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THE CONTINUITY OF ROMAN WATER SUPPLY SYSTEMS IN POST-ROMAN SPAIN: THE CASE OF VALENTIA, A RELIABLE EXAMPLE?

La continuidad del sistema de aprovisionamiento de aguas en la España post-romana: el caso de Valentia, ¿un ejemplo significativo?

Ur horniketaren jarraitutasuna erromatar ondoko Espainian: Valentziako kasua, adibide adierazgarria?

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Abstract:

Even if the general assumption is that Roman water supply systems (aqueducts in particular) ceased to function during the late Roman period, and that these were not present in medieval cities, recent archaeological research is proving that this was not always the case. Several cities in Spain show archaeological continuity in their water supply systems into the Visigothic period, and one of these seems to be Valencia. There is archaeological evidence to suggest a functioning aqueduct until the eleventh century, probably linked to episcopal patronage or, less probable, due to royal intervention. The information available comes from the excavations at L'Almoïna, c/ Cavallers and c/ Quart, in which not only sections of the aqueduct with complete preserved stratigraphy have been retrieved, but also important water-consuming structures. Valencia is also a unique example of the reparation of Roman water supply systems in the Umayyad period.

Key words:

Aqueducts; Continuity; Visigothic period; Umayyad period; Valencia.

Resumen:

Aunque la idea general es que los sistemas de suministro de agua romanos (en particular los acueductos) dejaron de funcionar en el periodo tardorromano, y que estos no estaban ya presentes en las ciudades medievales, las recientes investigaciones arqueológicas están demostrando que este no fue siempre el caso. Varias ciudades en España muestran arqueológicamente la continuidad de sus sistemas de suministro de agua en el periodo visigodo, y uno de estas sería Valencia. Hay

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material arqueológico suficiente para sugerir que el acueducto continuó en uso hasta el siglo XI, probablemente ligado al patronazgo episcopal o quizá, y menos probable, a la intervención regia. El material del que disponemos proviene de las excavaciones de la Almoina, c/ Cavallers, c/ Quart, en las cuales no solo se han conservado tramos del acueducto con una estratigrafía completa, sino también varias estructuras importantes que consumían agua corriente. Valencia es también un buen ejemplo de reparaciones de conducciones de agua romanas en el periodo omeya.

Palabras clave:

Acueductos; Continuidad; Periodo Visigodo; Periodo Omeya; Valencia.

Laburpena:

Erromatar garaiko ur horniketa sistema (bereziki akueduktuak) Berant Antzinaroan bertan behera geratu eta Erdi Aroko hirietan ez zirela egon uste izan den arren, azkeneko ikerketa arkeologikoen arabera hau ez zen beti horrela izan. Espainiako hainbat hirietan burututako azterketa arkeologikoen agerian utzi dute ur horniketaren jarraitutasuna aldi bisigotikoan, besteak beste Valentzia. Material arkeologikoen arabera akueduktuaren erabilera XI. mendera arte luzatu zela aditzera eman daiteke, seguruenik apezpikutzaren babesari lotuta edo agian, baina aukera gutxiagorekin, erregearen esku-hartzearekin. Eskura dugun materiala Almonia, Cavallers kalea eta Quart kaleko indusketei dagokio, non ez dira bakarrik estratigrafia osoa erakusten duten akueduktu atalak irau baizik eta ura kontsumitzen zuten egitura garrantzitsuak ere. Valentzia aldi omeiatar zehar erromatar garaiko ur eroanbidetan egin ziren konponketen adibide ona da.

Hitz Gakoak:

Akueduktuak; Jarraitutasuna; Aldi bisigotikoa; Omeiar aldia; Valentzia

Rome was famous for its aqueducts, and the Romans were renowned for their hydraulic engineering. The construction of aqueducts was something so clearly Roman that it is difficult to imagine these lofty-arched structures in any other time period. But these were too big and too useful to be simply destroyed once the Roman Empire had fallen, and still it is difficult to imagine a medieval city with an aqueduct. This seeming nonsense is the main focus of my doctoral research, in which I try to identify those aqueducts that continue to function into the Visigothic period and beyond, reasoning why this happened and how it affected late antique urbanism. When I was offered to contribute to the first issue of *Arkeogazte*¹, I thought that it

would be a great opportunity to present this topic, which has hardly been analysed or taken into consideration in broader studies of late antique urbanism, presenting Valencia as a case study, which has been widely published although very little attention has been paid to its aqueduct.

This paper will thus be structured in several sections. First it will be necessary to approach the topic of Roman water supply systems as a whole, their direct relationship with urbanism and city-dwellers, and how these monuments were a clear indicator of *Romanitas*, even in the post-Roman period. Once this has been explained, an overview of the aqueducts in late antique Spain and how

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they evolve in the Visigothic period can be given before approaching Valencia. Then, when the course of the aqueduct is outlined, and its remains explained, it will be possible to enter into a detail study of the available chronological evidence, which is the key element for this study, because only with solid dated material the development of the aqueduct during Late Antiquity until its final abandonment in the eleventh century can be studied. The last part of this paper will judge the available information of Valencia as a good indicator of the fate of aqueducts in the Iberian Peninsula after the fall of Rome.

1. Aqueducts and urbanism

The link between water supply and urbanism is certainly a very close and important one, as towns are normally great agglomerations of inhabitants, which require a constant and secure supply of clean drinking water. And as outlined before, Roman water supply systems are famous because of their monumentality, as noted by ancient writers, ranging from Strabo, who said *while so plentiful is the supply of water from the aqueducts, that rivers may be said to flow through the city and the sewers, and almost every house is furnished with water pipes and copious fountains* (*Geographica*, V.3), to Cassiodorus, who wrote *but in the aqueducts of Rome we note both the marvel of their construction and the rare wholesomeness of their waters* (*Variae* VII.6.2), including obviously Frontinus' famous quote, *with such an array of indispensable structures carrying so many waters, compare [the aqueducts], if you will, [to] the idle Pyramids or the useless, though famous, works of the Greeks!* (*De Aquis* I.16).

The presence of aqueducts in Rome can be explained as a response to the actual need of the city itself to supply drinking water to its increasing population, although the first aqueduct (the Aqua Appia) was built by Appius Claudius to increase his own political prestige (*De Aquis* I.5). After all, the citizens did not actually *need* an extra supply of water for their drinking needs, as it became evident in the 537 siege of Rome, because once Vitigis had cut the aqueducts, the main concern

of the Romans was not the lack of drinking water, but the lack of water for the baths (PROCOPIUS, *De Bello Gothico*, I.19). Rome had plenty of natural springs inside the walls, and as elsewhere in the Mediterranean basin, drinking water was normally obtained from rain-water cisterns and wells. After all, aqueducts were not commonplace again until cities grew too much for their local resources in the Early Modern period.

