | 9.06 |
| 33 | VF14.SP386D | stray find | fired ceramics | Irregular clay cube, numbers on the faces marked with small dot impressions | 1.10; 1.09; 1.07 (side mean 1.08) | 2.15 |
| 34 | SP909 | stray find | bone | Regular cubic dice, numbers on the faces marked with centered circles | 1.16; 1.28; 1.28 (side mean 1.24) | 3.62 |
| 35 | CDA95-C35-F2 | Castello di Annone cum. 35 | fired ceramics | Irregular clay cube, two sides marked with Etruscan letters, the other four sides marked with dots and lines | 1.41; 1.39; 1.37 (side mean 1.39) | 3.94 |



Figure 2. The dice CDA95-C35-F2 from Castello di Annone with signs, dots and two Etruscan numbers in letters [12]. Scale bar: 4 mm.

Because of the puzzling presence of several cubic dice with no writing marks or numbers, Raman chemical mapping and multispectral optical imaging were also used to image the unmarked surfaces in the attempt to check for eventual phantoms indicating residues of disappeared, degraded, or canceled signs. Surprisingly, no evidence whatsoever was found of labile or disappeared inscriptions, therefore supporting the pristine unmarked state of several of the cubic dice.

3. Results of the Materials Analysis

For each find, the mean dimensions (i.e., mean side for cubes and mean diameter for spheres and circles, Table 1) were calculated for statistical analysis and comparison purposes. The details of the statistical distributions of dimensions and shapes for each typology of material are reported and discussed by Angelini et al. [11].

Here we only report the observation that independent of the size and shape of the object, the approximate density obtained by the calculated weight/volume ratio is constant, and indicates similar raw materials and manufacturing techniques. Moreover, the density of the ceramic used for the production of the dice is similar to the one of bone dice. This characteristic may be relevant in the throwing of the dice.

In each class of objects, or considering the whole set of finds, no occurrence of specific values of weight, and no system of multiple or submultiple values was observed. It is, therefore, possible to exclude the use of these objects as weights. This deduction is supported also by the absence of hooks, holes, or lateral grooves that are generally present in Bronze Age and Iron Age weights ([11], and references reported therein).

As expected from the visual observations and the preliminary density measurements, the main composing material of the ceramic bodies is a common mixture of clay and sand, fired at relatively low temperatures (600–800 °C). The range of firing temperature is deduced from the absence in the XRD analyses of clay minerals that decompose generally at about 600 °C or below, and the presence of micas that commonly start dehydroxylation transformations at temperatures of about 900 °C. Apart from the VF.SP251 washer disc that was manufactured by filing and abrading a recycled ceramic fragment of common

fired pottery, all other objects were roughly put into shape by hand modeling the clay paste before firing. Most of the decorating nail marks visible on the washer-like discs (Figure 3) were also made before firing.

