Program of the 2nd meeting of EAVP, Brno

Monday, 19th July

16.00 – 18.00 Registration in the entrance hall of the Moravian museum – Dietrichstein Palace, Zelný trh, 8

18.00 Icebreaker party with snacks, beer and wine

Tuesday 20th July

08.30 – 09.00 Registration of the participants
09.00 – 09.20 Official opening of the meeting

Chairperson: Ch. Meyer

09.20 – 09.40 **Averianov, A. – Leshchinskiy, S. – Skutschas, P. – Fayngertz, A. – Rezvyi, A.:** Dinosaurs from the Early Cretaceous Ilek Formation in West Siberia, Russia

09.40 – 10.00 **Barco, J. L. – Canudo, J. I. – Cuenca-Bescós, G. – Riuz-Omeñaca, J. I.:** New sauropod remains from the Villar del Arzobispo Formation (Upper Jurassic-Lower Cretaceous transition) of Galve (Teruel, Spain)

10.00 – 10.20 **Coffee break**

Chairperson: E. Hoch

10.20 – 10.40 **Buffetaut, E. – Suteethorn, V. – Tong, H. – Kosir, A.:** First dinosaur from the Shan-Thai Block of South-East Asia: a Jurassic sauropod from the southern peninsula of Thailand

10.40 - 11.00 **Csiki, Z. – Grigorescu, D.:** Maastrichtian sauropods of the Hateg Basin

11.00 – 11.30 **Poster Session**

11.30 – 13.00 **Lunch break**

Chairperson: D. Frey

13.00 – 13.20 **Cavin, L. – Forey, P. L.:** Review of ichthyodectiform fishes

13.20 – 13.40 **Gregorová, R.:** The assemblage of the Oligocene fish fauna from the "Menilitic Formation" of the West Carpathians (Czech Republic).

13.40 – 14.00 **Micklich, N.:** The fish fauna of Messel Pit: A strange assemblage

14.00 – 14.20 **Coffee break**

Chairperson: M. Kundrát

14.20 – 14. 40 **Rücklin, M.:** New vertebrate localities from the Frasnian of Morocco

14.40 – 15. 00 **Gál, E. – Kessler, E.:** The oldest modern bird (Neornithes) remains from Hungary

15.00 – 15. 20 **Liston Jeff:** Lured By the Rings - Growing Pains of a Big Dead Fish

15.20 **Visit of the Mendelianum** (Department of the History of Biological Science)

Wednesday, 21st July

Chairperson: D. Grigorescu

09.00 – 09.20 **Den Brok, B. – Favre, P. – Meyer, Ch. – Thüring, B.:** Marine reptiles from the Middle Jurassic of Northwestern Switzerland

09.20 – 09.40 **Frey, E. – Buchy, M.-C. – Stinnesbeck, W. – González-González, A. – Di Stefano, A.:** A brick in a wall: the first nyctosaurid pterosaur from the Coniacian of NE Mexico and its impact on the pterosaurian wing anatomy

09.40 – 10.00 **Ősi, A.:** A plant-eating crocodyliform from the Late Cretaceous of Hungary

10.00 – 10.20 **Cofee break**

Chairperson: I. Novikov

10.20 – 10.40 **Schulp, A.:** Feeding the Mechanical Mosasaur: what did *Carinodens* eat?

10.40 – 11.00 **Smith, K. T.:** The early middle Eocene taxon *Geiseltaliellus* from Geiseltal and Messel, Germany, and the evolution of corytophanid lizards (Squamata: Iguania)

11.00 – 11.30 **Poster session**

11.30 – 13.00 **Lunch break**

Chairperson: E. Buffetaut

13.00 – 13.20 **Grigorescu, D**.: Telmatosaurus hatchlings and embryos from Tustea (Hateg Basin, Romania)

13.20 – 13.40 **Dostál, O.:** Permian vertebrates on the Obora locality (Czech Republic)

13.40 – 14.00 **Meyer, Ch. A. – Thüring, B**.: The first dinosaur footprints from the Middle Jurassic (Bathonian – Callovian) from the Middle Atlas mountains (Morocco)

14.00 – 14.20 **Coffee break**

Chairperson: R. Musil

14.20 – 14.40 **Novikov, I. V. – Sennikov, A. G.**: The tetrapod assemblage from the Early Triassic locality „Donskaya Luka“, Russia

14.40 – 15.00 **Schwarz, D. – Meyer, Ch. A. – Frey, E.:** The inflated sauropod – distribution and development of pneumatic structures in the cervical vertebrae of *Diplodocus* (Sauropodomorpha)

15.00 **Visit of the Augustinian monastery (place of J. G. Mendel´s researches)**

Thursday, 22nd July

Chairperson: J. Liston

09.00 – 09.20 **De Esteban, S. – Bertó, J. V. – Figueirido, B. – De Renzi, M. – Palmqvist, P.:** Body mass estimation in Xenarthra

09.20 – 09.40 **Hoch, E**.: The beak of the beaked whales, Ziphiidae, and a multi-toothed ziphiid from the Tortonian North Sea

09.40 – 10.00 **Reimann, Ch. K. – Ostertag-Henning, C. – Strauch, F.:** Colourful past-Discolouration of Pleistocene mammal bones and its relevance for age Prediction

10.00 – 10.20 **Coffee break**

Chairperson: M. Buchy

10.20 – 10.40 **Ivanov, M**.: Early Miocene amphibians and squamates from the Mokrá-quarry site (Czech Republic)

10.40 – 11.00 **Musil, R.***:* Environmental changes across the Early-Middle Pleistocene Transition

11.00 – 11.20 **Schreiber, D.:** Inventory and documentation of the fossil remains from the early Middle Pleistocene of Mauer (SE Germany) – a new project in the current research

11.20 - 14.00 **Lunch break**

14.00 Field trip Stranská skala Hill - an exceptional Jurassic and Quaternary site (visit included in conference fee)

18. 00 Annual meeting of EAVP (Historical Hall of Moravian museum)

20 .00 Conference diner (cost included in the conference fee)

Friday, 23rd July

09.00 - 17.00

Field trip: excursion to the sites northwest and north of Brno. We will visit an important Permian site, Bacov, with stegocephalians (the famous site of Prof. Augusta and Prof. Špinar – scientific collaborators of the painter Z. Burian) and the Moravian Karst region (macocha Abyss, the Kůlna Cave); costs including the lunch are 30 Euro

Saturday, 24th July

09.00 - 16.00

Field trip: to South Moravia at Dolní Vestonice site – place of the discovery of the Venus of Vestonice, and to Lednice –Valtice area protected by UNESCO, costs including the lunch are 30 Euro

Abstracts of Papers

Dinosaurs from the Early Cretaceous Ilek Formation in West Siberia, Russia

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The Lower Cretaceous deposits of Ilek Formation in West Siberia produced a number of micro- and macrovertebrate sites along Kiya River in Kemerovo Province (localities Shestakovo 1 and 3 [Sh-1, 3] and Ust' Kolba [UK]) and Bol'shoi Kemchug River in Krasnoyarsk Territory (locality Bol'shoi Kemchug 3 [BK-3]). The vertebrate fauna include dental and skeletal remains of salamanders, turtles, lizards, crocodyliforms, diverse dinosaurs, birds, tritylodontids, and mammals. Among dinosaurs the following taxa have been identified so far.

Titanosauriformes indet. are present by articulated foot [Sh-1, Averianov et al. 2002], procoelous midcaudal vertebra [BK-3] and abundant teeth similar to those of North American *Pleurocoelus* [BK-3, Sh-1].

Theropoda are known by isolated teeth of cf. *Prodeinodon* (?Dromaeosauridae), anterior dorsal vertebra of cf. Dromaeosauridae [Sh-1], and isolated teeth of cf. *Paronychodon* [BK-3]. Troodontidae indet. were reported for Sh-3 by Alifanov et al. (1999), but we cannot confirm the presence of troodontids for the Ilek Formation.

Stegosauria indet. [BK-3, Sh-1] are present by few isolated teeth.

Ceratopsia are known by isolated teeth of *Psittacosaurus* sp. [BK-3, Sh-1, 3, U-K] and numerous isolated bones, partial skeletons and two complete skeletons [Sh-3] of *Psittacosaurus sibiricus*. It is the largest and most derived species of the genus, having such apomorphic characters as a relatively long parietal frill (15-18% of the skull length), well developed jugal horns (possibly a sexual dimorphism character), three postorbital horns among which the ventral one is the most prominent, deep cleft on the posterior portion of the jugal for insertion of the quadratojugal, which goes anteriorly up to the jugal horn, external mandibular foramen absent, predentary long and vertically very shallow, strong ventral flange on the dentary, and great presacral vertebrae count (23: 9 cervicals and 14 dorsals).

Hypsilophodontidae indet. sp. 1 [BK-3, Sh-1] are represented by isolated teeth with asymmetrical lanceolate crowns. Both carinae bears 5-7 denticles in posterior teeth. In anterior teeth the anterior carina has no denticles, in some anterior teeth denticles are reduced also from the posterior carina, and there are few presumably most anterior teeth completely lacking denticles. Hypsilophodontidae indet. sp. 2 [Sh-1] differs by relatively lower and wider crowns with fewer (4-5) and larger denticles.

The age of microvertebrate sites within the Ilek Formation is estimated as ranging from ?Hauterivian-Barremian [BK-3] to Aptian-Albian [Sh-1, 3].

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New sauropod remains from the Villar del Arzobispo Formation (Upper Jurassic-Lower Cretaceous transition) of Galve (Teruel, Spain)

BARCO José Luis, CANUDO José Ignacio, Gloria CUENCA-BESCÓS & RUIZ-OMEÑACA José Ignacio

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In the Eastern Iberian Range (Spain) the Villar del Arzobispo Formation, Tithonian-Berriasian in age, represents transitional environments between the shallow marine facies of the end of Jurassic and the continental facies of the Lower Cretaceous. In this formation it has been found an assemblage of big sauropod, theropod, and stegosaur dinosaurs. One of these dinosaurs is the sauropod from the outcrop of Cuesta Lonsal in the Galve sub-basin, which is partially excavated. In this communication we present the study of an almost complete middle dorsal vertebra and a posterior dorsal neural spine of the Cuesta Lonsal sauropod. The dorsal vertebral record shows these autapomophies: Elongation Index much less than 1 (around 0,5); insertion of centropostzygapophyseal and centroprezygapophyseal laminae situated in the anterior and posterior centrodiapophyseal laminae and not in the vertebral centrum; parapophysis situated in the centroprezygapophyseal lamina and not in the anterior centrodiapophyseal lamina as in the rest of sauropods; and finally the presence of diverse accessory laminae (below the intraprezygapophyseal laminae, below the postzygapophyseal laminae and between the spinoprezygapophyseal and the spinodiapophyseal laminae). In addiction, it shows a singular combination of characters that are present on several sauropods of different clades. The most relevant are: marked lateromedial expansion of centrum and neural arch; big pneumatic cavity that occupies almost all the centrum; anteroposterior expansion of neural spine greater than the lateromedial one; absence of pre- and postspinal laminae and presence of pendant, triangular lateral processes in the distal end of the spine. This combination of characters and the autapomorphies indicate that the Cuesta Lonsal sauropod belongs to a new unnamed taxon, and different to *Losillasaurus giganteus*, which is defined in a stratigraphic level that could belong to the Villar del Arzobispo Formation.

The cladistic analysis shows that the Cuesta Lonsal sauropod is a neosauropod not belonging to the Macronaria or to the Diplodocidae+Dicraeosauridae clades. This analysis also shows a polytomy within the Neosauropoda clade, with the Cuesta Lonsal sauropod, *Haplocantosaurus*, *Jobaria* and the "rebbachisaurids" as the sister group to (Diplodocidae+Dicraeosauridae)+Macronaria. The complete study of the Cuesta Lonsal sauropod will provide new data to the neosauropod origin.

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First dinosaur from the Shan-Thai Block of South-East Asia : a Jurassic sauropod from the southern peninsula of Thailand

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Southeast Asia consists of a mosaic of microcontinents, which apparently separated from the northern margin of Gondwana during the Palaeozoic, and then drifted northward, eventually colliding with one another and with South China. Abundant remains of Mesozoic vertebrates are known from the Indochina Block, in northeastern Thailand and Laos, indicating biogeographical affinities with Laurasia at least since the Late Triassic. Until recently, Mesozoic vertebrates from the Shan-Thai (or Sibumasu) Block, which includes part of Burma and western Thailand, including the southern peninsula, were represented mainly by freshwater forms (hybodont sharks, bony fishes, temnospondyls, turtles, crocodilians) from the Jurassic Khlong Min Formation of southern Thailand.

A dinosaur vertebra has recently been found in a non-marine calcareous breccia of the Khlong Min Formation in Krabi Province (southern Thailand). Although incomplete, it is clearly a dorsal vertebra of a large sauropod. On the basis of the cancellous structure of the centrum and the relatively small, oval pleurocoel, it is referred to a member of the family Euhelopodidae, which includes various genera from the Jurassic and Early Cretaceous of China, such as *Euhelopus*, *Mamenchisaurus* and *Omeisaurus*. Despite doubts expressed about its validity by some authors, the family Euhelopodidae does seem to be a well-defined group of sauropods which apparently evolved in eastern Asia at a time when this part of the world was geographically isolated (being separated from Europe by a seaway). Euhelopodids have also been found in the Mesozoic of the Indochina Block.

The occurrence of a sauropod belonging to an endemic eastern Asian family in the Jurassic of the Shan-Thai Block shows that at that time there were already land connections between this microcontinent and “mainland Asia” (including the Indochina Block and the Chinese Blocks). This confirms provided by turtles from the Khlong Min Formation (which show affinities with Chinese and Central Asian forms), and is in agreement with the hypothesis that the Shan-Thai Block collided with the Indochina Block in the Triassic, but not with that of a later (Cretaceous) collision.

