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Comments on facies development and stratigraphy of the Devonian, Barrandian area, Czech Republic

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Abstract: The Devonian of the Barrandian area is characterized mainly from the viewpoint of facies development. Several types of facies changes are shown to occur, some of them within a few dozens of metres, some other within a distance of several kilometres. Even though the basin has been shortened during the Variscan orogeny, the distinct lateral changes in limestone composition are surprising. Micritic limestones pass often more or less abruptly or gradually into predominantly bioclastic limestones. Platy limestones with shale intercalations pass into crinoidal bioclastic limestones. The attempts to explain such rapid facies changes by tectonics, or even by nappe structures, is needless because many examples show that they can be explained by variations in depositional environments and sedimentary mechanisms. The specific and more or less isolated Koněprusy area with its special lithological and stratigraphic development represents a serious problem. However, it can be shown that its isolation is not absolute and many stratigraphic and facies analogues can be found in near and more distant sections. The plausibility of paleogeographical reconstruction of the Devonian basin in central Bohemia is also discussed. It is documented that small relics of Devonian rocks do not allow reliable paleogeographic reconstruction and that the occurrences of Devonian rocks outside the limits of the Barrandian area indicate a presence of large marine basin with a broad gateway to the ocean. Even though shallow-water sedimentation prevailed during the Devonian, there is no indication of the presence of a coast and/or a shoreline. The main facies boundaries in the Barrandian Devonian are oblique to the strikes of Variscan structures. However, the course of the Devonian facies boundaries conforms with the strikes of structures associated with tensional regime in the Barrandian Upper Cambrian. The attached list of significant Devonian localities summarizes 72 sections and outcrops on which the Devonian stratigraphy is based.

Key words: Devonian, Barrandian area, stratigraphy, lithology, facies, paleogeography, Variscan tectonics

Introduction

Although the Devonian rocks of the Barrandian area in central Bohemia became world-famous since the classic works of J. Barrande (1852–1887) and succeeding generations, their importance for modern stratigraphy was markedly increasing during the latter half of the 20th century – the time of rapidly evolving attempts to rejuvenate stratigraphic principles on international scale, thus making way for the application of new methods in stratigraphy.

This is reflected, for example, in the now generally accepted principle of stratotypes of global chronostratigraphic units (GSSP), for which the Barrandian became the first testing area (the Silurian/Devonian boundary internationally standardized in 1972). Also some other Devonian chronostratigraphic units, either officially accepted as global standards (Lochkovian, Pragian) or widely used in international correlations (Zlíchovian, Dalejan), have their stratotypes or reference sections in this area.

A similar situation exists with the recently evolving methods in stratigraphic geology, such as ecostratigraphy, cyclostratigraphy, magnetostratigraphy and event stratigraphy which can be also easily applied in the Barrandian (as example, several Devonian global events bear names derived from Barrandian units). Modern geological mapping, making use of many boreholes, test trenches and pits, and detailed investigation of stratigraphically significant sections, started in the 1950s and continues until these days. Specific data on individual sections, however, are dispersed in many Czech and foreign papers, often not easily accessible. This is why a general overview of facies development, reference to principal field documentation and brief discussion of some problems became topical. The main purpose of this paper is to help in understanding the present state of stratigraphic investigations and ideas. As these should be based principally on a detailed field work – the basis for subsequent laboratory studies – a list of most important outcrops and localities with data on their present stratigraphic assignment, and their modern status, is included.

The present author gathered the data during fifty years of work in the Barrandian area, often with the help of his collaborators, among whom particularly Pavel Lukeš should be named. General characteristics of the Devonian units and their fossils were summarized mainly in the monographs on the Barrandian Palaeozoic (Chlupáč et al. 1992 – Czech version, 1998 – updated English version) and also in shorter reviews by Chlupáč (1988, 1993, 2000).

Comments to the presented facies schemes

The Devonian of the Barrandian area can be characterized by the following general features:

1. Continuous, predominantly carbonate sedimentation from the Silurian up to the Middle Devonian (Eifelian).

This is the last work of Prof. Ivo Chlupáč. Unfortunately, he had no chance of completing it and putting the finishing touches to the manuscript. This is why the handling editor reviewed it, attached an abstract, the list of references, rearranged a list of localities and made some formal improvements in the text. The author's views and conceptions, however, have not been affected at all by these steps.

2. Rich facies differentiation within the carbonate complexes embracing transitions from basinal micritic and anoxic environments to extremely shallow-water reefal development.

3. The facies differences are associated with clearly observable changes in fossil assemblages, represented by rich benthic, nektonic and planktonic forms, which enables a correlation by means of different methods of biozonation.

4. Well traceable global and/or regional events in different parts of the stratigraphic section.

5. Clearly expressed cyclicity of different scales (high-order cyclicity expressed by repeated lithofacies of individual formations, high-frequency cyclicity expressed by more or less regular alternation of several types of sediments).

6. Abrupt onset of siliciclastic lithofacies close to the base of the Givetian as a signal of starting Variscan orogeny.

The published facies schemes are based mainly on the study of specific sections measured by the author and his colleagues between 1952 and 1998. More than 120 sections were measured and some of them published. They were complemented by 200–300 boreholes drilled for economic purposes.

Results of the official geological mapping carried out chiefly by J. Svoboda and F. Prantl in 1949 and 1956, later revised and updated by the present author, were published as maps 1 : 25,000, although their accuracy often corresponds to scale 1 : 10,000, and moreover, in some economically important areas even to scale 1 : 5000. The whole Devonian area is covered by the Basic Geological Map of the Czech Republic 1 : 25,000, sheets 12-243 Praha-sever (Králík ed. 1983), 12-401 Praha-jih (Cháb ed. 1990), 12-4012 Rudná (Kovanda ed. 1984), 12-414 Černošice (Havlíček ed. 1987) and 12-413 Králův Dvůr (Chlupáč ed. 1989). These maps show basic lithostratigraphic units, i.e., the formations, and only in some cases also important members, mappable to this scale. The published schemes try, in contrast to the official maps, to illustrate all members, mappable to a larger scale, e.g. 1 : 10,000, to show their mutual relationships and their transitions. Longitudinal cross sections striking NE–SW are drawn in real topographic proportions. Transverse sections striking NW–SE double the real distance between the sections, permitting the more widely spaced sections to show their original position in the basin before its shortening during the compressional phase of the Variscan orogeny.

Some topical stratigraphic problems

The character of facies changes and the role of tectonics

Devonian rocks of the Barrandian area can be characterized by common transitions between different facies, mainly between bioclastic and micritic limestones. Such facies changes are generally explained by transitions between depositional environments, mainly depth changes. Lateral changes within the individual stratigraphic formations are generally gradual, but the distance between two defined facies may differ substantially, being traceable at a distance of several metres to kilometres.

A typical example of a very slow and gradual lateral transition is that of the Lochkov Formation: The Radotín Limestone (dark, fine-grained limestone with interbeds of calcareous shales) passes across the transitional “Kosoř Limestone” (lighter and somewhat coarser-grained limestone with rare shale interbeds) into the Kotýs Limestone which is markedly lighter and coarser-grained, without shale interbeds, and can be classified as crinoidal bioclastic limestone. However, the lateral and also vertical transitions are so gradual that the Kosoř Limestone is not mappable as a separate member and represents a typical intermediate type between the Radotín and Kotýs facies. Such lithological changes manifest themselves also in the faunal content and fauna preservation (Chlupáč 1953, 1983, etc). The environmental system can be characterized as zones of basinal, stagnant, partly anoxic deeper-water facies of the Radotín Limestone passing into shallow-water oxic Kotýs Limestone facies.

Another example of gradual lateral transitions can be observed in the Zlíchov Formation, especially in the distribution of the so-called Kaplička (Chapel) Member. Limestone breccia with coarse bioclastic limestone passes into platy micritic limestones within a distance of several kilometres. First, fine-grained interbeds increase in their thickness and finally the whole sequence consists of micritic limestones (Chlupáč 1957, 1993, Chlupáč et al. 1998).

The third example of gradual facies change of kilometre-scale can be seen in the Choteč Formation (Eifelian), where such transition resembles that described from the Lochkov Formation (Chlupáč 1959, 1998, 2000). Gradual lightening of limestones follows their coarsening in the southwestward direction.

All these mentioned gradual lateral changes are associated with corresponding faunal change. The described stratigraphic system with the respective formations and members is agreed upon and generally accepted by many authors, even though the interpretation of the depositional mechanism may be different. Lithological changes are explained either by bathymetric phenomena associated with wave and bottom traction current mechanism (Kukal 1964), or by the action of turbidity currents (Hladil et al. 1996, Čáp et al. in print).

By contrast, some lateral lithological changes occur within a short distance, occasionally forming even more or less sharp boundaries. A typical example of this is the relation between the bioclastic Koněprusy and Slivenec limestones on one side and the micritic Dvorce-Prokop Limestone on the other side, all belonging to the Praha Formation (Pragian in its original sense). Earlier, light bioclastic limestones (Barrande’s *bande f2*) were thought to be older than the micritic units. A detailed study of the sections, their faunas, and the onset of new biostratigraphic zonations (tentaculites, conodonts, etc) later justified a completely different view: their complicated relations and general contemporaneity (Chlupáč 1957, 1988, Čáp et al. in print). Anyhow, the problem of lateral transitions in the Praha Formation still exists: does the lateral transition from bioclastic limestones (particularly the Loděnice, Řeporyje and Dvorce-Prokop limestones) embrace only the lower part of the Praha Formation, or its whole section? The bioclastic limestones generally dominate in the lower part of the sections and their amount decreases upward with the transgressive trend during the Pragian. The question of complete or partial lateral facies change can be solved by a detailed study of the onset of sedimentation after a stratigraphic break above the Koněprusy Reef Complex (see discussion on page 302).

