1st Meeting of the **EAVP**

Natural History Museum Basel
Augustinergasse 2
CH-4001 Basel
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Abstracts with programm
Tuesday 15th of July to Saturday 19th of July

Preliminary programm with a time schedule of all presentations.

Day	Speaker	Titel
Wednesday		
8.30h- 8.50h	Welcome address	Ch. Meyer
		chairperson N. Bardet
8.50h - 9.10h	**Cavin, L. et al.**	News about the fishes from Phu Nam Jun, Late Jurassic - Early Cretaceous of North eastern Thailand
9.10h - 9.30h	**Liston, J. & Martill, D.**	Lines of arrested growth in the Giant Middle Jurassic pachycormid Leedsichthys
9.30h - 9.50h	**Frey, E.**	New pterosaurs from Mexico
9.50h - 10.10h	**Schultze, H.-D**	The ?Clasper of xenocanth sharks
		chairperson H. D.Schultze
10.45.h - 11.05h	**Borsuk-Biaynicka, M.**	A basal archosauriform from the Early Triassic of Poland
11.05h - 11.25h	**Bardet, N. & Pereda, X.**	A new mosasauroid (Squamata) from the late Cretaceous of Morocco
11.25h - 1145h	**Schwarz, D.**	Options of prey capture in dyrosaurid crocodilians
11.45h - 12.05h	**Delfino, M.**	The crocodiles of the "Pietra Leccese" (Miocene of Southern Italy)
		chairperson D. Frey
14.00h - 14.20h	**Buffetaut, E.**	A sauropod with prosauropod teeth from the Jurassic of Madagascar
14.20h - 14.40h	**Le Loeuff, J**	Discovery of the first complete titanosaurid skeleton in Europe
14.40h - 15.00h	**Osmólska, H.**	Some aspects of the oviraptorosaur (Dinosauria, Theropoda) braincase
15.00h - 15.20h	**Thüring, B. et al.**	Cal Orcko the world largest dinosaurtracksite – Aspects of assessment, protection and conservation
16.00h - 16.20h		Poster session
16.20h - 16.40h		Poster session
16.40h - 17.00h		Poster session
17.00h - 17.20h		Poster session
17.30h		**Official launch of the EAVP**
Thursday		***chairperson Csiki, Z.***
8.30h- 8.50h	**Fozy, I**	The most important vertebrate fossils of the Carpathian Basin
8.50h - 9.10h	**Barisone, G.**	The beaver from Baccinello V3 (Latest Miocene, Tuscany, Central Italy)
9.10h - 9.30h	**Fejfar,O.**	Pliocene carnivores from Slovakia (mit Sabol)
9.30h - 9.50h	**Canceled Boeuf, O. & Monguillon, A.**	New remains of Carnivores from the upper Pliocene locality of Chilhac (Haute-Loire, France)
9.50h - 10.10h	**Rössner, G.**	Miocene Ruminantia from Southern Germany as indicators of habitat conditions
		chairperson Ch. Meyer
10.45.h - 11.05h	**canceled Kordos, L.**	Lower Jurassic Footprints from Hungary
11.05h - 11.25h	**Marty, D. & Cavin, L.**	A "baby"-sauropod trackway from the Late Jurassic Courtedoux Dinosaur Trackside Excavations,
11.25h - 1145h	**Mezga, A. & Bajaraktarevic, Z.**	First record of the dinosaurs in the Late Jurassic sediments of Istria, Croatia
11.45h - 12.05h	**Milàn, J.**	How to distinguish between true tracks or undertracks - experimental work with artificial substrates
		chairperson J. Le Loeuff
14.00h - 14.20h	**Doukas, C.**	The WINE project – Workgroup Insectivores Neogene Eurasia
14.20h - 14.40h	**Lehmann, T.**	Chad: New impetus to the study of the Tubulidentata
14.40h - 15.00h	**Kalthoff, D.**	Eomyid incisor enamel mictrostructure reconsidered - New evidence for palaeobiogeography
15.00h - 15.20h	**Canceled Kazár, E.**	Paleobiogeographical aspects of Central Paratethys cetaceans in the Miocene
		chairperson E.Buffetaut
16.00h - 16.20h	**Osi, A.**	Pterosaurs and birds from the Late Cretaceous of Hungary
16.20h - 16.40h	**Frey, D. & Meyer, Ch.A.**	Unusual preservation of a new pterosaur from Solnhofen
16.40h - 17.00h	**Csiki, Z. et al.**	A new, spectacular kogaionid specimen from the Hateg Basin
17.00h - 17.20h	**L. Cavin**	Discussion about Oryctos
19.30 h		**Conference dinner in Restaurant Storchen**

Friday		***chair B. Engesser***
8.30h- 8.50h	**Argenti, P. & Kotsakis, T.**	Fossil Apodemus of Italy (mit Kotsakis)
8.50h - 9.10h	**Gal, E.**	Pleistocene avifauna of Romania: a review
9.10h - 9.30h	**Van der Made, J.**	Large mammals and Pleistocene biostratigraphy
9.30h - 9.50h	**Feijfar, O.**	Reconstruction of extinct animals

10.45.h - 11.05h	Guided tour through the exhibit „Dinosaurier.“
11.05h - 11.25h	Guided tour through the exhibit „Dinosaurier.“
11.25h - 1145h	Discussion about the next meeting in Brno
11.45h - 12.05h	

13.30h **Departure field trip Frick from Münsterplatz by bus**

Posters

Name	**Vorname**	**Posters**
Athanassiou	Athanassios	Reghínio, a new mammal locality from the Plio-Pleistocene of Greece
Boeuf	Odile	Chilhac (Haute-Loire, France), upper Pliocene locality, results of research
Buchy	Marie-Céline	Buchy/Frey: Was it really eating granite? We are searching hard: history of the Monster of Aramberri
Buchy	Marie-Céline	Buchy/Frey/Métayer: Slicing plesiosaurs, part II: plesiosaurs' internal nares are no nares at all.
Constantin	Paul	Fossil Vertebrates in the Collections of the National Geological Museum from Bucharest, Romania
Dal Sasso	Cristiano	Delfino/dal Sasso: Marine "crocodiles" (Thalattosuchia) from the Early Jurassic of Lombardy
Delfino	Massimo	Delfino/dalSasso: Marine "crocodiles" (Thalattosuchia) from the Early Jurassic of Lombardy
Èermák	Stanislav	Fossil records of Quaternary ochotonids from the Czech Republic and Slovakia
Focsaneanu	Cristian	Shell microstructure of dinosaur eggs from the Upper Cretaceuous of Romania
Gasparik	Mihály	Neogene and Early Pleistocene Proboscidea from Hungary
Gregorova	Ruzena	The Oliogocene shark fauna at the Litencice and Bystrice/Olsi localities of the Carpathian flysh
Kocsis	László	Revision of the Lower Miocene Shark fauna of Ipolytarnoc, Hungary
Lamagna	Raffaella	Fossil DNA of *Capra ibex* from Ausino Cave (Southern Appennine)
Lehmann	Thomas	The first known aardvark remains from Chad
Liston	Jeff	Poco a poco - the Emerging Osteology of Leedsichthys problematicus
López-Arbarello		Perciform remains from the Campanian-Maastrichthian Saldeño Formation (Mendoza, Argentina)
Nedomova	Jana	The beavers of the Czech Pleistocene
Pazonyi	Piroska	The Late Quaternary vertebrate ecostratigraphy in the Carpathian Basin
Posmosanu	Erika	New data on Lower Cretaceous dinosaurs from Romania
Reimann	Christina Karla	Reasonable age-prediction without age-measurement?
Schreiber	Dieter	Finds of Bubalus murrensis (Bovinae, Mammalia) from the Upper Rhine Valley:
Tong	Haiyan	Turtles from the Yixian formation of Liaoning province, northeastern China:
Venczel	Marten	Late Neogene and Quaternary extinction of lower tetrapods in the Carpathian Basin
Zabrowski	Michal	Two new species of scabbard-fishes from the genus Lepidopus (Trichiuridae, Perciformes)
Zachar István	István	Identifying Tertiary Myliobatoids from Hungary (not participating)

Organizers

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Abstracts of Papers

The Plio-Pleistocene *Apodemus* (Muridae, Rodentia) in mainland Italy

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Murids are very common in Late Miocene of Europe and a good number of genera is still present in Early Pliocene. Since Villanyian times the number of genera decreases. In Italy four different palaeobioprovinces (= pb.) have been identified for pre-Messinian Late Miocene: 1) Alpine (part of the European mainland); 2) Tusco-Sardinian (with endemic faunas); 3) Apulian-Abruzzi (with endemic faunas); 4) Calabrian-Sicilian (with African faunas). Micromammalian fossil remains are unknown in the Alpine (European) and Calabrian-Sicilian pb. whilst in the Tusco-Sardinian pb. the murids *Huerzelerimys*, *Parapodemus* and *Anthracomys* are present. The Apulian-Abruzzi pb. is characterized by the giant endemic murid *Microtia* associated with *Apodemus*. In the Messinian the Italian peninsula formed a single palaeobioprovince except for the Apulian section of the former Apulo-Abruzzi pb. The last one (with *Microtia* and *Apodemus gorafensis* Ruiz Bustos *et al*.) continued its existence till the Early Pliocene. The Messinian (= Late Turolian) faunas are charaterized by the presence of six murid genera: *Apodemus* (*A. etruscus* Engesser and *A.* cf. *A. gudrunae* Van de Weerd), *Paraethomys*, *Castillomys*, *Centralomys*, *Stephanomys* and *Anthracomys*. The Ruscinian assemblages of Italy are very scanty because continental sediments of Early Pliocene age are rare in the Peninsula; only two genera of murids have been discovered till now (*Centralomys* and *Stephanomys*). In Villanyian only the genus *Apodemus* survives in mainland Italy. The genus is known also in Sardinia and Sicily, collected in typical insular assemblages of latest Ruscinian and Early Biharian age respectively (*A. mannu* Thaler and *A. maximus* Thaler). In the peninsula new genera of murids occur only in the Holocene (*Micromys*, *Mus*, *Rattus*).
In the literature four species of *Apodemus* have been reported from Italian deposits of Villanyian, Biharian and Toringian age. New researches raised the number to eight. During Early Villanyian *A. alsomyoides* Schaub is present in north-western Italy. Late Villanyian is characterized by the presence of *A. dominans* Kretzoi, collected in some sites of north-eastern and central Italy. During the same period *A. mystacinus* (Danford & Alston), now living in Balkan peninsula, Anatolia and the Near East, makes its appearance in central Italy. It survives till the late Biharian as a rare element. In Early Biharian *A. atavus* Heller has been collected in a single locality of north-eastern Italy. During the latest part of Early Biharian the living species *A. flavicollis* (Melchior) appears. Its presence is reported mostly from the eastern (Adriatic) side of the Peninsula. During the same period (late Early Biharian) but in a slightly younger moment another living species of the subgenus *Sylvaemus*, *A. sylvaticus* (Linnaeus), occurs in central Italy. This last species is very common in almost all the micromammalian fossil assemblages of Toringian age. Two other species are known each from a single locality: *A. maastrichtiensis* from the late Early Biharian of central Italy and *A.* cf. *A. microps* Kratochvil & Rosicky from the Early Toringian of north-eastern Italy. Two species now living in Italy, *A. agrarius* (Pallas) and *A. alpicola* Heinrich make their first appearance during the Holocene. Three species (*A. atavus*, *A. maastrichtiensis* and *A.* cf. *A. microps*) are known each from a single locality but they are present with a large number of teeth.

A new mosasauroid (Squamata) from the early Late Cretaceous of Morocco

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The Cenomanian-Turonian interval is a key period in lepidosauromorph evolution, evidencing the early diversification and radiation of aquatic squamates within the Tethys margin habitats of Europe and Middle-East.

A new mosasauroid, based on both cranial and postcranial remains kept in the collections of the Museum National d'Histoire Naturelle of Paris, is here described (Bardet et al., submitted). The specimens come from fossiliferous sites located in the Goulmima region, Er-Rachidia Province, southern Morocco. These sites have yielded a rich fauna of marine vertebrates, including actinopterygians (Cavin et al., 2001), mosasauroids, turtles and plesiosaurs, as well as ammonites. The fossils are preserved in ovoid calcareous nodules that are concentrated in the Unit 4 of the Cenomanian-Turonian limestone bar, a reference level in North Africa. The Unit 4 is Early Turonian in age and corresponds to an open platform environment related to the maximum of the Cenomanian-Turonian transgressive phase (Ferrandini et al., 1985).

