



SONDERABDRUCK

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MITTEILUNGEN AUS DEM JAHRBUCH DER KGL. UNGARISCHEN GEOLOGISCHEN REICHSANSTALT

(XXI. BAND, 7. HEFT.)

ADDITIONS TO THE FOSSIL
HERPETOLOGY OF HUNGARY
FROM THE PANNONIAN
AND PRAEGLACIAL PERIODE.

By Dr. ST. J. BOLKAY,

ASSISTENT AT THE BIOLOGICAL LABORATORY OF THE TRAINING COLLEGE FOR SECONDARY TEACHERS.

[WITH PLATES XI. XII. AND 5 TEXTFIGURES.]

*Herausgegeben von der dem königlich ungarischen Ackerbauministerium
unterstehenden
königlich ungarischen Geologischen Reichsanstalt.*

BUDAPEST.

BUCHDRUCKEREI DES FRANKLIN-VEREINS
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Mr. THEO. KORMOS Ph. D. has entrusted me with the description of the rich collection of herpetological material of the Royal Hungarian Geological Institution, originating from the Pannonian and Præglacial (Interglacial?) periode.

The material is in a relatively good condition, and originates from six localities: Polgárdi, Beremend, Püspökfürdő, Villány (Nagyharsányhegy), Csarnóta and Brassó.

All the remains are as old as Præglacial (Interglacial?) excepting those of Polgárdi, which occur intermixed with the remains of Hippurion fauna.

The richest localities are Polgárdi, Beremend and the Somlyóhegy near Püspökfürdő.

From the localities mentioned I can enumerate 9 species of Amphibians, and 13 of Reptiles.

Out of the Amphibians 2, from the Reptiles 5 species are new for science.

List of species accompanied by the localities:

Amphibians:

1. *Molge Karelinii* STRAUCH (Brassó).
2. *Bombinator pachypus* BP. (Brassó).
3. *Pelobates robustus* n. sp. (Polgárdi).
4. " sp. (Püspökfürdő, Beremend).
5. *Bufo vulgaris* LAUR. (Polgárdi, Püspökfürdő).
6. " *viridis* LAUR. (Beremend, Püspökfürdő, Villány, Csarnóta, Brassó).
7. *Rana esculenta* L. (Polgárdi, Beremend, Püspökfürdő, Csarnóta, Brassó).
8. *Rana Batthyányi* n. sp. (Polgárdi).
9. " *fusca* Rös. (Brassó).

Reptiles:

1. *Testudo* sp.¹ (Polgárdi).
2. *Ophisaurus intermedius* n. sp. (Püspökfürdő).
3. *Anguis polgárdiensis* n. sp. (Polgárdi).
4. " *fragilis* L. (Püspökfürdő).
5. *Varanus deserticolus* n. sp. (Beremend).
6. *Lacerta viridis* LAUR. (Püspökfürdő, Csarnóta, Villány, Brassó).
7. *Tropidonotus natrix* L. (Polgárdi, Brassó, Püspökfürdő).
8. " *tessellatus* LAUR. (Polgárdi, Brassó, Püspökfürdő, Beremend, Villány).
9. *Zamenis hungaricus* n. sp. (Polgárdi).
10. *Coluber Kormosi* n. sp. (Polgárdi).
11. *Coronella austriaca* LAUR. (Brassó).
12. *Vipera Gedulyi* n. sp. (Polgárdi).
13. " *berus* L. (Brassó).

Description of the remains.*Amphibians:*1. *Molge Karelinii* STRAUCH.

An about complete skull and 6 parabasale. The following pieces are lost from the skull: maxillary from the left side, all the tympanic, quadrate and pterygoid bones.

The skull is rather large, a great deal larger, than that of typical *Molge cristata*. The series of palatal teeth are clearly visible and are \wedge shaped. The limits of bones in general are obliterated, the whole skull being encrusted with lime.

There are 11 dentaries from the lower jaw in relatively good condition.

Locality: Brassó, Fortyogóhegy (præglacial red clay).

2. *Bombinator pachypus* BP.

Two atlas and a pterygoid bone are left.

Locality: Brassó, Fortyogóhegy (præglacial red clay).

¹ I will describe this tortoise in a later article of mine.

