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Deinotherium levius Jourdan a jeho stratigrafický význam.

(1 obr. v textu a 3 tab.)

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V předložené práci jest podán výsledek zpracování nálezů zbytků *Deinotherií* od Opatova (Abtsdorf), jiv. od České Třebové, pocházejících většinou z nálezů z roku 1853. Po stránce systematické jak nálezů od Opatova (Abtsdorf) z roku 1853, tak i molár získaný roku 1936 nutno přiřaditi ke druhu *Deinotherium levius* JOURDAN z tortonu od Grive-Saint-Alban v dép. Isère ve Francii. Tento druh nutno pokládati za dobře odlišený od druhů *Deinotherium cuvieri* KAUP (*Deinotherium bavaricum* H. v. MEYER) i od *Deinotherium giganteum* KAUP.

Že také opatovské nálezů pozůstatků druhu *Deinotherium levius* JOURDAN jsou tortonské a ne starší, tomu nasvědčují mořské jíly, tvořící podloží celé oblasti opatovsko-třebovicko-třebovsko-rudoltické. Tyto miocénní jíly, vyplňující úzká údolí v křídovém terénu jako zálivy třetihorního moře, zasahující z vídeňské pánve přes Moravu až do východních Čech, nutno přiřleniti ke svrchnímu miocénu, a to tortonu, na podkladě asociace brakické fauny, odpovídající asociaci tortonské zvířeny z nalezišť SteinaBrunn ve vídeňské pánvi a Lapugy v Sedmíhradsku, jak na to poukázal už VLAD. JOS. PROCHÁZKA roku 1895.

V asociaci zvířeny působily PROCHÁZKOVÍ nesnáze jediné dva druhy, a to *Cerithium lignitarum* EICHW. a *Melanopsis tabulata* HÖRNES, které poukazovaly na příbuznost opatovských, třebovických a rudoltických jílu i s helvetem. Bližším studiem bylo však zjištěno, že exempláře, které VLAD. JOS. PROCHÁZKA řadil k *Melanopsis tabulata* HÖRNES z Grundu, nelze s HÖRNESOVÝM druhem stotožniti, přes to, že HÖRNES připouští značnou variabilitu svého druhu *Melanopsis tabulata*. *Cerithium lignitarum* EICHW. z Opatova (Abtsdorf) jsou vlastně dva druhy, a to jednak druh *Terebralia lignitarum* (EICHW.) (*Cerithium duboisi* HÖRNES), jednak druh *Terebralia bidentata margaritifera* SACCO. Oba tyto druhy jsou však zastoupeny stejně v tortonu jako

v helvetu. Není tedy překážek k připojení opatovských jílu k tortonské transgresi, jak ji vyznačil roku 1932 D. ANDRUSOV.

Z nálezů od Opátova (Abtsdorf), příslušejících druhu *Deinotherium levius* JOURDAN, jsou ve sbírkách Národního musea v Praze uloženy následující zuby a kosti: 4 hroty klů, z nichž 2 jsou namontovány na restaurovanou spodní čelist a 2 jsou volné (z nich 1 je jen fragment); zuby sestavené do spodní čelisti v celkovém počtu 10; volné zuby svrchních čelistí (maxill), původně také sestavené v celý chrup, jak ukazuje vyobrazení v díle J. KAFKY, později však zase rozebrané, když H. F. OSBORN za své návštěvy v Národním museu upozornil na omyly v sestavení chrupu. Zubů ze svrchních čelistí je 10, příslušejících však nejméně dvěma jedincům. Některé zuby se opakují, jiné úplně chybí. Dále jsou to 2 volné zuby ze spodních čelistí. Kromě toho r. 1936 získalo Geologicko-paleontologické oddělení Národního musea značně opotřebovaný spodní pravý M_3 . Jsou tedy ve sbírkách Národního musea od Opátova (Abtsdorf) zuby náležející nejméně 3 jedincům. Z nich molár získaný roku 1936 náleží staršímu jedinci, kdežto zuby pocházející z nálezu z roku 1853 náležejí nejméně dvěma mladým, dospělým jedincům, uhynulým v době výměny mléčného chrupu za chrup definitivní. Nasvědčují tomu mléčné chrupy značně opotřebované, zatím co poslední moláry nejsou ještě vůbec skousány. Také uvolněné epiphysy na dlouhých kostech i na obratlích ukazují na to, že jde o mladé jedince, u nichž nejsou epiphysy ještě úplně srostlé s těly obratlů a s ostatní kostí.

Z kostí jsou to: metatarsus II. sin., metatarsus IV. dext., metatarsus IV. sin., metatarsus II. dext., cuneiforme 3. dext., naviculare dext., astragalus dexter, pisiforme sin., pyramidale sin., semi-lunare sin., scaphoid sin., magnum sin., trapezoid sin., trapezium sin., metacarpus I. sin., unciforme sin., scaphoid dext., semi-lunare dext., pyramidale dext., trapezium dext., magnum dext., unciforme dext., metacarpus III. dext., astragalus dext., cuboid sin., scapula sin., scapula dext., humerus sin. pars dist., humerus sin. pars dist. fragm. inf., humerus dexter pars dist., femur dexter, femur sin., ulna dext. pars prox., ulna sin. pars prox. a četné zlomky kostí, prozatím blíže neurčitelné.

Dovoluji si současně na tomto místě poděkovati za laskavé zapůjčení některých velmi vzácných spisů především pánům Dru F. PRANTLOVI a doc. Dru J. AUGUSTOVI, Dru M. B. VOLFOVI a pak knihovně Královské české společnosti nauk v Praze a České národní radě badatelské za pořízení překladu.

There is not much known about the remains of the *Deinotheria* found near Abtsdorf. Uncertainties result from the contradictory statements in the reports dealing with the different finds and their final conclusions, the more so, since they have usually been published irrespective of the specimens preserved in the collections of the Department of Geology and Palaeontology, Národní Museum, Praha. The generic appurtenance of these finds was also

very indefinite; and even an approximative stratigraphic classification was absolutely omitted. All these facts induced me to revise the specimens of *Deinotheria* from A b t s d o r f preserved in the collections of the Národní Museum and to appreciate their scientific value, within the limits of the available material. The investigations took rather a long time, mainly because of the numerous errors and incongruities in the literature dealing with *Deinotheria* and in the literature treating the specimens of A b t s d o r f in particular. Also the procuring of the possibly complete literature necessary for the determination of the species of *Deinotheria* from A b t s d o r f and for their stratigraphic position, caused some difficulties.

Here I take the liberty to express my thanks for the loan of some very rare treatises to Dr. F. FRANTL; doc. Dr. J. AUGUSTA; Dr. R. SCHWARZ; Dr. M. B. VOLF; Česká národní rada badatelská; and the library of Česká královská učená společnost.

Systematic position of the species of *Deinotherium levius* JOURDAN:
Superfamily: *Deinotherioidea* (Osb. 1935).
Family: *Deinotheriidae* (vide Félix Bernard: *Éléments de Paléontologie*, II, 2, 1895).
Subfamily: *Deinotheriinae* (Osb. 1935).
Genus: *Deinotherium*, KAUP 1829.
Species: *Deinotherium levius*, JOURDAN 1861.
Deinotherium levius, DEPÉRET 1887.

As lectotype of the species of *Deinotherium levius* JOURDAN I designate the part of the palate beset with teeth, figured by C. DEPÉRET in 1887 (tab. 20, fig. 3). Tortonian; Grive-Saint-Alban (Isère); France.

The lectotype is the part of the palate with the milk teeth D_4 and permanent teeth P_3 , M_2 , and one M_3 .

The reason why I use the generic designation *Deinotherium* KAUP 1829 instead of the better known term *Dinotherium* KAUP 1836 is to maintain the priority of names in taxonomy. KAUP in 1836 did not give the reason why he modified the generic name *Deinotherium* to *Dinotherium*.

