Studying ceramics according to the stratigraphic method: Some examples from the Dvin case-study*

Elisa Pruno

Abstract: This paper explores the methodological framework and preliminary results of the ceramic analysis conducted in Area 1000 of the medieval site of Dvin, during the Armenian-Italian excavation campaigns of 2021–2023. Focusing on the stratigraphic study of pit fills, the research applies a systematic classification and quantification strategy to ceramic assemblages, integrating fabric analysis, typology, and functional assessment. Special attention is given to the concepts of primary, secondary, and de facto refuse, in order to refine interpretations of site formation processes and domestic activity patterns. Through the use of stratigraphic matrices and quantitative ceramic data (sherd count, weight, MNI), the study seeks to reconstruct the dynamics of occupation, abandonment, and urban reorganization following the Mongol conquest. The results underline the importance of integrating ceramic studies into stratigraphic analysis to generate independent chronological frameworks and to better understand the cultural and economic structures of past societies. Future excavation seasons (2025–2026) will aim to further validate this approach, offering new insights into the complex post-urban transformations of Dvin.

Keywords: Ceramic quantification, stratigraphic analysis, refuse theory, medieval Armenia, site formation, domestic activities.

Introduction

For several years, during the implementation of the project 'The making of the Silk Road in Armenia: a light archaeology of euro-asian connectivity in the middle ages (cc. 7-14)',[1] my scientific collaboration with Professor Petrosyan has focused – due to my specific interest in the archaeology of production – on the study of building stone, beginning with its extraction from quarries. Particular attention has been paid to tool marks, which offer valuable insight into the types of work performed and, in some cases, allow for the identification of specific workshops or labor groups. These traces may also contribute to the establishment of relative chronologies, provided they are corroborated by stratigraphic analysis, which remains the most reliable independent source for constructing relative dating frameworks. Only in recent years, following the initiation of archaeological excavations at the important medieval site of Dvin

* My research towards this paper was possible thanks to the funding ERC-funded Consolidator Grant Armenia Entangled: Connectivity and Cultural Encounters in Medieval Eurasia 9th–14th Centuries (ArmEn, P.I. Prof. Zaroui Pogossian), at the SAGAS Department of the University of Florence (grant agreement n° 865067). The latter project fall under European Union's Horizon 2020 research and innovation program

[1] This project, which began in 2014, is directed on the Italian side by Professor Michele Nucciotti and is funded by the Italian Ministry of Foreign Affairs and International Cooperation.

under the direction of Professor Petrosyan, I have extended my focus to the analysis of archaeological materials, with particular emphasis on ceramics, both locally produced and imported.[2] A primary objective of this research is to define stratigraphically secure contexts in order to reconstruct occupational phases, site functions, and abandonment processes through the study of material culture. At the same time, the aim is to refine the typological classification and chronological framework of the diverse ceramic assemblages uncovered.

The purpose of the present contribution – dedicated to Hamlet – is to set down in written form some of the ideas and hypotheses that typically emerge during our discussions on site at Dvin. It seeks to present methodologically grounded interpretations of selected contexts from our previous excavation seasons, based on the ongoing study of the ceramic material.

Pottery: Ubiquity and functions

It is well known that pottery is one of the most pervasive materials found in the archaeological record and almost always constitutes the majority of artifacts to be analyzed and studied during the post-excavation phase. First and foremost, it is worth emphasizing that this ubiquity in archaeological deposits is a direct consequence of the raw materials characteristics and production processes used to create ceramic vessels, regardless of their class or type. The mixture of clay and water that forms the base material of pottery, once fired, reaches an irreversible state – unlike materials such as metal or glass. As a result, even when equal numbers of metal, glass, and ceramic objects were in use during a particular occupational phase of a site, some of the metal and glass items would eventually be melted down and re-enter the production cycle, while ceramics, once broken, would be discarded from the context of daily life.

When considering pottery within the archaeological sediment, it is important to note that it is a material subject to relatively little degradation compared to others: it does not rust, it does not oxidize, and it rarely loses structural cohesion. These characteristics make pottery an exceptionally valuable archaeological artifact, with considerable documentary significance.

However, its ubiquity alone does not fully explain the central role it plays in nearly every archaeological research project involving excavation. One of the key reasons for the attention devoted to pottery is its multifunctionality throughout virtually all pre-industrial periods. Without attempting an exhaustive list, ceramics served a wide range of essential and meaningful functions: cooking utensils, storage containers for both dry and liquid goods, tableware (both utilitarian and decorative), transport vessels, lighting devices, water conduits, and more.

From an interpretive standpoint, pottery is of particular interest for multiple reasons. When subjected to archaeometric analyses, it can often reveal

[2] Similarly, the Italian team of the project is coordinated under the leadership of Professor Nucciotti.

the provenance of the raw materials used in individual vessels, thereby enabling hypotheses regarding production sites. Typological features assist in establishing the chronological framework for the production and use phases of different ceramic classes, and by extension, contribute to the dating of associated stratigraphic contexts. Moreover, by examining ceramic classes, it is also possible to propose socio-economic interpretations of the contexts in question. The presence of spindle whorls, for instance, indicates textile production, while transport amphorae speak to trade and the movement of goods.

