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UNDERSTANDING THE EFFECT OF TRAMPLING IN A SPATIAL PERSPECTIVE: A CASE STUDY FROM A LONG-LIVED-IN DWELLING SPACE OF THE BRONZE AGE SETTLEMENT OF COPPA NEVIGATA (SOUTH-EASTERN ITALY)

1. Introduction

Since the 1960s, debate on the formation processes of archaeological deposits became a pivotal topic for prehistoric studies (Ascher 1968; Binford, Binford 1968; Schiffer 1972; Binford 1981; Orton, Tyers 1990; Leonardi, Balista 1992; Wilson 1994; Brantingham *et al*. 2007; Lucas 2012; Milek 2012; Kuna 2015; Driscoll *et al.* 2016). The wide range of agents and dynamics that may have intervened during the process of formation of such contexts led researchers to adopt diverse methodological and interdisciplinary approaches: from morpho-dimensional analysis of objects (Balista *et al.* 1990; Di Lernia 1996) or ecofacts (Oría *et al.* 2016; Bovy *et al.* 2019) to micromorphological analysis of sediments (Matthews *et al.* 1997; Cremaschi, Pizzi 2010; Debandi *et al.* 2019). Clearly, each investigation is deeply influenced by the cultural and environmental characteristics of the context under scrutiny and by the archaeological questions being posed.

Long-lasting prehistoric settlements can constitute a tough challenge for the comprehension of formation processes of the archaeological record. Indeed, there are few cases in which this is relatively straightforward, such as those contexts affected by sudden destruction events, known in literature as "Pompeii premise" (Binford 1981; Schiffer 1985). On the other hand, for the vast majority of those characterized by a long-life use of the same physical spaces (Merrill, Read 2010) and incorporating much rubbish and debris, such as stated in the "flow model" by M. Schiffer (1972, 158)[1], the prolonged interweaving between anthropic and natural alteration agents produces hardly understandable narratives of the archaeological deposits. The unceasing transformations can be reflected in:

– primary deposition alteration, resulting in sub-primary, secondary or tertiary refuse deposits (Schiffer 1972; Kuna 2015);
– morpho-physical decay of the objects caused by mechanical and chemical stresses that hamper the possibility to achieve a specific stylistic-typological-functional identification of the archaeological remains (Skibo 1987; Nielsen 1991; Bovy *et al.* 2019).

[1] This concept has been expressed by L.R. Binford and S.R. Binford in 1968.

Intrasite dwelling spaces are often deeply affected by these alterations of the record; indeed, the repeated use of the space for different activities, physically overlapping each other (Merrill, Read 2010), results in a palimpsest of refuse elements apparently chaotic in their distribution and scarcely preserved. Since the archaeologist is faced by these puzzling conditions, long-life dwelling spaces have been often underused for interpreting social behavioural patterns, especially regarding spatial studies on the microscale. Naturally, those contexts characterized by the so called "Pompeii premise" are preferred (Binford 1981; Schiffer 1985). Currently, archaeological debate is overcoming this bias: recent studies stress the high potentiality these contexts have to help understand human behaviours, through an interdisciplinary approach that integrates, in different ways, analyses of archaeological deposit formation processes (Revelles *et al.* 2017; Achino, Barceló 2018; Lucci 2020).

This paper sets out the methodological approach used to analyse the effect of trampling on the archaeological record in a specific context. It is based on comprehending the fragmentation rate of *impasto* shards and the spatial distribution of well-preserved *impasto* vessels. The analysis is part of a wide PhD project (recently ended: Lucci 2020) aimed at understanding pattern(s) of use of an internal area of the Bronze Age settlement of Coppa Nevigata (South-Eastern Italy) through a GIS-integrated spatial analysis of artefacts and ecofacts. The approach is tailored to the specific case study, where, among the wide spectrum of post-depositional transformation agents, trampling, resulting from movement streams of human and animals (also potentially the use of chariots), is probably the most influential. It produced a high fragmentation of artefacts and ecofacts, resulting in little chances of achieving a stylistic and functional determination, and also in unintentional displacement. Thus, to take up the challenge of exploring the effect of trampling, *impasto* pottery (shards and well-preserved vessels) has been adopted as proxy data. This class of artefact has great potential in analysing a wide range of aspects of prehistoric studies, from chronology to technology, from the social organisation of production to socio-cultural identities. Such analyses are widely performed for the site of Coppa Nevigata (Recchia, Levi 1999; Evans, Recchia 2003; Cazzella 2012). However, for this article, *impasto* pottery has been used for a different purpose: to explore trampling effects over the area under scrutiny.

