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# Supplying the Roman Towns in *Hispania*. Granaries and warehouses

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# Supplying the Roman Towns in Hispania. Granaries and warehouses

Javier Salido Domínguez

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## Introduction

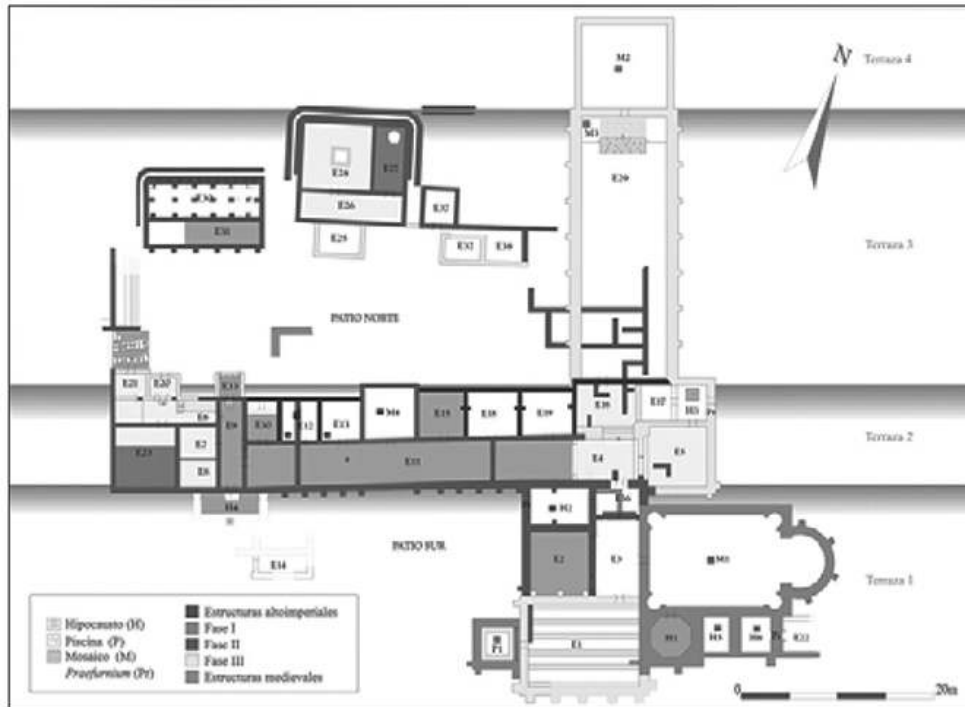
- 1 Food supply in Roman towns across *Hispania* has been a scarcely studied subject in historiography due to poor conservation of relevant structures (*borrea* –granaries and store buildings- and *pistrina*) and a lack of interest on part of experts dedicated to the archaeology of architecture, who have focused more on the religious, judicial and other types of sites and monuments. Consequently, the study of warehouses and other store buildings has been long neglected, despite being of great importance in terms of understanding the management of primary resources such as grain, one of the most crucial factors behind the functioning of a city<sup>1</sup>.
- 2 Recently, archaeologists have analyzed remains that give us more precise information about food production, storage and distribution, namely the *borrea*, warehouses and granaries, found in the rural as well as urban areas of the old Roman towns. This was precisely the subject of my doctoral thesis where, in an attempt to go beyond the national frontiers, I analyzed the *Granaries and Store Buildings in the West of the Roman Empire*, the results of which were partly published in a book titled *Horrea Militaria, Army's Grain Supply in the west of the Roman Empire*<sup>2</sup> and in other works dealing with the study of civilian and military supply in the ancient *Hispania*<sup>3</sup>. In addition, a scientific review titled *Horrea d'Hispanie et de la Méditerranée romaine*<sup>4</sup> has recently been published, albeit lacking an analysis of epigraphic documents and archaeological remains, which is precisely the objective of this research paper.

## Grain production in the *ager* of Roman towns in *Hispania*

- 3 The establishment of first colonies and territorial reorganization in Republican times were an answer to a planned program aimed at restructuring of the agricultural land in order to establish a new taxation System. The result of this territorial restructuring, apart from creating a new road network, would be the appearance of the first *villae* in the Iberian Peninsula<sup>5</sup>. In general, these were small rustic structures with modest residential spaces designed for the rural exploitation of the area that had previously belonged to its respective owners. Consequently, the *villae* were originally used as production centers. In this context, the construction of a granary in a rural area symbolized abundance, prosperity and economic wealth<sup>6</sup>. In fact, Varro confirms that the term *villa* stems from the word *vehere*, meaning the place where the harvest was taken to and stored<sup>7</sup>. However, it wouldn't be until the beginning of the first Century AD that a tripartite territorial division of the Roman *villa* set up by Columella (*pars urbana, rustica and fructuaria*) would manifest itself, reflecting the importance of a rural storage space for the agricultural products inside the property of the Roman *villae*. Still, despite the importance of granaries as being most indicative of the owner's wealth and providing us with valuable archaeological information on storage and production Systems in these rural centers, the most recent historiography has barely analyzed these structures<sup>8</sup>.



**Fig. 1**  
Distribution map of Roman rural granaries with raised floor in *Hispania*.

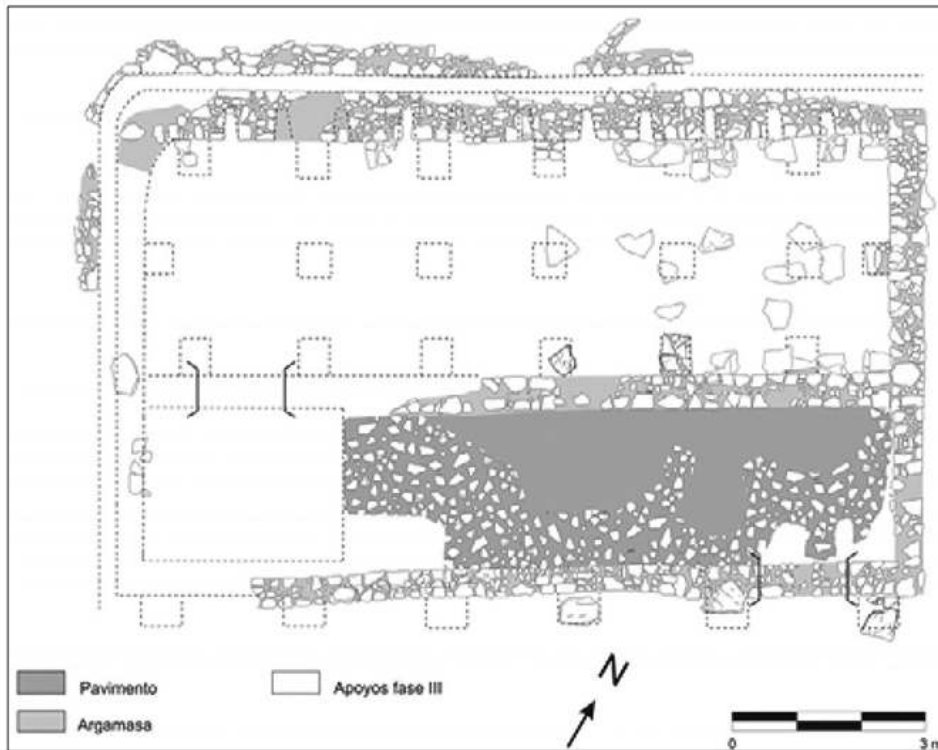


**Fig. 2**  
Plan of the excavated areas of the Roman villa of Veranes (Gijón, Spain).

- 4 These rural Settlements had areas reserved for grain storage in silos (well documented in numerous research centers in Catalonia and other areas across the Peninsula<sup>9</sup>) and in *horrea* with raised floors maintaining the grain in ideal temperature and humidity conditions in the long term. Grain was key to a family unit's self-supply and survival, used as a reserve for the next year's harvest, with the surplus sold in the towns. There was a taxation System of sorts, as the big part of production in these rural Settlements was remote from the *caput civitatis* where it was consumed. Even though the construction of the raised granaries was not so much a novelty in terms of the construction technique (after all, this was a well known construction model for centuries before – sixth Century BC in Iberian Peninsula)<sup>10</sup>, it did turn into a storage System that would come to represent the most efficient granary model that, among other advantages, offered the possibility of opening and closing the storage room as many times as was needed. The grain could thus be stored at any time without spoiling the rest of the products.

**Fig. 3**

3D Reconstruction of the *horreum* of the Roman villa of Veranes (Gijón, Spain).

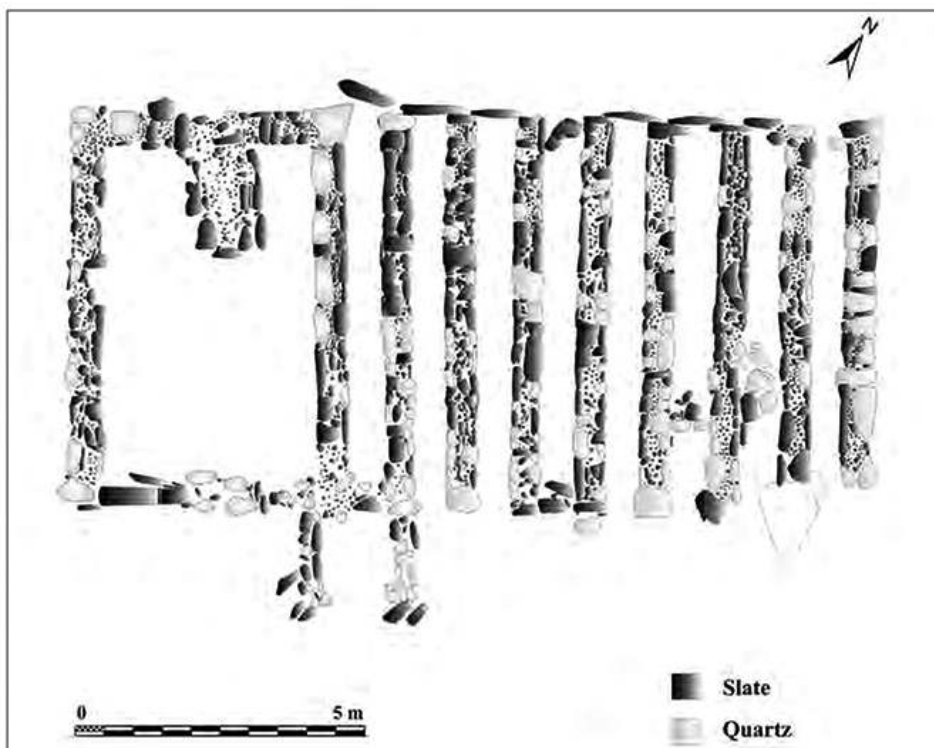
**Fig. 4**

Plan of the excavated *horreum* of the Roman villa of Veranes (Gijón, Spain).

