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AMPHIBIANS AND REPTILES FROM THE PLIOCENE LOCALITY OF WĘŻE II NEAR DZIAŁOSZYN (POLAND)

MŁYNARSKI, M., SZYNDLAR, Z., ESTES, R. and SANCHÍZ, B.: Amphibians and reptiles from the Pliocene locality of Węże II near Działoszyn (Poland). Acta Palaeont. Polonica, 29, 3—4, 209—226, 1985 (1984).

The following forms have been recognized in the Upper Pliocene fauna from the karstic deposits near Działoszyn: *Mioproteus wezei* sp. n. (Proteidae), *Palaeobatrachus* sp. and *Pliobatrachus* cf. *langhae* (Palaeobatrachidae), *Pelobates fuscus* (Pelobatidae), *Bufo bufo* (Bufonidae), *Rana* sp. (Ranidae), *Emys orbicularis antiqua* (Emydidae), *Ophisaurus pannonicus* and *Anguis* cf. *fragilis* (Anguidae), *Lacerta* cf. *viridis* and *Lacerta* sp. (Lacertidae), *Elaphe paralongissima* and *Natrix* cf. *longivertebrata* (Colubridae). The majority of the recognized taxa, including living forms (e.g. *Bufo bufo*, *Emys orbicularis*, *Anguis fragilis*) as well as extinct ones (*Pliobatrachus langhae*, *Natrix longivertebrata*), were widespread in the European Neogene and (eventually) Pleistocene.

K e y w o r d s: Amphibia, Reptilia, Pliocene, Poland.

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INTRODUCTION

The present paper describes for the first time in detail the herpetofauna from the locality of Węże II. This fossil site was discovered by Sulimski (1962) and named Węże II in order to distinguish it from the nearby locality Węże I. The latter locality, discovered in 1933 by Samsonowicz (1934), has become a classic fossil site in paleontological literature (cf. Stach, 1952, and later papers by various authors). The locality of Węże II is situated on the north-western slope of a Jurassic hill, Zelce, about one km from the willage Węże and about 200 m NE from the karst fissure of the Węże I locality. The entire sample from Węże II was excavated in the period 1958—1961 by Dr. Andrzej Sulimski and is now stored in the collection of the Institute of Paleobiology of the Polish Academy of Sciences, Warsaw for which an abbreviation ZPAL is used.

Detailed geological characteristics of the locality together with a pre-liminary list of its vertebrate fauna were given by Sulimski (1962).

In Sulimski's (op. cit.: 222) opinion, the age of Węże II is Upper Plio-cene, and therefore similar to the age of Rębielice Królewskie I and II (biozone MN 16) and somewhat younger than that of Węże I. However, according to current studies of Głazek et al. (1976), the previous view that the whole Węże I fauna was of an equal age (MN 15) is erroneous; in-deed, the fossil deposit of Węże I contained faunas coming from various epochs, from the Lower Pliocene until Late Pleistocene (Cromerian).

The amphibian and reptilian assemblage described here confirms Su-limski's (1962) dating, but does not allow further precision. The whole herpetofauna presumably comes from the same time period. In spite of the previous opinion of Młynarski (Młynarski in Sulimski 1962; Młynarski 1962) the herpetofauna from Węże II resembles that from Węże I to a small degree only, instead being more similar to the fauna of Rębielice Królewskie I (see final remarks).

The described collection in stored in the Institute of Paleobiology of the Polish Academy of Sciences (abbreviated as ZPAL).

SYSTEMATICS

Amphibia

Order **Caudata** Oppel, 1811
(by Richard Estes)

Family **Proteidae** Hogg, 1838
Genus *Mioproteus* Estes et Darevsky, 1977
Mioproteus wezei sp. n.
* (fig. 1)

Holotype: Trunk vertebra ZPAL Ab II/1, slightly broken; centrum length 7.5 mm; fig. 1: 1—5.

Type horizon: Pliocene.

Type locality: Węże II, Poland.

Referred specimens: ZPAL Ab II/1, 2, 4: seventeen trunk vertebrae, ZPAL Ab II/3: two ilia.

Diagnosis. — At present, specific separation from *Mioproteus caucasicus* rests on some minor differences in variable character states. In *M. wezei* the forking processes of the dorsoposterior region of the neural arch are consistently separated from the median neural spine (separated or not in *M. caucasicus*); these forking processes extend somewhat farther anteriorly, to about the level of the vertical lamina of the transverse process; in lateral view, the posterior portion of the interzygapophysial ridge has, in general, a greater dorsal curvature; the subcentral keel may in some vertebrae be less flattened and more sharply crested; although the ventral lamina of the transverse process is broken in all vertebrae, the
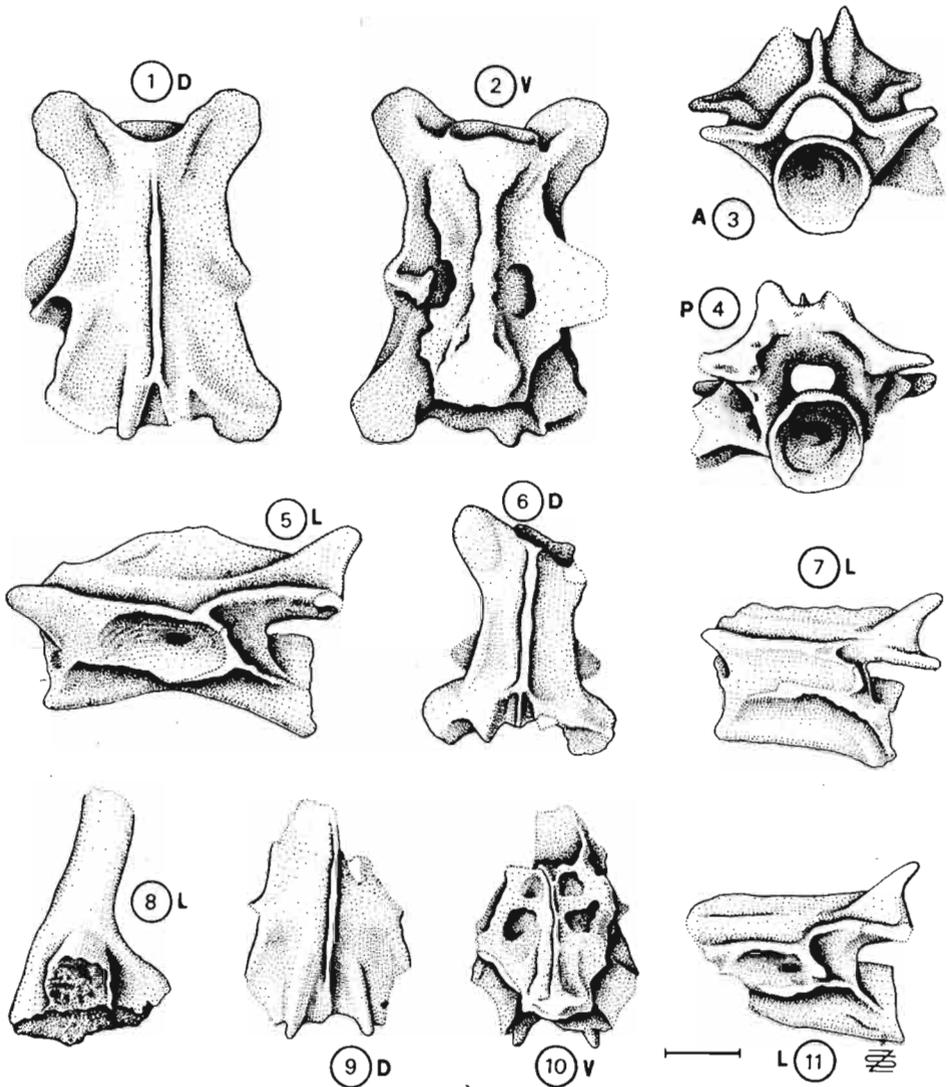