Review of ichthyodectiform fishes

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Ichthyodectiformes are basal teleosts that appeared in the fossil record in the Middle Jurassic and became extinct at the Cretaceous-Tertiary boundary. Ichthyodectiformes were referred to a variety of teleost lineages, especially the chirocentrid clupeomorphs (BARDACK 1965). PATTERSON and ROSEN (1977) showed that these fishes constitute a clade with no modern relatives rooted at the base of the teleost radiation.

The most famous ichthyodectiforms are the gigantic forms from the Late Cretaceous of North America (*Xiphactinus*, *Ichthyodectes*), but the group was very diversified and comprised several smaller species and was almost distributed worldwide. Most of them were fast swimming piscivorous predators and some showed very specialised modifications of the jaw structure, such as teeth on the premaxillary symphysis or the presence of a predentary.

Here we re-describe *Eubiodectes libanicus*, an ichthyodectiform from the Cenomanian Lebanese fish localities. We compare some of the ichthyodectiforms synapomorphies, pointing out specialisations related to the jaws, and discuss their functional implications. The phylogenetic history of the group is discussed in the light of the palaeogeographic and palaeoenvironmental evolution during the Late Jurassic and the Cretaceous.

References:

BARDACK, D. 1965. Localites of Fossil Vertebrates Obtained from the Niobrara Formation (Cretaceous) of Kansas. *Univ. Kansas Publ. Mus. Nat. Hist* 17: 1-14.

PATTERSON, C. and ROSEN, D. E. 1977. Review of Ichthyodectiform and other Mesozoic Teleost Fishes and the Theory and Practice of Classifying Fossils. *Bull. Amer. Mus. Nat. Hist* 158: 83-172.

Maastrichtian sauropods of the Hateg Basin, Romania

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Scanty sauropod remains were reported from the Late Cretaceous continental beds as early as the beginning of the 20th century by F. NOPCSA (in 1902), and their remains were discovered and collected even earlier by field geologist F. Schafarzik of the National Geological Institute of Hungary (in 1898). Their affinities were also recognized relatively early by NOPCSA (in 1904), who referred these (undescribed) remains to the titanosaurid sauropods.
However, sauropods include in the same time the last dinosaur taxon to be named by NOPCSA in his 1915 monograph on the Transsylvanian dinosaur fauna as *Titanosaurus dacus*, and the only one on which he did not made any detailed study afterwards. Instead he invited his friend F. von HUENE to include and discuss these titanosaurid remains in his monograph of the saurischian dinosaurs, to be published one year before NOPCSA's tragical death, in 1932.

Huene apparently did not have first-hand knowledge about all the sauropod material from the Hateg Basin available at that time, housed in the British Museum of Natural History and the collections of the Geological Survey of Hungary. In his study, he has split up the material and referred it to three different species of the newly erected genus *Magyarosaurus*, advocated by him to be different from *Titanosaurus*: *Magyarosaurus dacus*, *M. transsylvanicus* and *M. hungaricus*, although refraining to definitively accept the referral of the less-well known, large-sized species *hungaricus* to the same genus as the other two species. Moreover, large part of the available skeletal material was not referred to these taxa, even he shortly commented upon the probable affinities of these "not included" specimens.
Huene's taxonomic arrangement, based mainly on "desktop association" of largely disarticulated and isolated remains, was followed by some authors, but rejected by others, noting that individual variation, instead of taxonomic difference, might be responsible for the documented morphological differences. The most important drawback to the problem of the taxonomy and systematics of the Hateg sauropods, then as well as now, is represented the isolated nature of the largest part of the available material.

Recent first-hand reexamination of a large part of the old "*Magyarosaurus*" material, together with study of recently collected sauropod material from the Maastrichtian of the Hateg Basin, suggests that Huene's ideas were partly, but not completely, correct. This study suggests that several different sauropod taxa might be present in the Hateg Basin, documented mainly by caudal vertebrae; however, more recently found associated remains help to better define these taxa. Provisionally, the presence of two, maybe three, taxa can be documented: a small-sized titanosaurid with dorso-ventrally compressed caudal vertebrae, another small-sized titanosaurid with laterally compressed and only slightly procoelous middle caudal vertebrae and perhaps a third, larger taxon with strongly elongated middle caudal vertebrae.

References:

HUENE, F., 1932. Die fossile Reptile-Ordnung Saurischia ihre Entwicklung und Geschichte. *Monogr. Geol. Palaeontol.*, 1, 4, 1-361.
NOPCSA, F. 1902. Über das Vorkommen von Dinosauriern bei Szentpéterfalva. *Z. deutsch. geol. Gesellschaft*, 72, 34-39.
NOPCSA, F. 1904. Dinosaurierreste aus Siebenbürgen III. Weitere Schädelreste von *Mochlodon*. *Denkschr. königl. Akad. Wiss. Math.-Naturwiss., Wein*, 74, 229-263.
NOPCSA, F. 1915. Erdély dinoszauruszai. *M. Áll. Földt. Intézet Évk*, 23, 1-23.

Body mass estimation in Xenarthra

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The megafauna of South American xenarthrans (Lujaniense, late Pleistocene-early Holocene) have been object of numerous investigations centered in their paleobiology (FARIÑA, 1995: *Lethaia* 28, 189; ALEXANDER *et al.* 1999: *Zoological Journal of the Linnean Society* 126, 41, BARGO *et al.,* 2000: *Acta Palaeontologica Polonica* 46 (2), 173-192). Their modern relatives are not appropriate analogous for inferring their habits, due to their ecologically marginal niche and to their great difference in size. Also, within the Eutheria, the general primitiveness of the Xenarthra suggest a relatively primitive position, and it is not unreasonable to hypothesize that the Xenarthra is the sister group to all other eutherians (ENGELMAN, 1985 *in*: The Evolution and Ecology of armadillos, sloths and vermilinguas, 51).

The body mass estimation has a great importance in paleobiology, since is a variable that is interrelated with many physiological (McNAB, 1990, *in*: Body Size in Mammalian Paleobiology, 11) and ecological (DAMUTH, 1981: *Nature* 290, 699; EINSENBERG, 1990, *in*: Body Size in Mammalian Paleobiology, 25) characteristics of the organism, therefore it permits to predict many aspects of the biology of the extinct species. There are several methods to estimating the body mass of the extinct species, but perhaps one of the most common will be as of equations obtained interrelating cranial or postcranial variables with the body mass of extant species.

One of the first attempts of estimating the body mass of a Lujaniense xenarthran was that of CASINOS (1996: *Lethaia* 29, 87). In 1997 FARIÑA and VIZCAINO (*Z. Saügetierkunde* 62, 65) examined the allometry of the long bones in some species of armadillos, estimating the body mass of the extinct armadillo *Propraopus grandis*. On the other hand, FARIÑA *et al.* (1998: *Mastozoologia Neotropical* 5(2), 87) attempted to estimate the body mass of several species of extinct xenarthrans from certain sets de allometric equations previously defined for different groups of extant ungulates (JANIS, 1990, *in*: Body Size in Mammalian Paleobiology, 299; SCOTT 1990, *in* Body Size in Mammalian Paleobiology, 301). They observed that the dispersion of the body mass estimates obtained from the different equations was much greater in xenarthrans that in others mammals. Also they say that this must be due to the fact that the allometric equations used are not base on xenarthrans or other mammals of South American ancestry.

In this work is intended to evaluate, through measures of the cranial and postcranial skeleton of different species of extant xenarthrans of those we know their body mass, what are the most adequate equations to predict the body mass in this group. Furthermore, it is accomplished an alternative approximation, carrying out a principal components analysis of all the variables where the first component explains the size, and representing it upon the body mass is obtained a high correlation. With this is intended to evaluate the approximations made by FARIÑA *et al.* (1998: *Mastozoologia Neotropical* 5(2), 87) for several representative of the fauna of extinct xenarthrans of the South American Plio-Pleistoceno.

Marine reptiles from the Middle Jurassic of Northwestern Switzerland

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The Middle Jurassic record of marine reptiles is only poorly known. We report here on new material recently discovered near Ormalingen and other less known specimens from the Liestal and Basel Museums respectively.
In 1990 the local collector Fritz Schmutz discovered bone material at the Farnsberg near Ormalingen (Canton Baselland). These fossils come from the lower part of the Passwang Alloformation (Hauenstein Beds) and have been dated by ammonites (Ludwigia sp.; murchisonae zone, Aalenian). Subsequently, addtional material was discovered in the scree and could be traced to the original outcrop where in summer 2003 an excavation by the Museum.BLwas undertaken. A surface of 14 m^2 has been quarried and reassembled in the laboratory. A first superficial preparation survey revealed 45 bones. Among those are several vertebrae, a scapula and ribs that belong to different marine reptiles. Most of the bones are derived from the crocodilian Steneosaurus. Phalanges of an unknown ichthyosaur as well as a scapula and other fragments that pertain to a plesiosaur have also been uncovered. All the material seems to be derived from disarticulated specimens; neither taphonomical nor sedimentological clues have been found that might explain the formation of this local bone bed.

Maxillary fragments of an ichthyosaur are known from the Passwang-Alloformation of Buckten (Hauenstein beds ;Aalenian), but have never been studied in detail (Collection NMB). A snout fragment of Steneosaurus has been described by RIEPPEL (1981) that came from the lowermost part of the Passwang Formation found at Acheberg near Döttingen (Canton Aargau).

In 1995 vertebrae, ribs and teeth of a unknown plesiosaur have been collected in the higher part of the same formation (Rothenflue Beds, humphriesianum zone; Museum.BLcollection).
The elasmosaurid Muraenosaurus from the Varians beds (Bathonian) of Arbolsdwil (Collection NMB) is known from a single radius, a thoracic vertebrae and an isolated processus spinosus (Cimoliasaurus, LEUTHARDT 1907; Collection NMB). The same formation has yielded a fragmentary lower jaw of Steneosaurus from the Cheisacher close to Mönthal (Canton Argau; RIEPPEL 1981).

An single tooth of Liopleurodon from the Anceps-Athleta beds (Callovian/Oxfordian) of Wöflinswil, published in 1856 by von MEYER under the name of Ischyrodon meriani, is kept in the collection of the Natural History Museum Basel.

References:
LEUTHARDT, F. 1907: Über Reptilreste aus dem oberen Dogger im Basler Jura Tätigkeitsberichte Natf. Ges. Baselland. p. 79-83.
MEYER, Hermann von. 1856: Ischyrodon Meriani aus dem Oolith im Frickthale. Palaeontographica p. 19-21.
RIEPPEL, O. 1981: Fossile Krokodilier aus dem Schweizer Jura : Elcogae geol. Helv. 74/3: p. 753-751.

A brick in a wall: the first nyctosaurid pterosaur from the Coniacian of NE Mexico and its impact on the pterosaurian wing anatomy

FREY Eberhard[1], BUCHY Marie-Céline[1,2], STINNESBECK Wolfgang[2], GONZÁLEZ Arturo González[3] & DI STEFANO Alfredo[3]

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The first almost complete and articulated pterosaur from Mexico comes from the laminated limestone in the vicinity of the town of Muzquiz, Coahuila (NE Mexico). The adjacent ammonite assemblage allows to place the specimen in the Early Coniacian (late Cretaceous). It was discovered some 10 years ago by a local quarry worker and ended up in the wall of a mine manager´s office. From there it was excavated a second time in the year 2002. The enigmatic hatchet shaped humerus, the edentulous jaws and an occipital crest allows to doubtlessly refer the specimen to the nyctosaurid pterosaurs, and within these is referred to a new species. Fusion of the skull bones indicates an adult animal. This is strongly supported by the complete co-ossification of the caudal most gastral ribs with both ossa prepubis, which are also fused in the midline (BENNETT 2001).

With a wingspan of about 2 metres, calculated on the base of the biometric values of *Nyctosaurus gracilis* (MILLER 1972, BENNETT 2003, UNWIN 2003), the new Mexican nyctosaurid pterosaur represents the smallest adult pterosaur at least of the late Cretaceous and bridges the palaeobiogeographic gap between the nyctosaur finds from the Late Coniacian/Santonian Niobrara Formation in Kansas (USA; MARSH 1876, WILLISTON 1902, 1903, BENNETT 2003) and a nyctosaur report from the Maastrichtian of NE Brazil (PRICE 1953).

The preservation of mineralised tendons along side the arm bones and the *in situ* preservation of the carpus allows the reconstruction of some cardinal distal arm muscles and proves that the pteroid bone inserted medial to the preaxial carpal on the cranial faces of proximal and distal carpal. This contradicts most extant hypotheses concerning the anatomy of the pterosaurian wrist construction (e.g. WELLNHOFER 1978, FREY & RIESS 1981, PENNICUIK 1986). It is likely that the pteroid supported and controlled an antebrachial propatagium and served as a pivot for a propatagial tendon, which probably continued distally and formed a web for the three “free” fingers. The alteration of the wing cambering was brought about by the muscularised wing membrane (FREY et. al. 2003).

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The oldest modern bird (Neornithes) remains from Hungary

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The oldest modern bird (Neornithes) remain from Hungary is housed in the Department of Geology and Palaeontology of the Hungarian Natural History Museum. It is represented by a partial right wing skeleton embedded in Middle Oligocene rock, found in a clay mine in the Buda hills – nowadays part of Budapest – in the early 20th century. Its preliminary identification indicates a skua-like (Stercorariidae) seabird that certainly belongs to a new taxon. Detailed studies on the fossil shall clear its taxonomic position and palaeogeographical connections.

