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ETSCHREGULIERUNG: RECLAMATION, RIVER
EMBANKEMENT AND THE CONSTRUCTION OF
MODERNITY IN AUSTRIAN SOUTH TIROL

Etsch 2000: historical geography of river Etsch. – This paper presents the first outcomes of a multidisciplinary research project, named ETSCH 2000, which involves several scholars as hydraulic engineers, archaeologists, geologists and human geographers. Our study aims to reconstruct the evolution of Etsch valley in northern Italy during the last 2 millennia. The paper is focused on the political-historical dimension of river Etsch transformation during 19th century and its association with historical cartography.

Actually, the study embraces a very innovative methodology that integrates geo-historical analysis, geomorphological investigations and mathematical modelling. Historical geographers are involved in archive researches to collect the cartographical and documental sources to provide the basic documents in order to understand how and especially why human intervention shaped the morphology of the valley.

Surveys which concern the study of water and river landscapes have a long tradition in historical geography and geo-historiography (Baker, 2003). As well as many other European rivers, since the second half of 18th century several projects were developed in order to transform the river according to human instances. Melioration, drainage channels, solid and rectified dams were part of a complex territorial reorganisation all along Europe (Blackbourn, 2006).

Human actions related to the alteration of natural river flow in the Etsch valley was but certain not a prerogative of modernity. At least since medieval age several works were undertaken in order to modify the river bed and to meliorate the condition of land drainage in the valley.

These works were but not related to a general project for the whole river or at least for a significant portion of it. The works were rather linked to local interests, often in conflict with border communities. Till

nowadays scholars set the elaboration of river Etsch first general embankment projects to the end of 18th century (Werth, 2003).

Our inquiries discovered but older plans which date to the half of 18th century. The purpose to operate several rectifications of the river predates of almost half a century the great and well-known projects of the late 18th century and of the 19th century.

The first big project was elaborated by the mathematician and engineer Romualdo Bertaglia in 1752 and provided for the rectification of several meanders northern and southern of the city of Trento. The Republic of Venice, whose domain on the Adige river began northern of Verona, learned of the Tyrolean purpose which was supposed to radically change the hydrodynamic of the river. Consequentially the Venetian Senate carried out a diplomatic mission against Tyrol to persuade Tyrolean authorities to abandon the project.

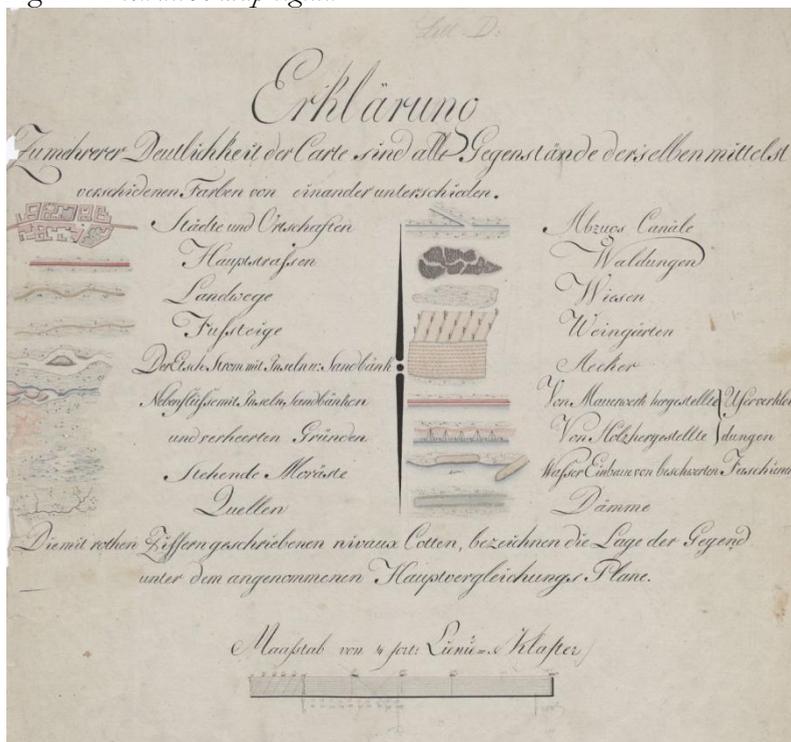
That is very significant because it underlines that the technical-engineering issues at the base of these projects represented just a second order of problems. In fact it was mainly a political issue which determined the realisation or the non-realisation of these works¹.

As in 1797, with the Treaty of Campoformio, the Republic of Venice ceased to exist, nothing could prevent the will of the Austrian Empire.

