

CARGOGRAPHY OF CATALONIA

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The study of the territory — which has been the object of several disciplines — has almost always used for its work the aggregate analysis or the variables and the quantified study of certain aspects, often forgetting its spatial dimension which is the only quality which defines it as something which is specific and singular.

Because of its capacity to incorporate factors of place, distance height and limits, cartography opens up a whole field which had lately been too much ignored and which should be recovered as an analytic instrument and an instrument for formulating proposals in the study of territory and its phenomena.

Whether cartography is considered a filial branch of different disciplines — especially geography — or whether it is considered a simply expositive technology, it has accumulated a heavy instrumental and theoretic baggage which is to serve as the basis for this work.

Cartography is not a technique for effecting the fiat representation of a space by means of contour lines of the different physical elements of the territory, as an objective witness to it, rather it is a form of analytical reading which describes this space starting from the idea that we have of the territory. To believe that an aseptic vision of the territory is possible, as some people have attempted based on photographic techniques and justified by a certain automatism with which they are elaborated and by the precision with which limits can be measured is not to understand the historical nature of the space which is being represented and therefore, the value of each element which is included.

The invention of fiat and drawn to scale representation of territory.

The first abstract step in cartography was to transcribe man's panoramic view into a fiat and drawn to scale representation. Because of the very special object which the sea is, nautical cartography was one of the first to make this interpretation evident.

As the vertical element does not exist, the theme of the sea chart is

reduced to a problem of temporary itineraries referred to dimensions which are not strictly materialisable such as winds and bearings, and to a problem of the limits between the sea and land.

Although the sea chart has understood the problems of determination and fiat representation of the coast, it introduces no novelty in the ideogrammatic and legendary form of understanding the inland. Cities, mountains and rivers, if there are any, are placed with lack of precision and if they are drawn it is done in a panoramic way and with perspective. It is only with the arrival of the Renaissance that the interest in inland cartography is born and the continental void of the nautical cartography of the Middle Ages is filled out.

Cartography as a cosmography

The sixteenth century opens up the way to a new concept of the world in which the Renaissance takes shape in all the fields of culture. The publication of Ptolemy's Geography in 1405, the invention of engraving and printing and the discovery of America renew all the previous cartography.

From this moment on the nautical map becomes integrated within the total of the studies of the known world. The Dutch school, which was built upon estimates which were different from the medieval ones, took up cartography as another way to desacralize and identify the world by means of scientific research and the recognition of a lay world.

Cartography stopped being only a nautical instrument and became a commercial document in which the accent is on pointing out cities and lands, bridges and gulches, and will place very little importance on elements which are not useful for commerce as J. Iglesias points out in his analysis of the old maps of Catalonia. These atlases were made by means of compilations and by works fitted together which gave greater importance to the work at the drawing board than in the field. A methodology was thus started which is of more interest because of the coherence of the whole, as a demonstration of the new rationality, than in the details which are represented. It is not unusual that certain empirical information should be refused, such as certain coastal profiles which figure in previous sea charts and which later would be proved to be correct, in favor of other information which was more in keeping with Ptolemy's texts and the geographic

revolution which their discovery had represented.

Apart from certain interesting work, such as the atlas of El Escorial, which had no later repercussions, it was the Dutch cartographers who fixed the shape of the continents and the countries. Thus, Catalonia had two types of map which were easily distinguishable because of the deformations of its coast.

The first model, which is attributed to Mercator, was published in 1580 in "Catalonia Principatus Descripció Nova", and the other was by the Frenchman Nicolau Sanson published in 1660. They were drawn to a very small scale (1/750,000) and there are numerous inland errors.

Small scale charts took on a strong momentum in the Renaissance cartography: new efforts are made to measure land, and systems of reference and of fiat projection are created, profiles are adjusted and a road is started upon which will not reach its culmination until Cassini's triangulations and the formation of national maps.

The three-dimensional character of architecture could only with difficulty be synthesized on a ground-plan until a school was formed which typified architecture through style and gave the key to the interpretation of all the building to the ground-plan. We are not speaking, therefore of how urban layouts began, gradually they are summed up in one of their documents: the ground-plan.

Maybe urban cartography wasn't born directly from the architectural school either: the foundation of cities ordered by means of the laws of the Indies — with clear precedents in the French scaffolding, the Catalan foundations in Mallorca or the agrarian foundations in both Sicilies — provide the first juridical charts for the division of ground and the sharing out of dominions which are the reason for the first urban representations in which the use of ground and the occupation of buildings is the clearest ideogrammatic representation of what is understood as a city.

The culmination of the work of geographers and the interest in large scale drawings.