3. *Pelobates robustus* n. sp.

(Plate XI, Figs. 1—5.)

Eight fragmentary pieces of maxillary, a pair of præmaxillary and 4 angulare are left from the skull.

This species exceeds in size the largest specimens of *Pelobates cultripes* CUR.

Maxillary is not covered with osteoderms in such great extent as that of *Pelobates cultripes*, being the under half of maxillary quite smooth. Characteristic is the furrow, which originates at the posterior margin of orbit and divides in two branches, the one stretching forward, the other backward.

This bifurcated furrow divides the osteoderms in two parts.

The præmaxillaries differs from those of *Pelobates cultripes* in the peculiarly depressed form of the ascending processes.

Processus coronoideus of angulare is carved out like a spoon.

From the hyoid apparatus the only remain is a thyreoid process.

The pelvic girdle is represented by an ileum, on which we may clearly observe the characteristic marks of the genus *Pelobates* viz. the total absence of tuber superior, and the presence of a canal extending from the inner margin of ileum, through the neck of ileum till the acetabulum.

The only remain of posterior extremity is an os cruris.

Locality: Polgárdi (pannonian filling of a hole on the Bányahegy).

4. *Pelobates* sp.

There are yet in the collection 3 ileums, which belong without doubt to the genus *Pelobates*. Regarding the great difference which exist between the Beremend, Püspökfürdő fauna on one hand, and between the Polgárdi on the other, I dare not determine this ileums as *Pelobates robustus* BY., therefore I denote it as *Pelobates* sp.

I think however that the remains¹ stand nearer to *Pelobates robustus* BY., than to the recent *Pelobates fuscus* LAUR.

Locality: Beremend (præglacial red clay with bean-ore), Püspökfürdő (præglac. red sand with stone-fragments).

¹ Especially the Beremend ileum.

5. *Bufo vulgaris* LAUR.

This species differs from those of living now, only in the greater proportions of its bones. There are in the collection bones of the skull, and other components of the skeleton. (Fig. 1.)

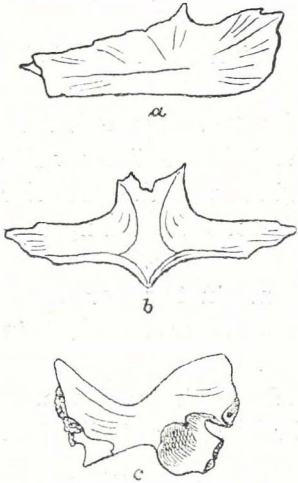


Fig. 1. *Bufo vulgaris* LAUR.
a = maxillary (from the right side), *b* \times os parabasale, *c* = scapula (from the right side), Magn. 2 \times . Püspökfürdő.

Notwithstanding the fronto-parietals of the specimen of Püspökfürdő are much larger than those of the recent, but this may be not a basis for specific distinction, being the fossil *Bufo vulgaris* more robust, than the recent ones.

Locality: Polgárdi (pannonian filling of a hole), Püspökfürdő (præglac. red sand with stone-fragments on the Somlyóhegy).

6. *Bufo viridis* LAUR.

The same case, as with the preceding species.

The only difference between the fossil and the recent ones, the greater development of tuber superior on the ileum.

Locality: Beremend (red clay), Püspökfürdő (red sand with stone-fragments), Villány (yellowish-brown clay), Csarnóta (bone breccia), Brassó, Fortygóhegy (red clay).

All are præglacial.

7. *Rana esculenta* L.

The remains, which enable us to determine surely the presence of *Rana esculenta* in this epoche, are not satisfying for detailed studies.

The species has flourished already from the Pannonian age, the proof of which is the occurrence of the species from all the localities mentioned.

DEPÉRET has stated the presence of the species in the Rousillon fauna.¹

¹ CH. DEPÉRET: Les animaux pliocènes du Roussillon. Mém. Soc. géol. de France, Paleont, Mém. 3, Paris, 1890, V, 173. Pl. XVIII. Figs. 21—25,

Locality: Polgárdi, Beremend, Püspökfürdő (Somlyóhegy), Csarnóta, Brassó (Fortyogóhegy).

8. *Rana Batthyányi* n. sp.

(Plate XI, Fig. 6—7.)