19th century: the great embankment projects. – At the beginning of the 19th century dates the first big project for the embankment of the whole river Etsch in South Tyrol and for the melioration of the valley. The plan was elaborated by the Austrian military engineer Ignaz von Nowack and considered to cut several meanders between the river spring and the southern Tyrolean border in order to reduce the river length of about 20 kilometres. Nowack carried out many inquiries along the river and elaborated a detailed map in 131 sheets which represents the river course and the whole valley at a big scale (about 28.000).

¹ Archivio di Stato di Venezia, *Provveditori all'Adige*, Busta 221, Fascicolo 2, *Relazione sopra l'inondazione che fa l'Adige sul Territorio e nella Città di Trento e del modo di provvedervi. Presentata agli Illustrissimi Signori Consoli della detta Città*, Remoaldo Bertaglia, 12 aprile 1752.

Fig. 1 – Nowack's map legend



Source: Landesarchiv Innsbruck, Karte und Pläne

As we can see in the legend in fig. 1, Nowack's map discloses a great detail in the representation, particularly regarding river situation, as e.g. different types of embankment, dams, island, sand banks, swamps, water springs, drainage channels, but also related with the nature of the territory, e.g. fields, vineyard, forests, common lands, as well as settlements, streets and paths.

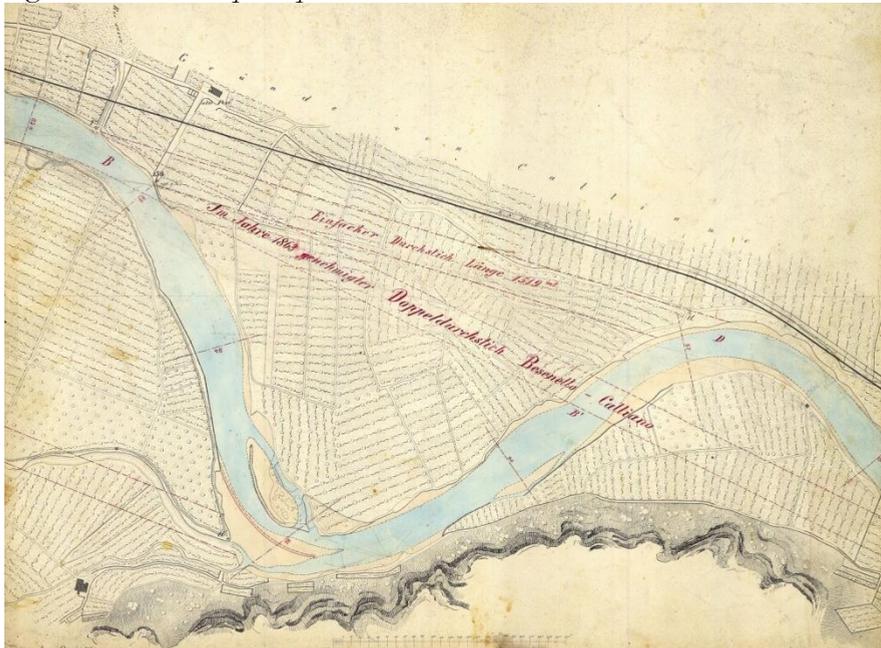
The map also indicates the places where Nowack had made his surveys and calculations, and the trace of the new river bed that was supposed to be realised by cutting the meanders.

Very interesting, also to reconstruct the morphologic and hydrodynamic features of the river, are the tables which report the results of Nowack's calculations. In this table we can see the measurement of river bed declivity and water flow speed, related to specific places where Nowack operated the calculation which are then indicated on the map.

That also testify the strong relation between technical inquiries and maps as instruments of representation (Dai Prà, Mastronunzio, 2013).

In the following years under the supervision of Tyrolean authorities and particular because of the interest of Bozen city council began the rectification of the river. Southern of Bozen were realized seven meander cut-offs, as the one we can observe in the map. These works were still operated not according to a general plan but under the pressure of single local authorities. Many of the indications of Nowack's plan were also neglected (Amministrazione Provinciale di Trento, 1926).

Fig. 2 – *Claricini's map sample sheet*



Source: Landesarchiv Innsbruck, *Karte und Pläne*

The results were also worse than the previous situation and several floods occurred in the following years. Particulat dangerous was the flood of 1845 and in the same year a new general plan was elaborated by the Venetian engineer Floriano Pasetti. He modified some of the interventions projected by Nowack and planned to embank also Etsch's tributary rivers (Pasetti, 1845).

The political decision was actualised just a couple of decades later when in Bozen a general agreement was signed by the different local and

central authorities. A significant contribution came also by the railway company Südbahn, which at that time was building the railway connection between Innsbruck in northern Tyrol and the city of Verona in the Po plain.

The agreement entailed the establishment of the Etschregulierungs-Kommission, the commission for river Etsch regulation, which was designated to govern the river rectification and embankment.

