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The Canadian Field-Naturalist

VOL. XLVI OTTAWA, CANADA, MAY, 1932 No. 5

*TWO NEW THEROPOD DINOSAURS FROM THE BELLY RIVER FORMATION OF ALBERTA**

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OBSERVANT collectors and students of vertebrate palæontology, who have studied the Belly River and Edmonton faunas fully realize that, in spite of the many fine dinosaurian specimens which have been collected from these beds in recent years, many forms are still imperfectly known. Perhaps the light-limbed theropods are among the least known of these dinosaurs. Three genera of light-limbed theropods have been described from the Belly River formation of Alberta but only one, *Struthiomimus*, is represented by a considerable part of the skeleton. The scarcity of fossilized remains of these forms may be due partly to the frailness of the bones and in part to a possible upland habitat. As these beds are essentially delta and flood-plain deposits complete skeletons of the animals, which lived back from the streams or far away from the deltas, would seldom be buried intact. In view of the scarcity of such remains it was with great satisfaction that, during the field season of 1928, the writer discovered, in the Belly River formation of Alberta, two distinct, undescribed, forms of light-limbed theropods.

Classification and Discussion

Vertebrate palæontologists do not fully agree on the classification of the Theropoda. Gilmore[1] and Nopcsa[2] refer the deinodonts to the Megalosauridæ whereas Matthew and Brown[3] and Huene[4] regard them as more nearly related to the Ornithomimidæ. Gilmore and Matthew and Brown refer *Ornithomimus* and *Cœlurus* to distinct families, the Ornithomimidæ and Cœluridæ while Nopcsa refers both to the family Compsognathidæ. For the purpose of this paper the deinodonts, ornithomimids and cœlurids are regarded as representing distinct families all of which are somewhat closely related.

Gilmore regards *Ornitholestes* as a synonym of *Cœlurus* (loc. cit., p. 127) and Matthew and Brown state that there can be no doubt that they are closely related and "that the characters of the cœlurid group can therefore be defined from *Ornitholestes*". For the present however the generic name *Ornitholestes* will be retained.

One of the specimens about to be described (Cat. No. 8538) is referred to the Ornithomimidæ and the other (Cat. No. 8539) to the Cœluridæ.

Some of the outstanding differences between the Ornithomimidæ and the Cœluridæ, as shown in the feet, are as follows. In the Ornithomimidæ the metacarpals are of subequal length and their distal ends are rounded. Metatarsals II and IV are long, slender and subequal in length whereas III is longer and much broader at the distal end but the shaft is greatly reduced proximally and almost, or quite, pinched out between the enlarged proximal ends of II and IV. In the Cœluridæ the metacarpals are of unequal length, slender, have deeply grooved, ginglymoid distal facets and metatarsal III is not reduced proximally. In the Deinodontidæ the median metatarsal is reduced proximally as in the Ornithomimidæ whereas the metacarpals, though proportionately very different, resemble the Cœluridæ in being of unequal length and having deeply grooved distal facets. It is most likely, as suggested by Matthew and Brown, that these three families were derived from a common ancestor.

Osborn states that the known Ornithomimidæ are confined to the Upper Cretaceous[5] but von Huene (loc. cit. p. 98) is inclined to the opinion that they had a much longer range.

The Ornithomimidæ are represented in the Belly River rocks by *Struthiomimus altus* (Lambe) and *S. samueli* Parks. A very fine skeleton of *S. altus*, in which most of the important parts of the skeleton are shown, was described by Osborn in 1916 (loc. cit.). The only representatives of the Cœluridæ to be thus far reported

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[1] Gilmore, C. W., Bull. 110, U.S. Nat. Mus. 1920. p. 116.

[2] Nopcsa, Baron F., The Genera of Reptiles, Palæobiologica, Band 1, 1927, p. 113.

[3] Matthew, W. D., and Brown, B., Bull. A.M.N.H. New York, Vol. 46, Art. VI. 1922.

[4] Huene, F. von, Revista des. Museo de La Plata, Toma 29, 1926, pp. 90-107.

