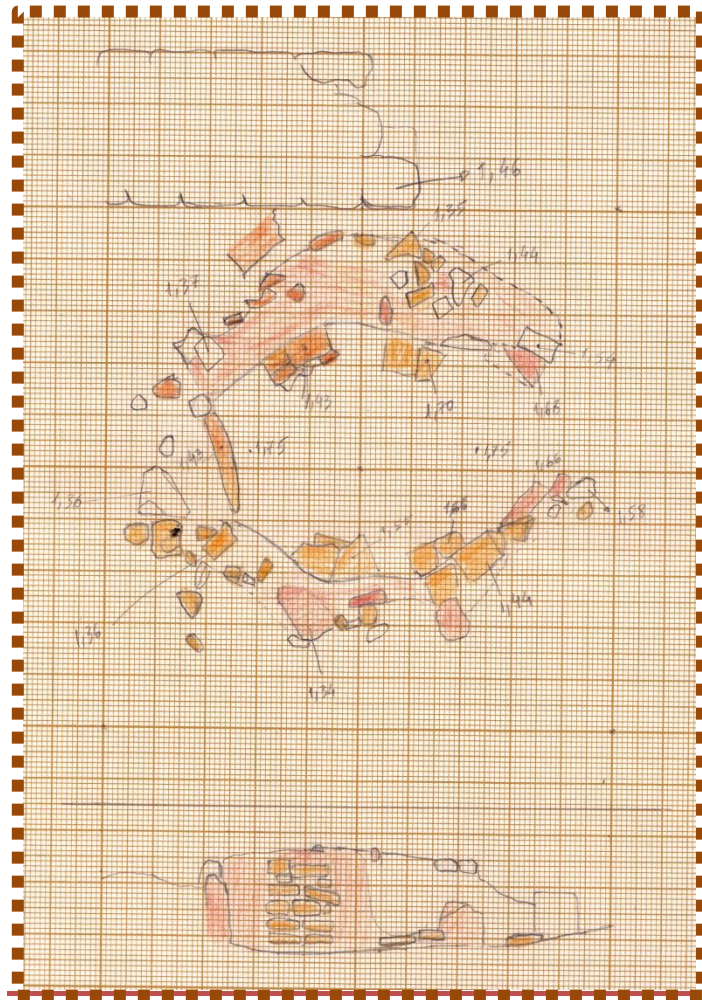


KILNS OF CONIMBRIGA



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ABSTRACT

During the three months of the Erasmus+ Practical Exercise project, one of the main jobs I had to do was cleaning and excavating two kilns in the area in-between the House of Cantaber, the Large South Bath House and the area of the Insulae opposite the Forum. The two existent kilns were previously excavated during the decades of the 60s and the 80s and, unfortunately, the condition of conservation to the two sites seemed poor, at best, if not altogether neglected. However, despite this difficult condition, while the whole process lasted, it became even clearer to me that even though the excavation had already taken place once in the past and the primary material was long collected and shorted out, the kilns had not yet “finished” with the amounts of information they were able to give us. It seemed important no longer, that the material usually excavated from that kiln today was mainly pottery; pieces of tiles or broken ceramics or bones of animals and fragments of glass. The kiln itself seemed now like a valuable source of information. Of course the architecture itself does not say much to the archeologist, for kilns of this sort were being built from prehistoric times till nowadays in traditional villages, however the very study of the kiln itself in its context can give valuable pieces of information mainly for a part of archeology people often forget; aspects of every-day life of the previous habitants of the city. The production of their utensils they used for everyday tasks such as the ceramics they cooked and ate from or the metal objects they used for their work. The kilns were the heart of this production, without a doubt. Not only that but the decision upon creating such a construction on a specific place, in a specific time and the duration of its use seem all to be valuable data to the researcher in order for him to come to a certain amount of conclusions that assist the study of the area around the kiln and mainly the building or the street the kiln is directly linked to.

Someone can very well see that the kiln is far more than just a proof of an industrial activity within the walls of an ancient city. It can be the missing link between two different theories and make them match to each other. Even if the material from a kiln can be even problematic sometimes, due to the fact that the dirt that falls on it can drag material along as well as the fact that disposed material is often found within kilns that belongs to different timeline with the construction itself. Nevertheless, having worked in two out of five kilns in Conimbriga, I have to say that the study is definitely worth the effort and archeological constructions such as this one should, for sure, stop being considered of “minor importance” even if they do not bring up the visual result of excavating a temple or a palace.

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MORPHOLOGY

However someone can question; what is a kiln? How can someone recognize it? Kilns are practically furnaces, ovens for baking material (its use might vary depending on the situation). They usually are round constructions (sometimes rectangular or oval) with fairly simple layout. The main part of the construction usually is a simple floor with a wall surrounding it from all directions. The wall is usually made of bricks or spare and recycled material (for example parts of broken tiles that are no longer on use). Sometimes the kiln might have two separate sections (“floors”), one bottom one which would be the section where the fire is lit and this would support a second, flat surface that would play the role of the floor to the second section, in which the material would be shorted out and placed to be baked. If that is the case, usually in excavation we can spot the extensions to the walls around the base of the kiln towards the inside, like “steps”. These small pieces of extra material could, most likely, imply this possibility that the kiln extends in two separate sections, the one on top the other. Since, as mentioned above, the kilns are ovens, the element of fire is essential so there should always be a source of heat to the base of it, whether it is in a separate section or not. Of course the shapes and the construction of the kilns can vary from area to area and from time to time, even if the basic structure remains the same.

The foundation of a kiln, however, can vary depending on when and where the people decided to build it. Occasionally they might have used an existent floor of a house that was no longer in use or that it was destroyed, without needing to work onto the ground first. Some other times the kiln could be constructed within a house or a building that was still in use. If that is the case, certain differences and modifications in architecture can be detected within the ruins of that very building. Usually a newer wall is built to separate the room where the kiln would be built in, from the rest of the house. In other occasion the kiln can indicate a layer of destruction if it was built upon a building no longer in use or already destroyed.

The upper construction of the kiln is equally simple in form as the foundation. As mentioned above, usually they are consisted of a simple wall created of stones or bricks or even discarded material in second use. Usually what remain throughout the years are the foundation and this specific wall. The dome was constructed every time a new set of pots or glass mass or metal was supposed to be baked or prepared. It was destroyed anew when it came for the material to come out and it was re-constructed for the next baking part. For this, the dome is almost never found intact. Usually material from the dome, such as the bricks or parts of them, can be located in a small area around the kiln. To find a kiln intact seems highly unlikely due not only to the fact that the dome itself was used only once every time but also because it’s construction was not meant to be perfectly stable so even if a kiln would be buried intact, the dome would most likely collapse.

