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The Secret Life of

Eleanor Clark, in *Rome and a Villa*, has rightly observed that the fountains of Rome have a visceral pull on our attention and emotions, equaled only by that of dreams and sex. She understood that fountains too, can be flamboyant, invigorating and life affirming; that they are immediate and physical; that they make us glad to be alive.

Roman

Fountains



Left: The low-pressure Piazza Colonna fountain, a member of the Vergine family.

Below: The restrained and polite Aracoeli fountain, located at the foot of the Capitoline Hill.



There is something deeply primordial about them. More than isolated monuments, they are integral elements of Roman identity, linked together by hidden, subterranean conduits of metal, stone and terra-cotta. Each fountain is part of a hydrological system that includes the Tiber River, springs, streams, swamps, sewers, aqueducts, wells, conduits, cisterns, floods and rainwater, all linked through topography. Together these elements weave physical and spiritual threads through spatial, social and historical spheres of the city and transform water infrastructure into art. They reveal the memory of the entire hydrological system and translate it through imagination, time, circumstance and gravity into the specifics of place.

Three aqueducts

Roman fountains, at least until the twentieth century, were fed by a vast, yet simple, aqueduct system that exploited the natural law of gravity to distribute water. Water flowed freely within the aqueduct channel, but once it reached the city, it was constricted in underground pipes that created the necessary pressure for distribution. Unlike mechanical systems that force water into unnatural contortions, a gravity system nurtures, exploits and enhances water's natural abilities as it flows through its watershed. Allowing for seasonal variation in water volume, each fountain was designed around the distinct, inherent possibilities of the water at a specific location. Whether it shot in a lofty jet, fell in a rushing cascade, bubbled from a low nozzle or slipped slowly over a stone lip, it did so because the symbiosis between gravity and topography had been exploited by the design.

Three pre-industrial, gravity-driven aqueducts still operate: Aqueduct Vergine, Acqua Felice and Acqua Paola. The Vergine, based on the antique Aqua Virgo, was restored several times during medieval and renaissance times. By 1570 one branch arrived near the Piazza di Spagna, at 20.5 meters above sea level (masl). It served the low-lying, densely populated Campus Martius area. This supplemented an earlier branch that arrived at the site of the Trevi Fountain at 20 masl, and added a crucial half-meter of head to the water.



Left: The small Campitelli Fountain (only three meters high) is one of the last “children” of the Acqua Felice.

Right: The Acqua Paolo has been tamed by the time it reaches this Piazza Farnese Fountain.

With only a seven-meter fall over the Vergine’s entire distribution system, there was little pressure available, and every fountain endeavored to carry water as high as possible for the most impressive display. Sites were often regraded, or fountains partially submerged below street level, to create enough room to manipulate the water. This meant that once released, Vergine water did not rise in jets and sprays but typically fell in veils and cascades, most dramatically at the Trevi fountain. When there was a jet it was typically a short, fat tube of water, as at the Barcaccia and Piazza Colonna fountains.

The Felice, which exploited the antique Aqua Alessandrina was completed in 1587 and arrived at the Moses Fountain on the Quirinal Hill at 59 masl. It provided water to a variety of locations, including the Esquiline and Pincian hills, political and ceremonial centers such as the Capitoline hill and the Roman Forum, as well as the low-lying Velabrum.

With over 40 meters of elevation difference in this system, the water shot or fell depending upon the fountain location and purpose. On hilltops the water customarily fell, as at the Moses, Quattro Fontane and Campidoglio fountains. In the valleys, water shot in jets and sprays as needed in a particular setting — a five-meter high celebratory plume of water for the Barberini Triton fountain; a chaste spray for the Madonna dei Monti, Giudea and Aracoeli fountains.

The lofty and serviceable Acqua Paola, based on the antique Aqua Traiana, arrived in 1612 at the Fontanone, or “big fountain,” on the Janiculum Hill at 72 masl. Unsuitable for drinking, it delivered water for industrial, irrigation and display purposes throughout Trastevere, the Borgo, the Vatican, Monte Testaccio and the Caelian, Esquiline and Aventine hills. With more than 50 meters of fall there was tremendous pressure in this system. The fountains in front of St. Peter’s for example, were designed to shoot jets 6.3 meters into the air — high enough to appear to spray the feet of the felicitous saints stationed on the colonnades!



Above: The fountains of St. Peter's are fed by the high-pressure Acqua Paola system. *Photo: Giulio Magni, Il barocco a Roma nell' architettura e nella scultura decorativa, 3 (Turin: Crudo, 1913)*

Right: The Baraccia is another member of the low-pressure Vergine family.