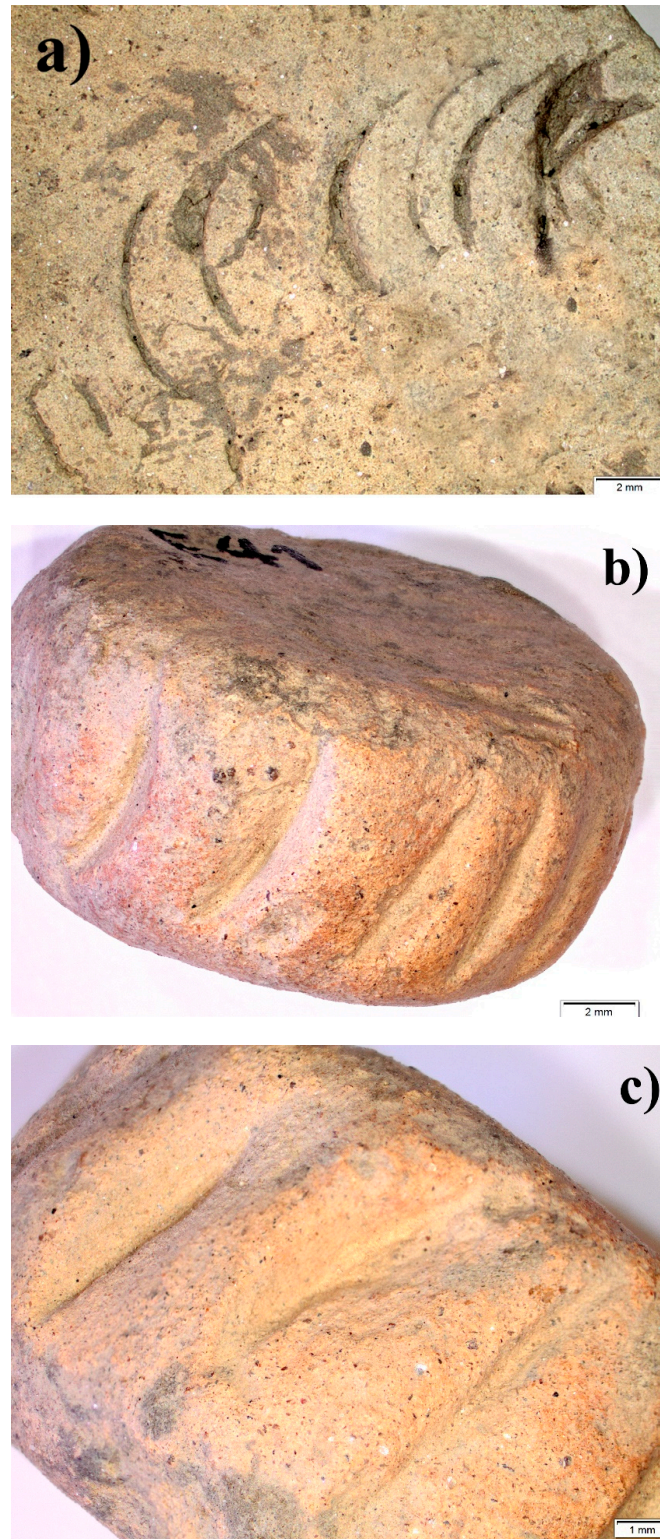


Figure 3. (a) nail marks visible on the flat surface of the VF-pU210-E10 washer disc; (b,c) vertical nail incisions made on the lateral edge of the VF-pd571-E41 washer disc. The scale bars are (a,b) 2 mm, and (c) 1 mm.

Indeed the systematic use of ceramics for such small pieces and for dice, in particular, is rather unusual since the great part of the investigated dice of Etruscan [13,14] or Roman [15] period are made of bone or ivory. Roman or pre-Roman dice made of amber, glass, metal, or stone are indeed known, though they are a very small fraction of those found in tombs and archaeological sites. This already indicates that the investigated assemblage from Villa del Foro has cultural aspects rather different from the main Etrusco-Roman tradition. As a matter of fact there are no known occurrences of Etruscan dice made of ceramics. The only reported ceramic dice are a few III millennium BC samples from the Middle East (Tepe Gawra, Iraq), and the Indus Valley (Mohenjo-Daro, Pakistan) [16,17], and several clay dice of the VII-VI centuries BC from Greek tombs [18]. The relevant presence of eighteen unnumbered cubic dice in the Villa del Foro context is also to be regarded as highly unusual. The only similar ceramic object known is from the nearby site of Castello di Annone (about 20 km west of Villa del Foro). Interestingly, in Castello di Annone was found also a ceramic dice with two numbers engraved in Etruscan letters (Figure 2) that were interpreted by Gambari [12] as ΘU (thu) and za (zal), respectively one and two. On the other faces of the cube are randomly impressed numerous points, and the dice seem to show the distribution: 1 (in letters)/18, 2 (in letters)/12 or 13, 9/22. The points are sometimes very close ones to the others and the decoration lines present on the edges of the faces may partially overlap the points; therefore, the readability of the points numbers seems to be not important for the use purpose of the dice. The function of these peculiar and unique dice has to be different from that of the normal dice with numbers or the unnumbered ones from Villa del Foro and Castello di Annone.