[5] Osborn H. F., Bull. A.M.N.H. New York Vol. 35, 1916, p. 738.

from the Belly River formation were described by Gilmore under the name *Chirostenotes pergracilis*[6].

A third adequate type of small theropodus dinosaur, from the Belly River formation, was described by Matthew and Brown[7] as *Dromæosaurus albertensis* and placed in a distinct subfamily, the Dromæosaurinæ which was provisionally referred to the Deinodontidæ. This species was based on a considerable portion of the skull with teeth and some foot bones. Unfortunately none of the skull or teeth is preserved with the specimens here described and the foot bones, preserved with the type of *Dromæosaurus*, have been temporarily misplaced so they are not available for comparison but, as will be shown later, neither of the specimens, here described, can be referred to that genus. There are disarticulated phalanges, in the Geological Survey collections, which are quite unlike those of either of the new species under consideration but which may pertain to *Dromæosaurus*.

In 1865 Leidy described a light-limbed theropod[8] from the greensands of New Jersey as *Cœlosaurus antiquus*. The types are (1) a complete tibia and (2) portions of tibia and metatarsal and phalanges. Matthew and Brown state that "It would appear that this genus is closely allied to *Struthiomimus* Osborn, and *Ornithomimus* Marsh, and perhaps identical with one or both". (loc. cit. p. 374). The external face of the distal end of the tibia of specimen No. 8538 has a moderately broad flat surface whereas Leidy's illustration shows the external edge of the distal end of the tibia of *C. antiquus* as making an acute angle. The phalanges of Leidy's second specimen are proportionately shorter than those of No. 8538. As the second specimen about to be described is a cœlurid there is little chance of its being congeneric with *C. antiquus*.

In 1924 Osborn described three new genera of small theropods from beds of Lower Cretaceous age in Mongolia[9]. It is very fortunate that in each of these types a fine skull, jaws and foot bones are preserved. Aside from the great geographical difference and the difference in age between the Mongolian beds from which Osborn's types were collected and the Belly River beds in Alberta, it seems clear that the Alberta specimens are quite distinct from those from Mongolia.

The two phalanges figured by Osborn as part of the type of *Velociraptor mongoliensis* appear to be very much like homologous bones of *Chirostenotes pergracilis*. The association, in *Velociraptor*, of very narrow, slender, penultimate phalanx and very narrow, strongly decurved ungual with the long slender dentary shows that Gilmore was probably correct in referring the long slender Belly River dentaries to *Chirostenotes*. *Velociraptor* appears to be more nearly like *Chirostenotes* than either of the genera here described and might well be regarded as ancestral to *Chirostenotes*.

Osborn's second type *Saurornithoides mongoliensis* is quite different from either of the specimens here described as shown by comparison of the hind feet, the phalanges of which are much shorter than in No. 8538 and of very different proportions from those of No. 8539. The third Mongolian specimen described by Osborn, as *Oviraptor philoceratops*, appears also to be quite distinct from the Belly River forms. The very peculiar modification of the skull at once removes it from the Cœluridæ and the manus is so different from that of *Struthiomimus* that there is little probability of specimen No. 8538, which is an ornithomimid form, being congeneric with *Oviraptor*. Though Osborn refers *Oviraptor* to the Ornithomimidæ he points out that the extremely elongate second digit is analogous to that of *Ornitholestes* and of *Chirostenotes* rather than to that of the more symmetrical digits of *Struthiomimus*.

Macrophalangia canadensis, gen. et sp. nov.

Plate I, Fig. 1.

Type: No. 8538, Geological Survey of Canada, consists of the distal extremity of the right tibia with part of the astragalus, two incompletely preserved distal tarsals, and a complete right hind foot except part of the proximal halves of metatarsals III and IV.

Locality and horizon. South end of deep cut on C.N.R. grade about 2 miles south-west of the mouth of Berry Creek (Steveville), Red Deer River, Alberta: about 100 feet below top of Belly River formation, Upper Cretaceous.

Characters. External edge of distal end of tibia moderately broad and flat; pes long and slender; Mt. III reduced in proximal portion but visible from front view; Mt. I developed distally; Mt. V represented by small proximal splint; phalanges long and slender; digits II, III and IV about equal, in length, to corresponding metatarsals; unguals long, pointed, narrow superiorly and decurved.

