

**FRESH WATER: Memory and Future Heritage**

**History of water usage in Spain**

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# Water in the Iberian Peninsula



- In the XIVth- XVth centuries the Iberian Peninsula was divided in Christian Kingdoms and Al-Andalus.
- **1) Al-Andalus:** It was an urban society and a commercial economy.
- Concerning water property, Al-Andalus accepts the Coran statement that says: “water is a gift from Ala”
- Water doesn’t belong to anybody. It is used for drinking, washing (ablutions), irrigation,
- The property is about water usage not about water itself.
- Due to the constructions done to use water we can thing that somebody has the property of water.
- Some laws appeared to regulate its utilization, to distribute water for irrigation in Granada Kingdom (s. XV) which still remain in some municipalities.
- **2) Christian Kingdoms:** This is a feudal society, with many agrarian activities.
- Here, roman rules are more important.
- As in Al-Andalus, water is a public good and its use is common.
- Water utilization and the creation of water use systems does that the owners of lands could have the right to it
- With regard to the springs, wells,... the owner uses these waters on his own benefit. Private use
- It happened that they’ve sold the water but not the land. In Al-Andalus it didn’t happen that.
- In the Christian Kingdom cities (Madrid, Toledo, etc.) it existed the Aguador Job : water was taken, a public good for the community’s benefit and it was sold to the citizens.
- In the XIV- XV centuries, in Al-Andalus and in the Christian Kingdoms, there were municipal laws or ordinances to regulate rivers water, fountains water, in order to avoid conflicts.
- A worry arised for waters cleanliness due to the appearance of some pollutant jobs as for example ranners, potters, dyers,... It was established to send them downstream from the city in order not to contaminate water for drinking. It was also forbidden to wash vegetables in the fountains. We cannot think yet about an ecological conscience.

# Roman water systems

## Aqueducts in Spain: Segovia, Tarragona and Mérida

The Aqueduct of Segovia is one of the most important monuments of the Roman engineering and the best preserved on the Iberian Peninsula



The Aqueduct "Devil's Bridge" (Las Ferreras), near Tarragona, not in an urban area but in a valley..



# Urban infra structures



## I.- THERMAE (ROMAN BATHS).

In the urban area we can find **the Thermae** and **the sewer system**.

- It exists, on the Iberian Peninsula, a great archeological variety of this kind of buildings. One of the best preserved is the *Alange Thermae*, near Merida which still are open and operating as a resort of medicinal waters.
- Roman culture promoted the cult of the body and as a result personal hygiene.
- Thermae or public baths became places of meeting people of different social conditions and its use was promoted by the authorities that in some occasions made the entrance was free.
- Women went there in the morning and men in the evening. Sometimes they used the same rooms but in those where women had a different room it was called "*balnea*"



## ***II.- Roman sewer system***

- **Romans understood from the very beginning that a town should have an efficient system of elimination of residues in order to increase.**
- **So, they built in almost all the important towns the known systems of sewer which still today are operating.**
- **In Mérida, for example, roman sewer was used till recently and its network is a reference to know how the old roman town was.**
- **In some other cities as for ex. León there are still remains of these infra structures and we can appreciate in rainy days, the perfection of the street drainage system to avoid floods.**