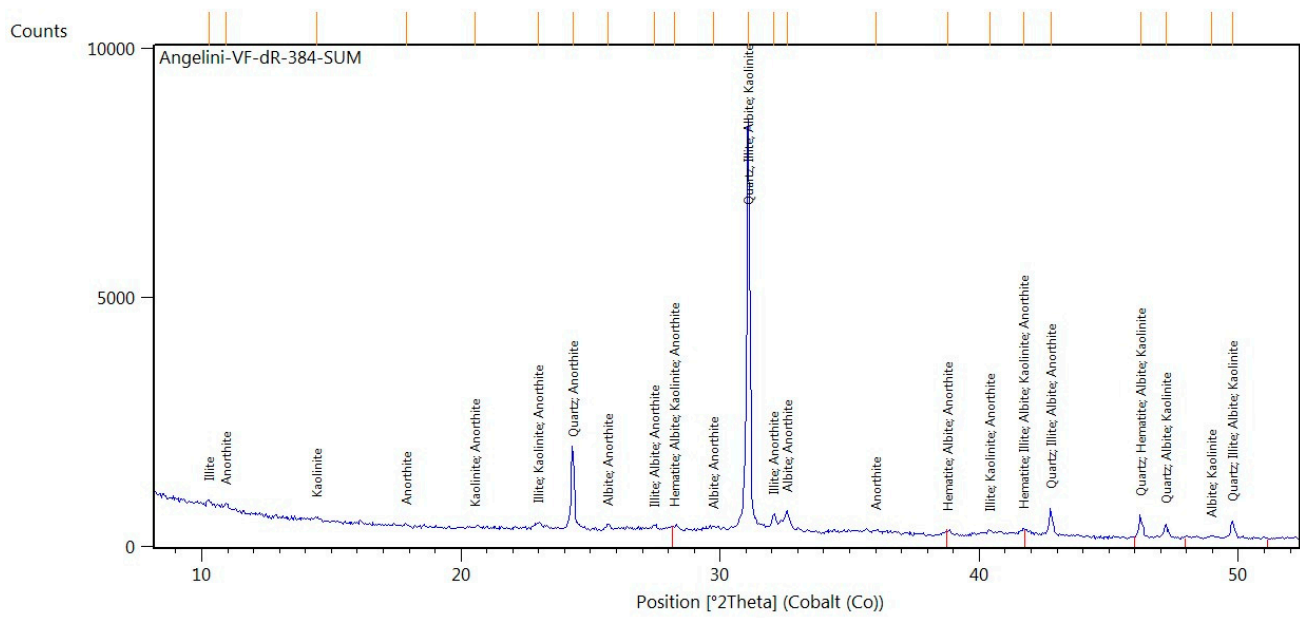
On the other hand, the use of fired ceramics for small spheres is a common occurrence in Northern and Central Italy since the Middle Bronze Age [19,20], so the presence of clay balls fits with the local use of such objects.

Concerning the colored surfaces, it should be noted that none of the washer-like discs has evidence of pigments in the surface, whereas one small sphere (VF.RS111, Figure 1b) and two dice have a visible red coating. The color is due to a hematite-rich surface layer in all cases, as unambiguously determined by XRPD and especially by the micro-Raman spectroscopy performed on a small quantity of the painted layers scrubbed from the surface of a die and a sphere (Figure 4). The other mineral phases identified in the red layer by XRD (mainly quartz, plagioclase and mica) may belong to either the ceramic body or the coloring raw material if an ochre-rich material was used. The red coating was, thus, made using crushed hematite or red ochre. In our opinion, the last hypothesis is more probable due to the availability, diffusion and large use of red ochre pigments.