Fig. 1. *Mioproteus wezei* sp. n. *1—5* holotype trunk vertebra ZPAL Ab II/1; *6, 7* trunk vertebra ZPAL Ab II/2; *8* right ilium ZPAL Ab II/3; *9—11* anterior trunk vertebra ZPAL Ab II/4. Scale equals 2 mm. *A* anterior, *D* dorsal, *L* lateral, *P* posterior, *V* ventral views.

remaining portions suggest that it may have been less extensive than in the Miocene form.

Description. — Trunk vertebrae (ZPAL Ab II/2) amphicoelous, no marked tendency for calcification in anterior cotyles; subcentral keels prominent, either bluntly flattened or sharp ventrally; presumed anterior trunk vertebra (ZPAL Ab II/4, third or fourth?) with paired subcentral keel, the halves joined by a crest posteriorly; basapophyses more or less prominent, issuing laterally from posterior part of subcentral keel; transverse processes of most vertebrae apparently uniformly unicipital, but anterior trunk vertebra ZPAL Ab II/4 has double rib-bearers set rather far back on the centrum; transverse process with vertical lamina that issues from the interzygapophysial ridge and joins the ventral lamina ventrally; interzygapophysial ridge with strong upward curve posterior to vertical lamina of transverse process; ventral lamina broken on all vertebrae but was apparently not extensive; deep excavations or pits present around transverse process that are usually confluent with the subcentral foramina; no foramina for spinal nerves present; neural arch prominent, wide, flattened; zygapophyses well defined and projecting; neural spine a well defined keel, extending anteriorly to the anterior border of the neural arch; forking processes on posterodorsal neural arch prominent, not connected to neural spine, and projecting anteriorly to level of vertical lamina of transverse process; in presumed anterior trunk vertebra ZPAL Ab II/4 no forking processes present and neural spine forms a single median projection; centrum length 4.3—7.5, $\bar{x} = 5.6$.

Comments. — Although these specimens are much later in time than those of *Mioproteus caucasicus* from the Upper Miocene of the northern Caucasus, they resemble the latter closely, differing from them in only the minor features given in the diagnosis. These character states at least in part reflect individual differences as well as position in the column, and their known extent of variation in the two species is heavily biased by the small size of the known samples. In *M. vezei* separation of the forking processes of the neural arch from the neural spine is consistent, but again this is variable in *M. caucasicus* (in Estes and Darevsky 1977, figs. 1, 2 show this region in the form of a "Y", fig. 3 shows the separate condition as in *M. wezei*). The relative breadth of the vertebrae across the heural arch that distinguishes *Mioproteus* from *Proteus* is also present in the Polish specimens, none of which show the slender, delicate construction seen in the living genus. In addition, one of the Węże vertebrae appears to be an anterior trunk vertebra (ZPAL Ab II/4) and shows the presence of double rib bearers, a condition often seen in anterior vertebrae of living salamanders that have lost this condition posteriorly, but one that does not occur in *Proteus*. The robust ilia indicate that as in *Mioproteus caucasicus* the limbs were strongly developed. As in the Miocene locality from the Caucasus, the presence of other salamanders (including newts), frogs, and more terrestrial lizards and snakes indicates that *M. wezei* retained the more characteristic salamander mode of life rather than being troglobitic as in *Proteus.*

Order **Anura** Giebel, 1847
(by Borja Sanchíz)

Family **Palaeobatrachidae** Cope, 1865
Genus *Palaeobatrachus* Tschudi, 1839
Palaeobatrachus sp.
(fig. 2: 1)

Material. — ZPAL Ab II/5: right ilium.

Description. — The ilium shows the characteristic features of the family (e.g. Vergnaud-Grazzini and Hoffstetter 1972; Estes and Sanchíz 1982), in particular absence of the pars descendens, presence of an interiliac synchondrosis, and lack of a well developed crista dorsalis ilii. The tuber superius, although undivided, shows several small insertion crests; the tuber protrudes dorsally in lateral view. There is a well developed pre-acetabular fossa (presumably the tendinous origin of the m. iliacus internus), delimited by the acetabular rim and dorsally by a crest.

Several of. the above features distinguish this ilium from that of *Pliobatrachus*, the other palaeobatrachid in the locality, as noted below. This specimen, although unidentifiable to species, conforms well to the morphology of the genus *Palaeobatrachus* and is thus of considerable interest, as it shows the persistence of the genus *Palaeobatrachus* into the Pliocene. Until now, the latest documented record was from the Middle Miocene (MN 6) of Sansan, France (Vergnaud-Grazzini and Hoffstetter 1972).

Genus *Pliobatrachus* Fejérváry, 1917
Pliobatrachus cf. *langhae* Fejérváry, 1917
(fig. 2: 2)

Material. — ZPAL Ab II/6: left ilium.

Description. — This single palaeobatrachid ilium agrees in morphology with the other Polish Pliocene finds of *Pliobatrachus* (Sanchíz and Młyarski, 1979; and references therein). Pars descendes absent; iliac synchondrosis somewhat stronger than that of the *Palaeobatrachus* above; tuber superius single, with no trace of crests; no well-developed pre-acetabular fossa. The tuber superius in less protruding in *Pliobatrachus* (lateral view) than in other palaeobatrachids, since the thal shaft is more elevated in the section immediately anterior to the acetabulum, altthough as in the other members of the family there is no well-developed dorsal crest.