- 5 The storage Systems that reveal the most about the agricultural potential of the area are obviously the raised granaries (Fig. 1). The fact that the rural Settlements did not include more than one *horreum* in their *fundi*, the ease with which we can identify these structures from an archaeological point of view and the possibility of comparing at least the size of those buildings make these warehouses more susceptible to research and allow us to learn more about the storing of grain and other food products in the rural setting<sup>11</sup>.
- 6 In the *ager* of the first towns, we find structures that tell us a lot about grain production, supply and its subsequent consumption in the actual towns. It is very

probable that the towns were organized around the *caput civitatis* and that there was a greater density of rural cultivation centers in their proximity<sup>12</sup>. This proximity explains why the *horrea* of certain rural settlements would have a smaller storage capacity. This is the case in the town of **La Burguera**, belonging to the *ager Tarraconensis*<sup>13</sup> where the first rural elevated stone *horreum* was discovered in *Hispania*<sup>14</sup>, dating back to the second half of the first Century AD. The construction model reminds of other storage buildings with five parallel walls that allowed for the wooden floor or *tabulatum* to be raised, over which the grain would be poured in.

- 7 In the territory of the old city of Gijón, we find a rural Settlement called **Veranes** (Fig. 2), some 800 meters from the Via de la Plata (Silver Way or Silver Route), that linked the old city of Gijón with *Lucus Asturum* (Lugo) and *Asturica Augusta* (Astorga), via *Legio* (León). In the western service area, close to the kitchen, it was found a Roman *horreum* from the Early Empire period that includes a storage room supported by pillars, which we were able to study in detail (Figs. 3 and 4)<sup>15</sup>.
- 8 Various *villae* were built in the economic territory of *Colonia Norba Caesarina*, the most prominent of which was Monroy/Los Términos<sup>16</sup>. Far from the *pars urbana*, an enormous *horreum* from the Early Empire period was discovered that, according to the *in situ* research I was able to do, included two entrances leading to two different rooms: the entrance hall and a storage room supported by eight dwarf walls<sup>17</sup> (Fig. 5).



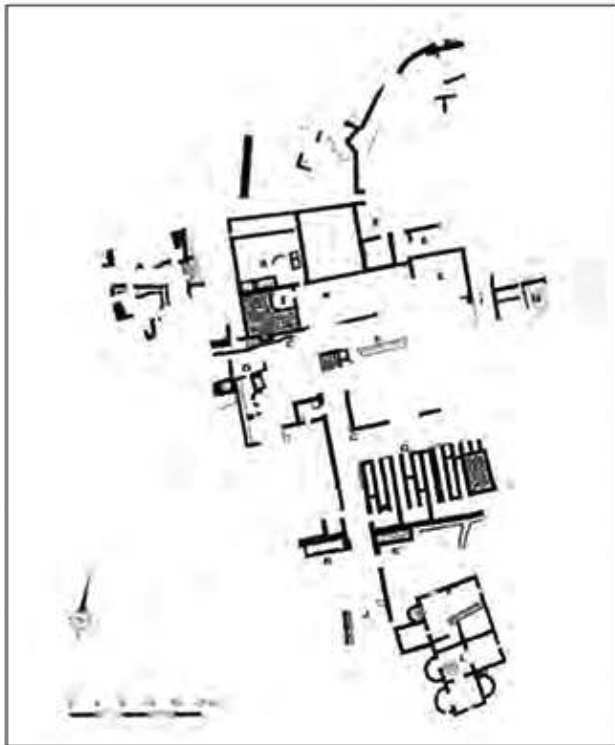
**Fig. 5**

Plan of the *horreum* of the Roman villa of Los Términos/Monroy (Extremadura, Spain).

- 9 Some 20 km from *Olissipo*, or the old Lisbon, an *horreum* in the **Freiria** settlement was discovered<sup>18</sup>. The streets that make up the urban planning of this rural Settlement (Fig. 6) and the large dimensions of its granary comprised of a storage room measuring approximately 12 meters in length and 8 meters in width (Fig. 7) permit us to hypothesize that this was an important rural enclave much like the rural *vici*. It's

imperative to point out that the socioeconomic link between the *vici* and the *villae* was so tight that Varro described the *vicus* as a supply hub where the surplus products from the *villa* were sold (Var. R. 1, 16, 4, 4r). On the other hand, Frontinus located the *vicus in modum munitionum*, close to the *villae* (*De Conditionibus Agrorum*, 53, 1-15)<sup>19</sup>. The organization of the Settlement would then explain why the *horreum* was the biggest of its kind in *Hispania*.

- 10 In *Lusitania*, recent excavations done during the construction of the Plata Highway (“La Vía de la Plata”) have also revealed various rural *horrea*, such as the granary at the rural establishment of Royanejos, some 6 km north of the *Augusta Emerita*, comprised of a storage room supported by six parallel dwarf walls<sup>20</sup>. In the municipality of Canaveral (Cáceres), another *horreum* was discovered which included two separate rooms: a big entrance hall facing north and a grain storage room supported by various dwarf walls<sup>21</sup>. Archaeological excavations in the municipality of Carrascalejo (Cáceres) revealed yet another *horreum* that must have been a part of the *pars rustica* of a Roman *villa* from the Early Empire period, dating back to the beginning of the first Century AD<sup>22</sup>.
- 11 A granary was built between the second half of the first Century and the beginning of second Century AD in the *pars fructuaria* of the Roman *villa* of Doha Maria (Badajoz), approximately 400 meters north of the *pars urbana*<sup>23</sup>. This is a building that included a slate floor supported by three parallel dwarf walls. In the Roman *villa* of São Cucufate, during the first third of the second Century AD (second phase), an *horreum* was built that was divided in six rooms used for grain storage<sup>24</sup>. The floor rested directly on the internal walls of the building and the benches next to the perimeter walls. The walls also included openings and a ventilation room in the bottom part, used to air the storage room and supported by brick arches.



**FIG. 6 (TOP)**

Plan of the excavated areas of the Roman villa of Freiria (Portugal).



**Fig. 7 (RIGHT)**

*Horreum* of the Roman villa of Freiria (Portugal).

- 12 In the rural Settlement of Torre de Palma (Portalegre, Portugal), in the mid first Century AD, a rustic structure was built that included a space used as a granary<sup>25</sup>. Bearing witness to its existence are three parallel inferior walls. However, it's difficult to accept Maloney's and Hale's hypothesis that another construction called the south granary was used as a second grain warehouse<sup>26</sup>. The construction type and the building floor do not give us enough information so as to determine its functionality.
- 13 Recent excavations have revealed an *horreum* supported by various dwarf walls in the Roman *villa* of Vale do Mouro (Coriscada, Méda, Portugal)<sup>27</sup>, but for the moment we do not have much information about this building. In the Roman establishment of Fonte do Sapo (Santarém, Portugal), it is recendy found another raised *horreum*<sup>28</sup>.
- 14 Granaries from the Late Empire were also found in *Lusitania*. This is confirmed in the Roman *villa* of São Cucufate (Beja, Portugal) where five parallel walls were the base of a *tabulatum* on top of which grain and other products were stored<sup>29</sup>. In the second half of that same Century, another granary was built in the rural establishment of La Sevillana (Badajoz)<sup>30</sup>.
- 15 The small distance between these rural settlements and the *caput civitatis*, anywhere between 5 and 20 km, indicates that the economic link between the two was very strong. A piece of information that could allow us to further study this link is a theoretical estimate of the storage capacity of the raised *horrea*, a calculation that should always be considered imprecise, ambiguous and possibly inaccurate. The first problem in this case is that the *horrea* were used not only for the storage of grain but other perishable food products as well, albeit separately. Furthermore, a passage for the warehouse personnel had to be set up. On the other hand, we should keep in mind that, even though the granary had certain dimensions, it could be empty at a given



moment during its period of use. Similarly, it could be repeatedly filled and emptied, depending on the season. Another problem arises from the fact that the actual grain was stored in bags, bulk, or wooden boxes, which makes it impossible to determine the exact storage capacity of the granary. Neither can we determine the width of the *tabulata*, an important piece of data when it comes to estimating the resistance capacity of the surface holding the stored goods, which could seriously damage the infrastructure of the *horreum*, especially those made of wood. Also worth mentioning is the fact that, in the case of *Hispania*, there was no archaeo-botanical analysis of the evidence gathered during the excavation that would allow us to determine which products were stored in those warehouses and how, as well as testify to the infestation of the stored grain.

- 16 Depending on these factors and information that is yet to surface on this subject, we'll have to wait until we are able to estimate the maximum storage capacity of the Hispano-Roman *horrea*. However, even though we can't offer a quantitative estimate of the granaries' storage capacity, it's true that a simple comparison of the dimensions of rural *horrea* of the Iberian Peninsula with those of the granaries discovered in other northern provinces of the Empire<sup>31</sup> allows us to hypothesize that not all of the grain produced in the *fundi* of the *villae* was stored in the rural Settlements or the size of the hacienda in the case of *Hispania* was smaller. If we think that the objective of the *dominus* was to sell the agricultural surplus<sup>32</sup>, rather than store goods that could have been spoiled by various factors (humidity, temperature, insects, rodents, etc.), it would have been more convenient to send a major part of the harvest in circulation to the towns or rural markets<sup>33</sup> and sell them later on, store them in other urban *horrea*, use them in the *pistrina* (mills and bakeries/patisseries) and, naturally, ground and cook them in the furnaces of the *villae*<sup>34</sup>. Consequently, the size of the *horrea* depended not only on the amount of grain obtained from the economic territory of the *villa*, but also on the *dominus*' personal interests and the size of the cultivation area since the best part of the harvest would have to be reserved for the next sowing. Another thing to keep in mind is the famine that jeopardized the very survival of the people working in the *villa* or field workers<sup>35</sup>.

