FUCINO: FROM WATER TO LAND

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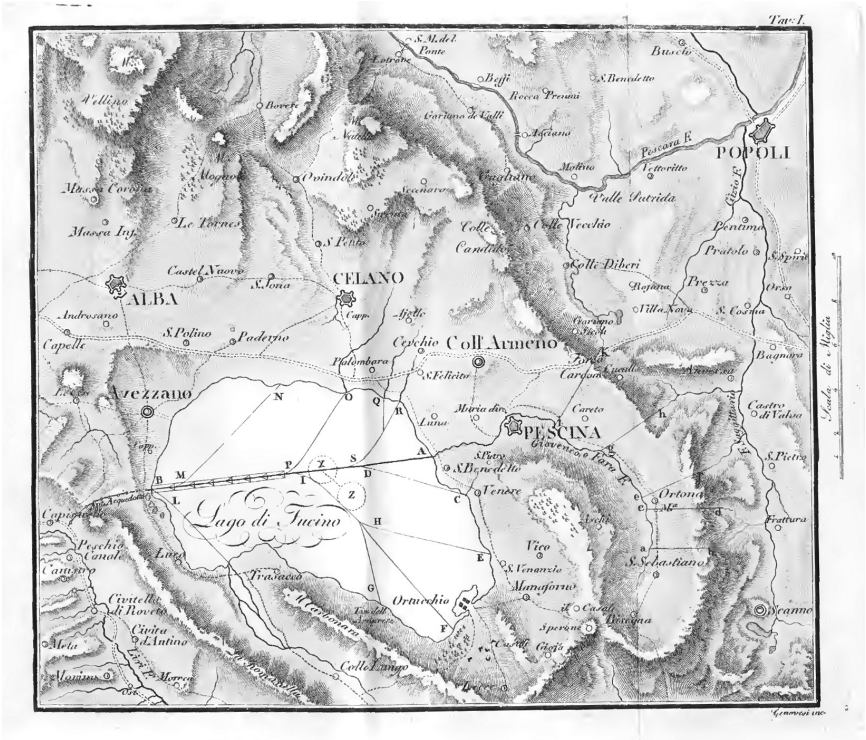
In 1829, gardener N.B.Ward invented the first terrarium accidentally noticing a small fern growing in a bottle (Keogh 2017). In the 1870s, Charles Darwin cramped his living room with terrariums to understand worms' ability to transform soil (Montgomery 2012, p. 11). In those decades, terrariums came to embody the tendency to enclose, discern, and abstract the "natural laws" that were being instrumentalised in enormous territorial infrastructural projects. One such project was the draining and reclamation of Fucino Lake, the third Italian lake. (Fig 01) A project that, as its promoter noted "in the century of discoveries and grand enterprises … cannot fail" (Afan De Rivera 1845, p. 620). The word *terrarium* derives its etymology from the *Terra*, the Latin personification of Mother Earth, embracing the dynamic and relational complexity of multispecies coexistence within an ecosystem. Yet, its suffix describes a confined and abstracted version of the earth in which natural life can be controlled and its rules selectively comprehended.

How was a lake transformed into a 150-hectare terrarium for agricultural crops? Today, the Fucino basin is a 650 metres elevated plateau of fertile farmland (In the province of L'Aquila, in Abruzzo). The prevailing narrative uniquely celebrates the banker and entrepreneur Alessandro Torlonia for his pivotal role in the enterprise. In 1875, he earned the title of "*the Prince of Fucino*" for "extending the territory of the new born Italian state"[1] (De Filippis 1893, p. 57). While the efforts to regiment the unstable waters date back to the first century AD with a Roman infrastructure, the idea of total draining implies a fundamentally different idea of land, and desire for land. The Fucino project stands as a paradigm of a territory's ecological and social upheaval by design; its motivations and tools are to be found in the reconceptualization and abstraction of two components: land and water.