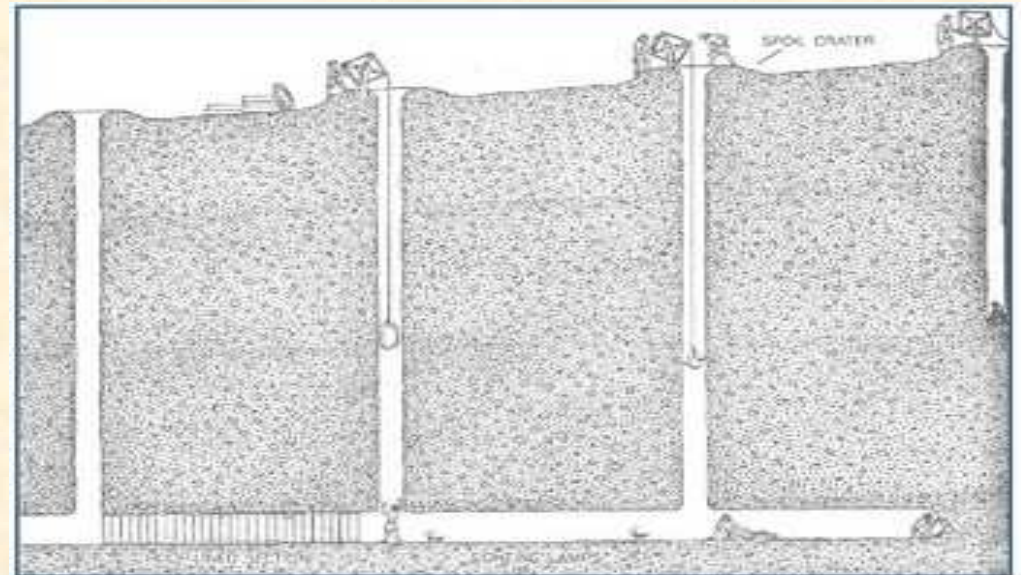
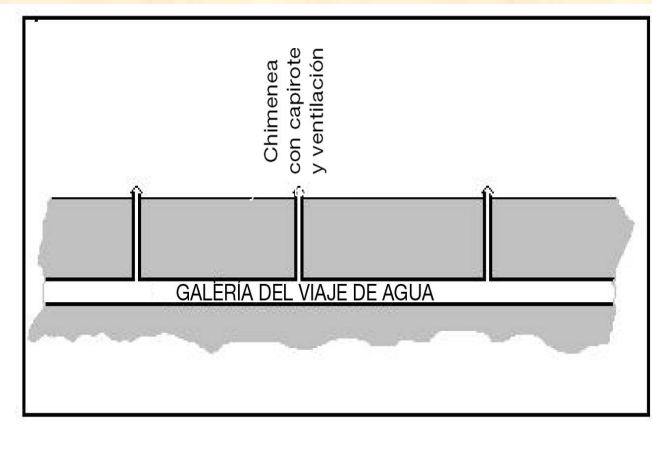
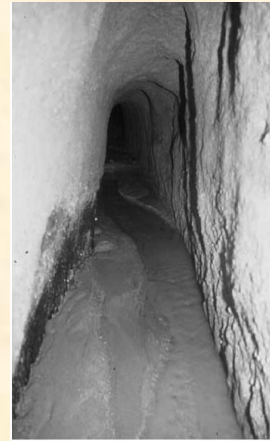


# Arabian water technology

- **Water was not only the origin of life but it also has a purifying sense, as it purifies the body and the soul, a spiritual sense. They introduced and widespread the usage of systems to draw water up from wells, as well as subsidiary means of transportation and reservoirs. They already had learnt that in Siria and Irak.**  
What they mainly wanted was to assure water to the towns, taking it across channels and making it run in the fountains.
- **Using the roman infra structure that they found, they introduced improvements in the construction of dams and new lifting devices. They were worried about irrigation and the capture of water as the base of a flourishing agriculture based on the polyculture The devout Spanish-Muslims tried to follow the purifying precepts having their own cisterns or wells at home or taking water from the fountains.**

# Arabian *qanats* system or “Viajes de agua”

- Qanats are underground tunnels (1'80m high, 1m wide), with a canal in the floor of the tunnel, which carries water. At regular intervals, well-like openings extend from the surface to the tunnel floor, and it is through these openings that the tunnels were built and through which they are maintained. The underground nature of the canal reduces evaporation.
- The difference between the qanat and a surface canal is that the qanat can get water from an underground aquifer, so a surface river or stream is not needed.
- Qanats network continued supplying water in Madrid till 1860.
- The most important were those from Madrid, which brought water from the Guadarrama river springs to the city and those from Crevillente (Alicante) 1500 ms long and 19 wells of aeration
- They were so important in Madrid, that the UNESCO recommended, in May 2002, their protection as a worldwide heritage monument.



# Arabian Baths.

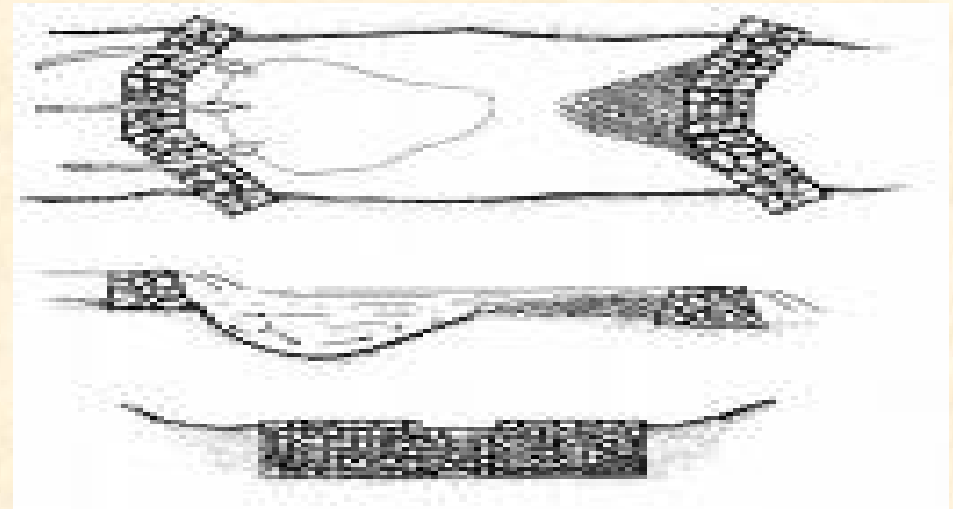
- **Baths as a meeting point**
- *The hammams* were usually located in the city centre near the Mosques. There were many hammams in Al-Andalus.
- Also at the gates of the city walled for travellers' service but always near the water conductions in order to supply enough water.
- The rooms disposition, inherited from the old roman baths, was:
  - A hall
  - A cold room (*bayt al-barid*) bigger and more decorated than the others
  - A warm room (*bayt al-wastani*)
  - A hot room (*bayt as-sajun*)