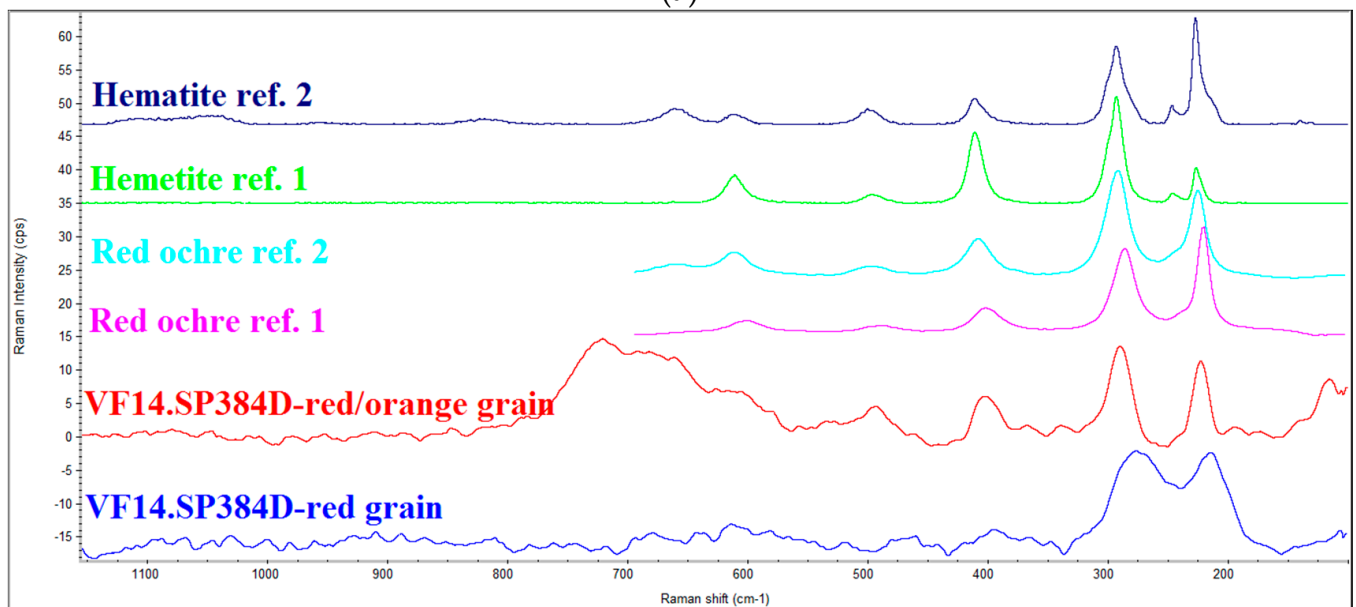
One dice (VF91.1531.E38) has a visible white coating layer on the surface, which is enriched in calcite, as shown by XRPD and Raman analyses (Figure 5).

In both the red and white cases the pigmenting mineral (ochre and calcite, respectively) form uniform patinas, that appear under the microscope as a compact layer, well connected to the ceramic body and that do not show loss of powder. It was not allowed to cut a section of the colored objects, but the OM study and the absence of organic or inorganic binders (especially in the red finds) suggest that the pigments were applied to the surface on purpose, likely before firing. The observation supports the fact that the dice are completely finished, and left unmarked intentionally.

A couple of dice show irregular black areas that were shown by Raman spectroscopy to be enriched in carbon black, possibly as the result of inappropriate firing during manufacturing in reducing conditions or accidental combustion at some point in the life of the object.