Comments. — The genus *Pliobatrachus*, with its many distinctive morphological features (e.g. Vergnaud-Grazzini and Młynarski 1969; Sanchíz and Młynarski 1979), seems to have been extensively distributed in Central Europe during the Late Neogene, its phylogenetic origins being unknown among other palaeobatracnids. There are no indications, at the moment, that would suggest the presence in the genus of more than one species among the known materials, but as only a few elements (not yet revised) were originally described from the type locality of Betfia (Romania; Fajérvary 1917), it seems preferable to use for the specimens, from other sites the taxonomic particle "cf." in the sense of Sanchíz (1977). It is the first time that *Pliobatrachus* has been found jointly with another palaeobatrachid in the same site, although Hodrová (1982) has mentioned the possible presence of two *Pliobatrachus* forms in her Czech material.

Palaeobatrachidae indet.

Material. — A fragment of vertebra (ZPAL Ab II/9), with the peculiar palaeobatrachid crescent centrum shape; it cannot be referred unequivocally to one of the two palaeobatrachids present.
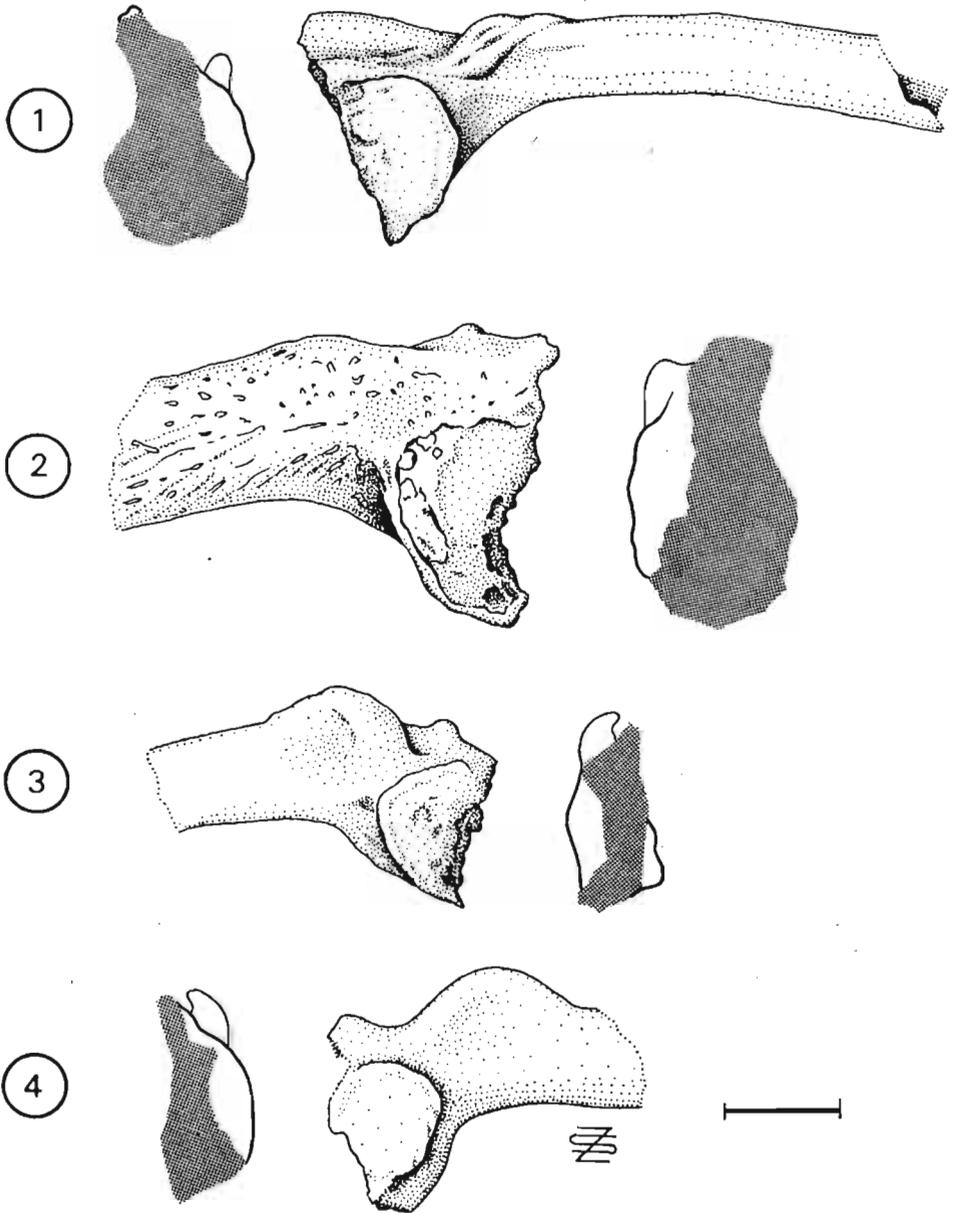
Fig. 2. Anuran ilia, lateral and posterior views. *1 Palaeobatrachus* sp., right ZPAL Ab II/5; *2 Pliobatrachus* cf. *langhae* Fejérváry, left ZPAL Ab II/6; *3 Rana "esculenta"* Linnaeus, left ZPAL Ab II/7; *4. Rana dalmatina* Bonaparte, right ZPAL Ab II/8. Scale equals 2 mm.

Family **Pelobatidae** Lataste, 1879
Genus *Pelobates* Wagler, 1830
Pelobates fuscus (Laurenti, 1768)

Material. — ZPAL Ab II/10: 5 maxillae, 5 fragmentary frontoparietals, 2 verte-brae, 5 humeri, 6 ilia, 1 tibiofibula, 1 fibulare.

The specific attribution is mainly based on the frontoparietal and maxillary fragments, with the latter showing, as in living *Pelobates fuscus*, a dermal sculpture with wider and more open polygons and lower density of ridges than the other species in the genus. The ilium lacks a dorsal crest and tuber superius, and has an interiliac articulation plane that is not so strong or striated as in other species of *Pelobates*. Presence of this plane, together with the character states of the maxilla, permits reference to *Pelobates* rather than *Eopelobates* (see Sanchíz and Sanz 1980; Roček 1981). The other recovered elements, although clearly referable to *Pelobatidae*, vary little in morphology within the family and their taxonomic information is consequently less.

Pelobates sp.

Material. — ZPAL Ab II/13: fragmentary frontoparietal.