All these factors – and many others – explain why archaeologists invest a significant portion of their research time in the inventory and study of pottery. And so do we, at Dvin.

Of pits, fills, and floors: Ceramic contexts

The excavation carried out by the Armenian-Italian team at Dvin since 2021 forms part of the study of an extraordinarily important site – a city that, for much of its existence, held prominent political and administrative roles. As such, it represents a unique and valuable stratigraphic observatory for the longue durée history (at least from the 4th to the 13th century) of the territories of Western Asia.[3]

Three five-week excavation seasons are certainly not enough to exhaustively reconstruct the complex historical trajectory of Dvin. Nevertheless, the overarching aim is to peer through the keyhole of stratigraphy in order to closely examine the processes of stratigraphic formation,[4] especially those related to the de-functionalisation and abandonment phases of a section of the city located on a flat area near the South Tower.[5] This area is particularly intriguing – at least in the opinion of the author – in light of prior publications, due to the presence of numerous structures with residential, productive, and mixed functions.

The excavations conducted in Area 1000 (Figure 1) are considered here as a case study to illustrate the workflow applied to ceramic contexts, and to offer some examples of the types of research questions such analysis can address. Of particular interest is context A 1097 (Figure 2), which was first excavated during the initial field season and whose materials have now reached an advanced stage of analysis.

At first glance, it might not appear especially noteworthy: a sequence of stratified deposits with no associated architecture, but instead comprising cuts and

[3] A complete summary of the studies dedicated to the city of Dvin would be extensive. Therefore, for a general overview, with particular attention to archaeological research, reference should be made to the bibliography cited in the French-language volume by A. Kalantaryan (1996). For excavations carried out after 1996, see Kalantaryan 2008 and Babayan 2018: 332-346. The research conducted by the Italian-Armenian team is published annually in the journal *Armeniaca*, starting from the first excavation season, and is available online: Petrosyan *et al.* 2022: 219-228; Petrosyan *et al.* 2023: 220-237; Petrosyan *et al.* 2024: 199-268.

[4] Nucciotti 2024: 220-222.

[5] For the excavations in the area of the South Tower, see Ghafadaryan, Kalantarian 2002 and Zhamkochyan 2015.

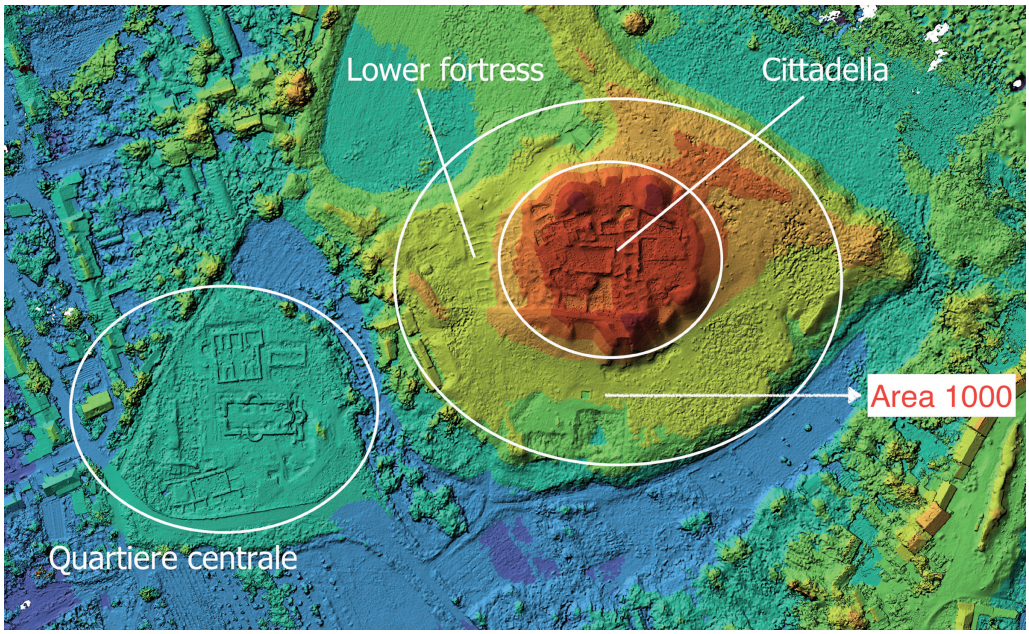

Figure 1. Total DEM of Dvin site and Area 1000 localisation.

fills – or, in the terminology of Edward Harris, positive and negative stratigraphic units.[6] However, on closer inspection, the context is in fact quite significant for its potential to shed light on the formation of the final occupational layers of the city. We are dealing with a set of stratigraphic units that define a surface of use, on which were located perishable structures (supported by wooden posts) and several pits used as refuse dumps. These were filled with soil and, predominantly, unglazed ceramic kitchen and storage vessels, along with the bones of butchered animals.

Such elements are indicative of domestic activity, and the artifacts recovered from these features are potentially highly informative about the daily life and final phases of occupation in this area. It is important to note, however, that we are not dealing with highly visible architectural remains or well-preserved masonry structures. The ceramic fragments are, for the most part, utilitarian and undecorated, and none were recovered in their entirety.

