

# FOUNTAINS OF MONTPELLIER, FRANCE. FROM PRIVATE AND UNSAFE TO PUBLIC AND SAFE WATER SUPPLY

Michel Bakalowicz

## FROM RIVERS AND WELLS TO AQUEDUCT

Montpellier in Southern France is presently known as the city of a hundred fountains. However, for a long time there was no fountain within the city walls, only wells; and the population was supplied from small springs by water carriers. The history of Montpellier is an interesting example of the development of water supply networks and municipal sanitary policy.

The city of Montpellier was founded at the end of the 10<sup>th</sup> century, in the area between the antique Via Domitia and the Lez and Mosson Rivers. The Seignior of Montpellier was created in the 11<sup>th</sup> century. The medieval city was surrounded by a defensive wall, whose la Babotte and des Pins towers still remain. At the end of the 13<sup>th</sup> century, Montpellier was a famous

*Fig. 1 The end of the aqueduct "Les Arceaux" at Le Peyrou Park, in Montpellier, France (Photo: Michel Bakalowicz, 2004).*



stopover of the Saint James pilgrimage with charitable societies and hospitals for accommodating and caring for the pilgrims. As a consequence, a school of medicine was founded there in 1220 by the legate of Pope Honorius III, later declared an official university by Pope Nicolas IV in 1289. The population was subsequently decimated by several epidemics during the 14<sup>th</sup> century which killed a third of them.

The two permanent rivers, although their flows are highly variable, as with all Mediterranean rivers, attracted many activities, mills, washerwomen, tanning and leather works, particularly on the banks of the Merdanson Creek, a tributary of the Lez River, presently named "Verdanson". The original name means in the old regional language "open sewer". Consequently, Montpellier was supplied from the beginning with water from public and private shallow wells, not surface water. At that time there was not yet any fountain.

The quality of the water deteriorated causing epidemics. According to Aigrefeuille (1877), the first plan to build an aqueduct from the Saint Clement spring about ten kilometres from Montpellier was presented in 1267. Due to technical and financial difficulties, the consuls, the local government, abandoned the plan. In 1317, the king of France, Philippe V, urged the consuls to plan a water supply system. Land surveys were attempted, and then abandoned. In 1456, King Charles VII authorised the consuls to levy a special tax for ten years for building an aqueduct. The plan was delayed for two centuries during which time the population had to be supplied from two springs connected to fountains: Font Putanelle, built in 1447 by Jacques Coeur, the Superintendent of Finance of King Charles VII, and Font Pila St Gély built in 1465. The population had to buy their drinking water from "possandiers", local water hawkers.

The population grew considerably during the 15<sup>th</sup> and 16<sup>th</sup> centuries, and the few fountains outside the city walls which were not properly maintained could not supply enough water. In 1686, the city council drew up an estimate of the cost of building an aqueduct from the St. Clement spring to town. Dur-

ing the same time King Louis XIV decided to erect an equestrian statue of himself in recognition of the improvements in Montpellier. Because there was no square worthy of the King within the town walls, that presented an opportunity to expand the town. Between 1690 and 1692, a new gate was built on the western side opening onto the new Le Peyrou Royal Square where the statue of Louis XIV was erected, in a style reminiscent of Versailles and Paris, as usual in France. The plan for an aqueduct was once more abandoned, because the city council did not have the money for it.

#### FROM AQUEDUCT TO MODERN FOUNTAINS

In 1712, de Clapiès, an engineer at the Royal Faculty of Sciences of Montpellier, demonstrated that it was possible to build an aqueduct from the St. Clement spring to Montpellier. Despite the high estimated cost of the work, the city council put up the money for the construction (Nougaret, 2005). In 1751, Henri Pitot, seigneur de Launay (1695 – 1771), director of civil engineering in Languedoc since 1740, was officially put in charge of devising a plan for leading water from the St. Clement spring to Montpellier City in order to supply several public fountains that the population depended on heavily.