The 7 ileums preserved differs from those of the *Rana* type in the following; the ileum on the region of neck bent in a great arch, there is no trace of a spina pelvis anterior, similarly the tuber superior is very weakly developed.

The considerable size of this animal is well indicated by the large fragments of maxillary, which are numerous in this collection.

The only remain of vertebral column is a fragment of the fourth vertebra, also large sized. It belongs yet to the remains two fragments of os cruris.

Locality: Polgárdi.

I name this new species to the honour of Count LEWIS BATTHYÁNY, the owner of the Polgárdi estates.

9. *Rana fusca* ROESEL.

One ileum, one femur, several tibiae and metatarsal bones, one coracoid, two humeri and three angulare.

Locality: Brassó (Fortyogóhegy).

Reptiles:

a) Tortoises.

1. *Testudo* sp.

Several remains.

Locality: Polgárdi.

b) Lizards.

2. *Ophisaurus intermedius* n. sp.

Mr. KORMOS has already described from this genus beautiful remains from Polgárdi under the name of *Ophisaurus pannonicus*.¹

¹ KORMOS T. A polgárdi pliocén-csontlelet. Földt. Közl. XLI. köt. 63—64. lap.

The present collection contains six osteoderms from Püspökfürdő. The osteoderms are so large, that I can not unite them with *Ophisaurus apus*, therefore I propose to name it *Ophisaurus intermedius*. According to my opinion, this animal may have been the connecting link between *Ophisaurus pannonicus* and *Ophisaurus apus*.

Locality: Püspökfürdő, Somlyóhegy.

3. *Anguis polgárdiensis* n. sp.

(Plate XII, Fig. 1.)

One parietal, two maxillaries and a fragmentary piece of dentary. Parietal differs from that of *Anguis fragilis*, in having the trace of a scutum interparietale in the form of a wide triangle, the two branches pointing directly to the front corners of parietal.

In connection with this I see, that the trace of a scutum occipitale is present on this species. I never observed this trace on recent parietal bones of *Anguis fragilis*.

A further peculiarity of this species is, that the teeth are more robust, less curved and more blunt than those of *Anguis fragilis*.

Locality: Polgárdi, Bányahegy.

4. *Anguis fragilis* L.

This species is represented by a complete parietal, a complete dentary, a fragmentary maxillary and three osteoderms.

It is worth to note, that the remains are in all respect identical with those of a typical *Anguis fragilis* except the teeth, in which respect it closely resembles to *Anguis polgárdiensis* Br.

Locality: Püspökfürdő, Somlyóhegy.

5. *Varanus deserticolus* n. sp.

(Plate XII, Fig. 2.)

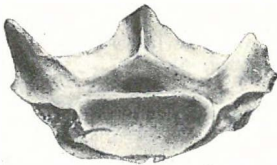


Fig. 2. Dorsal vertebra of *Varanus deserticolus* n. Beremend. Magn. 2 ×.

One of the most interesting phenomena in the collection is the genus *Varanus*, which is represented by a fragment of dentary, with a complete and a fragmentary tooth, and a vertebra.

The only complete tooth which is to be found in the dentary is rather flattened, and nearly straight, blunt at the end.

The vertebra is one of the dorsals and pretty large. (Fig. 2.)

On this vertebra we may clearly observe the processi obliqui directed strongly upwards, and the large horizontal-oval glenoid cavity.

Locality: Beremend.

6. *Lacerta viridis* LAUR.¹

Beautiful remains especially from Csarnóta and Püspököfördő, agreeing entirely with the same bones of *Lacerta viridis*, for which reason a detailed description is superfluous.

Locality: Püspököfördő, Csarnóta, Villány, Brassó.

c) Snakes.

7. *Tropidonotus natrix* L.

I have the unmistakable remains of this species before me from Polgárdi, Püspököfördő and Brassó. An about complete and several fragmentary parietals, and a complete basioccipital from Polgárdi, a complete maxillary with teeth and complete parietal from Püspököfördő.

Locality: Polgárdi, Püspököfördő, Brassó.

8. *Tropidonotus tessellatus* LAUR.

14 pieces of articulare, a fragment of dentary, an os transversum, a part out of the basisphænoid and a parietal not quite complete are left from this species.