Families of fountains

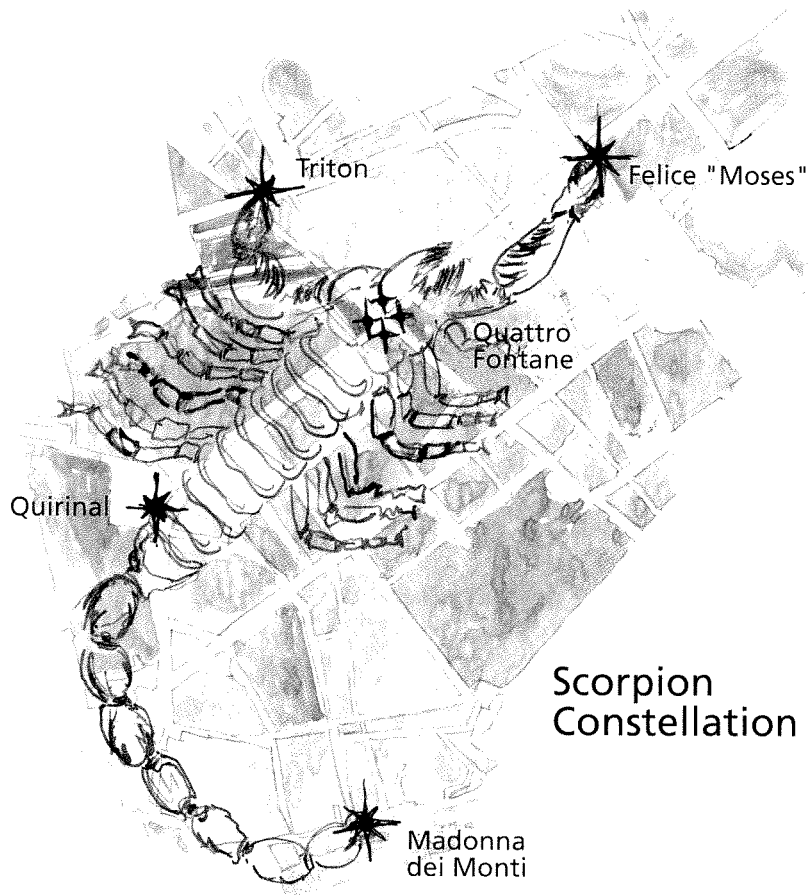
Each aqueduct generated a family of fountains, rather like far-flung siblings and cousins. The fountains in each family, while more or less distinctive in appearance due to functional necessity and propaganda considerations, shared behavioral characteristics that reflected the specific location of the fountain, both within the city and the individual aqueduct system.

Water spoke first in a roar, then a babble and, finally, a whisper as it moved through the city. Exuberant and flamboyant when released in ceremonial fountains, such as the Trevi, the Moses and the Fontanone, water typically became more reticent and polite as it moved through the city to smaller neighborhood fountains, which had less water and lower pressure. Hence each fountain told a topographic story that linked it simultaneously back to its aqueduct, back to preceding fountains and forward to subsequent fountains in its system.

The Baraccia Fountain, designed by Bernini and located at the foot of the Spanish Steps, is fed by the Vergine system. Its design — a sinking boat less than two meters high, including the central water jet — is a clear response to the limitations of its site. Yet the fountain has an almost monumental presence in the piazza. Because the available pressure was very low (less than a one-meter drop in elevation from the source) it was necessary to excavate the site, even to attain this modest display.

The entire Vergine system, not just the Barcaccia, is under low pressure. This, more than any other condition, determines that Vergine fountains, such as the Trevi, Pantheon, Piazza del Popolo, Piazza Navona (including the Quattro Fontane of Bernini) and Barcaccia, all exploit and celebrate falling water.

In spite of each fountain's topographic specificity, several have been peripatetic, having been relocated to other parts of the city due to urban renewal projects and street widening. A striking example is the Terrine Fountain, now in front of the Chiesa Nuova but formerly in the Campo dei Fiori. Like the Barcaccia, this member of the Vergine family was placed partially below ground level because of the low pressure available in the *campo*, where it serviced the public market. Since the new site, also within the Vergine watershed, is at approximately the same elevation (16.5 masl), the fountain displays approximately the same quantity of water as before and the intentions of the original water display, as part of the overall fountain design, has not been compromised.



Scorpion Constellation

instances the waters from several aqueducts are mixed together and even sent outside their original watershed areas. Consequently we have to work harder to understand the original gravity-based design intentions. However, with a renewed awareness of topography and the principles of gravity and pressure, the fountains can reveal hidden dimensions of the city, and it is possible to locate them, and oneself, within the larger water landscape of the city.

left: The Terrine fountain in its new setting in front of the Chiesa Nuova.

above: A "constellation" of Acqua Felice fountains, connected by underground conduits.

As such, the fountains provide landmarks for anchoring urban experience to the continuum of history and memory through topography. As we mentally connect the fountains by their underground conduits, we construct a diagram of the city made up of constellations of fountains. Like those in the night sky that they mimic, they help to construct order out of chaos and to orient us in the physical world, facilitating and enriching urban navigation.

Note

1. Today the water in all three systems is carefully controlled for water conservation. The fountains of St. Peter's, for example, now shoot about a one and one half meter jet of water. Bernini's Triton shoots only a one-meter jet, rather than the original five meters. Other fountains, such as the Trevi and the Fontanone, now use a pumping system to recirculate water.



Fountains move about town at their own risk, however, and others have not been so fortunate. Consider the original Piazza del Popolo (15 masl) fountain designed by Giacomo della Porta in 1572. It is about four meters tall, including its base, and originally displayed a jet of water about one-meter high. The entire composition rose to approximately 20 masl, or only one-half meter lower than the maximum elevation of the water near the Piazza di Spagna.

The new site is also within the Vergine watershed, but at 17 masl it is a full two meters higher than the Piazza del Popolo. Because della Porta had already stretched the limits at the earlier, lower site, it is simply impossible to display Vergine water at the new location. Today it is fed by the 1870 Acqua Marcia, a system that mechanically pumps water throughout the city.

Today the Roman water system includes both pressure-pumped and mechanically pumped systems. In some