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The case of a late-eighteenth-century Anglo-Chinese park: How archaeology has revealed the technical genius of eighteenth-century designers

The late-eighteenth-century park at Méréville in France is a rare example of a European garden in the Anglo-Chinese style, incorporating picturesque scenes with various structures and grottoes. Water was an important element of its design. The course of the River Juine was altered to form meandering streams crossed by bridges, and two lakes were created. Archaeological investigations conducted as part of current restoration works have shown how the landscape was changed. The results contribute to a better understanding of the historical hydrology and provide technical details concerning drainage and river bank construction.

THE VILLAGE OF MÉRÉVILLE is located seventy kilometers south of Paris (fig. 1), in the upper Juine Valley that cuts across a sixty-meter-high agricultural plateau of Beauce, forming a steep, wooded and humid area.

Méréville is known for its Anglo-Chinese park built in the late eighteenth century in a style that has few remaining examples in Europe, and for its nineteenth-century watercress beds. Local people have demonstrated that they can make

the most of Juine and its marshy grounds, in terms of both usefulness (watercress) and pleasurable (leisure park).

Méréville Park is a picturesque park (also known as an “Anglo-Chinese park”) designed and built between 1784 and 1794 by the architect François-Joseph Bélanger (1744-1818), with the contribution of the landscape and ruin painter Hubert Robert (1733-1808), for Jean-Joseph de Laborde (1724-1794), a wealthy sponsor and great lover of gardens.

The park's composition is a tribute to idealized and sublimated nature. It features artificial rock fills, waterfalls, and river bends. Further, it contains garden *fabriques* that thematically reference ruins and antiquity: the (mock) broken wooden bridge and the Ancient Temple. Finally, there are artificial caves that testify to the fascination with the underground world of origins, while the western hillside boasts artificial riprap and a covered gallery.

The park is decorated with water in all its forms – dormant, flowing, and gushing – which serves as a common thread and punctuates walks with artificial rivers and waterbodies as well as waterfalls (fig. 2).

The Essonne Département, which bought the area for the symbolic price of one euro in December 2000, wanted to make Méréville a heritage showcase of eighteenth-century picturesque gardens and a nature conservation site. As Méréville Park is a listed historical monument located in the Area of Natural Ecological, Floral and Faunal Interest (ZNIEFF), the Département faced the difficult task of restoring historical scenes related to water by integrating issues of preservation, diversification and enhancement of the natural environment.

Before restoration, it was necessary to:

- locate the remains of eighteenth-century hydraulic structures and study their technical characteristics;
- understand how they were integrated with the hydrogeological environment;
- compare field data with archival data (critical analysis of sources).

These tasks fall into the field of garden archaeology. A garden is a human construction. The technical interventions

related to its creation and maintenance (earthwork, planting, masonry, etc.) leave traces in the ground. Archaeology allows us to:

- access these traces to understand the technical and aesthetic character of garden structures from a given period;
- bring tangible elements into the restoration project.

In Méréville, available iconography reflects a radical transformation of the landscape, including its topography and hydrology, in the years 1781-1785/86 (fig. 3). Before Laborde and Bélanger designed the park, there was a regular garden there, with architectural terraces, regular water features, a naturally straight river and wet meadows (cf. map of 1781). It was then turned into an irregular park with serpentine rivers, lakes, waterfalls, recreational lawns and tens of thousands of trees from around the world planted in clumps (plan assigned to Bélanger, 1785-86).

The Napoleonic cadastral plan (1831) is an essential document that describes the original state of the remodeled park and its landscaped components (bridges, paths, *fabriques*, caves, rivers, lakes, waterfalls, islands, mill, vegetable garden, tree clumps, etc.).

We carried out two archaeological campaigns in 2014 and 2015 and made twenty-four trenches in search of the original riverbank and lakeside arrangements as well as missing bridges and paths (fig. 4). The aim was to characterize the eighteenth-century structures and to better understand the hydrological network established at that time, thereby providing tangible and operational data for the purposes of the restoration project.

The trenches across the north and south shores of the Grand Lac (fig. 5) were found to contain:

- a dry, stone bank wall with an inclined top, lined with a watertight clay core;
- a drainage fill of crushed limestone;
- original peat excavated on the left to form the basin of the lake, and on the right to spread the drainage fill.

