

NEW COMPLEMENTS ON *DEINOTHERIUM GIGANTEUM* KAUP FROM THE BRUSTURI PONTIAN (BIHOR DISTRICT)

by
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In Romania, the remnants assigned to the genus *Deinotherium* (Mammalia, Proboscidea) are considered paleontological rarities. All the records made so far have characterized the interval Middle Sarmatian (Bessarabian) — Pontian. The list published in S. Athanasiu's valuable monograph on Romanian fossil Proboscidea (1907) has been little enlarged with new localities. Among them, a few, in the Western part of the country, are outstanding from a palaeobiographical point of view: Derna, Brusturi (=Tătăruș) — Bihor district — and Derșida-Sălaj district.

As *Deinotherium* remnants are scarce in our country, we considered it worth presenting certain skeletal items belonging to the Geological Museum of the Geology-Geography Department in the Cluj-Napoca University (code GMGGD). The material we are presenting is part of the late Professor I. A. I. Maxim's donation, and was sampled around 1947—50 in the bitumen mines at Brusturi (=Tătăruș), Bihor district. These items, i.e. a mandible fragment and several post-cranial pieces, have been only partly dealt with so far.

Ord. Proboscidea Illinger 1811

Fam. Deinotheriidae Bonaparte 1845

Genus *Deinotherium* Kaup 1829

Deinotherium giganteum Kaup 1829

Mandible sin. (GMGGD 16 526) — Pl. I, Fig. 1—3.

The mandible has been reconstituted out of two fragments: one is its distal part (broken at the alveolar basis of the tusk), while the other represents a prolongation of the horizontal branch till the basis of the ascending branch, which is missing (broken). Unfortunately, these two fragments had existed apart in the collection, and have been correlated only recently, when we revised the collection of Proboscidea. It may be thus explained why T. Jurcsák (1973) described only the first fragment, as he ignored the existence of the other (T. Jurcsák, in verbis).

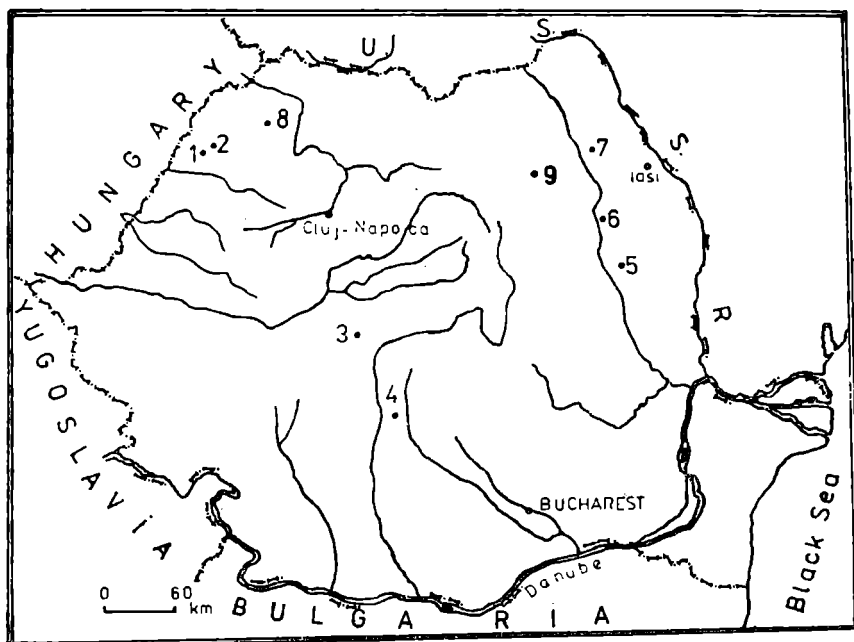


Fig. 1

Occurrences with *Deinotherium giganteum* Kaup in Romania: 1. Derna /Bihor/ (T. Juresák, 1973) Pontian; 2. Brusturi /Bihor/ (N. Onescu, 1951, as „*D. gigantissimum*”) Pontian; 3. Gușterița /Sibiu/ (M. Ackner, 1850, as „*Tapirus giganteum*”); uncertain record; 4. Vernești /Argeș/ (S. Athanasiu, 1907) Lower Pontian; 5. Găiceana /Bacău/ (Gr. Ștefănescu, 1891) Upper Miocene; 6. Drăgești /Bacău/ (G. Sova, 1963)? Upper Sarmatian; 7. Deleni—Hîrlău /Iași/ (N. Macarovici, N. Zaharia, 1967) Middle Sarmatian; 8. Supuru de Sus /Satu-Mare/ (V. Codrea, D. Andreica, 1988) Pannonian s-l. (? Pontian); 9. Neamțului Monastery area /Neamț/ (Gr. Ștefănescu, 1904, in S. Athanasiu, 1907) uncertain finding.