Of the finds from A b t s d o r f, belonging to the species of *Deinotherium levius* JOURDAN, the following teeth are kept in the collections of Národní Museum: 4 cusps of tusks, two of which being isolated (one of these is a mere fragment); 10 teeth set in the lower jaw; isolated teeth of the upper jaw (maxilla) formerly also arranged in a complete set of teeth as illustrated in the paper of J. KAFKA, but later on taken apart again, when H. F. OSBORN during his visit in Národní Museum pointed out the errors in the arrangement of the restored jaw. There are 10 teeth from the upper jaw belonging however to two individuals. Some teeth recur and some again are completely missing. Then there are 2 isolated teeth from the lower jaw. Besides that, in 1936, the Department of Geology and Palaeontology was given a considerably worn down lower right M_3 . Thus, in the collections of the Národní Museum, there are teeth belonging to 3 individuals. The molar ob-

	ČM 1611 D ₂	D ₃	D ₄	M ₂	M ₃	D ₂	D ₃	ČM 1610c D ₄	M ₂	M ₃	M ₃	
délka	0,0651	0,0571	0,0692		0,0727	0,0657	0,0569	0,0697		0,0724	0,0686	length
největší š.	0,0588	0,0671	0,0635		0,0791	0,0577	0,0650	0,0628		0,0779	0,0733	the great wth.
vnější d.	0,0650	0,0557	0,0684		0,0727	0,0647	0,0564	0,0691		0,0724	0,0686	outer length
vnitřní d.	0,0588	0,0512	0,0635		0,0676	0,0514	0,0505	0,0637		0,0676	0,0666	inner length
přední š.	0,0377	0,0658	0,0631		0,0791	0,0365	0,0641	0,0628		0,0779	0,0733	front width
zadní š.	0,0526	0,0638	0,0500		0,0667	0,0520	0,0630	0,0476		0,0677	0,0642	hind width
střední š.			0,0634					0,0585				average width

	ČM 1610a D ²	plaster cast D ² odlitek	plaster cast D ³ odlitek	plaster cast D ⁴ odlitek	plaster cast M ² odlitek			Deinothe- rium cuvieri M ² Depéret 17/5	ČM 1610b M ²	25137 M ³	plaster M ³ cast odlitek	
délka	0,0467	0,0470	0,0595	0,0701	0,0771			0,06284	0,0746	0,0845	0,0828	length
šířka	0,0383	0,0383	0,0495	0,0509	0,0591			0,06116	0,0606	0,0636	0,06155	width
vnější d.								0,06284	0,0713	0,0839		outer length
vnitřní d.								0,06084	0,0736	0,0736		inner length
přední š.								0,05766	0,0606	0,0636		front width
zadní š.								0,06116	0,0597	0,0578		hind width

	M ¹ tricuspid p. 459 3jarmý s. 459 Dein. minu- tum H.v. Me- yer 1841. N. J. Min.	D ⁴ Dein. cuvieri Chevilly Cuvier IV/5.	D ⁴ Dein. cuvieri after Meyer Gmünden, Meyer str. 507	D ⁴ Dein. cuvieri Gmünden Meyer	D ₄ (M ₁) Dein. cuvieri Depéret 17/ a	M ² Dein. cuvieri Chevilly Cuvier IV/1	M ² Dein. cuvieri Chevilly, After Meyer	M ² Dein. cuvieri Gmünden	M ³ Dein. cuvieri Gmünden. Meyer	M ³ Dein. levius Jourd. (Dein. cuvieri) Cu- vier VIII/2 Kaup 1832, str. 16	M ³ Dein. gigan- teum Eppel- sheim. Wang.	
délka		0,062	0,073	0,068	0,06166	0,059	0,052	0,0647	0,0687	0,08	0,101	length
šířka	0,049	0,042	0,044	0,0488		0,052	0,045	0,0597	cca. 0,0598	0,06	0,0805	width

	P ₄ Dein. cuvieri Chevilly odlitek plas- ter cast	P ₄ Dein. gigant. (Deingigant.) M. Pawlov	P ₄ Dein. levius Wang. p. 60 Dép. 20/3	P ₄ Deinot. Dép. 20/3	P ₄ Dein. No. 24556 loc.? Nár. museum	P ₄ Dein. gigant. Eppelsheim, Wang, p. 60	M ₁ Dein. gig. Cuvier II/2 s. 222; Kaup 1832. str. 4	M ₂ Dein. cuvieri Cuv IV/2a, VIII/1	M ₂ Dein. cuvieri Depéret 17/1a	M ₂ Dein. cuvieri Breitenbron	M ₂ Dein. cuvieri Pyhra No. 24680	
délka	0,0480	0,064	0,060	0,06466	0,0698	0,0795	0,095	0,06	0,0617	cca. 0,0668	0,0649	length
šířka	0,0531	0,074	0,075	0,07416	0,0769	0,081	0,077	0,06	0,0615	cca. 0,0688	0,0665	width

	M ₂ Dein. levius Depéret 20/3	M ₂ Dein. gig. Eppelsheim	M ₂ Dein. gig. Eppelsheim, Wang, 66	M ₂ Dein. gig. IV/2 Kaup 1836	M ₂ Dein. cuvieri Cuv. VIII/4	M ₃ Dein. gig. Klipst. et Kaup 1836						
délka	0,0815	0,0840	0,092	0,098	0,05	0,088						length
šířka	0,08284	0,0839	0,088	0,094	0,05	0,100						width

tained in 1936 is of an older animal, whereas the teeth found in 1853 belong to 2 individuals, as had been correctly stated by FR. KATZER and J. KAFKA (1892); and, moreover, to young individuals as KATZER pointed out in 1892, p. 1428. The latter 2 individuals, however, were not calves of *Deinotheria*, as might be erroneously supposed, but two fullgrown animals which perished at the time of the exchange of milk teeth for permanent teeth. This is shown by the fact, that the milk teeth are rather worn, whilst the last back molars are not abraded at all, yet. The loosened epiphysis of the long bones and of the vertebrae support the view that these were young individuals whose epiphysis were not yet completely grown together with the bodies of the vertebrae and with the rest of the bone.

Apart from the mentioned teeth of the species of *Deinotherium levius* JOURDAN from A b t s d o r f, the following remains of skeletons are preserved in the collections of the Národní Museum: metatarsus II. sin. (KAFKA) p. 19, fig. 16a as phalangs of the hind leg of *Deinotherium*), metatarsus IV. dext. (KAFKA, p. 18, fig. 13a as phalangs of the third toe of the left fore leg), metatarsus IV. sin. (KAFKA, p. 18, fig. 13b, phalange of the fourth toe of the left fore leg.), metatarsus II. dext. (KAFKA, p. 19, fig. 16b, phalangs of the fourth toe of the left hind leg.), cuneiforme 3. dext. (KAFKA, p. 19, fig. 16c), naviculare dext. (KAFKA, p. 19, fig. 17/2), astragalus dexter (KAFKA, p. 19, fig. 17/1), pisiforme sin. (KAFKA, p. 20, fig. 18c), pyramidale sin. (KAFKA, p. 18, fig. 14), semi-lunare sin. (KAFKA, p. 20, fig. 18ab), scaphoid sin., magnum sin., trapezoid sin. (KAFKA, p. 20, fig. 19ab), trapezium sin. (KAFKA, p. 20, fig. 19c), metacarpus I. sin. (KAFKA, p. 18, fig. 13/4), unciforme sin., scaphoid dext., semi-lunare dext., pyramidale dext., trapezium dext. (KAFKA, p. 18, fig. 15ab), unciforme dext. (KAFKA, p. 18, fig. 15c), metacarpus III. dext. (KAFKA, p. 18, fig. 13/3), astragalus dext., cuboid sin.?, scapula sin., scapula dext., humerus sin. pars dist. fragm. inf., humerus dext. pars dist., femur dexter (KAFKA, p. 16, fig. 10), femur sin., ulna dextra pars prox. (KAFKA, p. 16, fig. 11), ulna sin. pars prox., and other numerous fragments of bones not determined.

The results of the measurement of all the teeth of the *Deinotheria* from A b t s d o r f, preserved in the collections of the Národní Museum, lead us to the conclusion, that the specimens of the A b t s d o r f must be referred to the species of *Deinotherium levius* JOURDAN. I emphasize that the most reliable are the measurements and the comparison of the second and third molars. Thus no such errors as those found in the works of some authors, which were caused by their mistaking milk teeth for permanent ones, can occur. On this error, WANG based his wrong determination of the species of *Deinotherium cuvieri* KAUP. In the section treating the species of *Deinotherium cuvieri* KAUP, WANG made the following remark (p. 67): "Es ist auffallend, daß die Breite (vorne sowie hinten) des P⁴ die des M¹ weit über-treffen, was bei allen anderen Arten nicht der Fall ist." Since WANG stated that DEPERET unfortunately had mentioned no dimensions of the set of teeth, and since on the same page he designated the concerned specimen to

be the original of DEPÉRET (referring to the I. page of his own paper, i. e. p. 60 of Mémoire of the Inst. of Geology), it is thus quite obvious that this specimen is *Deinotherium levius* DEPÉRET (orig.) from La Grive-Saint-Alban. On p. 60, WANG alludes to tab. XX, fig. 3 in DEPÉRET. In this drawing, WANG considers D^4 to be M^1 which is much narrower than P^4 (analogy with *Deinotherium giganteum* KAUP, the right maxilla with D_4 , tab. 14, fig. 3). For this reason and also because P^4 are practically not worn down at all, WANG placed this specimen to the species of *Deinotherium cuvieri* KAUP. Even if the illustration in tab. XX, fig. 3 were somewhat inaccurate as regards its dimensions, still the measuring and the comparison with the dimensions of the teeth found in PONTLEVOY (shown in tab. XVII, fig. 1 and in the same work considered by DEPÉRET as the species of *Deinotherium cuvieri* KAUP) proves clearly that the specimen from Grive-Saint-Alban illustrated in tab. XX, fig. 3 is of considerably stouter build than *Deinotherium cuvieri* KAUP, inclining greatly to the species of *Deinotherium giganteum* KAUP. Hence, it is quite obvious, that this very specimen from Grive-Saint-Alban can by no means belong to the species of *Deinotherium cuvieri* KAUP. KAUP designated even tab. VIII, fig. 4 of CUVIER as *Deinotherium cuvieri* KAUP, where M^3 measures 0,05 in length and 0,05 in width. On the other hand, in M_3 from Grive-Saint-Alban (drawn in tab. XX, fig. 3 by DEPÉRET), WANG measured the length 0,08 and the width 0,089. (Since such a drawing is not precise as the present photographs, the measurements are somewhat inaccurate. In my own remeasurement of the above designs, the following results have been obtained: length 0,0826, width 0,0858.) On the other hand, M^3 of *Deinotherium giganteum* KAUP (KLIP. et KAUP 1836) has the following dimensions: length 0,088, width 0,1.

