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Brachypotherium aurelianense Nouel, var. nov. *Gailiti*, from the Miocene deposits of the Turgai region.

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The continental Tertiary deposits of the Turgai region, as has been repeatedly mentioned, contain at least three successive Mammalian faunas. The most ancient one, that of the Upper Oligocene *Indricotherium* beds, has been fully studied by the author (as regards all the hitherto collected material); the most recent Pliocene *Hipparion* fauna is so far but scantily represented; as to the intermediate Miocene fauna from the gypsiferous clays of the river Jilančik, a description of one of its representatives is given for the first time in the present paper.

The Jilančik fauna is not very diversified consisting all but exclusively of Rhinoceroses (at least three species) and Mastodons. The description of this fauna begins with a form, which, besides affording morphological and partly paleozoogeographical interest, is important from a stratigraphical point of view: similarly to what had formerly occurred in referring the fauna of the *Indricotherium* beds to the Oligocene by means of the study of the remains of *Epiaceratherium turgaicum*, the Burdigalian (Lower Miocene) age of the Jilančik fauna is now with still greater precision established in view of the occurrence of *Brachypotherium aurelianense*.

The following parts of the skeleton have been preserved from the form which is now being described:[1] one distorted skull (№ $\frac{1401}{D\ 399}$), and an incom-

[1] The Jilančik fauna has been revealed as a result of excavations undertaken under the auspices of the Academy of Sciences, in 1914; since that year the Geological Museum has repeatedly received specimens from the Jilančik beds: excavations have been since resorted to in 1916, 1924, and 1926; all the material collected prior to 1926 (collection 1401 D and 1748) forms the subject of the present paper.

plete dental apparatus from another (№ $\frac{1401}{D\ 2}$); of the skeleton nearly all the bones of the limbs (partly from one individual) could be pieced together; the lower jaw and the vertebrate column are lacking.

An exact determination of these remains (as of the Jilančik fauna in general) could only be reached after a careful comparative study of the fossils of the Museums in France (Marseilles, Lyon, Paris, Strassburg), England (London), and Germany (Stuttgart and Munich). I feel much obliged to the authorities of these Museums on account of the opportunities granted for my studies.

Skull. The specimen under review is depressed, its upper part being at the same time deflected to the right; the nasal bones are curved upwards, and the frontal-nasal suture is crushed; the temporal arches are fractured and adpressed to the skull. The skull, reconstructed (so far as it could be) in its original form (pl. I, fig. 1), is brachycephalic, with a short muzzle and widely expanded powerful jugal arches. The frontal surface, slightly concave, represents a flat rhombus with a slight longitudinal ridge; cristae parietales, as also crista sagittalis are but feebly expressed (owing to deformation?). The occipital region is much crushed, it should have been originally fairly broad, and in no case was it constricted upwards; crista occipitalis, somewhat broken, exhibits a slight concavity.

Both zygomatic arches, as mentioned above, are fractured: the width of the preserved anterior parts (very massive) reaches 85 *mm*. The anterior border of the orbit lies between P^4 and M^1 (in the distorted skull), the posterior margin of the nasal-maxillary notch being disposed opposite the centre of P^3 or even between P^3 and P^2.

The frontal-nasal suture is fractured; the length of the nasal bones being about 170—180 *mm*, the distance from the nasal-maxillary notch not exceeding 120—130 *mm*; the nasal part of the skull apparently becomes narrower forwards; the precise form of the nasal bones, from their being much compressed, is, however, impossible to reconstruct: in any case these bones are fairly thin with an inconsiderable swelling in the region of the longitudinal suture, and constitute a sloping vault; they are, possibly, not joined all along the suture; at least, the separately preserved anterior part of the nasal bones exhibits traces of being united throughout a length of but a few centimeters anteriorly. The anterior extremity of the nasal bones is constricted and forms a swelling some five centimeters from its distal end; at this point the nasals are orbicularly trapezoid in section, with a deep groove along the middle line (in place of the suture; this groove extends across the swelling indicated); the outer borders of the bones, on approaching their anterior extremity, are slightly raised, thereby constituting slight indentations. The swelling exhibits a rough surface pointing to the presence of a small horn.

The auditory regions are much crushed on both sides of the skull, in their present condition they exhibit the following structure: proc. paroccipitalis is short, its length (from proc. post-tympanicus to the end) measuring but 35 *mm*, although it may have admissibly become shorter as a result of the depression sustained by the skull; below it becomes narrower and slightly curved; along its posterior side runs a perceptible ridge, while the anterior one is correspondingly concave. The proc. post-tympanicus fuses with the proc. paroccipitalis; it is abbreviated, swollen at its lower end, and curved, so that the auditory sinus becomes orbicular in outline; at the same time it slightly overlaps the proc. postglenoideus, whence no fissure is observable between the two. Proc. postglenoideus is short, massive, triangular in section (being thicker in front than behind).

