Cultural Landscape: Trace Yesterday, Presence Today, Perspective Tomorrow For "Roman Centuriation" in Rural Venetian Territory

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Abstract

This work aims to describe certain landscape ecology concepts applied to the possibility of environmental restoration and reinstatement, starting from recent studies carried out on land that once underwent Roman centuration. We considered an area containing an old quarry, subsequently converted into a rubbish dump, and applied certain concepts of ecology scale, hierarchy and metastability that, together with traditional investigations, were able to provide a thorough description of the conditions of prior territorial development and helpful indications of future potential uses. This experience has shown that the application of centuriation could still be beneficial for the territory concerned, revaluing the advantages of early biological agriculture (archaic cultivation, etc.) and its produce as a means for restoring deteriorated situations (conversion of rubbish dumps, reinstatement of forgotten land-marks and road-ways, etc.), for renewing traditional rural tourism (traditional local cuisine, historical handicrafts, etc.), and ultimately for proposing prestigious cultural schemes (an open museum).

Keywords: *cultural landscape, roman centuriation, venetian territory, restoration, rural land, waste disposal, open museum*

Introduction

Ancient works are not merely for archeological observation they are elements of continuity; their walls and construction, like the land on which they stand, are entirely tangible, especially in the cities of Italy and the rest of Europe. As Carlo Cattaneo (Italian economist, historian and statesman of 19th century) put it so well, they are an enormous store of human labor (Rossi 1981).

Historical events have threatened to erase these memories, and those that survive can only be interpreted where this "labor" was most concentrated, as in the case of the Roman centuriation of the Veneto and Po valley regions. This great work of architecture and engineering has become a primary feature of the territory, a monument strong enough to survive the wars, agricultural development, industrial and social change of the intervening centuries.

Essential Historical Features of the Venetian Plains

The agricultural landscape that characterizes most of the Venetian plains, from the Po river to the foothills of the Alps, from the Mincio river to the Isonzo, still has an orderly layout, with a regular division of cultivated "*ager centuriatus*" fields, country roads, drainage ditches and long stretches of vineyards and orchards.

It is impossible to understand the overall layout of the current agricultural landscape without clear idea of the extensive work done in this area during Roman times. This work, known as "centuriation," consisted of dividing the land along two main axes, nearly always based on important roads or watercourses, which crossed each other at right angles. The geometrical regularity of the grid was secured by dividing lines, or "*limites*," named according to their orientation: the "*Cardo Maximus*," oriented mainly N-S, and the

"*Decumanus Maximus*," which ran in an E-W direction. The various "*centuria*" obtained from this initial division were defined by a network of secondary cardines and decumans that created a grid of square plots with sides measuring 20 actus (2.52 ha). Each of the *centuria* could be further divided by "*limites intercisivi*" and even inner "*interlimites*." These divisions were used to establish boundaries between the "*sortes*," i.e., plots of land that were allotted to colonists who farmed them using advanced agricultural methods. All such surveying operations were called "*limitatio*" and the result a "*centuriatio*."

The Venetian plains offered vast, flat expanses of fertile and workable alluvial soil, abundantly irrigated by mountain streams and springs. Such terrain made possible the application of land surveying methods on a vast scale, which probably served initially to consolidate the defensive and offensive settlements in the territory, but subsequently provided the foundations for an orderly, intensive exploitation of the land.

This exploitation was certainly encouraged by the Veneto's favorable geographical location, which made the Veneto area an essential and almost unique link between the northern Alpine regions, the valley of the Danube, Bavaria and the Germanic regions, and the Etruscan and Atestine cultures, with their Oriental and Greek influences through sea traffic in the Adriatic (Rosada 1984). Thus, over the course of a few centuries, there occurred a Romanization of what was then called Venetia, and was the progressive implementation of a logistic strategy that led to the weaving of a dense fabric of roadways, forming part of what later became the "Great Roman Roads." In most cases, these were laid down along more ancient routes established by the Paleo-Veneti but modified to take advantage of environmental features (Bosio 1984). They included the "Postumia" from Genoa to Aquileia and the Annia between Adria and Aquileia, the latter passing through the cities of Padua and Altino. The presence of these roads was one reason for the creation of a number of *agri*, or farmlands, still detectable in the Venetian plains, that were created not only for defensive purposes (the presence of permanent colonists ensuring that the roads remained open), but also for purely economic reasons, to ensure a higher productivity of the land (for example the *agri* between Brenta and the Piave).