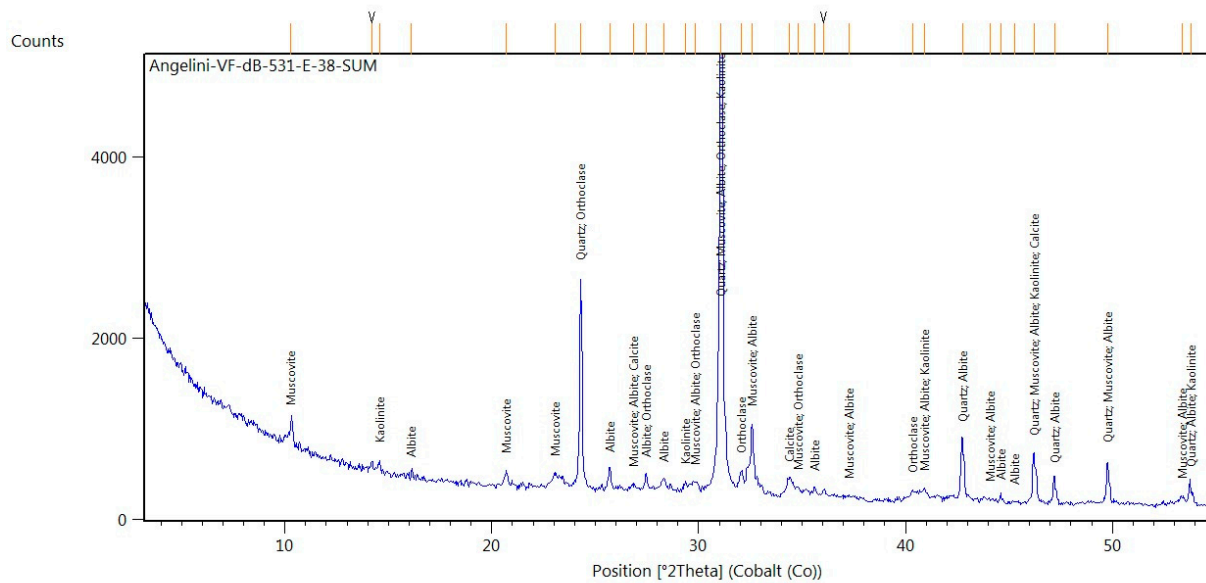


(a)

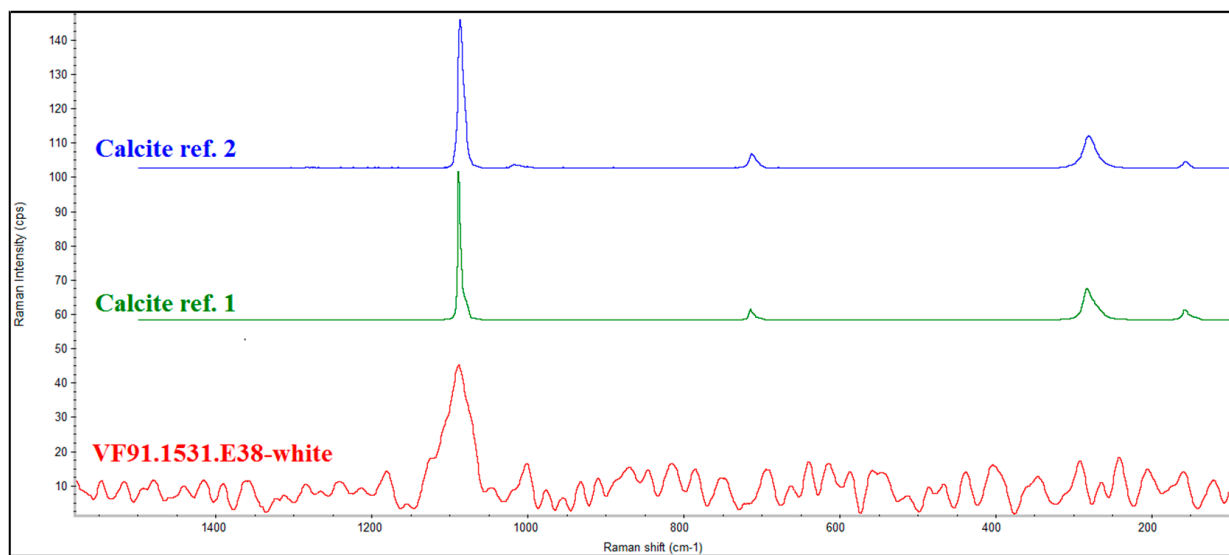


(b)

Figure 4. (a) XRPD diffractogram measured on the red coating of dice VF14.SP384D; (b) Raman spectroscopic signal of one red grain (blue spectrum) and one red-orange grain (red spectrum) present in the red coating of the same dice, compared with the spectra of two reference hematite (green and dark blue) and two red ochre samples (pink and cyan).



(a)



(b)

Figure 5. (a) XRPD diffractogram measured on the white coating of dice VF91.1531.E38; (b) Raman spectroscopic signal of the white coating of the same dice (red), compared with the spectra of reference calcite (green and blue).