Rapid and distinct facies changes were recently discussed in relation to tectonics, especially the rejuvenation of the idea of a nappe structure in the central part of the Barrandian area (Melichar and Hladil 1999, Chlupáč 1999). In this case we find the distance within which a facies change takes place to be the crucial problem. In the author's view, much evidence exists of distinct lateral changes within a distance of several hundreds or even dozens of metres.

A demonstrable example is the lateral transition between the white, richly fossiliferous Koněprusy Limestone and the rose-coloured, bioclastic and biomicritic Vinařice Limestone. This transition is well exposed in the northern face of the Plešivec Quarry in the Koněprusy area, where it can be traced at a distance of around 200 metres (see Chlupáč 1998).

A similar example is the development of the Slivenec Limestone in the lower part of the Praha Formation in the vicinity of the quarries of Cikánka and Hvížďalka in the Radotín Valley on the southwestern periphery of Prague. In the Cikánka Quarry, reddish bioclastic crinoidal Slivenec Limestone attains the thickness of 6–12 metres (Svoboda and Prantl 1950, Chlupáč et al. 1985), while further southwest its thickness decreases until it fully disappears within the lowermost part of the grey Dvorce-Prokop Limestone, somewhat enriched in crinoid hash. As observed by the author during subsequent phases of quarrying in the nearby Hvížďalka Quarry between 1952 and 1990, the transition between these clearly different facies could be traced at a distance of about 300 metres.

Almost the same phenomenon can be observed in natural outcrops east of the Cikánka Quarry, as reported and mapped by Svoboda and Prantl (1950) and documented by the present author (unpublished Thesis). Very similar is the facies change from the bioclastic to prevalently micritic facies documented at Karlštejn (Javorka, as described by Chlupáč 1955).

Very rapid transition from the multicoloured biomicritic Loděnice Limestone to the grey platy Dvorce-Prokop Limestone, over a distance of mere 6 to 10 metres, was exposed on the right bank of the Berounka River near Srbsko (Chlupáč 1957, fig. 5).

Facies changes of substantial parts of formations or even whole formations not directly exposed in continuous large outcrops but clearly revealed by detailed mapping, small outcrops and drillcores are exemplified by the transition of the Koněprusy Reef Complex into the basinal Dvorce-Prokop Limestone over a distance of 3 to 4 kilometres between Zlatý Kůň and Šamor (Chlupáč 1998). Also the facies change between the Radotín and Kotýs limestones within the Lochkov Formation can take place over a distance of only 1.5 km, as evidenced by the Lower Lochkovian at Kotýz and Koukolova hora Hill (Chlupáč et al. 1972 and geological map 12-413 Králův Dvůr).

To sum up, the Devonian rocks of the Barrandian area offer typical examples of both very gradual lateral changes within carbonate facies and also rapid and distinct lateral changes over short distances. Such changes reflect the dynamic depositional environment, rapidly changing current systems, deposition on submarine slopes, etc.

In spite of this, Variscan tectonic processes could have resulted in closer contacts of block with different facies developments. This holds for the well known Koda Overthrust at Srbsko which reduced the distance between blocks particularly differing in the thickness of the Praha Formation and in the development of the basal Zlíchov Formation (sections to the north and south of Srbsko, Chlupáč 1957, 1988, 1993, Chlupáč and Lukeš 1999). Similar effects could have been produced also by some Variscan normal faults, e.g., the large transverse fault striking NW–SE at Koda, the Tobolka Fault striking N–S NE of Beroun, etc. Less distinct differences in the limestone composition and unit thickness in the two juxtaposed blocks can be explained by vertical movements combined with horizontal displacement, i.e., by strike-slip faults of Variscan age, which commonly affected even the Givetian strata.

Except of the synsedimentary tectonics evidenced in the Koněprusy area and related to the uplift of this area [locally tilted and eroded blocks and repeatedly formed and refilled neptunian dykes, as described by Chlupáč (1957, 1996), Hladil (1995) etc.], no facies "disjunctions" need to be explained by synsedimentary faults as presumed for the Silurian strata by Kříž (1991, 1998, etc). Explanation of the facies changes by a nappe tectonic structure, as proposed by Melichar and Hladil (1999), is quite useless. The tectonic style of asymmetrical folds, few overthrusts and numerous younger normal and strike-slip faults, recognized already in the 19th century and later by R. Kettner, O. Kodym and others, and illustrated in the papers by Svoboda and Prantl (1948–1958), Havlíček (1981) and in geological maps 1 : 25,000 fits well the results of stratigraphic studies.

Spatial distribution of facies

It is generally known that the Silurian shallow-water facies concentrated to areas of volcanic centres on the NW flank of the Barrandian "syncline" and further SE are gradually replaced by various shale (to black shale) facies (Bouček 1934, particularly Horný 1955, 1962, Havlíček and Štorch 1990, Kříž 1991, etc). The small thickness of the Přídolí and Lochkov formations in the area of the Silurian Svatý Jan Volcanic Centre is conditioned by the presence of this volcanic centre. At Svatý Jan pod Skalou, the Přídolí (Požáry) Formation is around 20 m thick and the thickness of the Lochkov Formation does not exceed 40 m, whereas at Srbsko and Karlštejn, the Přídolí Formation is around 40–50 m thick and the Lochkov Formation as much as 100 m thick. The changes in the facies development and thickness are accompanied by corresponding changes in fauna with distinctly dominant shallow-water benthos (crinoids, brachiopods) in the NW and basinal character (graptolite shale interbeds) in the SE (Horný 1955, Havlíček and Štorch 1990, Kříž 1991, etc. for Přídolí, Chlupáč 1953, 1998, Chlupáč et al. 1972 for the Lochkovian).

A similar pattern of facies distribution, i.e., the decreasing thickness towards the NW accompanied by increasing amount of shallow-water (bioclastic, crinoidal) limestones, is displayed by even younger Devonian formations or their parts: the Praha and Daleje-Třebotov formations, and the uppermost part of the Zlíchov Formation (Chlupáč 1957, 1959, 1998). The influence of the former Silurian volcanic elevations is hardly responsible for this persisting and recurrent facies distribution – so more that some younger formations lack this trend at all, such as a major part of the Zlíchov Formation, the Choteč Formation and the Srbsko Formation. All this calls for some alternative explanation. The most probable explanation seems to be the contrasting stability of the NW and SE parts of the basin. The continental crust could have subsided more intensively in the SE part of the basin. This recurrent pattern, however, does not hold, or holds only partly, for the development of older Barrandian formations: while the Lower Silurian (particularly Llandovery) and the Upper Ordovician do not support this explanation due to their facies uniformity, and the Lower Ordovician rather fits the model of a linear depression of a graben type as presented by Havlíček (1980, 1981), the presumed distribution of Cambrian sediments and the Vendian Štěchovice Group could indicate a similar trend of more intensive subsidence in the SE during the Cambrian and the latest Proterozoic. This interpretation, however, has some weak points, such as the fact that the effects of the Cadomian orogeny are not fully resolved yet. Processes during the Vendian and Early Cambrian, and the large break in the Late Cambrian, were clearly connected with phases of intense erosion and paleogeographic changes.

Summarizing the spatial distribution of facies in the remaining Devonian sediments in the central part of the Barrandian area, it is remarkable that the main changes of facies do not correspond to the pattern of Variscan deformations, but are oriented oblique to their strike (Chlupáč 1957). This concerns especially the longitudinal fold axes and overthrusts, with a typical example of this being the Koda Overthrust. The present author cannot therefore accept the effect of Variscan synsedimentary tectonics on the facies diversity of Devonian sediments, even though it was applied for the Silurian by Kříž (1991, 1998, etc.). The less acceptable is then the speculative model of nappe tectonics presented by Melichar and Hladil (1999).

The courses of facies boundaries in the Devonian approach the strike of some structures connected with tensional regime in the Late Cambrian (the Křivoklát-Rokycany Volcanic Complex), or in the Ordovician (the Komárov Volcanic Complex). Significance of these structures, which could reflect the strike of deep-seated pre-Variscan faults, was stressed by Röhlich and Šťovíčková (1968) already.

Peculiarities of the Devonian sediments at Koněprusy: hiatuses and their significance

Within the Barrandian Devonian, the Koněprusy area exhibits many peculiarities which have been causing problems since the earliest investigations in the 19th century. They deeply influenced the international Devonian correlations, and remain topical until these days (for a recent list of references see Hladil 1995, 2000, Chlupáč 1998). The most characteristic feature of the Koněprusy area is the existence of the Lower Devonian (Pragian) reef complex with extremely rich fauna, and the influence of the reefal elevation on the development of younger, overlying formations. The Koněprusy Reef Complex is exceptional in many aspects and has only very few, not so thoroughly investigated analogues in the world, e.g., in the Carnic Alps, Arctic Canada or Ural Mts.

In this contribution, only a few selected topics – subjects of current discussion are dealt with, such as the demonstrable hiatuses and their significance.

1. The first clear break caused the erosion of the higher part of the Lochkov Formation below the Pragian reef complex, as discussed by Hladil (1995, 1997), Hladil and Slavík (1997) and Chlupáč (1998). This break is obviously a very local phenomenon only, limited to uplifted and tilted blocks of the Lochkovian limestones exposed to Pragian erosion. These blocks were observed only during quarrying in the northern part of the Čertovy Schody-West Quarry. Localized extent of this break and submarine erosion is demonstrated by its distance of only 500 m from the cliffs at Kotýs, where a conformity has been observed between the Lochkov and Praha formations at several places, e.g., near the "U tří volů" Cave (Chlupáč 1953). However, local beds of sedimentary breccia at the base of the Vinařice Limestone or near this base, with clasts of the Kotýs and Vinařice limestones, point to submarine erosion of the Upper Lochkovian and Lower Pragian strata in the close vicinity already during the Lower Pragian sedimentation.