In the same year a new general plan was elaborated by the engineer Martin Ritter von Kink, who was also designated as works supervisor.

Fig. 3 – Example of a project map near Vilpian (Bozen)



Source: Südtiroler Landesarchiv Bozen, Bonifizierungskonsortium Passer-Eisackmündung

Mapping the river: embankment projects and cartography. – Kink’s plan, as many other plan for Etsch regulation, exploited as cartographic basis the so-called Claricini map which was realised at different scales and in several further issues since the beginning of the 19th century. The map represents the course of Etsch river with the adjacent valley floor (fig. 2).

As a general consideration we can assert that all these territorial interventions were made possible also by the instrument of the modern scientific map and thanks to the much more precise and detailed representations which modern maps could offer.

It is not by chance that in this historical period, between the end of 18th century and the 19 century, several project of river embankment

were undertaken in many European countries. And from this period hail also the detailed topographic maps which can be now exploited for georeferencing.

As Emanuela Casti states: «Without cartography is not possible to establish a kind of order which is necessary to realize certain territorial processes» (Casti, 2013).

Furthermore every social group experiments a particular way to determine this order in the nature. In our case we can observe that the hydraulic maps of Tyrolean territory followed a process of progressive stratification depending on the different social and power groups. The most reliable maps were also exploited for several different projects and in this case cartography represented the first frame for different interventions, according to the different political wills.

A perfect example of different plan overlapping and cartographic stratification is the Claricini map, which represented a fundamental block in river Etsch planning along the 19th century. Many cartographer, technicians and engineers exploited this map as the basis for their further elaborations.

So the different and further versions of this map testify the different strategies and practises locate far away in place and time.

Conclusions. – Once defined a detailed cartographic image of the river valley and created the specific administrative bodies for its management, could finally begun the Etsch regulation, which was undertaken between 1870 and 1890, in some cases parallel with the construction of the railway line Innsbruck-Verona. Big scale maps, as the one in fig. 3, testify the nature of these work and the improvement of territorial order.

In the same period many other European rivers - like the Rhine in Germany - were concerned with similar projects. Swamps and marshes eluded cadastral calculation, therefore avoiding taxation and made difficult the strategic positioning of armies and fortification. In this sense they prejudiced the disciplined order required from modern state. Water itself was an irrational and unpredictable element, which needed to be contained. Since Renaissance cartographic technique advancement together with the progression of statistical inquiry allowed a new understanding of territorial rule. Maps and dataset were not just the means to realise these projects but became the archetype of a radical land trans-

formation (Schmale, Stauber, 1998). Straight roads and channels, reclaimed lands were the reflection of the imaginary lines depicted on the map. It is not by chance that the Etsch river rectification and embankment war strongly related to the *Brennerbahn* construction, the railway line between Innsbruck and Verona.

The same process involved property, administrative and political borders: modern territorial state conceived land reclamation and border demarcation as a whole.

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Etschregulierung: bonifiche, rettificazioni fluviali. La costruzione della modernità nel Tirolo Meridionale austriaco. – Il proposito di regolare il corso del fiume Adige nella contea austriaca del Tirolo risale alla seconda metà del XVIII secolo. Diversi progetti si susseguirono nel corso del tempo e i lavori furono finalmente conclusi entro la fine del XIX secolo.

Nello stesso periodo molti altri fiumi europei - come il Reno in Germania - furono interessati da progetti simili. Le aree paludose non era-

no soggette a misure catastali, eludendo la tassazione. La loro presenza, poi, ostacolava i movimenti delle truppe e rendeva difficile la costruzione di fortificazioni stabili, perciò pregiudicando l'ordine disciplinato che era necessario per stabilire un moderno stato territoriale. Sin dal Rinascimento lo sviluppo delle tecniche cartografiche assieme al progresso delle inchieste statistiche permise l'attuazione di un nuovo ordine territoriale. Mappe e dati statistici non erano soltanto il mezzo per la realizzazione dei progetti ma divennero lo strumento archetipico di una radicale trasformazione del territorio. Strade e canali rettilinei, terre bonificate divennero la manifestazione materiale delle linee disegnate sulle carte. Non fu un caso che la rettificazione dell'Adige si legò alla costruzione della *Brennerbahn*, il collegamento ferroviario fra Verona e Innsbruck.

Lo stesso processo riguardò i confini proprietari, amministrativi e politici: lo stato territoriale moderno, infatti, concepì allo stesso modo le grandi opere di bonifica, l'appropriazione del suolo e la determinazione dei confini. Questo articolo esamina i diversi progetti di sistemazione dell'Adige con la relativa cartografia che, nel corso di un secolo, trasformarono radicalmente la geografia della Val d'Adige.

Keywords. – river reclamation, modernity, critical cartography

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