A fragment of frontoparietal with a density of sculpture higher than *Pelobates fuscus*, in agreement with living *P. syriacus*, may indicate the presence of another species, although a precise species attribution is not possible at present.

As noted elsewhere (Młynarski 1977; Sanchíz and Młynarski 1979; Roček 1981), both *Pelobates fuscus* and *Eopelobates* seem to have inhabited Poland during the Pliocene. Owing to the small size of the Węże II sample, no exact figures can be given but *Pelobates* seems to be less well represented than in Węże I or Rębielice Królewskie I, where it constitutes the most abundant species. All the Pliocene remains from the above localities will be described by Prof. Špinar from Prague.

Family **Bufonidae** Hogg, 1841
Genus *Bufo* Laurenti, 1768
Bufo bufo (Linnaeus, 1758)

Material. — ZPAL Ab II/11: 2 right premaxillae, 1 angular, 19 vertebra, 8 sacra, 1 sacral centrum, 2 coracoids, 4 scapulae, 81 humeri, 4 radioulnae, 17 ilia.

Even though the available sample does not include cranial material, some elements are distinctive enough to provide a basis for the specific attribution. Böhme (1977) and Sanchíz (1977) have given several criteria to distinguish isolated elements of the three European living species. The material from Węże II, although somewhat variable (especially in the male humerus, for which two size classes seem to be present) is clearly referable to the living *Bufo bufo*, and a detailed morphological description would be superfluous. Nevertheless, the tuber superius ilii is laterally compressed, and thus differs somewhat from that characteristic for *B. bufo spinosus* (slightly more swollen; unpublished variability data, B. Sanchíz), being instead similar to that present in the nominal subspecies.

Sanchíz (1977) reviewed the European bufonid fossil record, showing that *Bufo* was already present in the Spanish MN 4, and that the three European living species can be traced back at least until the Upper Miocene (MN 12). It was suggested there that *Bufo* should be considered in Europe as an Asiatic immigrant with a Late Oligocene arrival datum, probably associated with the final closure of the Turgai straits, and thus being one of the components of the European "grande coupure". Concerning *B. bufo*, Hodrová (1980) has recently attributed several remains from Devínska Nová Věs, Czechoslovakia (= Neudorf, MN 6) to this species.

Family **Ranidae** Linnaeus, 1758
Genus *Rana* Linnaeus, 1758
Rana sp.
(fig. 2: 3, 4)

Material. — ZPAL Ab II/7: 1 sacrum, 1 urostyle, 3 coracoids, 14 humeri, 10 ilia; ZPAL Ab II/8: 4 sacra, 2 sacral centra, 2 coracoids, 1 scapula, 10 humeri, 17 ilia.

The material is fragmentary and difficult to identify taxonomically. The presence of green frogs of the *Rana "esculenta"* complex seems to be clearly indicated by most of the ilia ZPAL Ab II/7, with closest resemblance to *R. "esculenta"* rather than to *R. lessonae, R. ridibunda* (see Böheme and Günter 1979), or to *R. perezi* (pers. obs.). Nevertheless, at least in two specimens ZPAL Ab II/8 the morphological similarity points to the *R. dalmatina* species group (Böhme 1977), although no precise species referral is possible, as a precise comparative osteological study, taking into account the variation, is still not available for Recent forms.

Other anuran remains

Material. — ZPAL Ab II/12: 1 maxilla, 1 sphenethmoid fragment, 1 angular, 15 urostyles, 1 scapula, 31 humeri, 26 radioulnae, 1 ilium, 4 tibiofibulae.

Several bones, poorly preserved or with low taxonomic information content, mostly if not all from *Rana* or *Bufo*, have been also recovered. The sample from Węże II being rather small, it seems unrealistic to determine minimum number of individuals in the different excavation sections, and thus the attribution of these fragments becomes unnecessary. It should be emphasized, nevertheless, that there are no indications that would suggest the presence of species other than those mentioned above.

Reptilia

Order **Testudines** Batsch, 1788
(by Marian Młynarski)

Note. — The Węże II material as presently described does not include remains of *Testudo* sp. as was listed in older publications (Młynarski *in* Sulimski 1962: 221; Młynarski, 1962: 180; 1977: 27—28).

Suborder **Cryptodira** Cope, 1870
Family **Emydidae** Gray, 1826
Subfamily **Emydinae** Gray, 1826, emend. McDowell, 1964

Genus *Emys* A. Duméril, 1806
Emys orbicularis antiqua Khosatzky, 1956
(fig. 3)
1962. *Emys* cf. *orbicularis* Linnaeus, 1758; Młynarski: 180.

Material. — 85 shell fragments altogether, belonging to several adults and at least 2 juveniles. Bony fragments of taxonomic importance: ZPAL R III/1: fragment of a left xiphoplastron assembled from two isolated bone pieces from two different sediment layers; ZPAL R III/2, 3: pygal of a large specimen and a fragmentary bridge presumably belonging to the same individual.

Description. — Pygal plate (ZPAL R III/2 fig. 3: 4) is a characteristic element for the species under discussion and also for the whole subfamily Emydinae (McDowell 1964; cf. Młynarski, 1980: 19). The well-preserved bridge fragment is another noteworthy element (ZPAL R III/3; fig. 3: 3). Sculpture of its processes is characteristic for the genera *Emys* and *Emydoidea* and demonstrates the presence of a cartilaginous and therefore movable joint between the plastron and carapace. The fragmentary xiphiplastron (ZPAL R III/1; fig. 3: 1 and 2) is of special importance for identification of this fossil subspecies (Młynarski, in press). In appearance it resembles xiphiplastra of similar forms from Rębielice Królewskie I. The discussed element is somewhat larger and more strongly built than the type specimen (cf. Khosatzky 1956, figs. 1—2). Grooves of epidermal shields and of dermal ligaments, visible on the internal surface of the bone (sulcus dermoscuti of Ckhikvadze 1973; Xiphiplastralschwelle of Schleich 1981) are characteristic for this form. All the shell fragments are characterized by the fine sculpture of the epidermal layer, resembling that of most living specimens of *Emys orbicularis*. *E. o. antiqua* from Węże II thus seems to have had a more solid and somewhat larger shell than Recent terrapins.