All of these observations indicate that extensive earthmoving was carried out before planting. We assume that water could flow freely between the lake and the crushed limestone, and that both contributed to the internal drainage and hydraulic balance of the park.

In trenches across the south shore of the Petit Lac we found:

- a dry, stone bank wall with an inclined top, similar to the one in the Grand Lac, but without a clay core;
- original peat excavated on both sides: on the left to form the lake and on the right to enrich the soil.

Our interpretation is that this differential technical treatment reflects a reasoned and sustainable management of natural water flows (fig. 6). At the foot of the eastern and western hillslopes there are permeable walls that allow the gravity flow to enter both lakes. In the meadow, waterproof walls conserve levels in the water bodies and protect the soil (as well as root growth) from wetness.

The bank walls of the Juine river were built using the same principle. We discovered a wall without a clay core, meant to retain soil while allowing drainage. Its inclined top created the illusion of a natural riverbank. On the right river bank (towards the Great Meadow), a dry stone

wall without a clay core was found, whereas on the left bank (towards the Grand Lac) – a dry stone wall with a watertight clay core.

Taking the above into account, we have formulated the following two hypotheses:

- upstream of the Grand Lac, the designers provided watertight walls, lined with a clay core, to prevent lateral water loss, both upstream and beside the Grand Lac;
- downstream of the Grand Lac, they provided permeable masonry to allow underground flows through the drainage fill on the surface of stripped peat.

Beside the bridge known as the Grey Bridge, an eighteenth-century bank wall was found 1.5 metres off the current bank (fig. 7). We know that in the nineteenth century the mill became a sawmill. The original bridge was transformed into a dyke-bridge with a movable valve to increase the amount of water going into the mill diversion channel. Our interpretation is that, due to lack of maintenance, this new device has gradually led to silting and then to the shrinkage of the upper river bed, ultimately causing the historical banks to disappear. They were found later, during the excavations. As a result of these interventions, the hydraulic balance created in the eighteenth century was disrupted.

The ground also contains many aqueducts designed to direct water from one place to another. One underground aqueduct was discovered to connect the mill-house waters with the Grand Lac (fig. 8). It is a perfectly watertight masonry pipe with an internal duct coated with hydraulic mortar made using lime and crushed terracotta. This kind of mortar, which is specific to hydraulic structures, has been

known since antiquity and was used until the nineteenth century.

We also found masonry drains, known as *pierrées*, which captured groundwater from the eastern hillside and directed it to the Grand Lac.

Drawing on the above results, we have finally developed an idea of the work that was done prior to the plantations in the eighteenth century in order to ensure the sustainability of the Méréville Park. These interventions include:

- extensive stripping of the peat surface layer at the bottom of the valley (cited in archival documents and observed during investigation);
- application of crushed limestone fill as a draining underlayer, where water could circulate deeper without interfering with plantations (also cited in archival documents and observed in stratigraphy);
- artificial rivers and lakes dug into the peat (once soaked in water, the peat acts as a watertight base, without the need for an artificial bottom);
- construction of dry stone bank walls, with or without a clay core, built with an inclined top to create the illusion of natural banks;
- placing masonry drains to direct groundwater from the surrounding hillsides into the artificial waterbodies and rivers.

Aside from the quality of its aesthetic components, the success of the Méréville Park results from:

- empirical knowledge of local hydrogeological conditions;
- overall consideration of land use and potential;
- considerable but well-optimized financial resources.

Eighteenth-century designers never sought to dam the water, which was naturally present and abundant at the site. On the contrary, thanks to their intuition and empirical knowledge of hydrogeological processes, they were able to develop elaborate and ingenious technical solutions without cement or the help of any consulting office. This made it possible for the large, irregular park to exist and be admired by visitors for a hundred years.

The water balance was only broken in the twentieth century as a result of unfortunate and thoughtless actions – dismantling the park, planting and then removing a poplar grove – which were often motivated by profit and conducted in total ignorance of the invisible balance that had been created in the eighteenth century. It is the imperceptible equilibrium that archaeology is trying to highlight today. However, there are still many questions about how it worked.

This archaeological survey demonstrates that a garden is a technical structure, made of soil, water and plants, developed in a specific hydrogeological context. Thus, to be complete, its archaeological study requires a thorough, geoarchaeological approach adopted since the 1990s by French garden archaeologists.

The specificity of French garden archaeology consists in the adoption of methods developed in landscape archaeology (geo-archaeology) and search for anthropogenic modifications of soil under the garden's surface.