The methodological process is based on the combination of the statistical analysis of shards-fragmentation rate and the spatial analysis of well-preserved vessels. The entire record of the *impasto* shards and all the well-preserved vessels have been considered: i) to understand the dimensional variability range of the shards record in full (avoiding distortions deriving from random sampling), ii) to observe the quantity of pottery remains among the diverse spaces, and iii) to figure out the impact of any trampling effect over a wide space. The results, combined with those produced by the integrated spatial analysis of artefacts and ecofacts (stylistically and functionally characterised), allow us to critically define pattern(s) of use of the space of an internal area of the Bronze Age settlement of Coppa Nevigata. A further outcome of the analysis is that it identifies a practical method, able to be adapted, for late prehistoric contexts where trampling effects or other types of post-depositional agents introduce a bias in a contextual analysis of finds.

2. The case study: a long-lived-in dwelling space of the Bronze Age settlement of Coppa Nevigata (South-Eastern Italy)

The settlement of Coppa Nevigata (South-Eastern Italy) is one of the most extensively excavated Bronze Age sites in Italy. It was located on the shore of an ancient lagoon, which connected the village to the sea. A very long-lasting settlement, its occupation spanned to whole 2nd millennium BC, as is testified by the depth of the archaeological sequence (Cazzella, Recchia, 2012). One of the most significant features of the settlement is the complex defensive system. The spatial organisation of the dwelling underwent significant changes through time, but it always remained in the same physical position.

This study focuses on an internal area of the settlement dated to the late phase of the 12th century BC (Late Bronze Age) located on the NE side of the village. The excavation was carried out using a grid composed from units of 25 m^2 (5×5 m); 13 squares frame the area under scrutiny (Fig. 1) but the square F2P has been excluded from the fragmentation analysis due to its low statistical significance (only 17 shards). At the W a domestic building consisting of two adjoined rectangular rooms is present: the western one is provided with a small cobbled patio, while the eastern one includes a cobbled circular structure; an external hearth adjoins the Room East to its E (Fig. 1). Some postholes testify to the presence of a perishable structure in the eastern part of the area.

On the plan (Fig. 1) is shown the broad investigated archaeological deposit dating to the Late Bronze Age (12th cent. BC, as witnessed by radiocarbon dates, contextual analysis of structures and stylistic analysis of pottery), disturbed by a destructive intervention in 1979. The archaeological deposit results from the repeated use of the area and structures under scrutiny over a certain span of time, without significant gaps or episodes of collapse. It has built up from the growth of refuse material from diverse activities, numbering thousands of artefacts and ecofacts that can have maintained their position of discard (primary refuse deposit), or can be produced by deliberate dumping (secondary refuse deposit; Schiffer 1972, 1983; Kuna 2015).

To investigate the presence of one or both of these conditions (given the extent of the area), it was first decided to investigate the impact trampling had on refusal elements, its effect on the spatial distribution and physical decay of movable remains. Clearly, since various agents of different natures could have

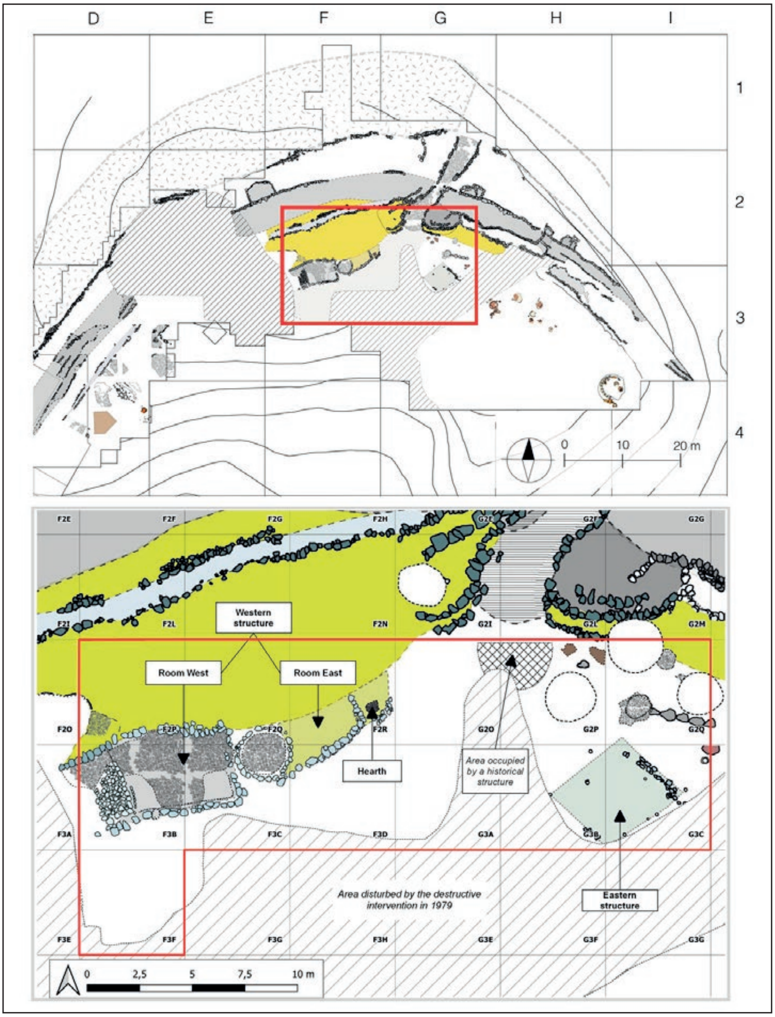

Fig. 1 – Above: map of the Coppa Nevigata settlement showing the features pertaining to the Late Bronze Age (12th century BC). The red rectangle marks the area under scrutiny. Below: the area under scrutiny with red line marking the grids analysed in detail.