Discussion. — Considering the probable faunistic similarity of Węże I and Węże II Młynarski (1962) provisionally referred the Węże II chelonian remains to *Emys wermuthi* Młynarski, 1956 (presently *E. orbicularis wermuthi*; Młynarski, in press), an endemic population from the Pliocene of Węże I. Detailed studies of the chelonian materials from Węże I and new materials from Węże II have revealed highly significant differences between both forms; *Emys orbicularis wermuthi* was of considerably smaller size, its shell was thinner and its carapace was strongly vaulted; *E. o. antiqua* was a larger form provided with a less convex carapace. The latter subspecies was described by Khosatzky (1956) from the locality of Stavropol in the Northern Caucasus, USSR, dated also as Pliocene. It now appears that this terrapin was widespread at the Tertiary-Quaternary boundary of Europe; previously it was usually determined as *E.* cf. *orbicularis* (Ullrich and Młynarski 1978: 98, fig. 1). In Poland, this form was especially common (remains of about 100 specimens) in the Pliocene of Rębielice Królewskie I (Młynarski 1964: 339 and 341—342, figs. 31—42).

In Dr V. M. Ckhikvadze's opinion (pers. comm.; paper presented at the meeting of paleocheloniologists in Paris, 1983, in press) *Emys orbicularis antiqua* as well as other fossils of the genus *Emys* from Europe show distinct features characteristic of the North American terrapin *Emydoidea* Gray, 1870 (type-species *E. blandingii* (Holbrook, 1838)). The differences can be seen in (1) longer and higher cervicals
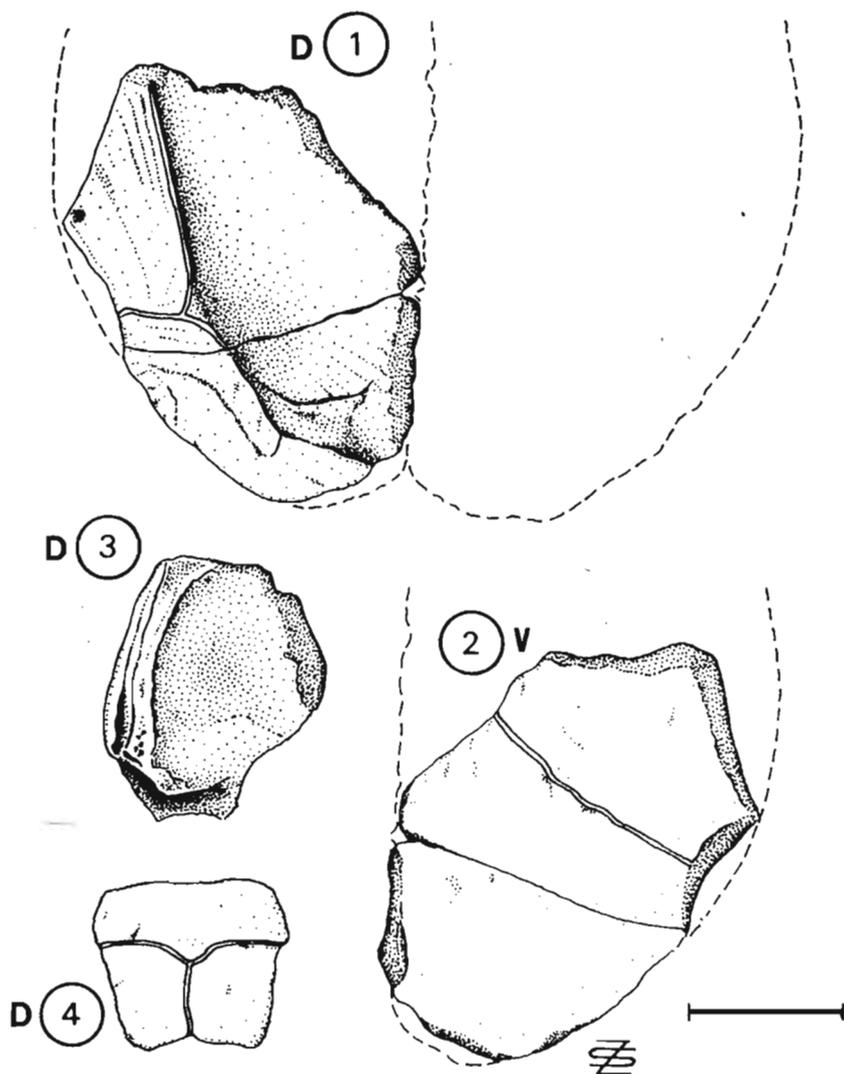
Fig. 3 *Emys orbicularis antiqua* Khosatzky. *1, 2* left xiphiplastron ZPAL R III/1; *3* fragment of left bridge ZPAL R III/2; *4* pygal ZPAL R III/3. Scale equals 2 cm. D dorsal, V ventral views.

than in *Emys*; (2) more robust epiplastra; (3) different disposition of "sulcus dermo-scuti" on external surface of the xiphiplastra. All these features occur in the fossils from Węże II and Rębielice Królewskie I. Possible re-classification of European fossil pond terrapins into the genus *Emydoidea*, however, should be preceded by detailed studies of large series of living specimens of *Emys orbicularis* and *Emydoidea blandingii*. No doubt, these terrapins are forms of very similar shell morphology (for a long time classified together in the genus *Emys*; cf. Wermuth and Mertens 1961: 79). Both the genera belong to the same Nearctic (not Holarctic) taxon, i.e. subfamily Emydinae.

Order **Sauria** McCartney, 1802
(by Marian Młynarski)

Suborder **Lacertilia** Owen, 1842
Infraorder **Anguimporpha** Fitzinger, 1900
Family **Anguidae** Gray, 1825
Genus *Ophisaurus* Daudin, 1803
Ophisaurus pannonicus Kormos, 1911
(fig. 4)

Material. — ZPAL R III/4: 1 fragmentary parietal, 4 trunk vertebrae, 3 caudal vertebrae, 9 osteoderms; ZPAL R III/5: 1 dentary of a juvenile, 8 trunk vertebrae (of adults and a juvenile), 1 caudal vertebra, 3 osteoderms; ZPAL R III/6: 1 fragment of a toothed dentary; and: 2 fragmentary maxillae, 1 fragmentary parietal, 2 fragmentary dentaries (one with 2 teeth), 3 trunk vertebrae, 10 osteoderms (not numbered).