At this point, it is essential to mention other Roman *agri* that were developed in the Veneto, e.g., the centuriations of Julia Concordia and Atestina, created for political and social reasons during the civil wars (around 40 BC), and the Camposampiero plots north of Padua and the nearby areas in Altino and Treviso. The former is still the best instance of Roman agricultural division enduring for centuries, to the extent that more recent urban planning systems have exactly repeated the ancient grid. Although there are no specific historical references to the latter, they can be dated to the time of land apportionment for economic and land registry purposes, and the land reclamation and agricultural development begun under the new administration at the end of the Republic and the beginning of the Empire (Bosio 1984). From this brief outline highlighting the essential historical background of the Veneto, it becomes clear that this area was able, over the centuries, to maintain the configuration it had acquired in Roman times.

Evolution in the Veneto Landscape in the Early Industrial Period

Around 1870, socio-economic conditions in the Veneto were determined almost entirely by farming. The national market had yet to be created and developed. When it was annexed to the Kingdom of Italy (1866), the region was suddenly separated from the Austrian economic context that had made Lombardy and the Veneto the granary of the Empire, and became part of a new context that demanded its adaptation to a single, competitive market.

It was silk-making that, towards the end of the 19th century, first imposed a separation between manufacturing and farming, leading to the birth of a genuine industry (Amadi and Dal Carlo 1991). Other production sectors developed in parallel with silk-making, e.g., the brick and tile industry that was located mainly alongside alluvial clay deposits. The brick industry triggered a long period of quarrying in all the farm lands near towns where brick clay was easily extracted. The signs are still evident in the area today, in the numerous quarries that have either been abandoned or converted into landfills.

Restoring the Environment

The numerous opportunities for re-using this land made derelict by industrial use include building projects, the development of recreational activities, farming, restoring the local territorial features, and so on. There are already some interesting cases of land restoration schemes in the Veneto entailing conversion to industrial-scale farming or the development of new activities. But there is no known experience of schemes for restoring an area's original topographical characteristics, which in many areas of the Venetian plains would mean returning to the conditions of the Roman centuriation. The project described in this paper proposes to do exactly that.

Reading the Signs of Centuriation in a Sample Territory

An interesting case study concerns an exhausted clay quarry located within the ancient Roman grid of Altino, which stretches as far as Robegano, now a small village in the province of Venice. The study involved an area of the grid between cardines III and IV east and decumans II and III south.

The oldest available document on the area is a "Robegano parchment" from the 16th century that clearly shows the signs of centuriation with the orthogonal pattern typical of the "*limitatio*" apparently unchanged. Indeed, decuman III is recognizable, together with a set of roads and "limites" that appear virtually the same in the 16th-century map and in all subsequent maps up until the Austrian-Italian land registry (Bortolato 1994).

One of the most clearly evident elements is the cardo III east in the Altino "*ager*," the agricultural territory of a *municipium* (town). Other elements also recur in the maps examined, such as country paths, ditches, territorial divisions, characteristic bends, rows of trees: all unmistakable evidence of the ancient Roman divisions, supported by small archeological findings. The frequent presence of drains or ditches, almost always flanked by trees and hedges, confirms the typical water distribution patterns of ancient Rome (Figure 1).

Subsequent inspections to measure the "*limites*" and "*sortes*" have confirmed the presence of the land allotments. The quarry (known to local residents as the Sant'Elena quarry after the name of a nearby village) is divided into three areas: a triangle of approximately 6,500 m^2 consisting of a single stretch of water with reeds and water plants; a second, trapezoidal area, measuring approximately 27,500 m^2 and comprising bodies of water alternating with dry land, all covered with thick reeds and shrubs; and a third, rectangular area consisting of two ponds fed by rainfall and local streams. The lay of the land has been changed by the quarrying work, with depressions that can differ in depth by up to 4 meters. Swamps and pools have formed in the deepest areas (Finco 1994).