A conformity is developed between the Lochkov Formation and the well documented base of the Praha Formation in all outcrops along the southern margin of the Koněprusy area, e.g., in the quarries at Homolák, Oujezdce and other sites NW of Vinařice (Chlupáč 1953, Chlupáč et al. 1985, Svoboda and Prantl 1949).

2. The break and erosion above the Pragian reef complex, i.e., between the Koněprusy (Pragian) and Suchomasty (latest Zlíchovian to basal Eifelian) limestones are

typical for the Koněprusy area. This feature was described by the present author (Chlupáč 1955), updated and re-evaluated in 1956 and 1957, and later confirmed by conodont and tentaculite zonations by Klapper et al. (1978) and Chlupáč et al. (1979). However, the question remains, what thickness of the underlying Koněprusy Limestone was eroded.

This question is not simple to resolve, as in the remaining part of the Barrandian area the upper and topmost Pragian is developed in the facies of micritic Dvorce--Prokop Limestone whose macrofauna – due to paleoecological conditions – distinctly differs from that of the reefal Koněprusy Limestone. Another problem lies in the fact that only a few fossils suitable for zonation in so much differing facies are known to exist. Among them, conodonts and tentaculites are promising. The Upper Pragian outside of the Koněprusy area is marked by the onset of the tentaculite genus *Guerichina* which, regrettably, was not found in the Koněprusy Limestone so far, though it was looked for by Pavel Lukeš and the present author at several sections close below the sharp boundary between the Koněprusy and Suchomasty limestones. Dacryoconarid tentaculites from the upper, but not uppermost, part of the Koněprusy Limestone, found in the Holubův Quarry and other places of the Koněprusy area yielded only *Nowakia acuaria acuaria* which is good indicator for the Pragian, but does not allow to distinguish its upper and/or uppermost parts from the older ones. The absence of the Pragian tentaculites can be explained, e.g., by the idea that the upper Pragian, in its original sense, was eroded. However, the uppermost part of the Koněprusy Limestone exposed at Zlatý Kůň, Voskop and other localities, is developed in the facies of coarse-grained bioclastic crinoidal limestone with corals. Its depositional environment was not suitable for the life and preservation of tentaculites, and yielded no remains of tentaculites yet. So, paleoecological and/or taphonomic factors could have been responsible for the absence of tentaculites.

It can be concluded that the hiatus between the Koněprusy and Suchomasty limestones, marked by the erosion of lithified basement, the formation of numerous neptunian dykes, an abrupt change in limestone composition and profound and drastic faunal differences, demonstrating the absence of almost the whole Zlíchovian except of the Nowakia (N.) elegans Zone, and yet undefined upper part of the Pragian, is the most characteristic break in deposition of the Koněprusy Devonian.

3. Chlupáč (1960) presumed that the Kačák Shale is not represented in the Koněprusy area and that it was eroded during the break connected with the Givetian transgression of the Roblín Member of the Srbsko Formation. By contrast, Hladil et al. (1991), Hladil (1993), Hladil and Kalvoda (1993) and Galle (1994) presumed that the Kačák Shale is present in the Koněprusy area, namely in the Jirásek Quarry between Zlatý Kůň and Zadní Kobyla hills, being represented by an 80 cm thick interval of dark grey bedded bituminous limestone within the uppermost part of the limestones now ranged with the Acanthopyge Limestone of the Eifelian age. According to the above mentioned authors, the dark limestone interval reflects the effect of the Kačák Event in this carbonate section. This concept was supported by finds of tentaculites allied to *Nowakia otomari*, the index fossil of the Srbsko Formation, and younger rugose corals and conodonts belonging to the Polygnathus ensensis Zone. However, the problem is not so clear and remains open: dark shales similar to the Kačák Shale were found in fillings of some neptunian dykes cutting the Koněprusy Limestone in the Čertovy Schody-West and Čertovy Schody-East quarries (Chlupáč 1996). This speaks against the idea that the dark limestone interval in the Jirásek Quarry represents the whole Kačák Shale. Moreover, Hladil and Slavík (1997) reported conodonts of Givetian aspect from dark shales, presumably fillings of the Eifelian paleokarst. These finds indicate that also the shales of the Kačák type developed in the Koněprusy area after the onset of the global Kačák Event and that the problem of the absence or presence of an equivalent of the Kačák Shale in the Koněprusy area is not clear.

4. Another sharp boundary related to the distinct erosion of the underlying beds and evidencing a hiatus is exposed on the upper level of the former Herget Quarry at Zlatý Kůň near Koněprusy. Calcareous sandstones and siltstones sharply and unconformably overlie the Suchomasty Limestone here. The stratigraphical assignment of this relic situated close to the Očkov Fault caused difficulties and has been a matter of discussion (Prantl 1941, Svoboda and Prantl 1949, 1955, Obrhel 1968, Chlupáč 1955, 1959, 1960, Kukal and Jäger 1988). This unit was stratigraphically defined as an equivalent of the Roblín Member long after its discovery (Obrhel 1968, Chlupáč 1956) and this age was proved by finds of terrestrial plants. These siliciclastic sediments overlie the Acanthopyhe Limestone in a borehole between the Jirásek Quarry and the Zadní Kobyla Hill (Chlupáč 1956). The described break seems to be of local extent and documents only a specific character of the Koněprusy Devonian. Anyhow, it represents the most significant sedimentary change in the Devonian of the Barrandian, the abrupt onset of the siliciclastic sedimentation of the Roblín Member terminating the carbonate deposition.

The lower boundary of the Roblín Member is generally sharp in all the studied outcrops in the Barrandian area (Chlupáč 1960, Chlupáč and Kukal 1986) and marks the Basal Roblín Event indicating the incipient Variscan orogeny, as pointed out by Kukal and Jäger (1988). According to these authors, the relics of the Roblín Member at Zlatý Kůň may be younger than the Roblín Member sequence preserved in other parts of the Barrandian. They compared flyschoid development of the Roblín Member outside the Koněprusy area with the molasse character of this member within the Koněprusy area and concluded that the molasse sediments generally postdate flysch sedimentation. Regrettably, biostratigraphic evidence for this idea is still lacking. New analyses of heavy minerals from the siliciclastics proved that some differences exist between heavy mineral assemblages at Zlatý Kůň and at other Barrandian localities, e.g., those in Praha-Hlubočepy and Hostim. However, they are not so significant and can be explained by grain-size differences and some other local phenomena. Easterly paleocurrent direction was suggested for the deposition of the Roblín Member by Oczlon (1992).

All important hiatuses speak in favour of the discontinuous sedimentation in the Koněprusy area during the Pragian to Givetian times. It is evident that another shorter breaks in deposition could have occurred within the Koněprusy Reef Complex where numerous very local erosional surfaces were found (Chlupáč 1957) and the same holds for the Acanthopyge Limestone (Havlíček and Kukal 1991, Oczlon 1992). All this illustrates the special character of the Koněprusy Devonian characterized by uplifts during the Lower and Middle Devonian tensional regime.

Spatial relationships of the Koněprusy Devonian

Unique development of the Lower and Middle Devonian in the Koněprusy area raised speculations on its separate tectonic position and its displacement by nappe movement (e.g., Melichar and Hladil 1999). The Koněprusy Devonian, however, displays a far smaller isolation in its development than defined by the above mentioned authors. Trends of its development are clearly visible in the diverse formations situated to the NE and E: in the vicinity of Tobolka, Koda, Srbsko and Hostim. In stratigraphical order, these trends are as follows:

1. In its classical outcrops at Kotýs and Klonk in the Koněprusy area, the Lochkov Formation shows a good analogy in its facies development (Radotín Limestone in the lower part, Kotýs Limestone in the upper part) and its thickness (about 90–100 m) with the section in the Berounka River valley at Karlštejn. The only distinct difference is the presence of some thicker beds of crinoidal limestones: At Karlštejn, they are more abundant at the base of the formation, as evidenced by the well-known Scyphocrinites bank at Budňanská skála. At Koněprusy (Kotýs), however, they are more numerous in the upper part of the formation (Chlupáč 1953).

2. The Praha Formation: The development of rosy-coloured and whitish crinoidal Slivenec Limestone at the periphery of the Koněprusy Reef Complex (Kobyla Quarry and boreholes) is almost the same as the development on Tobolský vrch Hill (southern slope, Chlupáč 1957). Moreover, no differences in their thickness exist in the two areas.

The Vinařice Limestone also bears resemblance in the sediment composition and fauna between the Koněprusy area and the other parts of the Barrandian area. Limestones exposed in the eastern part of the Koněprusy area (quarry at Měšťanská hájovna) are almost identical with bioclastic and biomicritic limestones on the western slope of Tobolský vrch Hill (V neckách locality; Chlupáč 1957). At Tobolský vrch Hill, however, the situation is more complicated. The proximity of the important Tobolka Fault striking N–S and the accompanying minor faults resulted in tectonic isolation of limestones with Vinařice-like fauna on the W slope from a typical Slivenec Limestone exposed on the S slope. The discussion as to whether the bioclastic and biomicritic limestones on the W slope should be called "Vinařice", "Slivenec", or "Loděnice" is misleading, as these limestones represent a transitional unit between bioclastic and biomicritic developments of the Praha Formation.