Even from their very beginnings, urban aqueducts were therefore not a need, but rather a luxurious commodity, which were more closely linked to political enterprises (Cf PLINY, *Epistulae*, X.46) and construction of baths than to truly drinking issues. Most of the aqueducts in the Iberian provinces were built during the first and second centuries AD, which correspond to a period of urban development and economic prosperity, in which towns went through processes of monumentalisation, prompted in my opinion by peer polity interaction and by the general granting of the *Ius Latium* to Hispanic towns. Aqueducts had become a symbol of *Romanitas*, and cities needed to have one in order to reinforce their position and status.

This does not mean, however, that aqueducts were only built as a way of claiming prestige; they were clearly functional and practical, and once a city had an aqueduct, it could quickly develop. Not only in terms of monumentality (baths, fountains), but also it could be claimed that they allowed population growth, for instance as the *urbs nova* of Itálica, which had its own aqueduct (CANTO, 1979). Roman water technology allowed the construction of large industrial complexes, such as the mills of Barbegal, or the mines of Las Médulas, but hardly ever did urban aqueducts supply industrial areas (Rome being a clearly exceptional example: WILSON, 2000, 2003).

Water was used in Roman towns for three main purposes, according to Vitruvius (*De Architectura* VIII.6): feeding public fountains, feeding public baths and supplying private individuals, in this order of priority, according not only to Vitruvius, but also to the existing *castella*

divisoria, such as those of Pompeii or Lyon. The presence of aqueducts is also normally linked to that of sewers, which collected the overflowing water from baths and fountains, washing away from the drains all the sewage that may have been in them.

2. Post-Roman Spain and its aqueducts

Thus, in a model provincial Roman city, an aqueduct would have fed baths, fountains and houses, it would have been built in a period of urban development during the 1st or 2nd centuries, and it would have allowed the town to develop and grow. In this model provincial town, its aqueduct then would have not survived beyond the fifth century, because once the curial elites lost their political and economic power in the fourth century, there would not be enough economic resources or political incentive to maintain and repair them (LIEBESCHUETZ, 1992). This may be the case for several Spanish cities in this period, which during the times of crises could not avoid the collapse of their own aqueducts, or were unable to repair them. Plus, by this time it was more important to reinforce the city inhabitants' identity as Christians (building churches) rather than their identity as Romans.

This was the case of small towns, such as Baelo Claudia, where the aqueduct collapsed after an earthquake in the fourth century and was never built again (JIMÉNEZ, 1974) or the small site of Los Bañales (BELTRÁN, 1977), although there are plenty of other examples of fourth-century abandonments, like Andelos (MEZQUÍRIZ, 2004), Itálica (CANTO, 1979), Toledo (ARANDA *et al.*, 1997) and León (CAMPOMANES, 2006). But this also happened in big cities such as Córdoba, where the great Aqua Vetus Augusta collapsed in the third century and it was abandoned (VENTURA and PIZARRO, 2010). This aqueduct would only be repaired by the Umayyads, as Abd al-Rahman III reused it for his new city, Madinat al-Zahra, although it is true that a new (and smaller) aqueduct was built to supply water to the palace-complex of Cercadilla in the tetrarchic period.

The decline in the number of aqueducts is evident in Spain, where from the over 25 cities with a total of almost 40 aqueducts present in the second century, it is only possible to claim with certainty that only the ones of Córdoba, Tarragona, Barcelona, Segovia and Valencia seem to have continued in use into the Visigothic period (MARTÍNEZ, i.p.). And it is not just chance that these cities keep their aqueducts: these cities played a key role in the administration of the Gothic kingdom, were episcopal seats and had a strong and important Hispano-Roman elite even in this late period. The political importance of these cities (excepting Segovia, which may be more closely linked to its sturdy construction) can explain not only why these aqueducts continued to function, but also how this happened. At least, in the cases of Barcelona, Córdoba, Tarragona and Valencia a pattern seems to appear, by which the aqueduct was semi-privatised by powerful individuals (kings or bishops) in order to supply their own palaces or episcopal complexes, but keeping the public access to fountains and baths. This appears to have been the only way to preserve the water-supply structures, because town councils lacked money or the willingness to do so. Plus, in this way these new powerful elites linked themselves to the Roman past by taking over these clear symbols of *Romanitas*, legitimising their position (FERNÁNDEZ *et al.*, i.p.). These conscious efforts to maintain these water supply systems in key symbolic places can be seen in the construction of the aqueduct in the newly-founded site of Reccopolis, or the repairs of the aqueducts of Rome and Ravenna by Theoderic early in the sixth century (MARTÍNEZ, 2010).

In the Umayyad period, however (especially in the ninth century), there were a series of repairs and reuses of some of these aqueducts, especially in Córdoba (VENTURA, 2002), but the nature of these repairs varied considerably from town to town, as the Umayyads fully privatised the water supplies for their own use (MARTÍNEZ, i.p.).

All of these transformations are noticeable in Valencia, where there is good archaeological

data for the aqueduct and the use of water all throughout Late Antiquity and into the eleventh century.

3. Valentia in Late Antiquity and beyond (4th-11th c.)

Valentia was a small coastal town in the province of Carthaginensis, located on the south bank of the Turia River, which was destroyed during the course of the third century by the Germans, and later rebuilt, so the city entered Late Antiquity completely refurbished (RIBERA, 2008: 303). When it was rebuilt, it was fully furnished with new buildings, including a curia and a lavish *nymphaeum* in the forum, which was in turn enclosed by a wall. Later on, in the area of the forum where the *kardo maximus* and the *decumanus maximus* met, a new sewer was built during the fourth century to substitute the old *decumanus* sewer which had collapsed (RIBERA, 2005: 210-2). The town had a circus too, which was in use until the fifth century (RIBERA AND ROSSELLÓ, 2000a: 156-7), when the town as a whole entered a period of crisis (as a result of the collapsing Empire). Only in the mid-sixth century Valentia recovered from this period of crisis because of the political autonomy acquired under the Visigothic kingdom, and, especially, thanks to the works and leadership of bishop Justinian (RIBERA, 2005: 208-209, 214; LINAGE, 1972).