Of course, as simple as the construction is, in terms of architecture, it doesn’t make it less difficult to build. In fact, according to Alison Burford, in her book *Craftsmen in Greek and Roman Society*, points out how difficult or even dangerous the process of building and re-building the kiln was, especially while the fire was still burning inside it and the potter had to open a small opening to the kiln, in order to check the process of baking, if it came out normally or not. And of course it is important to mention the detail that no matter how “simple” the construction, it still manages to pull through the task of baking such difficult materials as pottery in the

complicated ways we know, from the strong fire that requires oxygen and gives clay the red color till the black glaze of pots, which requires a fire without oxygen and extremely high temperatures in order to be perfected.¹ Likewise kilns that are used for metal, can still achieve high temperatures required to mold the metallic objects. Another opinion about this is mentioned by Henry Hodges, who also appears to be agreeing on the complexity of building a pottery kiln. Especially for pottery, he gives also some extra points of view about the types of kilns existing out there, depending on the region or the timeline. All kilns appear to have the same, basic structure, when it comes to architecturally-formed kilns but he also recognizes other types of kilns such as: *Domestic Fires, Bonfires, Updraught Kilns, Pit-kilns, Downdraught Kilns, Muffle kilns, Draught and Kiln fittings*.² From my observation to the kilns of Conimbriga, they appear to belong closer to the *Updraught* category, in other words structures in which the fire is lit at a pit below the pottery, which is enclosed in a dome. The pit often round or oval shape and it also often have shelves or fire-bars, on which the pottery is standing so to avoid direct contact with the fire. The footages remain permanently while the domes are broken after firing for access or, in larger kilns, a part of it be destroyed and re-constructed with the next firing. In any case, both researchers appear to agree on this point that the architecture, even though typical, is quite challenging to build and sustain.

When it comes to material usually found within the newly excavated kilns, in most occasions we're talking about a variety of different objects that might not be from a specific timeline only, but might as well show us how the kiln was used in the various stages of its life (from its very first use till its final sealing and abandonment). The most common finding, naturally, is the very product the kiln was supposed to bake, in other words pieces of pottery or masses of glass and metal. Sometimes, masses of half-baked clay might be detected within the kilns, as a reminder of some past attempt that probably failed to give this mass a proper shape. Other material that can be found within them is bones of various animals or oysters, if the kiln was used as a disposing point. Other objects can be detected in cases of ground fallen from a higher point within the kiln, bringing material from above with it. The material found within the kilns, though, is not only related to the use of the kiln itself but also with the general context within which the kiln was built in the first place. It tells a lot about what the building the kiln was built within was or what use it had throughout the time, based on the evidence the material of the kiln can give us.

Of course apart from the material, what usually proves the existence of a kiln is the element of fire. Naturally, since the kilns are mainly, ovens for baking the traces of burnt walls or half-baked masses of clay and metal can indicate the existence of a kiln that was in use. Of course a fire can indicate many things for the life of a construction but usually fire in combination with the findings, leaves almost no doubt.

As far as Conimbriga is concerned, there appear to be five known kilns of the roman times and possibly 1 of the Visigoths time that is currently demolished for the excavation of the *Insula of the Phallic Vase*. The kilns are given unique identity numbers and codes, depending on the area they were found (more analyzing concerning the context will be done on the next section).

¹ Burford A., *Craftsmen in Greek and Roman society* (1972), "Aspects of Greek and Roman Life" H. H. Scullard Thames and Hudson, 72

² Hodges H., *Artifacts an introduction to early materials and technology* (1964), 37-38

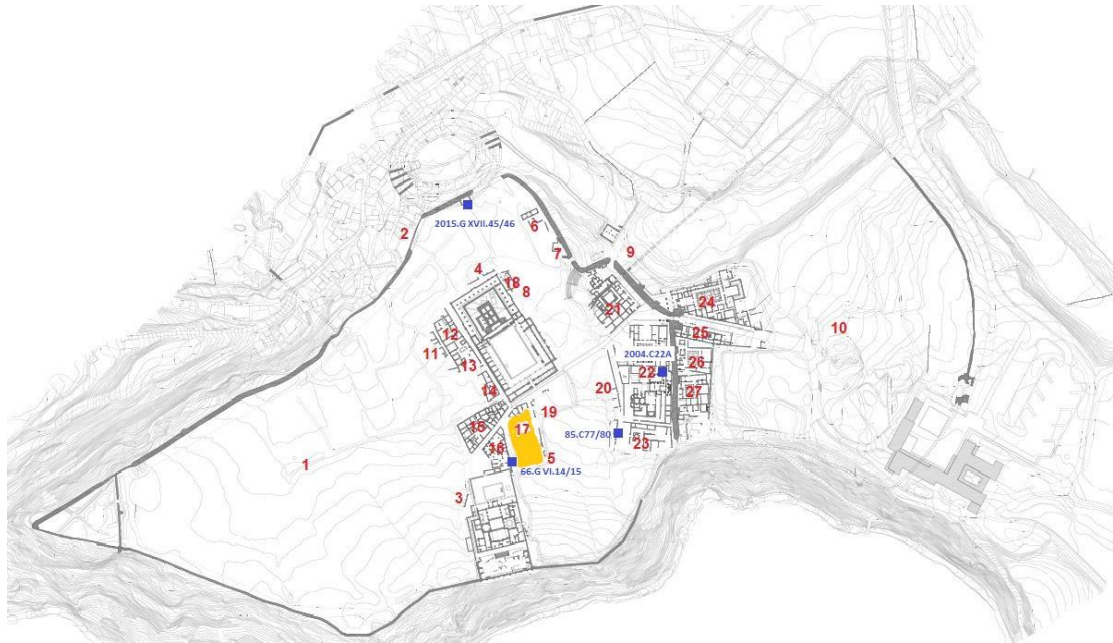


Image 1: Kilns of Conimbriga

The designations of the kilns are:

- G-VI 14/15 (Excavated in 1966)
- C77 and C80 (Excavated in 1985, prior excavation in 1940s)
- C22A (Excavated in 2004) –the kiln of the House of Cantaber-
- G-VII 45/46 (Excavated in 2015) –kiln at the Amphitheater area-

Despite the fact that the general logic of building a kiln remains the same, and the kilns do have their common characteristics, slight differences can be detected to the architecture (details such as their shape or their construction material) or the material and of course their use and their lifetime. As far as my job was concerned, I worked on the two kilns, to be more specific to the kilns G-VI 14/15 and C77. Unfortunately the neighboring to the latter, C80 is covered for protection and due to lack of proper preservation and is not currently open to the public therefore its current condition is unknown to me. Thankfully the area was photographed before to the previous excavation (1966 and 1985) and it still gives an idea, of how the kilns used to look like when fully revealed. Nowadays, years of neglecting have altered the kilns but even so, when compared to the previous photos, they still have kept their basic shape intact.



Image 2: Kiln C77 (1985 and 2019)

Especially, as far as C77 goes, it was a lucky thing that it was excavated during the middle of 1980's, since the newest theories of approaching archeology were already introduced and so the research was done pretty well and with fairly much detail compared to older excavation. The state of this kiln is not much altered either, given the poor conservation of the spot. Unfortunately not all kilns were as lucky as this one, for the majority of them are already claimed by nature, such as roots or dirt. Two of them (G-VI 14 and C80) are no longer visible to public but thankfully the House of Cantaber and all the constructions inside it seem to be kept in excellent condition. Below, we should better list every kiln of this area, along with the basic characteristics of each one of them:

- **G-VI 14/15** => Excavated in year 1966 and due to the two-phased excavation, it was given two numbers, this kiln is located fairly close to the grand Southern Baths, touching the road close to the insula at the area 16 on the map of *Image 1*. When excavated, it revealed a rectangular-shaped kiln with a fairly flat floor. Its shape and condition seem really bad but from the little that is visible, it appears to be a kiln with only one chamber since no supporting stones can be detected in its bottom. The surviving depth, according to the photo of the sight, appears to be about 70 cm. Its width can be visible in a sketch done to it. The width at the opening could be about 160 cm. The opening appears to be at the South-West part of the kiln. The height of it, at least to the sketch, appears to be the same as the width (160 cm), making it almost perfect quadrature, however from what the picture shows, it seems to be rather rectangular and not quadrature. I would estimate the height is at least 165 cm long. Its walls are not visible at this old picture but they appear to be built out of rough rocks probably on second use from a fallen previous building.