Locality: Polgárdi, Beremend, Villány, Püspököfördő, Brassó.

9. *Zamenis hungaricus* n. sp.

(Plate XII, Fig. 3.)

I describe this new species from a unique quadrate, which, examining all of its characters stand nearest to the genus *Zamenis*.

Taking into consideration, that the quadrate is one of the very characteristic bones in the snakes, and as I can't identify it with the

¹ Here may be mentioned, that there are yet in the collection a great many dentaries, and fragments of maxillaries from Püspököfördő, Polgárdi and Brassó. This may originate from one or several species of *Lacerta* (or perhaps of an other genus) but the determination for the incompleteness of the remains is almost impossible.

spp. of *Zamenis* occurring in our monarchy, I feel fully entitled to establish a new species upon it.

The minute investigation of the neighbourhood of Polgárdi would be desirable respecting the validity of this species.

Locality: Polgárdi.

10. *Coluber Kormosi* n. sp.

(Plate XII, Figs. 4—8.)

A præmaxillary, a fragment of palatine, five pieces of maxillary, two transversi, a fragmentary piece of basisphænoid, a basioccipital, and three quadrates.

I establish on this material the new species, which is the nearest ally of *Coluber longissimus* LAUR.

Comparing the præmaxillary with that of *Coluber longissimus*, the following peculiarities could be noticed: the anterior margin bent in a low arch, it is less carved out behind the two lateral processes, and the two little processes arising at the right and left side of processus nasalis are separated from the great process by a fine furrow. Processus nasalis softly widening upwards, in opposition to that of *Coluber longissimus*, which is parallel.

It is conspicuous on the palatine, that the flag-like process (Plate XII. Fig. 5.) is better developed, this process originating in general by a wider basis out of the palatine, and its lateral margin is more upfolded.

The characteristic marks of transversum are, that the handle of the bone is relatively longer, slightly bent, the gulf between the flag and the small thorn is less deep.

The median furrow on the ventral side of basisphænoid wider and much deeper than that of *Coluber longissimus*.

Basioccipital is pentagonal. Its lateral processes are strongly developed. Near to the anterior margin of basioccipital there are two protuberances, serving for adhesion of muscles.

This protuberances are connected with a weak transverse keel. This keel has a continuation in the middle-line and bifurcates again before the condylus occipitalis like a- λ .

Quadrates differs not from those of *Coluber longissimus*.

Locality: Polgárdi.

I named this new species to the honour of Mr. THEO. KORMOS Ph. D. Roy. Hungarian Geologist, by the kindness of whom, I was able to study this material, and who has collected most of the remains here described.

11. *Coronella austriaca* LAUR.

A complete basisphænoid (Fig. 3.), a fragmentary basioccipital, a quadrate and four pieces of articulare. This are the traces of the species from this epoche.

The bones agrees entirely with the recent and corresponding parts of *Coronella austriaca* LAUR.

Locality: Brassó, Fortygóhegy.

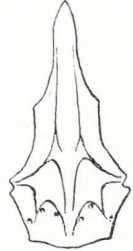


Fig. 3. *Coronella austriaca* LAUR.
Basisphænoid.
Magn. 4 X.

12. *Vipera Gedulyi* n. sp.

(Plate XII, Figs. 9—12.)

Nine præfrontals, two frontals, two fragments of parietal, one prooticum, one lateral occipital, 19 pieces of maxillary (7 with poison-fangs), 33 pieces of transversum, 15 basisphænoid, eight basioccipital, 26 articulare, and 206 separate poison-fangs. (Fig. 4.)

Before the characterisation of this species, I must notice, that the cause for which I separated it from *Vipera ammodytes* L. is the relatively old age and the considerably larger size of this Viper.

If we take the bones singly, we are surprised by the great degree of agreement which this species shows with *Vipera ammodytes*.

I describe in the following only the bones presenting at least some difference from the same parts of *Vipera ammodytes* L.

On the anterior margin of the maxillary's ascending process there is a strong bony keel, which don't permit us to see the total outline of the process. This keel is obliterated on *Vipera ammodytes*, and the outline of the whole process is clearly visible in front.

On the posterior aspect of maxillary there is a deep transverse canal, which is never as deep as in *Vipera ammodytes*.