So, how can we attempt to extract meaningful historical information from such remains?

First of all, we count them! While this may sound like a simplistic approach, it is in fact a critical first step. As is well known, in order to avoid providing merely superficial interpretations, ceramics can be effectively employed to address at least three major analytical dimensions:

[6] Harris 1989.

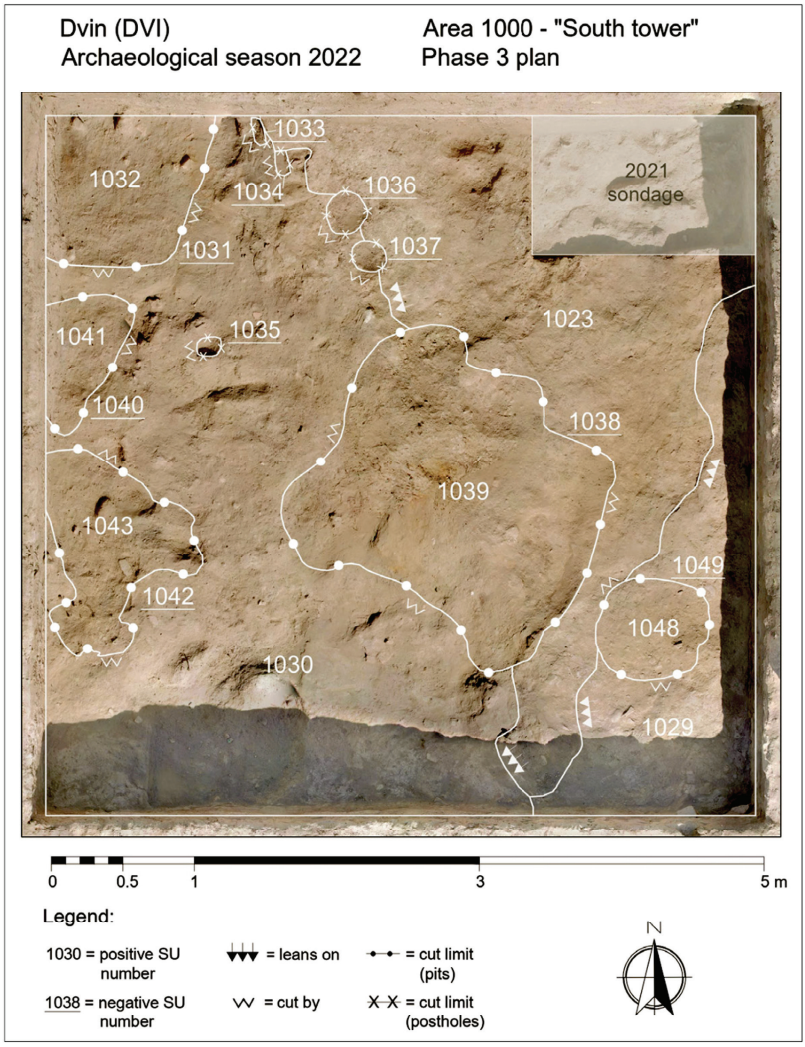

Figure 36 Area 1000: plan of phase 3

Figure 2. Area 1000 - 'South tower' Phase 3 plan

- to date the contexts, based on the relative chronology provided by stratigraphic excavation and that invaluable tool, the Harris Matrix;
- to identify, from a technological standpoint, the characteristics of the artifacts and, where possible, to hypothesize their provenance (*e.g.*, local workshops or imported wares);

– to determine the possible functions performed in the excavated areas or, for instance, to identify refuse zones containing material originating from other parts of the site.

To achieve these objectives, it is necessary to move from a collection of ceramic fragments – recovered according to stratigraphic units – to a quantifiable dataset consisting of percentages of ceramic classes, types, and forms.

First and foremost, let us begin with the classification criteria we are currently adopting. Our approach is based on distinguishing key technological features, namely: the characteristics of the fabric (coarse, refined, semi-refined); the forming techniques (handmade, wheel-thrown, mould-made); and the presence or absence of a surface treatment. When a coating is present, we record its characteristics – at least at a macroscopic level – such as slip, paint, glaze, or enamel.

In classifying the ceramic fragments in this way, we of course take into account the existing scholarly literature, both in relation to ceramics previously excavated at Dvin and within the broader Armenian territory.[7] For materials that may represent imports, we also consider comparative data from known production centers outside the region (this is for example the case of the Mina'y pottery, or of the Luster pottery). Based on this classification system, we proceed to quantify the ceramic classes represented within each stratigraphic unit. This step is both delicate and essential, as it is the only way to produce data that are truly comparable – both within the area currently under excavation and, more broadly, with other areas of the site of Dvin that we plan to investigate. In this way, we aim to contribute a new, first-hand source of data.

Numerous studies have addressed the various possible approaches to quantification, which seek to avoid under- or overestimating certain classes at the expense of others. These studies also consider the differing ways in which vessels break – whether we are dealing with fine porcelain or a large *karas*, for instance. Many of these quantification methods are quite complex, and the ratio between the time required to apply them and the overall economy of the research process is often unfavourable.