Dentition. The premolars differ considerably from the molars both in being smaller, and in exhibiting a peculiar structure (pl. I, fig. 2); molarisation of the teeth commences with P^4, which as well as P^3 is provided with an antecrotchet and a feebly developed crotchet sometimes replaced by small plications; the cingulum is well developed. The molars are characterised by possessing well modelled protocone and a highly developed rounded antecrotchet: the inner end of the protoloph assumes therefore the form of an assymetrical trifolium; the protocone widens considerably at its base, especially in M^3, its lateral sides being concave, not flat. The inner end of the metaloph is patterned similarly to that of the protoloph, but in a less pronounced degree; the crotchet is well developed, the crista being wanting.

P^1 — first premolar — is wanting.

P^2 — second premolar — possesses a crown transversely elongated, becoming narrower inwards, with the flat outer side much inclined inwards, and the inner rounded. The transverse crests are unequal: the protoloph being less developed and shorter than the metaloph with which it unites at its inner end as a result of trituration; the metaloph is much widened at its inner end which has an angular outline (having as it were a modelled tubercle at that end). The median valley is of an irregular triangular (trapezoidal) shape, the posterior valley being of a similar shape and of nearly the same size, but somewhat differently disposed. The ectoloph has a feebly developed parastyle; the usual external ridge is wanting (a very slight plication only may be observed), but a fore and a hind ridges occur along the borders of the outer face of the tooth.

The cingulum is well developed on the whole inner side of the tooth.

P^3 — third premolar — possesses a crown of a trapezoidal form, somewhat constricted inwardly with protolophs and metalophs equally developed; the former being provided with an indistinctly modelled small deuterocone (the anterior border of the protoloph is straight or nearly so), and a powerfully developed antecrotchet, generally fused with the protoloph; the latter widens inwardly and terminates in a constriction; the crotchet is either little developed or replaced by a small undulation of enamel. The median (closed) valley is sigmoidally curved. The posterior valley is fairly wide, being disposed obliquely. The parastyle is massive and feebly modelled. The external ridge is distinctly expressed, moreover, — there is a slight plication of the posterior half of the outer side of the tooth and a ridge running along its hind border.

The cingulum is well developed (especially in D 399) running on one level on the inner side.

P^4 — fourth premolar — is in general similar to the preceding, although slightly larger. The transverse crests are of the same shape, the metaloph being somewhat thinner than the protoloph; the crotchet is better developed, although not invariably. Thus, in D 399 it is nearly deficient in the right tooth, being largely developed in the left P^4. In D 2 the crotchet is fairly well developed in both teeth. The valleys are the same as in P^3. The parastyle, as well as the external ridge, are better modelled; the posterior part of the ectoloph seems to have a greater inclination inwards.

The cingulum in D 399 is developed similarly to that in P^3; in D 2 it has all but disappeared, persisting only on the anterior and posterior sides and at the entrance of the median valley, in that respect approaching the molars.

M^1 — first molar — in much abraded specimens (D 399) bears an antecrotchet that is bulkier than the modelled protocone; while in little worn teeth it is hardly discernible, the protocone remaining more or less constant in size. The trilobed form of the inner end of the metaloph is better developed in specimens more subject to abrasion; in little worn teeth but deep grooves model the median lobe. The crotchet inclined forwards is small. The median valley is widely expanded, but in much worn specimens the antecrotchet is contiguous with the plication of the metaloph, and separates the valley into two parts. The hind valley is triangular and widely expanded posteriorly: in much worn teeth it is closed behind, and assumes the aspect of a wide fissure elongated in a backward direction; the parastyle and the external ridge are well developed.

The cingulum persists on the fore and hind sides only: at the entrance of the median valley it is absent.

M^2 — second molar — while retaining the same features, differs from M^1: 1) in a somewhat less pronounced modelling of the inner ends of the transverse crests; as M^2 is invariably less worn than M^1, the more feebly developed plications become more conspicuous, and 2) in a more developed crotchet, bordered outwardly by the deeply depressed end of the median valley in the form of an acute loop; when little abraded the crotchet and the remaining part of the crest (its worn part) are subequal in size, but with progressing abrasion the crotchet rapidly diminishes, while the remaining part of the crest (its worn surface) increases.