The bone has a brown-yellowish patina, being highly imbued with black bitumens. Yellow efflorescences of a sulphurous nature can also be noticed on its surface.

The labial side is convex. Comparatively, the lingual one is much less convex. The symphysis, connecting the right and left branches, is broken, thus revealing part of the tusk in its alveolus. The horizontal branch is thick, gradually getting thinner from the basis of the ascending branch to the symphysis. As the whole mandible is stuffed with bitumens, the line of the mandibular channel cannot be followed. The labial face displays two elliptical mental foramina. The first foramen is placed about 50 mm under the space corresponding to P_3 of the alveolar range: the large diameter is about 30 mm. The second foramen occurs in a position antero-inferior to the first one, towards the median axis of the labial side, right on the tear line that separated the two mandible fragments

before reconstitution; it has about the same sizes. The dental row is slightly curved, with the concavity directed lingually. Only M_1 and M_2 are preserved, the rest of the teeth existing only as broken radicular fragments in the alveoli. The massive symphysis displays a beautiful antero-posterior and lateral-external curve.

Dimensions (mm)

— piece length, measured between the anterior curve of the symphysis and the posterior end: 710

— height from the basal border to the basis of	M_1 : 164
— „ —	M_2 : 155
— „ —	M_3 : 159

— maximum width of the mandibular body in the area of $M_1=129$; $M_2=138$; $M_3=149$.

— length of symphyseal curve on the convex surface, between P_3 and I : 370

— length of the dental row (P_3-M_3): ≈ 400 (estimated).

The Teeth

Dentition rather degraded. Dimensions presented comparatively to other findings (see Tables I—II; measured dimensions must be regarded as being sensibly smaller than the initial ones, due to the degradation that affected mainly the enamel).

I — As T. Jurcsák (1973) described it, the tusk is "relatively short, bent anteriorly and flattened on its lateral and median sides. The obtuse apex is significantly degraded on its anterior and lateral sides. A deep longitudinal impression can be noticed on the lateral aspect".

P_3 — Exists only as roots embedded in the alveoli. Triangular contour.

P_4 — Also broken. Rectangular contour.

M_1 — Rectangular elongated contour. Consists of 3 crests severely degraded. Dentin better preserved. Enamel destroyed almost completely; still noticeable in the last transversal groove as well as in the posterior part of the tooth, where it is much thinned, due to the contact with M_2 . Has a grey-blue-blackish patina. Although severely degraded, the tooth is visibly worn on the masticatory surface of its labial side.

M_2 — Quasi-rectangular contour. Similar degradation, extremely severe at the level of the metalophid. Enamel almost completely removed, like in the previous molar; still noticeable on the lingual side. The damage was probably caused when the fragment was dug out then transported.

M_3 — Broken. Rectangular contour.