Image 3: Kiln G-VI 14/15, excavation process of 1966

This kiln was the first kiln I dealt with during my practical exercise and the only one of the two kilns currently standing at the spot. Even in bad condition, it was still discovered in a recognizable shape. Its rectangular shape is still well preserved, however its floor is fairly rougher now due to the poor preservation state and the natural destruction by time. Its current surviving depth seems to be gradually reduced nowadays. Its current condition most likely does not allow it to stay on display for too long due to the poor

preservation. The kiln appears in the sketch to be having a circular pit. This circular pit is not currently visible.



Image 4: Kiln G-VI 14/15 (1966 and 2019)

- **C77** => Excavated in 1985 along with the kiln C80. It is one of the called “Kilns of the east of the Basilica”. It is located to the Southern part of the city, South-West to the House of Cantaber and close to the area marked with the number 23 on the map of *Image 1*. It was discovered in fairly good shape, despite the alterations caused by time and neglecting. It is a circular shaped kiln with a flat, lime floor (prior belonging to an older building). The floor is kept in very good condition and even the lines of its limits are visible. Perpetuating stones inside it, indicate that the kiln was a dual-chambered one. The current measurements, done in year 2019, point out a surviving depth of 70-75 cm. The opening is about 120 cm wide. The walls are constructed out of bricks and spare material in second use like broken pieces of pots or tiles. According to the diaries of the excavation, it appears to have its opening towards the North.

- **C80** => Excavated in 1985, along with the kiln C77, is located a bit towards to the West, compared to C77, closer to the House of Cantaber. Along with C77, it is also considered as one of the two “Kilns east of the Basilica”. Unfortunately, currently it is covered and is not visible in public, there is still the photographic material left from the first excavation. Though only partly surviving, and currently not able to be studied, it seems to have a similar shape and form to C77; circular construction with a possible second chamber inside it. According to the picture taken during the excavations, the surviving height as a little bit bigger; 90 cm. There is no measurement tape that shows the width or the height of it but one may possibly assume it is the same as the ones of C77. However, the walls this time appear to be made of large, stone blocks instead of bricks. The opening to the entrance seems to be exactly towards the North. Like the kiln C77, it was prior excavated in 1940s and most likely it was identified as kiln back then, for even in 1985 pictures, its condition seems to be really bad for its recognition as such. Unfortunately the bad condition C80 was found in could be also because of those excavations, if the excavations were done fast and without the proper attention, causing the construction to partly collapse.



Image 5: Kiln C80 (1985)

- **C22A** => Excavated in 2004, this is the kiln within the House attributed to Cantaber. The kiln was constructed at the south-east part of the house, located in one of the chambers, attached to the upper right corner, closest to the outer wall. It is one of the most preserved of the kilns, mainly due to the fact it is located within this important building. It is a rectangular-shaped construction and apparently it has several phases beneath it. The base of it is a mosaic, obviously the floor of the room that was there before its transformation into a kiln. Several layers of ground are added over it. The kiln's width appears to be around 1 m and its height 130 cm. The maximum surviving depth is around 50 cm. At that depth is the base of the kiln, in which the mosaic was discovered as well (49.47 cm). The wall is created with bricks and also uses the wall of the house itself for its eastern corner.

- **G-VII 45/46** => Excavated in the years 2015/2016 is the newest kiln of this area yet excavated. Probably, likewise the case of G-VII 14/15, this kiln also was excavated in separate parts so it was given two numbers. The kiln is located at the south part of the Amphitheater area, inside the limits of a prior residential area and now is directly attached to the late-imperial wall. It is a rectangular-shaped kiln with side around 130 cm of length. The surviving depth is not great either. Its walls are constructed with raw stones, similar to the construction of the wall itself. Currently the kiln is covered and not on display due to the lack of preservation ability at the moment.

CONTEXT

When it comes to context, as stated in the abstract, there can be lots of variations when it comes to the spot where a kiln is supposed to be built and used. For instance, the five known roman kilns of Conimbriga, are spread in different parts of the city, surprisingly, though, fairly close to each other. One of them located within the House of Cantaber itself, two of them to a street directly opposing it as well as the unexcavated area of the hill to its southern side (one of them currently revealed while the other lies beneath the path where people walk on; covered for safety and preservation), close to the Basilica. The fourth one is located to the other side of the unexcavated area, currently also open and one of the two I worked on. It is facing the road before the insulae and the grand Southern Baths. Despite its poor condition it is still distinguishable and it doesn't seem related to some building like the other one. The fifth one were located farther than the others, close to the area of the Amphitheatre. (*Forno do pórtico da insula a oeste das termas, Forno da insula do aqueduto, Forno junto ao castellum aquae, Forno da casa de Cantaber, Fornos da rua a oeste da basilica*)³ There was also a sixth one, at the Insula of the Phallic vase was unfortunately demolished during the excavation, in order for the insula to be revealed. It was probably a construction of the Visigoths but its general architecture was almost identical to the roman one, which also proves the previous point, that the kilns cannot be chronologised by their architecture.

The context each one of those kilns was located to, gives also its own material and that also proves different uses, however this will be analyzed later on, in this research paper. Generally speaking it appears that the majority of the kilns found in Conimbriga, seem to be located within the limits of the new walls of late-imperial times and, more specifically, relatively closely to the House of Cantaber and the area around it. Of course the context of the two kilns I was mostly working onto, to the south-east part of the House of Cantaber, still remains a bit unclear, mainly due to the fact that there is no real systematic excavation to the point beyond that kiln. Someone can only make speculations of what kind of facilities of buildings might be lying beyond that point under the surface. Of course one can make assumptions judging on the existent clues around. For instance, whether there is some luxurious construction to the area beyond the kiln (as some random tesserae found at the kiln area might indicate the presence of a mosaic somewhere close and therefore potentially the existence of a rich household), the floor directly beneath it is simple limestone, recycled and turned into a paste in order to form a rather simple floor, on which the kiln was later on built on. The speculation I could make on that was that, for certain, the kiln I was excavating to was related to a rather poor house or certainly not nearly as rich as the House of Cantaber. The context seems to be also extending up to the kiln right opposite it, even if out of sight currently, there appears to be a connection in-between them.

The kiln on the other side of the unexcavated area, close to the Insula of the Phallic vase, (G-VI 14/15) is more problematic in terms of context. Apparently it is not directly related to a building or a house but it rather seems connected to the road before the insulae. Moreover the excavation showed no steady floor beneath like it

³ Correia, Virgílio Hipólito (2016) - A dispersão urbana das actividades industriais (Unpublished presentation). Museu Monográfico Conimbriga: Jornada científica "Conimbriga: Centro industrial da Lusitânia Romana" (30/4/2016)

happened with the previous kiln. There is no flat surface beneath it that could point out at the prior existence of a house to the point where the kiln was placed on. The poor condition the kiln was found on, as well as the lack of systematic excavation to the point behind it, gives little to no clues at what kind of context this kiln might have had. It is unclear if it is directly linked to the insulae before it, or the unexcavated part that is behind it. The findings from the kiln are pretty much the typical you would expect from a kiln as well. That itself does not give us much clue for what the general context of this kiln might have been apart from its connection to the road.