M^3 — third molar—has a wide protoloph and a narrower metaloph: the antecrotchet is but feebly developed, even in much abraded specimens, its base, as in the preceding teeth, being curved towards the inner side of the tooth, and in M^3 filling up the wide entrance of the median valley. The metaloph possesses a groove modelling its inner end not only on the side of the median valley, but being sometimes well defined on its outer side; this form of the inner end, however, is not well expressed on the surface of abrasion: the crotchet may be likened to a small acute fold placed perpendicularly to the metaloph of the tooth. The parastyle and the powerful external ridge are well developed.

The cingulum is much better developed than in the other molars, as it is prolonged over the borders of the inner ends of the transverse crests on the inner face of the tooth, constituting a nodular partition in the entrance of the median valley. The cingulum is strongly developed on the inner half of the posterior side of the tooth, and sometimes forms a very strong spine.

Dimensions (in millimeters)

Length of the skull from crista occipitalis to the end of nasalia .	? 440
Width of frontal region	>150
Height of occiput (from lower border of the for. magnum)	about 200
Length of nasalia	170—180
Size of condyles	65× 35

№№		P 2 left	P 2 right	P 3 left	P 3 right	P 4 left	P 4 right	M 1 left	M 1 right	M 2 left	M 2 right	M 3 left	M 3 right
2	Length . .	?29	—	37	—	40	41	46	46	48	47	52	51
	Width . .	?40	—	49	—	53	52	55	52	57	56	51	51
	Height . .	27	—	35	—	41	41	38	34	39	40	44	41
								M 1 — M 3 = 130					
399	Length . .	28	26	36	34	38	37	—	42	—	54	—	56
	Width . .	?	38	45	45	49	48	52	52	—	54	—	50
	Height . .	16	15	25	23	29	31	25	25	—	35	—	38
								M 1 — M 3 = 131					

Affinities and peculiarities. In the structure of the dental system and of the nasal bones, the form under description is referable to the subfamily *Teleocerinae;* such a conclusion, as we shall see further, is confirmed by the occurrence of abbreviated limb bones in the specimens obtained from Jilančik.

Among *Teleocerinae* a European branch, *Brachypotherium* Roger, and an American, *Teleoceras* Hatcher, are being distinguished; and latterly, a third branch, *Chilotherium* Ringström, has been established[1] which similarly to the *Brachypotherium* has an Eurasiatic range.

The author of the last genus characterises in detail all the three genera; in his opinion they constitute a single genetic group (one subfamily), but have differentiated in various ways, partly in connection with dissimilar conditions of existence.

The form described should be referred to the genus *Brachypotherium*; of the representatives of this genus it is most nearly allied to *Brachypotherium aurelianense* Nouel.

[1] Ringström. Nashörner von Hipparion-Fauna Nord-Chinas, Paleontologia sinica, (C), v. I, no. 4.

From this latter form, besides separate teeth and bones of the extremities, a very well preserved skull is now in the Paris Museum (Jardin des Plantes), and two other skulls, not in so good a state of preservation, are preserved in the Museum of the École des Mines in Paris, and at the Geological Institute of the Strassburg University, all three, as the major part of the other remains, proceeding from the same sandy deposits (sables de l'Orléanais) at Neuville des Bois.

The first and the second skulls have been described by Mayet[1], who likewise gives an historical account of our knowledge of this form. Mayet's description does not contain details which are given below from personal observation.

The skull from the Paris Museum is somewhat larger than that here described, for its length from the occipital crest to the end of the nasals reaches 495 *mm*. However, if the deformation of the Jilančik skull (its nasal bones are upturned and forcibly thrust into the frontals) be borne in mind, the actual difference in size between the two skulls would be much less considerable; similarly, the length of the nasals in both specimens ought not to differ much. The general forms of the nasal bones (in the Paris specimen the nasal bones fuse together at their anterior swollen end, as is apparently the case in the specimen described) are perfectly similar, although the anterior end of the nasal bones in the Paris specimen is more swollen: as a matter of fact, in the region of the swelling (with the rough surface for the attachment of the horn) the nasals are 63 *mm* wide by 45 *mm* deep, the corresponding dimensions in our specimen being 55 and 35 *mm*. This difference cannot be accounted for by the two skulls belonging to individuals of opposite sexes, as the presence of the roughened surface implies that both specimens belonged to males. The occipital part of the skull under description, owing to its having been subject to much crushing, is at first sight very dissimilar from the Paris specimen; on closer examination, however, it is capable of being so reconstructed as to assume the form of that flat and broad piece which is distinctive of the occipital portion of the Orleans form; the foramen magnum of the latter is somewhat different, being transversely elongated, whence the condyles are widely separated: these difference may, however, be due to deformation of the Jilančik skull.