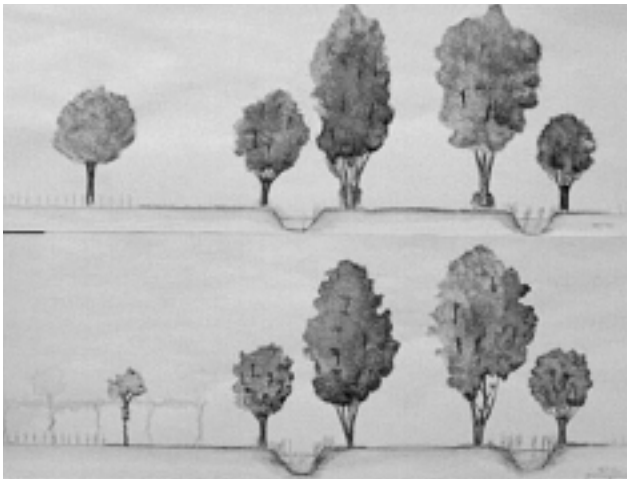

Figure 1. Typical elements of the Roman centuriated landscape: drains or ditches, almost always flanked by trees and hedges.

Project Objectives

For the restoration of the Sant'Elena quarry there were potentially three types of project option to consider. The first involved restoring the natural landscape to the way it had been before it became derelict, making it a part of the surrounding environment once again. Operations of this kind include all those naturalistic reclamation schemes designed merely to restore the environment to conditions that are as natural as possible. This includes plantation, reforestation and the restoration or creation of self-supporting natural ponds. Such operations involve reclamation, earth moving and planting, and the total absence of any interference or further human intervention (Boca and Oneto 1989). This is the case, for example, of nature reserves for protecting the local fauna and flora and providing space for undisturbed animal habitat. It would be unsuitable for the case in point because the quarry is relatively small in size and lies within a heavily populated area. This type of solution generally produces highly satisfactory results if it is implemented in mountain areas, or in sufficiently large tracts of land with little human interference, well away from urban settlements and roads with heavy traffic (W.W.F. Delegazione Veneto 1994): conditions that are hard to find in the Veneto.

Another solution might be the creation of an area of spontaneous natural marshland, a solution often adopted for abandoned quarries in low-lying areas. This type of solution usually leads to the creation of an area of woodland that is inaccessible to the community and inadequate both in monetary terms (since it cannot be exploited economically in any way) and in aesthetic-naturalistic terms, because it is resettled by pioneering and ruderal species. This solution is only considered suitable when the spontaneous return of plant growth and animal life is already well underway, whereas in our case the return of a spontaneous plant life had only just begun.

The second category of feasible actions involves putting the area to a new use to satisfy specific requests advanced by

the community. This type of project includes nearly all productive forms of re-use, such as farms, plantations or fish nurseries (Boca and Oneto 1989). Measure of this type nearly always entail earth-moving operations, bringing in soil from other areas, which means high costs and a considerable amount of work. In our case, the local authorities did not have sufficient economic resources for such filling and grading operations.

The third type of measure for abandoned quarries involves exploiting them as landfills for processing waste or "controlled dumping." Areas set aside for this purpose have to be carefully examined from a geotechnical and hydro-geological standpoint, to verify compatibility with the subsoil and the safety of this type of operation. This involves technical analyses to examine the nature of the subsoil (geomorphological conditions), the position of any water courses, the features of surface water drainage (hydrogeological conditions), and so on.

This last type of measure is often proposed since it helps to solve the important problem of the disposal of many waste products, such as building industry scrap, solid urban waste, industrial sludge, etc. It generally gives rise to a site that remains sterile, however, or at best (if good agricultural soil is added) to a site suitable for industrial farming. In the case of the Sant'Elena quarry, the surrounding territory is not suited to industrial farming, so the site would necessarily have become sterile. Moreover, past experience of each of the above described categories of intervention has shown that, without adequate financial resources, plans to restore these sites invariably remain on paper. It is therefore essential to propose a measure that is self-supporting in financial terms and that can restore to the site its cultural and historical significance: i.e., in our case a partial reconstruction of the Roman centuriation. The only way to cover the cost is to plan a partial filling of the quarry with waste materials (from the building sector and biological sludge), charging a price for their disposal.

The aim is therefore two-fold: to achieve a "philological" recovery of the pre-industrial agricultural nature of the land (a sort of "open museum") and to finance the work by means of income both from the initial waste disposal activities and from subsequent farming activities, using resources coming from the marketing of farm produce and the activities of the open museum.

So the final decision was to restore the top soil to farming activities, i.e., to the pre-industrial conditions existing since its centuriation. This choice was also supported by the fact that centuriation was a typical feature of cultivated land and that town-planning regulations generally identify abandoned quarries as "E" zones destined for agricultural use.[1] The combination of these two objectives (agricultural and historical restoration) would promote "historical farming" of the area, involving products typical of Roman times, many of which had lost much of their popularity but are now enjoying a comeback as large segments of the population seek more "natural" foods.