affected the archaeological record, this analysis does not resolve by itself the main question (viz. if the nature of the deposit is primary or secondary). However, the trampling effect here constitutes the most influential agent in bringing the depositional system to a high degree of entropy (fragmentation and repositioning of the elements), as well as hampering the chances of recognising the

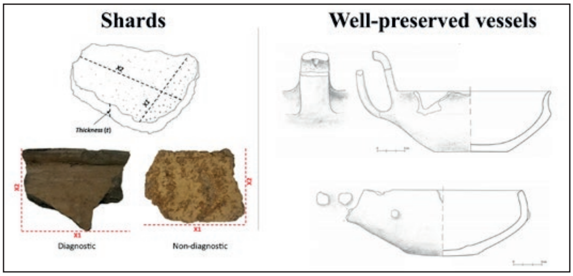

Fig. 2 – Left: *impasto* shards and dimensional parameters used to measure them. Right: two examples of well-preserved *impasto* vessels.

overall shape and functional attributes of the vessels. To deal with this, the effect of trampling on the archaeological record has been explored using a multi-analytical approach, which incorporates diverse data and types of analyses.

3. Materials and methods

3.1 *Impasto pottery as proxy data and introduction to the analytical processes*

Impasto shards can be considered a valuable proxy for assessing formation processes and post-depositional agents, such as trampling effects, in prehistoric contexts (Balista *et al.* 1990; Di Lernia 1996; Modesto *et al.* 2020). Here, after searching for joins and repairing the same, the vast majority of pottery elements remained as single diagnostic or non-diagnostic shards (pieces resulting from ancient breakage), though some pottery vessels were totally or partially restorable, so joining the category of well-preserved vessels (artefacts being at least 25% present; Fig. 2). Shards were firstly statistically analysed to understand their fragmentation rate, according to the dimensions of the pieces; secondly, the fragmentation rate across the space studied was assessed and recorded. A pivotal step in this analysis is the data entry process based on fixed size-groups. These size-groups have not been arbitrarily defined, but were tailored to the actual pottery assemblage; a random sample of 125 shards was statistically processed. The fragmentation rate of the entire pottery assemblage was then projected over the area under scrutiny to figure out diverse degrees of alteration over the area. In contrast, the better-preserved vessels were analysed exactly as and where they were found, in order to assess the presence of "respected spaces", that is to say areas only marginally affected by movement streams inside the settlement. Furthermore, a spatial distribution analysis of the shards of two well-preserved vessels was performed to observe the directions of dispersal encountered by the pieces of rubbish.

3.2 *Defining size groups on a sample of shards*

The fragmentation of pottery vessels in a prehistoric settlement is a stochastic process: it derives from an independent combination of factors (e.g., technological, human activities, environmental agents), producing a wide dimensional range of shards, hardly classifiable in a deterministic model. Defining significant variables for data entry is thus closely linked to the archaeological question and contingencies of the research (e.g., quantity of artefacts, aims of research, timeline). For the context under scrutiny, a fragmentation rate analysis was performed that would have produced results over a short period of time, in order to assess the potentialities of the spatial analysis during the initial phase of the process and then to critically understand the distribution of objects under the impact of trampling.

Hence, each shard has been measured using two variables that efficiently quantify the "width"*: X1* and *X2* (Fig. 2). The use of two variables, instead of the simple quantification of the fragment surface area, allowed to consider the overall fragment shape, which is crucial to understand the interaction between the alterative agent (i.e. trampling) and the object (e.g., a narrow-shape shard, in which *X1* is two or three times as much *X2* – or vice versa – reacts to mechanical pressure in a quite different way than one with square-shape in which those two variables are equal, even if they share a quite similar surface area). Moreover, a fragmentation rate of pottery cannot be really understood without considering the thickness of shards. It is an important aspect because this directly influences the resistance the shards possess to mechanical pressure. Clearly, thickness has a different nature compared to width: it derives from technological choices and is a static variable over the time[2]. It was measured once (a midpoint thickness) for each fragment (Fig. 2).

Basing on "width" and "thickness" variables, a random sample of 125 shards belonging to the squares F3B, F3C, F3D, G3A and G2O was measured (25 shards for each square, Fig. 1). This was done because the analysis was first carried out in those squares and then progressively expanded, in order to assess the viability of the methodological approach. It is important to specify that the number of fragments from the entire area was still unknown when this analysis begun.