Compared dimensions of P_3 — M_3 in *Deinotherium*

Species Occurrences	P_3					P_4				
	Length			Width		Length			Width	
	exterior	axial	interior	anterior	posterior	exterior	axial	interior	anterior	posterior
<i>Deinotherium giganteum</i> Kaup Brusturi (=Tătăruș), Bihor										
<i>Deinotherium giganteum</i> Kaup Derna, Bihor T. Jurcsák, 1973										
<i>Deinotherium giganteum</i> Kaup Drăgești, Bacău G. Sova, 1963										
<i>Dinotherium giganteum</i> Kaup Kettlasbrunn F. Bachmayer & H. Zapfe, 1976	68		66	45	56	73		72	62.3	63.5
<i>Dinotherium giganteum</i> Kaup Eppelsheim Weinsheimer, 1883; fide N. Moroșan, 1936		$\frac{68}{63}$		$\frac{41}{49}$	$\frac{54}{56}$		$\frac{81}{85}$		$\frac{82}{67}$	$\frac{83}{68}$
<i>Dinotherium giganteum</i> Kaup Sopron I. Vitalis, 1934		$\frac{67.5}{66.7}$		$\frac{51.1}{50.7}$		$\frac{74.9}{72.2}$			$\frac{60.8}{60.5}$	
<i>Dinotherium giganteum</i> Kaup I. Gräf, 1957	62.8—67.7			47.5— —54.7		61.0—78.1			49.9— —66.4	
<i>Dinotherium giganteum</i> Kaup Snitzow, 1898; fide N. Moroșan, 1936		60					80			
<i>Dinotherium giganteum</i> Kaup Voloneț, Telenești N. Moroșan, 1936		78		55	64					
<i>Dinotherium giganteum</i> Kaup Krivoy Rog L. S. Belokryz, 1960		81		64	?					
<i>Dinotherium gigantissimum</i> Stef. Mânzați Gr. Ștefănescu, 1899		90		47	63		90		72	73
<i>Dinotherium gigantissimum</i> Stef. Volcineț N. Moroșan, 1936		83		61	68		91		75	78
<i>Dinotherium gigantissimum</i> Stef. Dif. occurrences I. Gräf, 1957		70		54			$\frac{86}{93.6}$		72—73.7	
<i>Deinotherium gigantissimum</i> Stef. (= <i>D. giganteum</i> ; = <i>D. proavum</i>) Rachny—Lessowyja Wenjukow, 1903; fide N. Moroșan, 1936							98		73.5	76

Table 1

giganteum Kaup and *D. gigantissimum* Stef.

M ₁						M ₂					M ₃				
Length			Width			Length			Width					Width	
exterior	axial	interior	anterior	median	posterior	exterior	axial	interior	anterior	posterior	exterior	axial	interior	anterior	posterior
	82		55		59.3		76		72	71					
												96		86	81
	86		62	63	59		82		73	72					
81		82	59	62	57.5	82		80	76.3	77.5	103		82	81	76
	$\frac{95}{87}$		$\frac{66}{67}$	$\frac{66}{67}$	$\frac{61}{54}$		$\frac{85}{84}$		$\frac{80}{81}$	$\frac{79}{78}$		$\frac{111}{104}$		$\frac{87}{87}$	$\frac{85}{82}$
							$\frac{84.6}{82.6}$		$\frac{77.9}{76.5}$			$\frac{101.9}{84.5}$		$\frac{75.5}{68.0}$	
80.4—101.6				57.5—71.1		77.7—100.0			69.9—87.8		80.2—102.4			65.3—88.4	
	100			69								105		87	80
	100 ?		66	70 ?	66 ?										
							$\frac{?}{102}$		$\frac{86}{?}$			$\frac{105}{107}$		$\frac{93}{190}$	
	111		72	72	71		111		99	97		120		101	90
	107		74	74,5	77		111 ?		97	94					
	105						111		99			113— 114		92	
	109		77	?	70										

Comparative dimensions of the tusks

Table 11

Dimensions of tusks (mm)	<i>D. giganteum</i> Kaup Brusturi (=Tătăruș) Bihor	<i>D. giganteum</i> Kaup Kettlasbrunn Bachmayer et Zapfe, 1976	<i>D. giganteum</i> Kaup Diff. occurrences Gräf, 1957
Length on anterior curve	190	990—730	238—588(?)
Length on posterior curve	168	—	203—473(?)
Length in straight line	164	865—664	—
Antero-posterior diameter near the alveolus	102	190—170	156.4—65.5
Circumference near alveolus	308	500	418—189
Antero-posterior diameter towards the distal end	88	—	—
Circumference at the distal end	271	—	—
Antero-posterior diameter near the alveolus	93	127—125	101.6—52.5
Transversal diameter at the distal end	85	—	—

Postcranial pieces

Tibia sin. (GMGGD 16 527 a) — Pl. II, Fig. 1.

Shaped as a massive triangular prism. Facies lateralis degraded in the proximal concavity. Tibial tuberosity well developed. Malleolus massive and prominent. Cranial tuberosity broken. Tibial crest short and little distinguishable.

Dimensions (mm):

- total length: 840
- antero-posterior diameter of the diaphysis: 98.
- transversal diameter of the diaphysis: 119
- diaphysis circumference: 370
- proximal width: 275
- proximal articular width: 263
- distal supraarticular width: 229
- distal articular width: 205
- distal supraarticular width: 153

Humerus sin. (GMGGD 16 527 c) — Pl. II, Fig. 2.

Distal fragment. Yellow-greyish patina of the bone, due to the dark-coloured bitumens that also stuff the medulla chanell. A robust crista epicondylis lateralis with prominent rugae. Olecranon fossa prolonged, with a hollow slightly levelling towards the diaphysis. Diaphysis broken at about mid-bone.