The presence of a bishopric in Valentia dates back to the time of Saint Vincent, who preached and was martyred there. The presence of a local martyr allowed Valentia to generate a local cult, which soon favoured the creation of the bishopric. By the time Justinian was bishop (ci. 540) there were several churches in Valentia, as it is recorded in a funerary inscription². Amongst these, the excavated suburban martyrial centre

2 IHC 409: ... *Iustinianus caelebs pontifex sacerdos/nobilitate(m)placostruens vetustaque) rest[aurans]/... - ... Justinian, famous bishop and priest,/ building new temples and repairing the old ones/ ...*

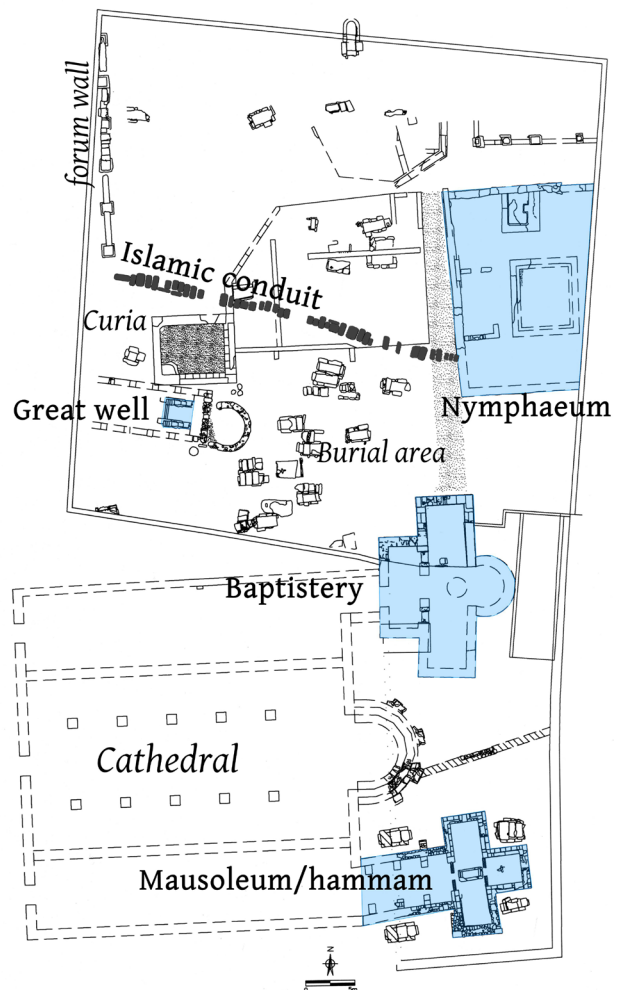


Figure 1. Site of L'Almoina showing the buildings of the Visigothic period and the ninth-century Islamic conduit, highlighting water-related structures (based on RIBERA 2008, fig. 8, adding the conduit according to MARTÍ AND PASCUAL 2000, fig. 4, re-labelled in English).

and monastery should be included (RIBERA AND ROSSELLÓ, 2000a: 160; RIBERA, 2008: 304). He was also probably responsible for the construction of the cathedral which has been excavated at the site of l'Almoina (Figure 1), on the site where the forum used to be. Though only the apse and part of its outer walls have been excavated, it is possible to tell that the cathedral, even if built on top of the forum, maintained the orientation of the urban grid, and did not block any existing streets (RIBERA, 2005: 214; 2008: 307). As time passed, this original complex was expanded,

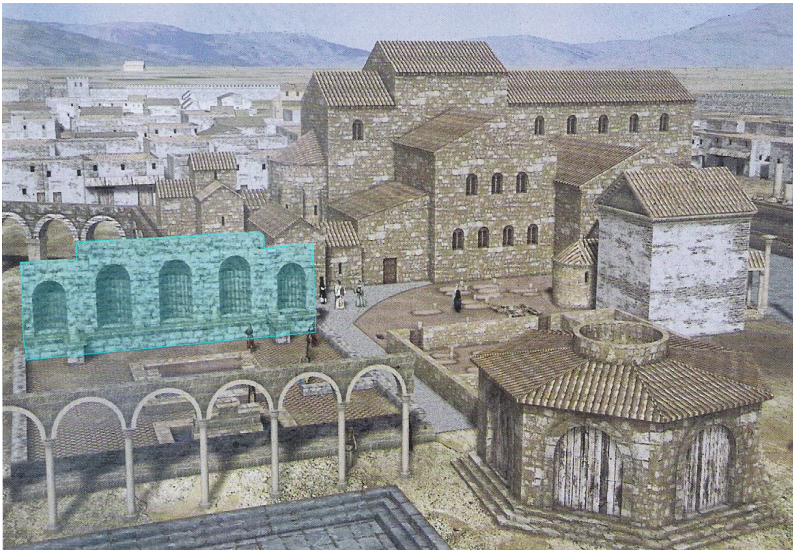


Figure 2. Infographic reconstruction of l'Almoína in the seventh century, highlighting the forum nymphaeum (RIBERA and ROSSELLÓ 2000: 172).

and two cross-shaped structures were built in the late-sixth century at either side of the apse, this time directly on top of the *kardo maximus* (RIBERA, 2005: 219). These two structures have been identified as a mausoleum or funerary chapel for the bishops of Valencia, known as the *Prision of Saint Vincent*, (SORIANO, 2000) and as a baptistery with a drain leading to the main sewer (RIBERA, 2005: 218-9).

Still in the forum area, north of the cathedral, new buildings were erected on top of the previously public spaces during the seventh century, which include an apsidal structure (probably a martyrial shrine), a large monumental well (the “great well”; RIBERA, 2005: 230-233) and a polygonal building (thought to have been a *macellum*; RIBERA and ROSSELLÓ, 2000b: 180). These buildings, however, respected the still-standing and still-functioning Roman structures that occupied that part of the forum: the curia (RIBERA and ROSSELLÓ, 2000b: 179) and the *nymphaeum* (Figure 2; RIBERA, 2005: 228-229).

Besides the excavations at l'Almoína which show the Christian monumentalisation of the forum, little is known from the rest of Valencia. We know, for instance, that the circus was partially reconstructed as a fortification during the

last decades of the sixth century (RIBERA, 2008: 313; RIBERA and ROSSELLÓ, 2000a: 157), and this has been explained by Albert Ribera and Miquel Rosselló as the result of the full incorporation of Valencia into the Visigothic kingdom during the reign of Liuvigild (ROSSELLÓ, 1996: 445-446; RIBERA and ROSSELLÓ, 2000a). As Valencia was very close to the Byzantine territories on the south-eastern coast, it became important to take control of Valencia to create a definite *limes* against the Imperial troops. This is further supported by the construction (according to the excavation material) in the late sixth century of the fortification of València la Vella

(“old Valencia”), a 4ha *castrum* ten miles away from the city (ROSSELLÓ, 1996, 2000; MARTÍ, 2001; RIBERA, 2008: 313), which further indicates the military presence of the Visigoths in the region. It is known that by 546 (when a synod was celebrated) Valencia was only loosely controlled by the Visigoths (RIBERA and ROSSELLÓ, 2000a: 152), but during the last part of the sixth century the city was finally *de facto* included in the Gothic kingdom.

