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Jaume Porta

EDITION BOARD

Jérôme Barrau

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Daniel Chemisana

Francesc Giné

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WATERSCAPES AND ENGINEERED HYDROGRAPHY IN VENETO, CATALONIA AND SOUTH-WEST ENGLAND: A COMPARATIVE STUDY

F. Visentin¹@; F. Vallerani¹; A Ribas²; D Pavón²

¹ Dipartimento di Economia, Università Ca'Foscari. Venezia (Italy)

² Departament de Geografia, Universitat de Girona. Girona (Spain)

franc.visentin@gmail.com

ramusa@unive.it

anna.ribas@udg.edu

david.pavon@udg.edu

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Introduction

The reorganization and control of water flows are among the most significant aspects of the human transformation of the natural environment (Smith 1975). Waterways do not only make the latter look better but also represent linear courses full of cultural significance, in which, thanks to the interaction between natural support and anthropic intervention, we can identify particular types of landscapes (Schama 1995). Today, in the geographic field, many scholars consider landscapes as the result of the intellectual and material transformation of nature by means of which human groups define and represent the specific dynamics of inhabited space, not without the intersecting of challenges and conflicts (Cosgrove and Daniels 1988; Mi-

chell 2003). Artificial canals thus become a chance to place water resources and the hydrographic network at the centre of territorial programs, of town and landscape planning and, more in general, of all types of intervention in which environmental, cultural, social and hydraulic aspects interact (Cosgrove and Petts 1990).

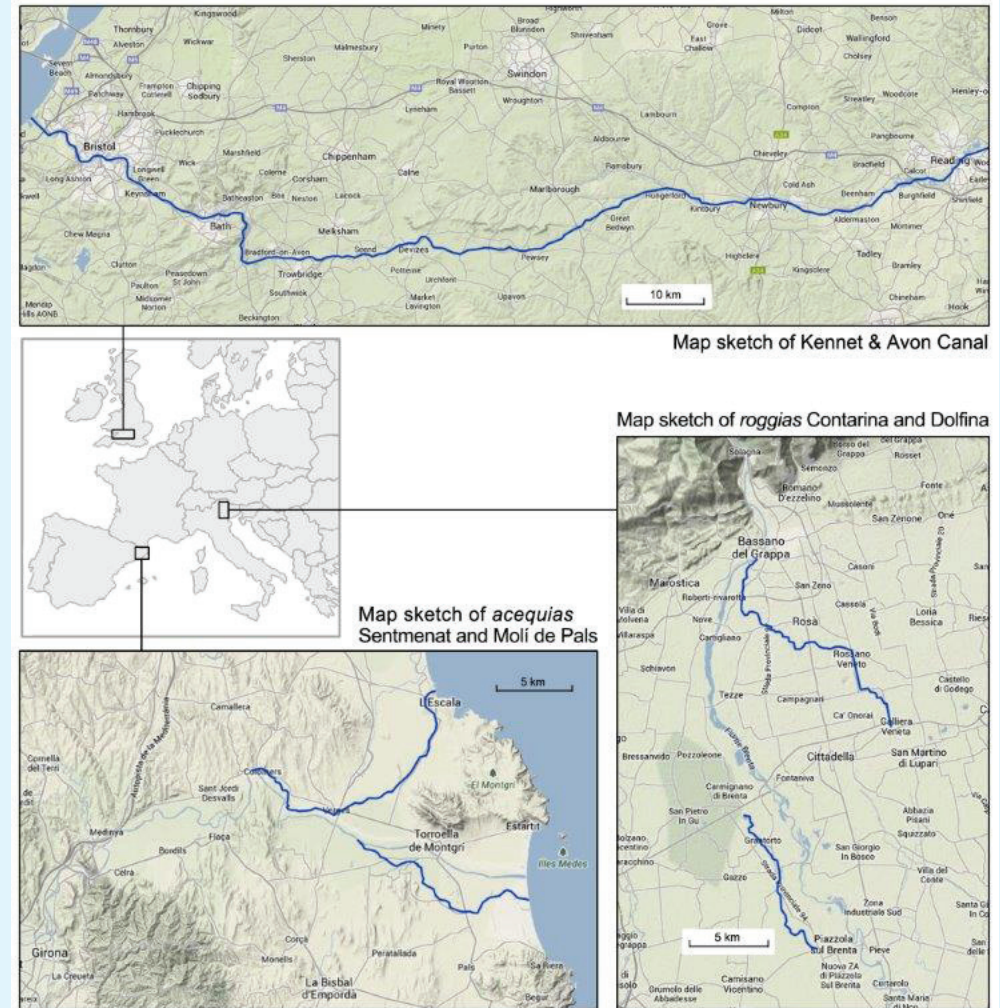


Figure 1.- Map sketch of the studied areas

The survey concentrates on the comparative analysis of three case studies identified in Italy, Spain and England inasmuch as interesting sample areas for evaluating the multifunctional nature of the artificial hydrographic network, to be collocated within the pan-European discussion on water management (fig. 1). From this viewpoint, tied to the complex multifunctional approach, both past and present, an attempt will be made to assess the functional evolution of these canals not only as elements contributing to the equilibrium of the area, both ecological and hydraulic, but also as cultural corridors to be recovered.