In our case, we have therefore chosen to adopt the following methods:

– the count of individual sherds per ceramic class (the simplest method, though also the most vulnerable to statistical distortion);
– the total weight of sherds per class (a measure with known limitations, but one that is easy to obtain and useful for a number of subsequent analytical purposes);

[7] There are numerous bibliographic references concerning the study of medieval ceramics in Armenia and specifically at Dvin. For Dvin, reference should be made to the excavation publications already mentioned, as well as to the works of A. Babajanyan, beginning with her important doctoral dissertation (Babajanyan 2015).

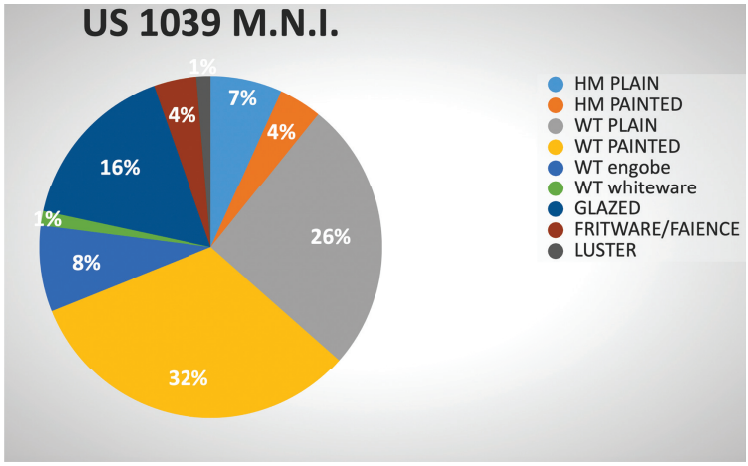

Figure 3. Graph illustrating the MNI (Minimum Number of Individuals) for Stratigraphic Unit 1039.

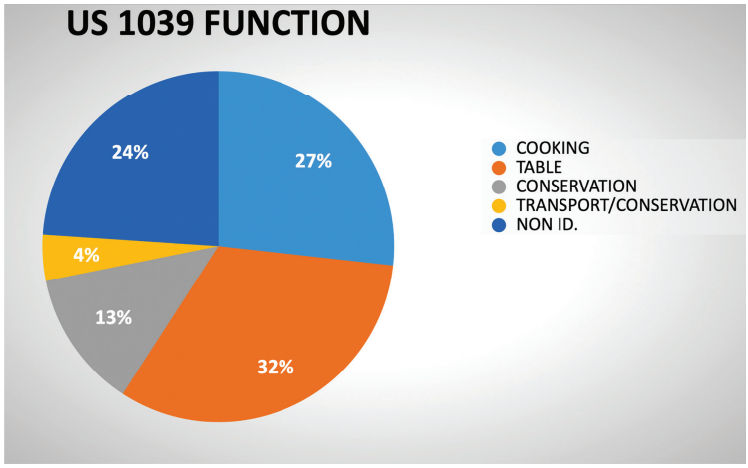

Figure 4. Graph illustrating the functions of pottery for Stratigraphic Unit 1039.

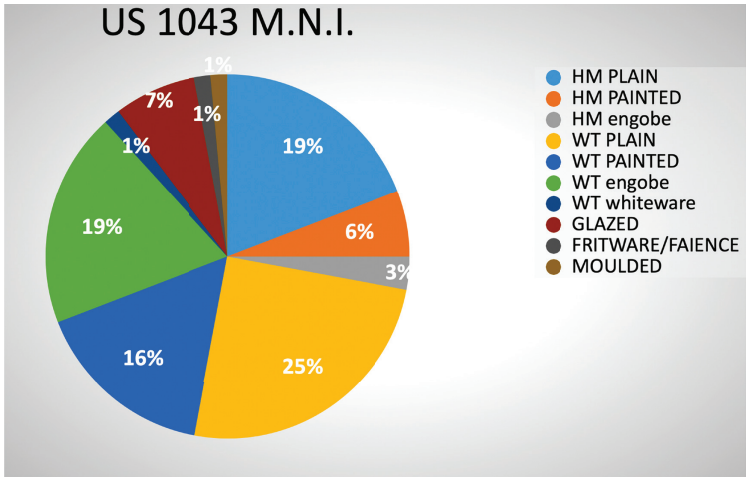

Figure 5. Graph illustrating the MNI (Minimum Number of Individuals) for Stratigraphic Unit 1043.

– the Minimum Number of Individuals (MNI), which attempts to estimate the minimum number of complete vessels represented by the total assemblage of fragments.

Let us now examine some examples from context A 1097, focusing in particular on fill US 1039, associated with cut US 1038, which itself cuts through the use surface US 1030. US 1039 yielded 107 sherds, from which a Minimum Number of Individuals (MNI) of 71 vessels was identified. These can be classified into ceramic classes according to the following MNI-based percentages (Figure 3): 1% each of lustreware and white ware; 4% fritware and hand-made red painted; 7% hand-made plain; 8% wheel-thrown with slip; 16% glazed ceramics; 26% plain wheel-thrown; and 32% red-painted wheel-thrown ware.