It is not quite clear to me why WANG does not acknowledge the species of *Deinotherium levius* JOURDAN and splits it into two species: *Deinotherium bavaricum* [v. MEYER] (p. 63) and *Deinotherium giganteum* [v. MEYER] (p. 65) respectively, at the same time regarding both as identical with *Deinotherium levius*, which is evident from p. 60 from his work. There he considers the smaller remains from the Upper Miocene as the species *bavaricum* (= *bavaricum* und *cuvieri*), the larger ones as *bavaricum* (= *levius*); the larger remains from Pliocene as *giganteum*, the smaller ones as *giganteum* (= *levius*).

Another obscurity may be encountered in WANG's statement on p. 60. Here he writes quite correctly *Dinotherium bavaricum* H. v. MEYER, but on p. 63 he speaks of *bavaricum* (v. MEYER), although MEYER's species *bavaricum* has not been ranked to another genus. Even less comprehensible is WANG's indication on p. 65, where the species of *Deinotherium bavaricum* is attributed to KAUP, *Deinotherium giganteum* to v. MEYER and that under

quite a different genus referred to as *Deinotherium* $\frac{\text{giganteum (v. MEYER)}}{\text{bavaricum KAUP}}$.

Likewise, I cannot agree with WANG's determination of the generic rank *Deinotherium bavaricum* — *Deinotherium giganteum*. If *Deinotherium bavaricum* = *levius* as well as *Deinotherium* $\frac{\text{giganteum}}{\text{bavaricum}}$ = *levius*, then the apellativum of *Deinotherium levius* JOURDAN is the only entitled to be reserved, because it may be readily differentiated from both *Deinotherium giganteum* KAUP and *Deinotherium bavaricum* MEYER, the latter name not being valid, since it is the synonym for *Deinotherium cuvieri* KAUP, as will be shown further on. Even if we consider WANG's designation of the generic rank to be fully entitled, it will be necessarily designated as *Deinotherium* $\frac{\text{cuvieri}}{\text{giganteum}}$ [= *levius* JOURDAN]. This name of *Deinotherium* $\frac{\text{giganteum KAUP}}{\text{cuvieri KAUP}}$ cannot

be taken as a correct one since it is the same as *Deinotherium* $\frac{\text{cuvieri KAUP}}{\text{giganteum KAUP}}$, which, again, is nothing else but *Deinotherium levius* JOURDAN, a result, which WANG would arrive at himself (p. 60). To start the generic rank from younger and stronger representatives of the genus towards the older and smaller ones, as WANG does, also appears to be a wrong idea.

As already pointed out, *Deinotherium cuvieri* KAUP, in WANG's conception, is invalid (p. 67). To this species WANG referred the specimens from Grive-Saint-Alban belonging to the species of *Deinotherium levius* JOURDAN, and also those belonging to the species of *Deinotherium cuvieri* KAUP.

Deinotherium bavaricum MEYER, as I have already mentioned, is nothing else but the species *Deinotherium cuvieri* KAUP. KAUP (in 1832) based his determination of the species *Deinotherium cuvieri* on the finds mentioned and drawn (in 1822) by CUVIER from the localities of Comminge, Carlat-le-Comte and Chevilly.

From CUVIER's work, KAUP enumerates the following teeth found at Carlat-le-Comte: $\overline{M^3}$ (tab. VIII, fig. 2); \underline{M}_2 (tab. VIII, fig. 1); \underline{M}_3 ? (tab. VIII, fig. 4); a tooth (tab. VIII, fig. 3); $\overline{M^2}$ (tab. IV, fig. 1); $\overline{D^4}$ (tab. IV, fig. 5).

In 1833 H. v. MEYER determined his species of *Deinotherium bavaricum*. Most likely unaware of KAUP's previous work published in 1832, he stated as *Deinotherium bavaricum* MEYER the same species determined before KAUP as *Deinotherium cuvieri* KAUP. Just as KAUP did before, so MEYER based the description of his species upon some specimens referred to by CUVIER in 1822 and referred by the latter to the "tapirs gigantesques". MEYER enumerates directly (p. 501) some of CUVIER's drawings which he considers to belong to *Deinotherium bavaricum* MEYER which he himself established. CUVIER's

illustration represents especially both projections of a jaw found in Comminge (tab. 5), one molar from Carlat-le-Comte (tab. 8, fig. 2) which, as he himself adds, appears to be rather similar not only to that from Comminge, but also absolutely identical with the last molar of a fragment of the jaw found in Bavaria. Furthermore, MEYER ranks the molars from Carlat, shown in CUVIER (tab. 8, fig. 1 and 4) to the same species, and, with a certain misgiving, also the molar (M^2) from Chevilly figured in CUVIER (tab. 4, fig. 1).

We must note the fact that in 1832 KAUP indicated also $\overline{M^2}$ shown in CUVIER (tab. 4, fig. 1) as belonging to the species of *Deinotherium cuvieri* in the list of teeth from Carlat-le-Comte. He gives the following dimensions: length 0,059, width 0,052. MEYER (in 1833) cites CUVIER's drawings (tab. 4, fig. 1) correctly from Chevilly and gives (according to CUVIER, p. 170) the following dimensions: length 0,052, width 0,045, and adds (p. 508): "Der Zahn von Chevilly scheint aus der rechten Unterkieferhälfte herzuführen", and in another place (p. 501): "Es könnte dieser in Milchzahn seyen; oder ist eine dritte, noch kleinere Species, als die von mir so eben aufgestellte, anzunehmen." If he means M^2 , then it cannot be a milk tooth. It rather demands the explanation that the great differences in the dimensions given, are due to inaccurate measuring of the drawing. The dimensions noted by KAUP, however approach other statements (DÉPÉRET) of $\overline{M^2}$ of *Deinotherium cuvieri*, although it cannot be denied that also 2 plaster cast teeth of *Deinotherium* from Chevilly preserved in the collections of the Národní Museum really show smaller dimensions than other finds ranked to *Deinotherium cuvieri* KAUP. So, $\underline{M_2}$ from Chevilly has: length 0,0574, width 0,0574, whereas M_2 illustrated by CUVIER in tab. VIII, fig. 1, has: length 0,06, width 0,06; $\underline{M_2}$ from Breitenbrunn: length about 0,0668, width about 0,0615. Similarly also, $\underline{P_4}$ from Chevilly probably has smaller dimensions; its plaster cast measuring: length 0,048, width 0,0531. Thus the question still remains, whether the specimens from Chevilly belong to one or more smaller individuals or whether they belong to an altogether different smaller species of the genus of *Deinotherium*, as MEYER had already stated.

It was KAUP who, as early as 1840, referred the species name of *Deinotherium bavaricum* MEYER (1833) to that of *Deinotherium cuvieri* KAUP. established by him in 1832 (N. J. Min. 1840).

Both authors agree in referring the respective specimens to the same species, but quite independently of one another they have named them differently.

Just as KAUP in 1832 (p. 2 and 14) had referred to his species of *Deinotherium cuvieri* two specimens, one coming from Furth im Walde (Bavaria) and described before by KENNEDY and SOMMERING, and the other from Felsberg near Nikolsburg; so also MEYER (1833, p. 505)

claimed, that $\overline{M^3}$ from Furth im Walde (KENNEDY, SOEMMERING) might belong to *Deinotherium bavaricum*.

