The *Map of Padua* by Giovanni Valle:
Hypertext/Hyper-Representation *Ante Litteram*

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The city of Padua is surveyed by technicians coordinated by Giovanni Valle, who elaborates, draws and 'amends', under the direction of Simone Stratico –whose role has not yet been clarified [1]– a map that was engraved in Rome, within 1784, by Giovanni Volpato. For technical reasons the huge surface of the drawing is transfered on 20 copper plates of various sizes [Ghironi, Mazzi 1985] becoming, in its original edition, one of the most important and famous maps of the city. Realized according to precise criteria of geometric measurement, it can be considered, therefore, a punctual record of the urban condition of Padua in the 18th century [Zaggia 2009]. For this reason, the map plays a role of great historical importance since it crystallizes the *forma urbis* of Padua before the wide nineteenth and twentieth century transformations. The Padova map of Giovanni Valle is, therefore, at the top of a long cartographic tradition that precedes the concepts of Descriptive Geometry and the rigorous codification of Orthogonal Projections, formulated only a decade later by Gaspard Monge at the École Politecnique of Paris [Cardone 1996; Cardone 2017]. Indeed, starting from the Renaissance, the representation of the city abandoned its symbolic role, describing the tangible physical features of places and architecture, adopting measuring instruments and mathematical-geometric rules based on the principles of Euclid's *Optics* and *Elements* [Stroffolino 1999].

What is interesting about the work of Valle is its effective 'composition', that has, on both sides of the plan projection of the urban area, a set of perspective views depicting some specific 'main places' of the city [Mazzi 1985, pp 32, 33].

Like many cartographers of the eighteenth century, Valle chose to overcome the limits of space and time in a single document, combining more 'views' of the city with its plan shape, as if a user of the document could stay, at the same time, in several positions of observation. This operation can be interpreted as a sort of optical zoom on

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the most important places of Padua, a strategy of representation which, although performed on a scale of greater detail, from an urban and orographic point of view, sees in the Gallery of Geographical Maps, completed in the Vatican by Egnazio Danti among 1581 and 1583, his most illustrious precedent [Gauthiez 2006].

This composition is therefore not new: the history of cartography of urban realities includes analogous, previous and contemporary examples, among all the map of Rome by Nolli, that of Naples by the Duca di Noja [Bevilacqua 2010] and –referring to the Venetian area– the map of Venice by Ughi. In all these cases the composition is the similar: a plan projection, and a series of perspective views that offer the vision of precise urban places. Two distinct modes of representation of the city are overcome, integrating different strategy of outilining the places, both easily recognizable in the history of cartography: the perspective view and the plan projection [Nuti 1996]. In the case of the view, we have a clear reference to what today we would call '3D view' of a three-dimensional entity, with the intention of showing how it looks, from an observation in the space; in the case of the plan projection, its aim is to read and communicate metric/geometric data and specificaaly, in the case of a city, the representation is certainly addressed to understand the relationships, the concerns and the properties of the forma urbis. So, the map by Valle –as well as Ughi's one– anticipates a concept through the combination of several representations: a hypertext, in which it is possible to grasp multiple information simultaneously, also for the presence of captions and lists of roads, buildings and notable places [2].

Indeed, let us read this map precisely in terms of a hypertext. Or rather, this map can be considered as a hyper-representation and, as uch, it must manage data, organizes them and offers outcomes in terms of communication. As a hyper-representation, Valle's map is a useful tool not only for visualization but, above all, for knowledge and communication of the architecture and the city, simplifying the rapid and accurate analysis of complex and variable data. According with Jean Luc Nancy, the hyper-representation: "it does not consist only in the colossal and boundless character of the representation, demonstration or spectularization systems […] it consists above all in a representation whose object, whose intention or idea is integrally realized in a manifested presence […] The hyper-representation […] is a reversed

revelation, a revelation that revealing does not portray the revealed, but on the contrary it exhibits, imposes and impregnates all the fibers of presence and that of the present" [Nancy 2007, pp. 90-91].

