

## Cambrian fossils from the Barrandian area (Czech Republic) housed in the Musée d'Histoire Naturelle de Lille

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**Abstract:** A complete list of fossils originating from the Cambrian of the Barrandian area and housed in the Musée d'Histoire Naturelle de Lille is compiled. The collection includes two agnostids, ten trilobites, one brachiopod and one echinoderm species, all collected at ten outcrops in the Buchava Formation of the Skryje–Týřovice Basin and most probably also at two outcrops in the Jince Formation of the Příbram–Jince Basin. A large part of the material was collected by Prof. Charles BARROIS and Dr. Louis DOLLÉ (both University of Lille) during the excursion organised before the Ninth International Geological Congress in Vienna in 1903. Other, poorly documented specimens were purchased from the enterprise KRANTZ towards the end of the 19<sup>th</sup> century and in the first years of 20<sup>th</sup> century. The geographic position and stratigraphy of outcrops, from which the material originates, are briefly discussed.

**Key Words:** Trilobita; Agnostida; Echinodermata; Brachiopoda; middle Cambrian; Barrandian area.

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**Résumé :** *Fossiles cambriens de la région barrandienne (République tchèque) conservés au Musée d'Histoire Naturelle de Lille.*- Une liste complète des fossiles provenant du Cambrien de la région barrandienne déposés au Musée d'Histoire Naturelle de Lille a été établie. La collection comprend deux espèces d'agnostidés, dix trilobites, un brachiopode et un échinoderme ; les fossiles récoltés dans dix affleurements proviennent tous de la Formation Buchava du bassin de Skryje–Týřovice et probablement également de deux affleurements de la Formation Jince du bassin de Příbram–Jince. Une grande partie du matériel a été récoltée par le Professeur Charles BARROIS et par le Dr. Louis DOLLÉ (de l'Université de Lille) au cours de l'excursion organisée avant le VIII<sup>ème</sup> Congrès géologique national à Vienne en 1903. Les autres spécimens, mal documentés, ont été achetés à l'entreprise KRANTZ à la fin de 19<sup>ème</sup> siècle et dans les premières années du 20<sup>ème</sup> siècle. La situation géographique et la stratigraphie des affleurements d'où provient le matériel sont brièvement discutées.

**Mots-clefs :** Trilobita ; Agnostida ; Echinodermata ; Brachiopoda ; Cambrien moyen ; aire barrandienne.

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## Introduction

Numerous Palaeozoic fossils of diverse invertebrate groups have been studied in the Barrandian area for more than 230 years (e.g., CHLUPÁČ, 1993; CHLUPÁČ *et al.*, 1998b, and BRUTHANSOVÁ *et al.*, 2007). The oldest levels containing a rich skeletal marine fauna belong to the Cambrian Jince Formation, where the presence of abundant and well-preserved skeletal fossils had already been established in the eighteenth century (e.g., BORN, 1772; KINSKÝ, 1775; see ŠNAJDR, 1958; CHLUPÁČ, 1999, and BRUTHANSOVÁ *et al.*, 2007). Lower Devonian trilobites and Silurian cephalopods, corals and brachiopods were also described during this century (e.g., BORN, 1772), while the discovery of fossils in the Cambrian of the Skryje–Týřovice Basin and in the Ordovician the Prague Basin followed several years later (see KRAFT & MAREK, 1992).

Bohemian Cambrian to Devonian fossils, in particular trilobites, agnostids and echinoderms, were intensively collected by professional geologists and amateur collectors already in the 19<sup>th</sup> century (BUDIL & CUNDIFF, 2009) and are widely distributed in numerous European collections (e.g., Geologische Bundesanstalt, Wien; Naturhistorisches Museum, Wien; Museum für Naturkunde, Berlin; Natural History Museum, London). Representative specimens are dispersed in various collections all over the world, including Russia, Australia and the USA. Only part of that material was collected by the museum staff. Numerous specimens were provided by the Czech or other investigators studying the Barrandian area during the 19<sup>th</sup> and 20<sup>th</sup> centuries. A very large collection of Cambrian through Devonian fossils originating from the Barrandian area is housed in the collections of the Museum of Comparative Zoology at Harvard University, Cambridge (Massachusetts, USA). This so called SCHÁRY Collection is, in fact, the largest collection of fossils from the Barrandian area housed outside of the Czech Republic. During his life, J.M. SCHÁRY, a private collector and beer baron, brought together the second largest 19<sup>th</sup> century fossil collection in Bohemia (KŘÍŽ, 1999a, 1999b). The collection was purchased by Louis AGASSIZ in 1882 from the heirs of J.M. SCHÁRY. After its arrival in the USA, the major part of the collection was never systematized (BUDIL & CUNDIFF, 2009), although BARRANDE's student Otomar Pravoslav NOVÁK planned to visit Harvard in order to curate it (HORNÝ, 2001). However, NOVÁK's early death in 1892 put an end to this endeavour. The collection contains over 100.000 specimens, representing all major taxonomic groups and also including numerous type specimens described by BARRANDE (1872).

In addition, BARRANDE himself, and also Jan FRIČ, the curator of his material in the National Museum Prague, distributed part of BARRANDE's comparative material among several European museums (very probably in the context of the

exchange of study material between these museums). Some of BARRANDE's comparative samples are thus housed in the collections of the Natural History Museum, London (part of them purchased from the Czech National Museum in 1890–1900), in Geologische Bundesanstalt, Wien, and in some other institutions.