Dimensions (mm):

- total length of fragment: 620
- maximum transversal diameter of the inferior extremity: 295
- height of the trochlea at its middle part: 98
- distal articular width: 253.5
- diameter of the trochlea at its middle part: 129

- width of the olecranon fossa: 68
- height of the trochlea on its inner side: 137
- articular diameter of the trochlea, measured on its inner side in strait line: 174
- height of the condyle on its external side: 108
- circumference of the diaphysis at its broken extremity: 460
- antero-posterior diameter of the diaphysis at its broken extremity: 161. 5
- transversal diameter, idem: 133.

Patella dext. (GMGGD 16 527) — Pl. II, Fig. 3

Facies cutanea with visible asperities. Facies articularis smooth. Viewed sagittally, the concavity of the articulation surface is rather marked. Angulus ventralis rather sharp, unlike medialis and lateralis, which are rather blunt.

D i m e n s i o n s (mm):

- maximum transversal diameter: 101
- maximum antero-posterior diameter: 73
- height: 171.

Coxal bone (GMGGD 16 527 b; fragment — illium?) — Pl. II, Fig. 4

Discussions

The records made in the Western part of the country have enlarged the already-known distribution area of these primitive forms of Proboscidea. The Pontian (Turolian) association of mammalia with *Deinotherium giganteum* Kaup from Brusturi-Derna, Bihor district (*Gomphotherium longirostre* (Kaup) / *Anancus arvernensis* Cr. et Job., *Platybelodon* sp., *Chalicomys jägeri* Kaup, *Ictitherium* sp., *Tapirus priscus* Kaup, *Tapirus* sp. *Propotamochoerus provincialis minor* Mottl, „*Dicerorhinus*“ *schleiermacheri* (Kaup),? *Aceratherium incisivum* Kaup, *Korynochoerus palaeochoerus* (Kaup), *Microstonyx erymanthius* (Roth et Wagner), *Cervavitus* sp., *Hipparion gracile* Kaup, *Hipparion* sp. — Mária Mottl, 1942; M. Kretzoi, 1982), represents on this meridian the last echo of a fauna living in the wet-swampy jungles of a tropical-subtropical climate with: *Glyptostrobis europaeus* Heer, *Betula macrophylla* Heer, *B. prisca* Ett., *Alnus* sp., *A. kefersteinii* (Goep.) Ung., *A. crebrinervis* E. Kov., *Carpinus grandis* Ung., *Quercus pontica miocenica* Kub., *Buettneria iliaefolia* (Al. Br.) Dep., *Acer* sp. (I. Al. Maxim, J. Petrescu, 1968).

In our country, *D. giganteum* disappears post-Pontian, as no traces of its continuity have been found so far in more recent deposits. Therefore, the opinion that the formation containing bitumen and lignite sands at Brusturi-Derna are rather recent, may be considered erroneous.

The first one to mention the presence of *Deinotherium* in the area was N. Oncescu (1951). He recorded a jawbone of *Deinotherium gigantissimum* Stef., without providing details to this information, but insisting on the Dacian age of the deposits. M. Paucă (1957), in his list of the mammalian association at Tătăruș (list probably drawn after that of Maria Mottl's), does not record the presence of *Deinother-*

rium. That's why, T. Jurcsák (1973) remains the first who presented sufficiently detailed arguments on this subject.

The assumption that a distinct species of *Deinotherium* of a smaller size existed in this facies (I. Al. Maxim, fide T. Jurcsák, 1973) is not grounded, as our paper has brought sufficient proof (dimensions of the mandible, of dental row) that this material belongs to *D. giganteum*. The smaller size of the tusk, compared to that of other findings, is only the result of advanced degradation and not a specific character. Certainly, it was an aged specimen, all the teeth being similarly worn. As F. Bachmayer & H. Zapfe (1976) asserted, the index suggested by Ingegard Gräf (1957) for the tusks, i.e. the sagittal diameter $\times 100 /$ curve length of convexity, cannot be applied to specific differentiations. We altogether agree with this opinion.

Nor is tibia length, corresponding to a smaller size specimen (H. Töbrien, 1986), are argument in this respect; the number of such *Deinotherium giganteum* post-cranial materials available is too low to lead to such conclusions.