Beyond the evidence for this given by the fortifications, the new burials identified in the forum area may indicate the inflow of Germanic populations. These can be securely dated by stratigraphy to the later sixth and seventh centuries, and anthropologically they belong to taller and more robust individuals (7cm taller on average, if compared to those individuals from earlier cemeteries), some of which show wounds caused by weapons. These have been identified as Gothic soldiers settled in Valencia (CALVO, 2000), not only because of the size and wounds, but also because the date matches precisely with the inclusion of Valencia in the kingdom. The presence of Gothic settlers can also be explained by the presence of an Arian bishop in the city by AD 589 (RIBERA, 2008).

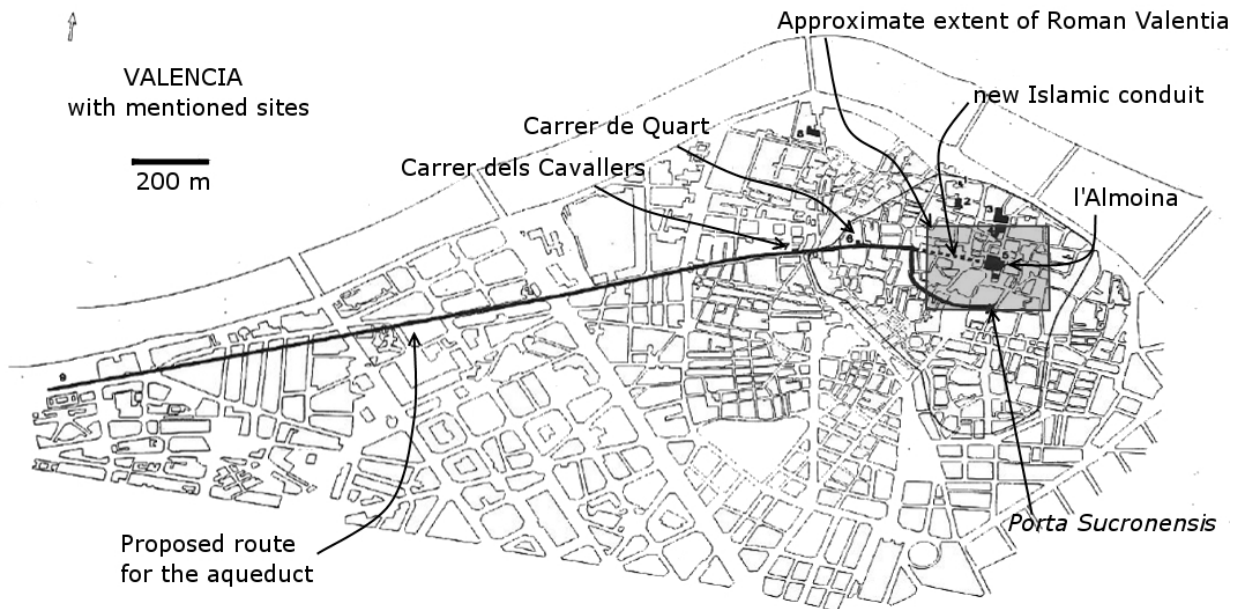


Figure 3. Course of the aqueduct inside the city (MARTÍ AND PASCUAL, 2000, fig. 6, re-labelled in English).

During the later Visigothic and the early Islamic period, the site of l'Almoina hardly changed and was only slightly transformed. During the course of the late seventh century a workshop area developed in the northern sector of the old forum. The eighth century is described as the darkest century of the archaeology of Valencia, because very little is known, and what is known can only be ascribed to this century with great difficulty. According to the written sources, the city was destroyed in the year 778 by the troops of emir Abd al-Rahman (MARTÍ and PASCUAL, 2000: 501; RIBERA, 2005: 237), although this has not been identified yet archaeologically either. It is not until the ninth century when real changes in the layout can be seen, with the construction of a *hammam* (Islamic bath) in the cross-shaped mausoleum (MARTÍ and PASCUAL, 2000: 510-511), the erection of new cisterns and the construction of a new water supply conduit, which is thought to have supplied the emiral citadel (RIBERA, 2005: 237-238).

4. The aqueduct

4.1. Its source and course

The aqueduct of Valencia (Figure 3; Table 1) is not very well known, for two main reasons: the course inside the city is documented in only two sites, known in two other, and outside the town all the Roman water conduits are considered to be rural watering channels.

The rural aqueducts have been surveyed at both sides of the river Turia: four are known on the north side while five are known on the south side. The north ones cannot be linked to Valencia because their courses go deep into the agricultural region north of the city³.

The five conduits known from the south bank had only been partially studied until very recently. The only major study until 2008 was a short work which dealt only with the sections standing in the municipality of Riba-roja de Turia,

³ These are the aqueducts of *Chulilla*, *les Llometes*, *la Covatella* and *Mandor* (PÉREZ 2006: 33-7).

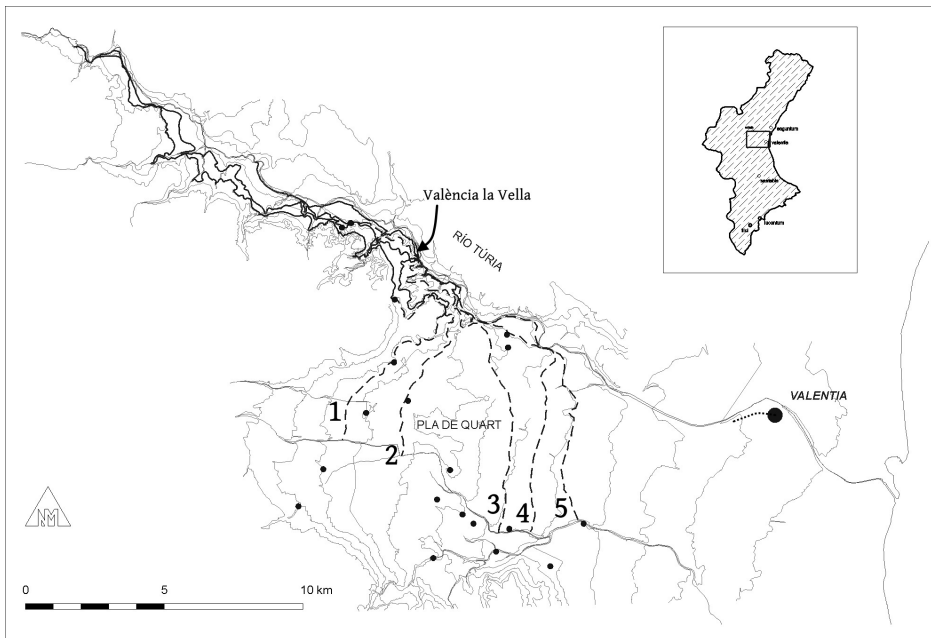


Figure 4. Reconstruction of the course of the rural aqueducts in the surroundings of Valencia, indicating the location of València la Vella and of the urban aqueduct (based on HORTELANO 2008, fig. 1).

published by Domingo Fletcher Valls in 1958, based on an 1849 unpublished survey and his own field work. In his work, Fletcher mentions two different conduits: he identifies one of them as an irrigation channel branching away from the other, the urban aqueduct, which in turn he identified in nine different sections. The main problem with Fletcher's work is that his chronology is not reliable (he describes the site of València la Vella as a Roman camp), and most if not all of the sections he mentions as existing in 1964 have certainly now disappeared under new urban developments, so it may be impossible to compare the date of these standing sections.