## Grain storage and distribution in the urban areas: archaeological evidence

- 17 When it comes to researching grain supply in Hispano-Roman towns, the problem is to determine the areas and buildings used for grain storage and distribution. The absence of specific research on the *horrea* as well as a lack of interest in these types of structures has largely left us in the dark as to the construction techniques, typology and grain storage methods in the Roman period. As a result, we know of very few urban *horrea* in *Hispania*, especially from the Late Empire period, as we continue to struggle with the analysis of the discovered buildings (Fig. 8). There is an overall tendency to refer to any building potentially used for storage as granary, but, as we have argued in other papers<sup>36</sup>, such buildings required special construction techniques for the optimal conservation of grain. On numerous occasions, buildings that were probably never used for grain storage are considered granaries; still, based on their discovery and dimensions, experts set out to analyze their capacity, grain supply and the taxation system of a city's rural territory<sup>37</sup>. Consequently, it's imperative to understand the

difference between granaries and generic warehouses, even though the Latin term *horreum* implies both types. Another thing to understand is that it's difficult to determine whether the *horrea* were under state or private ownership. In most references on the subject, large buildings found in urban areas are considered to be public, whereas the epigraphy and written documents tell us about the ownership type and management of numerous private and public *horrea*<sup>38</sup>. The last issue worth mentioning is the lack of archaeo-botanical analyses that would provide us with valuable information about the type of stocked grain, storage time and methods (in bulk, bags, etc.), production locations and supply radius of a particular grain type.



**Fig. 8**

Distribution map of Roman urban granaries and store buildings in *Hispania* (archaeological remains and epigraphical testimonies).

- 18 Most of the grain and other agricultural products obtained from the towns' economic areas were traded in rural markets, at *finies* even promoted on the properties of great landowners to save them in transportation costs<sup>39</sup>, as well as in the *macella*<sup>40</sup>, the *tabernae*, other commercial areas throughout the city<sup>41</sup> and through intermediaries in the *nundinae* or weekly fairs<sup>42</sup>. As a result, the commercialization of agricultural products, subject to fiscal taxes<sup>43</sup>, meant a continuous food supply for the population, so much so that even the *macella* would be known as the supply market where the plebeians got their supplies (Plin. Nat. 19, 52). This continuous trade eliminated the need for storing huge amounts of goods in large urban *borrea*, especially during the Republican period. Therefore, these buildings should not be considered warehouses of goods consumed on a daily basis but temporary storage and redistribution areas for specific purposes. Contrary to what has been argued thus far, many *borrea* were under private ownership, used for the distribution of seasonal products that had to be traded in the short term so they wouldn't spoil. Some were used as warehouses for products that would be sold later on by the merchants, who had previously rented out the *borra* or certain storage areas within the buildings. Other warehouses were used for the direct sale of products to merchants interested in reselling them later on<sup>44</sup>.

- 19 Even though we're mostly in the dark as to how and on what principles the majority of taxes in the Roman communities were administered or collected, we do know that it was mandatory to do several days of community work in cities such as the ancient *Urso* (Osuna, Sevilla), according to the *Lex coloniae Genetivae*. As a result of this community work, an enormous amount of agricultural surplus was generated. We also know that there was some sort of assistance program for the poor on part of big landowners that included selling grain at a low price<sup>45</sup> and also perhaps in-kind donations (Cic. Ver. 3, 2). The accumulation of agricultural surplus led to the construction of numerous *borrea*, but, unfortunately, we were barely able to find these in the archaeological register. Another factor to keep in mind is that, even though some warehouses were under public ownership, the management was in the hands of private landowners and landlords, as confirmed in the legal and epigraphic documents<sup>46</sup>.
- 20 The first urban *horrea* documented in *Hispania* coincide with the first expansion phase and the consolidation of Roman power in the Iberian Peninsula, constituting one of the most fundamental facilities to satisfy the territory's commercial needs and, of course, to guarantee the population's food supply. The oldest documented structure known to have been an *horreum* with its exclusive function as a warehouse for products is located in the Celtiberian-Roman city of *Contrebia Belaisca* (Botorrita, Zaragoza) that had strong ties to Rome through its connection with the Ebro river<sup>47</sup>. On the Southern hillside where a Settlement known as "Cabezo de las Minas" is located, there is a large structure built from sun-dried bricks dating back to the second Century AD, which heralded the construction model of the generic Roman warehouses<sup>48</sup>. This enormous construction (15 x 15 meters) consists of five wide and long rooms. Its floor plan is similar to the *horreum* in the North African city of Djemila<sup>49</sup>, but, unlike the latter, it does not include a raised floor that would allow for the conservation of grain in its inferior in the long term. The openings observed on the inside of the walls, some 3 meters above the ground, indicate that there was a second floor, but these do not correspond to the openings for the floor brackets. Therefore, this was a simple warehouse with five *cellae* and a porticoed space to protect the goods from severe weather conditions, brusque temperature changes and humidity, maintaining the city's food supply in perfect conditions<sup>50</sup>. Aside from this physical protection, the warehouse also required protection of the guardian deity kept in its interior<sup>51</sup>.
- 21 The exceptional nature of the Hispanic provinces where *horrea* from the Republican period were found allows us to understand why they were located in the central areas of the urban nucleus, unlike the pattern we would see in the Early Empire period, where they'd be found next to city gates and ports.
- 22 A building with a similar floor plan was discovered in the *forum* of *Valentia*, dating back to 100 BC<sup>52</sup>. Just like the other one, it included four *cellae* with a portico that closed off the complex on the far Southern side (Fig. 9). The storage rooms were made of *opus quadratum* walls with two and three courses, the first ones being the building's foundations. On top of this first level, a floor was placed on the Street level, which tells us this was not an raised floor typical of Roman granaries. This also means that we cannot compare the *horreum* at the Almoína of Valencia with the military granaries in *Numantia*, in floor plan nor in function<sup>53</sup>. What we have here is a generic warehouse where products for the city's supply were stored. The fact that it's located in the center, right in the middle of the city's *forum*, does not necessarily mean it was under public ownership since neither its monumental character nor its big dimensions are exclusive

features of public *horrea*, especially when compared to the huge Republican warehouses in Rome belonging to aristocratic families that had them built for their own private use<sup>54</sup>.

- 23 Based on the warehouse remains from the Republican period, we can conclude that the towns of this period didn't have huge grain reserves, which meant there were a lot of food crises during poor harvest years. It is likely that the *horrea* of these times served as short- and mid-term storage buildings, very practical for the survival economy and continuous trade where perishable products were consumed immediately after being sent from the production areas. Consequently, as was the case with the *magazzini repubblicani* in Ostia, these *horrea* could also be used as commercial areas where goods were bought and sold, storage rooms were rented for Wholesale, etc.

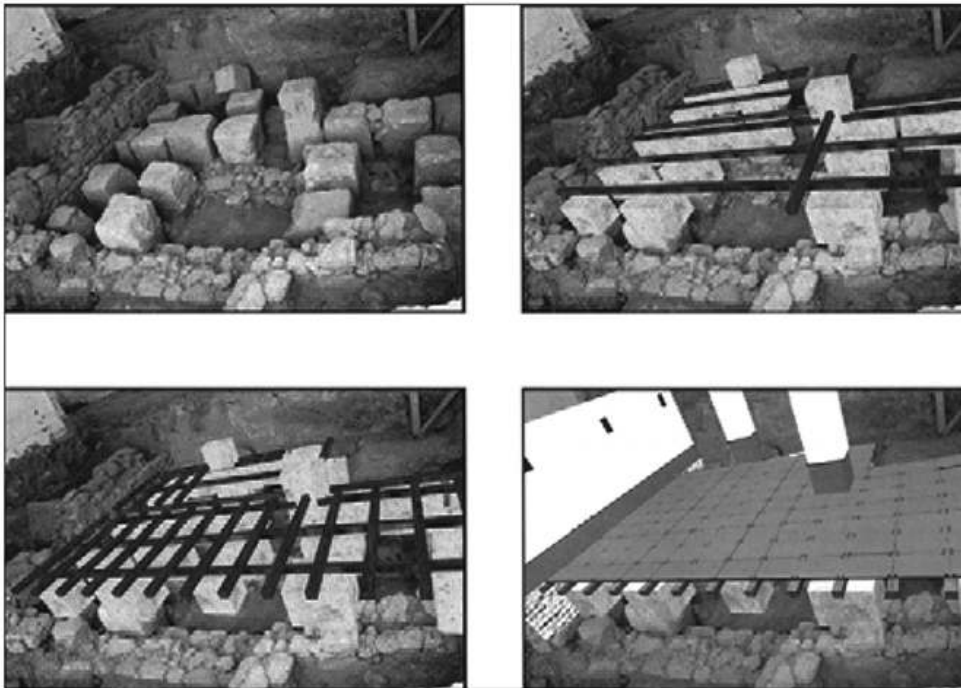


**Fig. 9**  
Horreum of the Roman city of Valentia (Valencia, Spain).

- 24 In the Early Empire period, the cities would get administrative mechanisms for the population's grain supply and obtain funds to keep it at an affordable price for the Plebeians, and there were even legations in charge of the city's supply in case of a crisis<sup>55</sup>. There are numerous references in classical literature to times when grain and other resources were scarce, but what really stands out are the negative consequences of political initiatives such as grain cutbacks that increased grain scarcity on more than one occasion. The answer to this phenomenon was the contraction of the economy on part of private merchants who, looking to profit more from the grain trade, decided to wait for the price of grain to increase with the demand and then sell their stock. The collusion of *aediles*, in charge of the *cura annonae* in the Early Empire period<sup>56</sup>, with the bakers and merchants would make this shortage crisis among the Plebeians even worse<sup>57</sup>.
- 25 To avoid fraud, the *Lex Irnitana* explicitly States that the *aediles* have the right and legal authority to control wheat supply (*annona*), product weight and portions (*fondera mensurasque*), as well as fine (*multam dicendi*) the *municipes* or *incolae* with a maximum of 5.000 HS in order to avoid the price increase (*Irn.* 19). The recent appearance of an

inscription in the Utrera municipality (Sevilla), dating between the second and early third Century AD, also confirms the use of fines for the *pistores* on part of the *duouiri*, possibly because the given punishment exceeded the quantity that the *aediles* could impose<sup>58</sup>.