3. The break in the Koněprusy area including almost the whole Zlíchov Formation and the uppermost (or more?) part of the Praha Formation is typical for the Koněprusy Devonian. Anyhow, tendencies towards breaks in the sequences at the base of the Zlíchov Formation are not exceptional, as evidenced by the section at the Červený Lom Quarry at Praha-Klukovice (Chlupáč and Lukeš 1999). Another example, this times closer to the Koněprusy area, only 3 km away, can be seen in the upper, SW part of the Císařská rokle Gorge, NW of the village of Korno, where the basal bed of the Zlíchov Formation, formed by light grey bioclastic limestone of the Tobolka Member (equivalent of the Kaplička Member), directly overlies the red limestone of the Řeporyje Member of the Praha Formation (Chlupáč 1957), which is really an exceptional case. Small thickness of the Dvorce-Prokop Limestone and the sharp boundary of the Zlíchov Formation with intraformational breccia at its base described from Hřib and Tobolský vrch hills (Chlupáč 1957), only 2 km from the Koněprusy area, can also indicate a break. Moreover, local breaks and submarine erosion within the Kaplička Member, evidenced by intraformational breccia, are present at many localities.

4. A development clearly similar to that in the Koněprusy area during the late Zlíchovian and Dalejan occurs in the vicinity of Hostim, NE of Koněprusy. Here, the reddish and bioclastic limestones of the Chýnice Member in the uppermost part of the Zlíchov Formation reach their maximum thickness of about 15 m (Svoboda and Prantl 1953a, Chlupáč 1957), whereas the Daleje Shale unit is not developed, being completely replaced by the limestone facies; this was evidenced by tentaculite fauna in a test pit at Hostim (Chlupáč et al. 1979). Predominantly micritic, reddish and only in the uppermost parts light grey limestone of the Třebotov Member exposed at different localities contains the same succession of tentaculite and conodont zones as the Suchomasty Limestone in the Koněprusy area (Klapper et al. 1978, Chlupáč et al. 1979). A certain analogy in composition with the limestone at Hostim is accentuated by increasing amount of crinoid debris in several beds. The thickness of the Třebotov Limestone at Hostim more or less equals that of the Suchomasty Limestone at Koněprusy (i.e., 20–30 m). Only the benthic fauna of the Suchomasty Limestone is clearly more abundant, showing a more shallow-water character, evidently due to the uplifting trends in the Koněprusy area.

5. The Eifelian Choteč Formation in the section at Hostim, i.e., in the most NW-situated occurrence, shows a significant analogy with the equivalent Acanthopyge Limestone of the Koněprusy area, especially the presence of thick beds of light grey crinoidal limestones. Its fauna is also similar. For example, the Hostim locality yielded the only specimen of *Acanthopyge haueri* known outside the

Koněprusy area, and some other species of trilobites are also identical (Chlupáč 1959, 1983).

6. The Givetian Roblín Member is characterized by beds of calcareous sandstone full of terrestrial plants. The local development at the well-known locality in the upper level of the Herget Quarry at Zlatý Kůň Hill near Koněprusy represents a real analogy with the locality E of Tobolka outside the Koněprusy area (the present distance between these two localities is 2.5 km).

All these points indicate that the character of the Koněprusy area is not so unique, and that analogies with almost all the formations in the SW part of the Devonian (environs of Srbsko, Tobolka, Hostim) can be found. These analogies concern mainly shallow-water depositional environment, fauna and breaks in stratigraphic record. Therefore, the Koněprusy area is not so “isolated” as to require any large-scale tectonic displacement such as by the supposed nappes.

Unfortunately, no strata younger than the Lochkovian occur to the W and N of the Koněprusy area. Therefore, a complete paleogeographic reconstruction of the Koněprusy Reef Complex and its carbonate platform is not possible and thus open for speculations.

The occurrence of Pragian limestones in a close proximity of the Variscan Praha Fault on the NW slope of Malý Plešivec Hill between Železná and Hýskov (NE of Beroun) with rocks lithologically similar to the Koněprusy and Vinařice (or Loděnice) limestones may indicate a possible extension of the Devonian of Koněprusy type towards the NE, thus following the strike of main facies changes. This occurrence, reported already in the first half of the 19th century, however, lacks any documentation of *in situ* outcrops. Later investigations revealed only clasts of Devonian rocks in the Late Carboniferous conglomerates or isolated blocks in Quaternary scree. Such blocks yielded the Pragian *Platyscutellum-Kolihapeltis* trilobite assemblage with some species unknown from other localities (scutelluids and proetids described by Šnajdr 1960, 1980). According to the investigations of the present author, the light crinoidal limestones contain massive crinoids analogous to those in the Koněprusy Reef Complex, where they are accompanied by tabulates (*Heliolites*, etc.). Havlíček and Vaněk (1998) mentioned the giant pentamerid brachiopod *Zdimir pseudobaschkiricus* from the collections of the 19th century and finds of trilobites which would point even to younger, Zlíchovian to Eifelian strata. This concept, however, is somewhat problematic, because the present author found blocks of different Devonian limestones near the Vápenice farm, fully corresponding to the Řeporyje, Zlíchov and other limestones from the neighbourhood of Loděnice. Their position *in situ* is doubtful: they might have been transported from quarries near Loděnice.

Plausibility of the Devonian paleogeographic reconstructions

Rich fauna and instructive exposures make the Barrandian Devonian a significant object for comparative stratigraphic, biogeographic, paleoclimatological and sedimentological studies. Such studies were performed here and their results are described in numerous papers. We refer mainly to the book by Chlupáč, Havlíček, Kříž, Kukal and Štorch (1998) and also to the paleogeographic reconstruction by Krs and Pruner (1995) and Crick et al. (2001). However, the present geographical extent of the Devonian rocks in the Barrandian area is comparatively small; therefore, any attempts to present an exact reconstruction are more or less speculative. The preserved relics of Devonian sediments allow only to suppose a basin shallowing towards the NW and deepening towards the SE. The pattern of facies changes indicates that the Devonian sedimentary basin was elongated NE–SW, which means that its strike did not coincide with clear Variscan tectonic structures. The facies distribution is distinctly asymmetrical, which does not support the idea of a narrow graben-like basin, as inferred by Havlíček (1980, 1981). By contrast, this Havlíček’s idea is acceptable for the Early Ordovician Barrandian basin.

Starting from the Late Ordovician, neither shorelines nor near-shore siliciclastic development are known from the Barrandian; so, the conception of a marginal sea with more or less wide gateway to the ocean seems to be more plausible (Chlupáč 1993). Therefore, the term “Prague Basin” in its original sense as a narrow graben is not used by the present author. Owing to the inferred rotation of large pre-Variscan blocks testified by paleomagnetic methods (Krs and Pruner 1995) the primary strike and elongation of the Devonian basin were probably markedly different from the post-Variscan arrangement.

Undoubtedly, the original distribution of the Devonian sediments in the central part of the Bohemian Massif (Bohemicum = Centralbohemicum = Teplá–Barrandian Zone = Barrandian–Železné hory Zone = Perunica = Barrandian, according to the terminology of different authors) was distinctly larger than suggested solely by the present Devonian relics. The Variscan metamorphic processes and subsequent long-lasting erosion almost completely obliterated the primary pattern of the distribution of the Devonian sediments. This idea is supported especially by one important information. Angular and rounded clasts of Lochkovian and Pragian limestones were found in the Lower Permian conglomerate in boreholes at Zdětín near Mladá Boleslav (Zikmundová and Holub 1965). In their composition, these limestone pebbles correspond to the Slivenec Limestone, and their mostly angular shapes speak in favour of the nearby source which could be far beyond the limits of the present Devonian occurrences. The idea of a larger extent of the Devonian sea is corroborated by the presence of Lochkovian limestone in the Vápenný Podol Syncline in Železné hory Mts., about 100 km east of Prague (these limestones were correlated with the Koněprusy Limestone by the end of the 19th century). The Devonian is also present in the metamorphic mantle (roof pendants) of the Variscan Central Bohemian pluton in the “Islet Zone” such as in the Sedlčany-Krásná Hora “Islet” and elsewhere. All these occurrences have to be taken into account in considering the Devonian paleogeography.

A special position from the viewpoint of facies development is represented by the predominantly siliciclastic Devonian rocks at Rožmitál pod Třemšínem, about 70 km southwest of Prague, with paleontologically evidenced Pragian and Upper Zlíchovian (Havlíček 1977, Röhlich 1957, Lukeš 1977, Chlupáč 1977). However, paleogeographic conclusions are also problematic here, with sediment composition indicating a relatively nearshore deposition with intensive siliciclastic input. The areal extent of the Devonian is very small here, it lies in complete isolation and on a tectonic suture of first-class importance.

Late Devonian rocks were discovered in boreholes near Hradec Králové, about 120 km east of Prague. They unconformably overlie the Ordovician and older basement (Chlupáč and Zikmundová 1976, Čech et al. 1988). Lower and Middle Devonian rocks are totally absent. This remote occurrence, far from the Barrandian area, also evidences a wide-scale erosion which affected the whole Bohemicum (Centralbohemicum) during the Givetian and Early Frasnian times. This is another reason why the present author does not venture to publish popular paleogeographic sketch of the Devonian basin and its surroundings. Nevertheless, the importance of the Barrandian Devonian for broader paleobiogeographic, paleoclimatological and other reconstructions is indisputable.

References

Bouček B. (1934): Bemerkungen zur Stratigraphie des böhmischen Gotlandien und seinen Faziesverhältnissen. Cbl. Mineral. Paleont., Abt B, 11, 477–494.

Čáp P., Vacek F., Vorel T. (in print): Microfacies analysis of Silurian and Devonian type sections (Barrandian, Czech Republic). Czech Geol. Surv. Spec. Pap. 15, Praha.

Čech S., Havlíček V., Zikmundová J. (1988): Upper Devonian and Lower Carboniferous in north-eastern Bohemia (based on boreholes in the Hradec Králové area). Věst. Ústř. Úst. geol. 64, 2, 65–75.

