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Fleeing from a Little Bit of Water: A Very ‘Un-Roman’ Response to Changing Environmental Constraints. A Case Study from Monteux, Southern France

Geomorphology; pollen analysis; rising water table; gallo-roman; irrigation; draining technics.

Introduction

We usually consider the Roman people as conquerors of the land, able to tame the landscape, with its constraints and changes, through often brilliant engineering solutions. Throughout the Roman Empire, including the south of France, they built aqueducts, roads, channels, terraces, and harbours, etc. As the population increased during the Early Roman Empire, the conquest of new agricultural lands became a necessity.¹ Arable lands and marshes, which were a source of fertiliser, were more and more sought-after.² Latin agronomists testify to the Roman knowledge and skills in draining wetlands, Columella writing that, if the land is wet, it would be dried with ditches collecting the overabundant waters.

With a proven ability to manipulate and dominate the environment and the requisite knowledge and experience to drain wetlands and ‘create’ suitable agricultural land, combined with the need to find new agricultural land during the 1st century AD, our question here is: why, after only three generations of occupation, did the Roman inhabitants of Beaulieu (Monteux) choose to abandon this site when the water table began to rise, rather than try to drain the water? In this study, we looked at a variety of data streams, including changes in building use, and geomorphological and environmental analysis to show that rather than modify the local environment and control changes in the water level, the Roman inhabitants of Beaulieu chose another course of action.

Archaeological Context

In autumn 2009, prior to the development of an industrial zone near the town of Monteux (Vaucluse, southern France), a Gallo-Roman settlement dating from the first through the middle of the 2nd century AD was excavated.³

The establishment is a classic L-shaped Roman exploitation. The site was badly preserved, with the stones from all of the elevations removed from the walls and the courtyard. The level of the courtyard was lower in relation to the two wings of the building,

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1 Berger 2000.

2 Girel 1996.

3 Buffat et al. 2011.



Fig. 1 | Site location and study area.

and included a ditch to evacuate water. In contrast to other settlements from the region dating to the same period,⁴ we do not know if the water evacuated from the courtyard was used for irrigation; nevertheless the ditch was oriented towards the agricultural area.

In the agricultural area, a complex system of ditches was preserved. Two main ditches, which are oriented north-south and east-west and more or less, divide the space. They are several hundred meters in length and between 0.7 and 1m deep. At their junction they reveal a curious pattern: extending perpendicular to each side of the north-south ditch are a dozen small trenches. At the terminus of each of these small trenches is a small 'gate' or 'lock.' The system illustrates without doubt an irrigation complex dating to the period of the establishment. These same ditches could also have played the role of drains, especially during heavy rain events.

Ceramics and coins were rare on the site, making it difficult to date the site's development precisely through time. The oldest levels delivered artefacts from the second quarter of the 1st century AD but it is clear that it was during the second half of the 1st century and the beginning of the 2nd century AD that the establishment was at its zenith. The archaeological data point to abandonment of the site in the middle of the 2nd century AD.⁵

The building shows signs that few modifications were made during its history. The north wing had been extended with the addition of two new rooms on the western side, while one of the original rooms, probably dedicated to agricultural activities, was divided in two. The east wing was also modified, with several internal walls removed to extend the two main rooms.

4 Breuil 2004; Pomaredes and Breuil 2006.

5 Buffat et al. 2011.

The courtyard covered a surface of 1150m², extending between the two wings to walls on the southern and western part, and was stabilised with tiles and stones, probably to facilitate the evacuation of water. The main entrance is likely located at a break in the western wall.

Rise of the Water

Two studies, a geomorphological investigation of the site, and a pollen analysis of the fill from the ditches within the agricultural area, were undertaken and led to the same conclusion: during the early Gallo-Roman period, the larger site area became dryer resulting from a decrease in the water table. This drying of the area allowed, for the first time at the beginning of the 1st century AD, the area to be settled and exploited agriculturally. This 'dry phase' persisted for at least a century, after which the water table began to return to its earlier level.⁶

Excavation of a series of ditches at the site revealed several phases up until site abandonment. Firstly, the ditches filled with aqueous deposits, characteristic of stagnant water; some of the ditches show evidence of dredging, suggesting the site was still occupied. The ditches were then abandoned, the ditch walls collapsing and filling in the base, with the walls stabilising at an angle of around 30°. The next depositional event is composed of sediments derived from the wider site area. Finally, and interestingly, travertine tubular concretions and mollusc shells in a sandy and chalky matrix were observed in a number of locations within the final deposit in the ditches. These tubular concretions indicate the colonisation of the ditches by aquatic plants, probably reeds, and thus a return to a natural depositional environment and a definitive and long-term abandonment of the establishment. This pattern was found at several locations across the site: in the courtyard area, as well as an artificial pond contemporary with the exploitation located a few metres to the north of the buildings. These deposits indicate the long-term presence of stagnant water, indicating that not only were the ditches abandoned, but also the wider site.

To confirm the sedimentary evidence of rising water levels and abandonment, the complete stratigraphic sequence of two main ditches was investigated using pollen analysis.⁷ The pollen assemblages from both the north-south and east-west ditches indicate a very similar environmental history, with higher percentages of Poaceae, tree and shrub pollen being replaced by increasing percentages of Cyperaceae, Lactuceae and other aquatic taxa. Overall pollen concentrations begin to decrease at this time.

