

Large rotations of the internal Variscides (from the Armorican Massif to the Bohemian Massif) during the Carboniferous convergence. New paleomagnetic data from the Bohemian Massif

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Previous paleomagnetic investigations carried out on Late Devonian–Early Carboniferous plutonic, volcanic, metamorphic and sedimentary units of the Paleozoic massifs of western Europe have yielded very similar results: 1) at least 90 % of the investigated rocks have been remagnetized; 2) six prominent overprinting phases were identified, three in the Carboniferous, one in the Late Permian–Early Triassic, one in the Late Triassic–Early Jurassic, one in the Middle Jurassic. 3) The oldest magnetizations which are labelled Co, are partly primary and were acquired in the Late Visean, around 340 Ma (VGP: 28° N/46° E); 4) the Cp components (VGP: 40° S/70° E) correspond to overprints contemporaneous with the latest Visean tightening and uplift around 330 Ma; 5) the B components (VGP: 8° N/123° E) are the result of the major overprinting phase that lasted from 325 to 315 Ma, in relation with extension in the internal zone of the belt. 6) The A1 magnetizations were acquired in the Late Westphalian–Early Stephanian. Their directions are similar within the belt and on the Laurussian continent indicating that at that time the relative positions were nearly the same as presently. The subject of this study are the tectonic motions in the Carboniferous; the later magnetizations are not presented.

The Carboniferous results indicate the same geotectonic evolution of the Armorican Massif, the Massif Central, the Vosges–Black Forest, the Odenwald–Spessart, namely 1) latitudinal N–S

drift probably in relation to the subduction from 340 to 330 Ma, 2) large clockwise rotation by about 70° from 328 to 325 Ma, 3) additional clockwise rotation by 45° in the Late Namurian–Early Westphalian.

Visean dykes and calcalkaline plutonic rocks, very similar to the investigated rocks of the same age (350–340 Ma) from the Vosges and Massif Central, were sampled in the Central Bohemian Pluton (CBP), the Nasavrky complex and the Jeseniky mountains, close to the border with the Bruno–Vistulian terrane. The paleomagnetic record is again very similar to that of the massifs to the west of the belt. C components, B, A1 and later overprints were found. A preliminary C pole (31° S/55° E), intermediate to the Co and Cp poles from the western massifs, obtained from 6 sites of the CBP, demonstrates that the Bohemian Massif has undergone the same large rotations as the Western Europe Variscides. The occurrence of B components of Carboniferous age in all three areas, similar in direction to the results obtained by different authors on the Devonian sediment of the Bruno–Vistulian zone indicates that the latter magnetizations are not Devonian in age but are Middle Carboniferous overprints and invalidates their interpretation in terms of oroclinal bending (Tait et al. 1996). Around 340 Ma, the paleogeographic reconstruction based on the C directions and on the Early–Middle Carboniferous poles of Baltica locates the Variscan belt in the close vicinity of the Urals belt.