



**The space perception of the relief of Europe
by contour lines: the remarkable work of J.-C. Houzeau,
edited in 1857**

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Abstract

The relief map of Europe by contour lines (hypsometrical curves) in a 1:5 000 000 scale is a monumental work produced by J.-C. Houzeau when he published his '*Histoire du sol de l'Europe*' (1857). Let us make clear that this work stands in the scientific and historical continuation of his '*Essai d'une géographie physique de la Belgique, au point de vue de l'histoire et de la description du globe*' (Tentative physical geography of Belgium, from the point of view of history and global description — 1854) and that it has established the author's scientific and literary reputation once and for all.

The hypsometrical map of Europe, the only one in this piece of work, is a genuine masterpiece: it involves the reduction of minutes worked out in a 1:1 000 000 scale. Houzeau notes (page 178): 'To take care in designing a new map of Europe was perhaps unnecessary as far as the coastlines were concerned. But it was certainly not the case for the location of the high points, the low height ridges in particular. Our sketch has been worked out in a 1:1 000 000 scale which offers a simple proportion between the map and the ground; one kilometre is represented by the length of one millimetre; we have put, according to their positions, the altitudes, and with the help of these figures, we have finally drawn the contour lines.'

It is these contour lines, worked out in a 1:1 000 000 scale, that were turned into a smaller 1:5 000 000 scale, with the aid of a pantograph. These bigger scale minute-maps were recently discovered in *Château de l'Ermitage* in Mons, where J.-C. Houzeau was born and used to live with his family.

This work by J.-C. Houzeau, carried out with the help of his brother Auguste, is a breathtaking achievement from a scientific and geographic point of view. J.-C. Houzeau made use of tens of thousands of altitudes obtained from the engineers-surveyors of the '*Ponts et Chaussées*' [roads and bridges] civil servants (if any) in the various countries concerned and the engineers-geographers of the military services, in charge of laying out the Ordnance Survey maps. More particularly, he used more than 12 000 barometrical marks! All the points that were used are positioned (in a 1:1 000 000 scale), in latitude and longitude, in one single frame which he created (conical projection with the Paris meridian as origin), involving thus an important number of conversions (the standard of the Greenwich meridian had not yet been established).

Let us make clear that the interval of the contour curves is 200 metres (the stroke of the curves which are multiples of 1000 metres is thicker). Moreover, many numbered points are clearly positioned for the indication of the location of the most geographically significant summits. Since this geographic exercise has been widely recognized, let us add that J.-C. Houzeau was particularly successful in toponomically describing the significant relief data (inter alia he very authoritatively describes the ridges). As far as the extension of the cartographic field is concerned, it is worth noting that Portugal and the western part of Spain were included in the representation (unlike in Berghaus' map).

On the contrary, J.-C. Houzeau deliberately leaves Russia and Scandinavia out of



the geographic representation field since 'the relief is low and not too much complicated. In Russia particularly, immense surfaces would have been crossed by one or two curves only'.

Nevertheless, the cartographic field of the representation is still considerable. In latitude, it extends from 35° to 56°; in longitude, from 16° west to 28° east, which presupposes that, on a 1:1 000 000 scale, the map would have been almost 2.5 metres high and more than 3 metres wide.

Let us also make clear that the hypsometrical map of Europe was printed, as usual, in one single colour (green, more or less dark according to the gradient of the heights).

On the other hand, two polychromic copies (handcoloured) were produced at that time thanks to the publisher of the '*Etablissement géographique de Bruxelles*' Philippe Vandermaelen. The '*Cartes et Plans*' section of the Royal Library of Belgium owns one copy. It is of course that copy which was selected for this exhibition.

We reproduce here an extract targeted at the Massif Central and the Alps (below in a 1:5 000 000 scale) as well as an extract from a handmade map (right, in a 1:1 000 000 scale), part of the same area. ◼



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