the Kapp Starostin Formation (Hovtinden Member, brachiopod cherty limestone with conglomerate at base, Kazanian). The hiatus is longest (Artinskian – Kungurian) at Hornsund, shortening and eventually disappearing northward, in Torell Land. It was a result of block–faulting and uplift along the eastern flank of the Hornsund High. This block, built principally of folded Ordovician, Cambrian and Proterozoic rocks of the Caledonian orogen, was first uplifted and subjected to deep erosion and planation already during the Svalbardian phase (Late Devonian), then it was covered by Lower Carboniferous clastics, lifted up again, eroded and planated once more during the Adriabukta phase (Mid–Carboniferous), and repeatedly warped during the Upper Carboniferous and Lower Permian (Asturic and Saalic phases, respectively). From its active eastern flank, built by the Devonian rocks, and from its Lower Carboniferous cover, were derived a major part of clastics supplied to the Mid–Carboniferous through Lower Permian Hyrnefjellet and Treskelodden formations (Birkenmajer, 1984a, b). The Hornsund High block lowered as a result of regional tension and was covered by short–lived Late Permian marine transgression (Kapp Starostin Formation, Hovtinden Member, Kazanian). Then it was lifted up again at the Permian/Triassic boundary (sedimentary break) to subside again at the onset of the Early Triassic marine transgression (Vardebukta Formation, Birkenmajer, 1977).

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STRUCTURAL SUCCESSIONS IN THE SAXOTHURINGIAN ZONE OF THE HERCYNIAN OROGENIC BELT: A BASIS FOR A MODEL OF GEOTECTONIC EVOLUTION

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Features indicative of an extensive polyphase deformational sequence and of polyphase metamorphism that are consistently displayed in the metamorphic rocks of the Bohemian Massif provide a structural basis for establishing a model for the geotectonic evolution of the Hercznian orogenic belt in Central Europe as well as for testing other models based largely on the distribution of litho–stratigraphic and tectonostratigraphic units. In the Saxothuringian zone of the southern Fichtelgebirge mutual relationships of structures seen at outcrop in interbanded pelitic – semipelitic – psammitic assemblages (e.g. at Cheb) form the basis for establishing structural successions using folded folds and folded schistosities – cleavages – lineations whose geometrical and time relations to the various fold sets are evident. The various local structural successions can be integrated into a regionally applicable deformational sequence of successive phases of fold formation to which phases of metamorphic reconstitution and neosome emplacement can be linked.

Corresponding, but differently expressed, sets of successively–formed folds are shown in the much more competent quartzites and psammitic schists of Vysoký Kámen adjacent to the border of the Czech Republic with Germany 7.5 km WSW of Kraslice. The mutual relationships of observed structures permit the erection not only of a structural succession of fold formation, but also of a suc–

cession of phases of translation – slip – transposition. In addition their relative timing can be linked into the timing of the various fold phases and the resultant local structural succession can be integrated into a deformational sequence applicable to the crystalline rocks throughout the southern Fichtelgebirge tectonic domain (Bowes et al., 1993).

Two early phases of mainly tight–isoclinal folds associated with medium–pressure (Barrovian-type) metamorphism and planar and linear mineral growth (particularly muscovite) are separated by SW–directed translation. Further translation this time N–directed, followed. It, in turn, was succeeded by slip folding and then by two sets of recumbent folds that deform the dominant metamorphic fabric. Asymmetry of some of these structures is indicative of potential associated WSW translation. Then SW–directed translation, followed by NNE–directed translation, took place with the subsequent formation of open to close folds with associated quartz gash veins. At least four sets of upright, open folds, with related weak cleavages, were formed late in the sequence as was the locally prominent low pressure (andalusite) metamorphic overprint. The last–formed structures that have been observed (excluding joints) indicate potential N–directed translation.

This regionally applicable deformational sequence determined from structures observed at outcrop integrates phases of fold and thrust development and permits a relative chronology of events to be established with confidence. With the addition of information relating to attitudes and orientations of the many fold sets to the information about the directions of movements during the many phases of translation – slip – transposition, the successively–formed stress systems operative in this part of the Hercynian orogenic belt can be established. The addition of (i) changes in P – T – depth – thermal gradient conditions provided by the integration of metamorphic mineral growths into the deformational sequence, and (ii) time constraints from studies of isotopic systems also integrated into the sequence, means that a very large multiparameter set of observed structural features can form the basis for a model to account for the extensive geotectonic evolution of at least part of this orogenic belt. Models based on structures inferred from distribution of lithologies, and on a much smaller data base, require reassessment in the light of the new and different kind of information now available.

Comparison of deformational sequences in different parts of the Bohemian Massif, and establishment of tectonic domains, form the basis for integrating the geotectonic evolution of other parts of the Hercynian orogenic belt with that revealed by the demonstration of such an extensive deformational sequence in the Saxothuringian zone. In this way the relative times of juxtaposing of different parts of the orogen including different cover units and different parts of basement (cf. Hopgood & Bowes, 1987; Bowes et al., 1992), can be established. Conversion of the determined relative chronology to an absolute chronology, and comparison with the timing of polydeformational and polymetamorphic histories and of multiple phases of igneous intrusion in other parts of the orogen, is dependent on the integration of structural and isotopic studies such as those carried out (e.g. van Breemen et al., 1982 ; Bowes & Aftalion,1991; Košler et al., 1993), and now in progress, in the Czech Republic and elsewhere.

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