

## THE MAPPING OF MOUNTAINS IN XVI CENTURY CARTOGRAPHY THROUGH FOUR EXAMPLES

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### SUMMARY

XVI century cartography is a good example of the importance of technique and art in the preparation, drawing up and printing of maps.

We propose to analyse a geographical aspect, orography, in some of the more representative maps of Spain produced in that century.

The study starts with a brief description of all the mountain ranges represented: their identification, orientation, shape, geographical location and topography. We will then compare the different orographic expressions, and end up with an interpretation of the data obtained and conclusions on the role played by mountain systems in the maps of Spain.

### 1 Maps selected

The maps selected, in addition to having been drawn up by the most well-known cartographers of the time, are all different. Care was taken to avoid maps that are exact copies of others; it is well known that the plates were acquired and reproduced without changing the map's content, only the cartouches, and sometimes not even them.

The maps studied are as follow:

- "Noua Descriptio Hispaniae" by the Neapolitain artist, architect and cartographer Pyrrho Ligorio (Map a), drawn up in Rome in 1558.
- "Hispaniae Descriptio" by the publisher and engraver, Dominicus Zenoi (Map b), in Venice in 1560. It is considered a copy of the map "Hispaniae Descriptio" by

Luchini-Peregrinus<sup>1</sup>.

- "Regni Hispaniae post omnium editiones locuplessima descriptio" which appears in the atlas of the Flemish cartographer Abraham Ortelio (Map c), already in its first 1570 edition, and on which the name of the author did not appear.

- "Hispaniae Nova Descriptio" by the French botanist and cartographer Carolus Clusius (Map d), edited by Abraham Ortelio in Antwerp in 1571, and consisting in six sheets.

The illustration on the following page show the orography of the Iberian Peninsula as represented on the selected maps, quoting the source of each map.

## 2 Description of relief

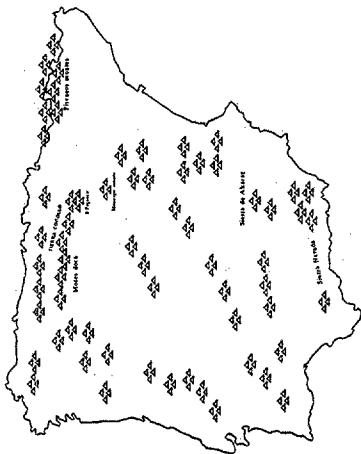
### 2.1. Identification of the mapped mountains

The identification of the mountain ranges is generally related to the edition consulted; some are more marked than others due to the shade used for the spurs, or the colour given to the area or region. The maps in Abraham Ortelio's atlas are a clear example. Sometimes the names of the mountains appear, so there is no problem in identifying them, this is the case on all the maps with the Pyrenees, the Montes de Oca, Sierra de la Cogolla, Sierra de Alcaraz and Sierra Nevada. While other mountains - Montserrat, Moncayo, Sierra Piquera, Montes de Toledo and Sierra Morena- may appear with their name, only drawn, or not at all.

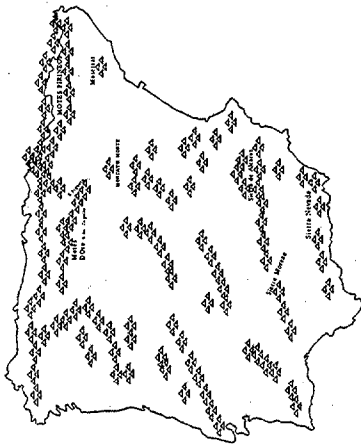
On the other hand, there are several range whose name does not appear, and are only represented as points on the maps, as in the cases of the: Cantabrian, Galician, Iberian, Central, Andalusian (Bético and Penibético) mountain ranges. It is worth stressing that the Catalan Massif does not appear as such on any of the maps, but Montserrat is represented in three of them.