Let us consider the tooth $\overline{M^3}$ from Carlat-le-Comte. It was drawn by CUVIER in tab. 8, fig. 2, and referred by KAUP (1832, p. 16) to *Deinotherium cuvieri*. MEYER, on the other hand, referred it to his species of *Deinotherium bavaricum*. Let us now exclud it from *Deinotherium cuvieri* KAUP and rank in to the finds of *Deinotherium levis* JOURDAN established and illustrated by DEPÉRET.

The systematical position of the specimens from Chevilly to the species *Deinotherium cuvieri* KAUP seems to be rather doubtful, as already pointed out from MEYER.

When we consider the specimens both from Furth im Walde and from Felsberg near Nikolsburg as belonging to the species of *Deinotherium cuvieri* KAUP, then we must also refer $\underline{M_2}$ from Pyhra (district Laa a. d. Thaya, No. 24.680) preserved in the collections of the Národní Museum, to the same species. In the dimensions, this molar appears to be closely related to $\underline{M_2}$ from Breitenbrunn. The length of the molar from Pyhras 0,0649, the width 0,0665, the length of the molar from Breitenbrunn about 0,0668, the width about 0,0688 and finally the length of $\underline{M_2}$ illustrated by CUVIER in tab. 8, fig. 1 is 0,06, width 0,06.

Remarkable in their character are the fragments of *Deinotherium* from Gmünden described by MEYER (1833). MEYER illustrated the fourth lower left milk tooth $\overline{D^4}$ (tab. 36, fig. 16) and on p. 516, he adds: "Vielleicht letzter Milchzahn aus der linken Unterkieferhälfte von der Krone gesehen." MEYER referred this tooth to *Dinotherium bavaricum* (p. 507) and gives the following dimensions: length 0,073; width 0,044. Without the specimen itself, however, it is difficult to state what is inaccurate, whether the given proportions of the tooth or of its drawing. One thing is certain, however, when measuring the drawing, we get slightly different dimensions, i. e. length 0,068; width 0,0488. To a considerable extent, these dimensions approach those of $\overline{D^4}$ from Chevilly shown by CUVIER in tab. 4, fig. 5 and referred by KAUP to *Deinotherium cuvieri*. The respective dimensions of $\overline{D^4}$ from Chevilly (tab. 4, fig. 5) are: length 0,062; width 0,042. When we take into consideration that the specimens from Chevilly are smaller in their proportions than the other specimens undoubtedly belonging to *Deinotherium cuvieri* KAUP, we come to the conclusion that even $\overline{D^4}$ from Gmünden is closely related to this species. We are confirmed in this belief by the dimensions of $\underline{M^2}$ from Gmünden, which measures 0,0647 in length and about 0,0597 in width, which again is a bit more than in the case of $\underline{M^2}$ from Chevilly drawn by CUVIER in tab. 4, fig. 1.

It was impossible for me to compare the proportions of a further tooth indicated by MEYER from Gmünden, viz., $\overline{M^3}$, referred also to *Deino-*

therium bavaricum and, consequently, to *Deinotherium cuvieri*. \overline{M}^3 from G m ü n d e n is 0,0687 long and 0,0598 wide, these numbers being considerably less than those of \overline{M}^3 from C a r l a t - l e - C o m t e shown by CUVIER in tab. 8, fig. 2 and referred by KAUP to *Deinotherium cuvieri* KAUP, which, as already pointed out above, I consider to belong to the species of *Deinotherium levius* JOURDAN. The dimensions of \overline{M}^3 from G m ü n d e n differ also from those of M^3 from A b t s d o r f which, according to the measurements, must also be regarded as a species of *Deinotherium levius* JOURDAN. \overline{M}^3 (No. 25.137) has the following dimensions: length 0,0845; width 0,0636. The plaster cast of the further \overline{M}^3 mounted in the restored jaws (where the last molars have been erroneously mounted, the left tooth having been interchanged with the right one) measures 0,0828 in length and 0,0615 in width. On the other hand, the dimensions of \overline{M}^3 of *Deinotherium giganteum* KAUP from E p p e l s h e i m, mentioned by WANG, are considerably greater and present the following figures: length 0,101; width 0,0805.

In this way the dimensions of the teeth of the *Deinotheria* preserved in the collections of the Národní Museum, after having been compared with those given for *Deinotherium cuvieri* KAUP and *Deinotherium giganteum* KAUP,*) give proof, that the specimens of A b t s d o r f belong to neither one of these two mentioned species, but to a third species which, in size, is midway between the two previously considered, viz. that of *Deinotherium levius* JOURDAN established for the first time by JOURDAN and later on described in full detail by C. DEPÉRET from the classical locality of G r i v e - S a i n t - A l b a n (dép. Isère).

It was JOURDAN in 1861 who first indicated the species of *Deinotherium levius* from G r i v e - S a i n t - A l b a n as a new one, but without any diagnosis or drawing. JOURDAN's specimens preserved in the Natural History Museum in Lyon were, later on, elaborated and figured by JOURDAN's successor, C. DEPÉRET, who thus fixed the species of *Deinotherium levius*.

JOURDAN made a special mention of the fact that the remains of his new species of *Deinotherium levius*, which he had correctly ranked to Proboscidea, are largely abundant in the new fossiliferous locality of G r i v e - S a i n t - A l b a n, situated near Bourgoin (Isère), 38 kms from Lyon. JOURDAN classed this locality to the Upper Miocene or, more precisely, to the Miocene, viz. in its lower section, and considered G r i v e - S a i n t - A l b a n unquestionably as the most important locality for this stage.

Of great importance is JOURDAN's observation that the fauna of G r i v e - S a i n t - A l b a n, which belongs to the most abundant, approaches the fauna of S a n s a n to a considerable extent, but differs from it in that *Deino-*

*) O. HAUPT considers both of them, together with *Deinotherium bavaricum*, to be of the same species, and from those *Deinotherium cuvieri* and *D. bavaricum* to be younger and weaker individuals or differing in size on account of the unequal development of sexes as an effect of sexual dimorphism.

therium, which is very rare at Sansan, is represented in Grive-Saint-Alban by the species of *Deinotherium levius* in great abundance. On the contrary, at Grive-Saint-Alban JOURDAN did not succeed in finding any remains of *Mastodon angustidens*, of which was found almost the whole skeleton in Sansan.

Thus we can say, that JOURDAN quite correctly perceived the relationship between the fauna from Grive-Saint-Alban and that of Sansan which may be considered as the highest section of the Helvetian and, consequently, of the Middle Miocene; but, on the other hand, he referred Grive-Saint-Alban to the lower section of the Upper Miocene, i. e. to the Tortonian, so that JOURDAN's specimens would correspond to the fauna of the Simorre Horizont (Simorre, dép. Gers, Armagnac).

In his monography, DEPÉRET indeed referred the fauna from Grive-Saint-Alban, consequently including also *Deinotherium levius* JOURDAN, to the lower Helvetian (the Middle Miocene) where the Mayencian, mentioned by DEPÉRET, belongs; this section is identical with the Langhinian. DEPÉRET thus placed Grive-Saint-Alban lower in its stratigraphic position than the fauna of Sansan (dép. Gers). But later on, in 1892, also DEPÉRET referred Grive-Saint-Alban to the Middle Miocene, the Tortonian, ranking, at the same time, the fresh-water *Deinotherium* sands in Bavaria*) containing *Mastodon angustidens* and *Hyaemoschus crassus*, to the Sansan Horizont (the Helvetian).

This DEPÉRET's idea rehabilitating JOURDAN's referring of the fauna of Grive-Saint-Alban (Isère) to the Tortonian, was followed, later on, also by some other authors, e. g. KAYSER and BUBNOFF (Grève-Saint-Alban; p. 1083).

Furthermore, the remains of *Deinotherium*, coming from Tiraspol, are referred by MARIA PAWLOV to the species of *Deinotherium giganteum* KAUP. The dimensions of the set of teeth, however, clearly testify that a part of the maxilla belonging to the species of *Deinotherium levius* JOURDAN is here involved and that again the animal was at the stage of the exchange of teeth which explains the small tricuspid M_1 , in reality D_4 . Mrs PAWLOV herself notes that these remains had been, no doubt, secondarily translocated, as can be corroborated by some marks. This, however, does not exclude the possibility that it could have been the remains of *Deinotherium* from Sarmatian as well as the real maxilla of *Deinotherium* from Tortonian translocated to the secondary locality.

From all these facts hitherto mentioned we can infer, that the specimens of *Deinotherium levius* JOURDAN from Grive-Saint-Alban are of the Upper Miocene, viz. the Tortonian. Now we are faced with the question what relationship may exist between the Tortonian specimens from Grive-Saint-Alban and those of *Deinotherium levius* JOURDAN from Abtsdorf.

*) With *Deinotherium cuvieri* KAUP.