Transversum differs from that of *V. ammodytes* that the ventral surface is not carved out totally, only at the dilated part of it.

The posterior end of the basisphænoid is in all cases examined drawn out in a point.

From this point a median keel takes its origine, this keel bifur-



Fig. 4. *Vipera Gedulyi* n. Poison-fang. Polgárdi.
Magn. 5 X.

cates in the front third of the bone, and vanishes in the direction of the two anterior lateral processes.¹

A conspicuous beak-like process on the basioccipital, pointing backwards, is never developed in such degree on the Sand-Viper. The general shape of basioccipital is triangular, and narrower, till that of the Sand-Viper is rather pentagonal and wider.

Locality: Polgárdi.

I dedicate this new species to the honour of my friend Prof. O. DE GEDULY, who put at my disposal precious material to compare with.



Fig. 5.

Vipera berus
L. Basisphænoid.
Magn. 4 ×.
Brassó.

13. *Vipera berus* L.

There is a complete, and a fragmentary basisphænoid in the collection. (Fig. 5.)

Locality: Brassó, Fortyogóhegy.

*

There are yet a great many vertebræ and ribs of snakes in the collection, but the specific distinction of them is almost impossible.

Zoogeographical and phylogenetic connexion.

If we look over the list of Amphibians and Reptiles living in Hungary during the Pannonian and Præglacial (Interglacial?) Periods, we may see that except *Rana Batthyányi* By. which has at present no relatives in Europe, all the species mentioned have direct descendants here on one hand or in Asia-Minor and Syria on the other.

I understand under the sentence of «have direct descendants here on one hand», that the species here occurring, occur in Asia-Minor and Syria, that is to say in West-Asia also.

There are namely between the species enumerated a few such, — as for instance *Varanus deserticolus* By. and *Pelobates robustus* By. — the probable descendants of which live now exclusively in Syria, being this the most north-western point of their distribution. *Varanus deserti-*

¹ This two lateral processes on the anterior third of bone are too characteristic on the basisphænoid of Vipers, and are in opposition to *V. ammodytes*, strongly developed in *Vipera Gedulyi* By.

colus has a relative in *Varanus griseus* DAUD., and *Pelobates robustus* in *Pelobates syriacus* BTGR.¹

We may solve the whole problem by this two species. To this reckon yet amongst the Amphibians *Molge Karelinii* STRAUCH, amongst the Reptiles *Ophisaurus pannonicus* KORM., the descendants of which live now in the mediterranean region.

Ophisaurus pannonicus KORM. undergoing perhaps on some changes, has lingered yet for a time in the environs of Püspökfürdő.

It seems to be in general, that Püspökfürdő was a refuge for several now mediterranean species in the Præglacial and even in the Pleistocen periode.

I am inclined to refer the remains of *Lacerta viridis* LAUR. here described to the form-group of *Lacerta major* BLGR. that is to say *Lacerta strigata* EICHW. living now in Asia-Minor and Syria also.

The incompleteness of the remains prevented me however to unite them with the species here mentioned.

In this manner only the logical supposition remains, that there, where *Ophisaurus* and *Molge Karelinii* were found, the natural surroundings were not the same as should be favourable to the typical *Lacerta viridis*; so that by this reason we could rather suppose the ancestor of *Lacerta major*, the descendant of which is still now occurs side by side with *Ophisaurus* and *Molge Karelinii*.

In account of seeing this whole question as lightly as possible, let us suppose, that before the Glacial periode, strictly speaking in the Pannonian age, when the climatic zones were not yet so sharply limitid as now, this southern and south-western species may have been distributed all over the Periarctic and Palæarctic regions of to-day.

In the time, when the first great glaciers came from the north, the more delicate species little by little extincted, others less delicate remained on several protected spots, and spreading out from them, populated our pleistocenic regions.

After the definite withdrawal of the glaciers the mediterranean and south-western asiatic species have reconquered their ancestral territoriums northwards as far, as the newly warmed up climate made it possible.