Taking into account the high dimensional variability that could have affected the sample, clustering statistical analysis – specifically, K-means analysis (Baxter 2003) – was applied to figure out size groups of width. However, this clustering operation was not applied without a critical approach for the processed data. The estimation of the number of *K* has been obtained through

[2] Excepting cases in which pottery surfaces have broken off, but this was uncommon for the context under scrutiny.

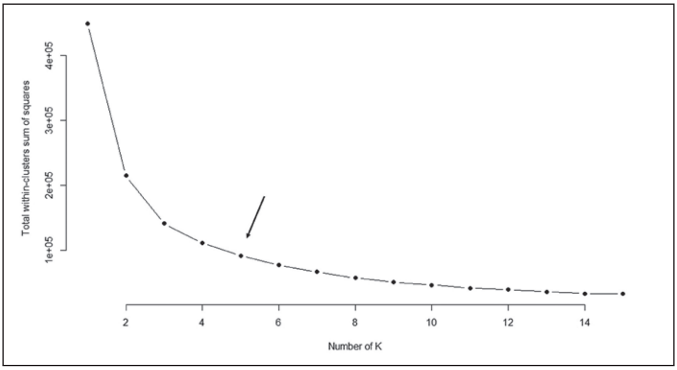

Fig. 3 – Chart produced by processing the dataset of 125 shards with Elbow method, the arrow highlights the number of chosen clusters.

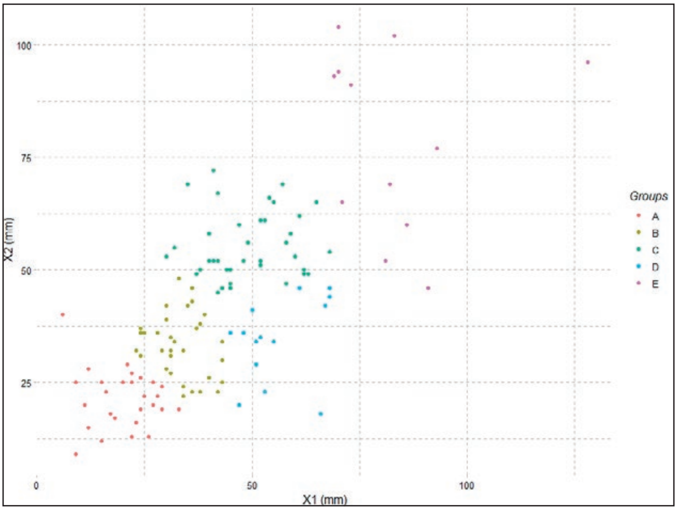

Fig. 4 – Plot of the sample composed by 125 shards; the diverse colours indicate the width groups defined through the K-means analysis.

the Elbow method (by the use of RStudio - Version 1.2.5), in order to return a viable number of partitions (or *K*). On the chart (Fig. 3) it is possible to observe the result of this test: despite the smooth trend of the curve, it is significantly influenced by the dimension variability of the shards (based on *X1* and *X2*), *K*=5 being considered as a significant value. The K-means analysis applied to the sample of 125 shards, according to the number of classes defined by the Elbow method (*K*=5), produced the results visible in the plot (Fig. 4). It

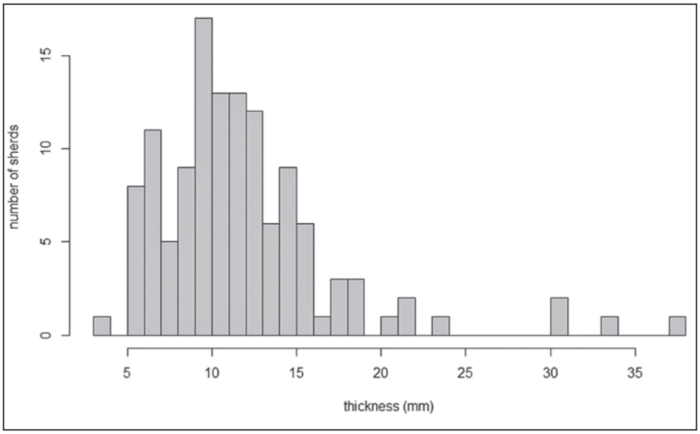

Fig. 5 – Histogram of the sample composed by 125 shards based on the thickness.

shows the distribution of elements indexed by clusters obtained through the K-means analysis. The C and D groups are symmetrically placed with respect to each other, but the difference is simply attributable to the orientation of the shards during measuring (not always definable), so they have been considered as a unique group (CD); furthermore, taking into account the presence of bigger fragments, a further group emerges besides those shown on the chart: Tab. 1 synthetises the width classes.

Width groups	X1 and/or X2 ranging from:
A	0 - 30mm
B	30 - 45 mm
CD	45 - 75 mm
E	75 - 110 mm
F	> 110mm

Tab. 1 – Width groups.