In the ear region of the Paris skull the proc. paroccipitalis has not been fully preserved: its lower part has been broken off on both sides; it is

[1] Mayet. Étude des mammifères miocènes des sables de l'Orléanais, Lyon, 1908.

represented as an anteriorly concave thin plate provided with a crest behind; it is produced into a shorter, but somewhat more massive post-tympanic process which projects outwards, representing as it were an immediate continuation of the flat occipital region of the skull; the post-tympanic process is not contiguous with the postglenoid process, from which it is separated by a noticeable fissure. In the skull under discussion the shape of these two processes fully answers to the above description, the post-tympanic process being, however, thrust on to the postglenoid process (see above). At present, it remains an open question whether such a situation of the processes could not be due to deformation.

The nasal bones of the Strassburg skull (in a state of inferior preservation to that of the Paris specimen) in the dimensions of their swollen anterior end approach more closely to the skull under discussion. In its frontal region the skull is fractured, so that the nasals cannot be measured, yet in the plane of fracture the pneumatisation of that region may be observed. The structure of the occipital and auditory regions is exactly similar to that of the Paris specimen, the occipital shield being somewhat wider: thus, in the specimen from the École des Mines it is 190 *mm* in height and 230 *mm* wide, whereas in that of Strassburg the width exceeds 250 *mm*, the height being the same.

As regards the dental system, the Paris skull has very much worn teeth, and their structure is better seen in a separate fragment of the upper jaw which is preserved in the same Museum. The degree of wearing of the teeth in this specimen is moderate, being somewhat greater than in our № 399; on the contrary, the teeth of the Strassburg skull are less worn than in our № 2, but somewhat more so than in the skull from the École des Mines.

According to these specimens, the molars of *Br. aurelianense* are constructed exactly like those of our form, the dimensions of the teeth (including the height of the crown) in the Paris specimen being all but identical with ours, and in that from Strassburg somewhat larger (thus, the $M^1 + M^2$ have a combined length of 101 *mm* against 91 in our specimen, the $P^2 - P^4$ having correspondingly 100 and 90); neither do the premolars differ essentially from those in our specimen: as both in the Paris and Strassburg specimens, they are not provided with a typical crotchet — even in P^4 the latter is replaced by minor festoon-like plications which are especially well developed in the Strassburg teeth (smaller plications in P^2, larger in P^4). But in our specimens the crotchet appears in P^4 alone (and even in that tooth the presence of a crotchet does not constitute a constant feature) being replaced in the other teeth by plications (festooned). The antecrotchet in the Paris specimen is similarly developed to that of ours, being less so in the Strassburg teeth: thus, in P^3 it is modelled by a slight groove and situated nearly on the lingual side of the protoloph, while in P^4 the antecrotchet is more fully indicated.

It is worth noting, that these latter features (the incipient disappearance of the antecrotchet), in connection with a somewhat larger size of the teeth, places the Strassburg form as regards the degree of differentiation of the teeth somewhat higher in the evolutionary series than the Paris form (in *Br. brachypus* from the Middle Miocene the antecrotchet is generally known to be still further reduced); nevertheless, both specimens proceed from the same Orleans sands (Lower Miocene — Burdigalian), although possibly from different localities.

Skeleton. While setting aside a detailed examination of the skeleton of the Jilančik form till some future time when it may become the subject of a monographical description, we may now consider some of its more prominent features.

The fore limb is almost completely known (nearly all the bones of the left limb of one individual are preserved).

The scapula is so fragmentary (it is represented by a few pieces, №№ 894, 896, 903 + 893) that no exact idea of its construction can be formed. The anterior and posterior fossas are broad, and the spina is supplied with a very long tuber, recurved backwards. The tuber scapulae is placed very low down. Its general length reaches up to 400 *mm*, the width of the neck is about 80, the surface of articulation is 70 × 60 *mm*.

It may thus be assumed that the scapula is of the same type, as in the representatives of *Chilotherium* and *Teleoceras*;[1] a totally distinct form of scapula of the Oligocene representative of European short-legged Rhinoceroses, *Br. aginense* Rep.,[2] may be due to its having been reconstructed from incomplete remains.

Humerus (№№ 282, 268, 256) is a relatively wide bone (pl. I, fig. 3), with strongly developed deltoid ridge, teres tuberosity, etc.; tuberculum intermedium is much developed and considerably approximated to tuberculum

[1] Ringström, l. c., p. 61.

[2] Repelin. Les Rhinocératidés de l'aquitanien sup. de l'Agenais. Ann. Mus. d'Hist. N. de Marseilles, XVI, 1917.

minus. The distal articular surface is broad, with a wide reentering angle, and of small diameter. The bone is up to 340 *mm* in extreme length, the dimensions of the capitular condyle is 75 × 65 *mm*, the width of its distal end about 100, of its articular surface 85 (the cones being 60 and 40 *mm* respectively in diameter).