F. KATZER (p. 1429) considers the sea sediments at Abtsdorf and Triebitz as belonging to the Upper Miocene and corresponding to the Sarmatian or Congerian stage of the Vienna Basin. In order to obtain the most reliable limit of the age of *Deinotherium levius* JOURDAN from Abtsdorf, it is necessary to discuss, at least briefly, the stratigraphic position of the subjacent brackish clays of Abtsdorf and Triebitz.

Already V. J. PROCHÁZKA showed, that the Sarmatian age of the Miocene at Abtsdorf is out of question. The relatively common *Terebralia bidentata margarifera* SACCO (1895) which has been designated till now as *Cerithium lignitarum* EICHW., and *Terebralia lignitarum* (EICHW.) stated by HÖRNES as *Cerithium duboisi* HÖRNES, prove the Helvetian or Tortonian age of the brackish clays of Abtsdorf and Triebitz. *Melanopsis tabulata* HÖRNES would indicate identity with the layers of Grund, as also TOULA had stated, i. e. the age of the lower section of the Helvetian, if only the specimens from Abtsdorf, Triebitz and Rudelsdorf were really identical with the highly varying species of *Melanopsis tabula* HÖRNES. And this seems to be quite a different species.

When, on the other hand, we take into consideration the comparison of the faunal association from Abtsdorf with that from other localities, as had been done by V. J. PROCHÁZKA, we arrive at the conclusion, that the sea gulfs penetrating from Moravia into the long-drawn valleys in the region of the Upper Cretaceous in the East of Bohemia belong, most probably, to the Tortonian, inspite of the fact that the transgression both of the Tortonian and Sarmatian is recorded to be more moderate than that of the Helvetian, as has been stated by D. ANDRUSOV (1938, p. 173, 23). For, most of the fauna discovered in the clays at Abtsdorf and Triebitz has also appeared in the deposits of the Tortonian at Steinabrunn and at Lapugy in Transylvania. There were really only two species which caused V. J. PROCHÁZKA some difficulties in the comparison of the faunas, viz. *Cerithium lignitarum* EICHW. and *Melanopsis tabulata* HÖRNES which, according to PROCHÁZKA's opinion, seem to be of the Helvetian age of Abtsdorf clays. But HÖRNES, in his own work, indicated the species of *Cerithium lignitarum*, established by himself, as belonging to both the Helvetian and the Tortonian. Among other localities of the Vienna Basin he mentioned Grund, Baden, and Steinabrunn as finding-places of this species, and according to the specimens he had at hand mentioned also Lapugy and Triebitz in Bohemia (railway tunnel). SACCO then distinguished *Cerithium lignitarum* EICHW. (as described and drawn by HÖRNES in 1854), from the species of *Terebralia lignitarum* (EICHW.) and took HÖRNES's drawing (tab. 42, fig. 1) as a type of his new variety of *Terebralia bidentata margaritifera* SACCO (1895). The diagnosis of this variety is attributed to HÖRNES, for SACCO only mentioned it in a note referring to the Helvetian species of *Terebralia bidentata sulfurea* SACCO, which is closely related to *Terebralia bidentata margaritifera* SACCO. Fig. 1 and 3 in tab. 42 in HÖRNES's work come from Grund, fig. 2 in tab. 42

from Baden. The specimens from Triebitz are identical with them. I can only compare the specimens from Tortonian strata at Lapugy which are identical with the specimens from Grund as well as with those from Vel. Izvor in Serbia. Since the entire association of Abtsdorf shows the same character as the Tortonian fauna, we must assume that not even *Terebralia bidentata margaritifera* SACCO make any exception and that it corresponds to the fauna of the Tortonian. Consequently this certifies the view that the sea gulfs penetrating from Moravia into Eastern Bohemia*) really belong to the Tortonian, where they have already been placed by VL. J. PROCHÁZKA, who believed them to be coeval with the sediments from Steinabrunn and Lapugy. Hence, the clays of Abtsdorf and Triebitz would be equivalent to the Tortonian transgression as has been shown in the Moravská Ostrava region by O. GANS (1936) and already in 1932 by D. ANDRUSOV.

After the retreat of the Tortonian sea, the Proboscidea of the genus of *Deinotherium* KAUP found suitable life conditions in the marshy region round Abtsdorf and Triebitz. Our species of *Deinotherium levius* JOURDAN of Abtsdorf can be imputed to the Upper Tortonian; thus there are no obstacles to its stratigraphic coordination with those from Grive-Saint-Alban (Isère).

J. KAFKA (1888), it is true, made a note of fact that the first remains of *Deinotheria* in Bohemia had been found near Abtsdorf in the Tertiary Basin of Vienna in 1846 when the railway was being built there. KAFKA repeated the same statement in his work "Kopytnatci země české. Žijící i vyhynulí" issued in the "Archiv pro přírodovědecký výzkum Čech" in 1909. He states as follows: "In the České Museum there is a specimen preserved of *Deinotherium* from Abtsdorf near Česká Třebová. According to the communication of Mr Prof. FRIČ who gathered this specimen on the place in 1852 and transported it to the České Museum, he really made two finds. The first specimen was detected some time earlier, when the building of the State Railway Company was being performed, and several chests of bones from this find came to Vienna where nobody knows anything about them. The second time, when the slopes warped and subsided, a new digging was carried out and a number of bones was found which were afterwards preserved in the České Museum." It is rather astonishing that this record treating the find of 1846 has not been mentioned anywhere before 1888, when it was reported by KAFKA.

We must consider, as the oldest record of the finding of the remains of *Deinotheria* from Abtsdorf the note made by E. F. GLOCKER in 1852. In a letter from the 21st of July 1852, communicated to W. HEIDINGER

*) These have been termed by ANDRUSOV (1938, p. 4) as Tortonian gulfs, in his work "Paläografická skiza západních Karpat v miocénu" (Paläographic sketch of the Western Carpathian Mountains in the Miocene).

and published in Jahrb. d. G. A.-A. 1852, p. 132, GLOCKER writes as follows: "Gerne möchte ich Ihnen noch etwas über verschiedene interessante mährische Petrefacten, worunter einige *Unica* sind, mittheilen, z. B. . . . über einen langen Fangzahn und große Backenzähne und Knochen eines *Dinotherium giganteum* aus dem Tegelmergel bei Absdorf unweit Zwittan . . ."

J. SV. PROCHÁZKA, obviously misled by KAFKA's remark of the finding of remains of *Deinotheria* near Abtsdorf in 1846, claims the specimen from 1852 to the second one of that kind. At the same time he adds: "... the first one occurred some time earlier while the line of the State Railway Company was under construction. It included several chests of bones which came to Vienna where nobody ever knew anything of them again." Consequently it is clear enough that notes of the finds before 1852 are sparse, and are of a later date. Contemporaries mention none of them.

A further report treating the specimen of Abtsdorf was published in the periodical "Živa", volume I., 1853, by the famous botanist JULIUS SACHS.*) At the same time when the remains were detected, JULIUS SACHS was sent to Abtsdorf accompanied by ANT. FRIC, the assistant of the Museum.

JULIUS SACHS (p. 317) wrote of this find in No. 10 (October copy) of Živa (1853) as follows: "On a dike near Abtsdorf, where the railway runs, remarkable remains of a primeval beast have been found lately which, by virtue of special care of Mr VOLKMAR, the assistant, and Mr ŠTĚPÁNEK, the inspector, were cautiously dug out and preserved, whereupon the Knight SACHER-MASOCH, Court Councillor and Police Director in Praha, always very interested in making this Museum flourishing, succeeded in winning these rare remains for this Museum. I present here but a short preliminary report referring to this interesting find. The mentioned remains represent a part of the skeleton of a huge fossil primeval Mammel, called *Dinotherium giganteum*. This skeleton lay in the clay cut through by the railway line and abundant in sea shells and indistinct prints of plants. Close to the skeleton, there lay a big trunk of a fir tree very little changed in its consistence, so that it was possible to cut it and on thin splinters all wood cells could be detected under the microscope, just like on a fresh stem."

It might be disputable, whether JULIUS SACHS meant, by the expression of "lately", the specimen noted by GLOCKER in 1852 or some other one dating really from 1853 when the discovery was reported. But it seems to be rather queer that he did not mention the find of 1852 or even a more previous one, although he remarked that a part of the dike slid down already several times (p. 318). And in the same manner, A. E. REUSS 1860 (vol. XXXIX, Sitzungsberichte der mathem.-naturwiss. Classe d. k. Ak. d. Wiss., sep., p. 73) gave evidence of the discovery of a skeleton of *Dinotherium giganteum* near Abtsdorf only in 1853. He writes: "Im Jahre 1853 wurde in Folge einer Abrutschung des Tegels an der westlichen Seitenterasse der

*) By mistake, his name is given in the article as SAX.