This could be a starting point for the creation of a territorial museum, with a partial reconstruction of the landscape based on the typical pattern of centuriation (Figures 2 and 3), reinforcing the most significant lines and distinctive markings where necessary. The result must be a valid grid system (Figure 4), a site of cultural and historical interest, and an additional tourist attraction.

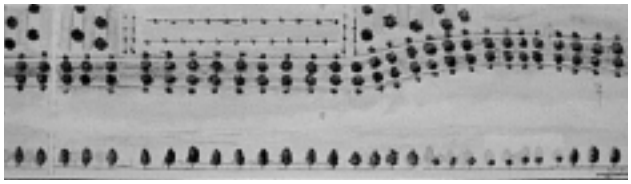

Figure 2. Layout of partial reconstruction of the Roman centuriation grid.

Figure 3. Aerial view of partial reconstruction of the Roman centuriated landscape.

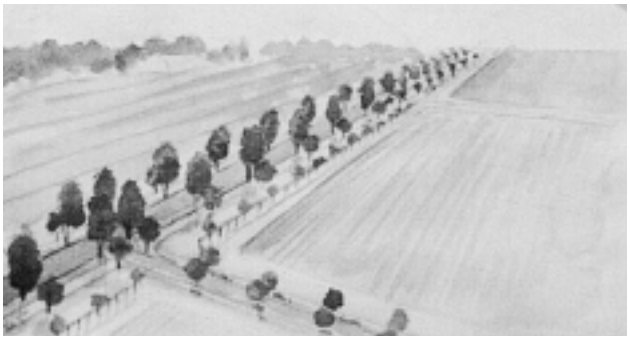

Figure 4. General view of partial reconstruction of the Roman centuriated landscape.

The idea for an operation of this type of project stems from similar experiences abroad services. In many countries — such as the United States, Switzerland, Denmark and France — there has been a trend in recent years towards creating so-called "open-air museums" or "historical sites." These consist in a perfect reconstruction of tracts of land with buildings, trees and other elements, all belonging to the same historical period (Shafernich 1983). Such schemes are developed on the basis of in-depth historical and scientific research by experts and scholars. The dimensions imposed by centuriation seem to be ideal for organic farming methods, and different kinds of hedging can also be adopted. The resulting grid is ideal for satisfying agricultural and social needs by facilitating both human and environmental communications (Caravello and Giacomin 1993).

Economic Feasibility

An economic evaluation of a project of this type requires complete information on the waste materials to be deposited at the landfill, the cost of their transportation, current legal standards for converting the quarry into a landfill, implementation of subsequent landscaping, sowing crops for farming, etc. Essentially, we have to consider the estimated cost of converting the quarry into a landfill and the subsequent cost of converting it into farmland. In the case of the old Sant'Elena quarry, chosen because most of the above mentioned information was readily available, an estimate was developed (using the income capitalization approach to value) by analyzing and capitalizing the potential future income (discounting income expectancies to a present worth estimate). The estimate took the following into account:

- the land had previously been used as a quarry;
- the quarry was exhausted about ten years ago;
- local authorities would only permit the land to be used for farming or as a poplar tree plantation, subject to permission being obtained for the dumping of non-polluting materials (building site scrap or mineralized biological sludge);
- any such conversion into a landfill would have be completed within 4 years of obtaining permission to proceed;
- after completing the landfilling operation and after creating a layer of fertile top soil, the area can be used mainly for farming along "historical" lines (separate, non-specialized, perennial crops).

On the basis of these hypotheses, the situation can be configured in the context of the estimated temporary and permanent incomes (income approach to valuation). In fact:

- after a series of conversion works, the quarry will be used for dumping materials, subject to the payment by third parties of a tariff for use of the landfill;
- after the three years that it will take to fill the quarry, the cost of creating the layer of top soil to make the area suitable for "historical" farming must be covered using the above source of income;
- once the area has been converted into farmland, it will be used permanently for cultivating "historical crops."

The situation is summed up in the following diagram (Figure 5).