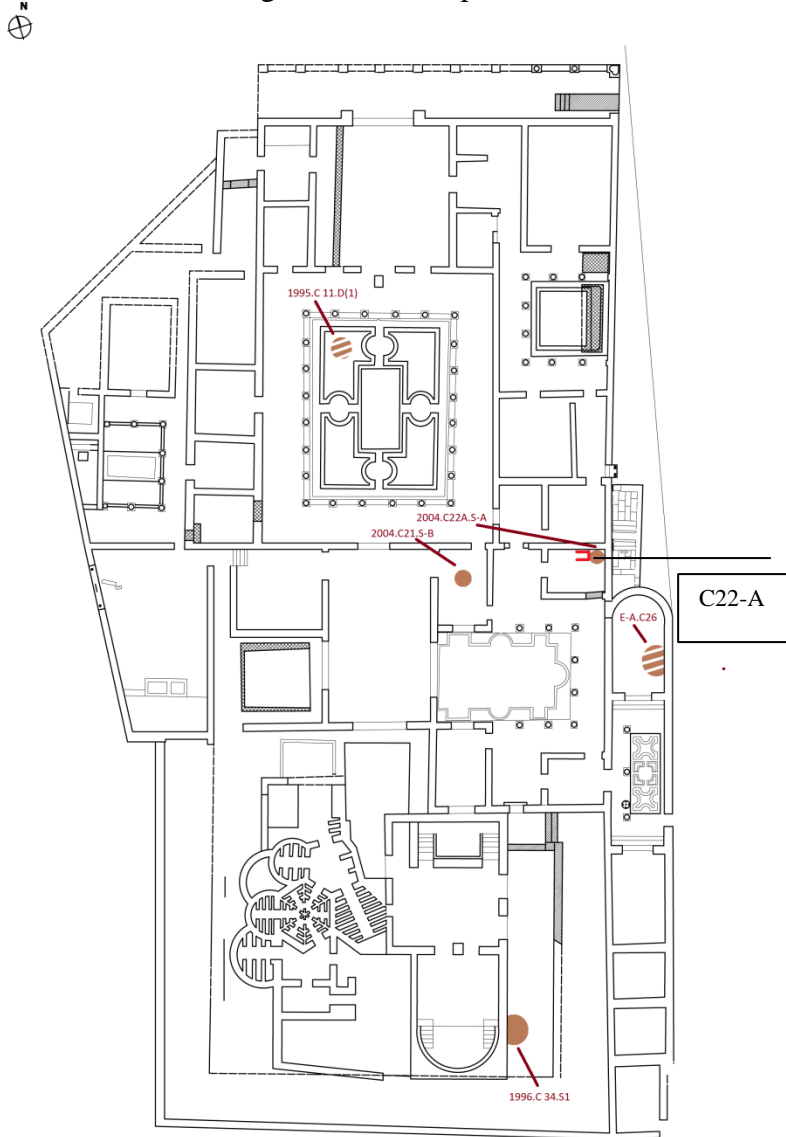


Image 6: House of Cantaber

Unlike either of the two (and the hidden kiln C80) is the kiln of the House of Cantaber. The context is pretty much clear at that point as the kiln is located directly into the house, into one of the many rooms. The area marked as C22-A, lies at the south-east of the mansion, discovered during the excavations in the house in-between the years 1994-2004. A kiln placed within such a rich household, someone can indicate it was for an equally rich purpose. Even if the House of Cantaber had probably stopped being used by an elite family, its importance of position as well as its history was definitely worth mentioning. However the uses of the kilns are to be analyzed later on, in this research paper, as stated above. And yet it is not so strange to find a kiln

even in such an important area in a city. A similar example we can see in Pompeii. According to Giuseppina Cerulli Irelli in 18th February 1959 she discovered a kiln inside a house during the excavations close to the *decumano maximo* of the city. In this case, of course they were talking about an insula and not a villa, even if the House of Cantaber probably could be being used as an insula as well by that point, however the general context is interesting, since the area the kiln was located was fairly close to the biggest and most important road of the city.⁴ The production of the material the kiln had to provide must have been equally important to the position it was found. The direct link to a very important road as it happens in Pompeii, as well as the direct link to a very important building, like it happens to Conimbriga certainly points out material of certain importance as well or, as in the case of Pompeii, a successful ‘business plan’ if someone can use that phrase, for the kiln was located close to the basic street of a city and so, without a doubt, it was used by a great number of people, as well as the products could be moved much easier from their baking point to their selling location. The house of Cantaber, located directly near the new wall has definitely a very privileged position, especially since it is surrounded by roads as well. The communication with the area undoubtedly makes the kiln inside it much more important to the general production than someone could originally think.

What is indeed interesting to comment, is the fact that such a great number of kilns was actually built within the walls of the city. The usual would be for such an industrial activity to take place outside the city walls or at least far away from residences and occupied areas. Due to the heat, or the smoke, a kiln would be avoided to be built close to a house or to a residence both for aesthetic and hygiene reasons. Another interesting fact is that in Rome it was actually strictly forbidden for industrial activities, and especially those related to fire, to take place within the limits of the wall and yet there are kilns, such as the kiln G-VII 45/46 that was actually constructed exactly at the same time as the new wall was, which means there was some movement of industrial activity within the new limits of the late-imperial time Conimbriga. The theory behind this type of change could be, probably, detected at the latest events that took place in Europe of the late 3rd century. Barbarian tribes crossed the Rhine River and eventually got settled down even till Iberian Peninsula, in Spain. At that period many roman cities were strongly fortified, not necessarily because of a direct threat but because of the general climate of insecurity built in the area and the fear that some new threat or even the existent tribes would eventually attack unprotected cities. However not all cities did obey the imperial law and while some cities were strongly fortified, some others were not. Perhaps this movement of the industrial activity within the walls has to do with that general insecurity feeling, spread to many cities. Conimbriga could be one of those cities who “disobeyed” the imperial law concerning the industrial activity within the city’s limits out of refusal to risk their main production sources to remain outside of the walls. This hypothesis could make a lot of sense if someone considers also the fact that most of the kilns, regardless of the production they provide, they were built fairly close to each other. This could mean that the people of Conimbriga had turned that part of their city into an “unofficial industrial area” especially since buildings on that part appear to have been either abandoned and collapsing or deliberately demolished. So perhaps this is one of the few examples of “disobedience” to the imperial laws but of course it needs to be noted that the areas

⁴ Cerulli Irelli G., *Officina di lucherne fittili a Pompei*, in *L'instrumentum Domesticum di Ercolano e Pompei nella prima età imperial*, (1977), 53

around Conimbriga were not excavated nearly as much as Conimbriga city and so we do not know yet other similar examples to the area around.

CHRONOLOGY

As stated before, to the previous sections, one difficult part for archeologists is the chronology of a kiln, since its construction is pretty much typical for all timelines from prehistory till modern times. That, for example, is proven by the latest Visigoth kiln demolished for the Insula of the Phallic Vase. Kilns of the Visigoths as well as kilns of the Romans look identical. Therefore, the general context might be, sometimes, easy to determine, if there is some known building close by or some other form of construction that can give us information regarding the location the kiln was discovered, it for certain is difficult to determine the *chronological context* of such constructions and determine how older or how newer the kiln is to the construction close to it. Sometimes the context itself helps the determination of timeline, in which the kiln was most likely constructed or used (for instance if the kiln is constructed upon a floor of a previous building or below its foundations) or even the material itself can give certain information about the construction. Pottery is one way of determining the timeline, if the pots are decorated or sophisticated of shape (since storage pots or commercial amphorae have very little difference in construction throughout the time) however at the same time, as mentioned before, it is not always a solution, since the material within the kiln could be the result of disposal from the ancient till the modern times or result of nature's elements, such as fall of dirt from an upper level into the kiln and so, the material from newer time finds itself within the kiln. Nevertheless there are two ways of determining time: *relative* and *absolute* chronologies.

