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A new model for the Hercynian Orogen of Gondwanan France and Iberia: discussion

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1. Introduction

The study by Shelley and Bossière (2000) is an important contribution to the discussion concerning the Ibero–Armorican arc (IAA) generation model. This model comes as one of a sequence of previous ideas already published in several papers (Bard, 1971; Matte and Ribeiro, 1975; Lefort and Ribeiro, 1980; Ribeiro et al., 1980; Burg et al., 1981; Brun and Burg, 1982; Julivert, 1987; Ribeiro et al., 1990; Dias and Ribeiro, 1995; Ribeiro et al., 1995; Silva, 1997). A common feature of the interpretations in these papers is the great importance attributed to two major transcurrent faults: the dextral Porto–Tomar shear zone (PTSZ) and the sinistral Tomar–Badajoz–Cordoba shear zone (BCSZ), to explain the extension of the Iberian structures into the Armorican Massif in the form of trace the arcuate shape of the IAA.

The large-scale migration, rotation and accretion of microplates controlled by oblique interactions have been a matter of controversy since researchers applied different kinematic models to reconstruct such global tectonic movements. For example, Badham (1982) interpreted the Hercynides as the result of dextral interaction between Europe and Africa and considered the arcuate geometry of the IAA as a secondary structure. In contrast, Matte (1986) compared the present example of the Himalayas with the structures of the IAA in terms of an indentation of crustal fragments, and proposed the progressive development of the symmetrical outward lateral escape of blocks in France and Iberia. In this model, the indentor migration caused opposing strike-slip movements on either side represented by the major transcurrent faults of the Armorican Massif and the Iberian Massif. This geometry and kinematics were considered to be syngenetic with the formation of the arcuate structure of the IAA. However, the main geologic lines linking these western European Hercynian massifs through major shear zones are still questionable (e.g. Lefort, 1989).

In this comment we believe that the regional approach regarding the transcurrent faults of Hercynian Iberia (BCSZ and PTSZ) cannot be considered to be well established. In the following text we will comment on significant omissions concerning available work of the last decade and also focus our discussion on field data and the structural interpretation of Hercynian Iberia (Portugal and Spain).

2. Age constraints of the geodynamic evolution of the BCSZ: an Hercynian sinistral transcurrent fault superposed on the Cadomian arc of Iberia

The presence of a sinistral transcurrent transpressional regime of deformation in the BCSZ during the Hercynian is a well established fact (Burg et al., 1981).

There are a number of reasons to think that the main fabric developed in the BCSZ is Eohercynian–Hercynian justaposed on an earlier Cadomian arc structure (Upper Proterozoic–Lower Cambrian) and that the PTSZ represents a later Hercynian transcurrent fault.

In order to re-evaluate their recently proposed model for the Hercynian Orogen of Gondwanan France and Iberia, Shelley and Bossière (2000) need to consider recent data presented in the last decade by Iberian geologists.

2.1. The BCSZ comprises several tectonometamorphic Hercynian units

Recent field data (Pereira, 1999) allowed a subdivision of the BCSZ into different tectonometamorphic units characterised by a well developed mylonitic S–L fabric with NW–SE trend and low-to-high-grade metamorphic conditions (Campo Maior unit migmatites give a protolith age of 465 ± 14 Ma and Carboniferous age for migmatization, 335 ± 14 Ma, SHRIMP U/Pb on zircons; Ordoñez-Casado,

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