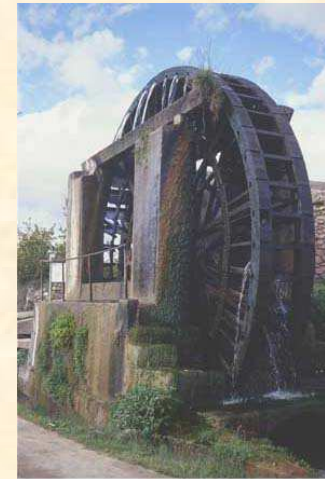
# The “azudes”, the essential constructions

- The “azudes” (*al-sudd*) or Al-Andalus dams accomplished a very specific mission: to conduct waters from a tide and not to store it
- The “azudes” derived water to the irrigation channels, aqueducts,... and stopped in many occasions the big flow of rivers in their swell and drew the level of current water up to a necessary height to be able to turn it aside.
- There were “azudes” in all Al-Andalus, as for example in the zones irrigated by fluvial waters as Aragón, Tarragona, Valencia or Murcia, as this kind of construction was necessary for the draining of water (turning of its course) waters with an intermittent flow.

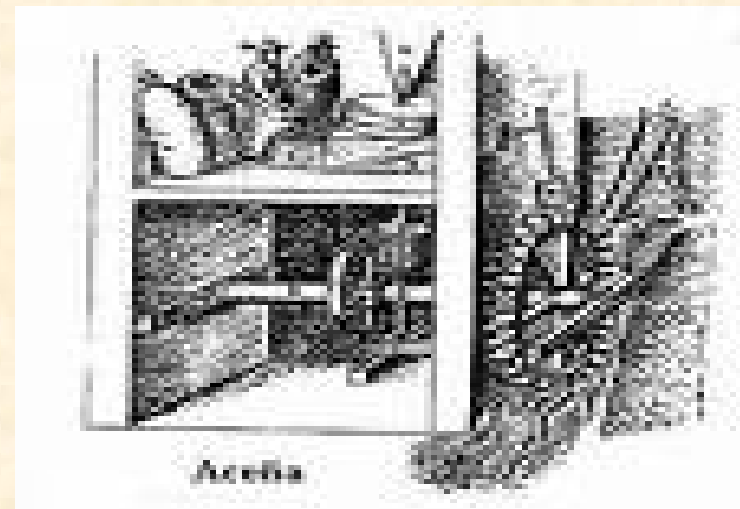


# Water wheels and the “aceñas”

- They were already used by the Romans. In Al-Andalus, it must have been also used together with another one whose origin was oriental, it was used in the rivers from East. For example the well-known water wheel in “la Vega of Murcia”
- The size was, generally, in function of a greater or minor difference of elevation of water.
- The geographer, al-Idrisi (s. XII) described us the Water wheel in Toledo, near the Alcantara bridge and he says that water was elevated 90 elbows of height.
- These innovations may have been the greatest gifts the Arabs gave to Spain and Portugal, thanks to which the Iberian fields were for centuries better developed than those in the rest of Europe.



*Noria en Abarán (Murcia)*





# Wells

They have been widely and continuously used (manual pumping, engine-pumping)



# Arabian Cisterns

The existence of a cistern in houses, long ago, was essential for domestic usage in the provision of drinkable water reservoir.

1.- Cistern built, by the house, to get some water from the rain (**Asturias**).

2.- Cistern situated in the basement of the Veletas House (**Cáceres**).