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CITEVA DATE SUPLIMENTARE PRIVIND DEINOTHERIUM GIGANTEUM KAUP DIN PONTIANUL DE LA BRUSTURI (BIHOR)

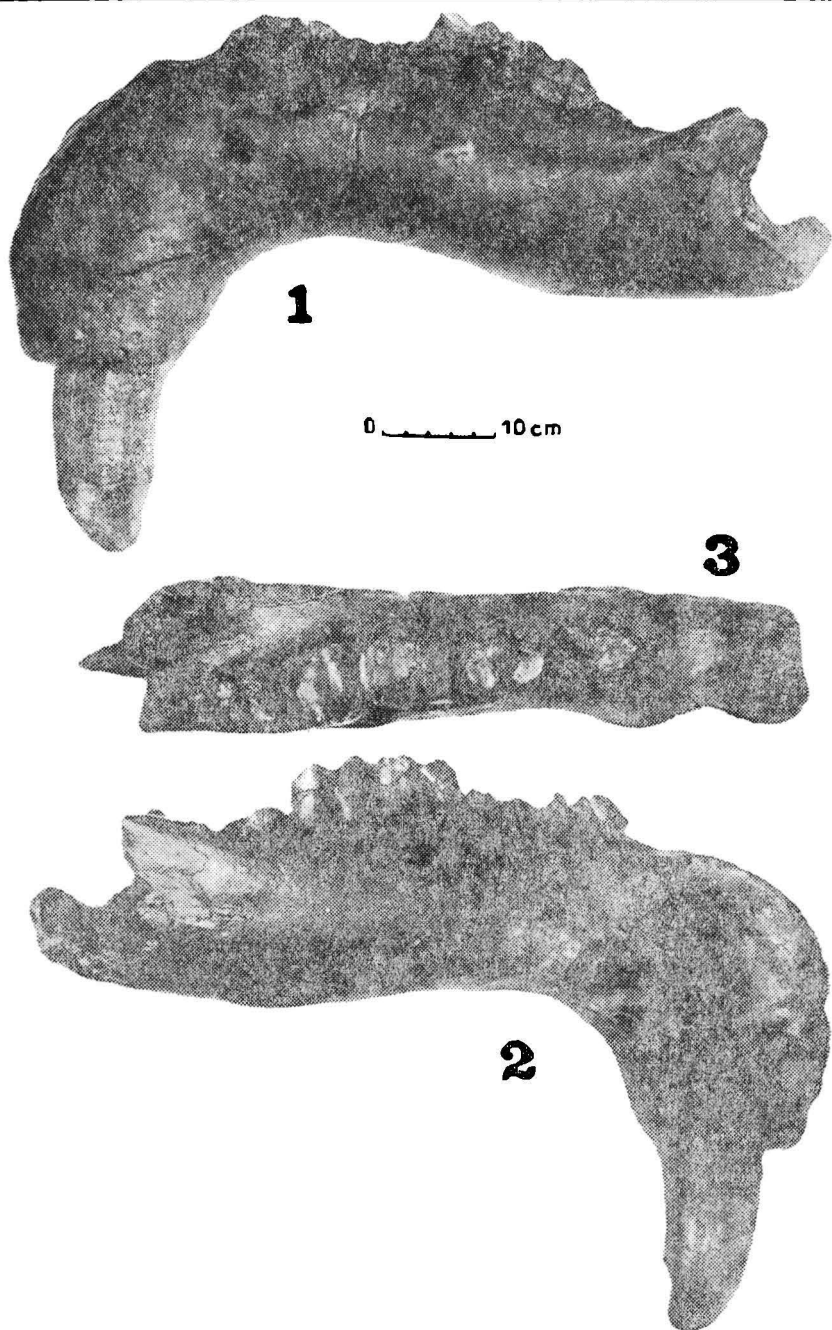
(Rezumat)

În România, resturile de *Deinotheriide* (Mammalia, Proboscidea) sînt puţin frecvente. Din acest considerent, descoperirile paleontologice dintr-o serie de localităţi situate în nord-vestul ţării (Derna, Brusturi — jud. Bihor, Derşida — jud. Sălaj) au permis extinderea arealului din care aceste forme primitive de proboscidiieni sînt cunoscute pe teritoriul românesc.