Pitot, who was primarily a mathematician, specialised in hydraulics, invented the well known Pitot tube, an airspeed indicator. He was considered an engineer and scientist of genius of the Age of Enlightenment. He modified and complemented de Clapiès' plan and submitted it in 1752 to the city council which accepted it (Archives Municipales, 1985). The aqueduct was opened in 1765. The structure was completed by the architect Jean-Antoine Giral in 1772 after Pitot's death. The aqueduct was connected to the water storage structure built underneath the Peyrou public park subsequently. The aqueduct raised on arches terminates at the Peyrou park and is considered one of the most beautiful constructions in France (Montens, 2001) being now a listed building (Fig. 1).



Fig. 2 (left) The fountain with the unicorns, La Canourgue Square in Montpellier, France (Photo: Michel Bakalowicz, 2008).

Fig. 3 (right) The three Graces Fountain, La Comédie Square in Montpellier, France (Photo: Michel Bakalowicz, 2008).



The total length of the aqueduct is 13,904 metres. It has a covered feeder canal and ends in an arched aqueduct, 880 metres long and up to 28 metres high. Before building the aqueduct, between 1743 and 1747, Pitot was the engineer in charge of reinforcing the base of the famous "Pont du Gard", the Roman aqueduct which originally supplied the Roman city of Nîmes from the Fontaine d'Eure karst spring at Uzès. The main goal was not to preserve the antique aqueduct, but to build a bridge on the Gard River, next to the aqueduct, for the royal road from Paris and Lyon to Montpellier. Pitot's design for the framework of the final part of the aqueduct, with large arches supporting small arches, was inspired by the Roman aqueduct; it was designed as stable as possible to ensure its watertightness. These arches, the so-called "Les Arceaux", gave their name to this neighbourhood of Montpellier.

Three monumental fountains were then commissioned in 1770 to complement the water facilities. The works were sped up after a major fire in 1770. One fountain was built against a wall. Two others were intended to be erected in the centre of the town hall square and La Canourgue Square. The fountain with two unicorns (Fig. 2) was put up in 1777 in town hall square, and moved in 1865 to the La Canourgue Square. The second fountain is topped by the three Graces: Aglaea, Euphrosyne and Thalia, associated with the cult of Demeter and Persephone. It took 18 years before it was erected in 1794 in La Canourgue Square, from which it was finally moved to the Comédie (the opera house) square in 1865 being presently the most popular meeting point in Montpellier (Fig. 3). The original carving in Carrara marble is now at Fabre's museum; it was replaced by a copy in 1989. The third fountain, initially named "Intendance Fountain", has stood on Chabaneau Square since 1776 (Fig. 4).

The aqueduct ends in the temple of waters (Fig. 5), lined up with the equestrian statue and the royal gate. It towers above the arches linked with the reservoirs. The creation of public water supply, instead of water supply organised on individual, private initiative gave a new and important role to the City Council

and public services in general: it was the beginning of public utilities. Public water was then regarded as sacred, as illustrated by the “temple of waters”, at the end of the arches. The fountains supplied water for consumption, but not for fun in the form of water jets as in Versailles and other towns.

The St. Clement spring’s supply capacity soon ran out due to the increasing population (about 20,000 in early 18<sup>th</sup> century, 37,000 in 1837, 46,000 in 1851, 56,000 in 1882). In 1851, there were plans to extend the aqueduct to the Lez spring, near Prades-le-Lez, the main regional karst spring, the source of the Lez River. The river was used by millers who tried to prevent the withdrawal of its water, convinced that their livelihood would be jeopardised. The extension was completed in 1859. The entire history of water management in Montpellier and the surrounding region has been characterised by pressures put on the authorities to protect certain water uses. The total flow rate of the aqueduct was first doubled to 50 L/s, then increased to 125 L/s in 1882, and to 250 L/s in 1899, despite the protest of the millers. The last figure was ten times the initial flow rate calculated by Pitot.

Sanitary concerns also emerged due to the absence of a sewage network and the first bacterial analyses 1899 found that the water from the Lez spring was contaminated by a faecal matter, which is now a well-known feature concerning most karst springs. The supply network expanded rapidly with several terminals built in each district. Now that water is supplied to all settlements, the fountains are the symbol of life in a modern city. Besides ancient monumental fountains, modern, sometimes computerised ones now adorn Montpellier, the “city of a hundred fountains” (Fig. 6).