Water, culture and the production of Hydro-landscape

Over the centuries, human civilizations have inhabited and transformed primordial natural environments into cultural landscapes. This transformation process and gradual familiarity with water control have played a crucial role, leaving numerous marks on the landscapes, which can be read and interpreted (Vallerani 2004). If we consider the landscape as the continuous consolidation of human action, this provides interesting opportunities for identifying and analyzing its material and symbolic features (Meinig 1978).

More specifically, Neil Smith through the 'production of nature' locution, has, in the long-standing debate on landscape, tried to concentrate attention on the close relations existing between social and natural elements and on how such inter-relation produces interpretable ties (Smith 1984, 1996). This concept had been previously addressed by Henri Lefebvre, who pointed out how the 'production of nature' has historical-geographic implications through which to convey a particular unitary view of nature-culture relations, analyzing them and looking at them as specific processes (Lefebvre 1991). In this respect, this study – by dealing with water in the territory, and therefore with historical sedimentations which over the centuries have contributed to building specific, but dynamic geographic configurations – enables us to move within the landscape concept, which has numerous theoretical implications of crucial importance. For our analysis, it will be important

to evaluate what role social processes play and which are the natural factors in the formation and construction of certain areas; the two components are intimately related. When one proceeds to analyse waterscapes, one is almost led to consider them as a compendium of the 'constructed nature' concept, i.e., of that area process which has modified the environment, by adapting and superimposing itself on the natural invariances (Swyngedouw 1999, 2007).

For Eric Swyngedouw "the 'world' is a process of perpetual metabolism in which social and natural processes combine in an historical-geographical production process of socio- nature" (Swyngedouw 1999, 447), and consequently the landscape, and in particular the waterscape, has a 'hybrid' character (Latour 1993). In it, the relationship between internal and external relations affects and transcends the two dialectic concepts through which it has been discussed: nature and culture. The landscape can be considered as a theatre inside which certain social groups have historically structured themselves with respect to the territory and to other groups of people in a continuous relationship of exchange (Cosgrove 1984). In this formation process, the implicit capacity to produce knowledge and give new substance has favoured a dual relationship: as a reflection of territorial actions and as a metaphor of the representation which human beings give of themselves through its conception (Turri 1998).

The construction of the Palladian Landscape: the *Rogge* of Middle Brenta

As regards the case of Italy, a specific river context will be taken into consideration in the hinterland of Venice, which up to the mid-15th century represented an important example of fruitful construction of one of the most productive agrarian landscapes in Europe. The study will examine the upland crossed by the middle course of the river Brenta, extending from Bassano del Grappa as far as Piazzola sul Brenta, in particular the *Roggia* Contarina and *Roggia* Dolfina, two of the most significant canals of this area. This is an important irrigation belt made up in part of permeable and rough alluvial

sediments and, on the other, of an impermeable clay deposit, inside which the artificial draining canals of the Brenta, called *rogge*, built in the period of the Venetian Republic starting in the 16th century up to the 17th century, are the unmistakable structural feature of an innovative organization of the rural landscape all set to remain unchanged until the middle of last century and which gave life to what has been recognized as ‘Palladian Landscape’ (Cosgove 2000).

Besides irrigation use, starting in the 17th century, a flourishing proto-industrial and manufacturing activity asserted itself which triggered widespread conflict tied to the exploitation of water resources. After the fall of the Venetian Republic (1797) up to the mid 20th century, the hydrographic system being examined here managed to maintain a fair balance between agricultural functions and hydraulic energy and the environmental quality of a suggestive rural landscape. Modernity produced changes, but not the upheavals witnessed during the years of the so-called economic boom, and which have continued up to the present day, as in the case of hydro-geological risk, and the extensive pollution of surface waters and water-tables caused both by industry and by the fertilizers used in agriculture (phosphates and nitrogen) and finally the concrete loss of the ecological and cultural heritage caused by the frequent burying of entire drainage systems or uncontrolled development along river banks.

The historical canals of Bajo Ampurdà: multi-functionality or abandon?