The external edge of the distal end of the tibia of No. 8538 is of moderate breadth and flat or slightly concave. This flat surface is 15 mm. broad and at right angles to the longer axis of the

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[6] Bull. No. 38, Geol. Surv. of Can. 1924. pp. 1-12, pl. 1.
[7] Bull. A.M.N.H., Vol. 46, 1922, pp. 383-5.
[8] Leidy J., Smith. Contr. to Knowl. Vol. 14, p. 100, Pls. 3, Fig. 3 and 17, Figs. 6-11; 1865.
[9] Osborn, H. F., Amer. Mus. Novitates No. 144. Nov. 1924.

PLATE NO. I

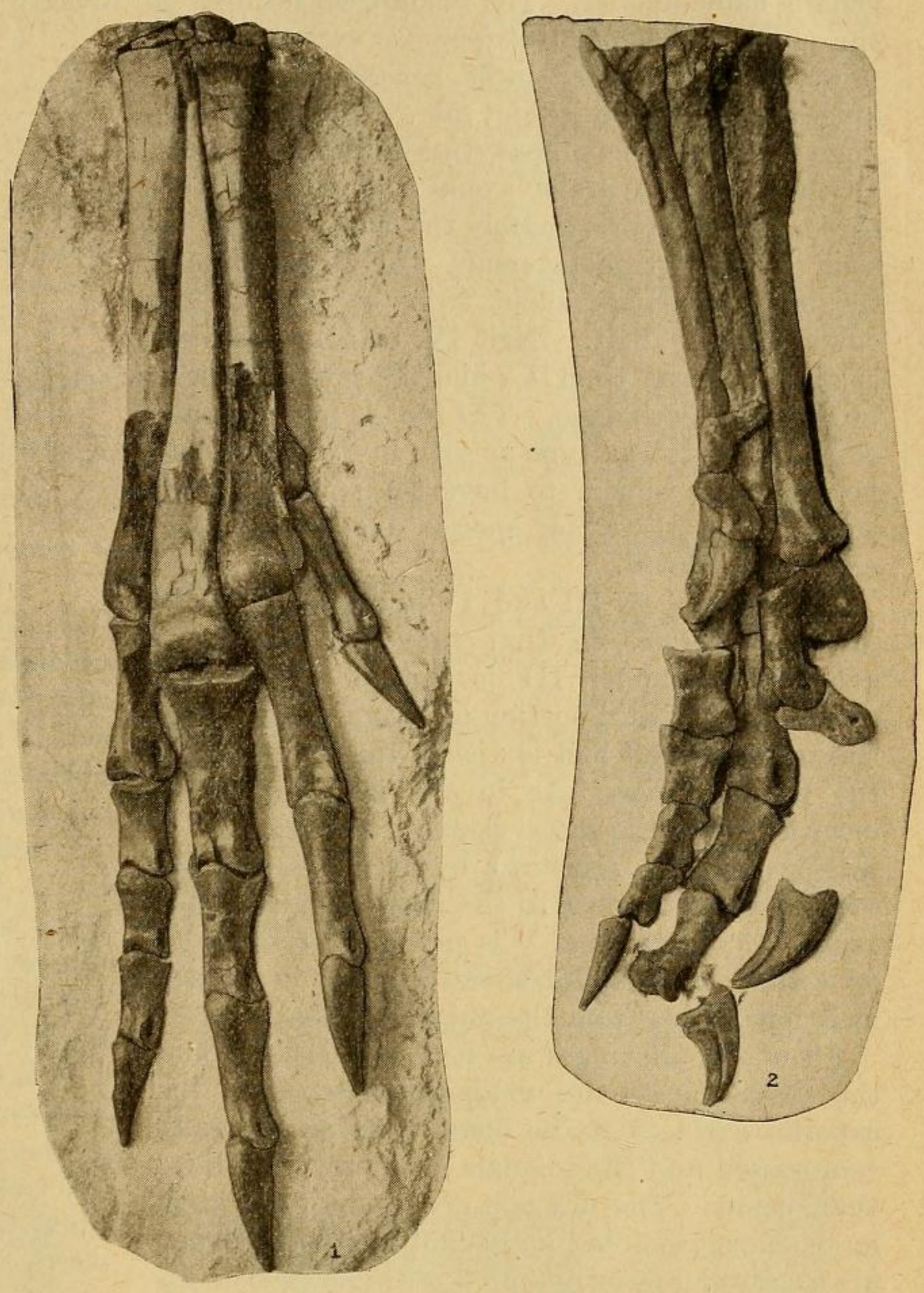


FIGURE 1. FIGURE 2.

FIGURE 1.—*Macrophalangia canadensis*, Type No. 8538, Geological Survey, Canada. ¼ natural size.

FIGURE 2.—*Stenonychosaurus inequalis*, Type No. 8539, Geological Survey, Canada. Slightly less than ¼ natural size.

distal end of the bone except at the posterior angle of the extremity where it rises to the somewhat enlarged external condyle. The breadth of this face is more than half the greatest fore and aft diameter of the distal end of the bone.

Except for the great difference in size the astragalus seems to more nearly resemble that element in *Gorgosaurus* than in *Struthiomimus*. Much of the ascending process is missing so its height can not be given.

The extreme proximal ends of all the metatarsals are preserved, except the anterior face of IV. All the elements of the foot were naturally articulated and beautifully preserved. Digit No. IV was partly folded under No. III and some of the phalanges had suffered slight crushing but these have been restored. This digit was moved slightly but the rest of the bones are preserved as found. Plate I, Figure 1, in which the restoration of the proximal ends of Mts. III and IV is shown in lighter colour, gives a very good idea of the foot except for metatarsal V which is completely hidden from view by the restoration of metatarsal IV.

The proximal end of metatarsal III is preserved and shows as a small, laterally compressed, tip very similar to the homologous portion of this bone in *Struthiomimus altus* except that it was visible from the front view. The tip is preserved for 20 mm. but the rest of the upper three-fifths of this bone was destroyed by erosion. The preserved portions, however, show conclusively that the median metatarsal was reduced in its proximal portion, trigonal, and the inferior sides were appressed to the lateral metatarsals. The metatarsals are long and slender and the phalanges are very long.