The assemblage of the Oligocene fish fauna from the "Menilitic Formation" of the West Carpathians (Czech Republic)

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The"Menilitic formation" (Rupelian) of the Carpathian flysh zone is known with the presence of the fossil fish fauna. Together with the genetically related regions in the external zone of the Alps and the Rhine Fosse, this facies represents an important record of the sea fishes of the Oligocene in the large European territory.

In the assemblage of the fossil fishes of the Carpathians (Czech Republic) there were recorded representatives of the families Clupeidae (*Clupea sardinites, Alosa* sp.), Argentinidae (*Glossanodon musceli*), Gonostomatidae (*Scopeloides glarisianus, Kotlarczykia bathybia*), Phosichthyidae (*Vinciguerria obscura*), Sternoptychidae (*Argyropelecus cosmovicii*) Myctophidae (*Oligophus moravicus, Eomyctophum koarense*) , Gadidae (*Palaeogadus simionescui*), Hemiramphidae (*Hemiramphus* sp.), Holocentridae, Zeidae (*Zenopsis clarus*), Syngnathiade (*Syngnathus* sp.), Serranidae (*Serranus budensis*), Priacanthidae (*Pristigenys spinosus*), Caproidae (*Capros* sp.), Euzaphlegidae (*Palimphyes* sp), Trichiuridae (*Anenchelum glarisianum*), Gempylidae (*Hemithyrsites* sp.), Echeneidae (*Echenis* sp), Scombridae (*Scomber* sp.), Ostraciidae (*Oligolactoria bubiki*). The taphocenoses in general belong to the open ocean environment (meso-epipelagial).

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Telmatosaurus hatchlings and embryos from Tustea (Hateg Basin, Romania)

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Key-words: dinosaur eggs. *Megaloolithidae* family, hadrosaur, *Telmatosaurus* ,hatchlings and embryos ,Maastrichtian, Hateg Basin.

Since 1990 when the first remains of very young individuals of the hadrosaur *Telmatosaurus transsylvanicus* were discovered in Tustea ,close to the first egg clusters uncovered two years before ,the question on the eggs and babies connection did not cease to be risen. This because, on one side -the eggs belong undoubtedly to the Megaloolithidae family ,commonly represented in the Late Cretaceous of Spain, France , India , South America and whose connection with the Titanosaurid sauropods was clearly documented by the discoveries from Argentina ,while on the other side – the hatchlings ,equally undoubtedly belong to the hadrosaur *Telmatosaurus*.

Several new clusters with Megaloolithid eggs ,representing the original nests were uncovered in Tustea during the last years and , frequently in their proximity or even inside the nests were found small bones ,usually incompletely formed, with a porous texture on the surface ,all of them coming from the same *Telmatosaurus transsylvanicus* , one of the characteristic species in the assemblage from the Hateg Basin. Contrary no sauropod remains, either from old or young individuals were recorded in Tustea .Most of these bones belong to early hatchlings or unborn embryos, but in few cases there were found associated bones of grown juveniles, indicating a possible altricial behavior of Telmatosaurus. The paper present the distribution of the hatchling remains , the physical characters of the bones and the ontogenetic significance.

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The beak of the beaked whales, Ziphiidae (Odontoceti), and a multi-toothed ziphiid from the Tortonian North Sea

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Beaked whales are large marine carnivores which hunt pelagic squids and fish at great depths. 20+ extant species are known, several of them described on stranded individuals only. There may be living species still unknown to man. Most extant ziphiids are functionally toothless suction-feeders. The males have one or two pairs of protruding teeth in the lower jaw applied in inter-male combats. Pachyosteosclerosis affects the skeleton of the beak (rostrum and lower jaw) to various degrees during ziphiid ontogeny. Another male feature in some species is ossification of the mesethmoidal cartilage lodged in the mesorostral canal. Beaked whales, together with sperm whales, have been observed along the continental shelf break off North America's Atlantic coast seemingly preferentially within the shelf-edge canyons (WARING et al., 2001). Nutrient-rich upwelling zones at steep marginal shelf slopes leading to oceanic abysses are favoured ziphiid habitats, and eleven species are recorded from the southern Pacific Ocean around New Zealand (VAN HELDEN et al., 2002). Six (or more) species of ziphiids are indigenous to the North Atlantic Ocean.

Ziphiids are rare in shallow marginal basins such as the present North Sea, where *Mesoplodon bidens*, Sowerby's beaked whale, *Hyperoodon ampullatus*, the northern bottlenose whale, and *Ziphius cavirostris*, Cuvier's beaked whale, may occur as stray whales. The two northern forms may become "lured into" the North Sea through the deep Norske Rende along southern Norway, whereas the more thermophilic *Z. cavirostris* may enter through the English Channel. The trapped animals may become stranded on the treacherous low North Sea beaches.
The Tortonian (early Late Miocene) North Sea connected with the oceans solely between Scotland and Norway, and the central basin exceeded 500 metres water depth (RASMUSSEN, in print). Along its eastern margin, deltas and estuaries built out from Fennoscandia and the Baltic area, and in relatively shallow waters over future Danish ground settled cetacean carcasses on silty bottoms. The majority of fossil cetaceans in the Tortonian Gram Formation of south-western Denmark are cetotheroid mysticetes. Remains are recovered of only one beaked whale, an adult individual, 6-7 metres in estimated length. This may suggest it were a stray whale in the North Sea.

Alternatively, the species may have belonged to the deep North Sea fauna. Form and structure of its beak appear plesiomorphic, possibly indicating retention of a basic odontocete adaptation for seizing-holding-mutilating larger single prey before swallowing it (by simple suction). Long upper and lower homodont tooth rows, and a pair of large and a pair of smaller "tusks" anteriorly in the long mandibular symphyseal region characterize this Tortonian ziphiid, the "tusks" probably marking it as a male individual. Tooth wear and bone ossification indicate mature age. A spacious mesorostral canal, roofed over by the contacting and coossified premaxillae, is open (sediment-filled) testifying to a non-ossified mesorostral cartilage. Preserved cervical vertebrae are unfused, and secured some flexibility of the neck, in contrast to, e.g., *Hyperoodon* with fused cervicals and a very short neck. - As a character for phylogenetic evaluation among ziphiids the +/- mesorostral ossification is of limited value, as it is male-bound, develops through ontogeny (as do most skeletal features), and varies within the genus, e.g. *Mesoplodon* (DALEBOUT et al., 2002). - Ziphiid mesorostral ossification is known from the late Middle Miocene (MEAD,1975).

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Early Miocene amphibians and squamates from the Mokrá-quarry site (Czech Republic)

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Mokrá-quarry represents one of the most important Miocene herpetological site in the area of Czech Republic. There has been found a relatively diversified herpetofauna there since 2001 including amphibians, terrestrial tortoises and squamates. As regards fauna of amphibians and squamates the following taxa have been identified (IVANOV, MUSIL - in press) from the two fossiliferous carstic fissures (1/2001 "Turtle fissure"; 2/2003 "Reptile fissure"): Salamandridae: *Chelotriton* cf. *paradoxus*, Pelobatidae: *Pelobates* sp., Anguidae: cf. *Ophisaurus* sp., Varanidae: *Varanus* sp., Lacertidae: *Lacerta* sp. (small form), Biodae: Boidae gen et sp. indet. (large form), *Bavarioboa* cf. *hermi*, Colubridae: *Coluber* sp. 1, *Coluber* sp. 2, Colubrinae gen. et sp. indet., *Natrix* sp., Elapidae: Elapidae gen. et sp. indet., Viperidae: *Vipera* sp. 1 („Oriental vipers"), *Vipera* sp. 2 („European vipers").

Excavation in 2003 brought new interesting results. Numerous remains (especially vertebrae) were recently determined as belonging to *Chelotriton* cf. *paradoxus*. Fragmentary frontoparietals of the anuran genus *Pelobates* are very similar to the frontoparietals of the common species *Pelobates decheni* which has been reported e.g. from the Early Miocene of Merkur-North, MN 3a (VEJVALKA 1997) and Dolnice, MN 4 (HODROVÁ 1987).

Unspecified anguiomorph lizards, cf. *Ophisaurus* sp., are represented by discoveries of numerous osteoscutes, fragmentary parietal bone, and posterior part of the left mandibula. Surprising discoveries of monitor lizards, *Varanus* sp., are probably closely related to Asiatic forms (especially to *Varanus flavescens* and *Varanus salvator*). 1/2001 "Turtle fissure" and 2/2003 "Reptile fissure" in Mokrá quarry are the only localities with fossil varanid remains within the area of Czech Republic.

Discoveries of snake vertebrae of the family Boidae, morphotype Boidae gen. et sp. indet. (large form) and *Bavarioboa* cf. *hermi*, are of particular importance. The genus *Bavarioboa* represents the common genus of the European Oligocene and Miocene. As results from numerous discoveries, especially in Germany, the species *Bavarioboa hermi* is known only from the Early Miocene localities (SZYNDLAR, RAGE 2003), zone MN 4. Therefore, it is very probable that fossiliferous sitly clays from 1/2001 "Turtle fissure" and 2/2003 "Reptile fissure" are of late Early Miocene age (most probably MN 4). Colubrid snakes are represented by *Coluber* sp. 1, *Coluber* sp. 2, and *Natrix* sp. (similar to living forms). Somewhat surprising is absence of North American genera – e.g. *Neonatrix*, *Thamnophis*, As regards viperid remains two morphotypes have been distinguished - *Vipera* sp. 1 'Oriental vipers' (vertebrae + maxillary) and *Vipera* sp. 2 'European vipers' (only vertebrae).

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Therizinosauroid Affinities Within Maniraptoriform Theropods Based On Embryonic Data

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Therizinosauroid dinosaurs have been hypothesized to be a sister group of Ornithischia, or relatives of Sauropodomorpha, or considered as a sister group of a monophyletic Prosauropoda, or even qualified as a new dinosaur order, Segnosaurischia. Recently it was shown that Therizinosauroidea [= Segnosauria] are theropods, and further suggested that these animals are related to maniraptoriform theropods. For a long time, the skull anatomy of therizinosauroids remained unknown, prolonging this uncertainty of their closer phylogenetic affinities within Theropoda. Here, the anterior part of the basicranium of embryonic therizinosauroid dinosaurs, preserved in eggs from the Upper Cretaceous of Nanchao Formation, Nanyang Valley (Henan Province), People´s Republic of China, are described and compared to those of non-avian theropods and palaeognathous birds. These neurocranial segments illustrate a highly developed pneumatic system derived from the anterior tympanic recess invading the interior of the parabasisphenoid (including massive base of the cultriform process) and the reduced basipterygoid process. Embryonic anatomy of the therizinosauroid parabasisphenoid shows similarities with the corresponding braincase region of ornithomimids and oviraptorosaurs, but share most characters with those of the troodontids: broad U-shaped dorsal surface of the cultriform process immediately in front of the hypohysial fossa, pneumatized basipterygoid process, large external auditory meatus (= lateral depression), V-shaped notch-like ventral parabasisphenoid recess, reduced basicranial tubera. The embryonic parabasisphenoid also revealed characters never described in theropods before, but known in birds: broad interaural pathway, tube-like carotid canals projecting within the infrahypophysial recess, and paired foramina for the sphenoid arteries on the dorsal surface of the cultriform process. The basicranial similarities listed above suggest a closer relationship of therizinosauroids to troodontids, than to oviraptorosaurs or ornithomimids. However, developmental aspects of the embryonic bones compared to corresponding adult structures of maniraptorans, as well as potential homoplasies in neurocranial pneumaticity must also be taken in account before a definitive conclusion of our analysis can be reached.

The first dinosaur footprints from the Middle Jurassic (Bathonian – Callovian) of the Middle Atlas mountains (Morocco)

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The Middle Jurassic dinosaur fossil record is very scarce and indicates a poor and incomplete record of this important time interval, when many dinosaur groups radiated. Recent discoveries of coeval dinosaur tracksites from Portugal, the United States and England have greatly enhanced our understanding. The first account of dinosaur body fossils in the El Mers area dates back to TERMIER (1942). On the basis of two partial postcranial skeletons LAPPARENT (1955) described the sauropod *Cetiosaurus mogrebensis* and the theropod *Megalosaurus mersensis*. Some of Lapparent's localities could be relocated an can be placed in the uppermost part of the El Mers Formation. We report herein the first dinosaur tracks from the Middle Atlas mountains in two different stratigraphic units with a total of thirteen different levels.

The first set of track localities lies in the middle of the Ich Timellaline and J'bel Bou Akrabène Formation; ammonites (*Parkinsonia sp.*) indicate an Early Bathonian age (du DRESNAY, 1963). Outcrops in the canyon of the Oued Tamghilt east of El Mers, have yielded three localities that contain an important set of dinosaur trackways. So far tridactyl footprints and trackways attributed to theropods have been found. Smaller footprints (FL: 15 – 30 cm) show slender toes and digit III has a slight inward rotation, larger footprints (FL: 40 cm) have blunt toes, the digit III is straight and can be attributed to the ichnogenus *Megalosauripus*. Furthermore, we have mapped a series of very large sauropod trackways (pes length up to 130 cm) that appear to be narrow gauged. Size, trackway width as well as missing toe or pollex impressions suggest the ichnogenus *Breviparopus*. Most of the tracks occur as positive epichnia, however many level show negative hypichnia up to 20 cm deep) and many surfaces are heavily trampled.

The second set of trackbearing surfaces has been located at the base of the El Mers Formation, ammonites point to a Late Bathonian (to ?Callovian) age (du DRESNAY, 1963). Here mainly small theropod footprints (FL 20 cm) have been observed, some of the trackways show a medial posterior groove as well as clearly defined imprints of the hallux. Isolated footprints of large sauropods (FL: 100 cm) have also been recorded.