In comparison with other short-legged Rhinoceroses, the humerus in our form must be regarded as wanting in massiveness. In that respect it differs in a particular degree from *Chilotherium* (and *Teleoceras fossiger* ?), and much more nearly approaches *Br. aginense:* some specimens of the humerus of the latter have as highly a projecting deltoid ridge and as wide an angle of the distal articular surface.

The radius (pl. I, fig. 4) is represented by several specimens: the bone is much shortened, but not massive; a large corrugated depression on the fore side of its proximal end extends downwards and inwards throughout nearly one half of the bone; the ulna apparently joined to the radius throughout all but its entire length. The distal end is widely expanded, and its external border is swollen at the place of attachment with the ulna, where it is provided with a semicrescent-shaped articular surface. The distal articular surface is well elaborated; besides the usual articular surfaces: for the scaphoideum and for the lunatum, a small triangular articular surface (narrowed posteriorly) for the cuneiforme may be observed; it is contiguous with the ulnar articular surface, severing off the outer posterior angle of the distal end. The radius is 230—260 *mm* long, the width of the proximal end being 80 *mm*, of the distal 74 *mm*, length of distal articular surface 62 *mm*.

Fig. 1.

The ulna has not been preserved.

Like the humerus the radius, relatively far from being massive, in that respect approaches to the corresponding bone of *Br. aginense.* In passing it may be observed that the distal end of the radius in the latter form possesses a trace of a third articular surface (for the cuneiforme), being well developed in one specimen;[1] the structure of the articular surface of the distal end of the radius in *Br. aginense* thus seems to exhibit a transitional character to that of our form. The bones of *Chilotherium* are much more massive: the ulna is almost as powerful as the radius,[2] the distal end of the latter displaying the same peculiarity, i. e. three articular surfaces.

[1] This very specimen seems to have been figured in Repelin, l. c., pl. XII, fig. 5, although as mounted at present it differs from the figure.

[2] Ringström, l. c., p. 56.

The carpus is on the whole short (its breadth being twice its height); the entire carpus of the above mentioned left limb (see p. 281, fig. 1), subject to very slight deformation, exhibits, however, very poorly preserved articular surfaces. Both in the size and shape of bones it occupies an intermediate position between *Br. aginense* (the highest carpus) and *Br. brachypus* (the broadest). Not all its bones, however, present these proportions in an equal degree: the features referred to are most strikingly displayed by the os magnum, as well as the unciforme and scaphoideum, whereas both the trapezoideum and even lunatum are more indifferent. The os lunatum, however, is distinguished by the shape of its capitulum being cylindrical, while in *Br. brachypus* it approximates to a spherical form.

The carpus of *T. fossiger* is not so broad (its magnum is nearly of the same size as in our form), and some of its bones, especially the scaphoideum, as also the unciforme, are quite peculiar.

The metacarpalia are also of an intermediate character, more closely approaching the corresponding bones of *Br. aginense* than those of *Br. brachypus*: the bones in *Br. aginense*, having the same width, are somewhat longer; those of *Br. brachypus* are larger, having the same proportions in the length and width of the median metapodial, and somewhat reduced lateral metapodials; in all the distal ends are considerably more swollen.

In all three forms the lateral digits are in an equal measure slightly set back; in the form under discussion moreover the lateral digits are slightly spread outwards; the Mc_{IV} is even completely apposed to the Mc_{III}, but being crooked, its distal end points to the side; in *Br. brachypus* the lateral digits being more mobile, are more widely spread. Correspondingly, the lower articular surface of the lateral digits in the first form (as in *Br. aginense*) is asymmetrically, while that in *Br. brachypus* is symmetrically (and its Mc_{IV} is straight, not crooked) set.

A peculiar position in this respect is held by *Chilotherium*, in which the lateral digits are set (rotated) much further backwards, exhibiting in the meantime a considerable reduction in size. In *T. fossiger* the foot is constructed as in *Br. brachypus*, i. e. the digits spread, the Mc_{IV} is straight, its distal articular surfaces being more or less symmetrically disposed. As a peculiar feature in *T. fossiger* the presence may be indicated of two large foramina nutritia on the upper border of the lower articular surface, which latter (in skirting these foramina) assumes a festooned appearance. Similar foramina are observed in Mc_{III} of *Br. brachypus*, but here they do not modify the borders of the lower articular surface.