Relative chronology refers to the placement of an artifact or a construction to the chronological context, based on elements such as style, general context of finding and sometimes position. This way of chronology gives us a fairly good image of how old an object or a construction is but not with the absolute accuracy. The absolute chronology gives us a more accurate image of when and for how long an artifact or a construction had been created or used throughout the time. This way of chronology is based on written sources, references from sources contemporary to the object or the construction or laboratory analysis of findings to the spot. Absolute chronology is not always possible, especially in cases such as kilns or disposal spots and during historical times, the relative chronology can be pretty sufficient due to the constant changes in style of pottery and metallurgy. The slightest of changes can give us a relative chronology with pretty safe and pretty accurate way, especially since certain styles of drawing and crafting have become "fashion" for a relatively small time during the past and that can give us a relative chronology that extends in less than 20 years, which is pretty accurate itself and so the need of absolute chronology sometimes is not that much needed as in other cases where the changes in style happened with differences of several hundred years. In case of Conimbriga we have both relative and absolute chronologies, depending on the buildings around or close to the kiln and/or from radio-chronology from material such as the one from the House of Cantaber. Relative chronology can be achieved by checking the context. Some kilns do have a perfectly clear context such as the kiln in the House of Cantaber or like the kiln at the Amphitheater area. At those times not only we do have the rest of the buildings but also sometimes even the area around gives us a very good chronology. Some other times the relative chronology coming from the context becomes almost impossible, such as the two kilns of the area of the Basilica.

The kiln C77 has an unknown context and, therefore, it is impossible to tell the chronology by it. What is more; is that the area beneath that point is unexcavated and so we do not have material to compare. The kiln contains broken pieces of pottery, bones and some fragments of glass and metal, which could be fallen from another part to the upper area, as well as some random mosaic pieces. Under these circumstances is almost impossible to give a proper chronology to that kiln just yet. However, putting it to the general context of the city's fortification, we can assume it was built in the late 4th or 5th century. However this is a speculation and under no circumstances can it be properly proven unless the area is excavated properly.

At a similar fate appears to be also the C80 kiln. It is closely associated to the kiln C77 so they could be used about at the same time but it is hard to assume due to the lack of proper evidence or the fact that both of them are in bad condition and also C80 is currently covered. Another problem in chronology to C80 (as well as C77) is that they were both excavated during the 1940s, when the archeological methods were not yet so well developed as they are now or even as they were introduced during the 1980s. Therefore, we can assume that a large number of evidences was pretty much lost during those 40 years in-between 1940s and 1980s as well as probably the first excavation was not nearly as systematic and careful as the excavation of the 80s was.



Image 7: Area of the Basilica

What is more, we have as evidence, the proof of demolished buildings, since the kiln C77 was built on top a floor that has been built and...recycled already in the past. This late chronology can be explained by the fact that whatever building was constructed there before, at the time of the kiln, the building was no more and so, someone can say indeed that the kiln was built somewhere after the second wall was created, if not during the time the Basilica was constructed.

The kiln G-VI 14/15 to the other side, has exactly the same problems of both relative and absolute chronology. What is more, this kiln does not seem to be connected to any building at all, so to give us some context clearly. Most likely it is related to the street instead. The material found to the area is not yet thoroughly studied either, making both absolute and relative chronology almost impossible. However, once again the assumption about the time this kiln was constructed in the first place can be made by the very fact that the kiln is located within the walls of the city. If it

were built before the northern tribes had crossed the Rhine, then most likely it should have been built outside the limits of the city. Of course there is no clue that directly connects this kiln to the kilns of the area of the Basilica, however the closeness as well as the fact that it was built inside the walls as well, could be giving us a similar chronology to it.

Completely unlike this situation is the kiln of the House of Cantaber, which not only has the relative chronology of the general context the building is placed but also we do have the absolute chronology of material with the method of radio-chronology.⁵ First of all, being the biggest and one of the most important residences in the city of Conimbriga, the House of Cantaber, which provides the context and therefore partly the relative chronology to the kiln, was thoroughly examined and studied and its circle of life is pretty much known down to the exact detail in terms of its chronology. We do know about the attack in Conimbriga from enemy tribes and during the excavations, skeletons were discovered within the central yard's pool and it is speculated that they belonged to the original family of the house that they were killed and abandoned there during the attack. After that, it seems that the House of Cantaber began to be used again however most likely not as a domus for the rich anymore. What it seems possible is that the central garden became a common yard of some sort and perhaps the house was turned into an insula, with the rooms now being turned into apartments for families instead. Modifications to the building, especially to the side that interests us, seem to have occurred. Certain doors had been narrowed and extra walls were added. It seems more likely that the kiln was built during that time, in other words after the 4th century. The radio-chronology seems to be confirming this. The material found in disposal silos around give a chronology among the years 425-595 AD⁶. Both terms of relative and absolute chronology are most certainly answered in the kiln of the House of Cantaber as well as its purpose and use, which will be analyzed later.

In a similar situation appears to be the kiln of the Amphitheater, the kiln G-VII 45/46. Its context once again gives us a good first view and a really safe relative chronology. The kiln is believed, and with a great certainty, to be created almost at the same time with the northern parts of the wall, which gives us a safe chronology of the second half of 5th century, in other words 450-470 AD⁷. It is, most certainly a late-roman construction. What is more; apparently the walls of the kiln itself as well as the wall of the house in which the kiln is in, give us a really good chronological order as well. Apparently the kiln was built during Phase III of this entire construction process. This narrows the chronological window even more, to the years 465-468 AD.⁸ Once again, like it happened to the kiln at the House of Cantaber, the use is pretty clear as well.

⁵ De Man A., *Actividade Metalúrgica na Casa de Cantaber* (2005), in *3o Simpósio sobre mineração e metalurgia históricas no sudoeste europeu Oporto*, 9-10

⁶ Correia V. H., *Caracterização das actividades metalúrgicas na Casa atribuída a Cantaber*, (Conimbriga, prov. Lusitania, Portugal)

⁷ Geraldês L. M. P., *Escavações arqueológicas na zona norte de Conimbriga: Resultados das campanhas de 2013 e 2015-16, Caracterização das ocupações e atividades produtivas* (2017), 63

⁸ Id. *Ibid.* 60

URBAN/ARCHITECTURE CONTEXT

It was analyzed prior how important the context is not only for the identification of a construction as a kiln but also for its chronology. However there is another important part that needs to be mentioned and analyzed a little bit further; the importance of the Urban Context, in other words the buildings themselves that host the kilns or that they are closely related to them as well as whether the buildings were still in use while the kiln was or if the building was already demolished or re-constructed and used in a different way. Sometimes this is hard to see unless there is clear evidence of a destruction level (for example signs of a fire or destroyed material that indicates some other natural disaster) but it is equally important to the identification of a construction as well as for creating a better image for the past and the use of the area in general.