Both main levels can be found in laminated siltstones with ripple marks, that have been formed during the initial phase of a regressive sedimentary cycle. Sedimentary structures as well as abundant remains of wood indicate a deposition in a shallow siliciclastic tidal flat. The vertebrate ichnofacies of the El Mers area is in many ways similar to the one encountered in the Iouaridène basin and adjacent areas in the High Atlas (400 km to the west). In comparison with other Middle Jurassic localities (England, USA, Portugal) the Moroccon sites display the highest diversity of track morphotypes.

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The fish fauna of Messel Pit: A strange assemblage

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The fish fauna of the world-famous middle Eocene fossil site Messel Pit (8 km NE of Darmstadt, Hessen, S Germany) presently consists of eight nominal genera and species. Taxonomically, it is less diversified than some other almost contemporary freshwater fish associations, e.g., the Green River Shales in Wyoming, USA. However, according to morphological details, most Messel fish taxa clearly exceed the degree of intraspecific variation known from closely-related extant or fossil species. Only a few of these deviations may be due to well-known phenomena (e.g., artefacts of fossilization or time averaged sampling). Therefore, the Messel fish fauna may represent a "cradle of species" rather than an ancient "death trap". It is furthermore distinguished by a set of other peculiarities, which bear --as Messel fishes, by contrast to the majority of the other respective vertebrate fossils, really inhabited the ancient lake (at least for certain periods of time) and also died there-- comprehensive informations for the reconstruction of the palaeoecological and -environmental framework. These start with the general composition of the fauna with reference to the presumed life habits of the incorporated taxa, and continue with population characteristics (e.g., the predominance of juvenile individuals), vertical and horizontal distribution patterns (e.g., with main frequencies of certain taxa that are restricted to certain excavation areas and oil shale sections), indicators of feeding habits (e.g., a high number of specimens which are preserved with evacuated digestive tracts and a few others with prey items which either indicate rare forage species, or those which cannot be expected according to the general morphology of the respective predators). They finish with pathological phenomena, like scale and finray regeneration patterns, traces of material absorption and local scale perforations, which must result from the survival of a large variety of negative events. Of these, the large amount of regenerated scale is most difficult to understand and to explain. In almost all Messel fish species, the respective counts and percentage values distinctively exceed those from extant reference species, which either are closely-related to the Messel ones or which can be expected to represent similar ecotypes. Unfortunately, all well-known reasons for the occurrence of a relative large amount of scale regeneration in the extant species can be discarded for the Messel ones.

Environmental changes across the Early-Middle Pleistocene Transition

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In this paper all environmental and biological changes from sediments of the limestone hill Stránská Skála (Moravia, Czech Republic) are described from the period of Jaramillo subchron across the M/B limit up to the complex of Cromerian Interglacials (Cromerian I, II and III).

Stránská Skála is situated at the eastern margin of the town of Brno. It is a 1500 m long and ca. 400 m wide hill, formed from Jurassic limestones, in wich numerous fossiliferous fissures and caves were found. . In the Early and Middle Pleistocene Stránská Skála constituted an outer bank (river bluff) of the river Svitava.

The length of the exposure was 11 m, thickness 13 m. The height above sea level at its summit is 310 m, geographical co-ordinates are approximately 49° 11´ N, 16° 36´ . Stránská Skála has a highly stratified profil. It shows a complex sequence of various fluvial, colluvial and eolian deposits between which several layers of fossil soils and soils sediments are intercalated.

Environmental results arise from the study of disciplines: sedimentology, geochemistry, granulometry, palaeopedology, phytopalaeontogy, palaemagnetic data. Individual animal groups are evaluated ecologically depending on the time period and it appears that these evaluations differ in the same time period according to the size of the area inhabited by the individual animal groups. The environment is described on the ground of conclusion of individual disciplines. In the last layer of Cromerian age there appear also traces of the activity of the then Man.The species of vegetables, mollusc, birds, amphibians, reptiles, bats, small and big mammals were determined separately from the individual layers.

Stránská Skála is one of the few sites representing in one place in superposition the transition of Early and Middle Pleistocene in numerous layers with a great number of finds that permit to interpret the development of the earlier environment

The tetrapod assamblage from the Early Triassic locality "Donskaya Luka", Russia

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The Early Triassic Donskaya Luka locality is situated in the Lipovskaya Balka Ravine (right bank of the Don River), 100 km to the northwest of Volgograd city. The bone-bearing deposits represented by conglomerates and sandstones pertain to the Lipovskaya Formation, which lies unconformably on the Carboniferous limestones. The locality is unique for its abundance and the faunal composition. The vertebrate community known from there includes fishes (dipnoans, actinopterygians, elasmobranches and crossopterygians), temnospondyl amphibians, thecodonts, prolacertiforms, procolophonids, trilophosaurids, therapsids, sauropterygians and, probably, ichthyopterygians. The bone remains are isolated, fragmented and often abraded to different degrees.

The bulk of the tetrapod materials belongs to temnospondyls that are represented by three families, Capitosauridae (*Parotosuchus panteleevi*), Trematosauridae (*Trematosaurus* sp. nov.) and Brachyopidae (*Batrachosuchoides lacer*). The thecodonts are known to include the rauisuchids (*Tsylmosuchus donensis*, *Scythosuchus basileus*) and the erythrosuchid *Garjainia* (?) sp. The prolacertiforms are represented by a new species and genus (unpublished) reminiscent of the *Tanystropheus antiquus* from the Triassic of Germanic Basin in morphology of cervical vertebrae. The procolophonid, trilophosaurid and therapsid materials are extremely rare and consist of the lower jaw fragments. The procolophonids *Orenburgia* (*Or. enigmatica*) and *Burtensia* (?) are known by just the four finds. The first recorded trilophosaurids include *Coelodontognathus* (*C. donensis* and *C. ricovi*) and *Vitalia* (*V. grata*). A poorly known *Doniceps* (*D. lipovensis*) is thought to assign to the trilophosaurids also. The only known therapsid find is a new species and genus (undescribed) of a kannemeyerid dicynodont. This is the only evidence of dicynodont existence in Olenekian Age in the territory of Eastern Europe. The sauropterygian materials include the isolated bones, both cranial and postcranial, of the cymatosaurid *Tanaisosaurus kalandadzei*. Probably, this form is the earliest known Triassic eosauropterygian. The ichthyopterygians are represented with a single tooth presumably assigned to ichthyosaurs.

As a whole, the tetrapod assemblage of the locality pertains to the late grouping of the *Parotosuchus* fauna, specific for the Gamskian horizon (Upper Olenekian) in the Lower Triassic of the East European platform. The study of the Donskaya Luka locality genesis shows, that the bone-bearing rocks were deposited in the deltaic conditions on the coast of the secluded distilled marine basin. This conclusion is founded primarily on the presence of the sauropterygians and ichthyopterygians among the tetrapods, the coccolithophorales as well as on the ichthyofauna composition.

A plant-eating crocodyliform from the Late Cretaceous of Hungary

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Two skulls of a spectacular small-bodied crocodyliform were discovered from Upper Cretaceous (Santonian) beds (Csehbánya Formation) at Iharkút (western Hungary).
The best preserved skull possesses mixed features of notosuchian and modern crocodyliforms. The low and flat skull, the dorsally oriented orbits and external nares indicate a modern crocodylian affinity, nevertheless the posteroventrally projected occipital condyle suggest that the new Hungarian crocodyliform may be related to the Notosuchia.

One of the most fascinating character of this new Hungarian crocodile is its dentition. Teeth are preserved only in the last two alveoli of the 17 alveoli of the upper jaw. They are flat, multicuspid molariform teeth with a main longitudinal row of cusps and surrounded by many radial rows of smaller cusps. The last two teeth differ from each other in size and in the number of cusps. Many isolated, multicusped teeth were found with different number of cusps. Probably they belonged to this heterodont crocodyliform forming a special dentition with incisiform, caniniform, premolariform and molariform teeth in the jaw similar to *Malawisuchus* or *Candidodon*. The preserved mammal-like molariform teeth in the maxilla of the new crocodyliform refer to a herbivorous or/and mollusc-feeder habit.

Up to now, only the heterodont *Chimaerasuchus* with multicuspid, molariform teeth has been known from the Cretaceous of the northern (non-Gondwanan lands) hemisphere.

Colourful past- Discolouration of Pleistocene mammal bones and its relevance for age prediction

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As introduced on the meeting of the EAVP one year ago, our investigation deals on the age-prediction of mammal bones from a river current according to their colour.
The problem with the about 5000 analysed, late Pleistocene to Holocene bones is their unknown age as they were unearthed by a suction excavator from different stratigraphical stages. As it is not possible to do an age-investigation on every bone, the bones were subdivided into colour groups to prove a possible synchronity within the groups. Furthermore, element analyses by REM can help to see the influence of element inclusions on the bones` colour. By the investigation of thin sections the histological patterns can be detected to prove possible changes of microstructure associated to increasing age.

So if there was a relation between age and colour, element inclusions or microstructure it would be possible to make a statement concerning the age of numerous bones of one and the same outcrop by measuring only the age of a few of them. A broader interpretation in terms of ecology and environment would become more likely.

In addition stable isotope measurements ($d^{13}C$ and $d^{15}N$) give further information about dietary behaviour of animals and men whose remains have been found in Greven.

New vertebrate localities from the Frasnian of Morocco

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The eastern Anti-Atlas of Morocco is famous for its extraordinary fossils and excellent outcrops of palaeozioc rocks.

Vertebrates occure in the Devonian sediments, they were first descriped by LEHMANN (1956) and later on studied by LELIÈVRE (LELIÈVRE et al. 1993). The focus of the research was on finds from the Emsian, Eifelian, Givetian and Famennian. Placoderms from the Frasnian are only known in view fragments from the Tafilalt and Maider (LEHMAN 1976, 1977, LELIÈVRE et al. 1993).

New material in the collections of the Muséum National d'Histoire Naturelle in Paris gave the first hint on a new occurrence in the Upper Devonian Kellwasserfacies of southern Morocco. After a successfull prospection in 2002 a larger collecting took place in autumn 2003. In an area of about 40 km length and 20 km breadth approximately 100 remains of placoderms in eight time equivalent outcrops of the Upper Frasnian were excavated. Among the finds are hitherto unknown taxa for Gondwana and also new taxa.

WENDT (WENDT et al. 1984, WENDT & BELKA 1991) investigated the sedimentology and stratigraphy of the eastern Anti-Atlas and divided the area of study into the „Tafilalt Platform" and „Tafilalt Basin". The new localities are from bituminous, fossil rich limestones of the platform facies to shales and marls with calcarous concretions of the basin. This distribution of vertebrates makes it possible to interpret the palaeoecology of the occurence of different placoderms.

The comparison of the new localities with the famous Frasnian localities, especially Bad Wildungen, shall present a more precise knowledge of the palaeobiogeographical distribution of the placoderms.

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Inventory and documentation of the fossil remains from the early Middle Pleistocene of Mauer (SE Germany) - a new project in the current research

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In 1907, on October the 21st, the lower jaw of *Homo heidelbergensis* was found in a sand pit, called 'Sandgrube Grafenrain', north of the village of Mauer. After the discovery of Neanderthals (1856) and Java Man (1891), this lower jaw was the third evidence for the existence of fossil hominids.
BRONN (1830) had first mentioned the fossiliferous fluvial sediments in the area of Mauer in a short notice. Many pits yielded well-graded sand, which was used as building material until the 1960s. Throughout the decades a rich and diverse assemblage of mammalian fossils has been exposed by the excavation in the pits (see KOENIGSWALD 1997, KOENIGSWALD & HEINRICH 1999).

Today the fossil material, mainly from the pit 'Grafenrain', is spread out in several public and private collections, known or still unknown. Most is stored in the 'Heidelberger Sammlung' (Heidelberg collection) at the ‘Geologisch-Paläontologisches Institut Universität Heidelberg’ (GPIH) and the ‘Staatliches Museum für Naturkunde Karlsruhe’ (SMNK) (ca. 4500 specimens). Other material is reposited at the ‘Hessisches Landesmuseum Darmstadt’ (HLMD), and ‘Reiss-Engelhorn-Museum Mannheim’ (REM).

In 2001 the society "*Homo heidelbergensis* von Mauer e. V." (http://www.homoheidelbergensis.de) was founded by intrigued citizens and scientists with the aim of supporting the research on *Homo heidelbergensis* and its palaeoecological environment. One goal is to found a museum in cooperation with the commune of Mauer that would emphasise the scientific and cultural importance of the locality.

As a first step the society launched a project in cooperation with the SMNK, financially supported by the ‘Klaus Tschira Stiftung’ (http://www.villa-bosch.de) to compile a comprehensive inventory and documentation of the fossil remains from the locality of Mauer. The goals are in detail:
inventory of the fossil remains from the locality of Mauer
osteological and taxonomical identification of the remains
documentation of the history of sand mining and the outcrops in the Mauer area.
Because Mauer is an established locality this project constitutes one important task for palaeontologists: work on basic research. In Mauer it remains to acquire a better understanding of the stratigraphical range of the locality, of its geological setting, and, through revision, of the fauna it produced and to explore new sites for detailed excavation.

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Feeding the Mechanical Mosasaur: what did *Carinodens* eat?

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Carinodens is amongst the smallest mosasaurs known, and one of the most elusive at that. This enigmatic taxon is known from just two dentary fragments and just over a dozen of isolated teeth, mainly from the Maastrichtian type area, The Netherlands. A few more isolated teeth are known from Brazil, Morocco and Bulgaria. Based on this limited material, an attempt has been made to improve our understanding of the species' dietary habits, by comparing tooth and jaw morphology to extant analogues, and by matching a biomechanical model with 'feeding' experiments using an artificial mosasaur jaw equipped with a force gauge. *Carinodens* appears to have been a durophagous mosasaur, capable of crushing small molluscs and arthropods, but its dietary habits may not necessarily have been limited to hard-shelled food. Contrary to what has been suggested previously, the experiments do suggest however, that *Carinodens* was poorly equipped for feeding on squid.