It may be noted besides that the distal end of Mc_{III} in *Br. brachypus*, and the proximal in *Chilotherium*, exhibit a tendency to swell; in *T. fossiger* an inconstancy in that respect is stated. Lastly, in the form under discussion the articular surface of Mc_{III} — Mc_{IV} is duplex, while in *Br. brachypus* it is single, being formed from the fusion of two surfaces (the same applies to *T. fossiger*).

It only remains to refer to the fifth metacarpale which in the form under discussion represents a fairly long bone of oval transverse section with much swollen ends of which the proximal is recurved backwards and bears the articular surfaces for the unciforme and Mc_{IV}; the distal articular surface is spheroidal, and is provided with a slight remnant of a keel at its posterior border.

That bone in *Br. aginense* is also very large, and is of the same general outline; the distal end bears a still more elaborated articular surface. This bone from *Br. brachypus* is unknown. In *T. fossiger* it is very much reduced (a small flat oval bone).

The phalanges are much abbreviated, with the exception of the third phalange of the middle digit, which has also the greatest breadth in its upper part, its general shape being all but semicircular. It is in this respect quite peculiar, as both in *Br. aginense* and *Br. brachypus* these bones are of the usual Rhinoceros type. The phalanges of the fifth digit are very much reduced, assuming the shape of small circular bones. In *Br. aginense* these phalanges are very much less reduced in size.

Dimensions (in millimeters)

Metacarpalia:	Mc_{III}	Mc_{II}	Mc_{IV}	Mc_{V}
Length	115 (109)	100	90	56
Width	42 (46)	30	32	14

Phalanges:		Middle digit	Second digit	Fourth digit
I	breadth	45	35	34
	height	17	20	20
II	breadth	46	35	36
	height	14	14	13
III	breadth	65	50	—
	height	37	25	25

Hind limb. — The pelvis has not been preserved.

Femur (№№ 315, 296). This bone (pl. I, fig. 5) is rather massive, with strongly developed trochanters: tr. major anterior has a well developed rough surface (all but reaching the head); tr. tertius is situated nearly in the middle of the length of the bone. Extreme length 390 *mm*, diameter of the head 65 *mm*, width of the bone in region of the trochanter tertius 97 *mm*.

The larger bone (length 500 *mm*) of *Br. aginense* is in general very similar to the described one. It differs in the less elaborated head in *Br. aginense*, as also in the structure of its distal end: in *Br. aginense* its frontal measurement is considerably greater than its sagittal measurement, while in ours the two are equal; in *Chilotherium* the bone is more massive (broader). In *Br. aurelianense* the femur is exceedingly like that one under description, but is somewhat bulkier: extreme length 430 (390), least width 60 (55) *mm*.

Tibia (extreme length 245—250, width 40, width of proximal end 95, of distal end 75—80 *mm*) is a short straight bone (pl. I, fig. 6) with much swollen ends, especially the proximal one: tuberositas tibiae is powerfully developed and reflected outwards. The distal end is subject to greater expansion outwards than inwards; the distal articular surface consists of two portions of subequal size and depth, and of the same width throughout its entire length.

In its general shape the bone in *Br. aginense* is very similar to this one (the same proportion in length between femur and tibia subsisting in both), the latter, however, is more massive, and its upper end is considerably more swollen. The tibia in *Br. aurelianense* is exactly similar, but like the femur somewhat larger (its length being 270 *mm*); as well as in our form, the distal end is expanded outwards. The bone in *Br. brachypus* is considerably larger (its length being above 300 *mm*). The bone in *Chilotherium* is likewise larger (its length reaching 280 *mm*), with a wider lower part.

Of the fibula there is but one specimen (lenth 230 *mm*), belonging to a tibia of a somewhat larger size than the above described one.

Tarsus. — The most typical bone, the astragalus, is distinguished by its stouted (not high) form and strongly developed trochlea; its articular surface descends lower than usual on its posterior side; the discs are subequal, but the groove of the trochlea is asymmetrical, the calcaneal articular surfaces are separated from one another: the middle facet by a deep depression from the upper one which is but slightly concave; the lower is small, and forms an obtuse angle, with the articular surface for the cuboideum.

Dimensions (in millimeters)

Height	59
Breadth	61
Diameter of discs	49—45

The bone in *Br. aginense* is but slightly larger, and the trochlea does not reach so far back. In *Br. brachypus* the bone likewise is not high, the discs are broad, the trochlea asymmetrical, the calcaneal articular surfaces of the same shape as in our form, exhibiting a tendency to the fusion of superior facets (№ 4803 in Stuttgart). The bone in *T. fossiger* is more closely related to the one described, while exhibiting, on the other hand, a slight concavity in the trochlea. In *Chilotherium* the bone is higher, and the trochlea does not descend posteriorly, the calcaneal articular surfaces are divided.