- 26 These shipments and stocks of grain made necessary the construction of *horrea* in the cities as well as port areas. In the case of *Hispania*, we have information about the warehouses from the Early Empire period mostly found in the city ports, except the one in the ancient *Carmo* (Carmona, Seville). This *horreum* dates back to mid first Century AD and was built next to the city's main gate (Sedía), in an area that facilitated the transport and trade of products<sup>59</sup>. This is a 34 m<sup>2</sup> *horreum* built from huge ashlars 0.70 meters thick in five rows (Fig. 10). These blocks served to support a *tabulatum* or a wooden garret made up of numerous beams, some built on the inside of the walls and also in some ashlars up on the second level with openings in them. This construction System protected and isolated grain and other perishable products from humidity, maintaining them in optimal conservation conditions for mid- and long-term storage. The construction model where the floor is supported by small stone support columns was not very efficient because it requires many pillars of the same height, making it difficult to place the floor horizontally and maintain it perfectly balanced.



**Fig. 10** Archaeological remains and 3D Reconstruction of the *horreum* of the Roman city of *Carmo* (Carmona, Spain).

- 27 This instability and difficulty with the placement of *tabulatum* or the floor explains why this was the least used type of support in the Roman period since it requires the presence of other support Systems, such as the wall openings, stone walls, double walls, benches, etc.<sup>60</sup>. In turn, a stone wall construction offers more stability and strength to the flooring. This construction model was also common in the military sector in the Flavian period at a time when the fronder stabilization policy was carried out<sup>61</sup>.

- 28 A similar building in terms of the construction techniques has recently been found in the **Oiasso** port (Irún, Basque Country), whose foundation dates back between 70 and 120 AD<sup>62</sup>. While we wait for more news to be published about this 2008 discovery, we can safely say that this construction was approximately 14 meters wide and included huge stone support pillars placed in two rows, and at least eight of these have been dug up.
- 29 In the **capital of Tarraconensis**, two enormous *horrea* have also been found from the Early Empire period<sup>63</sup>. These two constructions were built in late first Century AD and must have been used for the storing of food and other products. The western warehouse is divided into three big naves, approximately 18.40 x 6 meters each, with a total surface of some 110 m<sup>2</sup>. The difficulties surrounding archaeological intervention and the devastation of walls make it impossible to know if the interior partition walls included openings where support beams were placed for the raised wooden floor. However, three big ashlar were found built into each one of the façades as internal support columns of a possible *tabulatum* rather than just small reinforcements or buttresses. The partition walls between storage rooms also included these three big support columns that were aligned with and placed at the same height as the ones mentioned previously. Undoubtedly, these were used as support pillars of the raised flooring. The interior pebble surface was not done in preparation for a flagstone pavement as the archaeologists who excavated the construction hypothesized, but was made to isolate the humidity from the floor, which would also facilitate the cleaning of the lower part of the *tabulatum* where grain and other products would be dropped when emptied in bulk. Both buildings included a later phase with a monumental porticoed entrance directly facing the city's port area. The devastated level dates back to around third Century AD. The construction techniques and the floor plan are very similar to the granaries excavated in the North African site called *Thamusida*<sup>64</sup>.
- 30 Unlike the ones used in the Republican period, the construction techniques used to build *horrea* in *Hispania* in the Early Empire period indicate that these granaries were likely used to stock grain and other food products that would be distributed and/or frequently traded but also, more importantly, stored in the mid- and long-term. In other words, some of these *horrea* were strategic reserves of perishable products that would be sold at low prices during times of food crises in order to reduce the costs of first necessity products, most important of which was grain. All of this required the construction of raised floors and/or continuous removal and cleaning of grain and other perishable products stored in the *horrea*. Apart from these warehouses, there must have been other structures used for short-term storage of grain, after it was transported to the city and before it was traded in the markets. These, however, did not require elevated floors typical of the *horrea* we previously analyzed. This type of *horrea* must have been frequently built in Hispano-Roman cities but have barely been studied thus far. One such *horrea* was recently found in the ancient city of *Illipa*, very close to the river port<sup>65</sup> and in *Bracara Augusta* (Braga, Portugal)<sup>66</sup>. Another thing to keep in mind is that the family units had their own stock and raised granaries, where they could store the cereal necessary for the family's survival<sup>67</sup>.
- 31 The necessity for a continuous and enormous grain supply to make flour and bread in the Hispano-Roman towns must have shaped a large-scale industrial network that entailed the construction of mills, bakeries and furnaces in the dense urban areas and, naturally, in the *suburbia*. However, at this moment in *Hispania*, we know of very few

*pistrina* from the Early Empire period<sup>68</sup>. The term *pistrina* refers to both simple mills with areas used for grain grinding as well as the complex structures used for the milling, baking and/or trade/distribution of products used in bakeries.

- 32 Large mills were built a short distance from the urban hub, and this is where the grain was turned into flour in order to be distributed to various locations later on. One of these industrial complexes dedicated to grain treatment was found close to the city of *Asturica Augusta* (Astorga, León)<sup>69</sup>. This distinctly artisanal building included various rooms used for grain trituration, as indicated by the presence of many hand mills and an animal-drawn *mola* (by either donkeys or horses), which is why these mills are called *mola asinaria* (Cato. De Agr. 10, 4; 11, 4) or *iumentaria* (Dig. XXXIII, 7, 26). The reason why mills were constructed far from the center or urban hub could possibly be a practical one, namely the need for natural wells essential to the operation of mills. On the other hand, we need to keep in mind that the production costs were lower in rural areas where plots for the construction of the *molae* weren't as expensive as they were in the cities, especially in the second and third Century AD<sup>70</sup>. In addition, recently ground flour is not adequate for baking, so it wouldn't be necessary to join different activities such as grinding, kneading and baking in one single space. Consequently, we can assume that the grain was stored in bags or sacks, but no material evidence was left in the archaeological register. The flour production was located on these premises while the necessary oxidation changes were taking place, which were beneficial for the baking, as this is when the flour evenly matures<sup>71</sup>.



**Fig. 11**

*Pistrinum* of the Planetario's House of the Roman city of *Italica* (Santiponce, Seville, Spain).

- 33 Hydraulic structures for grain trituration have also been found in *Emerita Augusta* next to the city's supply reservoirs<sup>72</sup>. In addition, archaeologists found a construction linked to the hydraulic mill close to Pancaliente, on the shores of Guadiana<sup>73</sup>, which indicates there used to be a large-scale manufacturing complex.
- 34 The milling of grain for bread production in the urban area is confirmed by hydraulic mechanisms used for grain trituration, like the one in the Roman city of *Conimbriga*<sup>74</sup>.

These were also found in smaller settlements. For example, a hydraulic structure used for grain milling from the third Century AD was found in a *vicus* in Banos de la Reina in Alicante<sup>75</sup>.

- 35 Big quantities of flour were sent from the mills closest to the cities and those located in the urban areas to be used in the city's *pistrina* where bread was made. Apart from the recently found *pistrina* in *Emerita Augusta*, which is still being studied<sup>76</sup>, another *pistrinum* was found in cities like *Italica* in the houses called Casa del Planetario<sup>77</sup> (Fig. 11) and Casa de los Pájaros<sup>78</sup>. The two bakeries found in *Italica* included baking furnaces and were probably used for direct bread sale. However, the excavations don't tell us much about the potential function and use of other areas such as the milling rooms in the case of the *pistrinum* in Casa del Planetario.

## The management and administration of grain in the urban areas: epigraphic evidence

- 36 Even though the archaeological remains tell us about the construction of enormous granaries storing the *annona*'s product, it is difficult to distinguish between the community and private granaries. In that sense, epigraphic documents are key to a better understanding of the management and administration of grain warehouses.
- 37 Epigraphy also gives us information about the *frumentum municipalis*, a type of collect tax controlled and managed by the imperial administration<sup>79</sup>. An inscription from the ancient *Hispalis* mentions a freed imperial slave who worked as a *dispensator* of state grain (CIL II, 1197), which was probably stored in the city granaries that have not yet been found<sup>80</sup>.
- 38 Supplying the city didn't just require only the participation of State, but also the intervention of private commercial agents in charge of managing certain *horrea* as well as grain transport and trade. In the mid second Century AD, between 161 and 169 AD, during Marcus Aurelius' and Lucius Verus' reign, the *scapharii* or river boatmen in *Hispalis* dedicated an inscription to *Procurador Augg. ad ripam Baetis*, the local delegate of *praefectus annonae (adiutor)*, as confirmed in Mactar (CIL VIII, 11796), whose tasks were to control the Spanish and African oil (*annona*) as well as manage the transport of other annony products (*solamina transferenda*) (CIL II, 1180). In the latter reference, grain is not mentioned explicitly as an annony product, although some authors consider that the expression *solamina transferenda* includes grain shipment<sup>81</sup>. The inscription also tells us about the compensation paid to the *navicularii* corporations for their transport services<sup>82</sup>, merchants who maintained constant commercial maritime trade with Rome<sup>83</sup>.
- 39 Another thing to keep in mind is the collaboration between members of the wealthiest families when it came to supplying the cities. In order to win the favor of their fellow citizens, obtain economic or political compensations or simply out of their sense of civic duty, they significantly contributed to food supply in times of need (*annona cara o gravissima annona*)<sup>84</sup>. In one of these initiatives, three *collegia* paid homage to *duumviri* that put a stop to grain scarcity by placing an inscription in the ancient *Aeso* (Isona, Lérida) (CIL II 4468). The work of these professional associations in terms of supply of the *annona* has been confirmed in different sources, along with their hierarchy led by

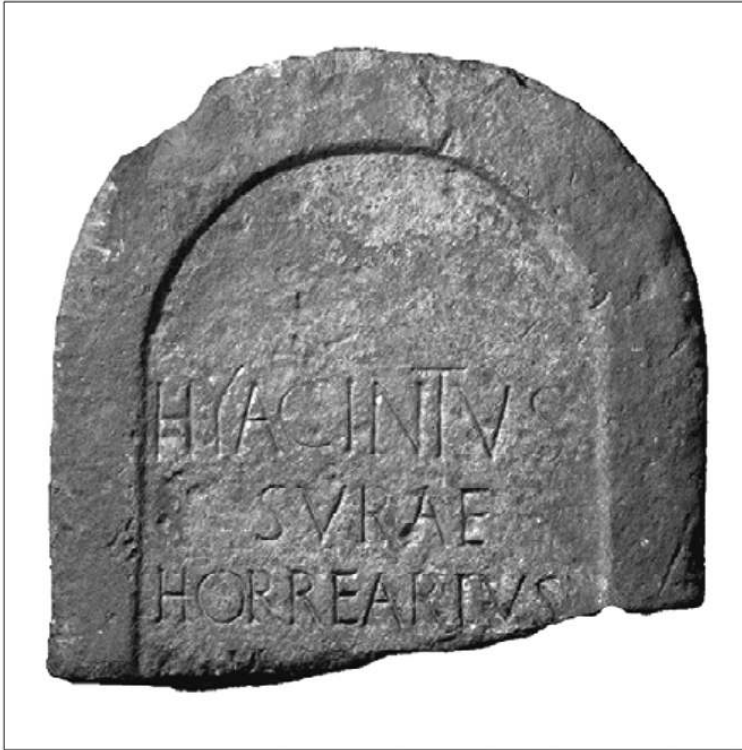


the *magistri*, *magistri quinquenales* and *curatores*, but there is hardly any record of the *collegia* in charge of loans.