În colecţia Muzeului de Geologie-Stratigrafie al Universităţii din Cluj-Napoca se găsesc cîteva piese revelatoare provenite din fostele mine de nisipuri bituminoase de la Brusturi (=Tătăruş): o mandibulă sin., un fragment distal de humerus sin., o tibie sin., o rotulă dext., şi un fragment de coxal. Toate aceste piese, înainte de a fi incluse în colecţia muzeului au aparţinut regretatului Prof. I. Al. Maxim.

Caracterele mandibulei şi ale pieselor postcraniene ne-au permis atribuirea acestor resturi scheletice speciei *Deinotherium giganteum Kaup*. Datele noastre completează şi totodată confirmă justetea determinării şi a consideraţiilor lui T. Jurcsák (1973), care la data elaborării lucrării avusese la dispoziţie doar un fragment al mandibulei, reprezentînd terminaţia distală, cu defenza.

Ocurenţa se identifică astfel cu cea mai substanţială găsimă de *D. giganteum* din această parte a ţării. Vîrsta pontiană a asociaţiei paleomamologice cu *D. giganteum* de la Brusturi este în afara oricărui dubiu.



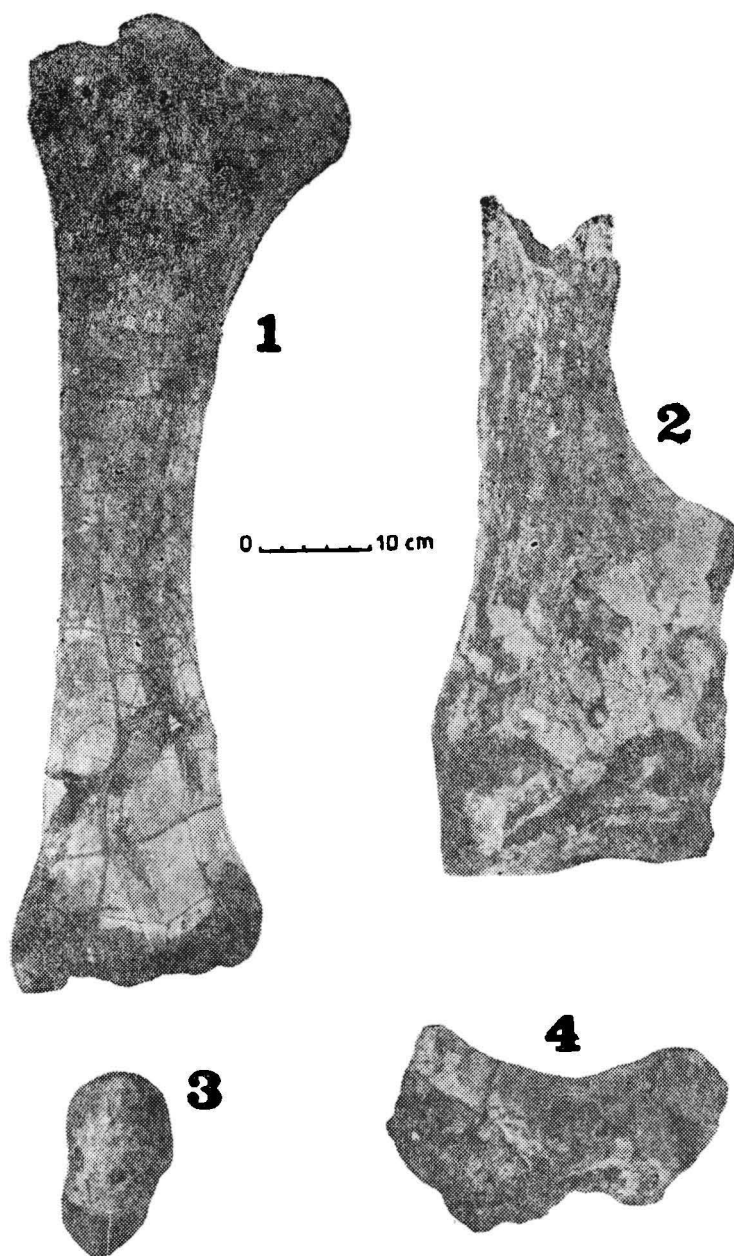
Pl. I

Deinotherium giganteum K a u p
Mandible sin.

Fig. 1 — outer view.

Fig. 2 — inner view.

Fig. 3 — occlusal view.



Pl. II

Deinotherium giganteum Kaup

- Fig. 1 — Tibia sin., anterior view.
Fig. 2 — Humerus sin., anterior view.
Fig. 3 — Patella dext., anterior view.
Fig. 4 — Coxal bone (fragment)