Eisenbahn das Skelet eines *Dinotherium giganteum* bloßgelegt." Here he obviously mentions the same discovery which had been reported by SACHS in 1853. Like SACHS, REUSS stated that the specimen had been transmitted, due to the efforts of the Knight of SACHER, to the collections of the České museum, Praha. REUSS promised to describe fully the discovery elsewhere; but the paper never appeared.

SACHS stated in 1853 that the mentioned skeleton was found by him during the removal of a part of the slope, "but in such a crushed and soft state that it crumbled into small pieces. The reconstruction of the skeleton from the pieces," he continues, "has now become very difficult, as the setting together of the single portions is considerably uncertain owing to their greatly damaged condition, and besides that, a great part of the skeleton is missing, namely 5 post. vertebrae of the neck and the whole spine, excepting the two front vertebrae of the neck and a few of the tail. Both two metatarsal bones, except the shuttle-bones, fit together, and in the metatarsus of the hind leg all bones are present, the whole bearing a close resemblance to the bones of a *Mastodon*."

That REUSS mentions in his paper (from 1860 treating the discovery from 1853) the same specimen as the one reported by SACHS, follows from what REUSS had written: "Leider zerfielen sehr viele derselben, als sie der Luft längere Zeit ausgesetzt waren, rasch; andere wurden, ehe die Kenntniss von dem Funde sich weiter verbreitete, zertrümmert oder bei Seite gebracht. Besonders der Schädel, die Schulterblätter, Beckenknochen und die langen Knochen der Extremitäten unterlagen beinahe sämtlich der Zerstörung. Erhalten wurden dagegen nebst dem vollständigen Gebiße des offenbar noch jugendlichen Individuums der erste und zweite Halswirbel, die Körper einiger Rücken- und Schwanzwirbel, ein großer Theil der Fußwurzel- und Mittelhandknochen und einzelne große Bruchstücke der langen Extremitätenknochen."

Obviously both SACHS and REUSS had noted the same specimen from 1853 which, as KAFKA mentioned in 1909, was gathered on the place by FRIČ and transported afterwards to the Museum. According to FRIČ's communication, KAFKA gives the date 1852, but seems to be an error already stated by KAFKA (1888 in *Vesmír*, vol. 17, p. 18). VL. J. PROCHÁZKA (1895), however, distinctly states the date of the find as 1853 (*Miocén východočeský*, p. 7).

It is noteworthy that the statement of SACHS and REUSS, respectively, were newly confirmed by an account adjoined to a drawing of the skeleton of *Deinotherium* found in Abtsdorf in July 1853. The account was reported by ŠTĚPÁNEK mentioned already in the note of JULIUS SACHS. The manuscript account with the adjoined illustration and the respective specimens of *Deinotherium* were most probably transmitted to A. FRIČ by ŠTĚPÁNEK, after he had been sent with SACHS to study the specimens from Abtsdorf. From the private archives of A. FRIČ who — as we know from SACHS's remark — studied the specimens with SACHS and compared them with CUVIER's figures, the manuscript came into the archives of J. PER-

NER, FRIC's nephew. J. PERNER, professor of the Charles University in Praha, lent it to J. AUGUSTA for publication, and it was not until then that some light was thrown upon several errors which had crept into the records of *Deinotheria* from Ab t s d o r f owing to the inaccuracy of KAFKA's citation. Therefore we can relate SACHS's account published in October 1853, stating that remarkable remains of a fossil beast had lately been found, to the discovery from July, 1853, noted by ŠTĚPÁNEK.

KATZER's annotation 1892 (*Geologie von Böhmen*, p. 1428) is consequently to be considered as a brief and, at the same time, comprehensive review of the knowledge in that question containing of course, all the mistakes taken over from KAFKA's paper. KATZER, e. g., noted the landslip of the Western slope of the railway cutting, NW of Ab t s d o r f in 1852. He mentions, however, the skeletons of two individuals of *Deinotherium giganteum* (in his work, by mistake, CUV.). He commemorates that the greatest part of the skeletons was lost and surmises — erroneously of course — that a complete set of teeth of one, apparently still immature individual, was preserved. Thus it is necessary to emphasize that already SACHS was right when claiming the *Deinotherium* he found to have been of a young age, an idea, which was later adopted also by KATZER.

That both accounts namely that of REUSS and ŠTĚPÁNEK deal with the same find, we may infer also from the identical proportions of the specimen. REUSS in 1860 (p. 73) says: "... dessen Knochen auf einer Fläche von 4 Klaftern Länge und 3 Klaftern Breite beisammen lagen." ŠTĚPÁNEK makes the following remark (AUGUSTA, p. 35): "In Paar Tügen nach vorsichtiger Arbeit fünde ich den ganzen Ungeheuer in 4 Klafter lange und 3 Klft. breite ins selben Figure wie jenseits gezeichnet ist."

It is necessary to emphasize that not even the jaw of the specimen noted and drawn by ŠTĚPÁNEK was detected on the same place as the rest of the skeleton apparently also incomplete. Thus we cannot exclude the possibility that it was not one animal, but remains of two individuals. It seems also probable that all the remains did not come into the Národní Museum. For it is difficult to comprehend that despite a careful lifting such big molars would have been overlooked; and yet they are missing. Though some teeth, e. g., kept in the collections of the Národní Museum, belong to two individuals, the second upper molars are missing, and so on. They are missing not only in the second specimen, but also in that lifted up by ŠTĚPÁNEK and VOLKMAR (FOLGMAR, according to ŠTĚPÁNEK). Most probably KAFKA was right, when he remarked (1888, p. 18) that, on the whole, two individuals were detected; he added, however, the following words: "but the bones had to be collected from common people who supposing them to be the bones of «gigants» took them away".

That *Deinotherium* was not really rare animal in the region of Ab t s d o r f, is shown by the following fact. Whilst all the teeth coming from the find in 1853 belong to young, grown up individuals being in the stage of the exchange of milk teeth for permanent ones, there is another molar

from Abtsdorf belonging to *Deinotherium levius* JOURDAN, preserved in the collections of the Národní Museum. The Národní Museum was given this tooth in 1936 by doc. Dr. VL. BERGAUER, who obtained it from MUC. J. HELLER (No. 25.137). In the adjoined letter, HELLER communicated as follows: "The inclosed specimen comes from a find of JOSEF HELLER, foreman on the railroad tracks, during the reparation of the top of the railway track at Abtsdorf about 70 years ago." This third right lower molar is considerably abraded and evidently belongs to a very old animal — the third one already. Hence, there is no reason to doubt that the remains of *Deinotherium* were discovered also in the year 1852. Unfortunately GLOCKER did not mention what became of the third afterwards.

It is quite interesting to follow how, in the course of time, the various notes on the find of *Deinotherium* at Abtsdorf in 1853 were distorted. SACHS who, according to KAFKA's statement from 1888, was sent with FRIČ to investigate the specimen of Abtsdorf, writes that a big trunk of a fir tree which was very little changed in its consistence was lying next to the skeleton. Since SACHS, as botanist, payed close attention, no doubt, to the fossilized wood (and in the fact, a portion of this petrefied stem was transported to the Národní Museum where it is still exhibited), we must consider this report fully reliable. It is noteworthy that FRIČ's account does not state whether only one specimen had been found as follows from the notes of SACHS, REUSS, and ŠTĚPÁNEK, nor does he distinctly mention, whether more individuals had been discovered. But yet he writes: "Thus one specimen of this animal was found at Abtsdorf under a big ... stem." From this we could understand also that more specimens were found at Abtsdorf. This would also be in agreement with FRIČ'S allusion, that *Deinotherium* (1869, p. 186) "had the front teeth or tusks in their lower part curved downward and the total number of molars was 32." FRIČ, though such an excellent zoologist, must have been apparently misled here by some supernumerary teeth.

Later on, in 1869, however, FRIČ (O vrstvách kůry zemské. Malá geologie, 1st ed., p. 186) wrote on the specimen of *Deinotherium* as follows: "One specimen of this animal was found at Abtsdorf under a big carbonized stem of 7 feet in diameter, which, undoubtedly, had fallen on top of it; for one portion of the skeleton lay to the right, the other to the left of this stem." In the 3rd edition of the same book, FRIČ expresses these proportions in the metric system, giving the diameter of the stem as 2 ms.

ŠTĚPÁNEK, on the contrary, mentions neither a stem nor a stump lying on the top of the skeleton, but he states, that "um die Knochen wurde viel Holz gefunden, welches bereits in Braunkohle verwandelt worden ist." But it is questionable whether ŠTĚPÁNEK had no noted in his report and drawing only one of two or even more detected individuals which need not have been found all at one time.