Chlupáč I. (1953): Stratigraphical investigation of the border strata of the Silurian and the Devonian in Central Bohemia. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 20, 277–347.

Chlupáč I. (1955): Stratigraphical study of the oldest Devonian beds of the Barrandian. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 21, 91–224.

Chlupáč I. (1956): A contribution to the stratigraphy of the Devonian of Central Bohemia (English summary). Věst. Ústř. Úst. geol. 31, 233–243.

Chlupáč I. (1957): Facial development and biostratigraphy of the Lower Devonian of the Central Bohemia. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 23, 369–485.

Chlupáč I. (1959): Facial development and biostratigraphy of Daleje Shales and Hlubočepy Limestone (Eifelian) in the Devonian of Central Bohemia. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 25, 445–511.

Chlupáč I. (1960): Stratigraphical investigation of the Srbsko Beds (Givetian) in the Devonian of Central Bohemia. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 26, 1, 143–185.

Chlupáč I. (1977): The trilobite genus Plagiolaria in the Devonian of the Rožmitál area (English summary). Věst. Ústř. Úst. geol. 52, 95–106.

Chlupáč I. (1983): Stratigraphical position of Barrande's paleontological localities in the Devonian of Central Bohemia. Čas. Mineral. Geol. 28, 3, 261–275.

Chlupáč I. (1988): The Devonian of Czechoslovakia and its stratigraphical significance. In: McMillan N. J., Embry A. F., Glass D. J. (eds) Devonian of the world, I. Canad. Soc. Petrol. Geol. Mem. 14, 481–497, Calgary.

Chlupáč I. (1989): Stratigraphy of the Sedlčany-Krásná Hora metamorphic "Islet" in Bohemia (Proterozoic? to Devonian). Čas. Mineral. Geol. 34, 1, 1–16.

Chlupáč I. (1993): Geology of the Barrandian. A field trip guide. Senckenberg-Buch 69, Frankfurt a. M.

Chlupáč I. (1996): Neptunian dykes in the Koněprusy Devonian. Geological and paleontological observations. Bull. Czech Geol. Surv. 71, 2, 193–208.

Chlupáč I. (1998): Comments on facies and stratigraphy of the Lower Devonian Reef Complex at Koněprusy (Barrandian area, Czech Republic). (English summary). Bull. Czech Geol. Surv. 73, 1, 1–13.

Chlupáč I. (1999): Comments to recently advertised alpinotype nappe structure of the Barrandian Paleozoic. Bull. Czech Geol. Surv. 74, 4, 369–370.

Chlupáč I. (2000): Cyclicity and duration of Lower Devonian stages: Observations from the Barrandian area, Czech Republic. N. Jb. Geol. Paleont., Abh. 215, 97–124.

Chlupáč I. (2002): Explanatory remarks to reprinted Joachim Barrande: Système silurien du centre de la Bohême, Vol. I. Crustaces: Trilobites (1852). Supplement au vol. I. Crustaces divers et poissons (1872). P. Materna, Praha.

Chlupáč I., Havlíček V., Kukal Z., Kříž J., Štorch P. (1992): Paleozoikum Barrandienu (kambrium-devon). Čes. geol. Úst., Praha.

Chlupáč I., Havlíček V., Kukal Z., Kříž J., Štorch P. (1998): Palaeozoic of the Barrandian (Cambrian to Devonian). Czech Geological Survey, Prague.

Chlupáč I., Hladil J. (2000): The global stratotype section and point of the Silurian-Devonian boundary. Cour. Forsch-Inst Senckenberg 225, 1–7, Frankfurt a. M.

Chlupáč I., Jaeger H., Zikmundová J. (1972): The Silurian-Devonian boundary in the Barrandian. Bull. Canad. Petrol. Geol. 20, 104–174.

Chlupáč I., Kukal Z. (1977): The boundary stratotype at Klonk. The Silurian-Devonian boundary. IUGS Series A 5, 96–109.

Chlupáč I., Kukal Z. (1986): Reflection of possible global Devonian events in the Barrandian area. C.S.S.R. Lecture Notes Earth Sci. 87, 171–179.

Chlupáč I., Kukal Z. (1988): Possible global events and the stratigraphy of the Paleozoic of the Barrandian (Cambrian-Middle Devonian, Czechoslovakia). Sbor. geol. Věd, Geol. 43, 83–146.

Chlupáč I., Lukeš P. (1999): Pragian/Zlíchovian and Zlíchovian/Dalejan boundary sections in the Lower Devonian of the Barrandian area, Czech Republic. Newsl. Stratigr. 37, 75–100.

Chlupáč I., Lukeš P., Paris F., Schönlaub H. P. (1985): The Lochkovian-Pragian boundary in the Lower Devonian of the Barrandian area (Czechoslovakia). J. Geol. Bundesanstalt 128, 9–41.

Chlupáč I., Lukeš P., Zikmundová J. (1979): The Lower-Middle Devonian boundary beds in the Barrandian area, Czechoslovakia. Geologica et Paleont. 13, 125–156.

Chlupáč I., Zikmundová J. (1976): The Devonian and Lower Carboniferous in the Nepasice bore in East Bohemia. Věst. Ústř. Úst. geol. 51, 269–278.

Crick R. E., Ellwood B. B., Hladil J., El Hassani A., Hrouda F., Chlupáč I. (2001): Magnetostratigraphic susceptibility of the Přídolian-Lochkovian (Silurian-Devonian) GSSP (Klonk, Czech Republic) and a coeval sequence in Anti-Atlas Morocco. Palaeogeogr., Palaeoclimatol., Palaeoecol. 167, 73–100.

Galle A. (1994): Rugose corals of the Acanthopyge Limestone of Koněprusy (Middle Devonian, Barrandian, Czech Republic). Bull. Czech Geol. Surv. 69, 1, 41–58.

Havlíček V. (1977): The Paleozoic (Cambrian-Devonian) in the Rožmitál area. Věst. Ústř. Úst. geol. 52, 81–94.

Havlíček V. (1980): The development of Paleozoic basins in the Bohemian Massif (Cambrian-Lower Carboniferous). (English summary). Sbor. geol. Věd, Geol. 34, 31–65.

Havlíček V. (1981): Development of a linear sedimentary depression exemplified by the Prague Basin (Ordovician-Midldle Devonian: Barrandian area – Central Bohemia). Sbor. geol. Věd, Geol. 35, 7–48.

Havlíček V., Kukal Z. (1991): Sedimentology, benthic communities and brachiopods in the Suchomasty (Dalejan) and Acanthopyge (Eifelian) limestones of the Koněprusy area (Czechoslovakia). Sbor. geol. Věd, Paleont. 31, 105–205.

Havlíček V., Štorch P. (1990): Silurian brachiopods and benthic communities in the Prague Basin (Czechoslovakia). Rozpr. Ústř. Úst. geol. 48, 1–275.

Havlíček V., Vaněk J. (1996): Brachiopods and trilobites in the Chýnice Limestone (Emsian) at Bubovice (Čeřinka hillside, Prague Basin). Palaeontologica Bohemiae 1–16.