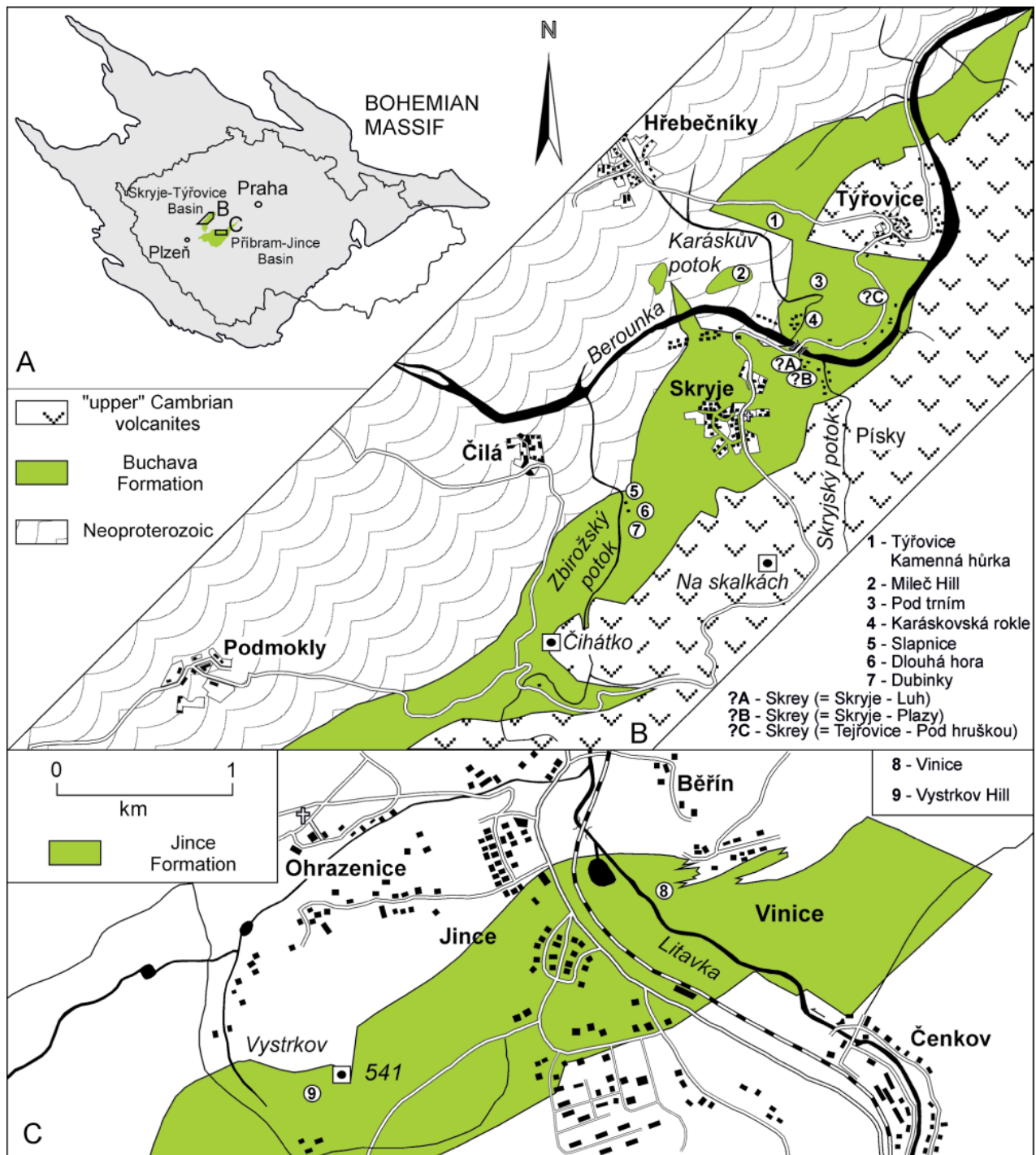
In 2010 and 2011, the programme PHC BARRANDE provided the chance to study the collection of Palaeozoic fossils stored at the Musée d'Histoire Naturelle de Lille. During two visits at the University of Lille in 2010 and 2011 we compiled a list of Cambrian fossils deposited in this museum and here we provided a brief report on this collection.

## Geological setting

In the Barrandian area, sediments containing abundant Cambrian fossils are known in two separate areas, the Skryje–Týřovice and the Příbram–Jince basins (Fig. 1.A).

In the larger Příbram–Jince Basin, a succession of Early to Middle Cambrian siliciclastics more than a two thousand metres thick is considered to have been deposited in lacustrine and fluvial environments. The exception is the Jince Formation, which contains common marine fossils and reaches a thickness of up to 450 m in the Litavka River Valley (HAVLÍČEK, 1971; GEYER *et al.*, 2008). The biostratigraphy and distribution of fossils in the Příbram–Jince Basin were recently reviewed by FATKA *et al.* (2004b) and FATKA & SZABAD (2014). The occurrence of the paradoxid trilobite *Paradoxides (P.) paradoxissimus gracilis* (BOECK, 1827) and the agnostids *Onymagnostus hybridus* (BRØGGER, 1878) and *Hypagnostus parvifrons* (LINNARSSON, 1869) in the Jince Formation indicate an age corresponding to the middle and higher levels of the Baltic *Paradoxides (P.) paradoxissimus* Superzone (AXHEIMER & AHLBERG, 2003; HØYBERGET & BRUTON, 2008; WEIDNER & NIELSEN, 2014; FATKA *et al.*, 2014).

In the Skryje–Týřovice Basin, an about two hundred metres thick succession of siliciclastics of the richly fossiliferous middle Cambrian Buchava Formation is known from the Berounka River Valley (HAVLÍČEK, 1971; GEYER *et al.*, 2008). The lithostratigraphy of the succession was recently reviewed by FATKA *et al.* (2011b). The occurrence of *Sao hirsuta* BARRANDE, 1846, and *Brunswickia (Jincella) prantli* (RŮŽIČKA, 1944) suggest a correlation of the Buchava Formation with the Drumian of the Ossa-Morena Zone in Spain (GOZALO *et al.*, 1994). Both the Jince and Buchava formations have been recently correlated with the Celtiberian Regional Series, namely with the Agdzian and Caesaraugustian regional stages in the West Gondwanan chronostratigraphic sequence (ÁLVARO *et al.*, 2004; GEYER *et al.*, 2008, Fig. 4.28; GOZALO *et al.*, 1994), and thus correspond to the global Drumian Stage of Cambrian Series 3 (FATKA *et al.*, 2014).