4. Interpretation of the Objects

The occurrence of several types of small ceramics materials at Villa del Foro stimulates a number of considerations concerning their use. It is not clear whether the washer-like discs, the spheres and the dice had common functions, although their archaeological association and chronological distribution indicates that they all were in use during the lifetime of the settlement, which is considered to be an Iron Age rich trade site (*“emporium”*) along the river Tànarò [9]. During VI and V centuries BC the site was a dynamic trade site between the Ligurian populations living along the Tyrrhenian coast, the Golasecca people living in the Pavese area, and the Etruscan population of the Po Valley to the East and of Central Italy to the South. The Villa del Foro settlement was abandoned around the mid-V century BC, a period that started to witness a substantial inflow of Celtic people

through the Po Valley, with subsequent intense interaction between the Etruscan and Celtic cultures [9,21]. The decline of the settlement is mainly related to the change of the trade routes towards the Western Alps (e.g., the way along the Scrivia valley in the direction of Milan and Como increase its importance in time) [9].

Several proposals have been put forward to interpret the use of ceramic washers and balls, such as cultural function, seal for containers of different types, loom weights, pieces for board games or kids' toys, tokens for computation support for pottery. A detailed discussion of the evidence in favor or against each one of the hypothetical functions can be followed in Paltineri [10] and Angelini and Bettineschi [11]. Here we just recall that based on the archaeological context [10], the use/wear traces, and the technological properties and weight of the objects, the most likely function should be either as computational tools, or pieces for board games, likely associated to the dice. The interpretation as tools for calculations is stimulating, and it could in principle be linked to the vast trading activities of the site. Further, it is known that the earliest calculation tools in the Middle East were composed of tokens having different geometrical forms [19]. However, the association of the washers and spheres with dice, especially with the unusually large number of un-inscribed cubic dice, may well indicate an assemblage of board pieces with different shapes and colors, given the observed pigment coating. Indeed the lack of marks or inscriptions in all three types of materials supports this interpretation, rather than counting or divinatory activities.

On the other hand, there is little doubt that the dice with incised numbers were used for games. The dice having stick, parallelepiped, or cubic form were in use in the Indus Valley, Mesopotamia, and Egypt at least from the III millennium BC [16,17]. The traditional interpretation is that the dice games were introduced to Central and Northern Italy by Etruscans through the Greek world. There is no evidence of dice in Central Europe and in the Celtic or pre-Celtic cultures West of Italy [16,22,23] before Roman times, and this sets the wider cultural context of the Villa del Foro site during the VI and V centuries BC: a trading place between different cultures. Possibly one of the places where dice games were introduced by Etruscans to nearby populations of North-Western Italy.

There are two dice with numbers at Villa del Foro: (1) sample SP909 (Figure 6), made of bone, with incised numbers in the 1–6 2–5 3–4 configuration, that is the opposite faces sum to 7 (also defined as the “*sum 7 rule*” [14,15]), and (2) sample VF14.SP386D (Figure 7), made of ceramics, with impressed small points indicating numbers in the 1–6 2–4 3–5 configuration. The detailed analysis of the distribution of the numbers on the sides of a dice is a very interesting operation [11] and it cannot be fully detailed here. Based on previous work [11,13–15,24–26] we recall some of the main issues involved:

- (a) disregarding the rotation of the dice and the relative disposition of the points in the side of the cube, there are only 15 possible coupled configurations of numbers on opposite faces [13–17,25];
- (b) the two most frequent configurations in ancient dice are the 1–6 2–5 3–4 configuration (“*sum 7 rule*”) that is virtually the universal configuration found in modern dice, and the 1–2 3–4 5–6 configuration (“*difference 1 rule*”). It turns out that none of the two numerical distributions are naturally inserted on the face of the cube without cultural imprinting [24]. This is strong proof of the social and cultural transmission values of dice games [2,3];
- (c) in ancient Italy, the dice were introduced by Etruscans, the early dice had a parallelepiped shape, then evolved into the cubic one. The early dice (VII–VI century BC) on both sides of the Apennines (i.e., Etruria, South of the Apennines, and Etruscan Po Valley) were mostly of parallelepiped shape and have a neat prevalence of the “*difference 1*” configuration”, then largely shifting to the prevalent cubic form with the “*sum 7*” configuration in the V century BC. In Bologna (*Felsina*), the capital of Etruria in the Po Valley, the old shape and numerical configuration seems to maintain prevalence throughout the V century BC. Starting from the IV century BC the latter configuration is virtually the only one present and it continued to be prevalent in

the Roman world [9,11–13]. Because of the conservative character of dice in Etruscan Bologna, the bone dice of Villa del Foro (SP909, Figure 6) seem to testify to contact with Etruscans from the Tyrrhenian area, rather than the Po Valley.