The calcaneum is a short and very much swollen bone (length 109, width 67 *mm*); the fibular articular surface is small.

The bone in *Br. aginense* is very similar, though slightly larger. In *Br. brachypus* it is distinguished by the same features. In *T. fossiger* the bone is relatively longer. The bone in *Chilotherium* is very similar to that in our form.

The remaining tarsalia offer no interesting peculiarities.

The metatarsalia display a greater degree of differentiation than the metacarpalia: Mt_{III} is considerably shorter than Mc_{III}, and its lower head exhibits a perceptible swelling; in *Br. brachypus* the latter feature is revealed also in the fore limb, while Mt_{III} is still more abbreviated in comparison with Mc_{III}. In both features mentioned, *Br. aginense* exhibits much less differentiation (Mt_{III} equals Mc_{III} in length and has a less swollen distal end). In this group of forms the lateral digits remain apposed to the middle digit, and do not exhibit a marked reduction in size (in *Br. brachypus* the distal border of Mt_{II} in the hind foot is situated on the same level with Mt_{III}); the distal articular surfaces of the lateral digits are correspondingly oblique.

It should also be noted that in the form described, Mt_{IV} is longer than Mt_{II}, whereas in *Br. aginense* and *Br. brachypus* this ratio is reversed. Finally, in the group under discussion, a tendency towards the formation on the Mt_{IV} of the facet for the cuneiforme (i. e. an elevation of Mt_{IV} relatively to Mt_{III}) is exhibited.

Dimensions (in millimeters)

		Length	Width
Metatarsale	III	106—93	42—34
»	IV	81	28
»	II	80—78	27—25

In *T. fossiger* the differentiation of the hind foot proceeds further than in *Br. brachypus*, the lateral digits (remaining apposed to the middle digit) being more abbreviated. In this form, in opposition to what is observed in the European group, a tendency to form facets for the cuboideum in Mt_{III} (a sinking of Mt_{IV} relatively to Mt_{III}) is exhibited.

It may further be remarked that in the form described the articular surfaces in Mt_{III}—Mt_{II} are separated, while in *Br. brachypus* they unite in one facet.

The hind foot of *Chilotherium* differs from all the others mentioned by a considerable reduction of the lateral digits.

The hind foot in *Br. aurelianense,* as may be judged from the specimen of the Paris Museum, disfigured by exostasis, apparently closely resembles the foot under description: the Mt_{III} seems to be somewhat longer and wider (113 and 42 *mm*), but its general shape, and the distribution of the corrugated surfaces are identical; the length of the lateral digits could not be measured (width Mt_{IV} — 29, and Mt_{II} — 28 *mm*).

From the foregoing description it may be concluded that the Turgai form is very closely related to the *Br. aurelianense* from the Orleans sands (the Burdigalian); but certain dissimilar features in the structure of the skull and of the skeleton, mainly in the shape and size of the nasalia and in the auditory region, forbid their being completely identified: it would be therefore more correct to regard the Turgai form at present as being a variety (local race) of the European. In the structure of the dental system our form is most closely related to the Paris specimen, and not to that of Strassburg (as apparently more highly differentiated). The above stated affords ground for admitting that our form cannot be more recent than the Burdigalian age.