This new mosasauroid, less than 3 meters in length, is mainly characterized by a parietal table ending posteriorly in two pointed pegs, a jugal with a large ascending ramus, a splenial with a large notched dorsomedial process, a surangular exposed medially ventral to the coronoid, a dental formula of 19-20 maxillary, 15-19 pterygoid and 18-20 dentary teeth and, finally, large paracotylar foramina on vertebrae. It also exhibits a mosaic of plesiomorphic characters, the most notable being those observed on the girdles.

A phylogenetic analysis based on the data matrix of Caldwell (2000) shows that, among Pythonomorpha, this new taxon shares many synapomorphies of Mosasauroidea ("aigialosaurs" + Mosasauridae) and appears to be the sister-taxon of Mosasauridae.

The distribution in time and in space of this new taxon fills the gap between the basal mosasauroids (Middle-East and southern Europe; mainly Cenomanian in age) and the Mosasauridae (earliest records from the Late Turonian of Colombia and Angola).

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The beaver from Baccinello V3 (Latest Miocene, Tuscany, Central Italy)

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The fossil mammals collected in the Baccinello area belong to the Tusco-Sardinian paleobioprovince, one of the four paleobioprovinces existing in Italy during the Late Miocene (Tortonian), characterized by pre-Messinian mammal communities. Four vertebrate faunas named V0, V1, V2 and V3 were identified in this area. The last one is the most recent faunal assemblage, of non-insular type, comparable with typical European faunas of the Late Turolian MN 13 unit. An age immediately following the faunal renewal is suggested for the presence of an endemic murid, *Anthracomys lorenzi*, inherited from the endemic fauna of Tusco-Sardinian paleobioprovince. In the Baccinello V3 assemblage one incomplete mandible and several molars of beaver were collected and ascribed to *Castor praefiber* or to *Castor* cf. *C. praefiber* or defined as "very similar to Montpellier form", but never studied. These fossil teeth have been analyzed and compared with specimens of living *Castor fiber*, Late Villafranchian beaver of Pietrafitta (Central Italy) (?*Castor plicidens*), Early Turolian *Castor neglectus* of Dorn-Dürkheim (Germany) (MN11) and other fossil material assigned to *Castor praefiber*, collected in Early Ruscinian (MN14) deposits of Montpellier (France) and in the Late Ruscinian (MN15) ones of Pont-de-Gail (France), Millas (Roussillon, France) and Wölfersheim/Wetterau (Germany); the last one represents the only big fossil population of *C. praefiber*. The Early Vallesian *Chalicomys jaegeri* of Eppelsheim (Rheinhessen, Germany) has been utilized as outgroup because of the great number of the samples. A multivariate statistic approach (PCA and DA analysis) has been used for species and population comparisons. A set of variables has been defined for the morphometric analysis of the molars occlusal surface of genus *Castor* and the species *Chalicomys jaegeri*, in order to characterize the different species: six measurements of length, six of width and six of enamel thickness, and fifteen indexes (depending as less as possible on the different ages and wear of the teeth). The analyses have been performed on P/4, M/1-2 and M3/. The last one did not give significant results; on the contrary both P/4 and M/1-2 pointed out a close affinity between the specimens of Baccinello V3 and *C. praefiber* of Wetterau, Pont-de-Gail and Montpellier; on the other hand, for both Villafranchian beavers of Pietrafitta and living *C. fiber* a specific separation is pointed out, especially due to the indexes concerning the mesoflexid and metaflexid. The chewing teeth pattern of *Chalicomys jaegeri* results to be similar to that of *C. praefiber* group, but in the first species para-, meso- and metastriid (striia) are long but their end is far from the crown basis. In *C. praefiber* teeth occlusal surface seems to show both plesiomorfic characters (inherited by an ancestor common with the *Chalicomys jaegeri*), and apomorfic ones (that characterize Ruscinian forms too). The *Castor neglectus* specimens appear to be very different from all the other *Castor* forms, and not correlated with *Chalicomys jaegeri*. Therefore the beaver of Baccinello V3 represents the most ancient fossil recovery assigned to *C. praefiber* and the first appearance of genus *Castor* in Italy.

A basal archosauriform from the Early Triassic of Poland

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Over the last decade, the Triassic terrestrial deposits of Poland have yielded several rich tetrapod faunas. These include the Triassic (Keuper, late Carnian) amphibian and reptile assemblage from the lacustrine and deltaic deposits of Krasiejow, southwestern Poland (e.g. Dzik in press), and an Early Triassic microvertebrate assemblage from the karst deposits of Czatkowice 1, Southern Poland (Borsuk-Bialynicka et al 1999). This latter locality was recently dated as Early Olenekian in age, on the basis of dipnoan teeth and procolophonian remains. The Czatkowice assemblage includes a basal archosauriform, which is the largest and most common element of this fauna, two possible representatives of the Lepidosauromorpha, one very small prolacertiform, and some procolophonians. It also includes a basal salientian (*Czatkobatrachus* Evans and Borsuk-Bialynicka, 1998) of a grade similar to *Triadobatrachus*, as well as very small, comparatively rare temnospondyls, and fish. Under chemical preparation, the material has yielded many hundreds of dissociated bones. These are mostly fragmented but show fine three-dimensional preservation with relatively little abrasion.
On the basis of the reconstructed skull and some postcranial elements (an account of the remaining skeleton is in preparation), the basal archosauriform from Czatkowice is a reptile of *Euparkeria* grade and size (estimated skull length 60-120 mm). The reconstructed braincase displays an array of plesiomorphic (according to Gower and Sennikov's 1996 polarity) features such as a ventral rather than lateral position of the entry foramina for the internal carotid arteries; a semilunar depression on the posterolateral margin of the parabasisphenoid; and an unossified medial wall of the vestibule. These character states argue against the inclusion of the Czatkowice archosauromorph within crown group Archosauriformes (or Archosauria), whereas the verticalization of the parabasisphenoid places it above the proterosuchid level. The other cranial characters show a mosaic pattern (plesiomorphic palatal dentition mostly retained, derived antorbital fossa developed, straight instead of convex margin of the maxilla), while the postcranial characters suggest a small lightly built predator, and imply a locomotor ability (markedly triradiate pelvis, ilium with a small anterior process, slender sigmoid femur with fourth trochanter) rather different from that of the Erythrosuchidae. This combination of character states is shared with *Euparkeria*, and may support the monophyly of the Euparkeriidae Huene, 1920. Although several genera from the Early to Middle Triassic of Africa, Asia and Eastern Europe have tentatively been included within the family, Euparkeriidae has remained virtually monotypic since only *Euparkeria* is adequately known. *Euparkeria* has always played a key role in the discussion of basal archosauriform and archosaur phylogeny. The Czatkowice archosauromorph provides both a range extension for the family and also additional detailed 3-D morphological information. This will permit a more rigorous testing of existing phylogenetic schemes and may help to resolve some of the current controversies.

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A sauropod with prosauropod teeth from the Jurassic of Madagascar

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Sauropod remains have been known from the Middle Jurassic of Madagascar since the late 19th century, but the evidence consisted almost exclusively of postcranial material.
An incomplete right dentary bearing several teeth, from the Middle Jurassic of the Majunga Basin in northwestern Madagascar, kindly made available for study by Didier Descouens, reveals an interesting combination of features. The dentary is typically sauropod-like, its height increasing significantly and regularly from back to front, unlike the prosauropod condition in which the dentary is deeper posteriorly than anteriorly.
The teeth, however, are leaf-shaped, with large serrations along the edges, and thus closely resemble those of prosauropods such as *Plateosaurus*, rather than the spoon-shaped or peg-like teeth seen in most sauropods. No sauropods with such "primitive" teeth had hitherto been reported.
This new Madagascan specimen, which very probably belongs to a new taxon, suggests that mosaic evolution was involved in the early history of sauropods, with the dentary evolving faster than the teeth towards the condition seen in Late Jurassic and later forms.

News about the fishes from Phu Nam Jun, Late Jurassic - Early Cretaceous of North-eastern Thailand

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The locality of Phu Nam Jun (the "hill of the spring"), North-eastern Thailand, is located in the Late Jurassic - Early Cretaceous Phu Kradung Formation. The Department of Mineral Resources of Thailand, in collaboration with the Palaeontological Research Centre of Mahasarakham University, the French CNRS and the Musée des Dinosaures of Espéraza undertook systematic excavations during two fieldtrips in spring 2002 and winter 2003. One hundred and twenty-four fish specimens have been recorded in February 2003, about one hundred have been taken away from the site and 51 are already prepared.

All but two specimens (according in part to field observations that are not fully reliable) belong to a new species of *Lepidotes*. A study is currently conducted in order to assess the wide range of anatomical and morphometric variations within the *Lepidotes* population, and to propose hypotheses to explain this variation (sexual dimorphism, several species, taphonomy, …).

A single nearly complete specimen found alongside the *Lepidotes* specimens represents a new genus and new species of Semionotiformes. It shows a mixture of semionotid-like characters, such as the pattern of cheek ossifications, and lepisosteid-like characters, such as the body shape and fin insertions. Moreover, it possesses only part of the characters currently used to define the Semionotidae. Cladistic analyses including various semionotid and ginglymodi taxa, together with *Amia calva* and *Leptolepis coryphaenoides*, show that the Semionotiformes (Lepisosteidae and 'Semionotidae') form monophyletic clade, but the 'Semionotidae' taxa form an unresolved polytomy. This new species is the only known example of a predaceous, probably piscivorous, 'semionotid'. It illustrates the great diversity and ecological adaptation of the non-gar semionotiforms during the Late Jurassic – Early Cretaceous.

A skull roof with associated jaws of a lungfish was discovered in the sandstone layer underneath the main fossiliferous layer. It represents the best-preserved and most informative post-Triassic Mesozoic dipnoi. A preliminary study shows that its calvarium differs from the calvarium pattern of all known fossil and Recent lungfishes. The occurrence of both toothplates and calvarium from a single individual is an interesting opportunity to assess the respective importance of these two skeletal complexes for understanding lungfish systematic and relationships.

Taphonomical observations indicate that the fish carcasses likely dried in the open air before burial. These are: 1) The spatial distribution of specimens, which is not random; 2) the mode of preservation of carcasses with their squamation decayed in a particular manner; 3) the location of the lungfish in a sandy pocket underneath the main fossiliferous layer, likely indicating that the individual was fossilised in situ during aestivation and 4) the general composition of the fauna with no tetrapods, which would have been able to escape a drying up pond, whereas fishes could only be trapped in it and die there.

A new, spectacular kogaionid specimen from the Hateg Basin and phylogenetic position of the Kogaionidae

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Kogaionids are a peculiar group of Late Cretaceous and Paleocene multituberculates, restricted to Europe, represented until recently mainly by isolated teeth. An isolated skull as well as recently recovered toothed jaw fragments are known only from the Late Cretaceous of the Hateg Basin. Their relationships to other derived multituberculates (the members of the Cimolodonta) are rather poorly understood.

During the sumer of 2002, following the 7EWVP held in Sibiu and fieldtrip to the Hateg Basin, participants from Germany and Romania took part in a short expedition to several Maastrichtian outcrops from the region. In one of these excursions a spectacular multituberculate specimen was discovered in the valley of the Barbat River, represented by associated skull remains and postcranial skeleton. Sedimentology of the fossiliferous rocks suggests that these remains belong to one individual; the scattering of the bones suggests that these suffered a slight *in situ*, pre-burial disturbance, but no significant transport.

Preparation of the specimen is not yet completed. What is known for the moment, however, suggests that we have at hand one of the most important multituberculate specimens from Europe ever discovered. Already prepared elements include both lower jaws, an isolated lower incisor, an isolated second upper molar, a femur, a fragmentary pelvic girdle and fragmentary vertebrae. The characters of the m1 with reduced cusp formula and of p4, highly arched, but with a low number of ridges, supports the kogaionid affinity of the specimen. Autapomorphic traits of the m1, as well as the dimension of the teeth suggest the skeleton might represent a new taxon within the family Kogaionidae.

The lower jaws are incomplete, the distal ends are broken in both cases; they also lack the m2. However, the right mandible has preserved i1, p4 and m1, while only i1 is missing from the left madible – it was recovered isolated from just under the left mandible, also suggesting that post-mortem, pre-burial disturbance of the skeleton was minimal. It is the first case the almost complete lower dentition of a kogaionid is discovered. Comparisons of the lower dentition with that of other multituberculate clades within the Cimolodonta also supports the separation and distinctiveness of the family Kogaionidae.