Havlíček V., Vaněk J. (1998): Pragian brachiopods, trilobites, and principal biofacies in the Prague Basin (Lower Devonian, Bohemia). Sbor. geol.Věd, Paleont. 34, 34–109.
Havlíček V., Vaněk J., Fatka O. (1994): Perunica microcontinent in the Ordovician (its position within the Mediterranean Province, series division, benthic and pelagic communities). Sbor. geol. Věd, Geol. 46, 23–56.
Hladil J. (1993): Tabulatomorphs and stromatoporoids below and above the Acanthopyge Limestone (Eifelian/Givetian transitional interval, Central Bohemia). Věst. Čes. geol. Úst. 68, 27–62.
Hladil J. (1995): Basic information about the sedimentology and diagenesis of the Koněprusy Reef (Lower Devonian, Pragian, SW segment of the Central Barrandian synform). Fossil Snidaria and Porifera 24 (1A), 26–41.
Hladil J. (1997): Lower Devonian open sea elevation of Koněprusy, evolution of reef facies. Field trip book, UNESCO-IGCP Profect 335, Biotic recoveries from mass extinctions, Final conference, 31–36, Praha.
Hladil J. (2000): Paleontologická a geologická bibliografie koněpruského devonu. Knih. Čes. speleol. Spol. 36, 141–147.
Hladil J., Čejchan P. (1998): Relations and tectonic setting of Emsian-Eifelian (Devonian) basins: Implication for early Variscan configuration of the Bohemian Massif. In: Theophrastus' Contribution to Advanced Studies in Geology, vol. II., pp. 149–179.
Hladil J., Čejchan P., Beroušek P. (1991): Orientation of the conical tests of tentaculites: internal waves in aqueous environment. Čas. Mineral. Geol. 36, 2, 115–130.
Hladil K., Čejchan P., Gabašová A., Táborský Z., Hladíková J. (1996): Sedimentology and orientation of tentaculite shells in turbidite lime mudstone to packstone: Lower Devonian, Barrandian, Bohemia. J. sed. Res., Sect A. 66, 5, 888–899.
Hladil J., Kalvoda J. (1993): Extinction and recovery succession of the Devonian marine shoals: Eifelian-Givetian and Frasnian-Famennian events, Moravia and Bohemia. Bull. Czech Geol. Surv. 68, 13–23.
Hladil J., Slavík L. (1997): Facies and stratigraphy of the Koněprusy limestones (Koněprusy, Čertovy schody quarry, Lower Devonian, Pragian stage). (English summary). Čes. Kras 23, 5–18.
Horný R. (1955): The Budňany Beds in the western part of the Barrandian. Sbor. Ústř. Úst. geol., Odd. geol. 21, 315–447.
Horný R. (1962): Das mittelböhmische Silur. Geologie 11, 8, 843–916.
Jahn J. (1896): Basalttuf-Breccie mit silurischen Fossilien in Ostböhmen. Verh. Geol. Reichsanstalt 16, 1–19.
Klapper G., Ziegler W., Mashkova T. (1978): Conodonts and correlation of Lower-Middle Devonian boundary beds in the Barrandian area of Czechoslovakia. Geologica et Palaeont. 12, 103–116.
Krs M., Pruner P. (1995): Palaeomagnetism and palaeogeography of the Barrandian terrane, Bohemian Massif. Acta Univ. Carolinae, Geol. 43, 519–522.
Kříž J. (1991): The Silurian of the Prague Basin (Bohemia) – tectonic, eustatic and volcanic controls on facies and faunal development. In: Bassett M. G., Lane P. D., Edwards D. (eds) The Murchinson Symposium: Proceedings of an international conference on the Silurian system. Spec. Pap. Palaeont., London, pp. 179–203.
Kříž J. (1998): Recurrent Silurian-Devonian cephalopod limestones of Gondwana Europe and Perunica. Silurian cycles – linkage of dynamic stratigraphy with atmospheric, oceanic and tectonic changes. N. Y. St. Mus. Bull. 491, 183–198.
Kukal Z. (1964): Lithology of carbonate formations. (English summary). Sbor. geol. Věd, Geol. 6, 123–165.
Kukal Z., Jäger O. (1988): Siliciclastic signal of the Variscan orogenesis: the Devonian Srbsko Formation of Central Bohemia. Věst. Ústř. Úst. geol. 63, 65–81.
Lukeš P. (1977): Tentaculites from the Devonian near Rožmitál pod Třemšínem. Věst. Ústř. Úst. geol. 52, 101–107.
Melichar R., Hladil J. (1999): Restored and new evidence for Early Variscan nappe structures in Central Bohemia. Geol. Vereinigung, 89th Annual Meeting, Freiberg.
Obrhel J. (1968): Die Silur- und Devonflora des Barrandiums. Palaeont. Abh., Abt B. 2, 4, 635–703.
Oczlon M. (1992): Example of Paleozoic contourites, tempestites and turbidites – classification and palaeogeographic approach. Heidelberg Geowiss. Abh. 53, 57–159.
Prantl F. (1941): Nová facie českého devonu. Věst. Král. čes. Spol. Nauk, Tř. mat-přírod. Věd 1, 12, 1–8.
Röhlich P. (1957): The finding of tentaculites in the Rožmitál limestones (SW part of Central Bohemia). (English summary). Čas. Mineral. Geol. 2, 1, 148–150.
Röhlich P., Šťovíčková N. (1968): Die Tiefstörungstektonik und deren Entwicklung in zentralen Teil der Böhmischen Masse. Geologie 17, 670–694.
Slavík L. (2000): Conodont biostratigraphy in the Čertovy Schody Quarry in the Koněprusy area (English summary). In: Zlatý kůň, Knih. Čes. Speleol. Společ. 36, 87–94.
Šnajdr M. (1960): A study of the family Scutelluidae (Trilobitae). (English summary). Rozpr. Ústř. úst. geol. 26.
Šnajdr M. (1980): Bohemian Silurian and Devonian Proetidae (Trilobita). Rozpr. Ústř. Úst. geol. 45.
Svoboda J., Prantl F. (1949): The stratigraphy and tectonics of the Devonian area of Koněprusy (Bohemia). (English summary). Sbor. Stát. geol. Úst. Čs. Republ., Odd. geol. 16, 5–92.
Svoboda J., Prantl F. (1950): On the stratigraphy and tectonics of the Lower Paleozoic around Koda near Srbsko (Central Bohemia). (English summary). Sbor. Stát. geol. Úst. Čs. Republ., Odd. geol. 17, 393–436.
Svoboda J., Prantl F. (1953a): The stratigraphy and tectonics of the Lower Paleozoic between Srbsko and Svatý Jan pod Skalou (Central Bohemia). (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 20, 205–276.
Svoboda J., Prantl F. (1953b): On the stratigraphy and tectonics of the Lower Paleozoic of Mt. Damil near Tetín. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 20, 381–414.
Svoboda J., Prantl F. (1955): On the stratigraphy and tectonics of the Lower Paleozoic in the wider vicinity of Karlštejn. (English summary). Sbor. Ústř. Úst. geol., Odd. geol. 21, 1, 519–596.
Svoboda J., Prantl F., Kukal Z. (1957): Hochwertige Kalksteine des Barrandiens. (German summary). Geotechnica 23, Praha.
Zikmundová J., Holub V. (1965): Valouny silurských a devonských vápenců v permokarbonu na Mladoboleslavsku. Věst. Ústř. Úst. geol. 40, 185–187.

Appendix

List of selected stratigraphically significant localities (sections, outcrops) in the Barrandian Devonian

This following list contains the most significant localities from the viewpoint of stratigraphy and facies development, on which the present stratigraphy is based. Many of them yielded also important fossils, but their paleontological importance was not taken as the main criterion for their inclusion. A list of classical Barrande's localities was published in other author's papers (Chlupáč 1983, 2002).

Almost all the reported sites are situated in protected areas, nature reserves and parks which are protected by law and where any destruction of rocks is prohibited. Research can be performed only for scientific purposes under special permission of authorities.

The sites are alphabetically arranged and numbered. Their names correspond to those used in stratigraphic schemes and diagrams. Alternative names of localities, if they exist, are also given. The list contains locality name, type of outcrop, stratigraphic data, the protection degree and in some cases also comments. The description of localities is concise, and papers listed in the references are to be referred to for the stratigraphical assignment.

Tab. 1. List of selected stratigraphically significant localities (sections, outcrops) in the Barrandian Devonian

Locality	Type of exposure	Exposed stratigraphic units	Protection status
1. Amerika	old gallery in the Amerika – Na rešnách Quarry	Silurian-Devonian boundary beds, Lochkov F.	NM
2. Amerika	numerous old quarries NW of Mořina v.	Lochkov, Praha, Zlíchov Fs. Kotýs, Koněprusy, Slivenec, Loděnice, Řeporyje, Dvorce-Prokop Ls., lower part of the Zlíchov F.	PA
3. Barrandov (Praha)	highway cut	Daleje-Třebotov, Choteč, Srbsko Fs. Complete section of the Třebotov and Choteč Ls., Kačák and lower part of the Roblín Mbrs. Now vegetated.	PA
4. Branická skála (= Braník Rock)	old quarry	Praha F., Dvorce-Prokop Ls.	NM
5. Branžovy Quarries between Loděnice and Lužce including the Záloženský Quarry	quarry	Lochkov, Praha, Zlíchov Fs. complete section: Kotýs, Koněprusy, Slivenec, Loděnice (type locality), Řeporyje, Dvorce-Prokop Ls., lower part of the Zlíchov F.	PA
6. Bubovice – Čeřinka Hill S of Bubovice	outcrops outcrops	Zlíchov, Daleje-Třebotov, Choteč Fs., Chýnice Ls., Daleje Sh., Třebotov Ls. Choteč F.	
7. Budňanská skála (Budňany Rock) Berounka River bank	road cut large outcrops	Silurian/Devonian boundary beds, Lochkov F. International auxiliary stratotype (parastratotype). Přídolí and lower parts of the Lochkov Fs.	NNM
8 . Cikánka in the Radotín Valley	large quarries small quarries	Lochkov, Praha Fs. Transitional facies between the Radotín and Kotýs Ls., Slivenec, Řeporyje, Dvorce-Prokop Ls.	NM
9. Cikánka	active marble quarry	Lochkov, Praha Fs. Historical quarry of the “Slivenec Marble”, parastratototype of the Lochkovian/Pragian boundary. Exposed topmost parts of the Lochkov F., Slivenec Ls.	NM
10. Čeřinka SE of Bubovice v.	quarry	Lochkov, Praha, Zlíchov Fs. Complete section from the Silurian/Devonian boundary beds (Kotýs Ls.) through the Praha F. (Koněprusy, Slivenec, Loděnice, Dvorce-Prokop Ls.) up to the lower parts of the Zlíchov F.	
11. Černá rokle near Praha-Barrandov	old quarry and outcrops in the gorge	Reference section of the Silurian/Devonian boundary. Přídolí, Lochkov (Radotín and transitional facies), Praha (Slivenec, Dvorce-Prokop Ls.) F.	NNM
12. Černá rokle near Kosoř v.	quarries, outcrops on a cliff	Original stratotype of the Lochkovian/Pragian boundary. Now stratotype of the base of the Praha F. and type section of the Radotín, Kosoř, Dvorce-Prokop Ls.	NNM
13. Červený lom near Praha-Klukovice	old quarry	Lochkov, Praha, Zlíchov Fs. Lochkov F. in the Kotýs Ls. facies, Praha F. in the Slivenec, Loděnice, Řeporyje and Dvorce-Prokop Ls. facies. Base of the Zlíchov F. with the Kaplička Mbr.	NM
14. Červený lom	quarry and cliff	Stratotype of the Suchomasty Ls. near Suchomasty v., in the upper part also outcrops of the Acanthopyge Ls. (Eifelian). Reference section for the conodont and tentaculite zonations of the interval uppermost Zlíchovian to Lower Eifelian.	PA
15. Chlum Hill near Srbsko v.	old quarry	Kotýs Ls., Praha F. in the Koněprusy, Slivenec, Loděnice, Řeporyje and Dvorce-Prokop Ls. facies, base of the Zlíchov F. The section is affected by normal faults.	NM
16. Choteč Hill N of the village	quarry and cliff	Zlíchov, Daleje-Třebotov, Choteč, Srbsko Fs. Upper part of the Zlíchov F. The classic Barrande’s locality in the uppermost Zlíchov F. reported as “Chotecz” NE of the village. Stratotype of the Choteč F. Devonian diabase and tuff also exposed with the upper part of the Třebotov Ls. – type locality of the Choteč Event. The Kačák and the base of the Roblín Mbrs. of the Srbsko F., studied in temporary test-pits.	PA
17. Chýnice	outcrops along the brook	Lochkov, Praha, Zlíchov, Daleje-Třebotov, Choteč, Srbsko Fs. Complete sequence of the Upper Lochkovian to Eifelian strata (between former Horní and Dolní mills). Another section starting in the Zlíchovian and ending with poorly exposed Srbsko F. between the former Dubecký and Jelínkův mills.	PA
18. Císařská rokle near Srbsko v.	large outcrops in a deep gorge	Praha, Zlíchov, Daleje-Třebotov, Choteč Fs. Slivenec, Loděnice, Řeporyje, Dvorce-Prokop Ls. of Pragian age, complete sequence of the Zlíchov and Daleje-Třebotov Fs., also lower part of the Choteč F.	NNM