Classes by thickness have been defined according to a single variable (*t*); hence, the analysis presents a lower degree of complexity. The bar-chart (Fig. 5) shows an asymmetric distribution-trend with modal value on 9-10 mm, a consequence of the low-level of standardization and differentiation of *impasto* pottery vessels. However, it is possible to observe two breaks falling at 8 mm and 14 mm, while the presence of additional breaks for the bar chart boundaries (smaller and bigger thicknesses) is harder to define, considering that the low-populated frequency classes have less statistical significance. Starting from those consideration, three thickness classes have been defined, as synthesised in the Tab. 2.

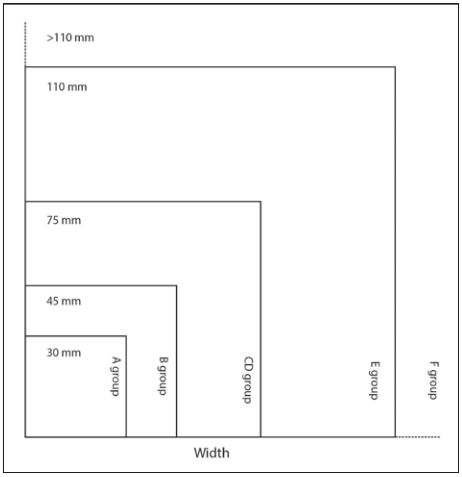

Fig. 6 – Data entry graphic model of width groups.

Thickness classes	Ranging from:
Thin	t ≤ 8mm
Medium	8mm < t ≤ 14mm
Thick	t > 14mm

Tab. 2 – Thickness classes.

Width size-groups did not remain abstract, but they have been translated in a graphic model (Fig. 6) and then used to physically measure shards. Thus, each shard was recorded and classified according to the size-groups listed above[3].

4. Results

4.1 *Spatial analysis of pottery fragmentation rate*

Basing on the data-entry model previously exposed, 11,411 *impasto* pottery fragments have been classified from the entire area under scrutiny, divided square by square as shown in the map (Fig. 7). The central squares show the largest numbers of fragments, whereas the marginal ones present a lower quantity of pieces (the square F2Q counts only 62 shards). These differences can be explained both as consequence of the different use of the

[3] Example of width recording: a fragment with X1=25 mm and X2=38 mm will be included in B group; a fragment with X1=70 and X2=42 will be included in CD group. Recording thicknesses is a simpler process, because it is represented by a single measure taken at a midpoint of the fragment.

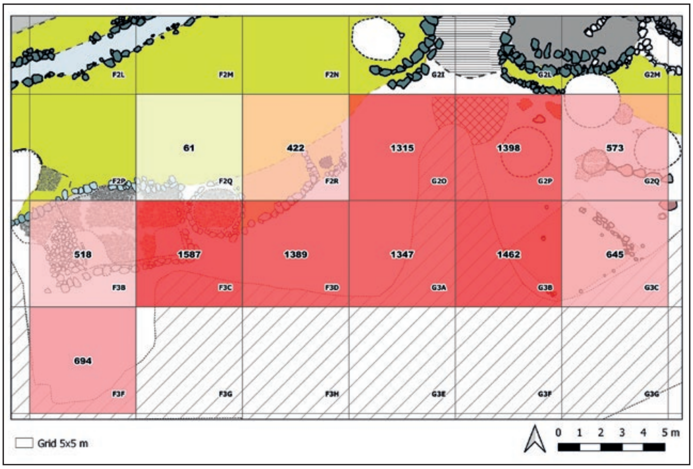

Fig. 7 – Number of shards yielded by the diverse squares under scrutiny.

spaces and related to the volume of preserved archaeological deposit that differs among the squares. These matters apart, the number of shards belonging to each square is statistically significant and comparable. Only the square F2Q needs a careful observation of the data, taking into account the particularly low number of pottery fragments (see above). With this premise, we can observe the results of the analysis performed over the entire record of shards classified according to the width and thickness size-classes.

The chart (Fig. 8a) shows the fragmentation rate combining the thickness classes (Thin, Medium and Thick; represented by the three coloured curves) with the diverse width classes (A, B, CD, E and F; on the horizontal axis). Considering the studied area in its entirety, it is possible to note that:

– the curve trend for the thin potsherds shows a high degree of fragmentation proportionally decreasing as their size increases, with no fragments for the bigger group (F);
– in the same way, the curve trend for the medium thickness shards, that represents the vast majority of the pottery fragments recorded, shows a high percentage of small fragments (A group) and medium-small fragments (B group) with a sudden decrease for the CD group and very low percentages for bigger ones (E and F groups);
– the curve of the thick shards shows a diverse trend from the others, it presents a peak for the medium-small and medium width groups (B and CD) and lower incidence for small (A) and medium-large and large (E and F) size-groups. This is probably linked to a greater resistance of the thick shards to the mechanical stresses they experienced.