The supposed stem said to have been lying over the skeleton of *Deinotherium*, inspired FRIČ with the idea of a reconstruction of the Bohemian

Tertiary landscape which had been effected by H. A. LEVÝ, according to FRÍČ's plan. In his typical drawing, FRÍČ conceived, at the same time, the locality in the railway-cutting at Abtsdorf (as can be seen from the note of ŠTĚPÁNEK, the place is situated near the guard-house No. 82; it is No. 853 in the profile) where he drew quite accurately a limb of *Deinotherium* and the mentioned stem lying on top of it. FRÍČ's original drawing bears the number ČM. 1608 and is now kept in the collections of Národní Museum. The question is whether it does not represent a second specimen found here at the same year in the course of the same dredging work. For, as has been shown by close studies, the collections of the Národní Museum contained teeth of two equally old individuals. KAFKA, therefore was right, when claiming that the bones from Abtsdorf, which were at that time restored, put together and prepared for further study by K. TONDL, must have belonged to two individuals (Vesmír, 1888, A. 17, p. 18). In the report of 1899 (Vesmír 28, p. 280, 1898—99), KAFKA states that in the collections of the Národní Museum the entire find from Abtsdorf is kept, consisting of two or three individuals of different size.

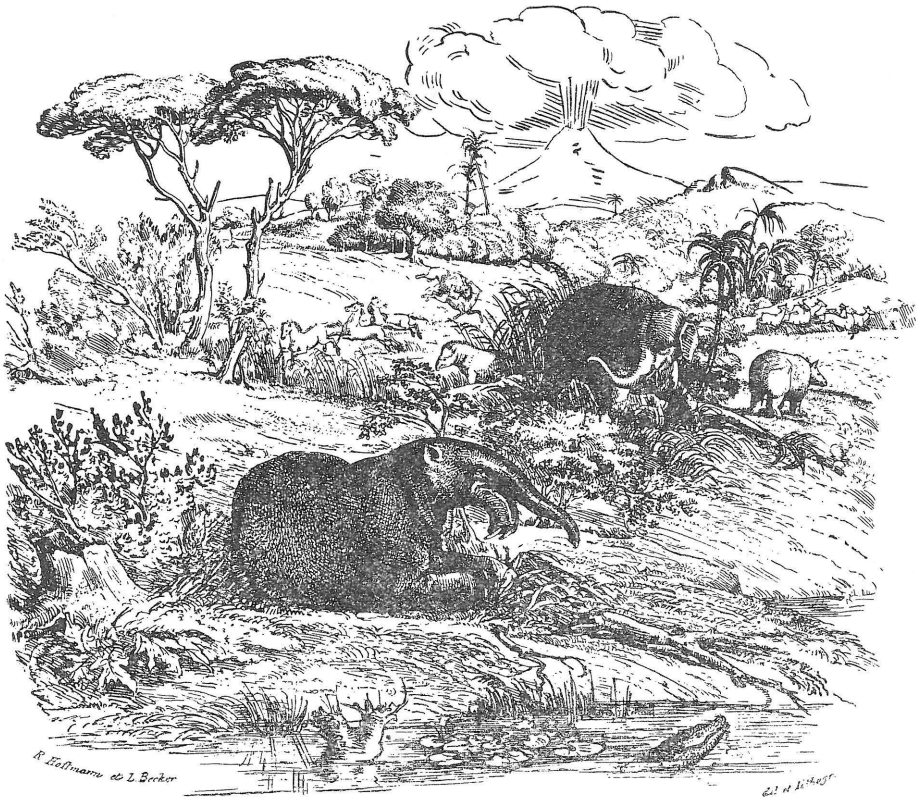
The first dated find of the bones of *Deinotherium* believed, at that time, to be the bones of giants, was made on January 11th at "Champs des Géans" in Dauphiné, SE from Lyon, as stated by O. ABEL in his work "Tiere der Vorzeit in ihrem Lebensraum", 1939, p. 72.

KENNEDY was the first, according to A. GAUDRY, who classified *Deinotheria* as belonging to Proboscidea. This was done most probably in the paper communicated by ILDEFONSE KENNEDY in 1785 in Mémoires de l'Académie de Munich, where the said author described a tooth not closely determined which he found in a sandpit near the river Cham at the town of Furth im Walde in Bavaria 1773. SOEMMERING repeated the statement of the discovery in the same Mémoires in 1818. This periodical unfortunately has not been obtainable to me, so that I have been compelled to refer here but to a short statement made by CUVIER in "Recherches..." (1822, p. 167), and by A. GAUDRY in "Les enchainements du monde animal dans les temps géologiques. Mammifères tertiaires". Paris 1878, p. 189. GAUDRY remarked here as follows: "Cependant, dès 1785, KENNEDY avait attribué un dent de *Deinotherium* à un proboscidien."

Deinotherium was pictured as a land-living Proboscidean bestowed with all the characteristics of the Proboscidea, for the first time in 1837. But as early as in 1836, KAUP and KLIPSTEIN found out, that it must be ranked among Proboscidea. As a supplement to their work "Beschreibung..."*) they issued (in 1837) an "Atlas Dinotherii gigantei". Although the "Atlas" does not bear any date nor place of edition, it obviously belongs to the "Beschreibung...", for it contains, apart from a drawing of the skull and the

*) J. J. KAUP and A. v. KLIPSTEIN: Beschreibung und Abbildung von dem Rheinessen aufgefundenen colossalen Schedel des Dinotherii gigantei mit geognostischen Mittheilungen über die Knochenführenden Bildungen des mittelrheinischen Tertiärbeckens, Darmstadt, 1836.

jaw represented here in quite a correct position, also some profiles and geological maps referred to in the preface of the "Beschreibung..." mentioned above. KAUP and KLIPSTEIN write as follows: "Dieser fügten wir noch zwei Profiltafeln und zwei Karten..."



The frontispice of the »Atlas Dinotherii gigantei«
(Klipstein, A. v. & Kaup, J. J.; Darmstadt, 1837?).

The frontispice of the "Atlas" represents a Tertiary landscape with an active volcano in the background; the country is vivified with some Tertiary mammals. In the reconstruction of the Tertiary landscape, the main attention is directed towards two individuals of the species of *Deinotherium giganteum* KAUP, one of which is lying on the bank of a pool or a river, the other walking a little way off along the subtropical semi-steppe vegetation. The walking animal, in particular, bears all characteristics of Proboscidea faithfully illustrated. In 1845, H. B. GEINITZ redrew the lying animal in "Grundriß des Versteinerungskunde" (tab. II, fig. 7).

From the biological point of view, it is a noticeable fact, that a considerable number of teeth of *Deinotheria* ever found belong to individuals perished in the very stage of the exchange of teeth. The two young indivi-

duals from Abtsdorf also belong to them. The palate beset with teeth, from Grive-Saint-Alban, figured by DÉPÉRET in 1887 (tab. 20, fig. 3) is of the same character. Also the find of the right maxilla in the Sarmatian sea deposits from Tiraspol, apparently from the secondary locality, described by M. PAWLOV in 1907, is the remains of an individual perished at the time of the exchange of teeth. I have payed close attention to this interesting phenomenon and have ascertained that in the collections of the Departement of Geology and Palaeontology in the Národní Museum, Praha, there are jaws of some other big animals perished at the same stage of development. A striking example may be offered in the maxilla of a pleistocene *Rhinoceros (Coelodonta) antiquitatis* BLUMB. I have been looking for the explanation of this phenomenon in the palaeontologic literature; but up till now, I have not succeeded in finding a reliable and adequate explanation. I mentioned this problem also to MUDr. JAN SKÁLA, amateur-collector from Velké Jirny, during one of his visit in the Museum, and I received the following explanation, which is not without a vast interest. During the exchange of teeth, the metabolism of calcium and phosphorous salts is weakened, its resistance is lowered, and it readily succumbs to infections. Animals grow sick and perish. The disturbances in big animals were so much the greater, since the abrupt changes in the concentration of calcium and phosphorous salts were due to the formation of relatively big teeth.

CONCLUSIONS.

The specimens of *Deinotheria* from Abtsdorf must be referred to the species of *Deinotherium levius* JOURDAN from the Tortonian of Grive-Saint-Alban (dep. Isère, France). This species must be considered as fully distinguished from the species of *Deinotherium cuvieri* KAUP (= *Deinotherium bavaricum* H. v. MEYER) and *Deinotherium giganteum* KAUP, respectively.

The fact that the remains of *Deinotherium levius* JOURDAN from Abtsdorf are of Tortonian age and not older, is proved by the bluishgreen marls forming the subjacent strata of the whole territory of Abtsdorf, Triebitz, Česká Třebová, and Rudelsdorf, respectively. These miocene clays which fill up narrow valleys in the Cretaceous terrain as gulfs of the Tertiary sea stretching from the Vienna Basin over Moravia towards the East of Bohemia, are to be ranked to the Upper Miocene, namely to the Tortonian, on account of the association of brackish fauna fully corresponding to that of Tortonian from the finding-place in Steinabrunn in the Vienna Basin and in Lapugy in Transylvania, as pointed out by VL. J. PROCHÁZKA in 1895.