Fletcher proposed a hypothesis for the urban aqueduct: its source may have been a diversion dam located at the Turia river in the village of Vilamarxant, located on the right bank (MARTÍ, 2001: 24; Cf. GLICK, 1970: 190-192). The aqueduct would then continue its course parallel to the river on its south bank until it appeared again at the site of València la Vella, in the village of Riba-roja (16km from Valencia). Fletcher mentions sections standing at the sites of Perpinyanet, Muncholina,

Porxinos (all between Vilamarxant and València la Vella), and Barranc del Pou (FLETCHER, 1958). These are the names of creeks that flow into the River Turia and are therefore the logical places to find an aqueduct bridge. It would then continue towards Valencia, appearing again at Manises, assuming that the Islamic bridge located there (and popularly known as *els arquets*, or "the little arches") is a reconstruction of an original Roman structure (MARTÍ, 2001; FLETCHER, 1958).

However, Ignacio Hortelano Uceda published in 2008 an up-to-date study of the aqueducts of the south bank. He identified five different aqueducts (Figure 4), which he classifies as rural watering systems (HORTELANO, 2008, esp. 80-81), on the grounds that they are not covered, following Vitruvius' advice (*De Architectura* VIII.1.6-7, VIII.6.1), and that they are cut into the soil rather than built out of masonry. The only parts of these aqueducts which are built on masonry structures and lined with *opus signinum* are those parts where bridges needed to be built in order to pass over *barrancs*. The conduits themselves are very wide (over 1.5m on average) which is also unusual for urban aqueducts. All of these aqueducts are fed from river diversion dams (which have been preserved), which Hortelano also points as a sign that they were not intended for urban supply, and that they ceased to function in the fifth century⁴.

⁴ Hortelano claims (*pers. comm.*) that these conduits can only be linked to Roman rural settlements, and that they

Furthermore, Hortelano claims that none of these aqueducts could have possibly continued towards Valencia (HORTELANO, 2008: 83-84). Hortelano proposes in his paper a course for each of the five aqueducts, in order to estimate it beyond the point where they are last attested, and his model predicts that all aqueducts would have turned south, towards the agricultural hinterland of Valencia (known as the *Pla de Quart*), where he identifies a great number of rural settlements. Aqueduct number 5, which is the one proposed by Fletcher as the one continuing towards the city, also turns south in Hortelano's model, so it could not have fed the city.

Its course is otherwise unknown until it reaches Valencia itself, as the whole bank of the river between Manises and Valencia is heavily constructed. The aqueduct has been located in two different excavations along the ancient road leading west, a continuation of the *decumanus maximus*. In the 1930's a section was located outside the provincial gaol (current Carrer Castán Tobeñas), but it was later destroyed (Figure 3; GLICK, 1970: 190). Down the road, the excavations at Cavallers and Quart that took place in the 1990's confirm that the aqueduct continued in a straight line towards the centre of town, although at some point it turned south, towards the *Porta Sucronensis* or southern gate (Figure 3; MARTÍ and PASCUAL, 2000: 513), where the *castellum aquarum* is supposedly located according to a fragmentary inscription recorded by Schulten (1955), which reads:

...]um qui aquam trahit... / ...]m a
Porta Sucronens[i... / ...] empturum V
kal(endas) maias
... who brought the aqueduct... / ...
from the Sucronensis gate... / ... he will

cannot be linked to the one Visigothic settlement known for this period, the palace of Pla de Nadal. However, Visigothic laws mention very specifically rural water conduits (*aquae inrigae*) in their laws: *Lex Visigothorum* VIII.iv.31 "De furantibus aquas ex decursibus alienis", and it is evident that there was a pre-existing irrigation network around Valencia before the Muslim invasion, according to Glick (1970: 190-2).

buy (?). [Given] on the fifth day before the calends of May⁵

Water would then be distributed from there to the rest of the town. This included the supply to the monumental forum, with its *nymphaeum* and, later on, its baptistery.

4.2. Chronology and dating evidence

There is very little evidence to date the aqueduct of Valencia *per se*, but the little we have is extremely telling. Overall it can be argued that even if we do not have a definite construction date for the aqueduct, it is clear that it only stopped functioning between the seventh and the eleventh centuries.

On the one hand, it is possible to say that the construction of a large fort outside of Valencia (the site of València la Vella) in order to control the town and its territory, would make more sense if Hortelano's aqueduct #5 (Figure 4) was still functioning, as it could supply water to the garrison there (MARTÍ, 2001). The source of this aqueduct is about a kilometre away from the site, so it could have been easily repaired, if at all needed. And if one of these rural aqueducts was functioning there is no positive evidence to suggest that the urban aqueduct was not working.

On the other hand, there is excavated material, obtained from the inside of the *specus* of the Roman aqueduct located at c/ Quart, which range from the Roman period to the eleventh century (MARTÍ and PASCUAL, 2000: 513). The *specus* located there was filled totally with clay sediments. There was plenty of material in these sediments, securely dated between the Roman and the mid-Islamic periods (the latter present in the upper sediments). This means that at the aqueduct was still carrying water least until the eleventh century, when it was completely packed with clay sediment, becoming useless.

⁵ 26th of April, year unknown.

A side-argument that can be obtained from this excavation is that the waters running through the aqueduct were very rich in suspended clay, which may indicate that it brought river water from a diversion dam, water that would later be cleaned and decanted at the settling tank (*castellum*). This would thus give a hint on where the water came from.

It is thus clear that the Roman aqueduct ceased to fully function in the eleventh century, but it is difficult to assess if it was fully functional until then. Beyond the data obtained from the aqueduct itself, it is possible to obtain information on the continuity of the aqueduct from other water-related structures of Valencia, namely the baptistery, the *nymphaeum*, the sewers, the great well, and the new Islamic conduit.

The baptistery as discussed above was first built during the sixth century, added to the west end of the cathedral, north of the apse. It was first identified in the 2002 excavation, but it has not been fully excavated due to the nature of the site. Nevertheless, the excavation has shown that it had a baptismal pool with a drain, which led the blessed water out of the baptistery into a pool on the street, where the faithful could collect it

(RIBERA 2008: 306; 2005: 218-9). It is not clear where the water for the baptistery came from, but it is not impossible that being so close to the *nymphaeum*, it was fed with water from the aqueduct.