When analyzing vessel functions, the following distribution emerges (Figure 4): 4% transport vessels, 13% storage, 27% cooking, and 36% tableware. Unfortunately, due to the condition of the sherds, the function of 24% could not be determined. A more detailed breakdown of the decorated red wares within this context shows that 67% belong to the red-painted category and 39% to the red-polished type.

Continuing the analysis of pit fills, we now consider US 1043, which is the fill of pit cut 1042. In this case, the total number of sherds is 95, with an MNI of 66 (Figure 5). The functional distribution is as follows: 18% cooking, 17% storage, 14% tableware, 3% transport/storage, and 1% lighting ceramics (Figure 6). A notable feature of this context is the high percentage (46%) of sherds for which function could not be determined. This is significant, as it speaks to the formation processes of this fill, which consists of highly fragmented materials. While fragmentation does not prevent

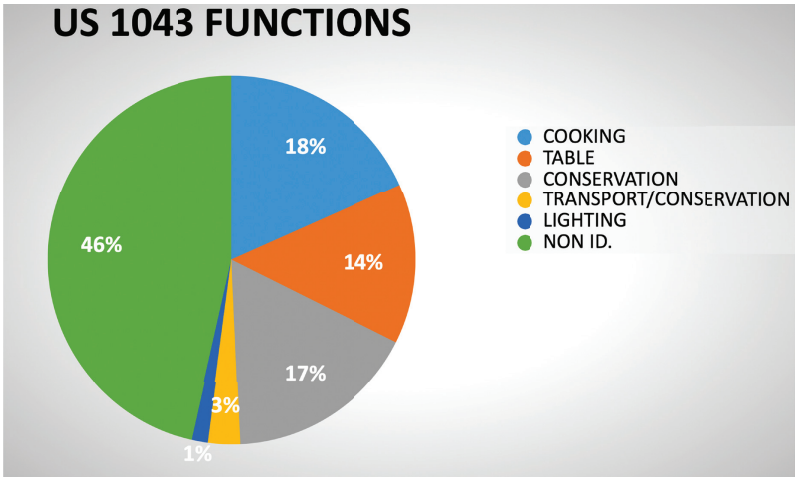

Figure 6. Graph illustrating the functions of pottery for Stratigraphic Unit 1043.

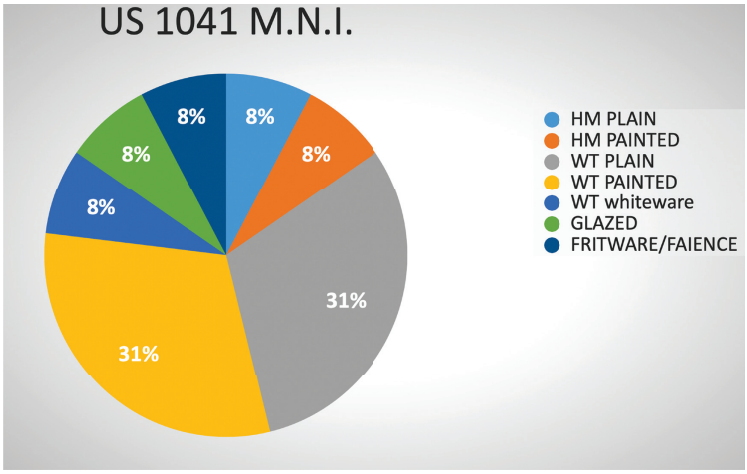

Figure 7. Graph illustrating the MNI (Minimum Number of Individuals) for Stratigraphic Unit 1041.

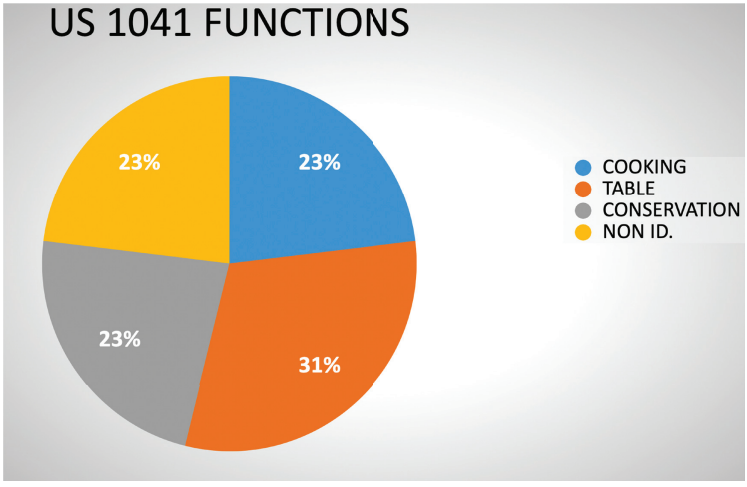

Figure 8. Graph illustrating the functions of pottery for Stratigraphic Unit 1041.

identification of technological class (*e.g.*, handmade, wheel-thrown, glazed), it does hinder functional attribution.

Moving on, we consider fill US 1041 from cut 1040. This unit produced 18 sherds, representing an MNI of 16. Although the small sample size limits the statistical reliability, class and functional distributions are illustrated in Figures 7 and 8.