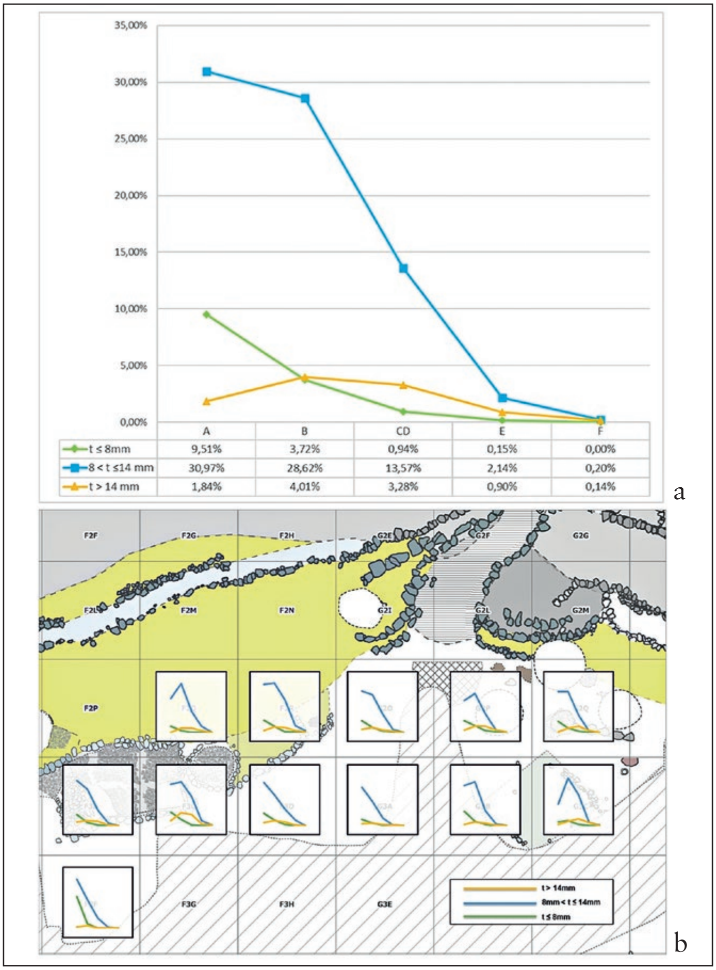

Fig. 8 – a) fragmentation rate of the entire area under scrutiny; b) fragmentation rate for each square.

Thus, it can be firstly observed that trampling effects have affected, proportional to the thickness, the whole record of shards. However, the observed area in its entirety includes various structures and spaces that could be affected by trampling to different degrees. Breaking down the data over the space, by squares, it becomes clear that the trends of shard fragmentation differ. The map (Fig. 8b) shows the charts by single squares, graphically simplified but structured in the same manner as seen in the previous chart (Fig. 8a): medium/small-size shards outnumber small-size fragments in the inner spaces and areas close to the structure. Conversely, moving away from the structure the small-size shards become the vast majority.

Therefore, it follows that the spaces close to the structures are less affected by trampling effect than the open spaces; moreover, the squares displaying a higher degree of shards fragmentation are placed along the settlement entrance axis, a further evidence that confirms the hypothesis about the presence of a "traffic zone"[4]. An exception is the square F3B, where a high level of small fragments is present. Here the ratio could be influenced by the structural characteristic of this space: the cobblestones on the eastern side of the Room West probably trapped the smaller shards on the top of their surface. Four squares to the E of the entrance show curves like those close to the western structure, so, in this area too the trampling effect affected less the fragmentation of refusal shards, probably as consequence of some structure now perished that was present in this part of the settlement.

Moreover, the distribution of pottery fragmentation (Fig. 8b) allows one to propose some other considerations: firstly, in F3F we can detect a higher incidence of thin pottery fragments, especially of small dimension (A group), than in other squares, this effect can be explained by a higher presence of small vessels on the spot or nearby. Secondly, F3C, which includes part of the stone structure and part of the adjacent open space, counts a high return of thick pottery fragments, with a peak in the B and CD width classes (med-small and medium size). The spatial analysis of functionally classified pottery stressed the presence of big vessels for storing and preparing foodstuffs here, notably at the SE corner of the structure (Cazzella *et al.* 2020; Lucci 2020; Recchia *et al.* in press), thus, in the opinion of the author we are observing a palimpsest of objects from a double point of view (morpho-functional and dimensional).

5. Exploring the distribution of well-preserved *impasto* vessels

The spatial analysis of well-preserved vessels (artefacts preserved at least for 25% of the entire) represents an additional opportunity to better understand formation and alteration processes in the archaeological deposit. Observing the map (Fig. 9), the distribution of these artefacts fits with the shard fragmentation rate distribution: the best-preserved vessels chiefly occur outside the structure, although in its proximity, with a notable cluster close to the hearth. Thus, we can assume that the further the distance from the structure the more trampling intensified. However, this map tells us something more: the distribution of well-preserved vessels follows the direction of the settlement entrance axis, a deduction in accordance with the pottery fragmentation rate (high-level of fragmentation) of the squares situated south of the settlement entrance.

[4] Term already adopted by A.E. Nielsen (1991).