The presence of conflicting character stages shared by the Kogaionidae and different other cimolodontan groups shows that our understanding of the ingroup relationships of the cimolodontan subclades is far from definitive.

Further preparation and subsequent study of this spectacular specimen (representing the first associated multituberculate skeleton from Europe, as well as the first dentaries with almost complete dentitions preserved from the Cretaceous of Europe) will surely has a significant impact on the understanding of the cimolodontan phylogeny and systematics.

The crocodiles of the “Pietra Leccese” (Miocene of southern Italy)

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The presence of crocodile remains in the Miocene sandstone called "Pietra Leccese" (Apulia, Southern Italy) has been reported since the middle of the XIX century by Oronzo Gabriele Costa, and then by Giovanni Capellini and Pasquale Aldinio, who, altogether, referred the speciments to the following *taxa*: "*Crocodilus*" sp., *Rhytisodon tuberculatus* Costa, *Streptospondylus Lyciensis* Costa, *Steneosaurus Lyciensis* (Costa), *Suchosaurus cultridens* Owen and *Tomistoma lyceensis* Aldinio.
New fossils collected in the last 20 years allow to reconsider on a sounder basis the whole history of the crocodiles of the Pietra Leccese and to revise the taxonomic allocation of all the remains known so far.
The studied and revised materials belong to the collections of the "Museum of Environment" of Lecce (specimens # MAUL 972/1 and # MAUL 973/1) and to the "Giovanni Capellini" Museum of Bologna (specimens # 2-4511 and # 8880-1 RE 43).
The specimen MAUL 972/1 is by far the most representative being a partial skull associated with some vertebral fragments. Its diagnostic features can be summarised as follows: evident longirostry, maxillary teeth not homodont, splenials participating in mandibular symphysis, deep splenial symphysis probably longer that 5 alveoli and forming a narrow "V", symphysary surface of the splenials devoid of *foramen intermandibularis oralis*, dorsal edges of orbits upturned (not telescoped) and procoelous vertebrae. According to the phylogenetic systematic context recently proposed by Brochu, the listed features are typical of Tomistominae. Although the presence of some peculiar characters (the degree of upturning of the orbits, the presence of a small tubercle on the lacrimal, the slenderness of the teeth) could deserve the erection of a new *taxon*, taking into consideration the largely unknown intra- and interspecific variability of the Miocene Tomistominae, this specimen is simply referred at subfamily rank at the moment.
Anyway, the identification of a Tomistominae showing particularly slender and pointed teeth allows to cast doubts on the presence of *Gavialis* in the European Miocene, since the sole evidence of this group in Europe is represented by isolated teeth (from Portugal and France) with a similar morphology.
The holotype of *Tomistoma lyciensis* (Costa) has not been located, however a cast is kept in the collections of the “Capellini Museum” in Bologna (specimen #2-4511). It does not show any feature allowing to confirm its specific status. Although rather different in general appearence and proportions from MAUL 972/1, it shows the same shape of the palatine-maxillary suture and is therefore tentatively referred to the same *taxon*.
Due to unfinished preparation, the specimen MAUL 973/1 is allocated at order rank, as well as some isolated teeth kept in the Bologna Museum (catalogue number 8880-1 RE 43).
The name *Rhytisodon tuberculatus* Costa has to be considered as a junior synonym of an odontocete squalodontid, while *Tomistoma lyceensis* Aldinio is a junior synonym of *Tomistoma lyciensis* (Costa), which seems to be a *nomen vanum*.

The project WINE and its goals

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The study of insectivores is reflected in individual work that gives emphasis either on systematics, or phylogeny, or ecology, or all of the above. That is why in November of 2002, European insectivore specialists gathered together in Frankfurt am Main to talk about giving insectivores a high profile and work in cooperation in solving the problems concerning this group.We decided then to work together on the Neogene insectivores, retaining the classic division, starting from the E. Miocene to the Villanian/Biharian boundary.Although most of our material comes from European localities, we thought that in order not to get biased information on migration, it would be best to include Asia. We have called our project WINE, Workgroup on Insectivores of the Neogene of Eurasia. Insectivores are the oldest placental mammals. Thinking of them, however, as primitive mammals is wrong because they combine a mixture of primitive and derived characters. Insectivores recently have been called Lipotyphla. However, this systematic has been proved to be useless to paleontologists. Presence or absence of "caecum" can not be detected in our fossils and the phylogeny of the group shows that only a part of the families can be assigned to Lipotyphla. Therefore our first decision was to return to the good old name of "insectivores ". However, previously the term "insectivores", was used as a waste basket referring to unclear definition. Now we understand "insectivores" as a covering umbrella. Following this train of thought and in order not to create havoc in systematic we retain the subdivision suggested by BUTLER (1972): Erinaceomorpha and Soricomorpha. During the Neogene lived all the extant families, Erinaceidae (hedgehogs), Talpidae (moles), Soricidae (shrews), Selonodontidae (solenodons), Chrysochloridae (golden moles) and Tenencidae (tenrecs), plus two extinct now families Plesiosoricidae and Dimylidae (ZIEGLER 1999).Even though, insectivores are usually less abundant than rodents in fossil small mammal assemblages, valuable collections of good material in dental and post-cranial elements exist. In the study of insectivores the use of post-cranials is also important.We have set as our first goal to gather and publish a fossil record of the Neogene insectivores which contains for every known locality, next to a fauna list, local stratigraphy, plus coordinates when available, MN zones, a reference list and place of storage of the material. With our first step, the fossil record, we are addressing the stratigraphic problem, mainly referring to local zonation. This is essential to be able to correlate to the MN zones. It has been proven that correlation to MN zones becomes problematic when you are geographically distant from the reference fauna and the local succession is not well known. After completing our fossil record, working groups should be formed, to work on mainly phylogeny and consequently to the other topics.Phylogenetic lineages, geographical patterns and in turn migration routes, should be studied. Knowledge of geographical boundaries is also important Insectivores are good ecological markers in the study of a fauna. Biostratigraphy information is normally taken from the rodent assemblages.In a project such as this, taxonomic differences arise. Therefore, a person with almost"dictatorial" powers is needed to confirm correct taxonomy. Burkart Engesser has accepted this rather difficult position. For the understanding of ecosystems today, modeling is "on vogue", not without a reason. Distribution and abundance of species can help in the reconstruction of humidity and temperature, or even more, in the seasonal aspects of climate. Small mammals, consequently insectivores, are good due to their short mean life expectancy, in calculating interannual variation.

Pliocene Carnivores (Carnivora, Mammalia) from Ivanovce and Hajnácka (Slovakia)

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In the territory of Slovakia, some sites with records of carnivores are known, but only two of them - Ivanovce (late MN 15) and Hajnácka (early MN 16) - yield a large quantity of carnivoran fossils. In the both sites, the ocurrence of the families Mustelidae and Procyonidae is similar represented by *Lutra* cf. *bravardi* and *Parailurus*. However, both sites differ by the presence of *Parailurus hungaricus, Megantereon* sp., *Hyaena perrieri*, Ursidae gen. et spec.indet. in Hajnácka, and by the presence of *Parailurus* cf. *anglicus, Hesperoviverra carpathorum* and Viverridae gen. et spec. indet. in Ivanovce.

The situation cannot be explained simply by paleoecology, because the paleoenvironmental conditions were quite comparable as shown by corresponding occurrence of Amphibians (Anurans), mastodons and tapirs. Both sites represent humid forest belts, along a maar lake in Hajnacka or along a broad river valley with a karstified limestone massif in Ivanovce; both areas were surrounded in higher elevations by an open probably drier habitat.

KEY WORDS: Carnivores, *Lutra, Parailurus, Mustela, Hyaena, Hesperoviverra, Megantereon*, Late Pliocene, Slovakia

The most important vertebrate fossils of the Carpathian Basin

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The lecture focuses on the most prominent fossil vertebrate findings ever discovered in the Carpathian Basin. The provenance, age, and importance of these unique specimens and some fossil assemblages are briefly discussed. In stratigraphic order, the following vertebrates are discussed:
Placochelys placodonta is one of the evolutionarily most advanced cyamodontoid of Late Triassic (Carnian) age. Discovered in Veszprém (Bakony Mts) more than a century ago, it is still one of the most valuable fossils from Hungary. Important Triassic vertebrates of the region Alesd and Lugas (Bihor Mts) also include placodonts as well as partial skeletons of *Nothosaurus* and *Tanystropheus*.
Jurassic rocks are generally poor in vertebrate remains. The only exception is the coal-bearing, parallic, Hettangian deposits of the Mecsek Mts, where numerous footprints of bipedal dinosaurs were discovered. The footprints (*Komlosaurus*) have a special importance, since lowermost Jurassic dinosaur tracks are poorly known all over the world. The terrestrial Cretaceous formations of the Carpathian Basin yielded rich and diverse vertebrate faunas. First of all, the classical uppermost Cretaceous reptile fauna of the Hateg Basin (Southern Carpathians), discovered by baron Nopcsa must be mentioned. The original descriptions included dinosaurs, crocodiles and chelonians. New findings from both the old localities and recently discovered outcrops contain additional dinosaur taxa, eggs, footprints, pterosaurs, birds, and also remains of early mammals.
Cretaceous vertebrates of the Cornet locality (Padurea Craiului Mts) include poorly preserved dinosaur remains, and a relatively diverse pterosaur and bird fauna. It's worth mentioning, that tiny, fragmented bones, were determined as *Archaeopteryx* sp. The paleofauna from Cornet is Early Cretaceous in age. The most recently discovered Cretaceous (Santonian) vertebrate assemblage of the region was found in the Bakony Mts. The rich fauna (including nodosaurid and rhabdodontid dinosaurs, pterosaurs and also birds) is currently under study.
From the Cainozoic, the famous remains of *Brachydiastematherium transilvanicum* from the Lower Eocene of Andrásháza (Cluj County, Romania) must be mentioned at first. This rare finding represents Tithanotheridae, a group which is mainly known from outside Europe. The same terrestrial succession of the very same locality yielded another important fossil: *Prochyracodon orientalis* (Middle Eocene), a small sized early Rhinocerotidae. Miocene marine formations contain some very well-preserved remains of Cetacea and the terrestrial Miocene is also rich in vertebrates. In the vicinity of Ipolytarnóc (Northern Hungary), Lower Miocene volcanic ash covering a sandstone bed preserved thousands of fossil footprints of a diverse mammal and bird community. The Late Miocene (Pannonian) is especially rich in terrestrial vertebrates. The ape (*Anapithecus*) and hominid (*Dryopithecus*) remains from Rudabánya (northern Hungary) has a special importance from the point of view hominid evolution. From the Plio/Pleistocene interval not only solitary specimens, but also complete assemblages can be mentioned. Some of the important localities (e.g. Villány, Csarnóta, Betfia) provided rich faunal assemblages which are the basis of widely used faunal intervals of the same name.
The rare and unique vertebrates of the Mesozoic and Palaeogene, provide patchy information on palaeobigeography and evolution of certain groups, while the extremely rich micro- and macro-vertebrate assemblages of the Neogene and Quarternary provide a solid base for precise stratigraphy and for accurate reconstruction of palaeoenvironment, including climatic changes.

A new pterosaur from Mexico

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Identifizierbare Pterosaurierreste sind aus fast allen Zeitabschnitten des Mesozoikum bekannt. Aus dem Coniacium fehlen bisher Nachweise für die Existenz von Pterosauriern. Im Frühling des Jahres 2002 wurde dem Direktor des Museo del Desierto in Saltillo (Coahuila, NO-Mexiko) der Fund eines Pterosauriers aus den Plattenkalken nahe der Ortschaft Muzquiz zur Kenntnis gebracht. Das Stück war Privatsammlerkreisen unter dem Namen „Jango“ („Affe“) bekannt und wurde vom Steinbruchbesitzer an einen Naturstein-Großhändler verkauft. Platte und Gegenplatte fanden wir eingemauert im Büro der Firmenmanagers und erhielten die Bergungsgenehmigung. Erste Untersuchungen zeigen, dass das Skelett der Pterosauriers fast vollständig und artikuliert ist; nur die distalen Termini der Flugfinger und das rostrale Ende des Rostrum fehlen. Das Sternum und die Ossa praepubis sind nach caudal verdriftet. Die langovale Orbita ist etwa so hoch wie die Fenestra nasoantorbitalis. Eine kurze, niedrige Crista occipitalis ist vorhanden und der erhaltene Teil des Rostrum ist auch rostral der Fenestra nasoantorbitalis zahnlos. Die Morphologie des Schädels erinnert an diejenige von *Cycnorhynchus suevicus* aus dem Malm (Oberjura) von Nusplingen (Süddeutschland). Der rechteckige Processus deltoideus des Humerus, die Proportionen der Vertebrae cervicales und die auffällig lange Metacarpalregion erinnern ebenfalls an *Cycnorhynchus*. Ein bislang einzigartige Besonderheit ist die Weichteilerhaltung im Bereich des Radius-Ulna-Komplexes. Dort sind phosphatisierte Muskel- und Sehnenfasern überliefert.