The *nymphaeum* (ALBIACH *et al.*, 2000: 68; RIBERA and ROSSELLÓ, 2000b: 183; RIBERA, 2005: 210, 239; 2008: 306), the monumental forum fountain, was built during the early years of the colony. It is a large structure made in *opus vittatum*, measuring 20 x 11m, and built probably when the aqueduct was first erected, with a three-niche wall over the main basin. It was probably fed by the aqueduct, as evidenced by the presence of a reservoir tower, measuring 8x6m with an inside lining of *opus signinum* 30cm thick, although it cannot be proved as the back part of the *nymphaeum* cannot be excavated. It was further monumentalised in the fourth century, refurbished and repaved with new tiles, although the wall decorations would only last until the fifth century. Then the *nymphaeum* was stripped bare of its (possibly marble) decorations, and was left as it stood in the third century again, as evidenced by the presence of fifth-century pottery in the spoil trenches. This, though, did not mean that the *nymphaeum* went out of use, as

the fountain was still standing and accessible during the sixth and seventh centuries, as the un-disturbed and very weathered tile-pavement indicates (figure 5). During the sixth century some obscure and very difficult to interpret timber structure (evidenced by the presence of postholes) was erected in the precinct of the *nymphaeum*, but it did not block the access to the pool, as its *opus signinum* lining had been repaired, indicating that it was still working in the sixth century. This repair is also linked to the restoration of the *nymphaeum*'s wall. It is only in the eleventh century when the pool was destroyed,



Figure 5. Nymphaeum tile-paving, with marks of sixth-century post-holes (ALBIACH *et al.* 2000, fig. 5).

according to the stratigraphy and the excavated material. During the middle Islamic period, in the ninth century, the *nymphaeum* was re-modelled, so its back part was transformed into a series of large cisterns, and the *lacus* was readapted into a pool, reusing the pre-existing hydraulic infrastructure, so that these cisterns were filled by the branch of the aqueduct that once fed the *nymphaeum* itself.

The construction of these cisterns in the middle Islamic period may indicate that the aqueduct had an intermittent or reduced flow, which made cisterns necessary in order to maintain the water pressure or to allow for a continuous supply. This solution had already been used in Rome in the Baths of Caracalla and those of Domitian, where in the fifth century the unreliable supply from the aqueduct had to be dealt with large new cisterns. In this way, by creating a water reservoir it was possible to maintain both a homogenous, constant supply and the water pressure (DeLAINE, 1997: 40; MARTÍNEZ, 2010).

The drains known from the forum were the main sewers of Valencia, as they were the *kardo* and *decumanus* collectors. It has been explained how in the third century one of these was rendered useless by silt and residues, which caused the construction of a new one in the fourth century (RIBERA, 2005: 211). There is no further dating material available and some authors (VIZCAÍNO, 2009: 360) argue that they ceased to function then, but the fact that the *nymphaeum* and the baptistery still evacuated their overflow to the cardinal sewer indicates that the sewers kept functioning as drains. Perhaps not at full capacity, but they still drained residual waters from the forum complex.

As far as the great well⁶ is concerned (figure 6), this was built in the north area of the forum, in front of the apsidal structure thought to be a martyrial shrine (both are probably part of the



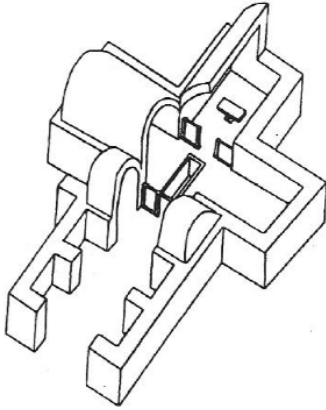
Figure 6. Great Well at l'Almoina (RIBERA AND ROSSELLÓ 2000b, p. 173).

same construction effort) which would point towards a liturgical function (VIZCAÍNO, 2009: 365). The well is lined with *spolia* slabs and ashlar blocks during the seventh century, according to the stratigraphy (RIBERA, 2005: 233; 2008: 313; RIBERA and ROSSELLÓ, 2000b: 179-180). It was finally abandoned in the eleventh century, according to the material obtained from inside the well, which includes Andalusian large globular *pithoi*, with weathered walls and remains of leather ties around the neck (showing how water was drawn from the inside with them; MARTÍ and PASCUAL, 2000: 509). The well must have supplied water at this stage to the workshops that had been built in the north Almoina sector during the course of the tenth century.

Lastly, the new Almoina water conduit (MARTÍ and PASCUAL, 2000: 510-2) provides us with further evidence to suggest that the aqueduct was operational during the middle Islamic period (figure 1; table 2). This new underground water conduit was constructed in the ninth century (according to the material retrieved from the foundation trench) to supply water to the *hammam*. Even if it is impossible to indicate with certainty where it came from or where it went to (because it is only known from this excavation), it may have been a branch diverting from the original Roman aqueduct heading towards the Islamic citadel (*alcázar*), located to the east of the site of l'Almoina, because it crosses the whole

6 Cf Vizcaíno Sánchez's position (2009: 360-3) on the increasing need for wells as a source of water in the Spanish coast during Late Antiquity.

Visigothic mausoleum (Cárcel de San Vicente)



Islamic hammam

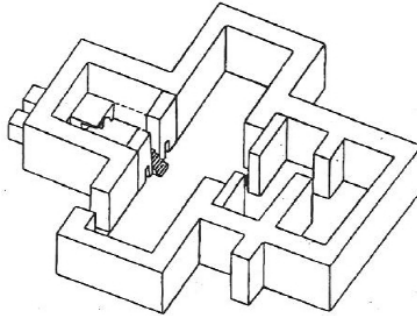


Figure 7. Evolution of the mausoleum into hammam (MARTÍ AND PASCUAL 2000, fig. 5, labelled in English).

of the excavated site from west to east. What seems clear is that the conduit was built out of *spolia* (ashlar blocks, column drums, millstones) and mortared rubble, and that it crossed the old forum without supplying water to the workshops that had been constructed there (excepting the aforementioned bath). This suggests that the water supply system in this period was not openly public and was limited to the palace supply.

The *hammam* (figure 7) built in the mausoleum at some point after the construction of the Almoína conduit (ninth century), which allegedly fed the baths, and was in use until the eleventh century, this date being given by the presence of green-and-brown Andalusian pottery in the abandonment layers. The old mausoleum was subdivided with walls, and its floor was raised in order to warm the rooms. A furnace was added outside the apse, where the hot room was built (MARTÍ and PASCUAL, 2000: 510).