As it was also mentioned to the part of the Context, there is a curious reality concerning the kilns of Conimbriga; the fact that all of them are located from the inside part of the walls and pretty much gathered around the same area, creating a form of “Industrial Area” inside the city, despite the general law that forbade the existence of industrial activity inside the walls, especially those who included fire and, therefore, heat, smoke and everything that went with it. Especially in metallurgy the heat must have been incredible since it requires more than 1000 degrees of temperature to melt metal. Moreover not only the heat was literally deadly but also the fumes coming from the furnaces had killed many of the workers there.⁹ Therefore transferring the industrial activity inside the walls (and there are metallurgy kilns within Conimbriga) seems worth commenting on. This curious fact can be explained with the hypothesis stated a little while before and, in a way, this hypothesis is proved by the architectural context or the urban context the kilns were built in or their time of use, compared to the use or abandonment of the buildings. Many of the buildings the kilns are now located, had pretty much already demolished or stopped from use or they had changed their original use, turning the area closer to the “industry” side than to the residential side.

For instance, the kiln C77, which I was working on, was certainly built upon a floor that belonged to an older building, a building no longer in use when the kiln was built. Not only that but, apparently, the previous residence (if we are hypothesizing it was a residence) or shop or whatever other type of construction it was, seems to be demolished long before the actual kiln was made. In fact it is important to say that if someone noticed the lines of the lime stone floor beneath the kiln, as well as the standing, low wall a little bit southern than the kiln, can express the hypothesis that the floor was already re-used one more time as a water-tank. The smaller and lower wall must have been used to separate in two the room that once stood there, creating a smaller space capable of holding this new construction. In fact my excavation a little deeper than the kiln floor revealed a ceramic tile that could be the original drain, from which the water from the tank could be coming or leaving. It is quite safe to assume that this specific kiln was already built upon a demolished construction, probably already re-used in the past. Of course the final result would come out only after the actual excavation of the hill's area. The neighboring C80 has an equally unclear context and currently is impossible to be studied, due to the fact it is covered. However I

⁹ Burford A., *Craftsmen in Greek and Roman society* (1972), “Aspects of Greek and Roman Life” H. H. Scullard Thames and Hudson, 72-73

would hypothesize that the state of the buildings around could be similar to that of the C77 and that could explain the fact why C80 was built so close to C77. Obviously there was enough ground and material for building a second kiln so close to that one and moreover, it doesn't seem possible that there were many residences still in use by that point. Another proof of demolition is the fact that C77 was not built exclusively by bricks but also by spare material, almost certainly in second use that could be coming from the destroyed, unused building the kiln is standing on right now. The only urban relation to C80 appears to be the Basilica of the Christian times. It does not provide much of information for this matter



Image 8: Low wall southern of C77

G-VI 14/15 is in a similar way, if not worse, than the C77 and C80, for it is not even associated with a building at all and mostly is close to the street, eastern the Southern Bathhouse (as its name indicates). Attached to the unexcavated area from one side and to an empty street from the other, it is impossible to create an urban context that could indicate when and how those kilns were created or even what they even were for in the first place. Even in the first excavation, the material found to that kiln was not enough to give us a complete idea of what that kiln was or what it was associated with. It could mean that it was used for a very limited amount of time before it was abandoned completely.

In a completely different context appears to be the kiln of the House of Cantaber. As the name indicates, the kiln is located inside the very building of the *domus* that was associated with Cantaber. The interesting fact is that there was observed some form of modification to the walls and to the entrances at the rooms around the kiln as well as to the room where the kiln itself was located. This proves that the house was, most likely, still in use when the kiln was constructed and also while it was used. Of course is the most normal to assume that the house was no long-

er a rich household, or else probably a kiln would not be located in it. Perhaps the House of Cantaber's central atrium was turned into a common yard and, maybe, the house was now turned into a form of insula, hosting a different family in each of its chambers (perhaps even families of the people working at the kiln).

Likewise the kiln at the Amphitheater area has a very clear urban context. Located within a building and really close to the wall, G-VII 45/46 gives us probably a very clear idea that it was constructed during the time the wall was being built as well. The building around it is even older. The existence of wall painting fragments proves that the house was not built to be industrial, originally. However, the modification at the entrance of one of the rooms to the south of it (as well as the existence of the wall) proves the modification of the area from residential to industrial. Of course the use of that building afterwards can only be speculated for now but the stronger walls at the base as well as the narrower form of the construction can indicate the existence of at least a second floor. It is equally possible that the lowest floor was used as a storehouse and the upper floor as residences of people (the most possible speculation could be that the people who lived there were the workers and the masters working at the kiln. In this case we are not talking about the use of the ready ground of a demolished house but we are seeing a really methodical modification of a previously demolished part of the city and, probably, the complete transformation of an area from residential to industrial.



Image 9: Kiln G-VII 45/46

USE

At this section of this research paper, will be a certain reference to the use of the kilns. As mentioned to the first part of this paper, a kiln is pretty much the obvious; an oven, a furnace aiming to bake something; from bread till metal. It certainly goes without saying that in order to say that a kiln had truly been *in use* we definitely need the evidence that proves there had been an open fire to the spot (like stated to the first sections), usually we can detect the black spots upon the walls of the furnace or to the material itself that happened to be too close to the area the fire was burning. The use of a kiln throughout its life, can be detected and recognized mainly out of the material left behind during the industrial process, in other words the waste of each time. If we are talking about a ceramic kiln then the material that point out this use would be broken pieces of pottery, completed vessels and half-baked clay within the furnace. Metal-making kilns, will leave behind half-melted pieces of metal or half-complete metallic objects or even rough material of metal before it was yet modified or molded. Glass-making kilns provide usually material such as broken pieces of some glass vessel or glass-masses that were not yet molded into an object. Furnaces used for baking edible material such as bread can perhaps be detected by remains of seeds or other material. Of course the latter type of kiln is mainly for domestic use and is not directly connected to the industrial activity, at least not to that extent. Conimbriga kilns we are dealing with in this research paper are industrial ones and usually include pottery or metallurgy. There were some remains of glass pieces in some of them but most likely they are not directly connected to the production happening within the kiln itself but they could have ended there as a result of secondary discarding material after the kiln seized being used. Unfortunately, though, the use of a kiln is not always clear by the evidence or the material.

The kiln C77 as well as the neighboring C80 to our great misfortune, are not perfectly clear in terms of use mainly because of the lack of context. However, since there is no real evidence of metallurgy within it as well as the fact that there is a clear evidence for metallurgy in kilns close to them, we can probably assume with certain safety that the kilns were used mainly for ceramic material, if not exclusively for that. The material extracted from that area seems to be proving this theory since there is mainly a large amount of pots, broken tiles and, especially in C77, remains of half-baked clay to the base of the kiln. The discovery of a single piece of iron within the area of C77 is not really evidence for metallurgy industrial activity for it could have ended up there from another part of the unexcavated area. There was not much fine pottery found on the spot either, with the majority of findings being pieces of large, storing pottery or tiles. Most likely it was not indicating the production of fine pottery at those kilns. Most likely we are talking about simple, large pottery. Another thing worth mentioning is the fact that the signs of fire to the walls of the kiln did not seem too intense. It could indicate that the kiln, for some reason, was not used for a wide extension of time and it was abandoned or turned into a discarding pit instead.