Significant remnants of pterosaurs are reported from nearly all sections of the Mesozoic. From the Coniacian, however, there are no proofs for the existence of pterosaurs. In spring 2002 a pterosaur find from the laminated limestone near the village of Muzquiz was brought to the knowledge of the director of the Museo del Desierto at Saltillo (Coahuila, NE Mexico). Among local private collectors the specimen was nicknamed “jango” (“monkey”) and was sold by the quarry owner to a stone yard manager. We discovered slab and counter-slab cemented into a wall of the manager´s office, but we received the permit for excavation. First investigations show that the skeleton of the pterosaur is almost complete and articulated. Only the distal elements of the wing fingers and the rostral terminus of the cranium are missing. The sternum and the ossa prepubis have drifted caudally. The long oval orbita is approximately as high as the fenestra nasoantorbitalis. As short and low crista occipitalis is present and the preserved part of the rostrum is edentulous even rostrally to the fenestra nasoantorbitalis. The cranial morphology resembles that of *Cycnorhynchus suevicus* form the Malm (Upper Jurassic) of Nusplingen (S Germany). The rectangular processus deltoideus of the humerus, the proportions of the vertebrae cervicales and the elongate metacarpal region also resemble the situation in *Cycnorhynchus*. A hitherto unknown feature of the specimen is the soft-part preservation around the radius ulna complex. Here phosphatised muscle and tendon fibres are preserved.

Unusual preservation of a new pterosaur from Solnhofen

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Vor einigen Jahren wurde in einem freigegebenen Plattenkalk-Steinbruch bei Eichstätt die Überreste eines Pterosauriers entdeckt. Der Finder, ein erfahrener Privatsammler, barg das Stück fachgerecht und stellte fest, das der Schädel fehlte. Die Nachsuche auf der Fundfläche in weitem Umkreis blieb erfolglos. Das Stück wurde nach der Bergung von einem ausgezeichneten Präparator freigelegt, wobei das Skelett auf der Liegendplatte präpariert wurde. Es stellte sich heraus, dass das postcraniale Skelett vollständig vorlag. Die Proportionen der Flugarmknochen zueinander, die extrem kurzen proximalen Finger sowie die relative Länge der Hinterextremitäten deuten auf eine bislang unbekannte Form hin, die den azhdarchiden Pterosaurierformen von der Konstruktion her nahe steht. Dies wird durch die ventrale Position der Fossa glenoidea untermauert. Der Abdruck des Schädels mit seinem nach dorsal gebogenen Rostrum ist im Sediment deutlich erkennbar. Selbst der Umriß des Kehlsackes ist erhalten geblieben. Das Sediment ist im Bereich des Kopfabdruckes übersät mit 0.1 bis 0.5 mm langen schuppenartigen Körperchen, die definitiv vom Kopf des Pterosauriers stammen müssen. Unklar ist bisher, ob es sich um abgelöste Hautschüppchen oder um Reste mikrobiellen Aufwuchses handelt. Unklar ist auch, warum der Kopf des Tieres nach der Ablagerung am Lagunenboden verloren gegangen ist. Ein vertikal stehender Halswirbel legt die Vermutung nahe, dass sich der nach dorsocaudal bewegte, bevor er vom Hals abgerissen ist. Die Lage des restlichen Skelettes wurde dadurch nicht verändert.

Some years ago a private collector discovered remains of a pterosaur in a quarry close to Eichstätt. The collector excavated the specimen and realized that the skull was missing. Despite an extensive search, the head remained missing. The preparation revealed a completely articulated postcranial skeleton. The wing bone proportions, the extremely short proximal digits and the relative length of the hindlimbs suggest a hitherto unknown genus, that is close to the azhdarchid pterosaurs. This is supported by the ventral position of the Fossa glenoidea. The imprint of the skull with its dorsally bent rostrum can be seen in the sediment, even the outline of the throat-pouch is preserved. Within the imprint the sediment is sprinkled with 0.1 to 0.5 mm long scale-like particles, which came from the head of the pterosaur. These particles can only be seen under UV-light. Up to now it remains unclear whether those are scales of the head or microbial encrustations. Furthermore, it is enigmatic why the head of the pterosaur has been lost after deposition on the floor of the lagoon. A vertically embedded cervical vertebra indicates dorso-caudal movement before the head was severed from the body. However, the position of the postcranial skeleton remained undisturbed.

Pleistocene Avifauna of Romania: a review

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The complete and detailed survey of Romanian Pleistocene bird fauna has been done. The author identified the new finds and reviewed the already studied remains. The resulted faunas were treated from a taxonomical, palaeoecological and palaeogeographical point of view. The treated 33 Romanian localities that have been excavated during a century belong to 6 different geographical areas, any majority of them are cave sites.

Among the Early Pleistocene sites Betfia complex (Bihor County) yielded the richest and most interesting Romanian faunas: 14 layers of 6 sites furnished 125 taxa by more than 1000 remains. Forty-five percent of the species belong to passerines. Localities Betfia (Püspökfürdő) 2 and Betfia IX yielded the most significant Early Pleistocene vertebrate faunas.

Only two poor bird fauna are known from the Middle Pleistocene, but an interesting moment is the occurrence of the last extinct, probably (sub)tropical species and the firstly appeared cold climate ptarmigans (*Lagopus*) in the same fossil assemblage.

The 29 Late Pleistocene localities mainly furnished sporadic finds. The poorly represented avifaunas excavated for a long time and coming from uncertain layers and periods are better suitable for comparison with other vertebrates from the same site, than with close bird assemblages.

The identified 175 taxa from the Romanian Pleistocene include 17 extinct species or subspecies, and 3 others are considered new fossil species for the science. In case of earlier described, sometimes uncertain taxa the author tried to resolve the misunderstandings and to confirm – or to refute – their validity by her own results.

The review provided many new results for palaeornithology. The Romanian Pleistocene avifauna has been enriched by 43 species: 55 species are new for the Early-, 4 for the Middle- and 13 species for the Late Pleistocene. For Europe, 6 species are new, in stages 42 species for the Early- and 1 species for the Middle- and Late Pleistocene, respectively. Two among the three new species belong to tropical or subtropical genera which fossil species were not known in Europe so far, and indicate a warmer climate during the Early Pleistocene. The successive faunas from several sites allow the palaeoecological and palaeoclimatic reconstruction of the surroundings, and following of environmental changes in certain periods. Appearance and disappearance of particular species into and comparisons of different Pleistocene avifauna drive to palaeogeographical conclusions.

Eomyid incisor enamel microstructure reconsidered - New evidence for palaeobiogeography

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Eomyids are a family of extinct rodents which are thought to have originated in the late Eocene of North America but recent finds from Kazakstan and China may indicate an Asian origin. In Europe, eomyids first appear in the middle Oligocene and thereafter play an important role in biostratigraphic zonation. For a long time both the relationships between North American and European emomyids and those among the evolutionary lines in Europe have been under discussion. Although the incisor enamel microstructure of eomyids had been studied previously it did not shed light on these questions since the schmelzmuster seemed to be rather uniform.

Intensive study of new incisor material assigned to species from Europe reveals that the eomyid incisor schmelzmuster is more diverse than was previously thought, however. Even a new, highly evolved enamel type was found which proves the existence of at least one of the assumed migration events from North America to Europe.

Chad: New Impetus to the Study of the Tubulidentata

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Tubulidentata, single order to possess only one living species, the aardvark, is one of the least studied groups of Mammals in biology or paleobiology. However, recent research on DNA (Yang *et al*, 2003) has added some critical information about this obscure animal in suggesting that it retains a karyotype close to the eutherian ancestral state. Although Tubulidentata are known since Lower Miocene in Eurasia and Africa, the scarcity of fossil material discouraged long term palaeontological studies.

Since 1994, the Mission Paléoanthropologique Franco-Tchadienne (MPFT) works in the Djourab desert (Northern Chad) on Mio-Pliocene fossiliferous sites. Two of them yielded early Hominid fossils, known as Abel and Toumaï (Brunet *et al*, 1995, 1996, and 2002). Correlatively, three fossiliferous areas (aged 7 - 4 Myr) delivered up to five sub-complete skeletons of fossil aardvarks. They are the first Tubulidentata ever found in Central Africa. These discoveries enable to launch a wide range comparative study and the revision of the order Tubulidentata.

The largest database on extant aardvark skeleton has been established prior to the fossil study in order to analyse subspecies validity, sexual dimorphism, and intraspecific variation patterns. The study of the Chadian material, as well as of the specimens from South Africa, Ethiopia, Kenya, and Eurasia is currently ongoing.

First results show that: the validity of the originally described 18 subspecies is not guaranteed; sexual dimorphism in size and shape is negligible, and it exists a latitudinal gradient of size increase in Africa. In a palaeontological perspective, the presented Chadian specimen emerged during a period of greatest biodiversity of the order and also a turnover with replacement of primitive forms with more extant-like aardva.

Lines of arrested growth in the giant Middle Jurassic pachycormid *Leedsichthys*: seasonal climate or punctuated life history?

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Re-examination of museum specimens of the giant Mid-Late Jurassic pachycormid fish *Leedsichthys* has revealed the presence of prominent lines of arrested growth (LAGs) in both cranial and postcranial bones.

The LAGs occur on the internal surfaces of periosteal bone and are only seen where the bone is broken, or has an open vacuity as in the proximal terminations of some large elements from the axial skeleton. The LAGs appear as alternations of smooth bands of dark and light bone and are arranged in an approximately circumferential pattern. Although prominent on the internal surface, there are no LAGs on the external surface of any bony elements other than some gill rakers, due to the distinctive reworked 'woven' texture of the outer surface of many large skeletal elements of *Leedsichthys*. Furthermore, thin sections of an axial skeletal element with LAGs shows that the lines are only developed in the cortical bone toward the inner surface, and elsewhere appear to have been destroyed by remodelling and the construction of internal trabeculae. The width of the growth bands is somewhat variable, with some being up to 2 mm thick, while others are considerably thinner. The LAGs do not appear to become thinner toward the margins, suggesting that the rate of accretion of new bone remained relatively constant and that the individuals were still growing at the time of death.

The presence of growth rings is not easy to account for in animals that lived in tropical to sub tropical marine settings. Three scenarios are proposed, which may not be mutually exclusive; 1, North west European Jurassic seas may have been subject to seasonal fluctuations in food volume supply and type, resulting in growth ring development; 2, *Leedsichthys* may have been a migratory fish, with feeding grounds in more than one region, with differing food supplies; and 3, *Leedsichthys* may have undergone a period during which it did not feed; it may have undergone a period of aestivation.

The recent (June-November 2002) excavation of a new specimen of *Leedsichthys* has yielded many new and unusually complete bones, which provide an opportunity for detailed comparison of the occurrence of this phenomenon throughout the skeleton of this remarkable fish.

The first articulated titanosaurid skeleton in Europe

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Late Cretaceous titanosaurids were first reported in Europe by Matheron in 1869, when he described *Hypselosaurus priscus* on the basis of fragmentary bones collected from the continental red beds of Provence. Matheron thought that *H. priscus* was a gigantic crocodilian (he still mentioned it as a crocodilian in 1891) and it was not before 1900 that Depéret suggested that it was a sauropod. Depéret claimed that a second sauropod, *Titanosaurus*, was present in southern France ; *T. indicus* is a poorly known Indian form described by Lydekker in 1877 on the basis of two caudal vertebrae. In 1947, Lapparent followed Depéret's systematics, referring the titanosaurid bones from Provence to *H. priscus* and *T. indicus*, here considered as *nomina dubia* (cf. Le Loeuff, 1993).