5. Islamic repairs or evidence for Gothic continuity? The history behind the evidence

With the available archaeological evidence it seems clear that the aqueduct was functioning

until the eleventh century, with a gap in the evidence between the seventh and the ninth. This chronology is built by the several *t.p.q.*'s and *t.a.q.*'s given by the dated material.

The *post quem* dates include the reconstruction of the *nymphaeum* (third-fourth c.), the construction of the fortification of València la Vella (late sixth c.), the probable use of running water of the baptistery (late sixth c.) and the public accessibility to the pool

of the *nymphaeum* and the re-lining of *opus signinum* (sixth and seventh c.). The *ante quem* dates all turn around the eleventh century: the destruction of the *nymphaeum*, the blocking of the Roman aqueduct at Quart, and the end of the Almoína water conduit. It is the evidence for the ninth century (the *nymphaeum* cisterns and the construction of the Almoína conduit) that generates most doubts.

The new constructions of the ninth century clearly point towards a renewal in hydraulic engineering, probably linked to a new urban period of revival but, does this indicate that the aqueduct was repaired then? The absolute lack of archaeological evidence for the eighth century prevents us from making further guesses, and both an eighth century working aqueduct and a ninth-century reconstruction seem plausible.

Overall it is clear that running water was important in Valencia's political centre, the forum-episcopium area, for all of late antiquity and into the mid-Islamic period. Probably during the later seventh and eighth centuries (a period characterised by crisis both in Visigothic and early Islamic times) the aqueduct did not function properly, and it needed repairs later in the mid-

Islamic period, but it was preserved well enough to allow the old Roman conduits to be in use until the eleventh century.

6. Valencia: exception or case-study?

It is important to present and assess the dating evidence, because after all it is the key issue of this study. However, without a proper analysis or out of context, the whole study is pointless. It is thus necessary to understand Valencia in its wider context, in order to know if it is a unique exception or a common pattern.

6.1. The late Roman and Visigothic periods

There is enough dating evidence to suggest a continuing life of the aqueduct of Valencia after the Roman period, at least in two clearly identifiable but yet not properly connected phases. The important issues remain still unanswered: why and how.

The fact that all the evidence we have comes, above all, from a single site may bias our analysis, but at least the preserved and excavated area is the forum, the centre of political activity in this period. The preservation of the curia (RIBERA, 2008) indicates that the urban elites still had power over their city, although it seems that after the fifth century crisis, the bishop emerged out of the power vacuum as the true leader of the community, which would explain the construction of the cathedral in the forum.

It is in fact in the political centre of Valencia up to the fall of the Visigothic kingdom where we find evidence for water consumption, although this is not that surprising knowing that water was, in this period, an element of prestige and legitimisation. The urban elites probably maintained (it is not possible to claim this on the basis of repairs found on the aqueduct) the water supply, as they certainly kept using it and maintaining the water-consuming structures, and certainly the bishops kept on doing this afterwards.

The important ideological load linked to the preservation of the aqueduct was used by the bishops to legitimise their position, slowly taking over it and privatising the supply. The way in which the episcopal complex was enclosed by a wall enhanced this apparent process of privatisation of the water supply, and even if the *nymphaeum* was open to the people, you would have to enter into the episcopal complex, as if the public fountain belonged to the bishop.

This is something parallel to what can be seen in Barcelona, where the aqueducts entered the city just where the episcopal complex was built (through the north gate). The bishops of Barcelona had obtained much political power in the Gothic kingdom after 592, when Reccared granted them fiscal privileges in the *De fisco Barcinonensi* (BELTRÁN, 2008), which can explain the construction of an episcopal complex which included a baptistery, a basilica, an audience hall, a chapel and a palace. It also included a new set of baths, securely dated to the sixth century (BELTRÁN, 2002:128; MIRÓ and PUIG, 2003: 175), which was fed by piped water. The bishops of Barcelona were also setting up public structures in their own private grounds. Obviously, in Barcelona the aqueduct was clearly functioning and repaired during the Gothic period (MIRÓ and OLENGO, 2010).

It can be claimed with less certainty that the Gaià aqueduct of Tarragona was probably maintained up to a certain undetermined moment in the sixth century, because its link with the development of an episcopal complex. This complex was developed then in the old precinct dedicated to the imperial cult, in the upper city (MACIAS, 2008), and there a huge cistern (147m³) was built in Visigothic times (MACIAS *et al.*, 2007; REMOLÀ and RUIZ DE ARBULO, 2002: 34). Whereas it has been argued that this is an indicator of the end of the water supply (MACIAS and REMOLÀ, 2005), I would rather see this as a last attempt to benefit from an unreliable and seasonal aqueduct. Just as mentioned above for the cases of Rome and Valencia.

Furthermore, it could be said that the usurpation over the water supply management by the Church is not only seen in Spain. It is evident in Italy too, especially in the case of Rome, where the Popes took over the management of the aqueducts during the mid-sixth century and kept it all over the Middle Ages (MARTÍNEZ, 2010). As far as Valencia as a case study is concerned, it is one of the very few cities in the Iberian peninsula that manages to preserve its aqueduct beyond the fourth and fifth centuries and, in this way, Valencia does not follow the norm. However, if compared to the other sites in Spain and Italy where the aqueducts are preserved, the importance of the church and the local elites is one of the key elements seen across all of the known examples.

6.2. The Islamic period

It is even smaller the proportion of Roman aqueducts that continue to function beyond the seventh century crisis and the Visigothic period. Out of the six Spanish examples (the five previously mentioned plus the Gothic aqueduct of Reccopolis), only Barcelona, Córdoba and Valencia maintained with certainty their aqueducts. Keeping Barcelona aside, as it was only briefly under Islamic control, Valencia and Córdoba are actually comparable, as the Islamic attitude towards these structures seems to have been similar in both places.

In both Córdoba and Valencia it is noticeable how the Umayyad authorities (the emirs in Córdoba, the governor possibly in Valencia) took over the Roman water supply systems and turned it into a private supply for their own benefit. In Córdoba they diverted the aqueduct to feed the palace, repaired the Valdepuentes aqueduct to supply Madinat al-Zahra, and only seem to have preserved the water supply to the fountain of the mosque, which is a public building closely linked to the Umayyad emirs. The “golden fountain” or “*funt awrya*” seems to have been the only known Roman public fountain working with an aqueduct (at least until the tenth century: VENTURA and PIZARRO, 2010). As already mentioned for Va-

lencia, the new Almoina conduit fed the Islamic palace, and only perhaps the baths, but certainly not the workshops. In the case of Valencia, the aqueduct seems to have still supplied water to the *nymphaeum* until it was destroyed in the eleventh century, indicating that the public fountain was preserved, but only because it was already existing and functioning.