All the species, which lived here in this periods and live here

¹ I compared during the description *Pelobates robustus* with *Pelobates cultripes* CUV., having no material from *Pelobates syriacus*. The latter species otherwise agrees strictly with *Pelobates cultripes* in osteological marks.

now too in a wide distribution, proof, that they were stronger against the catastrophes of the Glacial-periods; in opposition to this the weaker disappeared without any trace, or remained in their descendants in regions which were perhaps not disturbed by the Glacial periodes.¹

These are well illustrated by the genus *Varanus* on one hand; which already does not live more in Europe, and by *Pelobates robustus* on the other, the one probable descendant of which, *Pelobates syriacus* lives now in Asia-Minor and Syria, an other relative *Pelobates cultripes* is a native of South-France and the Iberian Peninsula.

There is yet an other species of *Pelobates* in Europe viz. *Pelobates fuscus*, the Garlic-Toad, which has the widest distribution of all. I consider this species as the direct descendant of *Pelobates robustus*, evolving already in the Præglacial periode, the proofs being the ileum's of Püspökfürdő and Beremend.

I refer however the Beremend ileum rather to *Pelobates robustus*, regarding the presence of *Varanus deserticolus*.

Considering the fact, that the *Anguis* remains of Püspökfürdő are most nearly related to the typical *Anguis fragilis*, if not exactly identical with it, the ileum of Püspökfürdő belongs more probably to *Pelobates fuscus*.

We could search for the relation or origin regarding our fauna in the Pyrenees, that is to say in the Iberian Peninsula.

So we are looking in vain for the relation of *Zamenis hungaricus* between the form-group of *Zamenis Dahlii* Fitz. or *Zamenis gemonensis* LAUR., we rather find that in the form-group of *Zamenis hippocrepis* L.

This supposition is thoroughly justified by the *Macacus* remains having found by Mr. KORMOS at Csarnóta² hardly distinguishable from the *Macacus inuus*, living now on the extreme south of Spain and in Morocco.

The species treated in this article has undergone from the Pannonian periode on some changes only, caused by the slow changes in the climatic and soil conditions. The only visible result of this changes was, that the skeleton of Reptiles and Amphibians has lost its former robust structure.

It had to be conspicuous already at the course of my descriptions,

¹ KORMOS T.: A magyarországi præglaaciális fauna származástani problémája. Koch-Emlékkönyv. Budapest, 1912.

² KORMOS T.: A magyarországi præglaaciális fauna származástani problémája. Koch-Emlékkönyv. Budapest, 1912.

that most of the species mentioned differs from those of living now in the more robust structure, that is to say in the more robust skeleton.

Such are for instance: *Pelobates robustus* BY., *Ophisaurus pannonicus* KORM., and *Vipera Gedulyi* BY., all being judged after their skeletal remains two-or three-times as large as their direct descendants living at present.

I already mentioned of the *Bufo vulgaris* living in this epochs, that its fronto-parietal was much wider and more robust, than that of the recent *Bufo vulgaris*.

I refer in the same category *Rana Méhelyi* BY. which was also a larger animal than its direct descendant *Rana fusca* RÖS.¹

But this is a general phænomenon observed at all the species being not only as old as Pannonian, but at Pleistocenic species too.

Such are: *Bufo vulgaris* LAUR., *Bufo viridis* LAUR., *Rana esculenta* L., *Rana Méhelyi* BY., *Anguis fragilis* L., *Lacerta viridis* LAUR., *Tropidonotus natrix* L., *Tropidonotus tessellatus* LAUR.

We may conclude, that all the genera and species respectively, characterized at present by strongly bony skeletal parts, are more ancient and are more dying out, or rather they give place with their descendants to a generation characterized — following the line of phyletic evolution — by the continual degeneration of the skeleton.

The Amphibians and Reptiles of to-day merely are the epigons of a class, flourishing in bygone-ages. The robust Amphibians and Reptiles living under the tropics exhibit some contradiction against this theory, but this is only a superficial view, because these are also the descendants of giant ancestors — one could say; living fossils — so that the life under the Equator to-day is only a weak remembrance of the life long ago disappeared during the various geological ages around the periarctic regions.

The difference between the vertebrates of our temperate zones and those of the tropical zones is as follows: till the first mentioned has run through all the various stages of geological evolution, from the beginning of organic life — the others stopped in the evolution and show the life disappeared on our regions in the Tertiary-period.