It is only this kind of deep approach that allows us to reveal and understand the preliminary works required to ensure the sustainability of the garden, including modification of the topography, drainage works and sediment inputs – works that were carried out before planting and the construction of the garden's visible components.

This “invisible” technology, specific to each garden or site, is almost never mentioned in the archives but constitutes essential knowledge for anyone aiming to restore a garden by taking into account all of its components, both aesthetic and technical. Understanding this is a prerequisite for the viability of the restoration project.

The restoration of the hydraulic structures at Méréville began in 2022, after twenty years of multidisciplinary studies and reflection. Works already carried out include:

- restoration of the ecological continuity of the River Juine by the mill diversion channel;

- enhancement of Petite Cascade du Pont des Roches;
- dredging the Grand Lac to restore its reflective qualities;
- construction of a submerged dyke between the River Juine and the Grand Lac;
- restoration of the Petit Lac and the scene of the Grande Cascade;
- reconstruction of Pont aux Boules d'Or.

Work is still in progress but the park of Méréville will be soon reopened to the public to the great satisfaction of European specialists in historic gardens.

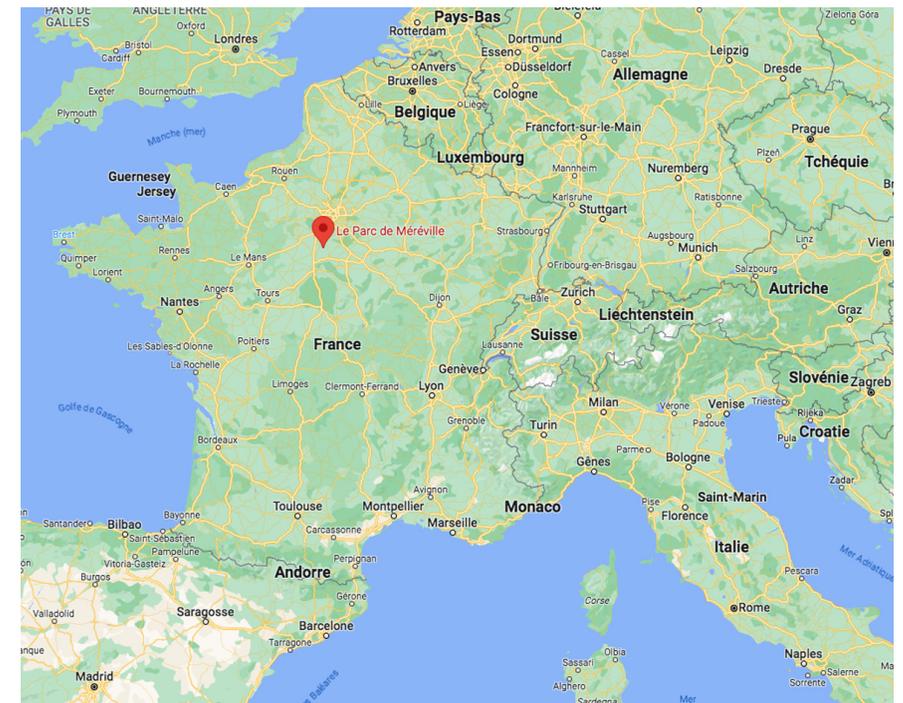


Fig. 1 Site location.

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Fig. 2 The Grande Cascade pictured in an oil painting *Peintre peignant le pont en bois du parc de Méréville* by Hubert Robert (1733-1808). National Museum, Stockholm, NM 2795.

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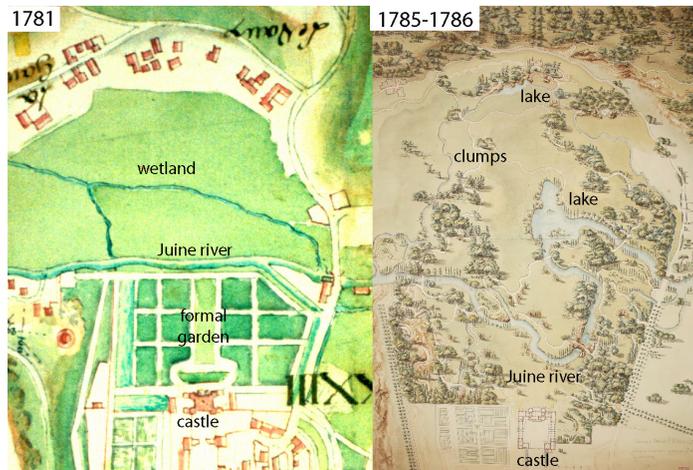