Since the late 1980s excavations in the Upper Aude Valley have yielded new correctly preserved titanosaurid material described by the author as *Ampelosaurus atacis* in 1995. This preliminary paper was illustrated with a few bones only (i.e. one tooth and dorsal vertebrae). Another paper was devoted to a description of the osteoderms referred to *A. atacis* (Le Loeuff *et al*, 1994). Since these years, an abundant new material has been unearthed at Bellevue (more than 500 bones), allowing the preparation of a more complete osteological description of *Ampelosaurus* (Le Loeuff, in press). It seems that a single titanosaurid species is represented in this locality and all the titanosaur bones from Bellevue are referred to *A. atacis*. Outside France, excavations in the Trevino area (Burgos province, northwestern Spain) yielded titanosaurid remains described by Sanz *et al*. as *Lirainosaurus astibiai* in 1999.

In 2001, we discovered the first articulated skeleton of *A. atacis* at Bellevue ; the excavation work, in the hard sandstones of Bellevue, should be completed in 2003. We have already extracted the thoracic cage, with associated pelvic and shoulder girdles. A well preserved disarticulated skull has also been discovered. Preliminary analysis of the prepared material gives interesting informations on several points of the still poorly known titanosaurid anatomy.

A "baby"-sauropod trackway from the Late Jurassic Courtedoux Dinosaur Tracksite Excavations, Canton Jura, Northern Switzerland

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In 2002, the "Section de paléontologie" discovered and excavated a new dinosaur tracksite at Courtedoux on the future course of the "Transjurane" highway. Intertidal to supratidal calcareous laminites of the Reuchenette Formation (Upper Kimmeridgian) contain at least 6 track-bearing levels in a total thickness of nearly 1 m. In 2002, the main track level has been excavated on a surface of about 650 m^2, revealing 2 trackways of theropods and 17 trackways of sauropods (Marty et al., submitted b). The latter belong to the ichnogenus *Parabrontopodus* (Lockley et al., 1994) being the first clear evidence in central Europe and the youngest well-dated evidence for this ichnogenus worldwide. The size range for the sauropod pes prints is between 34.4 and 46.8 cm length and between 27.0 and 35.7 width, which are the smallest known sauropod tracks in the Jurassic so far (Marty et al., submitted a). However, on an overlying level, about 2 m of a narrow gauge (interpedes distance/internal trackway width being about 13 cm) sauropod trackway segment has been excavated, exhibiting evidence for even smaller sauropods. The mean pes print length is about 20 cm and the mean width about 13.5 cm. The gleno-acetabular distance is about 0.8 m and according to the formula of Thulborn (1990: 252) a hip height of about 1.2 m results (hip height = 5.9 pes length). Such small sauropod tracks are only known from the Cretaceous Jindong Formation of South Korea (Lim et al., 1994) and Lockley (1994) attributes them to very young (post-hatchling) individuals in their first year of growth. The Courtedoux tracksite thus reveals the first ichnological evidence for Jurassic "baby"-sauropods.

The Courtedoux "Sur Combe Ronde" tracksite is a geotope or geosite of international importance and it will be protected over an area of approximately 1500 m^2 underneath an especially constructed highway-bridge. The site has the potential for development into one of the most important sauropod tracksites and it offers plenty of possibilities for future excavations and research, but also for public viewing and installation of an educational, tourist and interpretative center (Marty et al., submitted b).

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First record of the dinosaurs in the Late Jurassic sediments of Istria, Croatia (preliminary report)

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All fossil remains of dinosaurs on the Adriatic carbonate platform (which is now outcropping along the eastern coast of the Adriatic Sea) came from the Cretaceous sediments. Recently, a new locality with the Upper Tithonian dinosaur footprints have been discovered. The site is situated in an active quarry front near the village Kirmenjak in the central Istria.

The site consists of the peritidal limestones and the Upper Tithonian age was proved by microfossil assemblage found in stylolitised mudstones: *Clypeina jurassica* FAVRE, *Salpingoporella annulata* CAROZZI, *Campbelliella striata* (CAROZZI) and *Favreina* sp. The footprints are situated on the top of a fenestral mudstone layer that could be interpreted as an emersion surface. The intertidal environment and influence of meteoric water are indicated not only by fenestral fabrics but also by geopetal infillings of cavities, desiccation cracks and the presence of dinosaur footprints.

The site is very rich in footprints, some few hundreds of them have been found on the outcrop. The majority of the footprints show an oval or horse-shoed shape without clearly visible digit impressions and are relatively shallow (10-20 mm). Although the state of preservation is far from ideal, it is concluded that the prints, regarding morphology, belong to the sauropod dinosaurs. The oval prints would respond to the pes prints and the horse-shoe shaped ones to the manus prints. The footprints are of various dimensions; manus prints show the length range between 100 – 250 mm, pes prints between 350 – 500 mm. The calculated height at the hip ranged between 2.06 - 2.95 m.

Dozens of trackways can be observed on the outcrop and they frequently overlapp. There are also some areas which are heavily trampled by sauropod foots. The main direction of dinosaur movements was toward E-NE and because there are a number of parallel trackways it could be concluded that some of the individuals were moving together (indication of gregarious behavior). A large number of the trackways disappeared below the quarry surface and probably extend further. Some of the trackways show characteristics of a narrow-gauge type, some of them are slightly wider but none shows the wide-gauge character. The pace and stride lengths indicate slow walk of the individuals. The ichnocoenosis from this outcrop could be assigned to the *Brontopodus* ichnofacies.

The presence of the large sauropod dinosaurs on the Adriatic carbonate platform during the Upper Jurassic could be explained by its connection with the African continent via its southern margins. The sauropods could have migrated into the area during an emersion phase when the platform was exposed to subaeric conditions. There had to be a widespread continental area in the hinterland in order to support the survival of such large terrestrial herbivores as were the sauropod dinosaurs.

How to distinguish a true track from an undertrack: experimental work with artificial substrates

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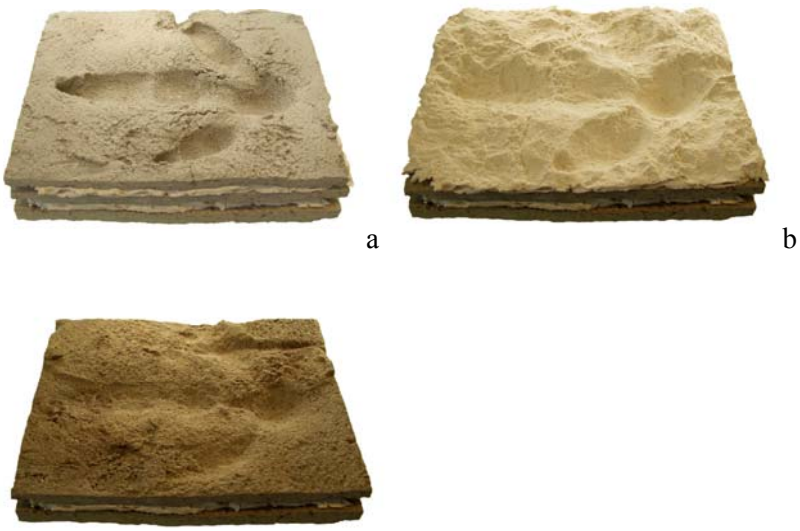
Undertracks form when the weight of an animal's foot not only forms a track in the surface layer, but also deforms the layers subjacent to the animal's foot, enabling the same track to be found at several horizons beneath each other. The formation of undertracks and the problem of distinguishing them from true tracks have been topics of much debate and the cause of many misinterpretations through time. Laboratory experiments were undertaken, involving emu tracks emplaced in various packages of artificial layered sediments, which were subsequently cut in vertical slices to reveal the appearance of the undertracks (fig. 1). Further experiments with tracks emplaced in a package of alternating layers of sand and cement enabling the package to be split along successive subjacent horizons, each revealing the morphology of the undertrack to different depths (fig. 2) The experimental work demonstrates that undertracks always appear broader and less well defined than true tracks. Delicate anatomical details are preserved only in true tracks, whereas gross anatomical features like digital pads can be preserved and recognized in undertracks to considerable depths. With increasing water content of the surface sediment, tracks tend to flow together, obliterating the shape of the true track; the shallow undertrack will then retain the shape of the foot better than the true track.

Figure 1. Vertical section through emu track emplaced in package of layered cement revealing the formation of undertracks in the layers subjacent to the true track.



a b c

Figure 2. Emu track and undertracks in horizontal view. (a) True track. (b) Undertrack at 1 cm depth. (c) Undertrack at 2 cm depth. The undertracks becomes successively shallower, broader and less well-defined with depth.

Pterosaurs and birds from the Late Cretaceous of Hungary

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The first pterosaur and bird remains were discovered from the Upper Cretaceous Csehbánya Formation, in Iharkút, Bakony Mts, Hungary. These are the first pterosaur remains from Hungary and the first bird remains from the Late Cretaceous of Central Europe. Four separate jaw fragments and a partial first wing phalanx are identified as belonging to pterosaurs. The jaw fragments probably represent the genus *Azhdarcho,* which also occurs in the Late Cretaceous of Spain and Usbegistan. The first wing phalanx indicates a medium-sized pterosaur with a total wing span of about 3.3 metres. A nearly complete left femur, a distal fragment of a left femur and a metatarsus III, identified as enantiornithine bird remains, represent the avian fauna. The well-preserved 2,2 cm long femur indicates a very small (size of a thrush) terrestrial bird early in the Santonian in Europe, which supports, that these Hungarian enantiornithines retained the small size of their Early Cretaceous ancestors.

Some aspects of the oviraptorosaur (Dinosauria, Theropoda) braincase

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Examinations of dinosaur endocasts do not usually give information how close walls of the endocranial cavity lay to the brain surface. It has been assumed by Jerison (1973) that cranial cavity in the fossil reptiles may have had a capacity about twice that of the brain size, which it contained in life. This opinion has not been concurred by Hopson (1979), who considered that this relationship might be variable in fossil forms as it is in the living reptiles. In birds and mammals, the brain surface is closely appressed to bones of cranial roof, and it leaves distinct impressions of the intracranial vascular channels on the undersurface of the bones in this region. In dinosaurs, the impressions of the brain vascular system, evidencing a direct contact between the brain surface and the skull roof bones, have been so far reported only in one theropod dinosaur, the ornithomimid, *Dromiceiomimus* (Russell 1972) and their presence has been suggested (Hopson 1979) in the troodontid, *Stenonychosaurus*. Both theropods represent the clade Maniraptoriformes within Coelurosauria. Up to now, it has not been known to which extent the brain filled the braincase in another member of the same clade, the oviraptorids. The here reported case of an oviraptorid representative, *Ingenia,* shows that in these maniraptorans the brain surface was also appressed to the undersurface of the skull roof, where it left distinct imprints of brain vascularization. In *Ingenia*, the imprints of the brain vessels are found on the undersurface of the frontals and parietals. They consist of numerous arborizing grooves, which cover undersurface of the skull roof bones in the region of cerebral hemispheres and the cerebellum. The density and regularity of the vascularization of the brain surface in *Ingenia* are incomparable to the scarce and irregular ones, previously stated in *Dromiceiomimus*.
The avialan status of Oviraptoridae has been postulated by some theropod students (e.g. Elżanowski 1999; Lu 2000; Maryańska, Osmólska & Wolsan 2002). The present finding may provide additional evidence supporting this hypothesis.

Miocene Ruminantia from southern Germany as indicators for habitat conditions

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Lower and Middle Miocene ruminant communities from neighbouring habitats of the upper Freshwater Molasse (southern Bavaria) and the Franconian Jura (southeast Bavaria) representing a 5-million-year time interval were studied. The species compositions comprise taxonomically mostly familiar but ecologically poorly characterized Central European species. Taxonomic composition, body mass estimation, tooth mesowear analysis, and δ13C enamel signature were used to interprete aut- and synecology.

The faunas are composed of 25 species. They are different but generally rich in species numbers, dominated by cervids and tragulids as well as browsers and small representatives. Qualitative and quantitative species composition differs from community to community and reflect a spatio-temporal diversity. This leads to interpretation and reconstruction of ecological conditions, which show on the one hand differences in both biomes and changes through time.

Options of prey capture in dyrosaurid crocodilians

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The high neural spines of the neck vertebrae of dyrosaurs indicate a large cross-section of the M. transversospinalis cervicis. The lateral flexibility of the neck of dyrosaurs is in contrast to extant crocodilians restricted by laterally overlapping cervical ribs and long retroarticular processes to ca. 10°. In ventral direction, the dyrosaur neck is flexible to about 20° from the horizontal plane whereas recent crocodilians cannot flex the neck farther ventrally than to the horizontal plane. The operational freedom for the movement of neck and skull of dyrosaurs is reconstructed to be dorsoventrally larger and laterally smaller than in extant crocodilians. The lateral flexibility of the neck of dyrosaurs is sufficient to catch prey with a quick sideward movement of neck and skull. The reconstructed locomotionary options of dyrosaurs indicate their ability to seize a prey either from swimming or from a resting and lurking position.