The inflated sauropod – distribution and development of pneumatic structures in the cervical vertebrae of *Diplodocus* (Sauropodomorpha)

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The cervical and dorsal vertebrae of sauropod dinosaurs often contain a complex system of pneumatic cavities. Reconstructions of the distribution and pattern of formation of hollow spaces within these vertebrae are the basis for reconstructing air-sac systems in the neck and trunk of sauropods. These reconstructions are part of a project in the Natural History Museum Basel (SNF No. 200021-101494/1) that comprises a constructional morphological analysis of the axial skeleton of sauropod dinosaurs. The results will be used to devise a bracing system of the neck, trunk and tail of several sauropods, and in the end will give new insights into the biomechanics and physiology of these extinct giant reptiles.

Reconstructions of the distribution of internal cavities within the cervical vertebrae of *Diplodocus* were made with the help of computer tomographic and neutron tomographic images and movies. The examined vertebrae came from adult and juvenile specimens, all from the Upper Jurassic (Kimmeridgian) Morrisson formation, and were collected in the „Howe Quarry“ locality in Wyoming/USA.

In contrast to the complexely hollowed out cervical vertebrae of the adult specimens, vertebrae of juveniles of *Diplodocus* are perforated by much more simple and fewer cavities. Differences between the vertebrae of juvenile and adult specimens of *Diplodocus* are also visible in the amount of external pneumatic structures at the vertebrae and the presence of bifurcated processus spinosi of the cervical vertebrae. In contrast to these differences, every examined specimen possessed a neural canal closely connected to internal and external pneumatic structures. As a consequence of the cavernous internal structure of the vertebrae, minimum of mass reduction can be calculated to approximately 40% in the cervical vertebrae of adults and approximately 30% in those of juveniles.

From a comparison between the cervical vertebrae of juvenile and adult specimens an increase of the size, complexity and frequency of the pneumatic structures is reconstructable. The development of pneumatic structures in the cervical vertebrae of *Diplodocus* suggest a complex process producing an irregular pattern of cavities within the vertebrae.

The early middle Eocene taxon *Geiseltaliellus* from Geiseltal and Messel, Germany, and the evolution of corytophanid lizards (Squamata: Iguania)

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Iguanian lizards constitute a group remarkable for the opacity of its higher-level phylogeny and historical biogeography. The natural range of pleurodont iguanians currently excludes Europe: most are confined to the New World, although there are notable exceptions, including (among living taxa) Opluridae, whose members are to be found solely in Madagascar, and *Brachylophus* on the islands of Fiji and Tonga; there are also a few pleurodont iguanians known from the Paleogene of Europe. Convergent evolution may be especially important in making higher-level iguanian phylogeny such an intractable problem. Additionally, the pre-Quaternary record of fossil iguanians that can be linked with particular clades is meager. These difficulties conspire to render the broad-scale historical biogeography and timing of divergence of iguanian clades extremely difficult to reconstruct.

The early middle Eocene taxon *Geiseltaliellus*, known for 60 years from Geiseltal near Halle (Saale) and more recently from Messel near Darmstadt (both in Germany), is important to our understanding of pleurodontan biogeography and evolution. In the original description Kuhn explicitly compared *Geiseltaliellus* to the extant *Basiliscus* of Central America, at least ecologically; further study has provided support for the phylogenetic propinquity of *Geiseltaliellus* and the extant clade Corytophanidae. Restudy of the specimens and a cladistic approach were pursued in this inquiry. *Geiseltaliellus* is shown to share several derived features with Corytophanidae, including a Y-shaped parietal table with median crest and dorsomedial expansion of the postorbital. It additionally displays other features that, although they have been suggested as synapomorphies of Corytophanidae, have not previously been demonstrable as such because they are shared by *Laemanctus* and the basal member *Basiliscus* but not the former taxon's sister-group *Corytophanes*. These features include interruption of the orbital rim near the lacrimal-prefrontal junction—of unknown biological significance—and a fenestrated clavicle and are suggested, then, to be primitive for Corytophanidae and further modified in *Corytophanes*, which has been considered paedomorphic. Other relevant features include a parietal foramen in the presumably primitive position at the frontal-parietal suture and a tiny and peculiar structure, interpreted as the postfrontal, wedged between a dorsally forked postorbital. The Messel and Geiseltal specimens of *Geiseltaliellus* show a few slight differences but share at least one apomorphy, a posterior process of the coronoid. The specimens differ in size and therefore also provide information on ontogeny in *Geiseltaliellus* and the evolution of ontogeny in Corytophanidae.

Because it retains several primitive features that were modified further prior to the origin of (crown) Corytophanidae, *Geiseltaliellus* is suggested to lie on the stem of that clade. It thus helps to clarify the morphology hypothesized for the most recent common ancestor of this clade. Its geographic location also strongly suggests that species on the corytophanid stem once had a quite different geographic range than their modern counterparts (which are confined to Central America and northernmost South America) and were distributed at high latitudes in North America during the greenhouse of the earlier Eocene, whence at least one species migrated to Europe. This biogeographic pattern is previously known from glyptosaurine anguids and possibly helodermatids, among lizards. The support found in this study for its alliance with Corytophanidae, in combination with its early middle Eocene age, renders *Geiseltaleillus* a good taxon for the estimation of divergence times in Iguania.

Posters

Upper Jurassic (Kimmeridgian and Tithonian) marine reptiles in the collections of the Universidad Autónoma de Nuevo León, Facultad de Ciencias de la Tierra, Linares, Mexico

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The collections of the Universidad Autónoma de Nuevo León, Facultad de Ciencias de la Tierra, in Linares, Mexico (UANL-FCT) include the holotype of the recently described thalattosuchian *Geosaurus vignaudi*, from the Tithonian (Late Jurassic) of Puebla State (FREY *et al*., 2002) . The collections of the UANL-FCT additionally document a new marine reptile assemblage from the Kimmeridgian (Late Jurassic) of northeastern Mexico. The specimens are fragmentary because they were mainly collected in the frame of geological surveys. They represent groups hitherto unknown from the Late Jurassic Mexican Gulf. The assemblage comprises thalattosuchians, ichthyosaurs, pliosaurs including the remains of the giant nick-named "The Monster of Aramberri" (BUCHY *et al*., 2003), and a single possible elasmosaur vertebra. Most of the diagnostic specimens are endemic at least at the species level, confirming the partial isolation of the Mexican Gulf during the Late Jurassic as was suggested on the basis of invertebrate assemblages. The composition of this new tetrapod assemblage is compared with the Late Jurassic marine tetrapod assemblages of Europe and South America.

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A big theropod from the Jurassic-Cretaceous boundary (Tithonian-Berriasian, Villar del Arzobispo Formation) of Galve sub-basin (Teruel, Spain)

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In the Galve area (Teruel, Spain) there is an important record of Mesozoic terrestrial vertebrate remains of Tithonian-Lower Barremian age. Galve fossil sites belong to the Maestrazgo basin (Central Iberian Range), Galve sub-basin, and appear in four geological formations: Higueruelas Fm. (Tithonian), Villar del Arzobispo Fm. (upper Tithonian–middle Berriasian), El Castellar Fm. (uppermost Hauterivian-lowermost Barremian) and Camarillas Fm. (lower Barremian). Most sites contain bone remains, but there are also paleoichnological and paleoological sites, with dinosaur and other reptile tracks and eggshells. Theropod dinosaurs are relatively abundant, but are represented only by tracks (Higueruelas, Villar del Arzobispo, and El Castellar Fms.), a vertebra (Villar del Arzobispo) and isolated teeth (Villar del Arzobispo, El Castellar and Camarillas Fms.). Teeth have been assigned to indeterminate theropods, baryonychines, coelurosaurs, dromaeosaurids, and "paronychodontids".

We describe a big theropod tooth (the biggest one in Spain) from the Villar del Arzobispo Fm. found in the Galve sub-basin. This tooth (IPSG-1) had been previously assigned to "*Charcharodontosaurus*" in 1966 by Miquel Crusafont and Rafael Adrover, and to *Megalosaurus* in 1968 by Walter Georg Kühne y M. Crusafont, but it has never been described. The tooth has a FABL of 34 mm, and 1.2-1.3 denticles/mm in both carinae. The position of the worn facets and the curvature of the posterior carina allow to identify it as a left maxillary tooth. It is a plesiomorphic tooth, with unornamented enamel, chisel-shaped denticles in both carinae and of the same average size, and without blood groves. By its big size and geological age, it is probably from an allosauroid. Allosauroids are present in the Upper Jurassic of Portugal and the Lower Cretaceous of England and, therefore, there is very probable their presence in the Spanish Jurassic-Cretaceous transition.

The tooth belonged to a very big theropod; comparison with teeth of *Acrocanthosaurus* (NCSM 14345) shows that the owner of IPSG-1 may have a skull length of 1 m, and a total length of 9.5 m. Up to now, small to medium sized theropods were represented in the Villar del Arzobispo Fm. by three trackways from "Las Cerradicas", a caudal centrum from "Carretera" (Theropoda indet.), one tooth from "Las Cerradicas 2" (Coelurosauria indet.) and another tooth from "Cuesta Lonsal" (Theropoda indet.). The newly described tooth represents a third tooth-based theropod taxon in the Villar del Arzobispo Fm. and increases the theropod diversity of this formation. The presence of very big allosauroids in the Tithonian-Berriasian of Spain has been previously suggested by the authors on the basis of gigantic theropod footprints (up to 70 cm in length) from Soria and La Rioja provinces (Cameros Basin, Huérteles Fm.).

Ochotona horaceki: A New Ochotonid from the Early Pleistocene of Slovakia

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A new species of ochotonid (Lagomorpha, Mammalia) from the Early Pleistocene site of Honce (southern Slovakia) is described (ČERMÁK 2004, in press). The record comes from the assemblage characterised by a common appearance of *Mimomys pusillus*, *M. savini*, and advanced forms of *Microtus* (*M. hintoni*, *M. arvaloides*, *M. nivaloides*), which suggests its position at the boundary of Early and Late Biharian. It is perhaps the first Biharian record in Europe of an ochotonid with a nearly complete skull.

Ochotona horaceki is a small sized ochotonid with the narrow skull and the short rostrum. The narrow interorbital part of the frontal bones has distinctive ridges, which extend posteriorly to the interfrontal suture. P^2 possesses one short anteroflexus directed postero-buccally. P^3 is trapezoidal in occlusal outline; it is much narrower anteriorly, than posteriorly. The alveolus of P_3 and P_3 itself is distinctly short and wide. The mandible is rather robust and high. The anterior mental foramen is situated below anterior part of P_3, the posterior one below M_1/M_2.

The recent studies show that *Ochotona valerotae* (Les Valerots, France), *Ochotona* sp. from Chembakchino (western Siberia), and ancient fossil forms of *O. pusilla* could be derived from a common ancestor supposedly distributed in Central Asia at the end of the Pliocene (ERBAJEVA et al. 2001). The essential characters of the new taxon are shared with *O. pusilla* and, hence, the new species can be arranged in the proximity of the above-mentioned taxa. This illustrates a high degree of morphological divergence already at an early stage of the phylogeny of this group. This supposedly may hold particularly pertinent to Europe for which one can expect a mosaic of vicariance situations during the Early Pleistocene with a long-term isolation events. According to the current view the European Pleistocene record comprises the following species: *Ochotona polonica*, *O. valerotae*, *O. horaceki*, and *O. pusilla*.

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LAGs (lines of arrested growth) in Xenarthra, methodologies, age estimates and metabolic rates

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In the South American Plio-Pleistocene existed a great fauna of megaherbivorous, belonging to the order Xenarthra. This fauna, had a great number of representatives of Cingulata (gliptodonts) and Pilosa (ground sloths). Using equations relating body size to population density and basal metabolic rate, it was proposed that the accepted environments could not have supported this on-crop biomass (FARIÑA 1995, Evolutionary Theory, 11). It has been suggested that *Megatherium*, one of the genera of ground sloth of greater size, considerate traditionally as herbivorous, would have been carnivorous (FARIÑA, R. A. & BLANCO, R. E. 1996, Proceedings of the Real Society of London, Serie B., 263). Another explanation (not necessarily excluding) would be that some of these species of megaherbivorous could have had a lower metabolic rates than expected for their size, it would suppose some lower energetic requirements. Extant xenarthrans have the lowest metabolic rates between mammals (McNAB 1985. In: The evolution and Ecology of armadillos, sloths, and Vermilinguas, 219), and there are some references of lower metabolic rates in extinct species (Ho TY. 1967, Comparative Biochemical Physiology 22: 113). We could suppose that extinct South American xenarthrans, had low metabolic rates.

The arrested growth lines (LAGs) indicate an interval which the animal growth is arrested. In mammals that live in climates with a labelled seasonality or that have a certain degree of poikilotherm LAGs can be observed. The presence of lines of arrested growth in dentin of some extinct xenarthrans would suggest low metabolic rates. When we quantify the lines of arrested growth in their teeth, due to continuous growth of these, we can have an estimate of their minimal age. Earlier research (DE ESTEBAN *et al*., 2003. *In*: Libro de resúmenes de la Sociedad Española de Paleontología, Morella, 63) have observed the presence of LAGs in the dentin of two genera of glyptodonts, *Glyptodont* and *Sclerocaliptus*, although they could not be detected in the ground sloth *Scelidotherium*. The technique used by DE ESTEBAN *et a*l. (2003), presented certain problems, which became a loss of information. In the present work are used different techniques for the observation of LAGs in teeth of extant and extinct xenarthrans, with the purpose of determining which is the most adequate for the examination and quantification of such lines in the dentin.