Tab. 1, continued

Locality	Type of exposure	Exposed stratigraphic units	Protection status
19. Daleje Valley E of Praha-Řeporyje	old quarries	Přídolí, Lochkov, Praha, Zlíchov Fs. Požár I. Quarry with the GSSP of the Lower Přídolí boundary above the entrance tunnel. Požár II Quarry with the Silurian/Devonian boundary beds. Vokounka Quarry,V rokli Quarry, Kalvarie Quarry: Lochkov F. in the Kotýs Ls. facies, Praha F. with the Slivenec, Loděnice, Řeporyje (type locality) and Dvorce-Prokop Ls., Zlíchov F. with a less typical Kaplička Mbr. at the base.	NNM NP
20. Damil Hill near Tetín v.	old quarries	The Bílý Quarry with the Silurian/Devonian boundary beds and the Kotýs Ls., Modrý Quarry with the Pragian sequence (Slivenec, Loděnice, Dvorce-Prokop Ls.) and the lowest part of the Zlíchov F. Small quarries in the Lochkovian and Pragian.	PA
21. Praha-Hlubočepy	old quarries	Praha, Zlíchov, Daleje-Třebotov, Choteč, Srbsko Fs. Eastern part of the Prokopské Valley with a syncline core formed of the Srbsko F. and flanks by successively older formations. Classical Barrande's localities. Stratotype of the Daleje Sh. and the Třebotov Ls.Vysoká Quarry with the world-index fossil for the base of the Middle Devonian - conodont *Polygnatus costatus partitus*. Described in several guide-books.	NM NP
22. Holý vrch Hill W of Roblín v.	large active quarry	Lochkov, Praha, Zlíchov, Daleje-Třebotov, Srbsko Fs. Kotýs Ls., Praha F. in the Slivenec, Loděnice, Řeporyje and Dvorce-Prokop Ls. facies, Zlíchov F. with a less typical Kaplička Mbr. at the base. Tectonically affected by the Koda Overthrust in the upper part. Reduced thickness of the Daleje Sh. and Roblín Mbr.	PA
23. Praha-Holyně	old quarries and outcrops	Zlíchov, Daleje-Třebotov, Choteč, Srbsko Fs. The largest Prastav Quarry approved by the IUGS Subcommission on the Devonian stratigraphy (1981) as the international parastratotype of the Lower/Middle Devonian boundary. Outcrops of the Kačák and Roblín Mbrs. of Srbsko F. in erosional gullies.	NNM
24. Homolák NW of Vinařice v.	old quarry	Uppermost Lochkov F. in the Kotýs Ls. facies, lower Praha F. in the Vinařice Ls. facies. Tectonically disturbed.	PA
25. Hostim	large outcrops along the Kačák Brook	Zlíchov, Daleje-Třebotov, Choteč, Srbsko Fs. Important test-pit which proved a total replacement of the Daleje Sh. by the lower parts of the Třebotov Ls. Outcrops of the Kačák Sh. and Roblín Mbr. along the road to Bubovice v.	NNM PA
26. Hvížďalka NE of the Kosoř v.	large active quarry	Lochkov, Praha, Zlíchov Fs. Whole sequence of the Lochkov F. exposed in the road cut. Complete sequence of the Praha F.	PA
27. Jiráskův Quarry near Koněprusy	small quarry	Acanthopyge Ls. with a dark grey interval possibly representing the Kačák Mbr. (Sponge-limestone of Svoboda and Prantl 1949). Sediments of the Roblín Mbr. and underlying beds identified in a borehole above the quarry.	PA
28. Karlické údolí (= Karlík Valley)	series of natural outcrops	Lochkov, Praha, Zlíchov, Daleje-Třebotov, Choteč Fs. Lochkov F. as Radotín and Kosoř Ls., Praha F. developed as Dvorce-Prokop Ls., Zlíchov F. with Kaplička Mbr.	NM PA
29. Karlštejn Hluboké Valley	series of outcrops with small quarries in a road cut	Lochkov, Praha, Zlíchov, Daleje-Třebotov, Choteč, Srbsko Fs. All the Barrandian Devonian units present here, starting with the Kotýs Mbr. in the S slope foot of Karlštejn Castle Rock and ending with the Roblín Mbr. N of Karlštejn.	NM PA
30. Kinzlův Quarry	Old quarry NE of Choteč v.	Kotýz Ls., complete sequence of the Praha F. and the Lower Zlíchovian with the Kaplička Mbr. A diabase dyke cutting limestone beds.	
31. Klonk near Suchomasty v.	steep rocky slope	Silurian/Devonian boundary beds, Lochkov F. International stratotype (GSSP) of the Silurian/Devonian boundary approved by the International Commission on Stratigraphy and IUGS at the 24th Inter.Geol.Congress in Montreal in 1972. Exposed Silurian Kopanina (Ludlow) and Přídolí Fs., and the lower part of the Lochkov F. in the Radotín Ls. facies. Described in many papers and guidebooks.	NNM PA
32. Klukovice (Praha)	large natural outcrops and Červený lom	Praha, Zlíchov, Daleje-Třebotov Fs. Pragian outcrops reported under "Červený lom Quarry" (No 13.). Large Quarry outcrops of the Zlíchov F., transition between the Zlíchov F. and the Daleje Sh. Old quarries in the Třebotov Ls. and younger formations completely destroyed by construction works.	NM NP
33. Kobyla Quarry	old quarry	Praha F. Slivenec Ls. with transition into the Koněprusy Ls. Očkov Overthrust, karst phenomena.	NM PA

Tab. 1, continued

Locality	Type of exposure	Exposed stratigraphic units	Protection status
34. Koda near Srbsko v.	natural outcrops, also pit test	Special significance for the Choteč-Srbsko Fs. boundary beds. See also pits under "Císařská rokle" (No.18).	PA
35. Koněprusy	large area with quarries and natural outcrops	Cumulative designation for the Devonian localities between Koněprusy v., Měňany v. and Suchomasty v. since Barrande's times. Now giant quarries in the W part of Zlatý Kůň Hill (Čertovy schody-West) and between Zlatý Kůň Hill and road to Suchomasty v. (giant quarry Čertovy schody E = Voskop). Nearby old quarries Houbův, Herget, Petrbokův, Husákův, etc. Pragian developed as the Koněprusy Reef Complex (Koněprusy, Vinařice Ls. and transitional facies). Largest part of the Zlíchov F. is missing (hiatus).The reef complex is overlain by the Suchomasty Ls. (uppermost Zlíchovian, Dalejan, lowermost Eifelian), followed by the Acanthopyge Ls. (Eifelian). Youngest relics belong to the Srbsko F., Roblín Mbr. Numerous special phenomena, such as neptunian dykes of several generations, interesting karst features, such as caverns.	NNM PA
36. Konvářka (Praha) = Dívčí hrady	old quarries, also outcrops in the railway cut	Praha F. as Slivenec Ls. with a thin interval of transitional beds of the Loděnice Ls. type. High thickness of the Dvorce-Prokop Ls. Minette dyke of Variscan age. See also "Zlíchov (Praha)", No. 72.	
37. Kobyla near Koněprusy v.	cliffs above the Suchomastský potok Brook	Lochkov F. developed as the Radotín Ls. in its lower parts, as the Kotýs Ls. in the higher parts (its type locality). Praha F. developed as the Vinařice Ls. with local beds of sedimentary breccia.	PA
38. Koukolova hora Hill	old quarries on the hill summit	Lochkov F. in the Kotýs Ls. facies.	
39. Kruhový Quarry near Srbsko v.	active quarry	Lochkov F. in the Kotýs Ls. facies. Praha F. developed as (from the base): Koněprusy, Slivenec, Loděnice, Řeporyje, Dvorce-Prokop Ls., also lateral transitions between last three members.	NM PA
40. Kuchařík	quarry SE of the Kuchař v.	Lochkov F., Praha F. Anticlinal structure with the Kotýs Ls. in the core and the Praha F. on its flanks. Praha F. in the form of Koněprusy, Slivenec, Loděnice or Dvorce-Prokop, Řeporyje Ls. The bioclastic limestone facies completely removed during quarrying.	
41. Lejškov	old quarries on the hill W of the Suchomasty v.	Lochkov F. in the facies of the Radotín and Kotýs Ls. Type locality of the graptolite *Monograptus hercynicus*, the global index fossil for the base of the Devonian.	PA
42. Lochkov (Praha)	old general designation for the Silurian and Devonian localities in the area of the former Lochkov v. Now natural outcrops along the road cut	Lochkov F., Praha F. Lochkov F. developed as Radotín and Kosoř Ls., Praha F. as the Dvorce-Prokop Ls.	
43. Malá Chuchle (Praha)	old quarry NE of Praha-Slivenec	Praha F. developed as the Dvorce-Prokop Ls.	NP
44. Měňany	old name for the localities in the eastern part of the Koněprusy area.	Praha F. as the Vinařice Ls. (transitional facies) and the transition between the Koněprusy and Vinařice Ls.	PA
45. Mořina	outcrops along the railway cut and a road to Karlštejn	Srbsko F. Outcrops of the Roblín Mbr. and the Lochkovian to Zlíchovian strata. See "Amerika Quarries" (No. 2).	PA
46. Mramor near Liteň v.	natural ourcrops	Lochkov F., Praha F. Lochkov F. in the facies of the Radotín and Kosoř Ls., Praha F. as Dvorce-Prokop Ls.	PA
Mramorka – see Zbuzanská mramorka (No. 71)			
47. Nová Ves (Praha) = Butovické hradiště	cliffs	Silurian/Devonian boundary, Lochkov, Praha, Zlíchov Fs. Complete section from the Ludlowian to the Lower Zlíchovian interval. Kotýs Ls. and less typical Kosoř Ls. in the Lochkov F., Praha F. with the Slivenec, Loděnice, Řeporyje and Dvorce-Prokop Ls. facies. Zlíchov F. with a thick Kaplička Mbr.	NM NP