Neither in Valencia nor in Córdoba were the aqueducts preserved as a way to link the new Umayyad state to the Roman past. There was no need to legitimise their own position as rulers of Spain through the Romans, as their right to rule was through conquest. The Roman aqueducts were by then ruins or ancient monuments worthy of comments by Islamic geographers (FERNÁNDEZ, 2008/1972: 205), but needed not to be repaired as part of political propaganda. This change of attitude was linked to the increasing number of cisterns and wells in Islamic houses as the main source of drinking water, further confirming that aqueducts were not an immediate need in the first place.

7. Conclusions

The evidence for the existence of the aqueduct of Valencia is very scarce (hardly four known remains inside the city, completely unknown in its hinterland), but the remains have provided enough evidence to make a strong statement of continuity. It is clear that the aqueduct continued to function into Late Antiquity and into the Visigothic period (according to the data from the *nymphaeum* and València la Vella), which is exceptional, as most of the aqueducts of the Iberian Peninsula had collapsed or had been abandoned by then.

The presence of a strong, local elite (lead by the bishop) during the period of power vacuum of the fifth and early sixth centuries can explain why the aqueduct was preserved, as the members of the elite maintained the aqueduct because it was a very strong symbol of their Roman past, which they could use in their own advantage to re-assure their rank and position.

In this aspect, Valencia exemplifies the pattern seen in the other places where the aqueduct is preserved in Late Antiquity.

Valencia is an extremely unique case too, because it is one of the few places in which the aqueducts are reused (or maintained) during the Islamic period, only abandoned in the eleventh century, as the material from c/ Quart shows. It is uncertain if the aqueduct kept functioning during the dark eighth century or not, but in the ninth century new water-consuming structures were built, and it seems that the aqueduct was partially diverted to supply the Islamic alcázar only. This privatisation is parallel to the reuse of the Roman aqueducts in Córdoba.

Overall, and returning to the question asked in the title of this paper, Valentia is indeed a good case study, which can set a pattern seen in all other continuing aqueducts, and even if the evidence could be better and more extensive, the data that can be obtained gives us enough information to make strong claims.

Tables

Table 1		AQUEDUCT OF VALENCIA	
		Identification	Reference
Modern name(s):	The name varies according to the section referred to: acueducto de la Pedrera, acueducto de Porchinos, els arquets, etc. Overall, acueducto de Valencia or aqueducte de València		Fletcher Valls 1958 Martí Matias 2001
Ancient name:	unknown		
Type of conduit:	Roman aqueduct		
Location:	Valencia		
Related aqueducts:	Almoína conduit		
Dating			
Construction:	Roman		Martí Matias 2001
Abandonment:	7 th - 11 th c. Uncertain continuity during the 8 th c.		Martí and Pascual 2000
Dating evidence	<i>Construction</i>	n/a	
	<i>Repairs</i>	- Nymphaeum in the 3 rd and 5 th c.	Albiach et al. 2000 Rosselló 1996, 2000
	<i>Use</i>	- Construction of València la Vella, late 6 th c. - Construction of baptistery, late 6 th c. - Forum nymphaeum in use in the 6 th and 7 th c.	Albiach et al. 2000 Ribera 2005
	<i>Abandonment</i>	- Islamic pottery (11 th c.) inside specus, Quart excavation - Destruction of nymphaeum, 11 th c. - Abandonment of l'Almoína conduit (6.2), 11 th c.	Martí and Pascual 2000
Basic data			
Course:	Largely unknown; parallel to River Turia		
Total length:	Over 16 km (2.44m/km drop)		
Caput:	Ribarroja? (105.000 m ³ /day), Vilamarxant?		Hortelano Uceda 2008 Fletcher 1958
Castellum:	<i>Porta Sucronensis</i> (?)		Martí and Pascual 2000
Constr. technique:	Mortared rubble and <i>opus vittatum</i> , lined with <i>opus signinum</i>		Martí Matias 2001
Conduit height:	n/a		
Conduit width:	120cm		Martí and Pascual 2000
Specus	<i>Width:</i>	60cm	Martí and Pascual 2000
	<i>Height:</i>	n/a	
Standing sections:	(Doubtful adscription to the urban aqueduct) - Barranc de la Cabrassa - Barranc de Crisostomo (10m long bridge) - València la Vella/Barranc de La Pedrera (walls 2m high) - Presa de Aguas (disappeared)		Fletcher Valls 1958 Martí Macias 2001 Hortelano Uceda 2008
Excavated sections:	- Section at Provincial Gaol (disappeared) - Carrer Cavallers (Valencia) - Carrer de Quart (Valencia): over 20m of conduit together with datable material for abandonment		Martí and Pascual 2000
Written references:	- Inscription: ... <i>jum qui aquam trahi[t.../...]m a Porta Sucronensi[.../...]empturum V kal(endas) maias</i>		Schulten 1955
<i>Variae</i>			
Most of the sections identified by Fletcher Valls have disappeared, and his identification of Roman conduits is doubtful.			

Table 2		ALMOINA CONDUIT	
<i>Identification</i>			<i>Reference</i>
Modern name(s):	None		
Ancient name:	Unknown		
Type of conduit:	Intra muros Islamic conduit		
Location:	Valencia		
Related aqueducts:	Aqueduct of Valencia, Palma Sant Just conduit (Barcelona), Alcázar aqueduct (Córdoba)		Miró and Olengo 2010 Ventura & Pizarro 2010
<i>Dating</i>			
Construction:	9th century		Martí and Pascual 2000
Abandonment:	11th century		Martí and Pascual 2000
Dating evidence	<i>Construction</i>	Pottery from foundation trench at L'Almoina site	Martí and Pascual 2000
	<i>Repairs</i>	n/a	
	<i>Use</i>	Islamic baths west of cathedral, 9th c.	Ribera 2005
	<i>Abandonment</i>	Pottery from inside blocked specus, 11th c.	Martí and Pascual 2000
<i>Basic data</i>			
Course:	Hypothetical		Martí and Pascual 2000
Total length:	Unknown		
Caput:	Roman aqueduct, after part located at Quart (?)		Martí and Pascual 2000
Castellum:	Islamic citadel, east of l'Almoina (?)		Martí and Pascual 2000
Constr. technique:	Spolia and mortared rolling stones		Martí and Pascual 2000
Conduit height:	n/a		
Conduit width:	200cm		Martí and Pascual 2000
Specus	<i>Width:</i>	60-80 cm	Martí and Pascual 2000
	<i>Height:</i>	80 cm	Martí and Pascual 2000
Standing sections:	n/a		
Excavated sections:	- Plaça de l'Almoina		Martí and Pascual 2000
Written references:	n/a		
<i>Variae</i>			
May have fed the Islamic citadel directly, as there is no evidence that suggests that it was used by workshops at l'Almoina, excepting for the baths			

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