The material is composed of vertebrae, osteoderms and maxillary fragments, the elements highly characteristic for the genus *Ophisaurus*. In their morphology and size the fossils closely resemble remains of *O. pannonicus* from Poland and other European countries (Fejérváry-Lángh 1923; Młynarski 1956; Bachmayer and Młynarski 1977). The specimens from Węże II are somewhat smaller than the largest examples from Węże I (Młynarski, 1956) and are of equal size as those from Rębielice Królewskie I (Młynarski 1964).
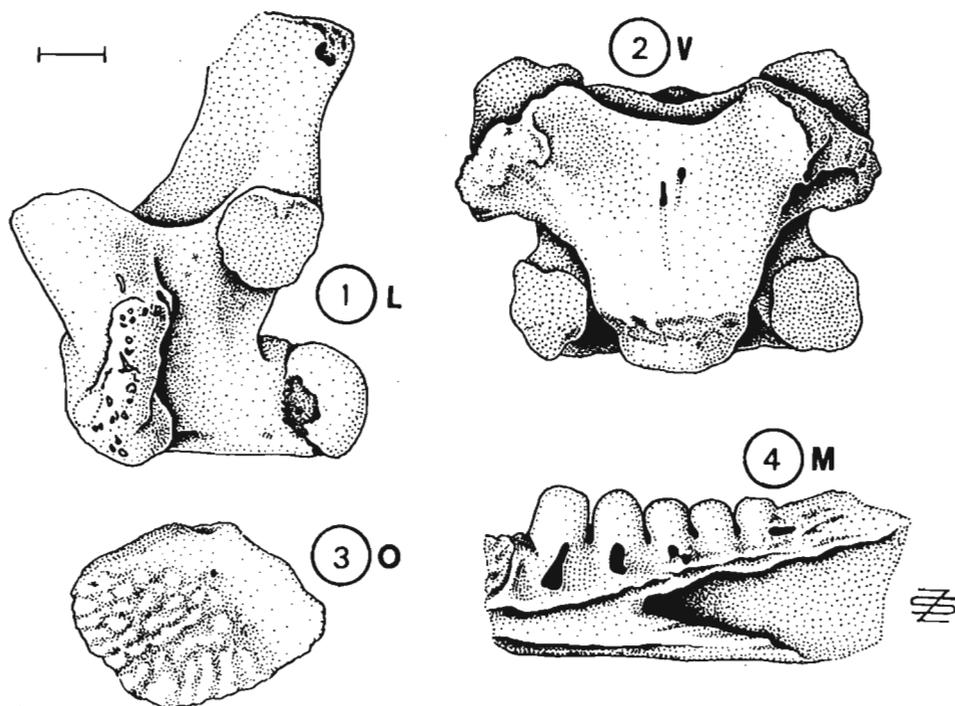

Fig. 4. *Ophisaurus pannonicus* Kormos. *1, 2* cervical vertebra ZPAL R III/4; *3* osteoderm ZPAL R III/5; *4* right dentary ZPAL R III/6. Scale equals 2 mm. L lateral, M medial, O outer, V ventral views.

Ophisaurus pannonicus was a very common and highly characteristic lizard during the Plio-Pleistocene of Central Europe. In Poland, this form occurred in the Pliocene of Węże I and Rębielice Królewskie I as well as the Early Pleistocene of Kadzielnia and Kamyk (Młynarski 1962). As it has been pointed out many times, *O. pannonicus* was closely related to the living species, *O. apodus* Pallas the only significant difference between these species being size. The former species may be ancestral to the latter one, nevertheless, there is also a possibility that only one species is concerned; the different sizes of these forms could have resulted simply from fluctuating climatic conditions in particular stages of the Plio-Pleistocene as in the case of the fossil snakes from the Polish Quaternary (cf. Szyndlar 1984). So far, however, we have insufficient evidence to recognize *O. pannonicus* as a synonym of *O. apodus* (see also Estes 1983).

Note. — In recent papers of Klembara (1979, 1981) this species has been reclassified into the genus *Pseudopus* Merrem, 1870 (emend. Klembara 1981: 139—140). This new taxonomic attachment will not be discussed in the present paper; a brief comment appeared in Estes (1983).

Genus *Anguis* Linnaeus, 1758
Anguis cf. *fragilis* Linnaeus, 1758
(fig. 5)

Material examined. — ZPAL R III/7: 1 dentary; ZPAL R III/8: 1 cervical vertebra, 8 trunk vertebrae. Moreover, vertebrae belonging to adult specimens can be found in almost all samples.

Presence of this species has been recognized on the basis of a single fragmentary dentary, the element characterized by a narrow Meckel's groove and sharp, slighly inclined posteriorly teeth. Also trunk vertebrae are highly characteristic for this lizard. The preserved fragments resemble, both in their shape and size, skeletal elements of *Anguis fragilis* presently inhabiting the Polish territory.
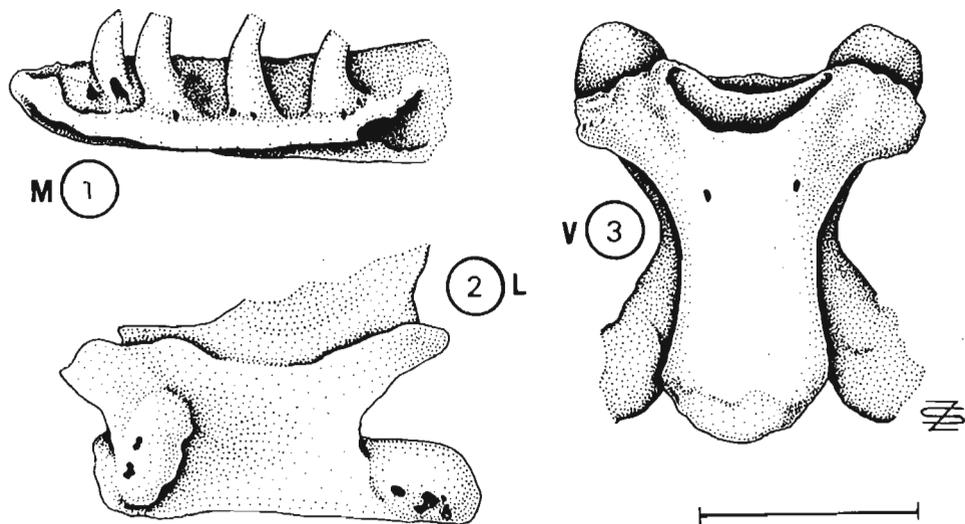

Fig. 5. *Anguis* cf. *fragilis* Linnaeus. *1* right dentary ZPAL R III/7; *2, 3* trunk vertebra ZPAL R III/8. Scale equals 2 mm. L lateral, M medial, V ventral views.

Anguis fragilis, a lizard relatively common in Węże II, is undoubtedly an archaic species, it has been freqeuntly found together with *Ophisaurus pannonicus*, e.g. in the Early Pliocene (MN 14) of Podlesice, Upper Pliocene (MN 16) of Rębielice Królewskie I and Early Pleistocene (MN 17) of Kadzielnia. Its remains are also known from younger Pleistocene sites of Zalesiaki A and Kozi Grzbiet (Młynarski 1977; Szyndlar 1981). All these remains (vertebrae, mandibular fragments, osteoderms) are identical, in shape and size, with bones of Recent *Anguis fragilis*. Comments on these and other *Anguis* fossils appear in Estes (1983).