As we said, a huge number of data, managed by drawing procedures, can be found in such an output. Indeed, more generally, through the forms of representation that are a privileged tool for the study and the analysis of what we identify with the terms 'architecture', 'city' and 'landscape', knowledge acquires communicative power; for this reason it is important that the architectural, urban and landscape heritage are based on representation to be studied and disseminated. A map, like the one that Valle outlined, today as in the past, must be assumed as a privileged place of knowledge and communication: the contribution of representation as a communicative vehicle is therefore fundamental. Today, refined digital technologies are used for the realization of such elaborates, but an idea of 'virtual' set still prevails, it even has sometimes a scenographic, if not a playful or an entertainment nature. However, the data managed in such a map are an enormous quantity of information that identifies:

– physical-naturalistic quality (the shape, the conformation rules, the configuration and transformation of the architecture and of the settlement and infrastructural apparatuses);

– historical-cultural quality (history, traditions, cultural and environmental heritage in general);

– social and symbolic quality (social values, attitudes and knowledge, aesthetic values and forms of perception consolidated in the communities);

– functional quality (a symbol is associated with each represented location remarking its intended use).

The solution is the organization of a data network, that allows a greater contamination with different disciplinary areas, giving a deeper degree of accessibility to an ever wider number of users: indeed, the creation of a hypertext, and in our case of an hyper-representation, certainly refers to a condition of extreme combinatorial freedom. And if we consider the Augmented Reality experiments, a sector of computer research that combines the real world with computer-generated virtual data, we face an anticipation –in the specific case of architecture, city and landscape– of the goals, putting in relation (virtual) entities that have not only external connotations, of perceptive appearance (the perspective views), but also metric and geometric features (the plan projection).

At this point, it is important to describe the operational analogies on 'how to' map and reference precisely on the 3D object/model metric information (architectural, urban, landscape), analytical type (study of sources and documents), synthetic type (creation of the 3D model – now also interactive). The current technology, as in the past, aims to the localization or to the movement in space, in the same way aesthetic and geometric attributes (color, texture, opacity, shape etc.) become further information suitable for the effective definition of such a work, providing –formal, constructive or structural– processes, organizations, and systems that are not immediately understandable and often hidden or untold.

Yet, compared to the present, there are differences. Certainly in the contemporary era, the generation of CAD, GIS and BIM technologies, also known as Software Object Oriented, is certainly more versatile and suitable. An Object Oriented software program is structured in numerous high-level objects, each of them replicates one or more aspects of the problem that is solving and interacting with others, 'exchanging messages', but maintaining its own status and data. The term Object Oriented describes, therefore, a program in which data are not defined as lines and forms but as virtual objects that can be assembled into larger components. It is therefore a software technology particularly suited to architectural, structural, and urban representation. Indeed virtual objects, in an Object Oriented application, can be equipped with the attributes of the physical objects they represent, such as the geometry and the characteristics of the material as well as energy efficiency, costs, maintenance requirements, evaluation of useful life and so on; the Object-Oriented technology makes the creation of a virtual model easier and more efficient than a series of separate drawings, according to a mental scheme analogous to the way of conceiving an architectural project.

If we consider a hyper-representation as the design and experimentat of a coordinated and interactive system, that elaborates various data in a simple and immediate format, then a map organized like that of Valle manages, in particular, variable data in constant flow, proceeding, ante litteram, through the following operational steps: the design of 3D models/representations with not only geometric but also semantic and descriptive integrated contents (today we would say: according to the recent OGC standard –Open Geospacial Consortium– CityGML) [De Carlo 2014; Huffman Lanzoni, Giordano, Bruzelius 2018]; identification/testing/development of methods for populating these 3D models; experimentation with navigation and interrogation tools for these models, experimentation that, today, takes place via the Web.

Notes

[1] His contribution seems more a scientific direction than a direct intervention. See Mazzi 1987, pp. 30-37; Mazzi 2013, pp. 187-197.

[2] It is interesting to note how in the preparatory drawing Valle indicated the properties of the individual noble palaces.

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