**Figure 1:** Distribution of Cambrian rocks in the Skryje–Týřovice [B] and Příbram–Jince basins [C], including the position of selected important localities discussed in the text. Geology modified after MAŠEK *et al.* (1997) in [B] and after FATKA *et al.* (2011b) in [C].

### Cambrian fossils in the Barrandian area

The history of palaeontological research of Cambrian fossils has been summarized by ŠNAJDR (1958), FATKA (2004), FATKA *et al.* (2004a, 2004b, 2011b) and FATKA & SZABAD (2014). The Jince and Buchava formations (Fig. 1) contain diverse associations of fossils. Primary producers of organic matter, such as algae, cyanobacteria, acritarchs and prasinophytes (see FATKA, 1990; FATKA *et al.*, 2004b) are present. This material is associated with various primary and higher consumers represented by foraminiferans, hyoliths, mollusks,

brachiopods, bivalved arthropods, agnostids and trilobites, also with ichnofossils (see ŠNAJDR, 1958; FATKA, 1990, 2004; MERGL & ŠLEHOFFEROVÁ, 1990; FATKA *et al.*, 2004b, 2011c; MIKULÁŠ, 2000; MIKULÁŠ *et al.*, 2012).

Recently, exceptionally well preserved fossils, including some with Burgess Shale-type preservation and specimens showing the rare "frozen behaviour", have been established at several stratigraphical intervals in both the Jince and Buchava formations. They include the bivalved arthropod *Tuzoia* WALCOTT, 1911 (see CHLUPÁČ & KORDULE, 2002; FATKA & HERYNK, in

press), the enigmatic genus *Wiwaxia* WALCOTT, 1911 (see FATKA *et al.*, 2011a), the lobopodians *Hallucigenia* CONWAY MORRIS, 1977, and *Onychodyction* HOU *et al.*, 1991 (FATKA, unpublished data), the anomalocarid *Hurdia* WALCOTT, 1912 (FATKA *et al.*, unpublished data), graptoloids (MALETZ *et al.*, 2005), and diverse soft-bodied problematica (MIKULÁŠ & KORDULE, 1998) as well as exceptionally well preserved ontogenetic stages of trilobites (LAIBL *et al.*, 2014).

Various ichnofossils associated with slightly skeletonized body fossils (MIKULÁŠ *et al.*, 2012), ichnofossils associated with their producers (FATKA & SZABAD, 2011), and the ichnofossil *Arachnostega* BERTLING, 1992, preserved with diverse groups of invertebrates (FATKA *et al.*, 2011c; FATKA & KOZÁK, 2014) have been noted in several stratigraphical levels.

### Specimens housed in Musée d'Histoire Naturelle de Lille

The Musée d'Histoire Naturelle de Lille is a multidisciplinary museum with 130.000 specimens, collected for over 130 years; the core collection encompasses four groups of samples: a regional collection (nearly all from the Paris Basin; 80.000 specimens), a collection from other regions (20.000 specimens), a palaeobotanical collection (6.000 specimens) and a collection of minerals (5.000 specimens) (OUDOIRE *et al.*, 2014). Since the 21<sup>st</sup> century, the Museum started an inventory policy and published several catalogues in the journal *Annales de la Société géologique du Nord* (MALVESY *et al.*, 1999, 2000, 2002; BLIECK *et al.*, 1999, 2013; OUDOIRE *et al.*, 2008, 2011).

The collection of Cambrian fossils from the Barrandian area includes more than 150 rock samples deposited under thirty-nine inventory numbers (Table 1). The origin of many of these specimens can be inferred.

(1) A large part of the specimens that were purchased by the museum from the KRANTZ Company in the late 19<sup>th</sup> and early 20<sup>th</sup> century. Information on stratigraphical and especially locality affiliations are often very doubtful, not only in the collection in Lille but also in collections of other institutions (Museum of Comparative Zoology at Harvard University Cambridge, USA; Natural History Museum, London, *etc.*; BUDIL, FATKA, LAIBL, POLECHOVÁ, personal observations).

(2) The labels on numerous specimens bear the indication DOLLÉ (1903) and it is supposed that they were collected either by DOLLÉ or by BARROIS during the excursion organized for the Ninth International Geological Congress in Vienna in 1903 (see below).

(3) Several specimens are marked by letters in ink directly on the rock specimen or they are associated with BARRANDE's original labels. It is probable, that these specimens were either collected directly by J. BARRANDE or his collectors. The selection of these duplicates for

other institutions was made by J. BARRANDE (the handwriting on specimens or labels is very probably his own) or subsequently by J. FRIČ (see above).

(4) Two specimens are very interesting, as they originate from the locality Hlohovice, a poor outcrop situated more than 15 km south-western of Tejšovice (JAHN, 1896, 1897). Both labels bear the name Wilhelm KUTHAN, who was a teacher in Tejšovice during the early years of the 20<sup>th</sup> century. It is known that W. KUTHAN intensively collected fossils in the area of Tejšovice, namely at the Pod trním locality (POMPECKJ, 1895, p. 555; PRANTL, 1941). POMPECKJ (1895, p. 514) named a new brachiopod species *Orthis Kuthani* [now *Pompeckium kuthani* (POMPECKJ, 1895)] to acknowledge his collecting at the Kamenná hůrka locality. However, it was not previously known that KUTHAN had collected fossils also from Cambrian outcrops in fields near Hlohovice.

It cannot be excluded, that also some other specimens in the Lille collection were collected by KUTHAN, as articulated exoskeletons of both *Ptychoparia dubinka* KORDULE, 2006, and *Lobocephalina emmrichi* (BARRANDE, 1846) are generally rare at the Pod trním locality. POMPECKJ (1895, p. 555) wrote, that KUTHAN and several other collectors provided hundreds of complete specimens of *Germaropyge germari* (BARRANDE, 1846) originating from this locality to collections in Vienna and in Prague.