#### CURRENT AND FUTURE WATER SUPPLY

Domestic water consumption increased drastically during the 60s with the repatriation of a large number of people from Algeria. During the 70s stakeholders and decision makers debated with water scientists, often in the regional media, about the water supply

of Montpellier and its suburbs. While hydraulic engineers suggested the use of surface water from the Rhone River through a regional canal built for irrigating the Languedoc area, the so-called Bas-Rhône–Languedoc canal, Jacques Avias, a famous French hydrogeologist, professor at the university of Montpellier, recommended drawing water from the Lez spring because of the high storage capacity of the aquifer and its sufficiency as a resource. The total need was estimated to be around 1.3 m<sup>3</sup>/s while the mean annual discharge is 2 m<sup>3</sup>/s, with a storage capacity of several tens of millions of cubic metres.

Avias (1995) considered that groundwater should be preferred to surface water for supplying domestic needs; he suggested pumping more than the natural discharge into the natural karst conduit upstream from the spring during the low summer flow. He thought that possible, because the storage capacity was large enough and would be restored by the recharge during the rainy season in autumn. The project was accepted by the city council, and the new



Fig. 4 The Chabaneau Fountain, Chabaneau Square, in Montpellier, France. It represents the City giving drinking water to its children (Photo: Michel Bakalowicz, 2008).

Fig. 5. (right) The temple of waters at the end of the aqueduct, above the reservoirs, Le Peyrou square, in Montpellier, France (Photo: Michel Bakalowicz, 2008).



water works went into operation in 1980, pumping around 1.5 m<sup>3</sup>/s, of which 160 L/s was discharged into the Lez River in order to maintain its biodiversity in the river when the spring tends to dry up because of the pumping. Pitot's aqueduct was abandoned in 1983 for a new buried water pipe.

After 28 years it is obvious that the exploitation of the Lez spring aquifer is sustainable in quantity and quality thanks to the good understanding of its characteristics and functioning. It is now considered the standard of reference for active sustainable exploitation of karst aquifers (Bakalowicz, 2005). However, the debate about the water resource has continued in the two last years after the local authorities launched a regional plan for supplying the extra demand for water. Some scientists and engineers are not yet convinced that karst aquifers can supply the entire domestic water demand.

The water history of Montpellier is an interesting example which shows the slow advance of ideas concerning the development and management of water supply in a Mediterranean city, from private wells and rivers to a public water utility. Montpellier is now a world reference for the sustainable exploitation of its karst groundwater resource, protected from over-exploitation and pollution by strict regulations and controls.

## ACKNOWLEDGEMENTS

I am particularly indebted to Professor Michel Desbordes who introduced me to the regional archives.

Fig. 6. The Nombre d'Or Fountain, a modern, computerised fountain, in Montpellier, France (Photo: Michel Bakalowicz, 2005).



## SOURCES

Aigrefeuille C. 1877. Histoire de la ville de Montpellier depuis son origine jusqu'à notre temps. C. Coulet, Montpellier. Archives Municipales. 1985. Montpellier et ses fontaines (XVIII-XIX<sup>èmes</sup> siècles). Ville de Montpellier. Booklet of the exhibition « Montpellier and its fountains ».

Avias J.V. 1995. Gestion active de l'exurgence karstique de la source du Lez (Hérault, France) 1957-1994. Hydrogéologie. No 1, pp. 113-127.

Bakalowicz M. 2005. Karst groundwater: a challenge for new resources. Hydrogeology Journal. Vol. 13, no 1, pp.148-160.

Montens S. 2001. Les plus beaux ponts de France. Bonneton, Paris.

Nougaret J. 2005. Montpellier monumental. Tome I. MONUM-Editions du Patrimoine, Paris.

A close-up, low-angle shot of water being poured from a glass, creating a dynamic splash against a bright, cloudy sky at sunset or sunrise. The water is in sharp focus, showing individual droplets and the texture of the liquid. The sky transitions from a pale yellow near the horizon to a deep blue at the top.

# WATER FOUNTAINS IN THE WORLDSCAPE

ARI J. HYNYNEN • PETRI S. JUUTI • TAPIO S. KATKO (EDS.)

INTERNATIONAL WATER  
HISTORY ASSOCIATION