The specimens are housed in the Natural Sciences Museum of Valencia and in the Institute Cavanilles of Biodiversity and Evolutionary Biology.

Lured By the Rings - Growing Pains of a Big Dead Fish

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The pachycormid fish Leedsichthys problematicus is known from the Callovian of England, France and Germany, as well as the Oxfordian of Chile. In February 2001, a series of apparent growth rings were discovered in elements of the splanchnocranium and the appendicular skeleton of the holotype specimen of Leedsichthys problematicus (NHM P6921), and at a scale clearly visible to the naked eye. Such rings have been known from contemporary fish since van Leeuwenhoek (1684), and have a role in estimating the age of fish populations in the fisheries industry, but they are usually only very small-scale structures occurring in otoliths, teeth and scales. In contrast, none of these three components have been identified in Leedsichthys.

Although attention is usually focused on reptiles, with respect to the incidence of fossilised growth markings, growth markings in fossil fish have also, very occasionally, been noted (Enlow & Brown Pt 1, 1957), but as with contemporary fish, these structures have usually only been detectable with visual assistance. In contrast, the structures observed here are easily distinguishable owing to both the thickness of the lines (up to 1mm) and their striking colour difference. Comparison with similar elements in the relatively complete Glasgow specimen (GLAHM V3363, 'Big Meg') confirmed that this was not an isolated occurrence, and the discovery, later in 2001, of a new specimen of this animal (PCM F174, 'Ariston') has resulted in a plentiful supply of test material for study. Comparative analysis of material from all three of these specimens is planned, to investigate the occurrence of this phenomenon, in terms of the degree of cyclicity in the colour patterns, the histology of the bone growth and the variations in geochemical signals within each line.

Late Cretaceous selachian fossil assemblages from southern Poland and their significance for paleoenvironment interpretation.

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The Opole Trough encompasses the interval from the Middle Cenomanian up to the Middle Coniacian. Turonian deposits contain abundant and diverse selachian teeth, mainly from bottom-dwelling ptychodontid sharks: *Ptychodus mammillaris*, *P. latissimus*, *P. polygyrus*, *P. rugosus* and Lamniformes: *Cretoxyrhina mantelli, Cretolamna appendiculata*, *Squalicorax falcatus*, *Scapanorhynchus raphiodon*, *Paranomotodon angustidens, Odontaspis subulata* and undetermined to genus level Cretoxyrhinidae. There also occur rare teeth *Hexanchus microdon, Synechodus major* and *Hybodus dentalus*. Cenomanian and Coniacian rocks contain numerous undetermined Cretoxyrhinidae. I also found very rare teeth of *P. mammillaris* and *S. raphiodon* in the Cenomanian mudstones. The teeth of *Ptychodus* are only abundant in the Middle Turonian sediments (middle *I. lamarcki* Zone) deposited during the peak of transgression. Trace fossils (references see NIEDZWIEDZKI & KALINA 2003) indicate deposition near storm wave base. On the other hand, the teeth of Lamniformes are abundant throughout the Upper Cretaceous succession of the Opole Trough. Additionally, *C. mantelli* and *Ptychodus* were abundant exclusively in deep-water environments of Cretaceous of the USA. It is suggested that *Ptychodus* is a good indicator of the paleobathymetry and the assemblage *Ptychodus* - *C. mantelli* is characteristic for the relatively deep-water environment of the off-shore and deep shelf. Exclusively cosmopolitan taxa occur in the Opole region. The shark assemblages from the other Upper Cretaceous basins of southern Poland and Bohemian Basin are of very close similarity to the selachian fauna of Opole. Only a few cosmopolitan species of the shark fauna of the mentioned basins (e.g. *P. decurrens*, *Cretodus crassidens, C. semiplicatus*) have never been found in Opole. It is probably the result of inadequate collections. In contrast to older data which suggested distinct differences between the ptychodontid faunas of Eurasia and North America, there is now good evidence that ptychodontid faunas contain a large number of cosmopolitan taxa. All species previously reported only from Eurasia (e.g. *P. rugosus*) also occur in the USA (references see NIEDZWIEDZKI & KALINA 2003). Rare endemic species (the taxonomic status of some species is doubtful) are known only from North America.

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New azhdarchid pterosaur remains from the Late Cretaceous of Hungary

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New remains of azhdarchid pterosaurs were discovered from Upper Cretaceous beds (Csehbánya Formation) of the recently documented vertebrate locality in western Hungary. In the material of seventeen tips of the fused symphysis and an anterior part of a cervical vertebra, a fully complete lower jaw were found representing one of the best-preserved mandibular material of any azhdarchid pterosaurs. The complete jaw and the partial neck vertebra are referred to *Azhdarcho* aff. *lancicollis*. The mandibular remains show that *Azhdarcho* was fully edentulous.

The anterior part of the complete jaw is a strong beak separated with a ridge from the posterior part of the symphysis. On the tomial surface of this beak-like tip small foramina are in two rows, furthermore foramina and small system of channels of different sizes are present on its lateral surfaces. These features indicate that this region was well supplied by blood vessels and nerves. The animal probably used this tip of the lower jaw like skimmers their beak today. During flying above the surface of the water this organ would have been shallowly submerged in the water to catch fish.

The articular bears a large fossa depressoria for a strong attachment of the adductor muscle M. pterygoideus posterior. This is another important structural adaptation for skimming. The morphology of the Hungarian specimen supports the hypothesis that *Azhdarcho* was also a skimmer. This interpretation indicates such skimming techniques for fishing were more widespread in pterosaurs than earlier thought, not only in Tapejaridae but also in Azhdarchidae.

The Late Paleocene fish fauna of Turkmenistan

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The unique Late Paleocene fish fauna of the Danata (Danatinskaya) Formation in Turkmenistan is one of most rich and diverse Early Paleogene ichthyofaunas of the world. The fish remnants were collected from two localities situated on the western slope of the Kopetdagh Mountains in SW Turkmenistan. One of them studied since 1956 is situated 2 km NW of Uylya-Kushlyuk village (Kizyl-Arvat region; 38°38'N, 55°48'E), and other is located 90 km southward, close to the Iranian border. The Danata Formation is composed of the Upper Paleocene to the Middle Eocene; fish-bearing layer of mottled clays lies at the base of the middle part of the Danata Formation and has total thickness of 9 m. This layer is now dated as terminal Upper Paleocene and is synchronic with late Tanetian anoxic events (MUZYLEV, 1994). Perhaps most similar in age and composition faunas are the Early Eocene fish faunas of Moler Formation in Denmark, of Isle Sheppey in England, of Bothia locality in Rajasthan (India), and of Alai Horizon in SW Uzbekistan, although only Moler fauna is similar in richness and diversity with Turkmenian ones.

DANILTSHENKO (1968) firstly presented taxonomic descriptions of the Danata fishes and established 20 species. Since 1979 the number of species was increased to 30 (BANNIKOV, PARIN, 1997; BANNIKOV, 2000). Most recent taxonomic investigations show that the middle Danata fish fauna includes up to 42 species of teleosts listed below. Besides, the shark teeth, portunid crabs and sea snakes *Archaeophis turkmenicus* Tatarinov are known from this locality. All these species are known only from the middle part of the Danata Formation. Endemic genera, subfamilies and families are marked by asterisk (*).

Order OSTEOGLOSSIFORMES: fam. OSTEOGLOSSIDAE: *Phareodus osseus* (Dan., 1968) [described in its own genus *Opsithrissops*, which is a synonym of *Phareodus* (Sytchevskaya & Prokofiev, in prep.)]. Order CROSSOGNATHIFORMES: fam. PACHYRHIZODONTIDAE: 1) *Platinx cognitus* Dan., 1968, 2) Gen. et sp. nov. Order ANGUILLIFORMES: fam. GEORGIDENTIDAE*: *Georgidens nikolskii* Sytch. et Prok., 2004; fam. OPHICHTHYIDAE: subfam. ASANOINAE*: *Asanoa kushlukensis* Sytch. et Prok., 2004. Order ELIMMICHTHYIFORMES: fam. ?: *Primisardinella** *genetrix* Dan., 1968 [probably more than one species under this name]. Order GONORHYNCHIFORMES: fam. CHANIDAE: *Chanos torosus* Dan., 1968. Order HALECIFORMES: fam. HALECIDAE: *Goodya** *danatensis* Prok., in press. Order STOMIIFORMES: fam. inc. sed.: *Idrissia turkmenica* Prok., in press. Order MYCTOPHIFORMES: fam. NEOSCOPELIDAE: subfam. NEOCASSANDRINAE*: *Neocassandra mica* Dan., 1968. Order OPHIDIIFORMES: fam. NEOBYTHITIDAE: *Eolamprogrammus** *senectus* Dan., 1968. Order LAMPRIDIFORMES: fam. TURKMENIDAE: 1) *Turkmene** *finitimus* Dan., 1968, 2) *Danatinia** *casca* Dan., 1968. Order GASTEROSTEIFORMES: fam. MACRORHAMPHOSIDAE: *Protorhamphosus** *parvulus* Dan., 1968; fam. UROSPHENIDAE: *Urosphenopsis** *sagitta* Dan., 1968. Order PERCIFORMES: fam. CHANDIDAE: Gen. et sp. indet. [misidentified as *Epigonus*? sp. by BANNIKOV (2000)]; fam. ASIANTHIDAE*: 1) *Asianthus celebratus* (Dan., 1968), 2) *Eosasia rekubratskii* Sytch. et Prok., 2003, 3) *E. lebedevi* Sytch. et Prok., 2003, 4) *E. kessleri* Sytch. et Prok., 2003, 5) *Pauranthus argutulus* Sytch. et Prok., 2003; fam. CAESIONIDAE: «*Caesio*» *breviuscula* Bann., 2000 [actually represents an undescribed genus possibly belonging to Caesionidae]; fam. CARANGIDAE: 1) *Archaeus oblongus* Dan., 1968, 2) *Seriola* sp. nov., 3) *Uylyaichthys** *eugeniae* Prok., 2002; fam. APOLECTIDAE: *Trachicaranx tersus* Dan., 1968; fam. MENIDAE: *Mene triangulum* Dan., 1968; fam. EXELLIIDAE: *Exellia proxima* Dan., 1968; fam. CENTROLOPHIDAE: *Karelinia** *paleocenica* Sytch. et Prok., in press; fam. LUVARIDAE: 1) *Luvarus necopinatus* (Dan., 1968), 2) *Avitoluvarus dianae* Bann. et Tyler, 1995, 3) *A. mariannae* Bann. et Tyler, 1995; fam. KUSHLUKIIDAE: *Kushlukia permira* Dan., 1968; fam. SIGANIDAE: *Siganopygaeus** *rarus* Dan., 1968; fam. EUZAPHLEGIDAE: *Palimphyes palaeocenicus* Dan., 1968; fam. GEMPYLIDAE: *Argestichthys** *vysotzkyi* Prok., 2002; fam. SCOMBRIDAE: 1) *Scombrosarda turkmenica* Dan., 1968, 2) *Eocoelopoma portentosa* Bann., 1985, 3) *Scomberomorus avitus* Bann., 1985, 4) *Palaeothunnus** *parvidentatus* Bann., 1979; fam. HEMINGWAYIDAE*: *Hemingwaya sarissa* Sytch. et Prok., 2002 [apparently misidentified as Blochiidae indet. by Bannikov & Parin (1997)]. Order TETRAODONTIFORMES: BALISTOIDEA inc. sed.: *Eospinus** *daniltshenkoi* Tyler et Bann., 1992.

New paleoichtyologic research at the Kelč locality (Middle Oligocene, Czech Republic)

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Rests of fossil fishes occur very abundantly in the Middle Oligocene sediments of the "Menilitic Formation" at the Kelč locality. Isolated bones, teeths, scales as well as complete skeletons have been found. List of ascertained fish taxa was compiled by Kalabis (1975), based on 70 specimens.

The original materials studied by Kalabis come from the locality Kelč – zámek (= Kelč-chateau). It is preserved in brown-grey to yellow-grey sandy claystones with calcareous admixture and marked lamination. Weathered rock is white.

The new material comes lighter more calcareous sediments from the Kelč-Strážné locality.

At all 241 fish specimen were analysed comprising: 7 genera of teleostean fishes (*Clupea*, *Glossanodon*, *Scopeloides*, *Vinciguerria*, *Diaphus*, *Anenchelum*, *Serranus*) and 2 genera of Elasmobranchii (*Alopias*, *Cetorhinus*).

Occurrence of the genera *Serranus* and *Alopias* have been established for the first time, but no representative of the family Gadidae was found.

The fish assemblage makes possible to suppose epipelagic to mesopelagic enviroment. The only genus *Serranus* could be classified as a classical representative of neritic enviroment.

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Two new ornithopod dinosaurs from the Lower Cretaceous (lower Barremian, Camarillas Formation) of Galve (Teruel, Spain)

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Two partially articulated skeletons with no cranial remains from the Lower Cretaceous of Galve, previously described as Iguanodon bernissartensis and Hypsilophodon foxii, represent two new unnamed ornithopod dinosaurs. The remains of these dinosaurs were recovered by the local amateur José María Herrero in the "La Maca" locality in 1958, and in the "Poyales Barranco Canales" locality in 1982. Both localities pertain to the small village of Galve, in the Teruel province (Northeast Spain), and are geologically situated in the Galve sub-basin (Maestrazgo Basin, Iberian Range), in two outcrops of the Camarillas Formation (Lower Barremian).