The history of the important reseller company KRANTZ that become to the oldest and the most important dealer of geological materials, including fossils, is comprehensively discussed by SCHEMM-GREGORY & HENRIQUES (2013) on the example of Devonian brachiopods (see also <http://www.gerl-mineralien.de/krantz.html>).

Based on the information directly written on rock samples or provided by labels, Cambrian specimens must have been collected at the following localities (Figs. 1 - 2).

### Localities in the Skryje–Týřovice Basin

(1) Kamenna Hurka (= Týřovice – Kamenná hůrka). Natural outcrops and small abandoned quarries in conglomerates and sandstones of the Mileč Member at the Kamenná hůrka Hill east of the village Týřovice (= Tejšovice in old spelling; see Figs. 1 - 2, locality 1).

(2) Milec (= Mileč Hill). Natural outcrops at the top of the Mileč Hill (Mileč Member) and small excavations on the northern and southern slopes of the Mileč Hill (Mileč and Slapnice members; see Figs. 1 - 2, locality 2).

(3) Pod trním (= Týřovice – Pod trním locality). A small quarry at the southern slope of the Karáskův potok valley opened near the end of 19<sup>th</sup> century and intensively quarried to the early 1920<sup>ies</sup> (Figs. 1 - 2, locality 3).



Table 1

NUMBER	ORIGINAL FIGURED NUMBER	SPECIES (original designation)	ORIGINAL LOCALITY	COLLECTED BY	RECENT DETERMINATION (recent designation)	LOCALITY	Fig. 4
MGL 83 106		<i>Agraulos ceticephalus</i>	Skrey	DOLLÉ (1903)	<i>Agraulos ceticephalus</i> on <i>P. (H.) carens</i>	Skryje	
MGL 83 107		<i>Agraulos ceticephalus</i>	Skrey	DOLLÉ (1903)	<i>Agraulos ceticephalus</i>	Skryje	
MGL 83 108		<i>Agraulos spinosus</i>	Skrey	DOLLÉ (1903)	<i>Skreiaspis spinosus</i>	Skryje	
MGL 83 109			Podrním	DOLLÉ (1903)	<i>Lobocephalina emmrichi</i>	Pod trním	H
MGL 83 111		????	Ginetz	DOLLÉ (1903)	<i>Paradoxides</i> sp. indet.	Jince	
MGL 83 112 (1-2)			Ginetz	DOLLÉ (1903)	<i>Ellipsocephalus hoffi</i>	Jince	
MGL 83 123 (1-5)		<i>Conocoryphe</i>	Skrey		<i>Ctenocephalus (C.) coronatus</i>	Dlouhá hora	I
MGL 83 125 (1-3)		<i>Ellipsocephalus</i>	Ginetz	DOLLÉ (1903)	<i>Ellipsocephalus hoffi</i>	Jince (Vystrkov)	
MGL 83 127	2	<i>Ellipsocephalus vetustus</i>	Kamenna Hurka		<i>Ellipsocephalus hoffi</i>	Kamenná Hůrka	
MGL 83 129 (A-B)		<i>Paradoxides</i>	Karasek		<i>Paradoxides (H.) carens</i>	Karáskův potok	
MGL 83 131		<i>Agraulos ceticephalus</i>	Milec		?	Mileč	
MGL 83 132 (A-B)	15	<i>Paradoxides rugulosus</i>	Groa Treim		<i>Paradoxides (Eccaparadoxides) pusillus</i>	Pod trním	
MGL 83 133 (1-9)	?	<i>Agnostus nudus</i> and <i>A. integer</i>	Karasek		<i>Phalagnostus nudus</i> and <i>Condylomyge rex</i>	Karáskův potok	A, B, D
MGL 83 134	10	<i>Paradoxides</i>	Glapnick		pleura of indet. <i>paradoxidid</i>	Slapnice	
MGL 83 135 (1-2)	8	<i>Paradoxides</i>	Lohovic		<i>Pompeckium kuthani</i>	Hlohovice	L
MGL 83 136		?	Milec			Mileč	
MGL 83 137	?	<i>Agraulos ceticephalus</i>	Lohovic	KUTHAN		Hlohovice	
MGL 83 139	6	<i>Paradoxides spinosus</i>	Karasek		<i>Paradoxides (H.) carens</i>	Karáskův potok	
MGL 83 140 (1-5)	4	<i>Arionellus ceticephalus</i>	Karasek	KUTHAN	<i>Agraulos ceticephalus</i>	Karáskův potok	G
MGL 83 165		<i>Agraulos ceticephalus</i>	Groa Treim		<i>Agraulos ceticephalus</i>	Pod trním	
MGL 83 167	?	<i>Agnostus nudus</i>	Groa Treim		<i>Phalagnostus nudus</i>	Pod trním	
MGL 83 168 (1-3)	23	<i>Lichenoides priscus</i>	Groa Treim		<i>Lichenoides vadosus</i>	Pod trním	
MGL 83 169 (1-2)		Hypostome de <i>Paradoxides</i>	Groa Treim			Pod trním	
MGL 83 170 (1-3)	20	<i>Conocoryphe streatex</i>	Groa Treim		<i>Conocoryphe sulzeri</i>	Pod trním	
MGL 83 171 (1-10)	18	<i>Paradoxides rugulosus</i> and <i>spinosus</i>	Groa Treim			Pod trním	
MGL 83 172	14	<i>Germaropyge</i>	Pod trním			Pod trním	
MGL 83 173	13	<i>Germaropyge</i>	Pod trním			Pod trním	
MGL 83 632		<i>Sao hirsuta</i>	?		Protaspid stage 3 of <i>Sao hirsuta</i>	Pod hruškou	
MGL 203 981 (1-4)		<i>Ellipsocephalus germari</i>	Podrním, Tejrovic	DOLLÉ (1903)	<i>Germaropyge germari</i>	Pod trním	K
MGL 203 983		<i>Paradoxides rotundatus</i>	Ginetz	KRANTZ	<i>P. (P.) paradoxissimus gracilis</i>	Jince	
MGL 204 640 (1-2)		<i>Ptychoparia striata</i>	Podrním (Tejrovic)	DOLLÉ (1903)		Pod trním	F
MGL 204 641		<i>Paradoxides spinosus</i>	Ginetz (Jince)	HEVER	<i>P. (H.) carens</i>	Skryje	
MGL 204 643		<i>Paradoxides spinosus</i>	Skrey (Jince)	KRANTZ	<i>P. (P.) paradoxissimus gracilis</i>	Jince	J
MGL 204 644		<i>Ellipsocephalus hoffii</i>	Ginetz	KRANTZ	<i>Ellipsocephalus hoffii</i>	Jince (Vystrkov)	
MGL 204 645		<i>Ellipsocephalus hoffii</i>	Skrey (Jince)	KRANTZ	<i>Ellipsocephalus hoffii</i>	Jince (Vystrkov)	
MGL 204 646 (1-4)		<i>Arionellus ceticephalus</i>	Skrey	KRANTZ	<i>Agraulos ceticephalus</i>	Skryje	C
MGL 204 647		<i>Paradoxides bohemicus</i>	Bohème (Jince)		<i>P. (P.) paradoxissimus gracilis</i>	Jince	
MGL 204 648 (A-B)	5	<i>Sao hirsuta</i>	Karasek		<i>Sao hirsuta</i>	Karáskův potok	E
MGL 204 649		<i>Conocoryphe sulzeri</i>	Groa Treim		<i>Conocoryphe sulzeri</i>	Pod trním	
MGL 204 650 (1-2)		<i>Agraulos</i>	Skrey	DOLLÉ (1903)	<i>Agraulos ceticephalus</i>		