With the same, if not bigger, mystery is surrounded the kiln G-VI 14/15. The material retrieved from that spot does not seem enough to categorize the kiln to which part of industrial production it belonged; metallurgy or pottery. There has been expressed the idea that this kiln is “undoubtedly for pottery”, however it seems there is yet another theory that apparently disagrees with this “undoubting” theory due to the lack of evidence found on spot. In fact there were barely two objects found at the spot. Indeed even throughout the re-excavation that I proceeded to in 2019, I discovered a

number of broken pieces of pottery on the spot which, however, could have been brought along with the dirt that covered the kiln from somewhere afar. A great number of bones was also discovered at the area but their source could either be bones discarded there in antiquity or bones that ended up there from other parts of the area and were brought there, along with the dirt. The poor condition the kiln was found in, nowadays, did not permit me to see any signs of fire either so not even the precise times this kiln was used did not appear to the scene. For certain the lack of intense fire could indicate to the exclusion of the hypothesis of being a metallurgy pit and so the theory of it being a pottery kiln could be true after all, however the evidence that was found still doesn't allow us truly to exclude anything.

Once again, the House of Cantaber kiln (C-22A) is proven to be an exception to the two kilns above since not only its context is stable but it is also quite clear what the products of it were. The discovery of metallic pins to the area, as well as the remains of them to discarding pits around the kiln, leaves no doubt that what industrial activity was occurring in that kiln was metallurgy. The mining material is known to existing to Conimbriga after all from the prehistoric times.¹⁰ The material points out a construction for the creation of golden material within the House of Cantaber during the use of the kiln. Despite being speculated that the mining industry was reduced in late Roman era¹¹ it is proven every day that the mining as well as metallurgy not only still occur but also provide objects of precious metal such as gold within the House of Cantaber.

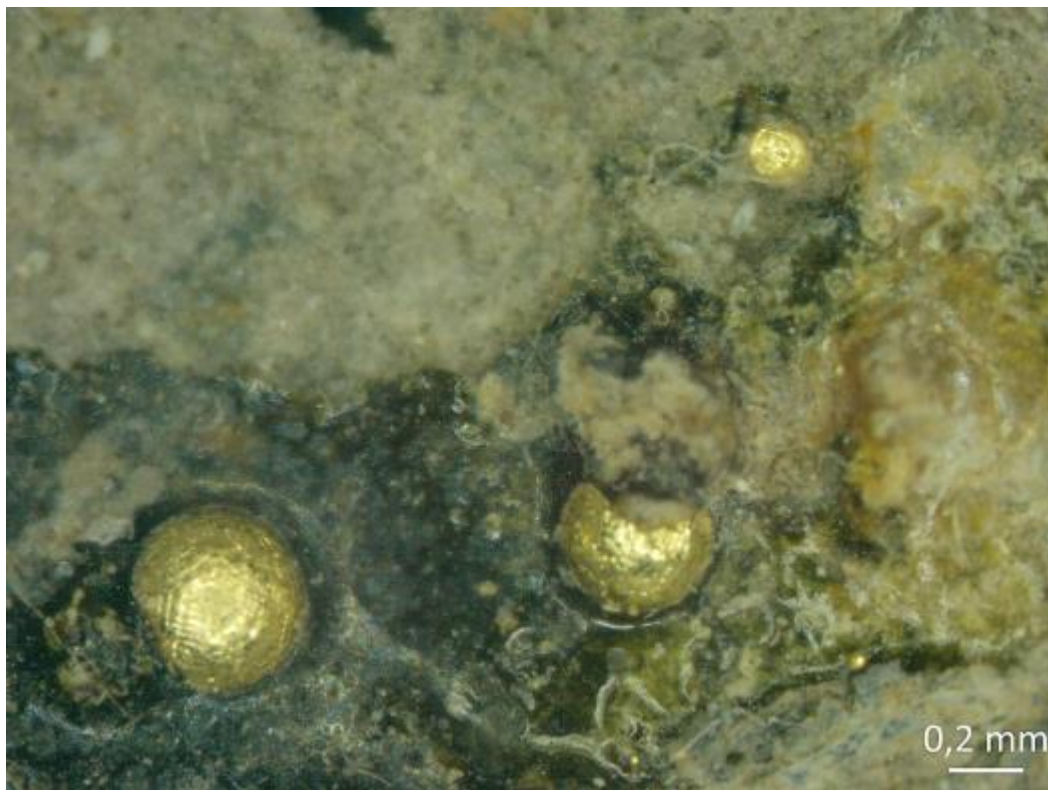


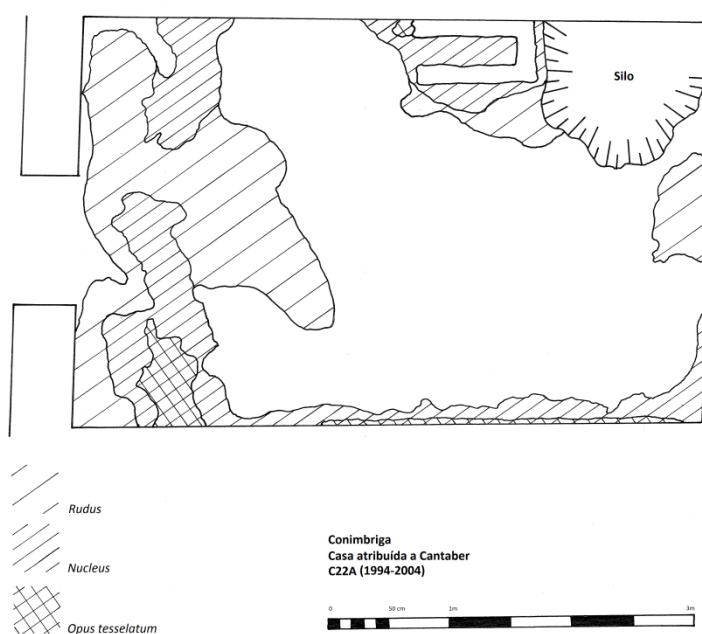
Image 10: Findings from the House of Cantaber

¹⁰ Correia, V. H., Valério P. - Araújo, M. F., Alves R. (2019) - Caracterização das actividades metalúrgicas na Casa atribuída a Cantaber (Conimbriga, prov. Lusitania, Portugal). XIII Congresso Ibérico de Arqueometria. Faro: ICARHEB (in print)

¹¹ Edmonson J. C., "Mining in the later Roman Empire and beyond: Continuity or Disruption?", *The Journal of Roman Studies* Vol 79 (1989), 85

The kiln, as well as the material from the silos around it, prove the existence of metallurgy within the city and within a building that used to be of such a great importance to the city since the old days of its existence. The position is important too, since it is directly attached to the wall, close to one of the entrances and close to a street. The transportation of the material, which is equally important with the creation of artifacts, is also assured in that place.

Image 11: Diagram of the silo in the House of Cantaber



And still, the House of Cantaber is not the only prove of metallurgy within the city of Conimbriga, since the kiln G-VII 45/46 has been thoroughly studied quite recently and the evidence also proves the existence of metallurgy within that very 'industrial complex' of constructions. The location of this kiln is also close to the walls and not far away from the entrance either, technically neighboring to the one of the House of Cantaber, so both the material and the finished products would have a direct way of getting in and out of the production spot. Amongst quite fine pottery from Spain, East or Africa etc and the pieces of glass also found to the spot, nine bronze coins were found to the spot as well giving us clues not only of the chronology but also the economy.¹² According to the researches, though, there is no doubt about the metallurgy taking place to the kiln.