Dyrosaurid crocodilians possess a longirostrine skull with large temporal openings and a homodont dentition that resembles in proportions the skull of the recent false gharial (*Tomistoma schlegeli*) and the African slender-snouted crocodile (*Mecistops cataphractus*). Reconstructions of the jaw adductors and abductor of dyrosaurs show that these crocodilians were able to quickly open and close the jaws a well as to develop larger bite forces in the preorbital region of the jaws than recent crocodilians.

Cal Orcko, the worlds largest dinosaur tracksite- Aspects of assessment, protection and conservation

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The Cal Orcko dinosaur tracksite, discovered in 1994, is situated in a still active limestone quarry about 4.5 km East of Sucre (Dep. Chuquisaca), Bolivia. The track-bearing layers form part of the El Molino Formation in the Puca Supergroup. The geological age is Late Cretaceous (Maastrichtian) and has been dated by microfossils. The sedimentological analysis of the strata indicates a lacustrine environment.

The first scientific mission took place in 1998 and was led by the second author. The approximative length of the wall is 1.2 km, the height varies from 15 m to over 100 m. The surfaces are almost vertical (72°) and dip to the SW. On the whole 102'000 m^2 have been exposed by quarry operations.

175 trackways can be followed over several meters, amongst them is one segment of a small theropod that can be seen for more than 500 m, making it the longest track in the world. The complete number of individuals comes to 332, consisting of 6 different morphotypes: large and small theropods, titanosaurid sauropods, large and small ornithopods and ankylosaurs. The most important new scientific discoveries are remains of sixteen trackways of ankylosaurs that run parallel to each other. This is the first report of herding behaviour for this dinosaur group.

In short, Cal Orcko was found to be the most important dinosaur track locality in the world in terms of size, diversity and geological age.

The mission in march 2003 included a documentation of wheathering, rockfall and destrution of the dinosaur tracks since 1998. A report with an assessment of the scientific value and a geotechnical analysis of the wall for protection and palaeontological conservation of this important site was made.

The concept of protection consists in stabilization of the fractured part of the wall by rock bolts, anchors and wire nets. In order to prevent further erosion of the footprints, impregnation of the rock with waterglass (sodium- or potassium silictae) is proposed. Furthermore a concept for the sustainable development and touristic potential has been made. The Cal Orcko dinosaurtracksite should be integrated into the UNESCO World heritage list.

Posters

Reghínio, a new mammal locality from the Plio-Pleistocene of Greece

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Mammal remains that come from a new locality in Central Greece are described in this paper. They comprise a partially preserved large cervid skull and elephant tusk parts. The cervid skull lacks the posterior part, as well as the antlers. It is metrically similar to a large *Eucladoceros*, or to a small megacerine, and it is referred to the former genus because of the mandible slenderness. The tusk parts are characterised by moderate torsion and bend, implying affinities to the early species of the genus *Mammuthus*. The morphology of the Schreger pattern points to this genus as well, so the elephant remains are tentatively referred to *M. meridionalis*. The up to date available material is still insufficient for biochronological purposes; however, the locality can be preliminarily dated to Late Pliocene – Early Pleistocene.

Slicing plesiosaurs, part II: plesiosaurs' internal nares are no nares at all.

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The internal anatomy of the rostrum of a hitherto undescribed polycotylid plesiosaur from the Turonian (Upper Cretaceous) of Morocco (specimen SMNK-PAL-3861, Staatliches Museum für Naturkunde Karlsruhe) is partly accessible along two transverse breaks.
As was previously described and discussed for a pliosaurid plesiosaur (Buchy *et al*., 2002; in prep.), no bony nasal duct linking the so-called "internal nares" to the external nares is identified. No respiratory function can be attributed to the "nasal" canal itself for biological reasons. Furthermore, the presence of a soft tissue duct is unlikely, due to the restricted volume of the "nasal" canal inside the rostrum of SMNK-PAL-3861.
The hypothesis of a respiratory function of these "internal nares", already invalidated by Cruickshank *et al*. (1991), must therefore be abandoned on the base of the new specimens, and these structures, situated rostral to the external nares in all plesiosaurs (s.l.), renamed "vomerian fenestrae". They are probably linked with an olfactory organ, and/or the salt glands.
As was suggested by Williston one century ago, we consider that the actual choanae are the so-called "interpterygoid vacuities", present in all plesiosaurs. The external nares were probably linked to the choanae, the actual nasal duct being possibly partially a soft structure.
The palatal anatomy of all plesiosaurs (s.l.) being similar, they most likely all possessed such a functional secondary palate.

Buchy M.-C., Frey E."D." & Salisbury S.W. (2002) - Cross-sections through a rostrum: a new pliosaur from Mexico, and some questions about its “internal nares” – The missing abstract, 50th SVPCA, 11th – 14th sept. 2002, Cambridge (GB).

Williston S.W. (1903) - North American plesiosaurs - Field. Columbian Mus. Publ., Geol. Ser., 2(1): 3-77.

Cruickshank A.R.I., Small P.G. & Taylor M.A. (1991) - Dorsal nostrils and hydrodynamically driven underwater olfaction in plesiosaurs, Nature, 352: 62-64.

Was it really eating granite? We're searching hard: history of the Monster of Aramberri (and stories about it).

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On the 28th of December 2002, the German magazine Der Spiegel published a 2-page article about a large pliosaur from Mexico nicknamed "the Monster of Aramberri"[1, 2], launching a long-lasting multimedia campaign of "godzillaisation"[3]. When the remains of the beast reached the State Museum of Natural History of Karlsruhe where it will be prepared and studied, it had became a 25 meter-long *Liopleurodon ferox* biting through granite.
Seven aligned vertebrae and a piece of jaw, found in 1985 by a student of the Autonomous University of Nuevo León, Linares, Mexico, were first identified as belonging to a carnivorous dinosaur[4]. We rediscovered the fossil in autumn 2000, and, on the basis of its pectoral vertebrae 22 cm in diameter, estimated the length of the pliosaur at about 15 meters[1, 2].
A field campaign was conducted the year after as a collaboration between the State Museum of Natural History of Karlsruhe, the University of Karlsruhe and the Autonomous University of Nuevo León, financed by the Deutsche Forschungsgemeinschaft. It yielded isolated cranial fragments, and the original pliosaur-bearing layer was identified. During the campaign 2002 we collected the head of a femur about 30 cm in diameter, part of the pelvic girdle, and more cranial fragments. We shall continue digging for some years before recovering the rest of the animal, which actually could have reached 18 meters in length, and certainly does not belong to the genus *Liopleurodon*. No hint allows to confirm, though, that it was chewing granite. We present here the history of the discovery and rediscovery, and a preliminary report of the field campaigns.

1. Frey E., Buchy M.-C. & Stinnesbeck W. (2001) – The monster of Aramberri and friends: new finds of marine reptiles in the Mesozoic of northeastern Mexico. 6th EWVP, Florence (Italy), 19-22 september 2001, Abstract Book.
2. Buchy M.-C., Frey E., Stinnesbeck W. & López-Oliva J.G. (in press) – First occurrence of a gigantic pliosaurid plesiosaur in the Late Jurassic (Kimmeridgian) of Mexico. Bull. Soc. Geol. France.
3. Richard Forrest's ultimate plesiosaur site: www.plesiosaur.com
4. Hähnel W. (1988) – Hallazgo de restos de dinosaurio en Aramberri, N.L., Mexico. Actas Faculta Ciencias Tierra UANL Linares, 3: 245-250.

Fossil records of Quaternary ochotonids from the Czech Republic and Slovakia

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Ochotonids (Mammalia, Lagomorpha) are represented in recent fauna only by the genus *Ochotona.* The three species of this genus are available in the Quaternary fossil record of Europe: *O. polonica* from the Polish localities Jaskinia Mamutowa, Jaskinia Żabia, Kielniky 3A, Zamkowa Dolna Cave (Villanyian-Biharian), *O. valerotae* from the French locality Valerot (Biharian), and *O. pusilla*. No sufficiently reliable Biharian findings of *O. pusilla* are known from Europe. Demonstrable occurrences of *O. pusilla* from the given area are recorded in fact from Upper Pleistocene, when the location of distribution to the Western part reached up to the British Isles. The distribution of ochotonids is substantially reduced on the European continent during the Holocene. The location of the distribution is limited to the steppes between the lower Volga valley and the South-Western slopes of the Altai mountain range at present.

The first systematic summary of these foremost European Quaternary taxon problems has been performed. You can find in this summary almost the entire inventory which is available from the region of the Czech Republic and Slovakia. Findings of species *Ochotona* were overall revised from 23 Quaternary localities. Thanks to the rich materials, metric and morphological analyses and comparison with the relevant European findings were possible. Biharian findings (biozones Q1, Q2) are not numerous, but rather are fragmentary and taxonomic determination to the level of species is not possible (Holštejn and Včeláre 3A, 5 localities), with exception of recently studied and described new fossil species from the territory of Slovakia (Čermák in press). Species *O. polonica* and *O. valerotae* from the introduced area were not proved. The fossil record from the younger phases of the Quaternary (biozones Q3, Q4) is exclusively limited to occurrences of the species *O. pusilla.* The findings from 12 localities are unambiguously taxonomically determined as *O. pusilla* by the evaluation of the taxonomic significant signs on P_3 (fusion between anteroconid and posteroconid, the morphology of anteroconid and posteroconid). The oldest reliable occurrences of the species *O. pusilla* are proved from the basis of the Toringian (Q3) from the locality of Stránská skála – cave. The youngest occurrences of the species *O. pusilla* are proved from the locality Mara Medveďka (Slovakia) and they are definitely young-Holocene (epiatlantic/subboreal) because of the occurrence of "Pilinska ceramics". On the basis of the metric and morphological analysis of the P_3 there is an obvious affinity to the other European findings ranged to the species *O. pusilla* (especially to the subspecies *O. p. spelea*, localities Kent's Hole, Great Doward Cave). The studied findings of the fossil species *O. pusilla* by morphology P^2 and P^3 without fail show clear morphological and metric affinity to the subspecies *O. p. pusilla* occurring in the Western part of the distribution area of the species *O. pusilla.*

Fossil Vertebrates in the Collections of the National Geological Museum from Bucharest – Romania

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The Geological National Museum of the Geological Institute of Romania was founded in 1990. It hosts collections of minerals, rocks and fossils which belonged mostly to researchers or co-workers of the Geological Institute, that was founded in 1906 in the actual building of the Museum.
Among the 21300 fossil specimens hosted by the Museum, there are hundreds of fossil vertebrate remains, as well. These consist of original fragments, more or less complete, belonging to some species from the classes: Ostracodermata, Acanthodii, Chondrichthyes, Osteichthyes, Reptilia and Mammalia.
The oldest fossil remains in the Museum consist of those belonging to Ostracodermata (specimens of *Cephalaspis*, *Pteraspis* and *Palaeaspis*, provided by the North Bucovina Gotlandian and belonging to Vascauteanu Collection).
The newest fossil remains are represented by some Holocene Mammals (Hienidae, Mustelidae, Canidae, Ursidae, Cervidae, Bovidae, Equidae and Elephantidae) which are provided mainly from different cave deposits.
Oligocene teleostean fossil fish holotypes (under revision) from Pauca Collection are to be mentioned.
Other intersting original remains in The Collections of the Museum are represented by those of MiddleTriassic reptils discovered at Lugasul de Sus and Pestis (disarticulated bones belonging mainly to *Nothosaurus transsylvanicus* and *Tanystropheus biharicus*), beside those of some belonging to Early Cretaceous reptils discovered in the bauxite of Cornet (*Valdosaurus canaliculatus*, *Iguanodon mantelli* and other undetermined fragments). The Museum also exhibits the reconstutitions of two dinosaurs (scale 1:1) provided by the Upper Cretaceous in the Hateg Basin (*Strutiosaurus transsylvanicus* and *Rabdodon priscus*) and some Hominidae skulls as well.
Fossil vertebrates are also represented by a series of plantar footprints of reptils, birds and mammals, provided by Miocene formations from Eastern Carpathians.