(4) Karasek (= Týřovice – Karáskův potok). Natural outcrops in the northern slope of the Karáskův potok valley; Buchava Formation (Figs. 1 - 2, locality 4).

(5) Glapnick, Slapnice (= Slapnický mlýn). Old abandoned quarries above the road, south-eastern slope of the Slapnický potok valley, lower levels of the Buchava Formation (Figs. 1 - 2, locality 5).

(6) Dlouhá hora. Numerous small natural outcrops and excavations situated in the eastern slope of the Dubinky Hill (Figs. 1 - 2, locality 6).

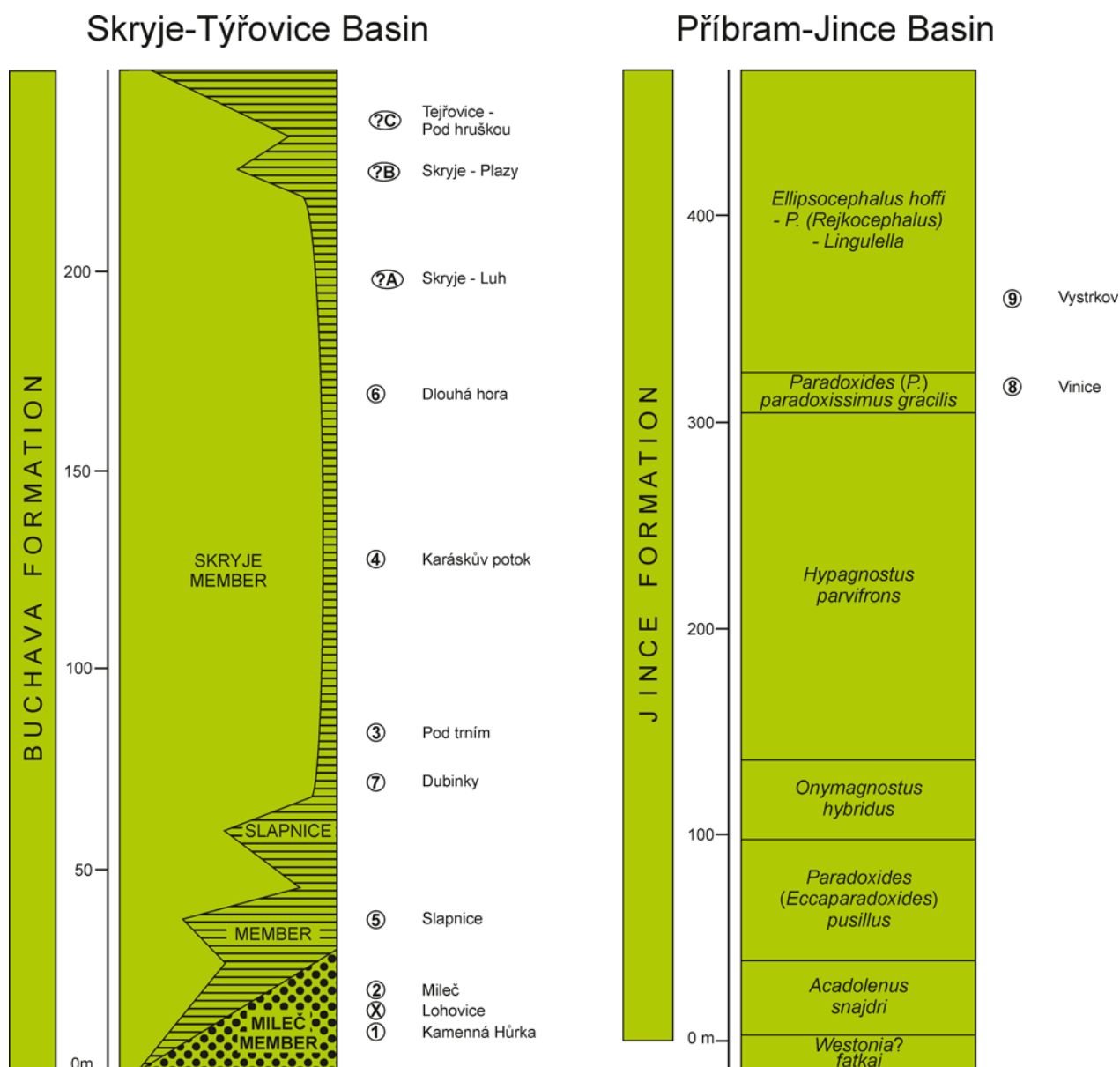
(7) Dubinky. Excavation in the lower third of the Buchava Formation (Figs. 1 - 2, locality 7).

