Contents

2. The basement and its cover

The Bohemian Massif (hereafter BM) is a roughly square-shaped morphological elevation, the subsided inner part of which is situated in the northern half. Denudation and erosion that imprinted the character of a denudation window on this clevation bordered by the arc of the Alps and Carpathians to the south and east, resp., have opened a view of the pre-Mesozoic, or rather pre-Upper Permian, of the continental crust of Central Europe. A ring of marginal mountains completes the morphological expression; their apices exceed 1000 m a.s.l. with the exception of the Nízký Jeseník and Drahany Highlands[1] to the east. Some highlands inside the massif attain heights between 800 and 950 m a.s.l. (Slavkovský les, Doupovské hory, České středohoří, Brdy Highlands, to the north and south of the Českomoravská vrchovina Highland). The surface descends from 500 to 300 m a.s.l. at the edge of the massif, and is even less than 200 m a.s.l. in the river valleys of the interior: the Danube River and its tributaries in the south, and the Labe (Elbe) and Odra rivers with their tributaries in the north. To the northwest, the massif is terminated by a long projection of the Thüringer Wald Highland up to the southern vicinity of the German town of Eisenach.

The basement rocks of the BM represent a section of the Central European part of the European Variscan orogen (Figure 2) and a small part of its foreland. The orogen itself is divided into the following generally linear tectonic units or belts between the Rhine area in the north and the Danube region to the south (F. E. Suess 1912a, 1926a, b; F. Kossmat 1927; H. Scholtz 1930; see also Dallmeyer et al. 1995)[2]:

RHENO-HERCYNIAN BELT

1. The Rhenohercynian Belt (Rhenohercynicum) contains exclusively Paleozoic rocks, mostly of Devonian and Lower Carboniferous ages. The belt is thrust over the foreland called the Brabant Massif and its eastern continuation toward the north and northwest. This autochthon is part of the dismembered paleocontinent Avalonia; it

[1] The term "highland" is attributed to hilly areas, the apices of which do not exceed 1000 m a.s.l., while the term "mountain" is used for areas with heights exceeding 1000 m a.s.l. This is a compromise between the Czech and English meanings of these terms.

[2] The last two reports of the Working Group for Regional Geological Classification of the BM at the former Czechoslovak Stratigraphic Commission (1992, 1994) proposed the following fundamental division of the Variscan basement in the territory of the Czech Republic: 1. The Moldanubian Region (Moldanubicum), 2. The Kutná Hora-Svratka Region, 3. The Central Bohemian Region (Bohemicum), 4. The Saxo-Thuringian Region (Saxothuringicum), 5. The Lusatian (West Sudetic) Region (Lugicum), and 6. The Moravo-Silesian Region (Moravosilesicum). These domains were considered to be distinct paleogeographic units, as terranes showing specific characteristics. However, many of these units, and their sub-units which are not mentioned here, are not defined sufficiently or even correctly (cf. Coney et al. 1980; Williams and Hatcher 1982). The members of the Working Group did not observe the principle of evolutionary conformity or analogy in defining the boundaries of these domains or units. In consequence, they sometimes linked distinct units together (Lugicum), or separated the basement from the overlying sequences of a single unit (Bohemicum, Brunovistulicum).

In a brief evaluation of the Czech version of the 1992 proposal, Suk (1994) pointed out the absence of a precise definition of the BM as a fundamental issue related to all its divisions. This problem most likely stems from the idea frequently reported in Czech studies (cf. Suk et al. 1984; and unfortunately also Chlupáč et al. 2002, p. 13), that the massif is an independent Variscan structure, which is completely false.

was squeezed between the then-accreting Laurussia to the north and Gondwana to the south during the Silurian before becoming amalgamated with Laurussia. Rocks dragged from the margin of the foreland (autochthon) occupy the deepest position, while those from the interior of the sedimentary basin, which long preserved their oceanic nature, are situated on top of the sequence of nappes and nappe slices. Traces of HP/LT metamorphism and scarce Ordovician microfossils are preserved in the rocks that form a narrow zone along the southern edge of the belt called the Northern Phyllite Zone (nördliche phyllitische Zone). Granitoid intrusions are extremely rare, occurring in the southern quarter of the belt, which is situated outside the BM.

MID-GERMAN CRYSTALLINE BELT

2. The Mid-German Crystalline Belt (Mitteldeutsche Krystallinschwelle: Scholtz 1930) consists of numerous units or blocks of various natures. Some of these contain medium- to high-grade metamorphic rocks with unknown protolith ages; others comprise low- to very low-grade metamorphic rocks, probably of Neoproterozoic or Cambrian to Silurian age (Weber 1995; Hirschmann 1995; Bankwitz and Bankwitz 1998). The Variscan and pre-Variscan granitoids are relatively abundant. The belt is exposed in only a few small inliers, one of which, the Ruhla Crystalline Complex, is located at the top of the projection of the Thüringer Wald Highland in the BM (Chapter 3.1). An area of low-grade metamorphic rocks called the Southern Phyllite Zone partly borders the Mid-German Crystalline Belt along its southern side (Bankwitz and Bankwitz 1998). This zone is considered by some to be part of the Saxo-Thuringian Belt, described below.

SAXO-THURINGIAN BELT

3. Research conducted since the 1990s has shown **the Saxo-Thuringian Belt** (Saxothuringicum) to consist of a complex system of nappes. These are composed of non metamorphosed to low-grade metamorphic Paleozoic rocks (hereafter STP = Saxo-Thuringian Paleozoic) in its northern part, which are locally superimposed by klippen consisting of very low- to high-grade metamorphic rocks. Nappes of low- to high-grade metamorphic rocks overlying high-grade metamorphic rocks of a parautochthonous unit are found in its southern part (Chapter 3.2) (hereafter KSCC = Krušné hory-Smrčiny Crystalline Complex). An antiform of the Saxon granulite body and its metamorphic envelope emerges from under the STP within its megasynclinorium.

MARIÁNSKÉ LÁZNĚ SUTURE BELT

4. The narrow **Mariánské Lázně Suture Belt** separates the Saxo-Thuringian and Barrandian-Armorican belts. It largely contains metamorphic basic and ultrabasic rocks (Chapter 3.3). This belt is a dismembered and metamorphosed ophiolite[3], that was brought to the present surface level along with rocks of another provenance (Štědrá 2001, 2003; Štědrá et al. 2002). The topmost thrust gneiss slice of the Münchberg Klippe in the previous belt, the "Hangendserie", seems to be an equivalent of the Mariánské Lázně Complex, the most important member of the suture belt (O'Brien 1991, Chapter 3.2).

BARRANDIAN-ARMORICAN BELT

5. The Barrandian-Armorican Belt consists of crustal blocks that consolidated during the Cadomian orogeny. The southern side of these blocks borders on the Moldanubicum or South Armorican Belt in France (Zoubek V. 1988a; Edel and Weber 1995). In an extensive handbook dealing with the Precambrian rocks of European Pale-

[3] One of the reviewers of the present text (V. Kachlík) brought a serious problem to the author's attention, concerning the difference between obducted, nonmetamorphosed or only slightly metamorphosed ophiolites, and assemblages of high-grade, often HP to UHP metamorphic basic and ultrabasic rocks that were dragged into a subduction zone, both of which are generally described as ophiolites (even in the present study). This problem deserves a thorough analysis beyond the scope of the present work.