- 40 The Aeso epigraph is truly exceptional, as it mentions the *collegia Kalendarium et Iduaria duo*, names of dubious meaning. Fita claims the epigraph's gist is that what was lent on calends was collected on the *idus*, basing his argument on Horace's commentary (*Epod.* 2, 64)<sup>85</sup>; D'Ors interprets them as funeral *collegia*<sup>86</sup>, while Lara considers that the members of these professional associations used those days to cancel the debtors' accounts, duly recorded in the corresponding books<sup>87</sup>. No analysis of the inscription took into account the fact that it wasn't the community, at first the main beneficiary of the donations, who paid that homage, but the lenders' *collegia*.
- 41 This epigraph does not tell us whether this act of euergetism was accompanied by more favorable lending terms, such as lower interest rates in times of economic hardship. Administering of the credit funds generally included the city's distinguished delegates, a *vilicus kalendarii* and even *curatores* with an equestrian rank<sup>88</sup> aided by the *vilici* and *procuratores*. As related in the Digest, these *curatores* could even organise in corporations in order to create credit funds to lend money for the good of the citizens (Dig. 50, 8, 12, 5).
- 42 These loans were promoted by the actual cities starting in the first Century AD to boost agriculture and address issues such as food scarcity by creating these agrarian credit funds called *kalendaria*, referring to the accounting book used to manage them (Isid. *Etym.* 1, 44, 1). The loans were set up to be paid back on a monthly or a quarterly basis and were usually repaid on the *idus* of a given month, which is where the term Aeso of the other two *collegia* comes from<sup>89</sup>.
- 43 Despite direct references to the concession of low-interest loans in times of scarce resources, this inscription does not tell us much about credit euergetism, as it is exclusively dedicated to *duumvir Lucius Valerius*, who was a member of an important family of landowners<sup>90</sup>.
- 44 Spanish euergetes also donated their wealth to the construction or renovation of certain municipal buildings. Standing out among these is the restoration of *macellum de Villajoyosa* on part of *M. Sempronius Hymnus* in the late second Century AD, as testified by the inscription sent to be made on one of the *mensae lapidae* in the market (CIL II 3570). Even more interesting is the inscription of Porcuna (Jaén) (CIL II, 2129) that tells us about the construction of an *horreum* and *tabernae* around second Century AD on part of *curator Baetis* on the ground bought for the city (*solo empto ab re publica*)<sup>91</sup>. Perhaps the privilege of buying this public vacant lot was given to this euergetes in return for building a warehouse behind some *tabernae* for community use. Even though the *post horreum* reference generated a certain debate among experts, we should say that the strong link between the *tabernae* commercial activity and the *horreum* leads one to think this was more of a spatial rather than temporary liaison. After all, it wouldn't make sense to emphasize the temporary nature of an euergetic initiative undertaken at a concrete moment on a recently bought plot. This hypothesis is further reinforced if we take into account the tight spatial and functional relationship between the *horrea* and *tabernae*, which must have been a part of the same property. The inscription explicitly mentions the location of the warehouse, stressing that a storage room was located in one of the far sides of the *insula*, with a commercial area in the back. A tight spatial link is also found in rules aimed at resolving inheritance issues in case of fire in two distinct units (*tabernae* and *horreum vinanum*), albeit located in the same

architectural unit (*insula*) (Dig. 33, 7, 7)<sup>92</sup>. On the other hand, the link between storage and commercial areas in this case should point to the functionality of these *horrea*, which, along with *tabernae* sales, could have been used not as grain warehouses but wine cellars (*horreum vinarium*)<sup>93</sup>, although this is a hypothesis that cannot yet be confirmed.

- 45 Spanish epigraphy also tells us about servants' working in the *horrea*, as was the case in **Caesaraugusta (Zaragoza)**, a port city of great economic importance, given Ebro's navigability in this area in the Roman period<sup>94</sup>. A tombstone belonging to *Hyacintus, horrearius* of *Sura* (HEp 25008) (Fig. 12), appeared in 1980. Greek origin of the deceased tells us about the servant status of the worker<sup>95</sup> who didn't have the *tria nomina* of free men, a legal condition common among the *horreani*<sup>96</sup>. Even though the *horrearius*' figure has been an object of discussion in modern historiography<sup>97</sup>, we are still in the dark as to what his responsibilities and functions actually were. In this case, we could be talking about a man working for *Sura* at his *horrea*, who, in turn, entrusts his workers, the *horreani*, with the task of keeping the warehoused products safe or simply storing them (Dig. 19, 2, 56; *idem Paulus, de off. praef. vig.*). This would mean there might have been some private *horrea* in the city or that storage space in public *horrea* was rented to private persons. It was the *horrearius*' task of watching over the stored goods that triggered continuous abuse and cheating of the servants, who facilitated warehouse robberies in cahoots with the thieves by breaking locks. We know that this must have been widespread practice, at least in third Century AD, because Caracalla himself included the punishment of torture for slaves working as warehouses custodians in case of a robbery where locks had been broken<sup>98</sup>.
- 46 Close to the *decumanus* of Zaragoza, another epigraph was found including a freed slave's dedication to a *genius* of the *horrea* (CIL II, 2991). These *genii* were revered as true gods because they were believed to provide royal protection<sup>99</sup>, and their image could be hung on the alcoves or *aedicula* of *horrea*'s inside forecourts or in small shrines and sacred areas honoring their cult<sup>100</sup>. They were guardian deities of the warehouses, *deus in cuius tutela hic locus est*<sup>101</sup>, or as Servius put it, *Genium dicebant antiqui naturalem deum uniuscuiusque loci vel rei vel hominis* (Serv. *ad Georg.* 1, 302). Inscriptions dedicated to the *genii horreorum* by the freed slaves and workers of servant origin are frequent in epigraphy<sup>102</sup> and appear in both private as well as public *horrea*<sup>103</sup>. Consequently, the inscription in Zaragoza does not offer any clues as to the ownership status of these *horrea*, which we can't even connect to warehouses where *Hyacintus*, the *horrearius* of *Sura*, worked. On the other hand, this votive inscription indicates that, unlike what happened with professional associations (*corpora, collegia* or *sodalicia*), the workers in charge of warehouses did not organize in religious associations<sup>104</sup>. In this case, the worker in question seems to have made his dedication in a specific context, fulfilling a promise to safeguard the warehouses.



**Fig. 12**

Inscription of the *horrearius* Hyacintus from the Roman city of *Caesaraugusta* (Zaragoza, Spain).

## “Horrea ecclesiae”: remarks on the role of the Church in the administration of food

- 47 In the late Roman period, there was a gradual increase of Church-owned properties. There are still some literary sources from Late Antiquity mentioning the storing of grain in the *horrea ecclesiae*<sup>105</sup>, as was the case in Rome during the fourth Century. According to Gregory of Tours, Tiber river flooded in 590 and destroyed the Church *horrea*, along with the grain stored inside. In 605, Pope Sabinian ordered the ecclesiastical granaries to be opened (*iussit aperiri horrea ecclesiae*) in order to distribute the stored grain to the poor. This role of the Church as the benefactor of the poor through the giving away of grain was common over the centuries and remained one of the principal commitments of bishops who had no reservations about helping the poor. This is evident in a versed commemoration to the Bishop of Tarragona, Serge, dating back to mid sixth Century, which talks more about spiritual rather than mundane gestures as well as the Bishop’s character as a man of the Church, the benefactor of the poor (*repperit alimentum*) (RIT 939; AE 1997, 963).
- 48 A construction of a warehouse, an *horreum*, dating back to 387 AD in *Hispania* is mentioned in *Oretum* (Granâtula de Calatrava) (*CIL*· II 3222)<sup>106</sup>. This inscription mentions the name of a contractor who registered the building (*ex officina Homom*) and recorded its landowner (*Vasconi*) and the officials in charge of its administration, that is, the *magistri* and the *scriba* who tracked the amount of grain stored in the *horreum*. We don’t know if the supplies stored inside the *horreum* were managed and controlled by the Church, but it is curious that *in Christo* phrase was included in the inscription.

49 Based on the information available, it is difficult to determine the exact role of the Church in tax collection and their control over the agrarian activities during the fourth Century AD in *Hispania*. On the other hand, evidence from certain *villae* leads us to assume there was significant ecclesiastical control over the agricultural production. Thus far, we know for sure that the wine-growing production in the urban area of *Tarraco* (Tarragona) was indeed under ecclesiastical control<sup>107</sup>. Similarly, the latest archaeological advances reveal the protection and control of grain production and storage on part of the Church in the Roman *villa* of El Saucedo (Toledo). In the late fifth and the beginning of sixth Century AD, the *oecus* of this rural establishment from the Early Empire period was renovated and turned into an enormous *raised granary*, and the salon of the old baths became a Christian basilica<sup>108</sup>. This tight spatial link between the *basilica* and *horreum* possibly tells us about the relationship between agricultural supplies in the warehouse and territorial control of the *basilica*. In other words, this information reveals a reality that was beginning to change, a reality in which the ecclesiastical power was strengthening in the economic aspect of the decadent Roman Empire.