(10) Lohovic (= Hlohovice). Fields south of the village Hlohovice (Fig. 2, locality x; it lies outside the area of the map shown in the Figure 1.

#### Localities in the Příbram-Jince Basin

(8) Ginetz, Jince – most probably the slope Vinice at Jince (old excavations in the slope above the Litavka River; for exact location see FATKA & SZABAD, 2014, locality 5; herein (Figs. 1 - 2, locality 8).

(9) Jince – most probably at the Vystrkov Hill near Jince (natural outcrops and excavations in the slope above the Pstruhový potok brook; for exact location see FATKA & SZABAD, 2014, locality 6; herein (Figs. 1 - 2, locality 9).



**Figure 2:** Lithostratigraphic subdivision of Cambrian rocks in the Skryje-Týřovice Basin (modified after FATKA *et al.*, 2011b) and biostratigraphy of the Jince Formation of the Příbram-Jince Basin (after FATKA & SZABAD, 2014), with stratigraphic position of the localities at which the materials were collected.

A large part of the Cambrian and other Palaeozoic material housed in the Musée d'Histoire Naturelle de Lille was collected in the year 1903. We suppose that these specimens were gathered during an international excursion organized before the beginning of the Ninth International Geological Congress in Vienna in August 1903 (JAHN, 1904). The program of this geological excursion can be briefly summarized as follows.

On August 11<sup>th</sup> the participants of the excursion collected fossils at several outcrops in Silurian and Devonian rocks south of Prague. On August 12<sup>th</sup>, they moved to the town Beroun, where a visit to the Museum in Beroun was organized. During the following three days they studied Ordovician, Silurian and Devonian outcrops exposed in numerous quarries and natural outcrops surrounding of the town of Beroun. A unique photograph captured the visit of both French scientists (Prof. Charles BARROIS

and Dr. Louis DOLLÉ) and a larger number other participants to Beroun City (Fig. 3). This unique photograph was acquired from Dr. Jaroslav MAREK (Charles University, Institute of Geology and Palaeontology). On August 13<sup>th</sup>, a visit to the famous Silurian outcrops at Dlouhá Hora near Beroun as well as visits to Devonian localities in the Koněprusy area (Zlatý kůň, Měňany, Červený lom) were arranged. On August 14<sup>th</sup>, the participants collected fossils from numerous localities in the Silurian and Devonian in the neighbourhood of Loděnice, Sv. Jan pod Skalou and in the Kačák brook valley. On the fifth day, August 15<sup>th</sup>, Ch. BARROIS and E. KRATOCHVÍL left the excursion and visited the Cambrian of the Skryje-Týřovice Basin (see note in JAHN, 1904, p. 804). L. DOLLÉ obviously took part in the excursion, including a visit to the Příbram-Jince Basin on August 16<sup>th</sup>.



## I. Bericht über die Exkursion I in das mittelböhmisches Paläozoicum.

(10. August, 12.—16. August.)

Von Prof. J. Jahn (Brünn).

Teilnehmer an der Exkursion: P. Bamberg (Berlin), Prof. Ch. Barrois (Lille), L. Dollé (Lille), Fr. Drevermann (Marburg), Prof. J. Felix (Leipzig), Prof. E. Holzappel (Aachen), Prof. M. Janischewskij (Tomsk), Dr. P. Oppenheim (Charlottenburg), Ing. G. Polak (Brüssel) [nur den 1. Tag], Ingenieur A. Renier (Lüttich), F. Raymond (Veyrins), T. D. La Touche (Calcutta), Upfield Green (London), Prof. B. Weigand (Straßburg), C. Wiman (Uppsala), Dr. J. Woldřich (Prag). In Příbram kamen dazu Dr. H. Witkamp (Freiberg) und Ing. J. Fourmarier (Lüttich). Von den einheimischen Geologen haben sich in Beraun angeschlossen Prof. C. v. Purkyně (Pilsen), Prof. V. Spitzner (Proßnitz), Dr. G. Danes (Prag), Dr. Nikolau (Prag), V. Bláha (Laun). Als Kassier der Exkursion fungierte Laborant St. Růžek (Brünn).

**Figure 3:** Participants of the Excursion I to the Palaeozoic in Central Bohemia and the first page from JAHN (1904).  
**Front row from left:** P. BAMBERG (Berlin), J. FELIX (Leipzig), Ch. BARROIS (Lille), J.J. JAHN (Brno), UPFIELD GREEN (London), P. OPPENHEIM (Charlottenburg), E. HOLZAPFEL (Aachen), C. v. PURKYNĚ (Pilsen);  
**Middle row from left:** Servant, B. WEIGAND (Straßburg), F. REYMOND (Veyrins), C. WIMAN (Uppsala), T.D. LATOUCHE (Calcutta), M. JANISCHEWSKIJ (Tomsk), G. DANES (Prag);  
**Back row from left:** L. DOLLÉ (Lille), A. RENIER (Lüttich), J. WOLDŘICH (Prag), Fr. DREVERMANN (Marburg), NIKOLAU (Prag).  
**Not present:** G. POLLAK (Brüssel), H. WITKAMP (Freiberg), J. FOURMARIER (Lüttich), V. SPITZNER (Prossnitz), V. BLÁHA (Laun).

From the detailed program and as based on several remarks published by JAHN (1904), the origin of Cambrian fossils in the Musée d'Histoire Naturelle de Lille could be well reconstructed with the following details.