The "La Maca iguanodontid" was briefly described by Albert F. de Lapparent in 1960. Its remains (cervical, dorsal, sacral and caudal vertebrae, cervical and dorsal ribs, chevrons and ossified tendons; left pelvis) are fragmentary because a bad dig, and are housed in the Museo de Teruel. It has been identified as an "iguanodontid" (i.e., a non-hadrosaurid iguanodontoid) by its deep prepubic blade and the absence of antitrochanter on ilium. The ilium is similar to that of "Camptosaurus" depresus from the Barremian of South Dakota (USA). The ornithopod from La Maca represents a new iguanodontoid genus characterized by the following autapomorphies: anterior dorsal ribs with a foramen; posterior dorsal ribs with long, parallel and unfused capitulum and tuberculum; ossified sternal ribs (also in Hypsilophodontidae); and straight and lateromedially expanded preacetabular process of ilium (also in Zalmoxes).

Two bones of the "Poyales hypsilophodontid" (left ilium and femur) were described by J. Luis Sanz and others in 1987. The preparation of the remainder of the skeleton (posterior dorsal, sacral and caudal series, left pelvis and both hindlims) by the first author, showed a characteristic of the femora, a dept cleft between the lesser and greater trochanters which is not present in Hypsilophodon. The skeleton was studied in 1996, in the unpublished master thesis of the first author, and a brief description has been published in 2001. The ornithopod from Poyales is recognised as an hypsilophodontid by its rod-shaped prepubic process, and has several autapomorphies: L-shaped first chevron; fibula shorter than tibia (85%) and with no contact to the calcaneum; twisted prepubic process (also in Parksosaurus and Thescelosaurus); and deep intertrochanteric cleft (also in Othnielia). It represents a new hypsilophodontid genus in the Lower Cretaceous of Europe.

Late Badenian Assemblage of Micromammals from Bonanza site (Slovakia)

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The Bonanza locality is situated in the Stockerau limestone pit near Devínska Nová Ves in the northern slope of Devínska Kobyla hill. The site is represented by a broad fissure, which is filled by marine sands, sandstone and large limestone boulders. Besides fossil remains of the terrestrial vertebrates (reptiles, insectivores, rodents, carnivores, artiodactyls and mastodons), the sandy sediments contain also fossil remains of the both marine invertebrates (molluscs) and vertebrates (fishes). Frog fossils suggest the presence of a fresh-water environment in near vicinity of the locality during the period of deposition of these fossiliferous sediments.

So far, 9 mammal taxa were known from this site. However, some new elements have been ascertained in the fossil assemblage of the Bonanza fissure. Generally, 18 new taxa have been found. Fossils of *Plesiodimylus chantrei* GAILLARD, 1897; *Dinosorex* cf. *zapfei* ENGESSER, 1975; *Spermophilinus bredai* (H. VON MEYER, 1848); *Bransatoglis* cf. *astaracensis* (BAUDELOT, 1970); *Democricetodon vindobonensis* (SCHAUB et ZAPFE, 1953); and *Neocometes brunonis* SCHAUB et ZAPFE, 1953 belong among the most important of all.

On the basis of micromammal fossils and the lithological circumstances we are able to draw that sediments of the Bonanza locality are younger than those of the Neudorf-Spalte site (early MN 6, Middle Badenian). Thus, the age of the Bonanza locality has been determined as the the MN 6 biozone (Late Badenian). It is in good agreement with the age of the Sandberg locality, which is also situated in the territory of Devínska Kobyla hill. Transgressive Sandberg deposits are dated to the Late Badenian too (upper part of the MN 6 biozone). However, it is not out of question that they are probably about something younger than these from the Bonanza fissure are.

Thus, three paleontological sites are situated in the territory of Devínska Kobyla hill, where it is possible to regard the faunal succession from the Middle Badenian (Neudorf-Spalte, early MN 6) to the Late Badenian (Bonanza, MN 6 – Sandberg, late MN 6).

The Phu Nam Jun locality, Late Jurassic Early Cretaceous of northeastern Thailand

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The Mesozoic sediments from the Khorat Plateau, northeastern Thailand, have yielded abundant vertebrate assemblages ranging in age from Late Triassic to Early Cretaceous. However, the Thai record of Mesozoic bony fishes is scarce, comprising mainly isolated actinopterygian teeth and scales and some lungfish tooth plates. We report herein a new locality in the Late Jurassic – Early Cretaceous Phu Kradung Formation containing numerous well preserved articulated bony fish specimens.

The new locality is called Phu Nam Jun (the "hill of the spring") after the name of the area. It was discovered some years ago by local people. The villagers conducted excavations and collected pieces of semionotid fishes, which are easily recognisable thanks to the presence of ganoid scales and thick dermal bones. Scores of specimens were brought to the local temple, Wat (temple) Buddhabutr, where they are curated by the head of the monastery, Phra Sakda Thammaratho. The Department of Mineral Resources of Thailand, in collaboration with the Palaeontological Research and Educational Centre of Mahasarakham University, the French CNRS (Centre National de la Recherche Scientifique) and the Musée des Dinosaures from Espéraza, France, undertook systematic excavations during three fieldtrips in 2002, 2003 and 2004. The specimens were mechanically prepared with air-pens in the laboratory of the Sahatsakhan Dinosaurs Research Centre (SDRC), Kalasin Province.

Lepidotes buddhabutrensis Cavin et al., 2003 is by far the commonest fish at Phu Nam Jun. Preliminary comparisons of this species with other semionotidae show that *Lepidotes* is probably not a monophyletic genus. If *L. buddhabutrensis* is closely related to the other Early Cretaceous semionotidae from continental deposits, this group have a great potential for palaeogeographical studies.

A single specimen of an elongated fish with ganoid scales represents a new genus and new species. It shows a mixture of semionotid-like characters and lepisosteid-like characters, such as the body shape and fin insertions. The new fish appears to belong to the Semionotiformes, but it occupies an unclear position within this group, being either the sister group of gars or the sister group of Semionotidae sensu stricto (*Semionotus*, *Lepidotes*).

A single isolated lungfish (dipnoi) skull roof, with associated pterygopalatine tooth, mandible and a few pieces of axial elements, has been discovered in 2002. Isolated tooth plates of lungfish, are relatively common and occur worldwide in Mesozoic freshwater deposits, but cranial remains, especially with associated tooth plates, are very rare. Among Recent lungfishes, the African *Protopterus* and the South American *Lepidosiren* have the ability to survive dry spells by aestivation in a burrow or mud hole, enveloped in a mucous cocoon. The specific location of the lungfish in the site was in a sandy pocket underneath the main fossiliferous layer and likely indicates that the individual was fossilised in situ during aestivation and, accordingly, that the environment was in the open air.

First carettochelyid turtle from the Lower Cretaceous of Thailand

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The Early Cretaceous Sao Khua Formation of the Khorat Plateau, NE Thailand, has yielded an abundant and diverse vertebrate fauna, consisting of fishes, turtles, crocodiles, sauropod and theropod dinosaurs and birds. Recently reported turtle remains include adocids and an undetermined trionychoid (Tong *et al*., 2003a, b). Here we report new turtle remains from the Sao Khua Formation, collected by one of us (P. S.) from the Phu Wat locality, about 30 km NW of Khon Kaen city, in Khon Kaen province. They consist of fragmentary shell material. The shell surface is covered with a pitted decoration, the nuchal is wider than long, the neurals bear a high dorsal keel, the carapace has a serrated margin. All these features are reminiscent of *Kizylkumemys*, a carettochelyid turtle known from the Late Early Cretaceous - Late Cretaceous of Middle Asia and Mongolia (Nesov, 1977; Sukhanov, 2000). The material from Thailand is too fragmentary to allow a reconstruction of the shell. It is tentatively assigned to the Carettochelyidae and considered as closely related to *Kizylkumemys*. *Kizylkumemys* from Central Asia is a small turtle, 250 – 350 mm long, represented by a single species, *K. schultzi* Nesov, 1977. The size of the Thai specimens seems smaller.

The Carettochelyidae were a widespread group during the Early Tertiary, known from Europe, Asia and North America. The single extant species, *Carettochelys insculpta*, is restricted to New Guinea and northern Australia. However, the Mesozoic fossil record of the family is scanty. Besides *Kizylkumemys*, another trionychoid turtle, *Sinaspideretes* from the Late Jurassic or Early Cretaceous of Sichuan, China, was tentatively attributed to Carettochelyidae (Meylan & Gaffney, 1992). Some carettochelyid shell fragments are reported from the Late Cretaceous of Japan (Hirayama, 1998). This *Kizylkumemys*-like turtle from Thailand is the first carettochelyid record from the Mesozoic of SE Asia.

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Variability of the bones of fossil fishes from the family *Trichiuridae* (*Oligocene* of Polish Carpathians)

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There are many specimens which belong to the family *Trichiuridae* among teleostean fish remains from the Oligocene of Polish Carpathians. Remarkably slender body of these fishes influences the state of preservation of their remains. Complete specimens are very rare, and high percent of all fossils are isolated bones and groups of bones separated from the rest of the skeleton. It made a good opportunity to study details of skeletal elements structure, and also to compare them with the bones of related recent fish specimens. The variability of isolated bones, changes of the shape of them during Oligocene were studied – some of the results are illustrated by the poster.

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Excursion Guidebook

Field trip - Friday, 23rd July

1st STOP - BOSKOVICE BASIN Bačov

The Boskovice Basin and its demarcation

The Boskovice Basin represents a structurally complicated stretch of sediment that occurs within a depression that is about 80 km long and approximately NNE-SSW in directtion . It extends from Moravský Krumlov through the cities of Ivančice, Rosice, Černá Hora, Boskovice, Letovice, Moravská Třebová as far as Žamberk. The average width of the Boskovice Basin is about 5 km but is 12 km across at its widest. The Permo-Carboniferous sediments of the Boskovice Basin overlap crystalline rocks of the Moravikum (with the exception of minor faults or flexures) at the west. At the East it is tectonically bordered (called the Main fault of the Boskovice Basin) with rocks of the Brunovistulikum with remains from the Devonian and Culmian crust. The Boskovice Basin is separated from the Permian sediments of the Orlice Basin by the Malonín elevation. Underneath the Boskovice Basin several geological units come into contact – Moldanubikum, Moravikum, and Brno Batholith with a cover of Culmian greywacke.

The Boskovice Basin represents an asymmetric graben which is founded at the steep fault at the Eastern margin of the basin in an extension regime with synchronous Permo-Carboniferous sedimentation. The thickness of Permo-Carboniferous sediments from the south to the north is estimated to be 5000 – 6000 m. The sedimentation began during the Late Stephanian as a result of the Asturian stage of the Variscian orogeny and continued up to the Permian. The gradual sinking of the Boskovice Basin is remarkable especially in its Rosice-Oslavany segment (with coal-bearing Stephanian and Autunian sediments) and Letovice segment, which are separated from each other by the Tišnov rock bar. At the SSW extention of the Boskovice Basin it is possible to see isolated occurrences of the Late Paleozoic sediments in Miroslav and Austrian Zöbing. Outcrops of the coal seams occur along western margin of the Boskovice Basin between Zastávka (near Brno) and Nová Ves (near Oslavany). At the eastern margin sedimentary rocks of the Boskovice Basin submerge under the rocks of the Brno Massif which is thrusted across the eastern margin of the basin. The direction of the Permo-Carboniferous sediments of the Boskovice Basin is generally NNE-SSW and slope downward to the west towards the asymmetrical axis of the basin.

Sedimentation in the area of the Boskovice Basin

The sedimentation began at the Rosice-Oslavany (southern) segment as early as the Stephanian C when the roughnesses of the sedimentary base was leveled by the development of the facies of proluvial fans (Balinka conglomerates) passing into lake facies which developed at the mountainsides. Mountainsides were cut by numerous streams which contained pebbles of diversified petrographical composition.

The basal sedimentation at the western margin of the Boskovice Basin was formed by the Upper Carboniferous (Stephanian C) Balinka conglomerates. It is mainly reddish brown to yellowish brown and medium-grained petromict conglomerates. Pebble material comes mostly from the west Moravian crystalline complex. Looking from the S to the N, it is possible to observe rocks originating from the Moldanubikum and Moravikum regions and from the Letovice crystalline complex. The remains of Devonian limestone have been discovered within conglomerates near the town of Tišnov, the Culmian greywacke is the dominating rock in the southern part of the basin. Balinka conglomerates are formed mainly by reddish, locally by grey cycles (conglomerate – sandstone – claystone, sandstone – siltstone – claystone) and the presence of the clasts of the red eye-gneiss with pink feldspathic grains is typical.

In the overlying of the Balinka conglomerates the sequence of the Rosice-Oslavany coal seams occur at the sw. margin of the Boskovice Basin. This sequence is formed by three cycles of lacustrine and deltaic origin. The seams are tectonically affected and the coal quality diminishes from the N to the S. The majority of the mining was carried out in the I. coal seam (about 70%). At the beginning of the sixties, the deepest mine in the Rosice-Oslavany coal basin reached the depth of about 1550 m. According to recent studies, all three coal seams are considered to belong to the Stephanian C.

Most of the deposits within the Boskovice Basin belong to the Lower Permian where more than a 1000 m thick succession of clastic sediments was deposited. Cyclic fluvial to fluviolacustrine deposits formed by reddish brown sandstones, arkoses and claystones with isolated grey layers prevail at the western margin of the basin. Closer to the steep eastern margin of the basin the finely grained sediments alternate laterally with thick Rokytná conglomerates.