## References of the illustrations

- 50 **Fig. 1, 5, 8:** Javier Salido Domínguez.
- 51 **Fig. 2:** Fernandez Ochoa & Gil Sendino.
- 52 **Fig. 3:** Fernandez Ochoa *et ali* 2013, Fig. 84; Julio Mera, Zinco Comunicación.
- 53 **Fig. 4:** Fernandez Ochoa *et ali* 2013, figs. 53 and 58.
- 54 **Fig. 6:** Cardoso & Encarnação 1999, fig. 3.
- 55 **Fig. 7:** Fabião 2006.
- 56 **Fig. 9:** Archive SIAM, Valencia; according to Escrivâ, I., Ribera., A. & Vioque, J. Guía del Centro Arqueológico de l'Almoina, Valencia 2010,45.
- 57 **Fig. 10:** Roman 2001, fig. 4.
- 58 **Fig. 11:** S. Vargas.
- 59 **Fig. 12:** Photographic database of Hispania Epigraphica.

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## NOTES

1. Plu. *The Roman and Greek Questions*, 41: *Among the things convenient for the cities, the most important one is a good legislation; among the most necessary ones, the abundance of resources.*
2. Salido Domínguez, J., *Horrea Militaria. El aprovisionamiento de grano al ejército en el occidente del Imperio Romano*, Anejos de Gladius 14, Madrid, 2011.
3. Salido Domínguez, J., "Los graneros militares romanos de *Hispania*", A. Morillo, N. Hanel & E. Martin (eds.): *Limes XX. Estudios sobre la Frontera Romana*, Anejos de Gladius 13, volumen 2, Madrid, 679-692, 2009; Salido Domínguez, J., "El almacenamiento de cereal en los establecimientos rurales

- hispanorromanos”, J. Arce & B. Goffaux (eds.): *Horrea d'Hispanie et de la Méditerranée romaine*, Madrid, 127-142, 2011b; Salido Dominguez, J., “The Grain Supply for the Roman Army in Republican Hispania”, *XXI Limes Congress*. Newcastle, BAR, forthcoming; Fernandez Ochoa et alii, “Ciudades amuralladas y *annona militaris* durante el Bajo Imperio en Hispania. Una cuestión a debate”, J. Arce & B. Goffaux (eds.): *Horrea d'Hispanie et de la Méditerranée romaine*, Madrid, 265-286, 2011; Morillo, A. & Salido Dominguez, J., “El aprovisionamiento del ejército en Hispania. Transporte, almacenaje y redistribución”, P. Vicente, J. (ed.): *Militares y civiles en Roma. Dos mundos diferentes, dos mundos unidos*, Colección Aquilafuente 163, Salamanca, 135-164, 2010.
4. Arce, J. & Goffaux, B. (eds.): *Horrea d'Hispanie et de la Méditerranée romaine*, Madrid, 2011.
  5. For more on the historiographic debate regarding the surge of *villae* and territorial exploitation in the Republican period, see studies published in *Time of changes. In the beginning of the Romanization*, Studies on the rural world in the Roman Period 5, Girona, 2010; Nolla, J. et alii, *De l'oppidum a la civitas. La romanització inicial de la Indigència*, Girona, 2010.
  6. Purcell, N., “The Roman *villa* and the landscape of production”, T. J. Cornell & K. Lomas (eds.): *Urban Society in Roman Italy*, Tandon, 169-170, 1995.
  7. Varro. *tust.* 1, 2, 14: *Vilicus agri colendi causa constitutus atque appellatus a villa, quod ab eo in eam convehuntur fructus et evehuntur, cum veneunt.*
  8. For more on archaeological problems, see Salido Dominguez, J., “La documentación literaria aplicada al registro arqueológico: las técnicas de construcción de los graneros romanos rurales”, *Espacio, Tiempo y Forma. Serie I: Prehistoria y Arqueología* 16-17, 463-478, 2003-2004; Salido Dominguez, J., “Los sistemas de almacenamiento y conservación de grano en las *villae* hispanorromanas”, C. Fernández Ochoa, C., García-Entero, V. & Gil Sendino, F. (eds.): *Las villae tardorromanas en el Occidente del Imperio. Arquitecturas y función. IV Coloquio Internacional de Arqueología de Gijón*, Gijón, 693-706, 2008b; Salido Dominguez 2011b (see footnote 3).
  9. The bibliography on the subject is abundant; see Nolla, J. et alii, *De l'oppidum a la civitas. La romanització inicial de la Indigència*, Girona, 81-90, 2010.
  10. Gracia Alonso, F., “Production y almacenamiento de excedentes agrícolas en el NE. peninsular entre los siglos VI y II a.C. Análisis crítico”, R. Garcia Huerta & D. Rodriguez Gonzalez (eds.): *Sistemas de almacenamiento y conservación de alimentos entre los pueblos prerromanos peninsulares*, Cuenca, 9-72, 2009.
  11. Rural *horrea* where we don't know the *civitas* and the *territorium* to which they belonged are omitted from this work, as this makes their functionality as granaries dubious.
  12. Leveau, P., “Le rapport ville-campagne dans l'Antiquité romaine: *villa*, ville, village”, *Annales. Économies, Sociétés, Civilisations* 38.4, 920-942, 1983-1984.
  13. Macías, J. M., “*Horrea* y estructuras de almacenamiento en la ciudad y territorio de *Tarraco*: una primera aproximación”, J. Arce & B. Goffaux (eds.): *Horrea d'Hispanie et de la Méditerranée romaine*, Madrid, 189-190, 2011.
  14. Salido 2011b (see footnote 3), 133.
  15. Fernandez Ochoa et alii, *El horreum de la villa romana de λ/eranes (Gijón, Asturias). Primer testimonio material de los hórreos de Asturias*, Madrid, 2012.
  16. Cerrillo et alii, “Excavaciones en la villa romana de Monroy (Cáceres), 1981-1985”, *Extremadura Arqueológica* 1, 167-186, 1988.
  17. Salido 2011b (see footnote 3), 135.
  18. Cardoso, G. & Encarnação, J. D., “A villa romana de Freiria e o seu enquadramento rural”, *Studia Historica. Histona Antiqua* 10-11, fig. 4, 1992-1993.
  19. Martínez, J. I., “El vocabulario de los asentamientos rurales (siglos I-IX d. C.): Evolución de la terminología”, A. Chavarría, J. Arce & G. P. Brogiolo (eds.): *Villas Tardoantiguas en el Mediterráneo Occidental*, Anejos AEspA XXXIX, 117-122, 2006.

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21. Vargas Calderón, J. & Matesanz Vera, P., “Excavación arqueológica yacimiento número 6-8: Plasencia sur - Canaveral este”, *Extremadura arqueológica* 10, 121-122, figs. 1 and 2, 2006.
22. Drake, B., “Excavación arqueológica en el yacimiento de los sectores plataforma norte y sur del yacimiento 12 B (Carrascalejo)”, *Extremadura arqueológica* 10, 225, fig. 1, 2006.
23. Aguilar Saenz, A. & Guichard, P., *Villas Romaines d'Estrémadure. Doña Maria, La Sevillana et leur environnement*, Madrid, 110-111, fig. 34, 1993.
24. Etienne, R., *Les villas romaines de São Cucufate*, Paris, plate L, n° 1-6, 1990.
25. Maloney, S. & Hale, J., “The villa of Torre de Palma (Alto Alentejo)”, *JRA* 9, 282, fig. 4, 1996.
26. Maloney & Hale 1996 (see footnote 25), 281, fig. 4.
27. Preliminary results were presented at the Congress of SECAH at Braga (April, 2013).
28. Moutoso Batata, C. A., *Idade do ferro e romanização entre os nos Zêzere, Tejo e Ocreza*, Lisbon, 45, 219-220, fig. 15, 2006.
29. Etienne 1990 (see footnote 24), plate L, n° 22.
30. Aguilar & Guichard 1993 (see footnote 23), 123, fig. 43.
31. In the Rhine-Danube *limes*, in the late second Century AD, the grain for the troops was essentially supplied from the south because the Northern provinces where the army was based weren't sufficiently fertile to feed the soldiers. In this context, we should draw a connection between the great *horrea* in the *mlae* located to the south of *limes* and the shipment of grain to the troops at the border (Salido 2011 (see footnote 2), 259, ref. 216). The storage capacity of those granaries was much bigger than of the rural Hispano-Roman granaries.
32. Cato (*Agr.* 2, 7, 4) recommends that the farmer should focus his production on the market in order to yield greater economic profit. The author also says that crop growing stopped being profitable for the landowners who preferred growing vineyards and olive groves. In fact, only grain deposit and type of use was recorded in the farms' accounting books; in turn, when it comes to wine and oil, we see sales records, retail price, outstanding invoices and remaining supplies.
33. Gabba, E., *Del buon uso della ricchezza*, Milan, 152, 1988.
34. Pompeian mills and baking furnaces were found in various *villae* pointing to a large-scale production, possibly for subsequent trade in the rural areas. Among these are the Veranes furnace (Fernandez Ochoa *et alii*, “El area de servicios de la villa romana de Veranes (Gijón, Asturias)”, *Villas romanas en el Occidente del Imperio Romano*, Cádiz, forthcoming) and Veral de Vallmora furnace, located some 10 km from *Iluro* and *Baetulo* and some 20 km from *Barcino* (Martin I Oliveras, A., “Parc arqueològic Cella Vinaria (Teià, Maresme, Barcelona): descobrint el celler romà de Vallmora”, M. Prevosti & A. Martin i Oliveras (eds.): *El vi tarraconense i laietà: ahir i avui. Actes del Simpòsium*, Documenta 7, Tarragona, 200, fig. 5, 2009). Remains of mills and numerous agricultural tools from the Roman period were found in Cortijo del Donadío (Baena, Córdoba), on Guadaloz'left riverbank (Lacort Navarro, “Infraestructura hidráulica rural de época romana en la campina de Córdoba”, *Memorias de Historia Antigua* 9, 52, 1988) and in Puente Grande from the Late Empire period (Cádiz) (Bernai & Lorenzo, “Las estructuras de la villa en los ss. IV y V d.C.”, D. Bernai & L. Lorenzo (eds.): *Excavaciones arqueológicas en la villa romana del Puente Grande (Los Altos del Ringo Rango, Los Barrios, Cádiz). Una ventana al conocimiento de la explotación económica de la Bahía de Algebras entre el s. Iy el V d.C.*, Cádiz, 114-115; fig. 63, 2002), among others. Williams-Thorpe writes about a mill found in Vilauba, even though out of context, which must have been made in the Olot area (Williams-Thorpe, “Provenancing and archaeology of Roman millstones from the Mediterranean area”, *JAS* 15, 253-305, 2008). Prevosti's recent study (2011: 421-428) on the *villae* of *ager tarraconensis* tells us about the discovery of hand and animal-drawn mill remains used for grain treatment, such as the ones found in Els Antigons (Reus), Mas dels Frares (Constantí) and Mas de Alemany (Constantí) (Prevosti, “El sistema economic dels establiments de

l'*ager Tarraconensis*”, M. Prevosti & J. Guitart i Duran (eds.): *Ager Tarraconensis 2, El poblament*, Documenta 16, Tarragona, 405-454, 2011).