In its final stretch, the river Ter flows over a plain called Bajo Ampurdà (Province of Girona, Catalonia). In this area, the first attempts to regulate the river date back to Roman and Arab times. Despite these early efforts, up to the modern age, the area has always been considered swampy, above all due to the frequent overflowing of the river Ter. Between the 12th and 14th centuries, small drainage canals, barriers and dykes were built to try and drain the water and make the plain fertile and inhabitable (Soldevila 2007). Between the 16th and 17th centuries, a number of canals were upgraded and

strengthened. These include: the *acequia* de Sentmenat on the hydrographic left and the *acequia* de Molí de Pals on the right. The complex system of hydraulic infrastructures and outlets was designed and implemented not only to drain and control the waters which invade this plain, but also to irrigate fields and vegetable gardens and drive numerous mills of various kinds by hydraulic force.

Ever since they were built, right up to the present, these canals have also played a crucial role from an environmental viewpoint thanks to the thick local vegetation, habitat to many kinds of different animals and plants. They also act as ecological corridors and, finally, affect the regulation of the water table and floodwaters. The route of the two canals should not be underestimated: they cross a number of historic boroughs, giving them an original character and determining particular types of settlements and architectures (Ribas et al. 2012).

This delicate centuries-old balance is at risk due to a number of modernization projects proposed by the *Comunitat de Regants* (Canal management and maintenance bodies) for the purpose of cutting the consumption of water for irrigation and routine maintenance costs. In 2007, the *Comunitats* reached an agreement with the *Generalitat de Catalunya* (the autonomous Catalan government) to start building two underground pipelines close to the ancient river stretches to reduce infiltrations and leaks by 20/25% according to their calculations. These projects were opposed by a number of environmentalist groups, but also by important sectors belonging to the *Comunitat de Regants* and local communities. The doubts do not only concern economic aspects, in view of the high costs involved – around 30 million euros – but also the concrete risk of abandoning historical courses, a reduction in ecological functionality and the hydro-geological state of the area. Way back in 2008, the *Consorci Alba-Ter* (public body which avails itself of European funds) drew up a document with a number of ideas concerning the new management of the old canals. The proposals made are finding it hard to acquire concrete shape, while since the summer of 2013,

the new hydraulic works have started regularly operating.

From Canal Mania to Restoring Mania

The extensive network of English canals is interlinked with an equally complex natural hydro-graphic pattern with constant water flows. Along with the consolidation of political power, but above all commercial power in England during the 17th century, the hydraulic issue became a strategic one for land development. The building of the *Kennet and Avon Canal* between 1794 and 1810, is one of the most daring engineering works of the age and one that embodies and kindles the panorama of the modernist dream to transform the natural environment (Clew 1985). This historical period has been defined by many scholars as the “*Canal Age*” or “*Canal Mania*” to underscore a widespread interest for the construction of inland waterways to link sea ports with the thriving economic and mining districts of the hinterland (Hardfield 1969). With the building of the railways, the complex system of canals built in just a few years by the English fell into slow but sure decline which resulted in the abandonment or burying of most of the canals built during the ‘Canal Mania’.

The decadence and lack of care given to these hydraulic works risked jeopardizing the heritage value of landscape characteristics essential in defining the nature of English rurality. And in fact, after the Second World War, thanks to the efforts of the Inland Waterways Association (IWA), with the aid of numerous local volunteers who joined forces and formed groups to restore individual canal sections, slow but growing interest began for artificial waterways. The role of these associations was essential in initiating extensive restoration works funded by the government and coordinated by the British Waterways (BW) government body. Today, the Canal & River Trust (which has replaced the BW) manages about 200 miles of restored canals which, in 2013, attracted over 5 million tourists. Apart from this figure, the social, environmental, economic and landscape value has enabled the English countryside not only to maintain the imaginary image of traditional

rurality, but has also developed numerous new activities able to give back meaning to places and restore ecological quality along the hydro-graphic network.

Conclusions

From this analysis, it therefore appears evident that there is a growing interest for waterscapes among the public in general, consistent with more general topics tied to current discussions on the new socio-economic structures of the post-industrial age. The suggestive intertwining of waterways, most of which marginal with respect to the urban expansion subsequent to the prevalence of roadways, represents a major environmental heritage, where the interaction between natural base and anthropic intervention has produced significant landscape types. Effective to some extent in this respect is the definition of waterway as a “cultural corridor”, thanks above all not only to the presence of constructions related to specific hydraulic functions, but also of stately homes, places of worship, country homes and proto-industrial activity buildings. This then is an environmental system with a keen vocation for cultural tourism, not only for boating but also for holidays along the rivers. The planning myth of the post-industrial use of obsolete structures is widely confirmed in the case studies taken into consideration here, to the extent of representing good points of reference for similar hydraulic works, thereby showing how the management and the promotion of the extensive network of artificial waterways represent, in all regional contexts, a concrete challenge for developing policies aimed at increasing biodiversity, organic farming and, more in general, improving the quality of life of residents.

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