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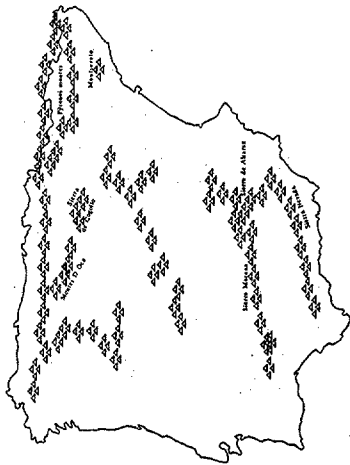
(1) COLOMER, Mn.I.M. (1992): *Cartografía Peninsular (s. VIII-XIX)*, Institut Cartogràfic de Catalunya, Barcelona.



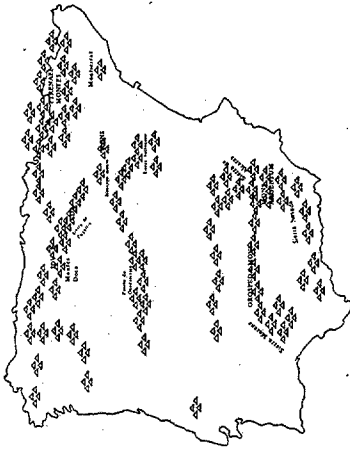
Map a: LIGORIO, F. (1559), "Nova Totius Hispaniae Descriptio", Romae.



Map b: ZENONI, D. (1560), "Hispaniae Descriptio", Venetijs.



Map c: Regni Hispaniae post omnium editiones locuplessima descriptio" in ORTELIUS, A. (1574): Theatrum Orbis Terrarum, C. Diesth, Anbers.



Map d: CLUSIUS, C. (1571), "Hispaniae Nova Descriptio" in SCHILDER, G. (1987), Monumenta Cartographica Neerlandica, Uitgeverij 'Canaleto'.

## 2.2. *Orientation and shape*

The orientation and shape given to certain mountain ranges is of considerable interest. The Pyrenees may appear as a semicircle facing France; in other maps the semicircle is not so pronounced and becomes an increasingly rectilinear ellipse. The maps drawn by Ortelio and Clusius show more clearly the existence of thicker central Pyrenees, facing the pre-Pyrenees. And in Ligorio's map, the Pyrenees are cut off at the ends, limiting their representation to central mountains.

The Iberian range does not appear as such; it can just be guessed at by the layout of the mountains drawn. The Galician chain is incorrectly oriented, whereas the orientation of both Andalusian spurs is extremely accurate. The Central range is fairly well oriented except in Ligorio's map, in which it appears intermittently, giving the impression of a series of independent mountains and not of a unique range.

Montserrat and Moncayo appear as isolated mountains. It is worth mentioning that in Clusius's map, Sierra de Balbanera is the name given to a spur situated behind the Moncayo; we can assume that the name comes from the monastery of Valvanera in the Sierra de San Lorenzo, near the Sierra de la Demanda.

Therefore, and in general terms, the large mountain chains are situated more or less in their right place, but at times their orientations are incorrect and there are small errors of position in the case of smaller ranges or sierras.

To draw the mountains, the cartographer uses more or less round shapes, some more conical (as in Ligorio's map). They are all lightly shaded, and in most of the maps the shading tends to the right, except in Ligorio's, where the shading tends to the left.

## 2.3. *Unification of criteria*

There are no specific criteria in the mappings; no distinction is made (size, length, thickness, shape, etc.) between sierras, mounts, coordilleras or mountain chains. Likewise, some ranges and not others appear, and some isolated mountains like Montserrat or Moncayo are included and not others, or the system to which they belong to is absent.

Neither is the size clear from the way the names are written, as in many cases a sierra or a mount stands out more than a cordillera.