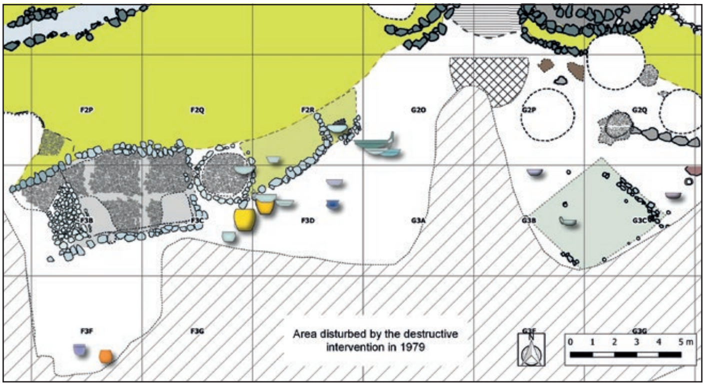

Fig. 9 – Spatial distribution of well-preserved vessels.

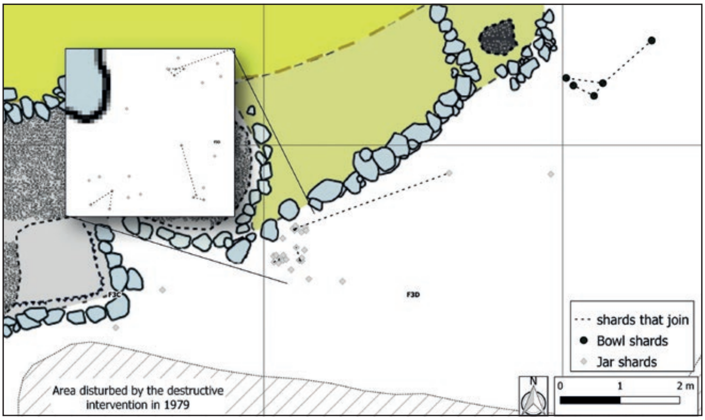

Fig. 10 – Spatial distribution of shards composing a well-preserved bowl and a well-preserved jar, the dotted line marks those shards that join.

This pattern emphasizes on one hand the presence of a more altered palimpsest of refusal elements in the open space, and on the other the direction of the main (or one of the main) "traffic zone" inside the settlement. In this way, the analysis combined the understanding of formation processes of the archaeological deposit and the pattern of use of the space. In an apparent and partial conflict to that is the absence of well-preserved vessels in the eastern area (only few small bowls), where there is low degree of fragmentation, but this is related to a different use of the area detected by the spatial analysis of other classes of finds (notably handcraft activities, e.g., bone artefact production; Cazzella *et al.* 2020; Lucci 2020; Lucci *et al.* 2020).

Nevertheless, it is important to take into account a further matter regarding the class of "well-preserved vessels". They were found in fragments, but these could be scattered over a wide space, or they may have been broken in the southern open space (or elsewhere) and then piled up along the south-eastern edge of the structure (the "marginal zone" effect discussed by M. Schiffer 1987 and then by A.E. Nielsen 1991). Thus, the spatial distribution of shards from two of the well-preserved vessels was analysed, in order to investigate about their range and dynamics of dispersion.

The map (Fig. 10) shows the shards related to two well-preserved *impasto* vessels: a bowl (diameter at the mouth of 28 cm and a height of 9 cm) and a small jar (max diameter of 17 cm and an estimated height of 22 cm). The bowl is made up from five big shards laid close to the hearth, which all join. Of the little jar the 30 shards brought to light were close to the south-eastern wall of the Room East: all the shards belong to the same artefact (according to the analysis of their technological characteristics), but not all join. The shards belonging to the bowl are clustered in a small group (within 1 m), excepting one lying about 1 m to the NE of the cluster. The pottery fragments belonging to the jar constitute a cluster close to the Room East (F3D), but two shards have been found close to the corner of the structure (F3C) and one fragment that fits with the others was recovered about 3 m to the NE. In this latter case, the fragments chiefly cluster over a little more than 1 m, with very few pieces scattered further afield (over a range of about 4 m). Both these shard dispersion analyses tell us something more about fragmentation and distribution processes; particularly, basing on the clustered distribution of the fragments, it is possible to rule out any dramatic effect of trampling and dragging on their spatial distribution in the archaeological record.

6. Final remarks

The understanding of the formation and alteration processes of prehistoric archaeological deposits represents a crucial step in exploring social patterns of behaviour through the spatial analysis of artefacts and ecofacts. Notably, the new perspectives afforded by GIS-based intrasite spatial analysis, increasingly focusing on archaeological contexts not affected by "Pompeii premise", require dynamic methods able to assess the reliability of the depositional set to reconstruct patterns of use of the space. This paper deals with this archaeological issue, showing the methodological approach, based on pottery fragmentation rate, adopted to better understand the effect of trampling on a long-lived in dwelling area of the Bronze Age settlement of Coppa Nevigata (South-Eastern Italy). The analysis sought to assess the reliability of that area in figuring out repeated patterns of use of the space, by carrying out a contextual spatial analysis of artefacts and ecofacts.