Family **Lacertidae** Bonaparte, 1831
Genus *Lacerta* Linnaeus, 1758
Lacerta cf. *viridis* (Laurenti, 1768)
(fig. 6: 1)

Material examined. — ZPAL R III/9: 10 fragmentary dentaries, among them one determined as belonging to a large and one — to a medium-sized individual. Moreover, fragments of maxillae belonging to large-sized lizards are present in almost all samples.

The relatively numerous poorly preserved fragments of maxillae and dentaries are all characteristic for the genus *Lacerta*, particularly in the morphology of
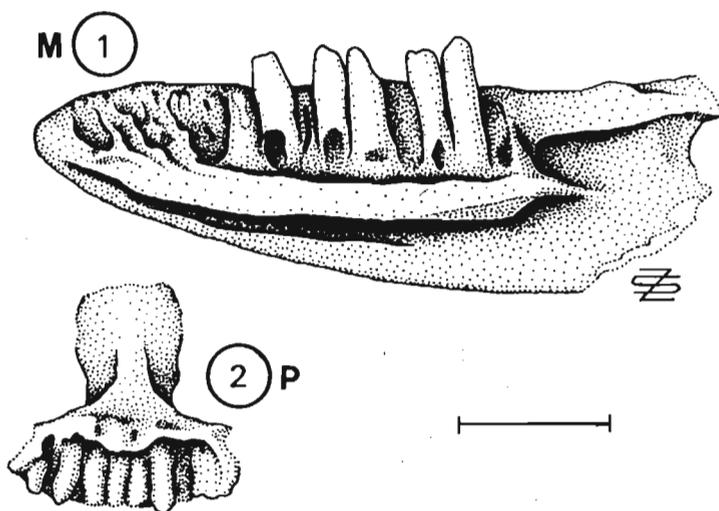

Fig. 6. *1* right dentary of *Lacerta* cf. *viridis* (Laurenti) ZPAL R III/9; *2* premaxilla of *Lacerta* sp. ZPAL R III/10. Scale equals 2 mm. *M* medial, *P* posterior views.

Meckel's groove in the latter elements. After comparison with skeletons of living lizards, considering the size of the remains from Węże II and the morphology of their teeth, they are provisionally referred to the recent species, *Lacerta viridis*.

L. viridis, a lizard typical for xerothermic environments, was rather common in the Pliocene of Poland (Rębielice Królewskie I and II). This species is also well-known from numerous fossil sites of Eastern and Central Europe (Estes 1983).

Lacerta sp.
(fig. 6: 2)

Material examined. — ZPAL R III/10: 1 premaxilla and 3 small-sized dentaries. Moreover, numerous maxillary fragments of small-sized lizards are present in all samples.

A fragmentary premaxilla, resembling somewhat that of *Lacerta agilis*, is of special interest. Small maxillary fragments show features of *L. agilis*, but also resemble, even to a greater degree maxillae of *L. muralis*. However, it would be unwarranted to include *L. agilis* among the Węże II herpetofauna based only on this single element, which may have belonged to *L.* cf. *viridis*, the lizard most common in the Węże II material. Moroever, considering that *L. viridis* and *L. agilis* occupy similar ecological niche, presence of these species together in one locality is doubtful, as the former does not tolerate other lacertid species in its territory. At the same time, we cannot exclude the presence in Węże II of *L. muralis*, a species living close to *L. viridis*, but occupying a different ecological niche.

Order **Serpentes** Linnaeus, 1758
(by Zbigniew Szyndlar)

Snake remains from Węże II, belonging to two different extinct species of the family Colubridae, have been recently described elsewhere (Szyndlar 1984). Below I repeat only their diagnostic features.

Family **Colubridae** Oppel, 1811
Genus *Elaphe* Fitzinger, 1833
Elaphe paralongissima Szyndlar, 1984
(fig. 7: 1, 2)

Material. — It consists exclusively of vertebrae, for the most part coming from trunk region of the column; cervical and caudal vertebrae are not numerous in the material. ZPAL R III/11, 12: ca. 350 vertebrae.

This species, known exclusively from Węże II, has been diagnosed on the basis of combination of the following features in its trunk vertebrae: prominent haemal keel, cuneate-shaped and strongly flattened, provided with paired tubercles below the cotyle lip; strongly developed interzygapophysial ridges; well-developed prezygapophysial process, flattened or obtuse; concave or straight anterior margin of the zygosphene.

Its vertebrae are mostly similar to those of the living European snake, *Elaphe longissima*, but differ from the latter in strong flatness of the haemal keel and presence of paired tubercles below the cotyle rim. In addition, statistical comparison of measurements taken from trunk vertebrae reveals highly significant differences between both species (Szyndlar 1984).

Genus *Natrix* Laurenti, 1768
Natrix cf. *longivertebrata* Szyndlar, 1984
(fig. 7: 3, 4)

Material. — ZPAL R III/15: ca. 70 precaudal vertebrae.

This extinct ophidian species, *Natrix longivertebrata*, has been erected on the

basis of numerous perfectly preserved vertebrae and skull bones from the Upper Pliocene locality of Rębielice Królewskie I. This species is easily distinguishable from other natricine snakes by having peculiar trunk vertebrae, characterized by the following features: great elongation of vertebral centrum (centrum length/centrum width ratio exceeding 1.90 on average); low neural spine with prominent anterior overhang and dorsal edge sloping distinctly posteriorly; neural arch depressed dorso-ventrally; hypapophysis sigmoid-shaped with very long ventral edge; parapophysial process strongly developed, projected anteriorly far outside the lover cotyle lip; extremely strong development of subcentral ridges (Szyndlar 1984).

All vertebrae from Węże II are preserved in fragmentary state; most of them are missing every protruding structure and no vertebra has preserved the neural spine. The Węże II vertebrae generally resemble those of *Natrix longivertebrata* from the type locality, but differ from them in having more vaulted and upswept posteriorly neural arch. Basic dimensions of the biggest vertebra from Węże II are: centrum length = 5.55 mm, centrum width = 2.82, ratio of these two values = = 1.97.