Marine "crocodiles" (Thalattosuchia) from the Early Jurassic of Lombardy (northern Italy)

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The Mesozoic Formations outcropping in Lombardy (northern Italy), represented by world-wide renowned fossiliferous localities as Besano (Varese Province), Cene and Endenna (Bergamo Province), have yielded an extraordinarily rich reptile fauna dating almost exclusively to the Middle and Late Triassic. Cretaceous evidences are limited to a plesiosaur humerus from the Campanian-Santonian of Zavattarello (Pavia Province), while Jurassic reptiles have been reported so far only in the Sinemurian locality of Saltrio, where dinosaur remains have been recently discovered.

The new findings here described come from the outskirts of Cesana Brianza (Lecco Province), where an Early Jurassic (Toarcian) layer of the Sogno Formation outcrops. The material consists of the remnants of two partial specimens (MSNM V4012 and V4013a, b), one of which preserved as part and counterpart. Most of the available skeletal elements are in anatomical connection, fossilised on slabs but well preserved in three dimensions and not showing any sign of erosion or damage due to post-mortem transport. Some of the elements, or part of them, are represented by imprints in a matrix that, being fine-grained, allow to identify in detail the original bone shape and, sometimes, surface morphology. Organic remains, possibly integumentary structures, are preserved in form of a black halo surrounding the caudal vertebrae of MSNM V4013.

Both specimens are small in size (vertebral centra average length around 10 mm), and lack of skull, anterior trunk vertebrae and front limbs. They are characterised by amphicoelous presacral vertebrae (with open neurocentral sutures), long and slender hind limbs, and a relatively well developed armour of osteoderms.

The available features match well with Thalattosuchian "crocodiles", and their allocation to the teleosaurid genus *Steneosaurus* or the metriorhynchid *Pelagosaurus* is still being evaluated.

Jurassic reptiles are rather rare in Italy, but the discovery of thalattosuchian remains in at least 6 Jurassic localities comprised within a relatively wide area of northern Italy (extended across Lombardy, Trentino, Veneto and possibly Friuli-Venezia Giulia) allows to consider the presence of these "marine crocodiles" as far from being sporadical. Although poor preparation and absence of well preserved cranial elements hinder a proper taxonomic allocation of the Italian findings, both Teleosauridae (genus *Steneosaurus*) and Metriorhinchidae (genus *Metriorhyncus*) families have been quoted.

The Cesana thalattosuchians here described are among the oldest "crocodiles" ever found in Italy. They are rather peculiar because their very small size contrasts with that of the Italian specimens referred to "putative" *Steneosaurus*. According to Brochu, the hatchlings of the Crocodylia show fully closed neurocentral suture in caudal vertebrae only, and closure follows a caudal to cranial sequence during ontogeny. The status shown by the Cesana thalattosuchians matches with such pattern, providing a size-independent criterion to assess the non mature condition of the specimens, and suggests that the usefulness of this criterion can be extended to mesoeucrocodylians too.

Shell microstructure of dinosaur eggs from the Upper Cretaceous of Romania: 3D models and porosity

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Consecutive slices of dinosaur eggshells represent a promising approach to determine temperatures and humidity in the nesting areas during incubation. As was argued by Grigorescu *et al.* (1994), temperature and humidity of the nesting site correlate with the distribution and volume of the pores in the eggshells, via an estimation of gas, water and heat exchange.
In order to estimate the porosity, a 3D model of the shell is built, based on a computer-aided analysis of its microstructure. This method requires first consecutive tangential sections of an eggshell fragment at the highest possible resolution. Each section is then polished and scanned. The images are superposed using a standard 3D rendering software, which allows the constitution of a 3D model of the eggshell fragment sectioned.
This method was applied to eggshell fragments from the Upper Cretaceous of Tustea and Totesti, two fossiliferous lacustrine localities in Hateg Basin, western Romania.
In the case of the eggs from Tustea, the red mudstone matrix filling the pores created enough contrast with the shell units, allowing a reliable 3D model to be built for calculating the porosity of the shell.
In Totesti the eggs are preserved in a dark gray mudstone. The contrast between the infill of the pores and the shell units is reduced and scanned images cannot be used for differentiating pores from shell units digitally. This problem was resolved by taking acetate peels of the surface of the polished sections. The digital images of those peels yield less precise results and a less reliable estimation of the porosity of the shell.
The accuracy of the conclusions regarding the nesting area environment drawn from such analysis must therefore be judged in light of these technical limitations.

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Neogene and Early Pleistocene Proboscidea (Deinotheriidae, Gomphotheriidae, Mammutidae, Elephantidae) from Hungary

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From Hungary there are more than 100 localities of Neogene (and Early Quaternary, MN 17) age from which we know Proboscidean remains (mastodonts and deinotheres). In the Proboscidean record there are four Deinotheriidae, five Gomphotheriidae and two Mammutidae species. (And from MN 17 one Elephantidae species, the Mammuthus meridionalis.) The earliest taxa (Prodeinotherium hungaricum and Gomphotherium angustidens) appeared here in the Earliest Ottnangian (MN 4). These remains are known from three localities from North Hungary. One of them (Salgóvár) is known only from literature, but there are remains in the collections of the Hungarian Geological Institute and the Hungarian Natural History Museum from two localities: a Prodeinotherium hungaricum milk-tooth from Meszesalja sand-pit at Salgótarján, and upper tusk fragments and an upper molar fragment of Gomphotherium angustidens from Nemti. The remains from both localities derived from the Zagyvapálfalva Clay Formation, which is underlying the Gyulakeszi Rhyolite Tuff Formation. In the last few years P. E. Renne calibrated the tuff with 40Ar/39Ar method. On the basis of these calibrations the age of the tuff is cca. 16.8 Ma, so it sems that the earliest Proboscideans appeared in the Carpathian Basin almost immediately after „Proboscidean Datum“ (17.5 Ma).
From the younger part of the Ottnangian three Proboscidean taxa were demonstrated: P. Hungaricum, G. Angustidens and Zygolophodon turicensis. From the Karpatian and Early Badenian (MN 5) we don’t know Proboscidean remains from Hungary. From the Late Badenian (MN 6) to the Late Sarmatian (MN 8) Z. Turicensis, G. Angustidens and Prodeinotherium bavaricum were present. Among them only Z. Turicensis survived from the Early Pannonian. In MN 9 three new Proboscidean taxa appeared: Tetralophodon longirostris, „Stegotetrabelodon“ gigantorostris and Deinotherium giganteum. During the Pontian (MN 11 – MN 13) two huge Proboscidean occurred: Deinotherium proavum and „Stegotetrabelodon“ grandincisivus. Z. turicensis disappeared around the end of Pontian (MN 13). The first remains of Anancus arvernensis and Mammut borsoni were derived from the MN 13. In the Early Pliocene (Dacian, MN 14 and less probably MN 15) D. Proavum and S. Grandincisivus probably were present in Hungary, but from the Late Pliocene (Romanian, Villafrancian, MN 16) only two mastodonts survived: A. Arvernensis and M. Borsoni. The last occurrences of these two species in Hungary are of Early Pleistocene (Romanian, Villanyian, MN 17) age.

The Oligocene shark fauna at the Litenice and Bystrice/Olsí localities of the Carpathian flysh in Moravia (Czech Republic).

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The fossil shark fauna from the Oligocene of the "Menilitic formation " of Carpathian flysh is less abundant and less typical than teleostean fishes. But its presence significantly complements the fossil assemblage from the palaeoecological and biostratigraphical point of view. At the relatively new localities of Litenčice and Bystřice/Olší nine species were discovered: *Chlamydoselachus* sp., *Heptranchias* aff. *tenuidens* LERICHE, 1938 *(Hexanchiformes), Squalus* aff. *alsaticus* (ANDREAE, 1892), *Echinorhinus* aff. *pollerspoecki* PFEIL, 1983 *(Squaliformes), Mitsukurina* sp.*, Isurus* aff. *flandricus* (LERICHE, 1910)*, Carcharias* cf. *acutissima* AGASSIZ, 1843)*, Cetorhinus parvus* LERICHE, 1908, *Alopias* cf.*superciliosus* (LOWE, 1840) *(Lamniformes)*. Five of them - *Clamydoselachus* sp.*, Heptranchias* aff. *tenuidens*, *Echinorhinus* aff. *pollerspoecki*, *Mitsukurina* sp, *Isurus* aff. *flandricus* were recorded for the first time in the Oligocene of Moravia.

Palaeoecologically the shark fauna corresponds to the palaeoecological conditions of teleostean fishes, that show - by the presence of the lanternfishes (Myctophidae), lightfishes (Gonostomatidae) and hatchetfishes (Sternoptychidae) - the mesopelagical condition of the environment. Except for *Cetorhinus parvus*, *Isurus* aff. *flandricus* and *Carcharias* cf. *acutissima,* the other sharks correspond to the pelagic species in midwaters between 200 and 1000 m.

Revision of the Lower Miocene Shark Fauna of Ipolytarnóc, Hungary

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DR. ANTAL KOCH, the famous Hungarian geologist of the last decade, wrote about the shark fauna of Ipolytarnóc exactly 100 years ago. 23 species of the 8 genera were described, among them three new species: *Notidanus paucidens, Lamna tarnoczensis* and *Oxyrhina neogradensis*. One year later, in 1904, another new species, the *Notidanus diffusidens*, was added to the faunalist by KOCH.
During the revision of this fauna the collection of the MÁFI (Hungarian Geological Institution), MTM (the Hungarian Museum of Natural History) and the National Park at Ipolytarnóc were examined. In Summer of 2002 an excavation at the area of the National Park was organized to collect further remains from the area. All in all, more than 1500 items have been studied.
After the revision we got the next Chondrichthyes faunalist:

Notorynchus primigenius; *Squalus* sp.; *Deania* sp.; *Isistius* cf. *triangulus*; *Squatina* sp.; *Odontaspis* cf. *ferox*; *Odontaspis* cf. *acutissima*; *Carcharias contortidens*; *Carcharias cuspidata*; *Mitsukurina lineata*; *Isurus desori*; *Isurus hastalis*; *Isurus retroflexa*; *Carcharodon* sp.; *Parotodus benedeni*; *Alopias exigua*; *Scyliorhinus* sp.; *Paragaleus* sp.; *Hemipristis serra*; *Carcharhinus prisca*; *Galeocerdo aduncus*; *Galeocerdo contortus*; *Triaenodon* cf. *obesus*; *Sphyrna* cf. *zygaena*; *Dasyatis* sp.; *Aetobatus* sp.

Seven of the Ipolytarnóc genera above, including two rays, (*Squalus, Deania, Isistius, Mitsukurina, Scyliorhinus Dasyatis, Aetobatus*), had not been known before.
The four species, described by Koch, were newly determined as *Notorynchus primigenius* (*Notidanus paucidens*, *Notidanus diffusidens*), *Carcharias contortidens* (*Lamna tarnóczensis*) and *Parotodus benedeni* (*Oxyrhina neogradensis*).

Fossil DNA of *Capra ibex* from Ausino Cave (Southern Appennine)

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This study examinees ancient DNA of *Capra ibex* coming from Ausino Cave (Southern Appennine), its genetic relationship have been analysed here. This species was adapted in the past to different environmental conditions than now.
We will try to understand if the species lived in the past is genetically identical to those that are living today in the National Parks of the Gran Paradiso and of the Stelvio.

The first step of this work has been the setting of the protocols on recent material and fossil material; this one consists of fossil teeth old about 30.000 y.b.p. During the extraction of mtDNA it is necessary to consider that every extraction often could introduces some contaminations that the operator should consider. For fossil samples, the extent of contamination depends on the type of material, on its age and on the quality of preservation. The DNA fossil can be extracted by a great variety of samples and the techniques and the results depend a lot on the type of fossilization to which they have been submitted. The protocols founded in literature cannot be always applicable as they are but must be adjusted to the material and the types of used reagents. The material used is constituted by teeth of fossils ibexes from a cave in the Cilento (Cave of the Ausino). The recovered finds are not only constituted by teeth but also by long bones, horns and more or less entire skulls. but for biomolecular analyses is preferred to use the teeth in that they are less porous than the bones and therefore less permeable to the contaminations. They lived in Campania in the upper Pleistocene (around 30.000 years ago) and subsequently they got now extinct. Actually they live in Italy only along the Alpine arc and precisely in the National Parks of the Gran Paradiso and Stelvio. For the comparison with the actual species we used blood of *Capra hircus* picked up from living goats in the Molisan Appennine (Riccia, CB) and of living ibexes kindly furnished by the experts of the National Parks of the Stelvio and the Gran Paradiso. The DNA sequences obtained have been analysed with Dna tree Software with the other sequences coming from GenBank to design a phylogenetic tree. So we can argue that *C. ibex* seems derive from *C. aegagrus*, actually living in Aegean Islands, Creta and Middle East Asia, as well *C. hircus* domestic European goat.