The reclamation of agricultural land exemplifies 19th century domestic colonisation: the European ethos of the time saw the private property and agricultural development as synonymous of civilisation (Mitchell 2002, p. 55). Borrowing Timothy Morton's vocabulary, the Fucino reclamation was yet another product of the *agrilogistic* society's struggle to reduce existence to sheer quantity (2016, p. 43). Such projects are contextualised by the emergence of modern nation-states' confidence in technological progress, which strived to control the outcomes of society, using quantification, legibility, and simplification (Scott 1998, pp. 11-15). For Fucino's water to be turned into farmland water, it needed to change in the realm of ideas first, using the abstract utilitarian logic of quantification.

Fig 01 Plan of the Lake
Published in Rivera, C. A. de, *Considerazioni Sul Progetto Di Prosciugare Il Lago Fucino e Di Congiugnere Il Mar Tirreno All'Adriatico per Mezzo Di Un Canale Di Navigazione*. Del Maggiore Cav. Carlo Afan de Rivera, Reale Tipografia della Guerra, 1823.



To imagine the annihilation of such a vast lake presupposes an existential question: how much water makes a lake? Who has the right to appropriate what's under it?

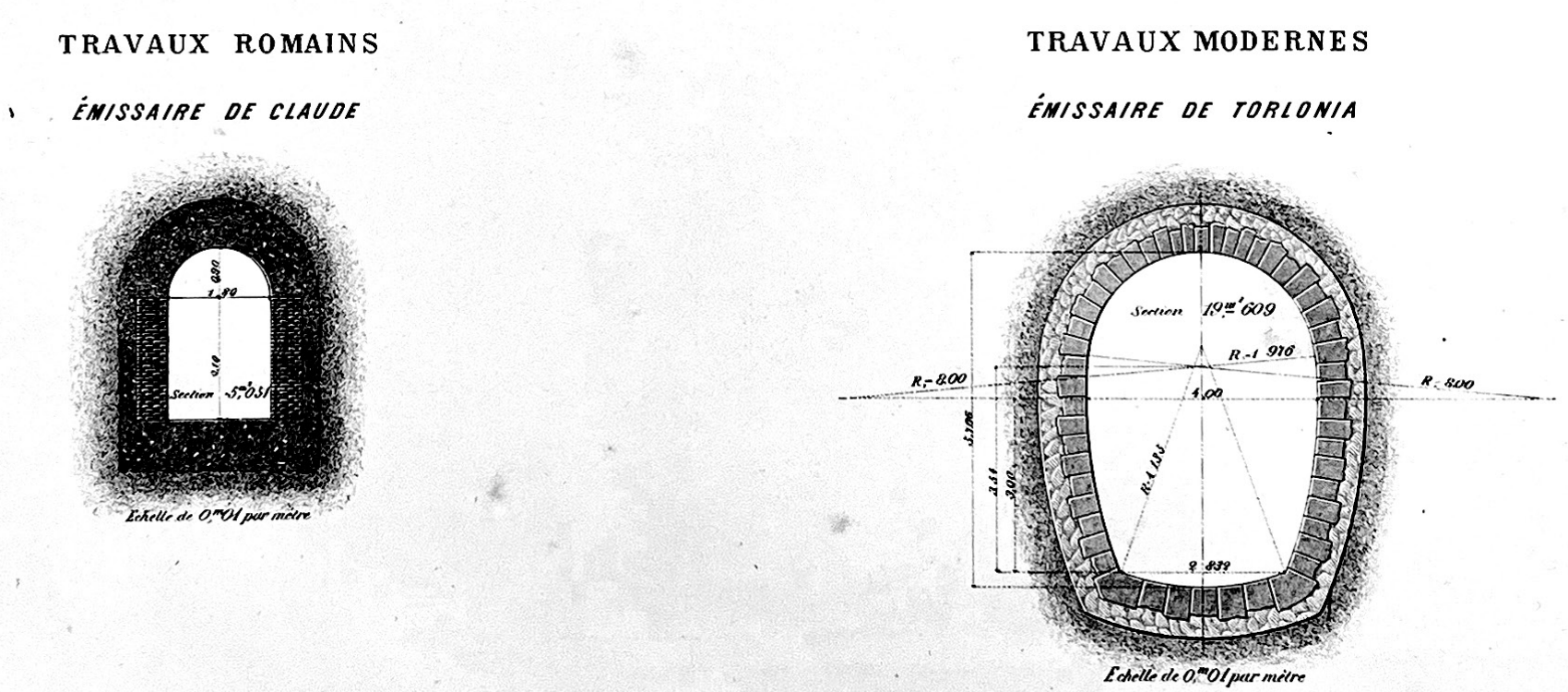
The emissary's infrastructure was the product of hydraulic innovation and a re-conceptualisation of water. The artificial outlet comprised a 6301,48-metre-long underground tunnel under a mountain (Parisi, Pica 1996, p. 122). The implementation was as challenging as it was conceptually simple. Montricher's project, Torlonia's engineer, was straightforward: the emissary would follow the path of ancient infrastructure, built by the Roman emperor Claudius. By the time of his intervention, the ancient tunnels had already been cleared and secured, and general calculations were approved (Parisi, Pica 1996, p. 109). Montricher's most significant design contribution was in the section of the tunnels (Fig 02). The ancient tunnels had a rectangular section surmounted by a semicircular arch. This shape, well-known by the ancient builders, adapted its height, width and materials to the different ground conditions (De Rivera 1836). In contrast, the modern infrastructure quadrupled the section to 20 square meters, to avoid "future flooding" by calculations. The piers and base of the new section are arched respectively 8,00 and 4,135 metres to resist the rock pressure better and facilitate water flow (Parisi, Pica 1996, p. 112). The new rectified tunnel, constant in section and materials, was a monument to the supremacy of objective science and its ability to harness water's properties. Only one hundred years before the effectiveness of the ancient emissary was questioned ♌; by the mid-19th century, it was deemed inevitable. Since then, the water became H_2O ⇊, turning into an abstract, non-social, and non-local scientific concept. Jamie Linton calls it the invention of *modern water* (2010, pp. 14-92). This ontological shift was entangled with the development of hydraulic sciences. From the perspective of a 19th century scientist, relying on machines was a way to see while blinding their inner eyes; a search for objectivity (Daston and Galison 2010, p. 140). Like in a terrarium, objects were deemed efficient in isolating and revealing the "rules of nature," collapsing reality with its measurements: The lake was merely an object to be dried. Torlonia claimed to have succeeded where emperors failed, ⋀ willingly confusing the aim of the ancient project.