(1) L. DOLLÉ participated in the official excursion program and had the opportunity to collect fossils at Jince. JAHN (1904, p. 805) reported that heavy rain made it impossible to visit the section along the railway at Jince on August 16<sup>th</sup>. In the afternoon, the participants collected fossils from two outcrops, the slope Vinice at Jince (outcrop 8 in Fig. 1.C) and at Velcí (= Vystrkov Hill; outcrop 9 in Fig. 1.C) with *E. hoffi* in abundance (JAHN, 1902, p. 44).

The specimen of *Paradoxides (P.) paradoxissimus gracilis* (inventory number MGL 204 643; figured herein as Fig. 4.J) originated from the first outcrop. Several specimens of *Ellipsocephalus hoffi* (stored under inventory number MGL 83 125) were most probably collected at Velcí, as articulated exoskeletons of this trilobite are very abundant at this outcrop.

(2) A large part of the collection from the Skryje-Týřovice Basin was most probably collected by Ch. BARROIS. It is not possible to determine which outcrops he visited. However, specimens in the collection must have come from one or more of easily recognizable outcrops.

A. Pod trním locality. More than ten samples originated from this outcrop. Representative samples includes several articulated specimens of *Germaropyge germari* (BARRANDE, 1846) - MGL 203 981, (Fig. 4.K) as well as two specimens of *Ptychoparia dubinka* KORDULE, 2006 - MGL 204 640 (1-2), (Fig. 4.F), and the articulated exoskeleton of a quite rare species, *Lobocephalina emmrichi* (BARRANDE, 1846) - MGL 83 109 (Fig. 4.H).

B. BARROIS probably visited some easily accessible outcrops in the Karáskův potok valley (Figs. 1 - 2, locality 4), the slope called Luh near Skryje (Figs. 1 - 2, locality ?A), the Skryje - Plazy locality (Figs. 1 - 2, locality ?B) and the Tejšovice - Pod Hruškou locality (Figs. 1 - 2, locality ?C; details see PRANTL, 1947; CHLUPÁČ *et al.*, 1998a and FATKA, 2004). From these outcrops, several interesting specimens

originate, for instance *Agraulos ceticephalus* (BARRANDE, 1846), associated with a thorax of *Paradoxides (Hydrocephalus) carens* (BARRANDE, 1846) (Fig. 4.G), and one unfigured early ontogenetic stage of *Sao hirsuta*.

Wilhelm KUTHAN provided two rock samples from the Hlohovice locality, namely the fine conglomerate with several specimens of the brachiopod *Pompeckium kuthani* (POMPECKJ, 1895) (see Fig. 4.L).

We do not deny that BARROIS and DOLLÉ may have visited also some other, especially Ordovician and possibly also Devonian localities besides those seen during the Congress excursion. They collected fossils, for example, at the Osek locality, as is well supported by the explicitly written remarks on labels for several trilobite specimens from the Šárka Formation nodules, housed in the Musée d'Histoire Naturelle de Lille (date of collecting is 1903 or 1905). It is possible, that a part of palaeontological samples of the Barrandian area provenance, stored at this museum, was originally included in the collection of BARROIS (see BUDIL *et al.*, 2012). Whether specimens were personally collected by BARROIS and DOLLÉ or if most of specimens were purchased from the local quarrymen (see BUDIL *et al.*, 2009) is, however, unknown.

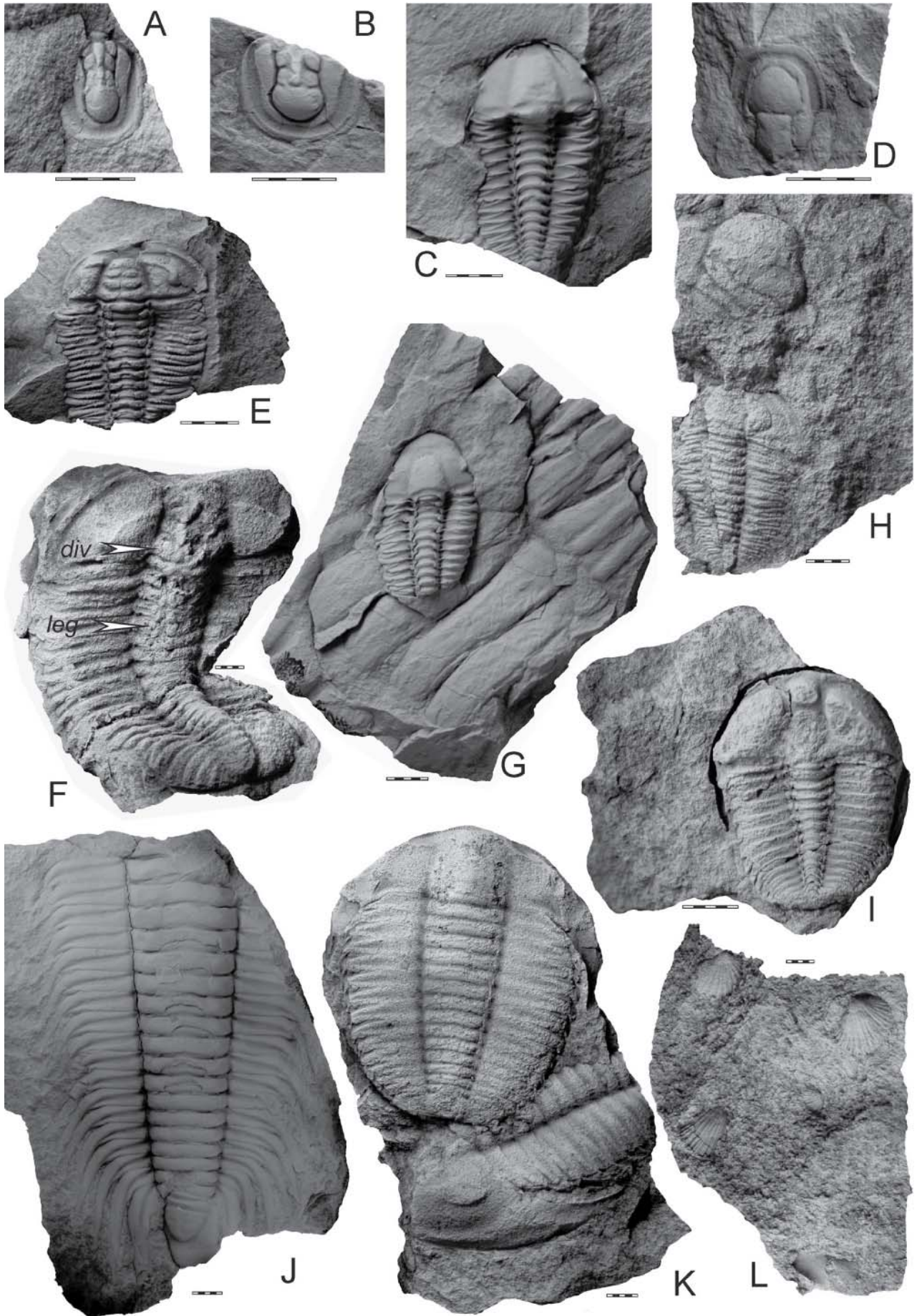
#### Description of scientifically important specimens