It now appears that *N. longivertebrata* was a widespread European species, both in space and time. Its remains are known from all Late /Upper Pliocene
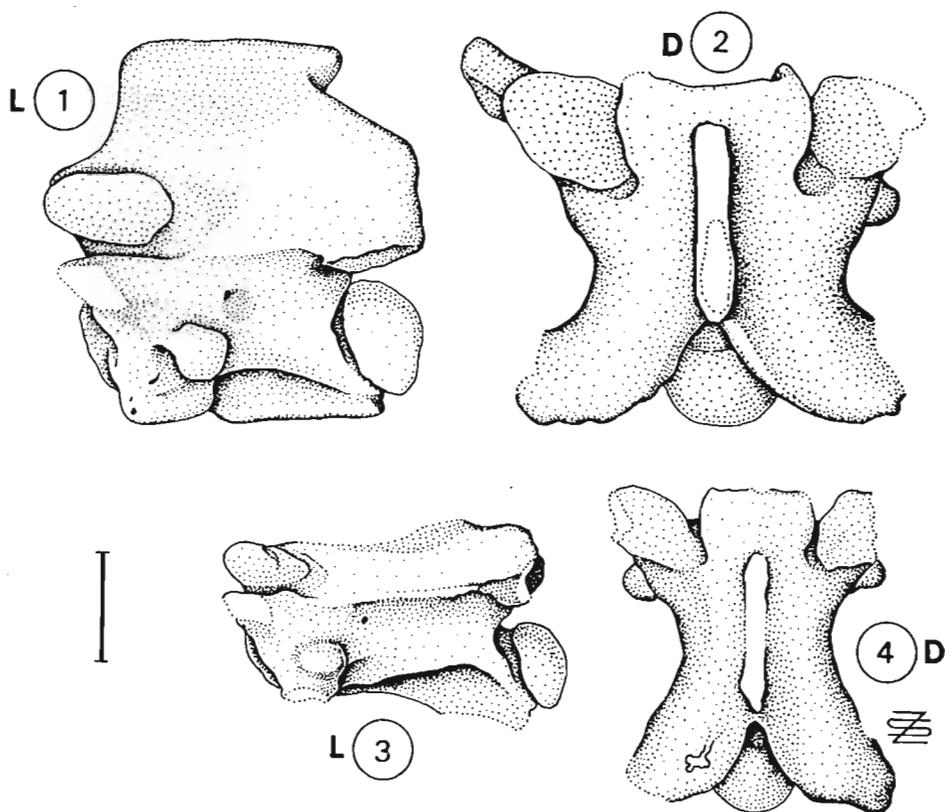

Fig. 7. Ophidian trunk vertebrae. *1, 2 Elaphe paralongissima* Szyndlar ZPAL R III/ /12, 11 (after Szyndlar, 1984); *3, 4 Natrix* cf. *longivertebrata* Szyndlar ZPAL R III/15. Scale equals 2 mm. *D* dorsal, *L* lateral views.

(MN 15—16) localities in Poland (Rębielice Królewskie I, Rębielice Królewskie II, Węże I, Węże II; Szyndlar 1984); recently, it has been also found in the Late Miocene (MN 11)[1] of Kohfidisch in Austria (Bachmayer and Szyndlar, in prep.) as well as in the Middle Miocene (MN 7) of la Grive L 7 in France (Rage and Szyndlar, in prep.).

CONCLUSIONS

The amphibian and reptilian fauna from Węże II contains, for the most part, elements well-known from other Pliocene localities of Poland. The herpetological assemblage from this site resembles closely that of Rębielice Królewskie I. Since the salamander *Mioproteus wezei*, sp. n., has now been also found in the latter locality, there are only two taxa, *Palaeobatrachus* sp. and *Elaphe paralongissima*, found in Węża II and not known from Rębielice Królewskie I. Several forms recognized in the Węże II material also have been recorded from other Pliocene localities of Poland — *Pliobatrachus* cf. *langhae*, *Bufo bufo*, *Ophisaurus pannonicus*, *Anguis* cf. *fragilis*, *Natrix* cf. *longivertebrata*; except for the latter species, the remaining forms are also known from the Polish Pleistocene. Presence of two amphibian genera, *Palaeobatrachus and Mioproteus*, recorded for the first time from Poland, is of special importance. The former form until now has been unknown from localities younger than Middle Miocene (MN 6). The latter genus, described originally from the Caucasus area, is now recorded for the first time in Europe.

Forms dependent on water or moist environments prevail in the Węże II herpetological assemblage (amphibians, *Emys*). Remains belonging to some xerothermic lizards (*Ophisaurus, Lacerta*) are also common, however, also suggesting presence of dry environments in this site.

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[1] = Early Pliocene in traditional German and East European classification.

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PŁAZY I GADY Z PLIOCEŃSKIEGO STANOWISKA WĘŻE II KOŁO DZIAŁOSZYNA

Streszczenie

Niniejsza praca zawiera opis szczątków kopalnych płazów i gadów pochodzących z górnego pliocenu (biozona MN 16) Węży II. W materiale oznaczono następujące formy: *Mioproteus wezei* sp. n. (rodzina Proteidae), *Palaeobatrachus* sp. i *Pliobatrachus* cf. *langhae* (Palaeobatrachidae), *Pelobates fuscus* (Pelobatidae), *Bufo bufo* (Bufonidae), *Rana* sp. (Ranidae), *Emys orbicularis antiqua* (Emydidae), *Ophisaurus pannonicus* i *Anguis* cf. *fragilis* (Anguidae), *Lacerta* cf. *viridis* i *Lacerta* sp. (Lacertidae), *Elaphe paralongissima* i *Natrix* cf. *longivertebrata* (Colubridae).

Większość powyższych form, zarówno współczesnych (np. *Bufo bufo*, *Emys orbicularis*, *Anguis fragilis*) jak i wymarłych (*Pliobatrachus langhae*, *Natrix longivertebrata*), była szeroko rozsiedlona w europejskim neogenie i również (z jednym wyjątkiem) w plejstocenie. Wymarły rodzaj *Mioproteus* natomiast został opisany

z obszaru Europy po raz pierwszy; jego występowanie w Wężach II stanowi do-
wód na istnienie związków zoogeograficznych pomiędzy Europą Środkową a Kau-
kazem. Obecność szczątków innego płaza, *Palaeobatrachus* sp., dotychczas niezna-
nego ze stanowisk młodszych niż środkowo-mioceńskie, dowodzi, że rodzaj ten prze-
trwał w Europie co najmniej do końca neogenu.

W porównaniu z innymi polskimi stanowiskami kopalnymi, herpetofauna Węży
II przypomina najbardziej faunę Rębielic Królewskich I, datowaną również na
górny pliocen.

Praca niniejsza została wykonana w ramach programu międzyresortowego
MR-II.3 przy współpracy Consejo Superior de Investigaciones Científicas (Madryt).