We look in vain for a phylogenetic connexion of our vertebrates

¹ BOLKAY, ST.: On the pleistocenic predecessor of *Rana fusca* RÖS. Mitt. a. d. Jahrb. d. k. ung. geolog. Reichsanst. Bd. XIX. Heft 3, p. 159.

towards the Equator, as we could find it in our own regions through various geological ages. The vertebrates really have their relations from the Equator to the Poles, but this is not at all a phyletic series, because the real blood-relation is to be found through the series of extinct forms.

The relation from the Equator to the Poles mentioned above, according to my opinion, is in fact the short recapitulation of the real phyletic evolution, on which all the species — living under the temperate zone — have undergone from the beginning of organic life till to-day.

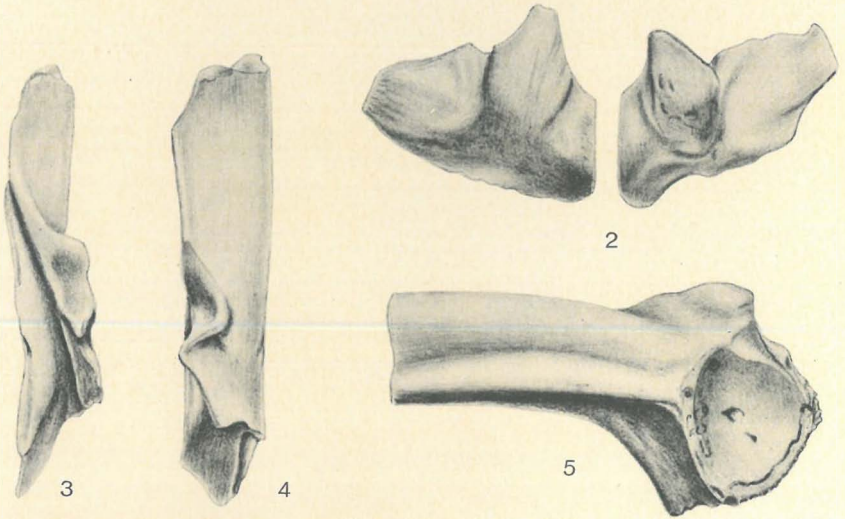
EXPLANATION OF PLATE XI.

1. *Pelobates robustus* n., Fragment of right maxillary. Polgárdi. Magn. 6×.
2. " " A pair of præmaxillaries. Polgárdi. Magn. 6×.
3. " " A fragment of left angulare. Upper view. Polgárdi. Magn. 6×.
4. " " The same from inside.
5. " " A fragment of the left ileum. Polgárdi. Magn. 6×.
6. *Rana Batthyányi* n., A fragment of the right ileum. Polgárdi. Magn. 6×.
7. " " A fragment of the right maxillary. Polgárdi. Magn. 5×.

The original examples belong to the collection of the Royal Hungarian Geological Institution.