The collection housed in the Musée d'Histoire Naturelle de Lille contains several scientifically interesting specimens collected from the Skryje-Týřovice Basin of the Barrandian area, namely:

(1) One sample with an internal mould of a nearly complete, articulated specimen of the genus *Ptychoparia* HAWLE & CORDA, 1847, shows an exceptional preservation of soft parts (Fig. 4.F). In the glabella and the axial part of the six anterior-most thoracic segments remains of metamERICALLY PAIRED DIVERTICULAE (*div* in Fig. 4.F) and structures comparable with proximal parts of legs (*leg* in Fig. 4.F) are discernible. These were previously discussed by JAEKEL (1901).

► **Figure 4:** A – *Condylopyge rex* (BARRANDE, 1846), MGL 83 133-2; Buchava Formation, Karáskův potok;  
 B – *Condylopyge rex* (BARRANDE, 1846), MGL 83 133-3; Buchava Formation, Karáskův potok;  
 C – *Agraulos ceticephalus* (BARRANDE, 1846), MGL 204 646-1; Buchava Formation, Skryje, exact locality unknown;  
 D – *Condylopyge rex* (BARRANDE, 1846), MGL 83 133-8; Buchava Formation, Karáskův potok;  
 E – *Sao hirsuta* BARRANDE, 1846, MGL 204 648-B; Buchava Formation, Karáskův potok;  
 F – *Ptychoparia dubinka* KORDULE, 2006, MGL 204 640-2; Buchava Formation, Pod trním, coll. DOLLÉ (1903);  
 G – *Agraulos ceticephalus* (BARRANDE, 1846) on part of thorax of *Paradoxides (Hydrocephalus) carens* (BARRANDE, 1846), MGL 83 140-3; Buchava Formation, Skryje, exact locality unknown;  
 H – *Lobocephalina emmrichi* (BARRANDE, 1846), MGL 83 109; Buchava Formation, Pod trním, coll. DOLLÉ (1903);  
 I – *Ctenocephalus (Ctenocephalus) coronatus* (BARRANDE, 1846), MGL 83 123-5; Buchava Formation, Dlouhá hora, coll. DOLLÉ (1903);  
 J – *Paradoxides (Paradoxides) paradoxissimus gracilis* (BOECK, 1827), MGL 204 643; Jince Formation, Jince area, exact locality unknown ;  
 K – *Germaropyge germari* (BARRANDE, 1846), Buchava Formation, Pod trním, MGL 203 981-1, coll. DOLLÉ (1903);  
 L – *Pompeckium kuthani* (POMPECKJ, 1895), Buchava Formation, Hlohovice, coll. KUTHAN (1903?), MGL 83 135-2.  
*div* – metamERICALLY PAIRED DIVERTICULAE; *leg* – proximal parts of legs. All scale bars are 5 mm.





(2) An articulated exoskeleton of a holaspid specimen of *Agraulos ceticephalus* (BARRANDE, 1846) is preserved directly attached to the middle part of part of the thorax of *Paradoxides (Hydrocephalus) carens* (BARRANDE, 1846) (see Fig. 4.G). (3) An early ontogenetic specimen of *Sao hirsuta*, protaspid stage 3 according to LAIBL *et al.* (2014).

(4) A cephalon and the anterior part of the thorax of a holaspid specimen of the trilobite *S. hirsuta* - MGL 204 648 (Fig. 4.E herein) represents quite a rare find.

(5) An articulated specimen of *Lobocephalina emmrichi* (BARRANDE, 1846) - MGL 83 109, (Fig. 4.H).

(6) An articulated specimen of *Ctenocephalus (Ctenocephalus) coronatus* (BARRANDE, 1846) - MGL 83 123 (Fig. 4.I).

(7) The material collected by KUTHAN at Hlohovice presents a unique documentation of early investigation at this, still poorly known locality. *Pompeckium kuthani* (POMPECKJ, 1895) - MGL 83 135-2 (Fig. 4.L).

### Conclusions

1. An examination of the Cambrian fossils from the Barrandian area housed in the Musée d'Histoire Naturelle de Lille shows that the major part of the fossils was collected by BARROIS and DOLLÉ during the excursion organised before the Ninth International Geological Congress in Vienna in 1903. The material was collected from four sections and six quite restricted outcrops in the Buchava Formation of the Skryje-Týřovice Basin and from two sections in the Jince Formation of the Příbram-Jince Basin.

2. Seven scientifically interesting specimens are briefly discussed and figured for the first time.

3. Two samples prove active collecting of fossils by the famous amateur collector KUTHAN in the quite distant Hlohovice area, presumably in 1903.

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