Fig. 3 Transformation of the Méréville landscape between 1781 and 1785/1786. Left: detail from *Plan d'intendance de St Pierre et de Méréville*, 1781 (Archives départementales de l'Essonne, C35/21, © Conseil départemental de l'Essonne); right: extract from *Plan aquarellé* attributed to François-Joseph Bélanger (Wallraf-Richartz-Museum & Fondation Corboud, Cologne, B 47, © Wallraf-Richartz-Museum).

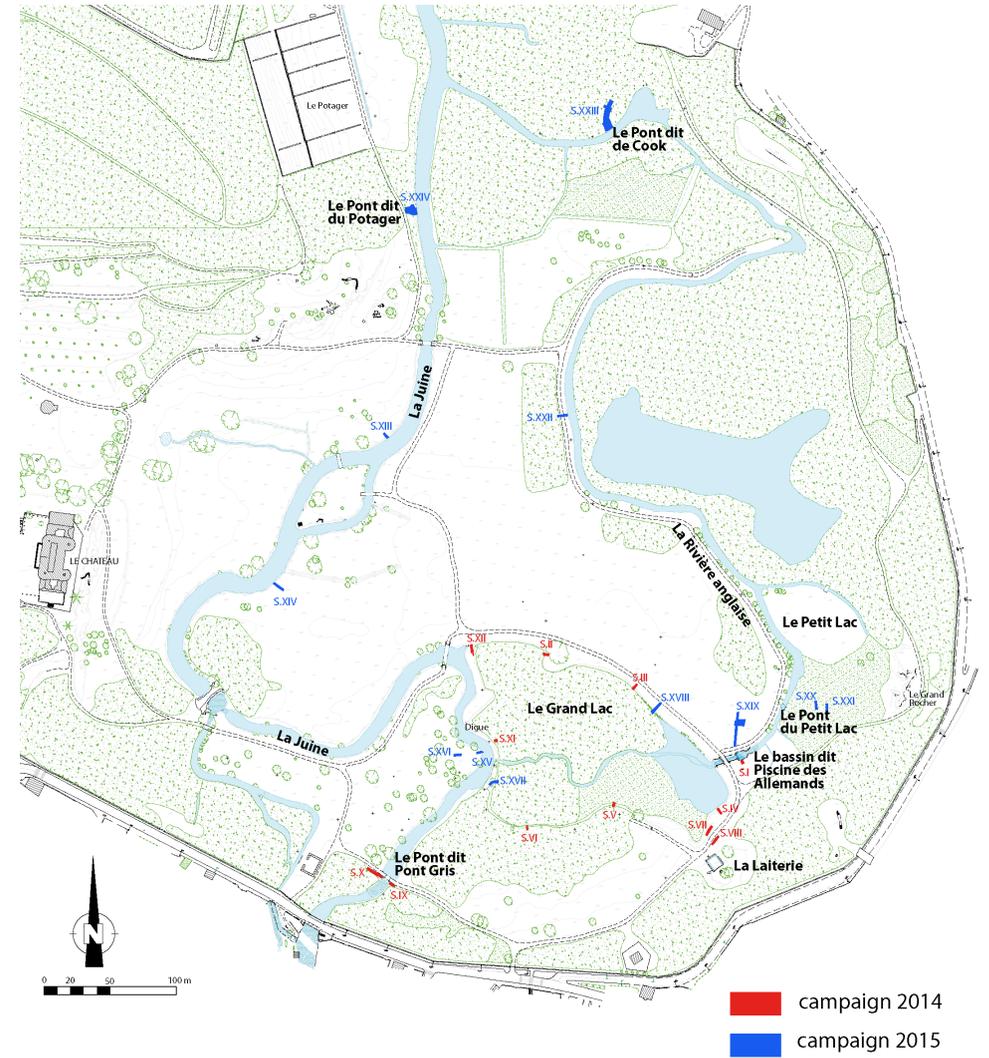


Fig. 4 Location of archaeological trenches and other soundings carried out between 2014 and 2015. Plan: Geomexpert SAS