The ancient Roman endeavours ⅃ reduced the lake's surface to a third. For Pliny the Elder (AD 23-79), water was the lord of all elements and entailed all beings (Linton 2010, p. 76).

Arguably, in classical times, the dismissal of an entire lake was unthinkable or, at the very least, undesirable.

After 7 years of water pouring out, the reclamation could

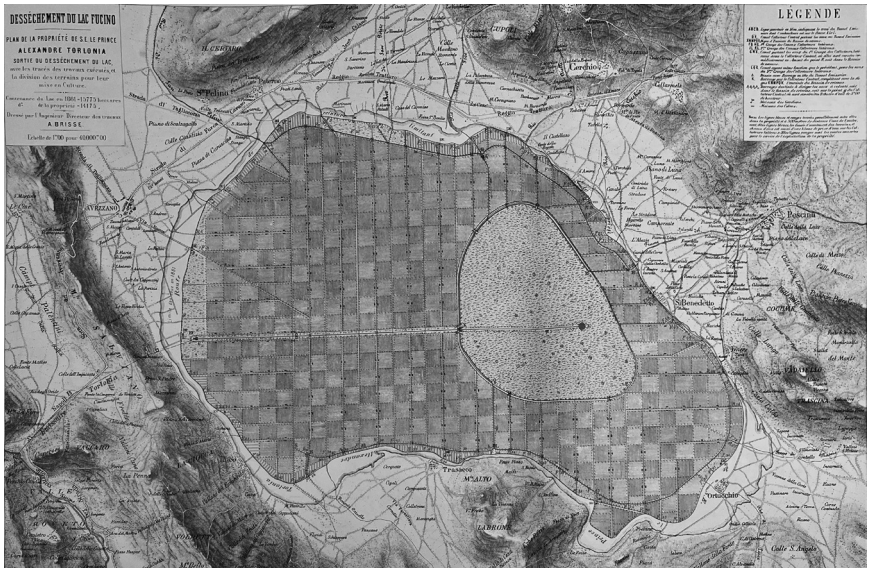
Fig 02 *Comparison between the ancient and modern section of the tunne*l. Published in Brisse, A., The Draining of Lake Fucino: Accomplished by His Excellency Prince Alexander Torlonia, Propaganda Press, Rome 1876.