Since the kiln within the Insula of the Phallic Vase was demolished for the sakes of the Insula to be discovered, there is no real clue about its use. Besides it wouldn't fit to this research paper since it extends away from the roman archeology field, to the one of the Visigoths.

¹² Santos A. C. P. C., *Intervenções Arqueológicas na zona norte de Conimbriga: Campanhas de 2013 e 2015-2016. Estudo das Cerâmicas de importação, vidros e numismas e cronologias de ocupação* (2017), 255-258

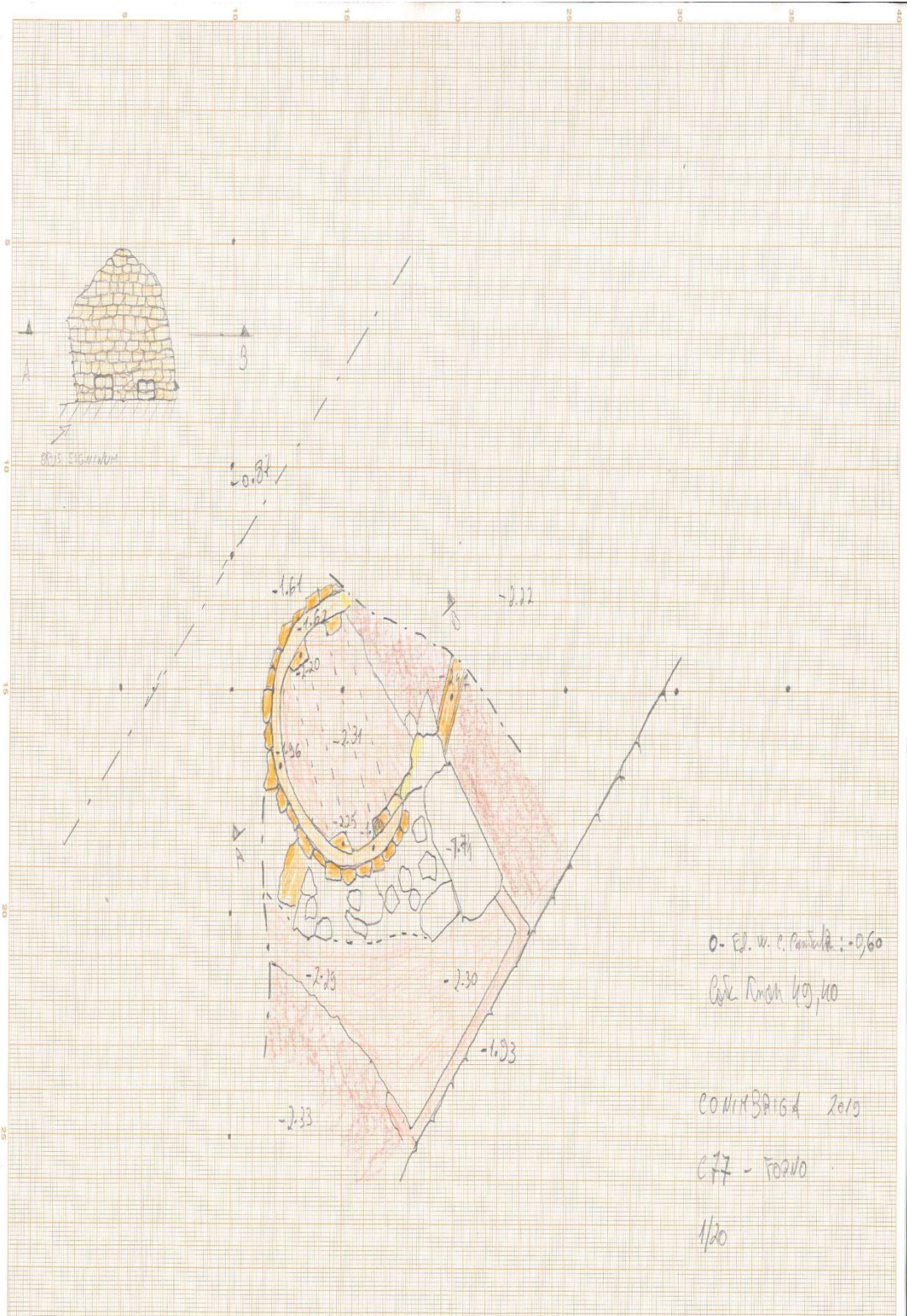


Image 12: C77 sketch (2019)

EPILOGUE

In conclusion, and in order to sum up what was written above, it becomes all clearer that in research sometimes the most valuable artifacts for constructing the past do not lie within the most 'important' buildings of a city or a temple out in the area but constructions built by the common people for their every day needs. We often forget or even omit every day people's stories when we are writing down history but in reality, if we really want to re-construct the past with the greatest possible accuracy, it is important not to leave out what people know so little about, because they get distracted by narrations of great battles or blinded by the shine of gold or jewels or artifacts found within a rich tomb. A part of this 'common storytelling', are definitely the kilns; the center of productive industry and has an unbreakable connection not only with the artifacts themselves but with the growth of the city as well. In the case of Conimbriga this becomes even clearer if someone takes under consideration this interesting exception of the rule; the industry moving within the walls of the late Roman city, providing us a huge number of clues and the remains of artifacts that give us a bigger picture of how the city looked like, how it continued to change throughout history ever since the new wall was constructed, reducing the size of the city almost in half by the Late Roman period. Their appearance might be simple but the construction and maintenance appear to be complicated enough as well as the danger people working at them was as well clear.

Unfortunately back then at the first excavations and even nowadays, this kind of constructions are left in neglect and they do not seem important always to the eyes of researchers. Hopefully they will be studied further and I seriously pray that the areas will be better taken care of as well as be thoroughly excavated so more pieces of this puzzle will be placed together and we can have a better image of what the city of Conimbriga might have looked like so many thousands of years ago from the large and rich houses like the House of Cantaber or the House of the Fountains till the small and yet so important constructions such as the kilns analyzed in this research paper. One thing remains for sure; that Conimbriga has yet to reveal more of her secrets, her life and her people that recided within her walls. As the researches continue, we can only expect new clues to come to the light of day and give us a small fragment more, to add to this reconstruction of this city.

Tsakalidou Aikaterini
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Thursday 22nd August 2019

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IMAGE ANNEX

- ✚ *Cover image*: José Ruivo (ca. 2014)

- ✚ *Image 1*: Correia V. H. (2010)

- ✚ *Image 2*: Isabel Pereira (1985) and Humberto Rendeiro (2019)

- ✚ *Image 3*: João Bairrão Oleiro (1966)

- ✚ *Image 4*: João Bairrão Oleiro (1966) and (2019)

- ✚ *Image 5*: João Bairrão Oleiro (1966)

- ✚ *Image 6*: Correia V. H. (2019)

- ✚ *Image 7*: Armando Guerreiro (November 2004 and August 2006)

- ✚ *Image 8*: Humberto Rendeiro (2019)

- ✚ *Image 9*: Ana Cláudia Santos, *Arqueológicas na zona norte de Conimbriga: Campanhas de 2013 e 2015-2016. Estudo das Cerâmicas de importação, vidros e numisms e cronologias de ocupação* (2017), 63

- ✚ *Image 10*: Pedro Valério (2018)

- ✚ *Image 11*: Correia V. H. (2019)

- ✚ *Image 12*: Correia V. H. (2019)