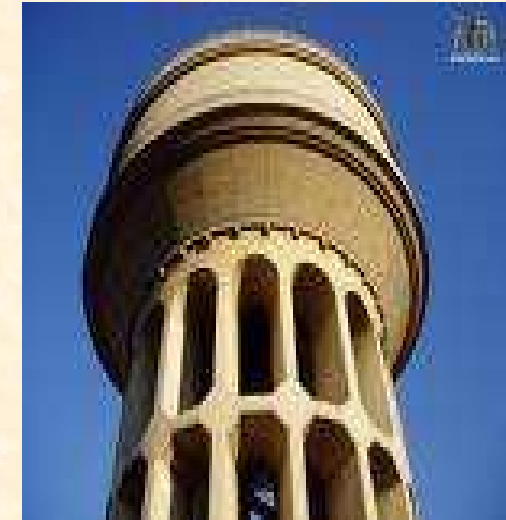


**WATER MILL.** Water mills became obsolete and started to disappear in developed countries because of cheap electrical energy, although some smaller rural mills are still operating. They have no water in abundance. This water mill has been recently repaired



# MAYRIT (WATER)

- In the 7th century the Islamic conquest of the Iberian Peninsula changed the name to "**Mayrit**", from the arabian term "Mayra" (referencing water as a "trees" or "giver of life", "water channel" and the Ibero-Roman suffix "it" that means "place". The modern "Madrid" evolved from the mozarabic "Matrit".
- There is still an arabian bath in Madrid called **Medina Mayrit**. Through its waters, perfumes and decor it pretends to recreate all the magic of Al Andalus Mudejar atmosphere. The Hammam has three water rooms with different temperatures: warm (36°C), heat (40°C) and cold (17°C).
- Water in Madrid is well known by its excellent quality. The history of Madrid is related to the history of its water. It has been hand in hand with a constant search for reserves of drinking water.
- The supply of water was taken as a State affair and they provided water to the city brought from the mountain.
- In 1851, was created the water enterprise "Canal de Isabel II".





# The “Aguador job” (water carrier)

- Due to the increasing of the population, the job of “aguador” was during more than 4 centuries one of the most important in Madrid. They met in the main fountains (Cibeles, Puerta del Sol,...) and they provided water until the arrival of running water to the houses earning the price stipulated.
- The fountains received water collected in the high zone of Madrid, a net of underground galleries that achieved 124 kms.
- These professionals were also an inseparable part of the court life until water from the Channel of Isabel II arrived.



# “The mountain of water”. Madrid

- There are 14 reservoirs in Madrid. Water in Madrid has a very good quality.
- The biggest ones are:
- 1.- The weir of El Atazar 1972. (Lozoya’s river) is the most important and it is the main responsible of the water supply to the region. Its storage capacity is 426hm<sup>3</sup>.
- 2.- Valmayor. 1976. Nowadays, it is the second reservoir as far as capacity of storage.
- 3.- Santillana reservoir. Manzanares el Real.1969

## River      Affluents      Subaffluents

### Tajo

Jarama

Lozoya

Guadalix

Henares

Tajuña

Manzanares

Guadarrama

Aulencia

Alberche

Cofio

Perales





# The Channel of Castilla. (1753-1849)

It was trying to join Segovia with Santander. In 1959, it stopped being used as a way of transport of cereals

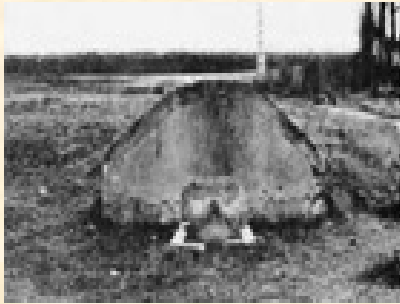


# When water didn't arrive home



- People had to go to public lavatories to wash clothes.
  - Animals drank water in public troughs.
- Citizens had to bring water home from the fountains located near or far from home.

# Water in Fuenlabrada.



- The name of Fuenlabrada, comes from **Fuente labrada** ( a carved fountain), because near the village, there was an old fountain, and it is said that the Moors did it. The first inhabitants went to the Fregacedos fountain to drink water.

The history of Fuenlabrada is closely linked to that of its fountains.

- Other fountains have joined in different moments and enclaves to give reason and signs of cultural identity to the inhabitants.
- The most significant are the following ones:
- **Four Tubes (Cuatro Caños).** Located in the “Four tubes square”, in the old town, is the most ancient and representative of the city. It was built due to problems with the supplying of water, when increasing considerably the population. Until then, the neighbours had to go to Fregacedos or to a well located outside of the village.
- **The Staircases fountain** was built in 1987 and it is composed of three independent elements of different measures with form of staircases.
- **The Solidarity Park Source**, The main Square source,...