35. Poor conditions in which Roman peasants lived are reflected in various references from the Early Empire period. Galen writes about his own experience with food supply in the country (*Corpus Medicorum Graecorum*, 5, 4, 2, 227): *This one time, when I was young, I went looking for adventure in the country with two friends of the same age, and we met a group of peasants that had just finished eating. The women were about to make bread, since they didn't have any, and one of them put some flour in a bowl to bake it. She added salt and offered it to us. Naturally, we accepted, as we had walked a lot and were quite hungry. We ate a lot but immediately after felt heavy weight in our stomach, as if we had eaten mud. Next day, we suffered horrible indigestion and were not able to eat anything else. I asked the people there how they felt after eating this baked flour and was told that they ate it frequently and that it indeed was heavy and indigestive....*

36. Salido 2003-2004 (see footnote 8); Salido Dominguez, J., “La investigación sobre los horrea de época romana: balance historiográfico y perspectivas de futuro”, *Cuadernos de Prehistoria y Arqueología de la Universidad Autónoma de Madrid* 34, 105-124, 2008; 2011 (see footnote 2).

37. Some warehouses that were found could have been used as temporary storage areas where grain was stocked in bags, but the construction techniques used in that case do not allow us to define them as raised granaries *a priori*. This was possibly the case with the *horreum* at Calipolis in the *ager Tarraconensis* (Prevosti 2011 (see footnote 34), 436-437), where archaeologists found support columns located sufficiently far apart so as not to be able to support the weight of the stored grain. Based on the information available, we can safely assume this was a warehouse for other types of product.

38. Dubouloz, J., “Propriété et exploitation des entrepôts à Rome et en Italie (Ier-IIIe siècles)”, *Mélanges de l'École française de Rome. Antiquité* 120 (2), 277-294, 2008; Tran, N., “Les collèges d'*horrearii* et de *mensores*, à Rome et à Ostie, sous le Haut-Empire”, *Mélanges de l'École française de Rome. Antiquité* 120 (2), 295-306, 2008.

39. Gabba 1988 (see footnote 33), 152-153; Chaouali, M., “Les *nundinae* dans les grands domaines en Afrique du Nord à l'époque romaine”, *Antiquités Africaines* 38-39, 375-386, 2005.

40. De Ruyt, *Macellum. Marché alimentaire des Romains*, Lovaina, 1983; Torrecilla Aznar, A. (2007): *Los macella en la Hispania romana. Estudio arquitectónico, funcional y simbólico*. Tesis doctoral inédita de la UAM, Madrid.

41. In the Spanish case, the epigraphy does not mention areas of economic activity like the ones in Rome or in the North of Africa, called *area radicularia* or *area frumentaria* (Papi, E. & Martorella, F., “Il grano della Tingitana”, E. Papi (ed.): *Supplying Rome and the Empire* (Siena-Certosa, 2004), *Journal of Roman Archaeology Supplementary Series* 69, Portsmouth, 182-183, 2007); however, there were probably areas inside the city reserved for daily grain-related operations.

42. Dig. 50, 11, 2: *Allowing farmers or fishermen to take their goods to the city to sell them jeopardizes the supply because they are away from their work.*

43. Var. R. 3, 2,16; Cic. Div. 2, 27; Tiberius 34; Calig., 40, 2; Plin. Nat., 33,164; *Edictum de Pretiis rerum venalium*; Hist. Aug. Helvio Pertinax, 7, 5-7.

44. For more on the multiuse of the *horrea*, see Virlovet, “Les entrepôts dans le monde romain antique, formes et fonctions. Premières pistes pour un essai de typologie”, J. Arce & B. Goffaux (eds.): *Horrea d Hispanie et de la Méditerranée romaine*, Madrid, 7-22, 2011.

45. Melchor Gil, E., “Evergetismo annonario y „Alimenta“ en Hispania romana”, *Veleia* 10, 95-104, 1993.

46. Dubouloz 2008 (see footnote 38), 277-294.

47. The influence explains the appearance of first *macella* in cities like *Celsa* (Torrecilla 2007 (see footnote 40), 19).

48. The use of this building has been much debated in historiography. Some authors argue it was a *curia* or a governmental building; others claim it was a temple, where each of the five units was

dedicated to a particular deity. Manuel Medrano is convinced it was a market, given its proximity to the tanneries excavated on the site (Medrano *et alii*, “Reconstitución del edificio monumental de *Contrebia Belaisca* (Botorríta, Zaragoza)”, *Complutum* 1, 281-292, 1991). A. and M. Beltrán are the only ones arguing it was actually a warehouse (Beltrán, A. & Beltrán, M., “Hipótesis sobre la función del gran edificio de adobe de *Contrebia Belaisca* (Botorríta, Zaragoza)”, *XIX Congreso Nacional de Arqueología*, vol. II, Zaragoza, 356, 1989).

49. Papi y Martorella 2007 (see footnote 41): 178-180.

50. These were perishable goods that, given the techniques used in the construction of the building, could only be conserved in the short term.

51. Salido Domínguez, J., “Manifestaciones religiosas y espacios sacros en los *Horrea* del Occidente del Imperio Romano”, *Madrid Mitteilungen* 53, 321, 2012.

52. The bibliography on the building is ample, but the one study that stands out is the research done specifically on the city’s *horrea* (Ribera i Lacomba, A., “Los *horrea* de *Valentia*. De la República al Imperio”, J. Arce & B. Goffaux (eds.): *Horrea dHispanie et de la Méditerranée romaine*, Madrid, 201-224, 2011).

53. Ribera considers that “the Numantian military buildings had similar floor plans, dating and most certainly function as the one in Almoína”; however, the research we were able to do on Schulten’s archaeological excavations allow us to conclude that the dividing walls in the Numantian *horrea* do not separate the *cellae* from the warehouse, but serve as floor support, so the building’s functionality is different (Salido 2009 (see footnote 3), 684-686). The layout of the dwarf walls, placed some 3 meters from one another and supporting the weight of the grain and other stored products, as well as their height leads us to assume they were used as a support system for the *tabulatum*.

54. Rickman, G., *Roman granaries and store buildings*, Cambridge, 163-170, 1971.

55. Between 1927 and 1929, an inscription (RIT 364) was discovered in *Tarraco* (Tarragona), as homage to a member of the *ordo* who led a legation in charge of the city’s grain supply (Melchor Gil, E., *Evergetismo en la Hispania Romana*, Tesis doctoral de la Universidad de Córdoba, Córdoba, 204, 1992).

56. Babled, H., *De la cura annonae chez les Romains*, Paris, 1892; *Lex Irnitana*, XIX, 16, 2, 17; Pérez Zurita, A. D., *La edilidad y las élites locales en la Hispania romana. La proyección de una magistratura de Roma a la administración imperial*, Córdoba/ Sevilla, 230-234, 2011.

57. Petronius’ *Satyricon* reflects the problems that plagued the population. For example, there’s Ganimedes’ complaint during a banquet at Trimalchio’s (Petr. 44): *Damned be the aediles in cahoots with the bakers!*. Other references to the malpractice of the *aediles* is mentioned in Cic. *Sest.* 95, 114 and 118; Lucil, 48; Suet. *Iul.* 9; Suet. *Dom.* 8; V. Max. 6, 6, ext. 5.

58. Ordóñez Agulla, S. & Saquete Chamizo, J. G., “Una dedicación votiva „ex multis pistorum“ hallada en la Bética”, *Habis* 40, 204, 2009.

59. Román Rodríguez, “El almacenamiento de grano en Carmona: el *horreum* de San Blas”, A. Caballos (ed.): *Carmona Romana. Actas del II Congreso de Historia de Carmona*, 233-250, 2001.

60. Salido 2011 (see footnote 2), 86.

61. Salido 2011 (see footnote 2), 257.

62. Alkain, P., “Aportaciones al conocimiento de las primeras etapas de ocupación de la aglomeración urbana romana de *Oiasso*, siglos I A.C. y I A.D. Los materiales itálicos de la excavación de Bidasoa-Santiago, Iran (Gipuzkoa)”, *Arkeolan* 16, 29-38, 2009-2010.

63. Adserias Sans *et alii*, “L’habitat suburbà portuari al sector afectat pel peri 2 (Jaume, 1-Tabacalera)”, J. Ruiz de Arbulo (ed.): *Tarraco 99. Arqueologia d’una capital provincial romana*. Documents d’arqueologia clàssica 3, Tarragona, 146, 2000.