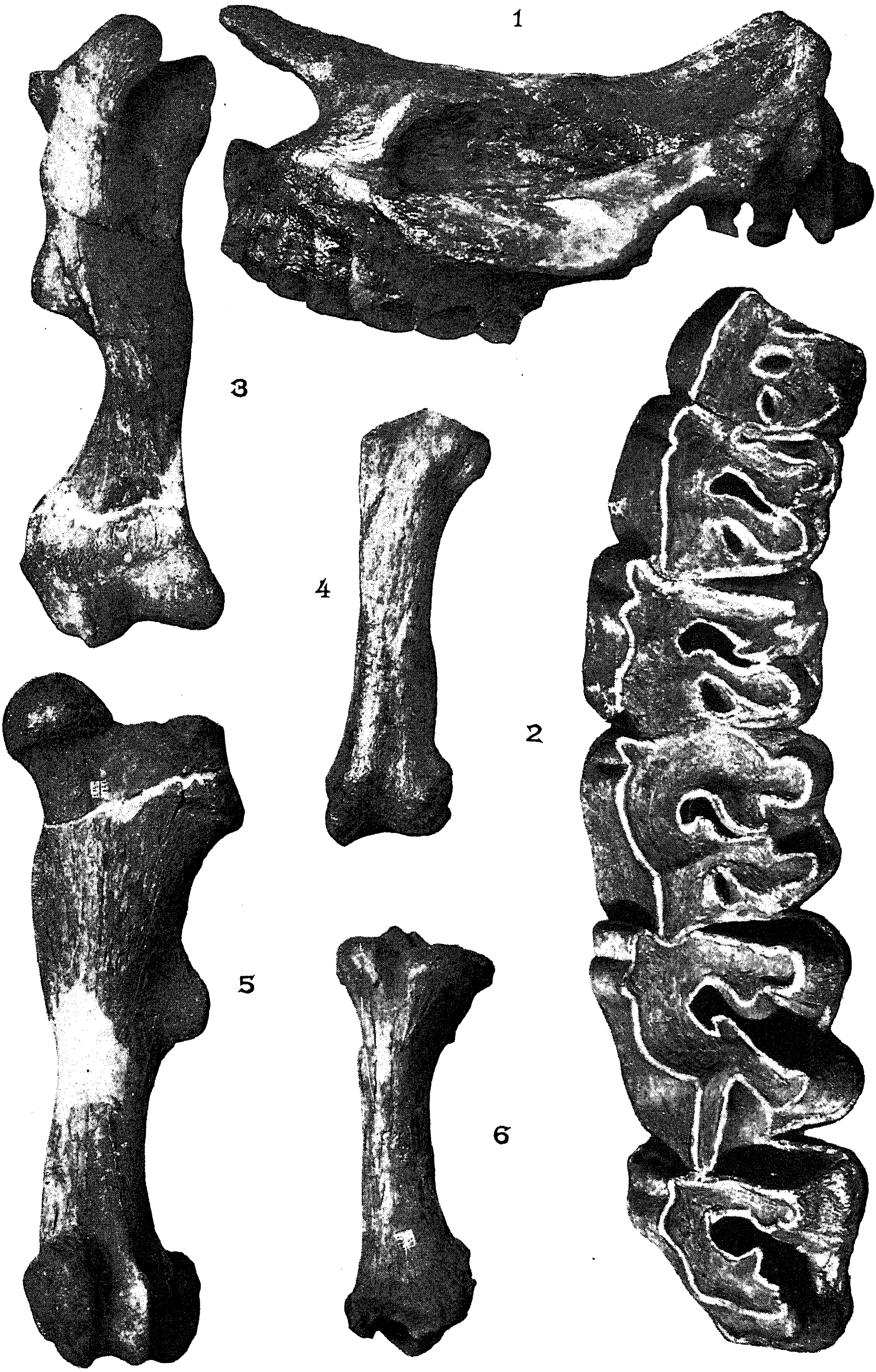
While the taxonomic position of the Turgai form was being ascertained, some information throwing light on the morphology of the whole group of short-legged Rhinoceroses has been obtained. This information can as yet be presented in the form of certain preliminary observations.

To begin with, the details presented above on structure confirm the establishment of the three branches mentioned differentiated in several directions. There can be no doubt of the affinity of the Jilančik form to the *Brachypotherium* branch, in which it occupies a perfectly definite position between the Upper Oligocene *Br. aginense* and the Middle Miocene *Br. brachypus*. The specialisation of this branch is distinctly perceived in the structure of these three forms, as regards the abbreviation of the limbs, and as increasing mobility of the digits; in this process, the hind limb has overtaken the anterior extremity; the spreading of the lateral digits seems to be more developed in the fore limb, and probably results from the greater weight of the fore part of the body, demanding more reliable support in treading upon soft ground. But does the Jilančik form exhibit features that are not shared by it with the other forms of the same series? In other words, does it occupy a position in the main line of development of this branch, or are there grounds for assuming that it may be regarded as being a lateral offshoot of that line? Towards this latter conclusion the following particulars may seem to lead: the structure of the hoof of the fore limb, which is more equine than typical for a Rhinoceros, and the extraordinary development of the articular surface of the trochlea of the astragalus. Neither the one nor the other feature have been referred to in the description of the Orleans form, in want of which in examining the specimens themselves this matter could not be sufficiently closely entered into. The first of these two features cannot be regarded as being connected with possible adaptations of this group, as in *Br. brachypus* it is wanting, and perhaps it would be more correct to consider both features as tending to indicate a superior swiftness in the gait of the Jilančik offshoot of the *Brachypotherium* branch as compared with its European allies.

December 23—1926.

Plate I

A. Borisyak (A. Borissiak). *Brachypotherium aurelianense* Nouel, var. nov. *Gailiti*, from the Miocene deposits of the Turgai region.



1. — Restored skull; 2. — Upper cheek teeth, right side, $P^2 - M^3$; 3. — Humerus; 4. — Radius; 5. — Femur; 6. — Tibia.