#### 2.4. Toponymy

The following table compares the mountain ranges represented in each map:

LIGORIO	ZENOI	ORTELIO	CLUSIUS
Pireneo montes	MOTES PIRINEOS	Pÿrenei montes	PIRENAEI MONTES
Montes doca	MOTES DOCA	MONTES DOCA	Montes Doca
SIERA DE COGOLLO	SIERA DE COGOLLO	SIERRA DE COGOLLO	Sierra de Cogollio
S.Piquera	S.PIQUERA	--	--
Moncayo monte	MONCAYO MONTE	--	Moncayo monte
--	--	--	IDVBEDA MONS
--	--	--	S. balbanera
--	S. MORENA	S. Morena	S. Morena
s.de alcaraz	S.de alcaraz	S.DE ALCARAZ	S.de Alcaras
s. nevada	S. NEVADA	S. Nevada	S. Nevada
--	--	--	OROSPEDA MONS
--	--	--	MONS ARGENTUM
--	Monserato	Monserato	Montserrat

Certain letters of some place-names and of some titles of maps have undergone changes, due to the successive copies made of the same. Thus, instead of "montes" we read "motes", or "siera" instead of "sierra".

Most place-names are written in Spanish with the exception of those on the map by Carolus Clusius, who quotes some ranges as they were known in the Antiquity. A cordillera separating the Iberians from the Celtiberians was known as "Idubeda", and can be identified as the present Iberian range. A similar case occurs with Orospeđa Mons, which was the name given to a part of the sub-Andalusian range situated east of Alicante. Mons Argentum is also the name given to spurs near Murcia from which a precious mineral could be extracted.

### 3 Analysis of the relief mappings

A detailed examination of old maps helps us understand, as Barella<sup>2</sup> says, the way cartographers perceived the territory, and also to deduce the possible sources of information.

The topographic elements are represented by drawing the silhouette, and therefore using pictoric symbols of local application. Thus, the mapping system used to represent a large number of mountains consisted in more or less round shapes very close to each other. This typical way to represent relief was stressed by Fritz Nussbaum<sup>3</sup> in a study on the Pyrenees. These more or less round, and at times more pointed, shapes impose limitations on the representation by not expressing the height of the cordilleras.

These symbols are accompanied by a play of shadows or the use of a specific colour to make more or less contrasted mappings, and establish the decorative relevance of the mountains.

The maps by Carolus Clusius and Dominicus Zeno present a more mountainous

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(2) BARELLA, A. (1977): *La cartografía antigua y sus artifices*, C.S.I.C., Barcelona.

(3) NUSSBAUM, F. (1952): "Les Pyrénées dans l'ancienne cartographie selon la collection de cartes de la bibliothèque de la ville de Berne (Suisse)" at the First International Congress on the Pyrenees of the Instituto de Estudios Pirenaicos, Instituto de Estudios Pirenaicos, Zaragoza, vol. V, pp. 131-152.

Iberian Peninsula than the other two maps, in particular Ligorio's, which shows few mountains and these are mapped far apart, giving the impression of a scarcely irregular terrain.

The majority of mountain ranges or mounts were perceived as a hindrance for travelling. Thus the Pyrenees were mapped as a barrier; they are a frontier. The same impression of obstacle occurs in the case of the Central System, mainly in Clusius and Zenoi's maps.

Clusius emphasizes a mountain pass, the Puerto de Guadarrama, situated in the Central system. This pass played an important role in the communication lines uniting Madrid to Segovia or Avila.

There is also a certain relationship between the mountains and the most used routes of the time; thus, the sierras or mountains that were more visible from the roads were mapped, and were obliged passage points, as for example Montserrat.

#### 4 Conclusions

As shown by the maps selected, during the Renaissance mountains were mainly expressed by drawings, so their position and representation depended of the drawing skills and talent of the cartographer, and the maps generally have an overall harmony and uniformity that comes from not taking into account the heights of the mountains. In general, mountains were seen as a frontier, adapting to the drafting intentions of the map. The mountain is perceived according to its function: to separate countries, an obstacle to internal communication or displacements in general, or as a decorative element.

The most serious problem we come against in the mapping of mountains is that the cartographers copied and recopied from each other, trusting oral information transmitted by traders and travellers, etc., so the knowledge of the mapped territory came, in the majority of cases, from indirect sources. Therefore, the maps show a subjective vision of a person who depended on inaccurate information received from

third parties, and they are not objective renderings by scientific geographers, using accurate measurements and figures.

These XVI century maps are a clear example of the cartographic documents that were drawn at that time and which were not yet scientific documents, with the result being documents with political or commercial nuances.