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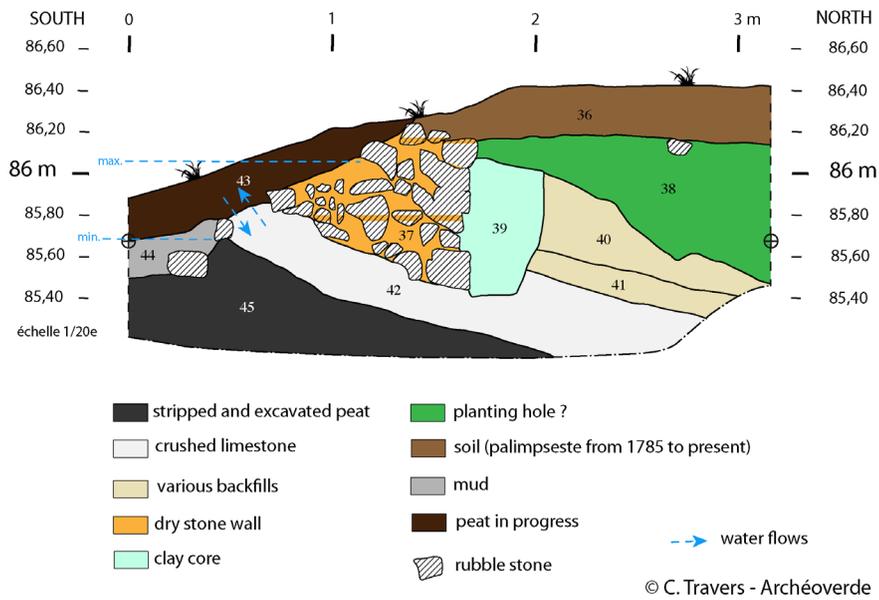


Fig. 5 Section of the north shore of the Grand Lac.
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Fig. 6 Differences observed in the treatment of individual water edges and banks related to the 1831 Napoleonic cadaster plan of Méréville (sheets C2 and D5); Service du cadastre d'Etampes (91). Photos: N. Gouiric.
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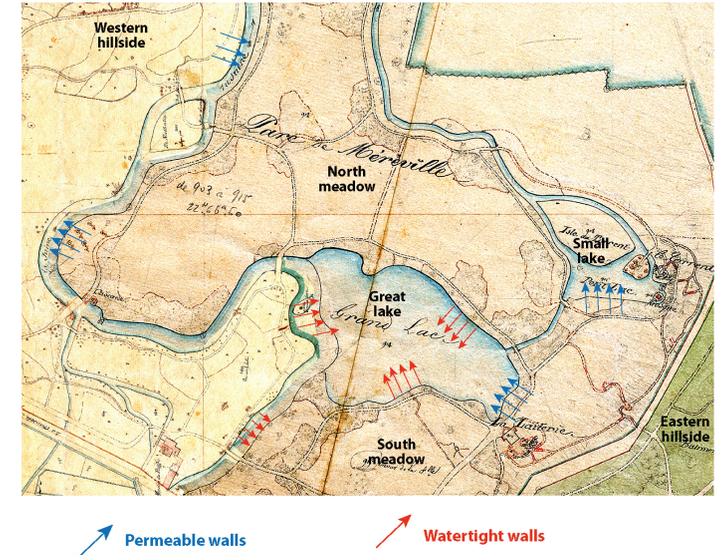


Fig. 7 The historic retaining wall at the bank of the River Juine, found during the excavations.
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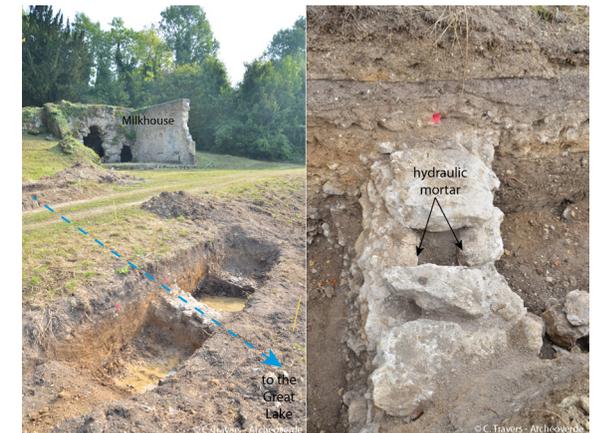


Fig. 8 Watertight masonry conduit between the Mill and the Grand Lac.
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