begin. It took 16 years. The new form of the Fucino Estate was drawn by Alexandre Brisse's for Torlonia (Brisse 1876) (Fig 03). An ordered grid of channels, roads, and bridges shaped it. The grid's span created 25 hectares plots, a size that Tolonia's administration was already very accustomed to (Felisini 2022). This final design embodies the managerial and technical ethos of the time. The scheme refused any display of landscape sensibility and hydraulic knowledge, favouring the scientific certainty of future water management (and productivity). Critics at the time realised how the infrastructure coincided with a predictable future of centralised water (and land) control (Morachiello 1976, p. 159). A new perimetral road defined the estate and connected the shores towns. The colossal enclosure resulted from a contract that disproportionately favoured Torlonia over the local population. The Neapolitan state agreed to transfer "all the dried land" to the banker's company. After the Unification of Italy, the original contract was re-negotiated with the newly established Kingdom. The property's boundaries were established on the historically high-water levels in 1962, and the onus of proof of any challenges to the new ownership was left to local landlords and municipalities (Colapietra 1978). The contracts that concretised the transformation of water in land were rooted in the re-conceptualization of land as a quantifiable abstract commodity. Following the 1806 laws that abolished feudalism in the Italian South, all land became privately owned, while state ownership of lakes remained unclear, in contrast to rivers (Rinaldi 1893, p. 112). The use value of land had given way to land as a speculative commodity. The intention to wipe out the lake became clear in 1838 (De Rivera 1845, p. 615). The ambitious reclamation projects of the Neapolitan Kingdom were driven by a bureaucratic and technical apparatus that prioritised infrastructural costs, land market value, and taxation. The promise of productivity guaranteed by understanding land as a legible and quantifiable commodity allowed the state to offset risks to a private company.

Torlonia completed the social and ecological transformation of the basin, successfully creating a gigantic terrarium: the estate was treated like a close object with inputs and outputs that could be manipulated. Written contracts appeared in the area for the first time, attracting many new settlers (Colapietra 1978, p. 14). The estate size allowed experiments with different forms of agriculture and land management that incited demographic growth and new forms of speculation (Felice 2023).

Fig 03 *Plan of the Estate*
Published in Brisse, A., The Draining of Lake Fucino: Accomplished by His Excellency Prince Alexander Torlonia, Propaganda Press, Rome 1876.



While grains, potatoes, and beetroots were successful, cultures like olives and almonds disappeared together with the fish due to local climate change.

Infrastructures and property contracts transformed Fucino into a terrarium thanks to the control and quantification of its elements: water was reduced to H_2O, and land was described as a contract. The Fucino Lake had to change in the mind of its executioners before disappearing. Regardless of scale, no terrarium truly exists in isolation; the self-contained nature of the system can be questioned with a shift in perspective. Fucino's hydrology still exists uninterrupted: Every year snow melts, rain drops, and local springs and rivers pour water into the basin. To these days, locks and canals, like one massive machine, prevent the lake from re-emerging. In some winter mornings the lake manifests as a ghost hovering over the grid of streets and channels in the form of a dense low haze. Cycles of flooding and droughts are a reminder of the lake's past. The accidental invention of the first terrarium relied on careful observation.

The same sensible scrutiny can challenge its boundaries, offering a broader ecological perspective.

The medal received mentioned "ITALIAE AGRUM AUXERIT".

In 1787 Engineer Nicola Carletti, surveying the infrastructures had clear opinions about its uselessness.

Louis Jacques Thénard rendered the now familiar H2O in 1836 for the first time in his Traite de Chime.

This narrative, still alive, has been put forward mostly by authors flattering Torlonia. First and forest his agent De Rotrou and his engineers.

There are mentions of Claudius (52AD), Tiberius (98-117AD) and Augustus (117-138) controlling the lake's waters.

The "Leggi eversive della feudalità" were issued in Naples during the Napoleonic government.