1

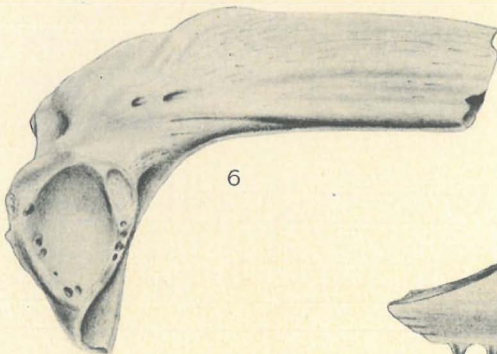


2

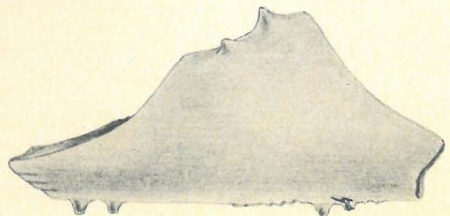
3

4

5



6



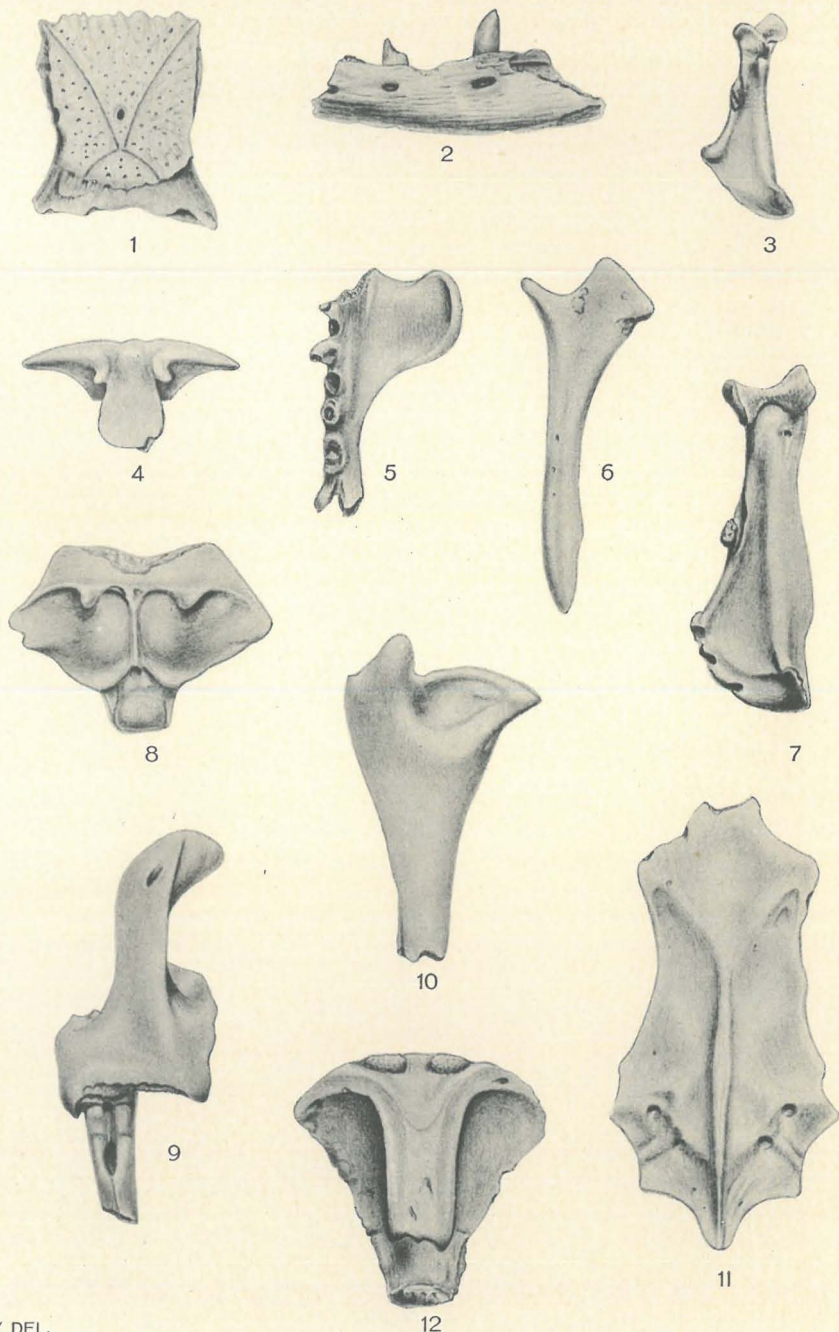
7

BOLKAY DEL.

EXPLANATION OF PLATE XII.

1. *Anguis polgárdiensis* n., Parietal. Polgárdi.
2. *Varanus deserticolus* n., A fragmentary piece of the left mandible.
3. *Zamenis hungaricus* n., Quadrate. Polgárdi.
4. *Coluber Kormosi* n., Præmaxillary. Upper view. Polgárdi.
5. " " Palatine from below. Polgárdi.
6. " " Transversum. Polgárdi.
7. " " Quadrate. Polgárdi.
8. " " Basioccipital. Polgárdi.
9. *Vipera Gedulyi* n., Front view of maxillary with a fragmentary poisonfang. Polgárdi.
10. " " Transversum, broken in the middle. Polgárdi.
11. " " Basisphæmoid, outer view. Polgárdi.
12. " " Basioccipital, outer view. Polgárdi.

All the figures are magnified 6-times. The original examples belong to the Royal Hungarian Geological Institution.



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