Rokytná conglomerates represent mostly reddish brown, sometimes rust coloured to yellow brown, coarse grained petromict conglomerates to breccias with blocks of rock reaching up to 0.5 m^3. Clastic material is formed primarily with Culmian rocks (90-95%),

mainly greywackes, but Lower Carboniferous limestones have been also discovered originating from the southern part of the Moravian Karst. The abundance of the Devonian limestones generally increases towards the North. This is related to the presence of the Devonian blocks which are wedged in the main fault of the Boskovice Basin in the East. Rokytná conglomerates are usually unstratified with the exception of the parts where conglomerates are interlayered by sandstone and siltstone layers and, locally, also by layers of claystone. Rokytná conglomerates form a continuous skirt on the surface of the eastern margin of the basin. Conglomerates alternate finger-like with deposits in the western basin limb towards the South. Rokytná conglomerates represent alluvial fans which were deposited by temporal streams with the simultaneous intensive fall of the basin deposits. The Boskovice Basin represents the limnic basin where relatively small shallow lakes developed in which sedimentation was slow and monotonic.

On the basis of the different character of deposits and their cyclicity, the intrabasinal complex is divided into several partial formations: the Rosice-Oslavany, Padochov, Veverská Bítýška, and Letovice formations.

Permo-Carboniferous deposits of the Boskovice Basin contain an array of fossiliferous horizons, besides grey and primarily clayish layers, coal seams and bituminous marlites there occur also horizons of pelocarbonates. Unfortunately, the precise mutual correlation of the pelocabronate horizons is still unresolved. Some experts presume that southern horizons are generally older than northern ones because of the shifting of the sedimentation from the S to the N in the area of the Bskovice Basin. Pelocarbonate horizons are numerous, especially in the Letovice region.

Grey horizons with layers of the both bituminous limestones and fine pelites are the most important horizons within the Boskovice Basin. Abundant fauna of discosauriscid amphibians and actinopterygian fish have been discovered, especially in the Boskovice and Letovice areas with typical Autunian flora containing *Walchia piniformis*, *Autunia conferta* and *A. naumanni*.

Bačov site

One of the best documented section in the Letovice segment of the Boskovice Basin is situated within the third Bačov quarry. The whole thickness of today's uncovered layers reach almost 40 m. The first notes on the palaeontological localities in the Bačov area were reported as early as the twenties of the last century by J. Augusta who discovered representatives of the

Lower Permian flora within the sandy clyastones.

At the beginning of the „Skalky“ valley leading to the quarries called „Na skalkách“ the black calcareous claystone occurs together with fossiliferous light calcareous claystone in the overlaying of the reddish brown sandy shales. Abundant remains of the Lower Permian flora and amphibian fauna have been discovered within the fossiliferous claystone. Although many localities have been studied in the Bačov area, close attention was paid to the third Bačov quarry which became the world famous site due to the stratigraphical-palaeontological investigations of V. Havlena and Z. Špinar during the 1950s. According to J. Jaroš, it is possible to include the section of the Bačov Hill with the first three greyish horizons from five Bačov grey pelocarbonate horizons. As to lithological point of view, pelocarbonate horizons were formed by greyish claystones which were grey brown to yellow brown as the result of weathering, and also because of the sandy claystones and siltstones with layers of fine-grained sandstones.

The remains of Lower Permian discosauriscid amphibians and actinopterygian fish, originating from the third Bačov quarry „Na skalkách“, were reported as early as the 1920s by J. Augusta (amphibians were also studied by A. Stehlík). Augusta reported several amphibian species – *Melanerpeton falax* Fr., *Melanerpeton pulcherrimum* Fr., and *Discosauriscus moravicus* Stehlík but his determination was later largely revised not only by J. Augusta himself but also by Z. Špinar and recently by J. Klembara.

The lower Permian flora was studied in fifties of the last century not only by J. Augusta but also by S. Daňková, who partially reviewed Augusta’s determinations. Altogether 35 floral taxa are reported in the locality at the present time; however, it is necessary to review all old phytopalaeontological investigations.

A. Mrázek and Z. Špinar reported in their preliminary report that almost complete skeletons of discosauriscid amphibians which were discovered in grey bituminous claystones about 2 m below the upper rim of the Bačov quarry. This report preceded the detailed stratigraphical-palaeontological investigations of the Bačov Hill in the 1950s. The detailed study of the Bačov Hill which was the most studied section in Bačov region (about 68.76 m long) was published by V. Havlena and Z. Špinar. These authors reported lower grey Bačov layers, middle red Bačov layers, middle grey Bačov layers, upper red Bačov layers, upper grey Bačov layers, and a base of the third red formation.

Strips of grey layers, which are repeated several times, are usually rich in organic remains and this fact distinguishes the grey layers from the strips of red layers. From a palaeontological point of view the grey Bačov layers are of particular importance because of

presence of about a 0.26 m thick horizon marker formed by dark grey pelocarbonate bituminous shales containing numerous remains of discosauriscid ampibians and fish. Z. Špinar reported the following amphibian taxa - *Discosauriscus pulcherrimus* (Fritsch), *Letoverpeton austriacum* (Makowsky), rarely *Discosauriscus potamites* (Steen), and *Letoverpeton moravicum* (Fritsch); however, all amphibians were recently revised by J. Klembara who presumes the presence of only *Discosauriscus austriacus* in Bačov site.

The rarely occurring remains of Lower Permian insects were reported from the Bačov site by J. Schneider in the 1980s- *Sysciophlebia alligans* Schneider and *Phyloblatta* sp.

2nd STOP – MORAVIAN KARST

Moravian Karst

The geological history of the Moravian Karst area considerably differs from that of the Central Bohemia. The old basement consists of granitoids and other plutonic rocks of the Brno Massif which belong to the Late Proterozoic magmatic activity connected with Cadomian orogenic processes. The rocks of the Brno Massif are affected by late Cadomian tectonism and their Proterozoic age is clearly demonstrated by radiometric data.

The Palaeozoic succession starts in the Moravian Karst with varicoloured clastic rocks, namely conglomerates and sandstone, assigned to the Lower (?) and Middle Devonian. They reach a thickness of several hundreds of meters and are similar to the Old Red facies of other regions.

The demostrably marine sedimentation starts in the late Middle Devonian (mostly Givetian). They are carbonate deposits of a shallow-water carbonate platform represented by the thick sequence of the Macocha Formation in which most karst phenomena are developed. The Macocha Formation of the Givetian to Frasnian age exhibits diverse facies among which the dark grey and bedded Lažánky Limestone with numerous dendriform stromatoporoids (Amphipora), and the light grey Vilémovice Limestone with common corals and stromatoporoids are most characteristic.

Close to the Frasnian-Famennian boundary the facies markedly changed due to effects of the world-wide Kellwasser Event. The next unit – the Líšeň Formation – is marked by a great facies diversity: the dark grey platy bioclastic Hády-Říčka Limestone (deeper-water calciturbidites) is locally replaced by fine-grained micritic and nodular, varicoloured Křtiny

Limestone which reflect a calmer environment. The sedimentation of both facies persisted up to the Lower Carboniferous (Tournaisian).

The onset of the terrigenous Culm facies falls in the Moravian Karst mostly close to the base of the Viséan Stage. The thick Culm sequence usually starts with the green or grey clayey and silty Březina Shale with locally rich trilobite fauna of lower Viséan age. The overlying Rozstání and Myslejovice Formation, formed by alternating shale, greywacke and higher also conglomerates of up to 2 000 m thickness, reflects the less stable environment of the Variscan flysch facies.

The folding of Paleozoic sequences is attributed to younger phases of the Variscan Orogeny (Sudetian or Asturian movements). After a long break, the new sedimentation cycles fall into the Late Jurassic, Upper Cretaceous and Miocene which all unconformably overlie the folded Paleozoic rocks.

The Moravian Karst represents the largest karst area in the Czech Republic. It originated according to the occurrence of the karst phenomena during two general karstification periods divided into several karstification phases: I. pre.-Cenomanian karstification period and II. Cenozoic (or post-Santonian) karstification period. Most important is the Cenozoic karstification period which is characterized by deep weathering end erosion of the Upper Cretaceous sedimentry cover in the tropical climate. Since the early Paleogene deep canyons and valleys developed in the Moravian Karst area. The evolution of a cave system and levels was closely connected within the stages of valley development.

Locality Macocha Abyss

The Macocha Abyss represents one of the Moravian Karst symbols. Its mouth is gigantic, 174 x 76 m. The bottom of the shaft is formed by great scree cone, 45 m high. At the foot of cone, 11 m deep Horní (Upper) Lake and 30 m deep Dolní (Lower) Lake are situated. The total depth of the abyss is 168 m. The abyss is 138,4 m deep down to the water level. Divers went to the abyss from the Amateur Cave through a 420 m long trap. The abyss was formed on a steeply SW dipping tectonic line of NW-SE strike with a sunken SW block. Walls of the abyss consist of the Macocha Formation limestone. The main wall of the Macocha Abyss displays a transition from the Lažánky Limestone into the Vilémovice Limestone of the Sloup Limestone. The wall shows an undisturbed sequence from the lower to upper Givetian. Several entrances to caves lie in the walls of the abyss. The natural connection with caves along the Punkva River was blocked during the origin and collapse of the abyss. The

Macocha Abyss was formed by the connection of an extensive old karst pocket with a later formed gigantic dome by a large collapse. The collapse was induces by water corrosion and fall of loosen blocks and the light-hole was formed. The entrance to the Punkva Caves was found in 1914 from the end of the Beams Cave. Man penetrated the abyss bottom for the first time from the Pustý Glen.

Locality Kůlna Cave

The Kůlna Cave is situated at the head of the Pustý Glen. It is a natural tunnel with entrances on both ends, up to 30 m wide and 85 m long. It belongs to the system of the Sloup-Šošůvka Caves. The cave is one of the most prominent and the most intesively explored archaeological sites in the Moravian Karst. Researchers of the Moravian Museum discovered a section examined to the depth of 10 m. It consists (from the base upwards) of the Riss Glacial, last Interglacial (Eem) and the whole Last Glacial and Holocene sediments and contains besides remnants of diverse faunas also remnants of human cultures beginning with the Middle Palaeolith, continues upwards with Taubachian, Micoquian and Graventtian and ends with Magdalénian and epi-Magdalénian. Most important are anthropologic finds such as mandible, parietal bone, milk molar of the *Homo neanderthalensis* and mandible of *Homo sapiens* was found here.

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Field trip Saturday, 24th July

Dolní Věstonice – Pavlovian people – mammoth hunters

Early Palaeolithe (Pavlovian=East Gravettian) Pavlovian people settled in Moravia 27 000-28 000 years ago, during the Upper Pleistocene Denekamp interstadial, due to favourable conditions for the life of mammoth hunters. Their sites were usually situated on the higher places from where it was possible to overlook large areas and control the movement of mammoth herds. They are known in Moravia from south to north along the route used by mammoth herds. The southernmost sites are on the northern slopes of the Pavlov Hills (Dolní Věstonice, Pavlov and Milovice), the next one about 80 km north in Předmostí on the knoll near Morava and Bečva rivers confluence and the northernmost on the hill in Petřkovice in Ostrava, near the northetn boundary of Bohemia with Poland.

The sites of Dolní Věstonice, Pavlov and Předmostí are famous for discoveries of art and burials. Dolní Věstonice and Pavlov, in addition, yielded numerous structures such as hearths, pits and huts, which were not recognised nor sufficiently documented by the early excavators at Předmostí. There are several types of hut constructions, with diameter between 4-6m. The most elaborate and stable structure was found at Dolní Věstonice. It is shallow depression with a hearth in the center, encircled by stone alignment and with postholes indicating the way the superstructure has been erected. Second is a stable structure limited by a circle of mammoth bones, discovered at Dolní Věstonice and Milovice. The third type, frequently found at Pavlov and Petřkovice, is a depression with central hearth or hearths. Finally, there are hearths encircled by a regular system of pits, most probably for cooking and roasting, repeatedly found at Dolní Věstonice site. While the first two types seem to be sufficient to withstand strong storms, the second two types are light structures, without visible marginal enclosures, and most probably seasonal.

Pits and depressions are usually shallow. There is only one example of a storage pit at Pavlov. By its depth (80 cm) it is comparable to the numerous and elaborate storage pits known from East European sites.

Pavlovian (=Gravettian) art includes statues in bone and ivory, plastics of baked clay, body decorations and engraved tools. The engraved decoration is strictly geometric: parallel lines, herring-bone patterns, triangles, arches and their combinations.

The three-dimensional representation is more realistic in animal subjects and more stylised in human, mainly female subjects. The animal plastics or baked clay are sometimes deformed, clustered around the hearths where they were made, together with other clay fragments. The whole situation suggests a ritual creation, frequenly followed by immediate destruction of the object. A simple explanation such as hunting magic, however, seems inadequate. Quantitative composition of the represented animals , dominated by moth bone deposits along the sites and other osteological evidence.

Some of the female, asexual and male human figurines appear in the same situations as the animal figures. The most famous figure, the Black Venus of Dolní Věstonice has been imitated by several other torsos, but the idea has also been transformed into carved abstract symbols. Even the carved female head, made of mammoth tusk is slightly stylized.

There is rich evidence of Pavlovian (Gravettian) burials. The most common position of the bodies is flexed on the right side it has been used without regard to sex of the diseased. While to date we cannot prove any regularity in orientation of the bodies or in artifact equipment, red ochre is usually not missing. The Předmostí grave is extraordinary for the large number of buried individuals (over 20), the male burial in Brno for association with carved male statue of ivory and with numerous decorative and symbolic objects, and the child burial in Dolní Věstnice for partial burning of the skeletal remains. The triple burial found in 1986 in Dolní Věstonice seems to represent a meaningful association of three bodies – an atypical female or asexual person in the middle, flanked by two young males. Finally, the last male burial found in 1987 has been places next to hearth inside a depression of 4,5 m in diameter, most probably inside of a hut.

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