Lastly, we examine fill US 1032 from pit 1031. This context contained 78 sherds, corresponding to 49 individual vessels. The distribution of ceramic classes is shown in

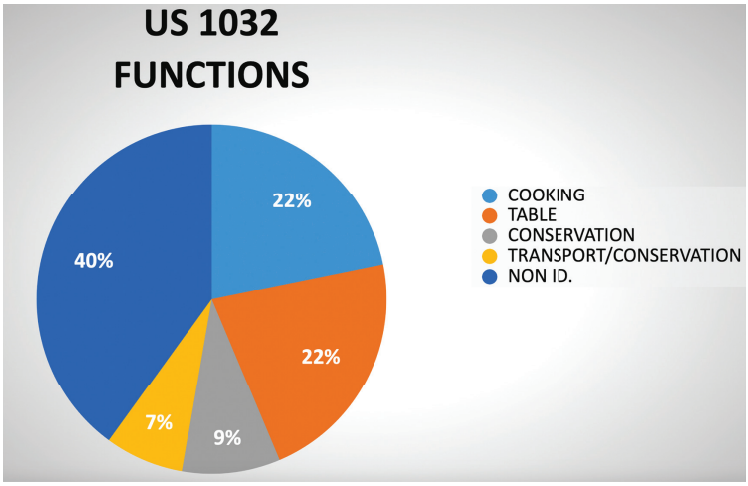

Figure 9. Graph illustrating the MNI (Minimum Number of Individuals) for Stratigraphic Unit 1032.

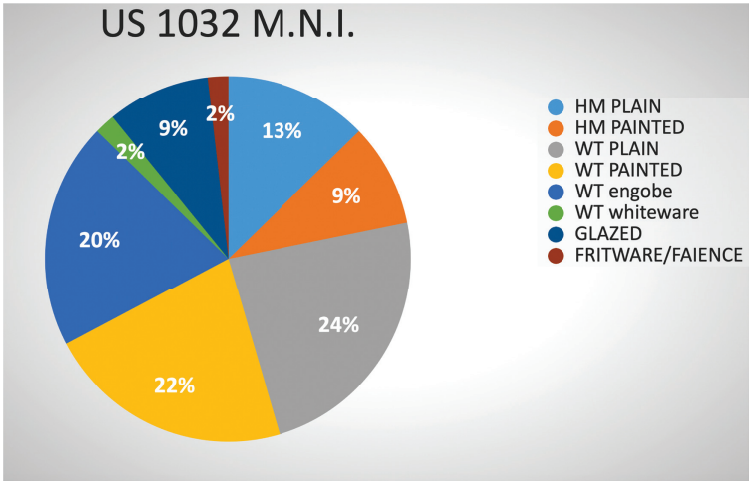

Figure 10. Graph illustrating the functions of pottery for Stratigraphic Unit 1032.

Figure 9. From a functional perspective, vessels associated with food-related activities (cooking and table use) are approximately equal, with remaining percentages assigned to storage and transport. As with other units, the high degree of fragmentation prevented the functional identification of a significant number of sherds (Figure 10).

This analysis, while undoubtedly time-consuming, provides valuable insights and does so in a manner that is quantitatively comparable with data collected from

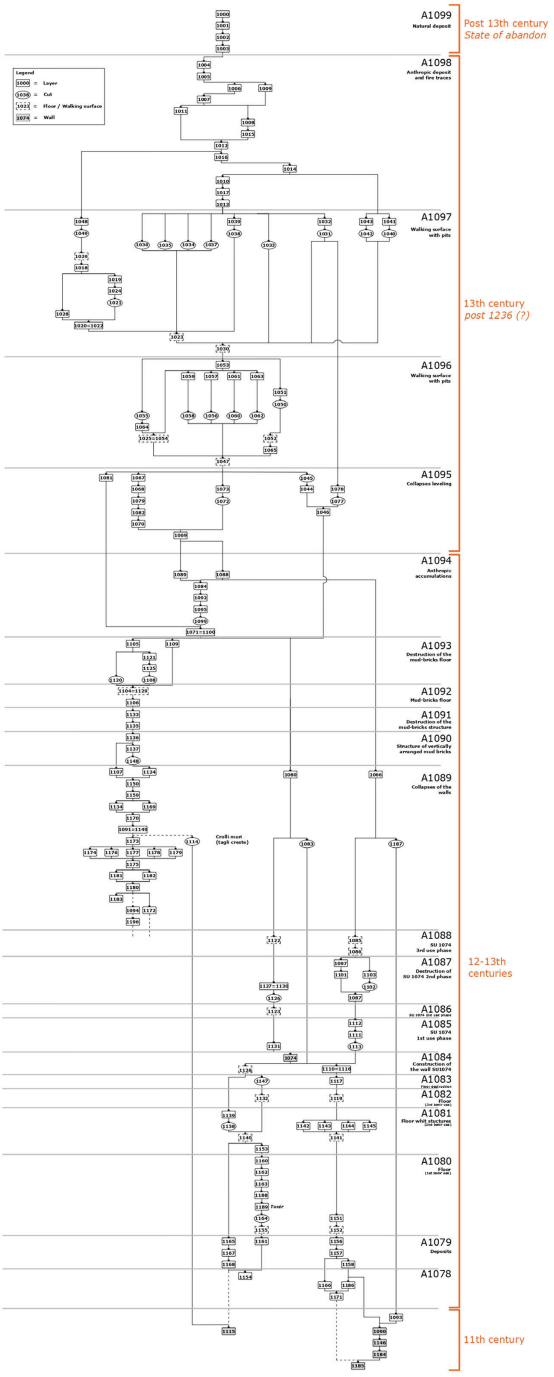

Figure 11. Matrix of Area 1000.