- (d) in all periods, there is a small fraction of dice having a numerical configuration different from the two prevalent ones. In most cases, we have a doubling of a number and a missing one (for example 1-1 3-4 5-6), and sometimes we observe the doubling of three numbers and the omission of the remaining ones (for example 1-1 5-5 6-6 or 2-2 3-3 4-4). Such dice were sometimes interpreted as manufacturing mistakes or intentional variations for cheating, though the most probable use is in connection with board games [11]. Interestingly, many of these anomalously numbered dice were found in association with board pieces, such as glass checkers [11,16,27].

Within this context, the ceramic dice from Villa del Foro (VF14.SP386D, Figure 7) has both a numerical configuration (1-6 2-4 3-5) and the nature of the material (ceramics) that has never been observed in Etruscan dice [11]. Once more, such features confirm the use of the Villa del Foro dice at the boundaries of Etruscan cultural influence.



Figure 6. The dice SP909 from Villa del Foro, with numbers 1–6 incised in the “7 rule” configuration. Scale bar: 4 mm.



Figure 7. The dice VF14.SP386D 9 from Villa del Foro, with numbers 1–6 incised in the 1-6-2-4-3-5 configuration. Scale bar: 4 mm.

5. Conclusions

The very unusual dice found in Castello d’Annone, bearing Etruscan letters and randomly distributed dots (Figure 2), is a *unicum* that may be somehow compared to the well-known Etruscan dice with numbers in letters from Toscanella, discussed by various authors and interpreted as being used for ritual or divinatory purposes [28,29]. The same function has been suggested for the inscribed dice from Castello di Annone [12]. The features of these dice reflect contact with the Etruscan culture, although it is made of ceramic, which is not employed in the making of Etruscan dice. The presence of unnumbered ceramic dice in the site, and the peculiarity of the marks suggest a local production. The ceramic dice from Villa del Foro with irregular numbers of points, that are not well readable on three faces (Figure 1d), differs from all the other dice found in the settlement, and possibly it was used for similar ritual or divinatory purposes as the Castello di Annone dice bearing letters and signs.

Overall, the materials analysis of the small ceramic objects excavated from the Villa del Foro archaeological site confirms their exceptional importance both for the large quantity of recovered finds and for the reconstruction of the social and cultural context of this “emporium”. Based on the measured data and the archaeological information, it is proposed that the ceramic pieces, in the form of washers, spheres, and unnumbered cubes, were used as counters in board games. The use of these objects as tokens for computation cannot be excluded, although in our opinion it is considered less probable for several reasons. At first, the recovery of two dice with numbers from 1–6 testify to the presence of ludic activities in the site. Moreover, in the Etruscan world game counters were widespread and often found in association with dice, as discussed below. The connection of Villa del Foro with the Etruscan culture is proved by different finds recovered in the site [9] and by the presence of cubic dice with numbering 1–6 and a configuration in agreement with the “*sum 7 rule*”. It is therefore probable that the numerous ceramic washers, cubes and spheres had the same function as the Etruscan counters made with different materials. The red or white color intentionally given to some sphere and cubes from Villa del Foro support this idea.

No remains of the board were found in Villa del Foro or in other sites in Northern Italy or in the Etruscan territories; so it is impossible to know what kind of game was played. On the other hand, the use of board games is well proven by the presence of numerous counters made with different colors and materials (often associated with dice), found in Etruscan tombs [10,11,19,22,27]. Based on the iconographic study of ceramic decorations and on a few engraving in stone found mainly in Greek and Roman contexts, many studies and hypotheses of the types of board game used have been published (e.g., [1,3,18,21]). Likely, the same or similar types of board games were played in Villa del Foro.

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