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New data on Lower Cretaceous dinosaurs from Romania

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The Lower Cretaceous dinosaur fauna from the bauxite deposit of Cornet, Romania has a low faunal diversity in comparison with other European Wealden vertebrate associations. The vertebrate fauna is dominated by ornithopod dinosaurs, but rare theropods, ankylosaurs, as well as pterosaurs and birds were described.
Late studies were focused especially on the re-identification of the ornithopod specimens, the difficulty of the identification is given by the disarticulated and often damaged material.
The ornithopod fauna comprises a camptosaurid, an iguanodontid as well as dryosaurids, including *Valdosaurus* sp (Posmosanu, 2002). Little attention has been paid to the skeletal remains belonging to armoured dinosaurs or theropods. Jurcsák et Kessler (1991) identified the nodosaurid *Hylaeosaurus* sp. on the basis of an armour spine. Recently more ankylosaur material has been identified including a left scapula. This scapula is a relatively short bone, with a wide scapular blade proximally, which bears a prominent scapular spine, which is ridge-shaped and there is no supraspinous fossa . It shows a primitive nodosaurid, being not co-ossified with the coracoid. It's size is much smaller than the English Wealden nodosaurids, but this feature is present for the ornithopods as well, which are determined as paedomorphic dwarfs (Milner et al., in prep). Among nodosaurid genera this scapula seems to present similarities with *Hylaeosaurus armatus* from the English Wealden, although it's scapular blade is more expanded proximally and the scapular spine is more prominent, therefore the Cornet specimen is tentatively determined as cf. *Hylaeosaurus* sp., but further comparison with other nodosaurids should bring new information on the Cornet nodosaurid.
Armoured dinosaurs were proposed to biostratigraphic correlations (together with *Iguanodon* species and *Hypsilophodon*) (Pereda-Superbiola, 1993). The presence of *Hylaeosaurus* in the assemblage together with the *Iguanodon* would confirm the Lower Wealden (Berriassian-Valanginian) age for the Cornet bone-bearing bauxite deposit. *Valdosaurus* is present both in the Lower and Upper Wealden.

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Reasonable age-prediction without age-measurement?

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An exact time determination of the sedimentation event is essential for every investigation of fossil habitats. Due to the generally difficult age estimation of fossils found in river currents, it is a pity to leave this rich fossil archive idle.
Classical methods of age determination such as carbon dating are at an immense disadvantage: High operation expenses often prevent a representative measuring if many samples are to be investigated besides the simple fact that carbon dating is limited to the last 40 ka.
If the salvaged layer is not directly accessible, e.g. when a suction excavator is used, it is common practice to subdivide fossils of different layers according to their state of preservation. The results are groups of fossils affirmed to be of equal age. But is this approach acceptable? Is it allowed to put bones out of one outcrop into groups of same age because of some external characteristics? Or is their synchrony just pretended?
This work is dedicated to go further detailed into this question. For this reason bones taken from sediments of the river Ems in a sandpit close to Greven, Münsterland, Germany are being investigated. The about 5.000 troves represent 28 taxa. Archaeological objects indicate a period from 115.000 years up to our times.
At first, the bones have been subdivided into 20 different groups due to their colour and their surface conditions. By using the means of amino acid racemization (AAR), the bone's age and with it the synchrony of the groups is to be proven. In addition, the density of the bones is also part of the investigations. By using REM, the possible assimilation of elements can be verified in order to check up their influence on weight and colour. Histological thin section shall help to analyse if there is a change in the bone's structure in relation to their age.
On the basis of these studies, it is possible to prove the possibility to subdivide bones of the same origin according to their mineralogy, state of preservation, density or microscopic structure into different groups separated by age. So the investigation of only a few bones of one group would offer the possibility to make a statement about the age of all bones of that group.

Finds of *Bubalus murrensis* (Bovinae, Mammalia) from the Upper Rhine Valley: a focus on the complex sedimentological conditions of a quaternary fluviatile system

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The upper sequence of the quaternary sediments of the northern and middle part of the Upper Rhine Valley has yield a rich sample of mammalian fossils. The sample contains taxa of the last glaciation (Würmian/Weichselian) and taxa of an interglacial period (Eemian), esp. *Hippopotamus amphibius* and *Bubalus murrensis*, both faunal elements of interglacial periods in the Pleistocene of Europe. But the stratigraphical position of these fossils can not be exactly determinate because the fossils were found in gravels which were extracted under the ground-water level by dredgers.
A hydrological active layer of clay and fine grained sediments exists in the northern part of the Upper Rhine Valley. This layer is called "Oberer Ton" and limits the extraction of material in the gravel pits. The mammalian remains occur above the “Oberer Ton”-horizon in coarse sediments. While the interglacial faunal elements (*Elephas antiquus*, *Hippoptamus amphibius*, *Sus scrofa*, *Capreolus capreolus* and *Bubalus murrensis*) were usually found right above the “Oberer Ton” the glacial faunal elements (*Mammuthus primigenius*, *Coelodonta antiquitatis* and *Rangifer tarandus*) occur in the upper part of the sequence. KOENIGSWALD (1988) excludes a diachrone displacement because of the relative high frequency of interglacial fossils (in the northern part of the Upper Rhine Valley), their good preservation and a complete skeleton (*Elephas antiquus*, Crumstadt).
In the middle part of the Upper Rhine Valley the upper sequence of the quaternary sediments are characterised by coarse grained sands and pebbles called “Oberes Kieslager” (OKL) above a fine grained sediment called “Oberer Zwischenhorizont 2” (OZH2). The OZH2 is correlated with the “Oberer Ton” of the northern part of the Upper Rhine Valley but it differs in the following points: grading up into coarser sediments, gets more inconstant laterally and less hydrological active. The OZH2 occurs in a depth of 15 to 35 m under ground level and does not limit the extraction in the gravel pits. The interglacial faunal elements occur above the fine grained sediments of the OZH2 (esp. *Bubalus* from Huttenheim out of 20 m deepness, or *Hippopotamus* from Brühl out of 21 to 24 m deepness). The glacial faunal elements occur in the higher levels. But there is one exception: *Bubalus murrensis* from Büchenau (Bruchsal). The left fragment of the skull was extracted in 10 m depth under ground level together with teeth of *Mammuthus primigenius* in 1966. This fragmentary specimen with marks of displacement is assigned by SCHREIBER & MUNK (2002) as an allochthonous find caused by a diachrone displacement.
The find of the waterbuffalo from Büchenau is an example for the exception which proves the rules. The stratigraphical model applied in the northern Upper Rhine Valley is supported by most of the finds in the middle part of the Upper Rhine Valley. But there is still no possibility for direct observations of the sedimentary structures and the arrangement of the fossils in the sediment. Fluviatile deposits like those of the Upper Rhine Valley are complex three-dimensional structures in which small scaled structures of different ages could occur in the same level. The stratigraphical determination of fossils and the geological interpretation of the deposits in the Upper Rhine Valley could be different to the general situation and has to be proved in any case.

Turtles from the Yixian formation of Liaoning province, northeastern China: new specimens and systematic revision

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The Yixian Formation, in Liaoning province, northeastern China, has yielded abundant turtle remains which were previously described as *Manchurochelys liaoxiensis*. The study of the new collection of the Geological Museum of China and reexamination of the previously studied IVPP collection allow to assign this turtle to *Ordosemys*. The additional primitive features observed in *Ordosemys liaoxiensis* (Ji, 1995) confirm its basal position among Centrocryptodira.

Late Neogene and Quaternary extinction of lower tetrapods in the Carpathian Basin

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Based on the available data the territory of the Carpathian Basin was inhabited by the geologically youngest Albanerpetontidae (Amphibia: Allocaudata) and Palaeobatrachidae (Amphibia: Anura). Furthermore, the only fossil members of land salamanders (Amphibia: Hynobiidae) of Europe are known from the Late Neogene and Lower Pleistocene of this area. Among modern Lissamphibia the albanerpetontids have one of the geologically widest fossil record. Beginning from the Middle Jurassic the group inhabited the territory of Laurasia. They survived the K/T event, and were rather frequent in the European Tertiary up to the Middle Miocene (MN 6/8). The record of a new species from the Middle Pliocene (MN 15) of Csarnóta 2, Hungary, extends at least 7 million years the fossil record of albanerpetontids, providing new data on the evolution of this group. The combination of character states of Csarnóta species suggest, that the latter form evolved isolated from the Western European species of *Albanerpeton inexpectatum*, and could have reached Central Europe from south, or south-east after Messinian Crisis. During Late Miocene times (MN 12 – MN 13) a group of presently Asiatic distributed land salamanders (Family Hynobiidae, *Hynobius*-group) extended their range of distribution, and reached westward the Carpathian Basin. They are known from three Upper Miocene – Lower Pliocene localities in Hungary (Tardosbánya 3 – MN 12, Polgárdi 4 – MN 13, Osztramos 1 – MN 14, and from one Lower Pleistocene locality in Romania (Betfia 9/C – MQ1). Based on the fossil record one may assume that the hynobiids never reached the western part of the continent, and became extinct during Lower Pleistocene times. The Palaeobatrachidae is the only frog family, which died off during Lower Pleistocene. The available data suggest that this group was rather frequent in Middle Miocene assemblages (e.g. Sámsonháza – MN 6, Mátraszőlős 1 and 2 – MN 7/8), but became extremely rare in younger localities. The type locality of *Pliobatrachus langhae* is Betfia 2. Recently, few remains were discovered from the locality of Betfia 9 (biozone of *Mimomys savini* + *M. pusillus*) too, while the locality of Subpiatră (biozone of *Mimomys savini*) probably yielded the geologically youngest specimens (about 700 my) of this group.

Two new species of scabbard-fishes from the genus *Lepidopus* Gouan, 1770 (*Trichiuridae, Perciformes*) from Oligocene of Moravian and Polish Carpathians.

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Two new species of the genus *Lepidopus* Gouan, 1770 were described from upper Oligocene deposits of Western Carpathians. Remains of *Lepidopus ruzenae* sp. nov. (Moravia, Važany nad Litavou locality, formation of Ždanice-Hustopeče, Eger) were originally described as *Lepidopus glarisianus* (Blainville, 1818) by Jaroš (1937). They differ from other representatives of the genus by lower number of vertebrae, lower number of dorsal fin rays, more short body, presence of particular structures in dorsal pterygiophores. Skeletons of *Lepidopus jerzmanskae* sp. nov. (South-Eastern Poland, Bachów locality, menilite shales, zone IPM 6) were mentioned by Jerzmańska (1975) as *Lepidopus isopleurus* (Agassiz, 1836). These fishes are characterized by: small number of abdominal vertebrae, big number of caudal vertebrae, very slender body, short, reduced pectoral fins. *Lepidopus ruzenae* and *Lepidopus jerzmanskae* are the oldest known species of the genus.

IDENTIFYING TERTIARY MYLIOBATOIDS FROM HUNGARY

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Determining and identifying teeth of myliobatoid rays was a poorly studied issue in Hungary - although there are plenty of fossils available for scientific investigation. The main problem is the general disagreement and the lack of unity in the literature about the determining characters, therefore the number of the reported species is so high that they are almost impossible to handle.

By defining the valuable characters (based on literatural data and specimens of collections) and using them properly, the Hungarian fossils of eagle rays (Chondrichthyes, Batomorphii, Myliobatoidea) were identified at the level of genera. After investigating and classifying the fossils from five - Eocene and Miocene - deposits, it could be said that there were undoubtedly at least three genera which occurred at the localities: *Aetobatus*, *Myliobatis* and *Rhinoptera*. Two of the deposits were studied in detail (approximately 500 tooth fragments and isolated teeth), Csordakút and Danitz-puszta, and their ray-faunas were compared. The observed differences (at Danitz-puszta rhinopterid teeth dominate while in Csordakút the three types are represented in roughly equal proportions) suggest that these genera could have represented different faunas in time and space, and it is not obvious that they preferred the same niche.

Since identifying has been a rather difficult matter so far, the number of the reported fossil species will need to be reduced, which will make determination a lot easier. Therefore, the Hungarian collections have to be revised too.

Furthermore, to learn more about the causes of the difference between the two main fauna, the age and ecology of the localities have to be studied further.