other contexts. A more comprehensive overview will be possible at the conclusion of the first phase of the project, following the excavation campaigns of 2025 and 2026.

In the meantime, however, we can already state that the function of four pits located within a beaten-earth floor has been identified. These features postdate the disuse of the structures previously present in Area 1000 (see *Report in Armenia*, 2024). This points to a phase in the life of the city – at least in the area near the South Tower – that warrants re-evaluation, particularly in light of data from earlier excavations, which lack similarly detailed and quantitatively grounded observations of ceramic contexts.

Conclusions

In these final remarks, I would like to offer a brief theoretical reflection. As is well understood, the archaeological study of a site aims to reconstruct its phases of occupation through the analysis of material evidence. At the same time, we must remain fully aware that archaeological contexts are not direct reflections – or 'photocopies' – of the systemic contexts from which they derive, unless one were to fall back on the so-called *Pompeii Premise*.[8]

Stratigraphic study and the comprehensive analysis of finds can, however, be extremely valuable in identifying the formation processes of archaeological layers. Once these processes are understood, they can unfold before us, offering the best possible framework for interpreting the life cycles, episodes of destruction, and phases of abandonment at a site.

Our goal is, in fact, to disentangle how archaeological sites are shaped by both human behaviors and natural processes, in order to draw reliable inferences about the past. To this end, the most effective approach remains the stratigraphic method. By distinguishing and thoroughly documenting the individual human and natural traces present within the archaeological deposit, stratigraphy enables us to reconstruct the temporal sequence connecting these events. The first outcome of this process is the construction of the matrix – a system which, by selecting the stratigraphic relationships from among the physical connections between each pair of stratigraphic units (US), allows for the establishment of a relative chronology of all the events, even the most minute, that have become 'condensed' within the stratification (Figure 11).

At the end of excavation, we are left – among other things – with the fragments of artifacts and ecofacts (in this case, I refer specifically to ceramics, though we are of course also dealing with other materials, including faunal and botanical remains). The analytical work still lies ahead. But toward what key objectives?

Quantitative data – particularly those related to ceramic artifacts from the pre-industrial phases of past societies – are crucial for reconstructing economic structures. This is especially true when considering trade, not only of ceramics themselves but

[8] When discussing archaeological contexts, systemic contexts, and the Pompeii Premise, it is necessary to cite at least the works of Binford 1981 and Schiffer 1987.

also of essential commodities such as wine, oil, and grain. Furthermore, ceramics offer key insights into fundamental cultural practices, especially those related to the food cycle.

But how can we move from a collection of transparent plastic bags, each containing numerous ceramic fragments sorted by stratigraphic unit (US), to a meaningful interpretation of the historical dynamics of an excavation area?

First and foremost, it is important to remember that what we find in the archaeological deposit largely represents discarded material – that is, 'the intentional removal of an object which, for various reasons (breakage, wear, loss of functionality, or simply obsolescence), was no longer considered suitable for its original use or purpose'.[9]

Following the theoretical framework proposed by Michael Schiffer, we can distinguish between primary and secondary refuse areas: the former (primary refuse) are contexts in which artifacts were abandoned directly at the place of use, while the latter (secondary refuse) are those where objects were transported and discarded elsewhere, at varying distances from their original location.[10]

Only by understanding these elements can we begin to define which functional contexts were present at a site during a given period. Primary refuse areas, in particular, allow us to identify the specific activities carried out in certain parts of the site at particular moments in time. In contrast, the location and nature of secondary refuse areas provide insights into aspects of social organization – for example, whether waste disposal was centralized or managed at the household level.

A specific type of primary refuse is what Schiffer terms *de facto refuse*, referring to objects left *in situ* at the moment of site abandonment. This may occur due to natural causes (the most well-known example being Pompeii) or as a result of anthropogenic events, such as the attack or destruction of a settlement by enemy forces.[11] In any case, the quantity and quality of materials present at a site are subject to numerous factors, the most important of which – unless there is clear evidence to the contrary – is the number of objects in use in a given area at the time the archaeological context was formed. This is precisely why it is worth investigating the quantity and distribution of different ceramic classes over time at a site.