The core of the methodological approach is the construction of a data entry model able to quickly record dimensional information of shards, exploiting the entire pottery record (diagnostic and non-diagnostic). Clearly, the specificities of the context under scrutiny and the general aims of the research in which this fragmentation analysis was attempted influenced the approach. However, it represents an effort to devise a method that can be easily reused and adapted to other Late Prehistoric contexts, by refining the diverse steps. In our case study, the statistically composed data entry model was sufficient for a rapid acquisition of the measuring of a huge number of *impasto* shards (11,411 pieces). The dimensional parameters constituted by surface width (*X1* and *X2*) and thickness (*t*) of each shard, statistically processed, yielded interesting results for understanding the fragmentation rate of pottery overall.

The high-level of small size pieces highlights the important impact of trampling on the archaeological record. However, when observing the fragmentation rate for single squares, the result clearly reveals a duality between spaces that include structures (eastern and western), with a low fragmentation rate, and open spaces, with a large number of small shards. The spatial analysis of the well-preserved vessels, supported by the distribution analysis of two refitted vessels, corroborates the hypothesis of a "traffic zone" oriented on the settlement entrance and the presence of "respected areas" close to the structures. It is important to specify that this traffic cannot be exclusively associated with activities carried out in this specific area but rather reflects movement streams over the wider expanse of the settlement.

These observations lead us back to a pivotal issue, previously mentioned: is the archaeological deposit under scrutiny composed by primary or secondary refuse? To answer this question, it is essential to assess the interplay between what has been previously observed and the results of the functional and spatial analysis of the diverse classes of refusal artefacts and ecofacts performed during the PhD project. Notably, geostatistical analyses (Kernel density estimation and L-function) allowed one to recognise coherent clusters of *impasto* vessels (shards and well-preserved) belonging to related functional classes (e.g., vessels for storing or preparing foods) close to the western structure (even inside the Room W) and to the hearth (Cazzella *et al.* 2020; Lucci 2020; Recchia *et al.* in press). On the other hand, the impact of trampling on the open space resulted in a lower number of stylistically-functionally classifiable *impasto* shards, due to their higher fragmentation rate, which is reflected in an absence of coherent clusters spatially distributed.

However, taking into account the diverse physical (e.g., hardness) and morpho-dimensional features of the different classes of refuse, the trampling clearly produced disparate effects on them. For instance, stone and small bone artefacts did not suffer much damage, and they have been mostly morpho-functionally classified. Here, spatial analysis highlighted an important presence of these classes of finds scattered over the open space south of the entrance and close to the eastern structure, allowing the identification of diverse craft activities (e.g., production of stone and bone artefacts, animal skin processing, etc., Lucci *et al.* 2020) occurring there. Thus, trampling did not produce dramatic effects on the physical preservation of these refuse elements. Even though it could have contributed to an increase in the trend toward an entropic dispersion, this did not hamper the ability to define a range of human activities carried out in this area. The long-lived-in dwelling area under scrutiny can be thus considered as composed by a primary refuse deposit, although affected by transformations caused by trampling and possible actions of refuse removal[5]. Hence, the artefacts and ecofacts brought to light represent valuable proxies for understanding human activities on a spatial perspective, but to arrive at this conclusion, a multi-analytical approach is the crucial factor in the research.

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[5] That would explain the presence of huge number of single shards.

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ABSTRACT

Long-lived-in dwelling spaces provide a huge number of valuable data by which to figure out human activities and patterns of space use by prehistoric communities. However, cultural dynamics can intervene during deposit formation processes and transform depositional sets of rubbish involving artefacts and ecofacts. Notably, trampling resulting from human activities represents the most intrusive agent that affects spaces continuously used over a certain timespan. Therefore, comprehending the effect of trampling represents a key-step to assess the distribution of items in the archaeological record and to establish a solid base on which to build valid models of the use of space. This paper proposes a methodological approach to figure out the diverse effects of trampling. The methodology has been tailored on a specific case study, a long-lived-in dwelling area of the Bronze Age settlement of Coppa Nevigata (South-Eastern Italy), dated to the 12th cent. BC. Here, cycles of use and of the discarding of pottery produced a massive number of shards, whose primary deposition has been probably subjected to alteration by trampling. On this premise, the impasto pottery record has been considered as viable proxy to investigate the effects of this cultural agent on the archaeological record. The analysis proceeds by three main steps: a data entry process structured to optimize the recording of shards dimension, fragmentation rate analysis of shards and spatial analysis of well-preserved vessels. This integrated approach allowed an assessment of the reliability of distribution and conservation of the archaeological record in the studied spaces, providing crucial information to better understand use of space patterns through a second analytical step: spatial analysis of artefacts and ecofacts. An aim of this paper is to provide an analytical process replicable for further Late Prehistoric contexts.