64. Papi & Martorella 2007 (see footnote 41).



65. Rodríguez Gudérrez, “*Ilipa Romana: la configuración de la ciudad a partir de los nuevos datos arqueológicos*”, E. Ferrer, A. Fernandez, J. L. Escacena & A. Rodríguez (eds.): *Ilipa Antiqua. De la Prehistoria a la Época Romana. I Congreso de Historia de Alcalá del Río*, vol. 1, Seville, 178, 2007.
66. Morais, R. & Salido Dominguez, J., “El horreum de la ciudad romana de *Bracara Augusta* (Braga, Portugal): funcionalidad, tipología y contexto”, *Sautuola*, 2013, forthcoming.
67. Research done in Pompeii and *Herculaneum* tell us about the temporary reserves of perishable goods such as grain inside the houses, even though the amount of supplies is indicative of their continuous consumption and domestic use (Monteix, N., “La conservation des denrées dans l’espace domestique à Pompéi et *Herculaneum*”, *Mélanges de l’École française de Rome. Antiquité* 120 (1), 123-138, 2008).
68. Salido, J. & Bustamante, M., *Pistrina Hispaniae. Panaderías, molinerías y artesanado alimentario en la Hispania romana*, Monographies Instrumentum 47, Montagnac, 2014.
69. The complete analysis of the artisanal structure and material found in Astorga is being studied by A. Morillo, J. Salido y R. Morais.
70. During the banquet, it is said that the site where Trimalchio's *domus* was located had previously been a *pistrinum* (Petr. 73, 2).
71. This depends on the ventilation and temperature, as the maturing occurs at a much slower pace during winter months. However, the distance between the mills and the urban hub was sufficiently small so as to avoid the spoiling of flour which occurs much faster in humid conditions. Consequently, grain was generally transported in herring-bone patterns (Salido 2012 (see footnote 51): 253). This is why these *pistrina* or mills were not far from the town center.
72. Arenilla, M. “Obras hidráulicas en *Hispania*”, *I Congreso de Obras Publicas romanas Mérida*, <http://traianus.rediris.es/textos/hidraulicas.htm>, 2002.
73. Estévez Morales, J. A., “Nuevos datos para el conocimiento arqueológico de un gran espacio extramuros próximo al río Guadiana”, *Mérida. Excavaciones Arqueológicas 1999*, Memoria 5, 141-163, 2001; Alba Calzado, “La industria artesana en *Augusta Emerita*”, Alvarez, J. M. & Mateos, P., *Actas del Congreso Internacional 1910-2010. El yacimiento emeritense*, Mérida, 356, 2012.
74. Brun, J.-P., “Um primeiro moinho hidráulico romano na Península ibérica, em *Conimbriga*”, *Portugal romano. A exploração dos Recursos naturais*, Lisboa, 30-31, 1997.
75. Abascal, J. M., Cebrián, R., Ronda, A. Ma. & Sala, F. (2007) (coords.): *Baños de la Reina de Calpe. Un vicus romano a los pies del Peñón de Ifach*, Calpe, 69-78.
76. Salido et alii 2013 (see footnote 68).
77. Luzón, J. M., *La Itálica de Adriano*, Sevilla, 1979, 62.
78. Salido et alii 2013 (see footnote 68).
79. Cicero (*Dom.* 10, 25) expresses his unease to a person he entrusted with the supply of Rome (*omne frumentum privatum et publicum*), buying grain (*provincias frumentarias*), transporting (*manicipes*) and storing it in the horrea, which means the *manicipes* were probably in charge of transporting grain to Rome (Alzon, C., *Problèmes relatifs à la location des entrepôts en droit romain*, Paris, 34, 1964).
80. The material remains that have appeared in Seville thus far, do not seem to correspond to big *horrea*. The only one that could have stored State-administered grain was the building in Francos Street, but, according to latest research, it could also have been used for the storage of Baedcan oil exported to Rome (Ordóñez Agulla, S. & González Acuña, D., “*Horrea y almacenes en Hispalis. evidencias arqueológicas y evolución de la actividad portuaria*”, J. Arce & B. Goffaux (eds.): *Horrea d’Hispanie et de la Méditerranée romaine*, Madrid, 173, 2011). Still, In the light of recent archaeological data, it seems we cannot confirm that this building corresponds to the typical *horrea* model with a forecourt which included the cellae organized around this central space.
81. Le Roux, R., “L’huile de Bétique et le prince sur un itinéraire annonaire”, *Hommage Robert Etienne*, Paris, 265, 1988. For more on this subject, see Remesal, J., *La annona militaris y la exportación de aceite bético a Germania*, Madrid, 101-102, 1986.

82. Well-known in this context are the emperors' efforts to concede privileges to the *negotiatores* or *navicularii* who worked with Rome's supply, such as the Edict of Claudius that offered reimbursement guarantees in case of a shipwreck or the soiled goods (Suet. Cl. 18, 3-4 y 19; Gaius, *Inst.* 1, 32, c; Tac. *Ann.* 12, 43, 2-4), thoroughly analyzed by Rougé, Pomey and Tchernia (Rougé, J., *Recherches sur l'organisation du commerce maritime en Méditerranée sous l'Empire romain*, Paris, 1966; Pomey, P. & Tchernia, A., "Le tonnage maximum des navires de commerce romains", *Archaeonautica* 2 (2), 237-243, 1978). The Digest (50, 5, 3; 50, 6, 6, 8) also tells us about the immunity of municipal Supervisors to whom it was contributed with one or more cargo ships with at least 50,000 bushel baskets during Hadrian's reign.
83. *Codex Theodosianus* (13. 5. 4) tells us about tax regulations for merchants from Spanish ports upon their arrival to *Portus*.
84. Various inscriptions have been preserved in *Hispania* which tell us about the annony euergetism, see Rodriguez Neila, J. F., "Notas sobre las *annonae* municipales de Hispania", *Hispania Antiqua* 5, 315-326, 1975; Rodriguez Neila, J. F., "Liberalidades públicas y vida municipal en la Hispania Romana", *Veleia* 6, 135-170, 1989; Dardaine, S. & Pavis D'Escurac, U., "Ravitaillement des cités et euergetisme annonaire dans les provinces occidentales sous le haut-Empire", *Ktema* 11, 291-302, 1986; Melchor Gil 1992 (see footnote 55), 203; 1993 (see footnote 45); Navarro Caballero, M., "Les dépenses publiques des notables des cités en *Hispania Citerior* sous le Haut-Empire", *Revue des études antiennes* 99 (1-2), 109-140, 1997.
85. *Omnem relegit idibus pecuniam, quaerit kalendis ponere* (see Fita 1898: 533-534).
86. D'Ors, A., *Epigrafía jurídica de la España romana*, Madrid, 382, 1953.
87. Lara, F., *Epigrafía romana de Lérida*, Lérida, 229-231, 1973.
88. Vat. 187; *CIL* IX, 1160; *CIL* IX 1619; *CIL* X, 146; *CIL* X, 4584.
89. Refunds were made on the *idus*, as Horace himself confirms (*Epod.* 2; *Sat.* 1, 6) and the Digest (46, 3, 89, 2, *scaev.* 29). For more on this subject, see Giliberti, G, *Legatum kalendarii. Mutuo feneratio e struttura contabile del patrimonio nell'età del Principato*, Napols, 5-14, 1984.
90. The *CIL* II, 4125 epigraph alludes to the conflict between *Valeria Faventina*, a relative of *Valerius Faventius* of *Aeso*, and other landowners regarding property limits, indicating ample land ownership on part of *gens Valeria* (see Pons, J., "Propiedad privada de la tierra y comunidades campesinas pirenaicas: Análisis de una sentencia judicial del año 193", *Memorias de historia antigua* 3, 111-124, 1979). The *duumvir*'s wealth indicates that the grain came from his own stock (Melchor 1993 (see footnote 45), 99).
91. There is a historiographic debate on the meaning of *solo empto*. Traditionally, experts thought the land was bought by the city, but Goffaux argues that the construction took place on plots bought by the city's euergetes (Goffaux, B., "Evergétisme et sol public en Hispanie sous l'Empire", *Mélanges de la Casa de Velázquez* 33.2, 225-247, 2003).
92. Dubouloz 2008 (see footnote 38), 280.
93. Written sources tell us about the construction of *horrea vinaria* (*Sen. Ep.* 114, 25; *Hor. Carm.* 3, 28, 7; *Dig.* 33.7.7).
94. Recent research in Zaragoza has revealed structures of the ancient *Caesaraugusta* river port (see Erice, R., "El puerto fluvial de *Caesaraugusta*", J. Arce & B. Goffaux (eds.): *Horrea d'Hispanie et de la Méditerranée romaine*, Madrid, 143-158, 2011).
95. Two inscriptions mentioning *Hyacinthus* were found in *Hispania* in Sagunto (*EE* IX 379; *CIL* 112/14, 540; *HEp* 12, 2002, 506) and Mérida (Ramírez Sádaba, J. L., "Anexo C. Epigrafía", J. M. Alvarez & T. Nogales (eds.): *Forum Coloniae Augustae Emeritae. «Templo de Diana»*, Mérida, 364-365, n° 17, 2003; *AE* 2003, 877; *HEp* 13, 2003-2004).
96. Dubouloz, 2008 (see footnote 38), 282.
97. For more on the functions of the *horrearius*, see Alzon 1964 (see footnote 79); Dubouloz 2008 (see footnote 38); Dubouloz, J., *La propriété immobilière à Korne et en Italie, Ier-Ve siècles*, BEFAR 343,

Roma, 2011; Serrano-Vicente, M., *Custodiam Praestare. La prestación de custodia en el derecho romano*, Seville, 2006.

**98.** Serrano-Vicente 2006 (see footnote 97): 134-135.

**99.** Speidel, M. & Dimitrova-Mileva, A., “The Cult of the *Genii* in the Roman Army and a new military deity”, *Aufstieg und Niedergang der römischen Welt* 16.2, 1549-1550, 1978.

**100.** The only statuette of a *genius horreorum* – in this case in a military setting–has been found in the Niederbieber camp (*CIL* XIII, 7749). The statuette is very interesting because its dimensions and meaning tell us about its placement in an alcove or *aedicula* of the *horrea* (Salido 2012 (see footnote 51)). The epigraphy also tells us about the other sculpture’s placement, which hasn’t been preserved, but must have been placed in a small *sacellum* in the central interior forecourt of the *Horrea Agrippiana*, dedicated by three *curatores* of a *collegium* to other merchants related with the *horrea* (AE 1915, 97; AE 1923, 57; AE 1927, 97) (Rickman 1971 (see footnote 54), 312-315; Salido 2012 (see footnote 51)).

**101.** Rickman 1971 (see footnote 54), 312; Henzen, W., *Acta Fratrum Arvalium*, Berlin, 146, 1874.

**102.** Rickman 1971 (see footnote 54), 312-315; Salido 2012 (see footnote 51).

**103.** It is difficult to distinguish between the private and public *horrea* based on a simple reference to a particular *horreum* or a worker’s dedication.

**104.** Tran 2008 (see footnote 38), 298-299.

**105.** Rickman 1971 (see footnote 54), 156-157.

**106.** Arce, J., “*Horrea* y aprovisionamiento en Hispania (ss. IV-VI)”, J. Arce & B. Goffaux (eds.): *Horrea d’Hispanie et de la Méditerranée romaine*, Madrid, 289-290, 2011.

**107.** Peña Cervantes, Y., *Torcularia. La producción de vino y aceite en Hispania*, *Documenta* 14, Madrid, 188, 2010.

**108.** Castelo, R. *et alii*, “El Saucedo (Talavera la Nueva, Toledo). Un ejemplo de villa bajoimperial en la provincia de la Lusitania”, A. Chavarría, J. Arce & G. P. Brogiolo (eds.): *Villas Tardoantiguas en el Mediterráneo Occidental*, *Anejos de AEspA* 39, Madrid, 173-196, 2006.