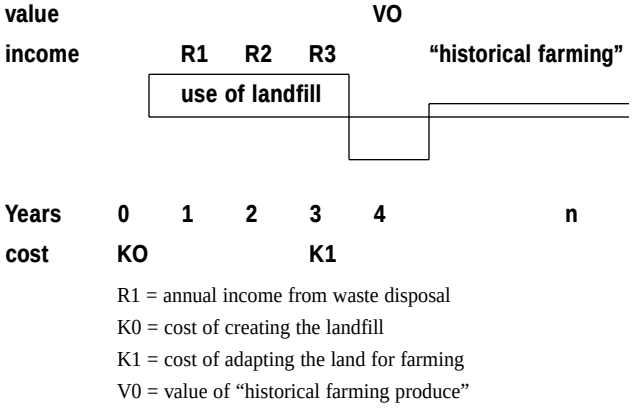

Figure 5. Outline of the context of temporary and permanent sources of income.

In the case of the Sant'Elena quarry, the initial income capital (present value of the stream of cash returns) derives from using the quarry for the disposal of a total of 53,000 m^3 of waste, ash and biological sludge, corresponding to a value of Lit. 7,643,000,000, in three years. The value of the farming activities ("historical crops" having the same value as 4.7 hectares of vineyard) discounted at today's rates (present worth, discounted at a given rate of interest) was estimated to be Lit. 157,774,000. The estimated cost of the conversion

works and management of the landfill, including the cost of its initial setup, amounted to Lit. 2,445,843,000.

As illustrated in Table 1, the net profits from the landfill operation would also suffice to cover the cost of planting and the conversion work to create the open museum.

Table 1. Income/costs comparison from the landfill operation

Income from waste disposal operations	Lit.	7,643,000,000
Current value of farming activities	Lit.	157,774,000
Cost of creating and managing landfill	Lit.	2,445,843,000
Residual income	Lit.	5,354,931,000

Discussion

In our opinion, this type of experience could become a valid model for projects in our territory. Since, in our case, the historical period is remote, certain elements may not be entirely reliable and it may not be possible to reconstruct the whole grid. A territorial museum could nonetheless offer positive input for a variety of schemes related to the restoration of the centuriation (e.g., cuisine), which could be combined to create a valid starting point for a new type of tourism (agritourism, cultural tours, gadgets, etc.).

It is worth emphasizing the economic aspect of this proposal, which is one of the primary conditions for its feasibility. This restoration scheme is not only justified by technical aspects relating to the physical and natural features of the area; it can also represent a considerable source of income (Table 1), both initially (exploiting the space for landfilling) and later on, when the area becomes an attraction in the region and inspires a chain of projects and events that are bound to be more profitable for the community than an agricultural or environmental restoration scheme pure and simple.

Endnote

1. Regional Role 27 June 1985, n.61

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References

Amadi, R., G. Dal Carlo. 1991. *Aspetti metodologici per una ricerca di archeologia industriale*. Venezia, Italy: IUAV.

Boca, D. and G. Oneto. 1989. *Zone ad alto impatto: progetto, gestione e recupero di Discariche, Cave, Miniere ed aree "difficili" o inquinate*. Milan, Italy: Pirola.

Bortolato, Q. 1994. *Salzano, note di storia comunale*. Venice, Italy: Rebellato.

Bosio, L. 1984. "Capire la terra: la centuriazione romana nel Venetia," In *Misurare la terra: centuriazione e coloni nel mondo romano. Il caso Venetia*. Modena, Italy: Panini.

Caravello, G.U. and F. Giacomin 1993. "Landscape ecology aspects in a territory centuriated in Roman times," in *Landscape and Urban Planning*. Amsterdam, Nederland: Elsevier Science Publisher B.V., 24, 77-85.

Finco, F., M. Spadazzi., Zanessi, A. 1994. *Recupero ambientale della ex cava di S. Elena*. Venezia, Italy: I.U.A.V.

Rosada, G. 1984. "Funzione e funzionalità della Venetia romana: terra, mare, fiumi come risorse per una egemonia espansionistica," in *Misurare la terra: centuriazione e coloni nel mondo romano. Il caso Venetia*. Modena, Italy: Panini.

Rossi, A., 1981. "Introduzione," in M. Zancanella, L. Vedovato, *La centuriazione compiuta*. S. Maria di Sala, Italy: S. Maria di Sala Public Library.

Shafernich, S.M. 1983. "On Site Museum, Open-Air Museum, Museum Village and Living History Museum," in *Museum Management and Curatorship*, 12, March 1983.

W.W.F. Delegazione Veneto 1994. *Gli ambienti di cava senile del Miranese*. Spinea, Italy: A. Azzolini.