Tab. 1, continued

Locality	Type of exposure	Exposed stratigraphic units	Protection status
48. Oujezdce Quarries	old quarries at southern margin of the Koněprusy area	Lochkov F., Praha F. The Lochkovian/Pragian boundary interval exposed in all quarries. Lochkov F. developed as the Kotýs Ls. facies. Overlain by the Vinařice Ls. of Pragian age.	PA
49. Petzoldův Quarry	abandoned quarry W of Karlštejn	Lochkov F., Praha F., Zlíchov F. Kotýs Ls., Koněprusy and Slivenec Ls. displaced from the Zlíchov F. by a normal fault.	NM PA
50. Plešivec near Měňany v.	quarry on the hill	Praha F., lateral transition hillside from the fossiliferous Koněprusy Ls. into the less fossiliferous Vinařice Ls. exposed.	PA
51. Pod Barrandovem = Barrandovské skály	large outcrops along the Vltava River bank	Lochkov, Praha, Zlíchov Fs. Complete section starting from the Silurian and continuing as the Barrande's Rock (Lochkov F.) through the complete Pragian sequence (Slivenec Ls. at a base, thick Dvorce-Prokop Ls. up to the Zlíchov F. with the Kaplička Mbr. at its base, (the type locality, stratotype of the Zlíchov F.). The whole section is well known since the middle of the 19th century.	NNM
52. Pod Opatřilkou Quarries	old quarry	Silurian/Devonian boundary, Lochkov F. Lochkov F. in the Kotýs Ls. facies. Reference section of the Silurian/Devonian boundary.	NM
53. Podolí-Praha	former Podolí cement plant, now swimming pool	Silurian/Devonian boundary, Lochkov F., a Praha F. Section from the upper part of the Přídolí to the lowermost Pragian. Lochkov F. in a special development near its base. Praha F. represented by the Slivenec and Dvorce-Prokop Ls.	NM
Požáry Quarries, see Daleje Valley (No 19.)			
Prokopské Valley near Praha-Nová Ves, see Nová Ves, Butovické hradiště (No 47)			
54. Radotín Valley = Radotínské skály	large outcrops and old quarries	Silurian/Devonian boundary, Lochkov, Praha, Zlíchov Fs. The Silurian/Devonian boundary interval exposed in the "Antipleura gorge". Complete section of the Lochkov F. in the Radotín and Kosoř Ls. facies. Praha F. in the Dvorce-Prokop Ls. facies. The upper part of the Lochkov F. and the lower part of the Zlíchov F. with the Kaplička Mbr. exposed in old quarries on the SW slope of the valley.	PA
55. Roblín	old quarry and outcrops	Daleje-Třebotov, Choteč, Srbsko Fs. Section of the Kačák Sh. of the Srbsko F. exposed in test pits.	PA
56. Srbsko-North	cliffs on the Berounka River bank near Srbsko v.	Lochkov, Praha, Zlíchov Fs. Complete section starting with the Přídolian and ending near the Zlíchovian base. Tectonically affected Zlíchovian by the Koda Overthrust. Significant karst phenomena.	NM PA
57. Srbsko-South	rocky cliffs on the Berounka River bank along the road to Karlštejn	Lochkov, Praha, Zlíchov Fs. Lochkov F. developed as the Kotýs Ls. facies, Praha F. as the Koněprusy-Slivenec, Loděnice, Řeporyje and Dvorce-Prokop Ls. facies. Major part of the Zlíchov F. with the Kaplička Mbr.	NM PA
58. Srbsko – village	outcrops in the Bubovický Brook valley and along the road to Hostim v.	Daleje-Třebotov, Choteč, Srbsko Fs. Stratotype of the Kačák and Roblín Mbrs.	NM PA
59. Stydlé vody Quarries	old quarries NE of the Svatý Jan pod Skalou v.	Lochkov, Praha, Zlíchov Fs. Silurian/ Devonian boundary interval, Lochkov F. in the Kotýs Ls. facies. Praha F. in a complex development (Koněprusy + Slivenec, Loděnice, Dvorce-Prokop, Řeporyje Ls.), transition into the Zlíchov F. (without the Kaplička Mbr.), complete section of the Zlíchov F. ending with the Chýnice Ls. Locality of the youngest European graptolites.	PA
60. Svatoprokopský Quarry (St. Prokop Quarry = Schwarzenberg Quarry)	Prokop Valley in Praha-Hlubočepy	Praha F., Zlíchov F. Dvorce-Prokop Ls. Kaplička Mbr. of the Zlíchov F. This locality is not accessible.	
61. Šamor	hill E of the Vinařice v.	Upper Lochkovian as the Radotín and Kosoř Ls. Pragian Dvorce-Prokop Ls. exposed in old test pits.	PA
62. Švagerka (Praha-Zlíchov)	railway cut and nearby slope	Zlíchov F., Daleje-Třebotov F.	NM
63. Švarcava Valley near Solopysky v.	natural outcrops	Lochkov, Praha, Zlíchov Fs. Lochkov F. developed as the Radotín and Kosoř Ls., Praha F. as Dvorce-Prokop Ls. facies. Complete succession of the Zlíchov F., transition into the Daleje Sh.	NM PA

Tab. 1, continued

Locality	Type of exposure	Exposed stratigraphic units	Protection status
64. Tetínské skály	cliffs on the Berounka River bank	Lochkov F., Praha F. Silurian/Devonian boundary interval and the Lochkov F. in the Kotýs Ls. facies. Praha F. in smaller outcrops (Koněprusy Ls., Slivenec Ls.), tectonically deformed.	NM PA
65. Tobolský vrch	natural outcrops on the slopes of Tobolský Hill	Praha F., Zlíchov F. Praha F. developed as the Slivenec and Dvorce-Prokop Ls. Basal beds of the Zlíchov F. also called "Tobolka Ls" which is equivalent of the Kaplička Mbr. Transitional development of the Slivenec Ls. in biomicritic limestone comparable with the Vinařice Ls. Tectonically deformed due to the proximity of the Tobolka Fault.	NM PA
66. Trněný Újezd	quarries Čížovec and nearby outcrops	Silurian/Devonian boundary interval, Lochkov F. in the Kotýs Ls. facies and Praha F. in reduced thickness. Base of the Zlíchov F. with interfingering of the Kaplička Mbr.	PA
67. Velká Chuchle (Praha)	natural outcrops and old quarry	Complete section of the Lochkov F. (Radotín and Kosoř Ls.). Synclinal structure with the international GSSP of the lower Pragian boundary on the Homolka Hill foot. Praha F. in the Dvorce-Prokop Ls. facies.	NNM
68. Vysoká skála	hill S of the Vinařice v.	Lochkov F., Praha F. Lochkov F. developed as the Radotín and Kotýs Ls., Praha F. as the Dvorce-Prokop Ls.	PA
69. Zabitá rokle	exposures in the gorge	Zlíchov, Daleje-Třebotov, Choteč Fs. Outcrops of the Chýnice Ls., Daleje Sh., Třebotov Ls. and the Choteč F. The NW continuation of the gorge, sampled by Barrande, now destroyed by quarrying. Barrande's locality "Ravin des explorateurs".	PA
70. Zadní Kopanina (Praha)	old quarries and natural outcrops	Lochkov, Praha, Zlíchov Fs. Lochkov F. in the transitional facies between the Radotín and Kotýs Ls. Praha F. as dolomitized Slivenec Ls , Řeporyje and Dvorce-Prokop Ls. Zlíchov F. with the Kaplička Mbr. A dyke of basic volcanic rock.	
71. Zbuzanská mramorka near Chýnice v.	quarry near the road to Ořech v.	Praha and Zlíchov Fs. Upper part of the Praha F. (Řeporyje, Dvorce-Prokop Ls.), lower part of the Zlíchov F. with rudimentary Kaplička Mbr. Reference section for a discussion on the Pragian/Emsian boundary.	
72. Zlíchov (Praha)	rocky hill with the Zlíchov church	Praha and Zlíchov Fs. Dvorce-Prokop Ls. at tectonic contact with the Zlíchov F. See also localities Švagerka, Konvářka, often mentioned under the name Zlíchov or "Slichov".	

Explanation of used abbreviations and symbols:

F. = Formation
Fs. = Formations
Ls. = Limestone
Mbr. = Member
Mbrs. = Members

Sh. = Shale
v. = village
PA = Protected area (e.g., the Bohemian Karst)
NM = Nature Monument
NNM = National Nature Monument (with highest degree of protection)

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