Returning briefly to the stratigraphic units discussed in the previous section, we can state that the study of the pit fills in context A 1097 allows us to begin to reconstruct a moment in which the city – at least in this sector – was occupied by trampled surfaces with small wooden structures and refuse pits filled with ceramic waste and animal bones. These findings define an open-air area where domestic activities such as butchery and cooking took place: '*The decline in urbanization in this part of the city, following the Mongol conquest (1236), had already been noted in earlier excavations.*

[9] Ceci, Santangeli Valenzano 2016: 13.
[10] Schiffer 1987.
[11] Of course, instances of intentional deposition may also occur, such as burials accompanied by funerary goods, hoarding phenomena – such as coin deposits – or cases of accidental loss.

K'alant'aryan (1996, 85) records the presence of fragmentary pauvres masures (poor hovels), and Žamkoč'yan (2015) reports that Mongol-period layers with huts and dwellings made from modest materials were not mapped in the area of the South Tower. He also notes that certain sections of the defensive walls of the Citadel, once they lost their original function, were reused and transformed into makeshift domestic structures'.[12]

In closing these notes, I would like to extend my sincere thanks to Professor Petrosyan for many years of collaboration on fascinating research projects, and for the opportunity – made possible in large part through his support – to experience Armenia firsthand, a land as complex as it is captivating.

Elisa Pruno
University of Florence,
via San Gallo 10, 50121 Florence, Italy

elisa.pruno@unifi.it

Bibliography

Babajanyan, A. 2015. *Hayastani ŽD-ŽĒ dd. xec'ełenə (Armenian Ceramics of Fourteenth-Seventeenth Centuries).* PhD dissertation, Yerevan, Institute of Archaeology and Ethnography, National Academy of Sciences of Armenia.

Babayan, F. 2018. Norahayt šinut'yun Dvini mijnaberdum (Newly discovered building in the Dvin Citadel). *LHG* 3(654): 332–346.

Binford, L.R. 1981. Behavioral archaeology and the 'Pompeii Premise'. *JAR* 37/3: 195-208.

Ceci, M., Santangeli Valenzani, R. 2016. *La ceramica nello scavo archeologico*. Rome: Carocci editore.

Ghafadaryan, K., Kalantaryan, A. 2002. *Dvin II. Dvin k'ałakə ev nra pełumnerə (1973-1980 t't'.) /(Dvin II: The City of Dvin and its Excavations, 1973-1980)/* (Hnagitakan pełumnerə Hayastanum 20 / Archaeological Excavations in Armenia 20). Yerevan: HH GAA 'Gitut'yun' hratarakčut'yun/Publishing House 'Gitutyun', NAS RA (in Armenian).

Harris, E.C. 1989. *Principles of Archaeological Stratigraphy*. 2nd ed. London – San Diego: Academic Press.

Kalantaryan, A. 1996. *Dvin: Histoire et Archéologie de la Ville Médiévale* (Civilisation Du Proche-Orient, Hors Série II). Neuchâtel-Paris: Recherches Et Publications.

Kalantaryan, A. 2008. *Dvin IV. Dvin k'ałak'ə ev nra pełumnerə (1981-1985) /(Dvin II. The City of Dvin and Its Excavations, 1981-1985).* Yerevan: HH GAA 'Gitut'yun' hratarakčut'yun/Publishing House 'Gitutyun', NAS RA (in Armenian).

Nucciotti, M. 2023. A first interpretation and final remarks for Area 1000 based on the 2022 mission, in Petrosyan *et al.* 2023: 229-233.

Nucciotti, M. 2024. Cons and pros of a micro-stratigraphic approach, in: Petrosyan *et al.* 2024: 220-222.

Petrosyan, H., Nucciotti, M., Pruno, E., Squilloni, L., Kirakosyan, L., Vardanesova, T. 2022. The Armenian-Italian joint expedition at Dvin: Report of 2021 activities. *Armeniaca: International Journal of Armenian Studies* 1: 219-228.

Petrosyan, H., Nucciotti, M., Pruno, E., Squilloni, L., Kirakosyan, L., Vardanesova, T., Cheli, F., Hovhannisyan, H., Abrahamyan, H., Petřík, J., Slavíček, K. 2023. The Armenian-Italian joint expedition to Dvin: Report of 2022 activities. *Armeniaca: International Journal of Armenian Studies* 2: 193-246.

Petrosyan, H., Nucciotti, M., Pruno, E., Vardanesova, T., Cheli, F., Squilloni, L., Abrahamyan, H., Kirakosyan, L., Leonetti, M., Dall'Olio, L. 2024. The Armenian-Italian joint expedition to Dvin: Report of 2023 activities. *Armeniaca: International Journal of Armenian Studies* 3: 199-268.

[12] Nucciotti 2023: 229.

Piliposyan, A. (ed.) 2017. *Mecamor. Kesdarya pełumneri patmut'yunic' (Metsamor. The Chronicle of Fifty Years of Excavations)*. Yerevan: Service for the Protection of Historical Environment and Cultural Museum-Reservations NCSO (in Armenian).

Schiffer, M.J. 1987. *Formation Processes of the Archaeological Record*. Albuquerque: University of New Mexico Press.

Zhamkochyan, A. 2015. Dvini mijnaberdi haravayin burgi šertagrut'yan patmut'yunic' (Excavations and stratigraphy of the southern tower area of Dvin), in: Piliposyan 2017: 206-217 (in Armenian).