



River capture controlling changes in the drainage pattern and river slope

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The crystalline block of Les Guilleries, in the northeast of the Iberian Peninsula, is part of the Hercynian basement over which Palaeogene materials of the Ebro basin were deposited. This massif is affected by a family of basement fractures of NW-SE direction which continue under the Paleogene cover. This is evident in the areas of contact between the two units.

One of these areas affected by fractures was used by the primitive river Ter to transition, through a process of river capture, from the crystal unit Guilleries, with a rectangular drainage pattern, toward the sedimentary cover of the Ebro basin, with a meander drainage pattern. The fractured material that the river Ter used to deepen against the dip of the layers is more evident due to it being rigid and resistant to erosion, the Sandstones of Folgueroles Fm. The use of fractures resulted in a course of the river Ter that can be divided into three subparallel reaches with a shape of Z, which can be described as structural pseudomeanders.

The change in the drainage pattern of the river between its passage across the basement and the cover can never be the product of a process of antecedence or superimposition as has been proclaimed earlier. The rectangular pattern fits the structure of the crystalline massif. The meandering pattern on the cover is due to the difficulty of flowing through the Sandstones of Folgueroles Fm, and to the subsequent pressure loss affecting the current of the river that moves upstream beyond the Bellmunt Anticline. Up to the point where the pattern meander is conserved, river slope is below 1%. Upstream, the river slope increases significantly due to the adaptation of the river to a new layout.