If the Atlas and the cosmographies summarize all knowledge of space during the sixteenth and seventeenth centuries and especially during the second half of the eighteenth century, there will now be the culmination of

all previous work thanks to the appearance of new techniques and inventions in this field.

Since the end of the seventeenth century astronomic and geodesic knowledge play an important role in the composition and drawing of maps. Colbert carried out the first cartographic surveys with the direct application of this knowledge. The reorganized Royal French Navy planned to draw up the chart of the coast of their country in 1671. In 1693 "Neptune Français" appeared in accordance with rigorous and exact restitutions made *in situ* from now on the territory is framed by a coordinated system. The old empirical and recompiling system of the Dutch school has definitely been abandoned.

The appearance of more consistent geographical studies which are more than a picturesque and literary story and become ever more systematic. The regional descriptions of the eighteenth century begin to deal with localities and areas: local and monographic histories of the cities, which are encouraged by the economic societies of friends of the country, include data regarding agriculture, population protection and even some small maps.

As well as these small informative works, the institutions which are necessary in order to encourage these disciplines were created. In 1748 the Acadèmia de Geografia i d'Història was founded. Astrological Observatories and the Corps of Cosmographic Engineers, which are directly bound to the geodesic cabinets of the State, are created. The State also concerned itself with the systematic compilation of the dispersed Spanish cartography (pre-statistical).

Parallel to this road of scientific maturity of charts and maps, the military have developed large scale cartography. The chronicles of war, first with panoramic views and then with plans appear systematically accompanying the invading armies after the middle of the seventeenth century.

The topographic structure of the territory which in a chart covering large extensions of land loses its significance, becomes in diagram and conventional sign the centre of concern of the military plan, in view of the fact that it is basic to their strategy.

For the military every obstacle and the distance to it is important.

The art of war still requires the direct observation of the movement of troops, the parabolic shot or the siege and it, therefore, needs a precise

plan to refer to for the distance between objects, and more precisely the relative heights between elements. Absolute heights are of no interest, just the structure of gorges, passes, valleys, of the territory.

The formation of the “National” topographic and of an urban cartography.

The nineteenth century sees the definite consolidation of small scale cartography which had been thought of in the previous century, and an urban cartography understood as such makes its appearance. In 1870 the order is given to make up a National Topographic Map. Charles III orders the military engineer Tobiño to elaborate a geodesic chart of the peninsula. We have before us, therefore, an important effort to carry out basic works which will ensure the cartographic coverage of the state territory.

The effect of the new century, with its battles to obtain a constitutional state, was to consecrate private property and to develop a new tax policy which would be reflected in cadastral cartography. Until that time two different juridical nets were superimposed on territory, one which referred to the domination of the ground and one which referred to its use, but when state and ecclesiastic properties were desamortised certain practices of emphyteusis, such as the ‘rabassa morta’ contract, were consolidated and an only division of territory was established: that of full property instead of the dichotomy which existed previously between dominion and use of the ground.

With the introduction of contour lines as an extrapolation of levels mi absolutely new code becomes available, which is farther away and much more abstract than the type of representation of which we have spoken but also than its way of understanding territory: this is no longer a system of slopes but of superimposed planes.

The projection of irrigation canals, railways, sewers, could not have been carried out with the old documents. The design of these substructures required mi exact knowledge of the topography of their course. The first layouts which were probably planned on the spot were accompanied by very precise levellings. As these works became larger so they required more extensive documents to base themselves upon which would permit some form of test before the definite project. The plans with slopes were

therefore of no use for applying levels to. It is logical that the first law which required that plans should be drawn up with contour lines should have been a Napoleonic decree with a view to the constructions of roads.

The railway, the most modern form of substructure, is the definite force which makes the use of topographic maps with contour lines obligatory where each and every one of the points of a territory may be related to each other based on an only and extensive system of arithmetical relations.

The uneven success of this cartography is slow because although it is one of the supports of the idea of extension of the industrial city, even more projects for expansion are based on the old form of cartography. However, the 1846 law regarding the drawing up of geometric plans of towns will demonstrate the maturity of cartography of cities, to the point where it was understood that to draw up a plan of a City was to a great extent to project it.

The latest contributions and discussions in the field of cartography, before the irruption of modern restitution techniques, referred to operative scales of drawing — 1:1250 fixed for the erection of geometric plans, to 1:500 for the plan of the city of Barcelona or 1:50,000 fixed by the Institut Geogràfic — and we shall see that gradually not only does a new thematic cartography appear but the scales become specialized and they become defintory of the contents and the possible uses which the plan is to have.

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