In the faunal association only two species caused PROCHÁZKA some difficulties. They are: *Cerithium lignitarum* EICHW. and *Melanopsis tabulata* HORNES, which pointed to the affinity of the clays of Abtsdorf, Trieb-

bitz and Rudelsdorf with the Helvetian. A closer study showed, however, that the specimens ranked by PROCHÁZKA to *Melanopsis tabulata* HÖRNES cannot be referred to the species established by HÖRNES, even though HÖRNES admits a considerable variability of his species of *Melanopsis tabulata*. The second doubtful fossil, *Cerithium lignitarum* EICHW., appeared to be referable to two species, *Terebralia lignitarum* EICHW. (= *Cerithium duboisi* HÖRNES) and *Terebralia bidentata margaritifera* SACCO, respectively. But both these species are represented in the Tortonian as well as in the Helvetian. Hence, there are no objections to the raking of the clays of Abtsdorf to the Tortonian transgression as pointed out by D. ANDRUSOV in 1932.

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VYSVĚTLIVKY K TABULKÁM.

EXPLANATIONS OF THE TABLES.

TAB. I.

Deinotherium levius JOURDAN. Torton — Tortonian. Abtsdorf.

1. Druhý svrchní levý mléčný zub. — Second upper left milk tooth.
2. Třetí svrchní mléčný zub. — Third upper left milk tooth.
3. Čtvrtý svrchní levý mléčný zub. — Fourth upper left milk tooth.
4. Třetí levá svrchní stolička. — Third upper left molar.
5. Třetí pravá spodní stolička. — Third lower right molar.

TAB. II.

Deinotherium levius JOURDAN. Torton — Tortonian. Abtsdorf.

1. Druhý pravý svrchní mléčný zub. — Second upper right milk tooth.
2. Třetí pravý svrchní mléčný zub. — Third upper right milk tooth.
3. Čtvrtý pravý svrchní mléčný zub. — Fourth upper right milk tooth.
4. Třetí svrchní pravá stolička. — Third upper right molar.
5. Druhá spodní pravá stolička. — Second lower right molar.

TAB. III.

Deinotherium levius JOURDAN. Torton — Tortonian. Abtsdorf.

1. Čtvrtý pravý svrchní mléčný zub. — Fourth upper right milk tooth.
2. Třetí svrchní pravá stolička. — Third upper right molar.

Deinotherium levius JOURDAN. Miocén — Miocene. Lok.?

3. Čtvrtý svrchní levý třenák. — Fourth upper left premolar.

Deinotherium cuvieri KAUP. Miocén — Miocene. Pyhra, okres Laa a. d. Thaya, Dolní Rakousy. — Pyhra, District of Laa a. d. Thaya, Lower Austria. (Ostmark.)

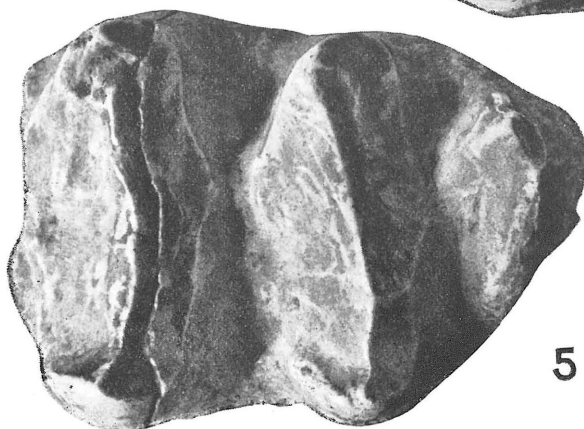
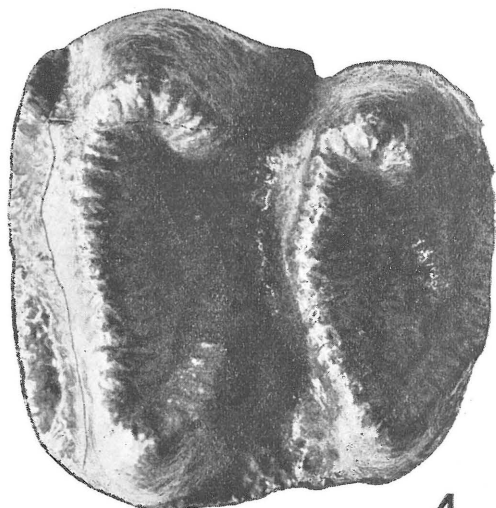
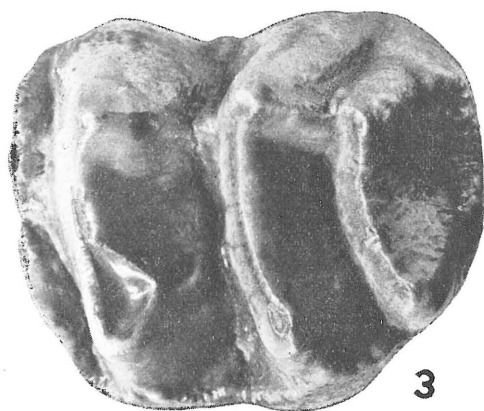
4. Druhá pravá svrchní stolička. — Second upper right molar.

Deinotherium levius JOURDAN. Torton — Tortonian. Abtsdorf.

5. Druhý spodní pravý mléčný zub. — Second lower right milk tooth.

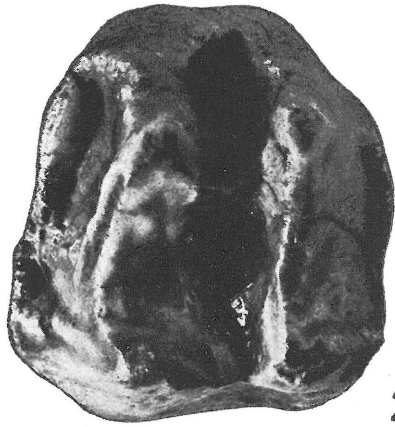
Všechny vyobrazené zuby jsou uloženy ve sbírkách geologicko-paleontologického oddělení Národního musea v Praze. Vyobrazené exempláře fotografoval FR. TVRŽ, Národní museum, Praha. Vyobrazení jsou ve stejném poměru o trochu zmenšena.

All the figured specimens here are preserved in the collections of the Department of Geology and Palaeontology of the Národní Museum, Praha (Bohemia). The photographs were made by FR. TVRŽ, Národní Museum, Praha. The pictures are in the same proportion, a little reduced in size.

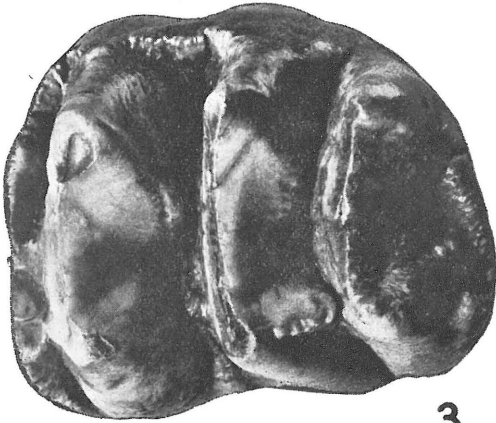




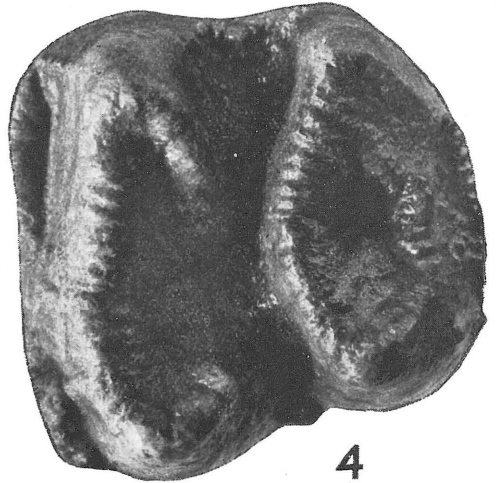
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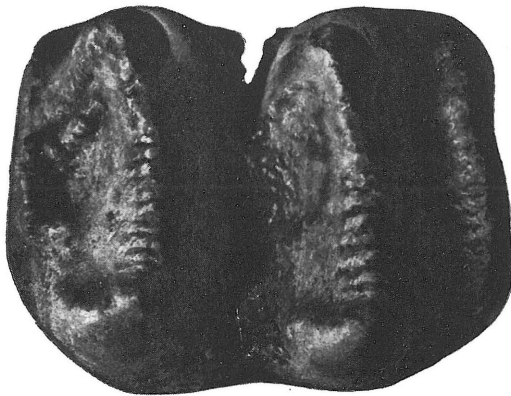
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