# Evidences for relative sea-level fall, evaporite deposition and weathering of the source area across the Ovetian-Marianian transition (Lower Cambrian) in the northern Iberian Peninsula

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The varied and abundant relics of primary to early diagenetic evaporites (gypsum, anhydrite and halite) recorded in SW Europe across the OvetianMarianian transition (Liñán et al., 1993) demonstrate that extensive evaporitic conditions were locally associated with the evolution of Early Cambrian carbonate-dominant and mixed platforms on the western Gondwana margin (Alvaro et al., in press). As a result, the existence of an Early Cambrian southern Hemisphere arid belt can be envisaged in terms of widespread evaporites in the this margin of Gondwana. On the other side, this time span recorded in SW Europe sedimentary deposits related to regressive tendencies. We present below a brief description of the sedimentary features recorded across the Ovetian-Marianian transition in two distinct areas: the Iberian Chains (NE Spain) and the Cantabrian mountains (NW Spain).

In the Iberian Chains the late Ovetian-Marianian interval is represented by mixed (carbonate-siliciclastic) deposits, comprising the jalón and Ribota Formations. The jalón Formation (250-325 m thick) is composed of stromatolitic dolostones, sandstones and variegated shales deposited under shallow marine environments ranging from shallow subtidal into intertidal and supratidal which yield common halite pseudomorphs in muddy shales (Schmidt-Thomé, 1973). This formation is overlain by 30-120 m of dolostones and marls (Ribota Formation), which represent the establishment of shoals and subsequent development of back-shoal, peritidal deposits with scattered halite moulds, frequently submitted to subaerial conditions; by contrast, the distal shoal dolostones have yielded anhydrite/ gypsum pseudomorphs (Álvaro *et al., 1995).*

On the other side, the Ovetian-Marianian boundary of the Cantabrian Zone can be tentatively placed across the Herrería-Láncara transition. The upper member of the Herrería Formation (100-400 m thick), named Barrios beds by Lotze *(1961),* consists of sandstones and quartzites, conglomerates and green and purple shales, which contain Lower Cambrian trilobites (Sdzuy, *1961, 1971).* Sdzuy *(1971)* erected the Ovetian stage (Early Cambrian) on the basis of the trilobites recorded in the Barrios beds. One of the most representative sections, in the Barrios de Luna area, has been studied from different points of view, such as stratigraphy (Van den Bosch, *1969),* paleoichnology (Seilacher, *1970;* Crimes *et al., 1977)* and biostratigraphy based on acritarchs (Palacios and Vidal, 1992. *The* Barrios beds of the Barrios de Luna area represent sha11ow P1atform deposits, in which progradational delta sets were punctuated by intertidal sediments, and ochre-stained and red beds. The source of the red pigment is due to the presence of amorphous and microcrystalline goethite, which can represent *90%* of the whole rock. Silt and clay fractions in the Barrios red beds generally are more strongly stained by goethite than associated coarser sediments. This implies that the clay fraction in these sediments is derived from iron-oxide-rich soils formed generally in regions characterized by intense weathering. Source area weathering and subsequent oxidation of iron-rich clays are considered to be the origin of most of the ochre and red pigment in the shales and finegrained siltstones of several units found in the uppermost part of the Barrios beds. The lower member of the overlying Láncara Formation *(50-300* m thick) contains distinct facies rich in birdseyes, microbial laminites and oolitic grainstones containing dolomite rhombs, pseudomorphs after

calcium sulphate minerals, and scattered idiomorphic ,quartz interpreted as being characteristic of hypersaline conditions (Zamarreño, *1972;* Álvaro *et al.,*in press).

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