The assemblage indicates that trees and shrubs decreased across the site during the early portion of the occupation, and most likely represents clearance at the site, possibly for settlement or agricultural purposes. The high values for Poaceae pollen in particular suggest that pastoral farming activities may have formed an important component of the local environment. Their decreasing concentration together with tentative identifications of *Avena* (oat), *Secale* (rye) and *Hordeum* (barley) suggest that arable farming also took place near the site. The early domination of the sequence by Poaceae gives way to high Cyperaceae, Lactuceae, and other aquatic plant pollens indicating a transition to a wetter local environment.

Response to the Invasion of the Water: Flight

As we explained above, the Beaulieu site was a quite 'young' establishment when it was abandoned around the middle of the 2nd century AD, and this abandonment is related to the site becoming wetter and as such un-exploitable (the habitation, the agricultural

6 Buffat et al. 2011.

7 Save, Batchelor, and Marini 2011.

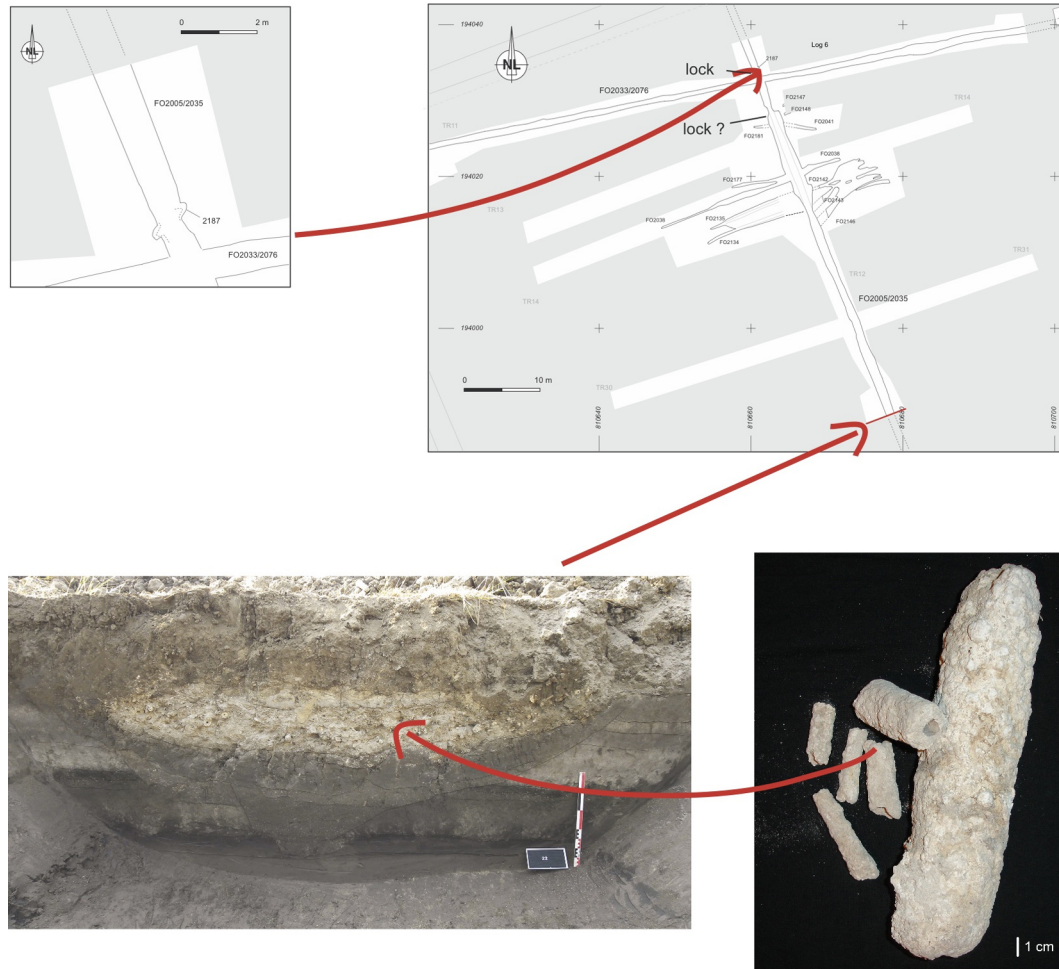


Fig. 2 | Detail of a portion of the irrigation system (above) and ditch profile and tubular concretions (below).

area?). The total absence of artefacts in the upper and ‘aqueous’ sediments in the ditches, the courtyard and the pond shows the inhabitants did not try to stay, even for a limited amount of time, once the water table rose.

The complex system of irrigation and drainage built in the agricultural area testifies that the inhabitants had the knowledge and tools to control water. However, the simple maintenance of the system, evidenced through the cleaning and re-cutting of several ditches, was not enough to prevent the eventual inundation of the site. Nevertheless, the rise of the water table was a relatively long affair (it did not happen overnight), yet we find no evidence of the modification of the drainage system in the agricultural area nor in the courtyard. Additional drains could have been built, or those existing, enlarged.

The precise answers to these questions have been lost with the inhabitants of Beaulieu. Today it seems strange that such an investment would not be saved. Perhaps the inhabitants of Beaulieu were not the owners of the establishment, or perhaps it was just easier to find a new place to live? What is clear is that a pluridisciplinary approach, combining traditional archaeological methods, geomorphology and detailed paleoenvironmental studies, allowed a more nuanced study of the occupation and abandonment of Beaulieu and the plain of Comtat Venaissin during the Roman period, even if, in the end, it has resulted in more questions.

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