While this genus is clearly distinct from *Struthiomimus* and *Ornithomimus*, as shown by the presence of digit I, the greatly elongated phalanges and the decurved unguals, it would appear to be referable to the family Ornithomimidæ. Of course there is the possibility of its falling within the subfamily Dromæosuarinæ but this is not considered probable because, if the foot bones, preserved with the type of *Dromæosaurus*, pertain to the pes they appear to be totally different from those of *Macrophalangia canadensis*. On the other hand if they pertain to the manus, as believed by Matthew and Brown, they would appear to be very different from what one would expect in an animal with such long slender digits, in the hind foot, as are seen in *M. canadensis*. No figure of these foot bones was published but their description by Matthew and Brown and their further discussion by Gilmore (loc. cit. pp. 3-4) seems to show clearly that they pertain to an animal which was structurally very unlike that here described.

The most outstanding feature of the pes of *Macrophalangia canadensis* (Plate I, Figure 1) is the long slender phalanges, to which the

generic name alludes. The phalangeal formula is the same as that of *Struthiomimus* except for the presence of digit I but in *M. canadensis* the phalanges are all much longer, more slender, and the unguals are more compressed laterally, and curved. Digits II and IV are subequal in length and all three are of approximately the same length as their respective metatarsals. In *Struthiomimus* the metatarsals are about twice as long as the corresponding digit. Digit IV, of *M. canadensis* is slightly longer than II while the reverse is true in *Struthiomimus altus*. The foot is not a highly developed cursorial type as seen in *Struthiomimus* nor would it appear to have the same grasping power as in the other species about to be described (No. 8539).

Metatarsals II, III and IV differ from those of *Struthiomimus* in that they are less elongated and number III is not so broadly expanded in its distal portion or so much reduced in the proximal half and is visible throughout from the anterior view. As in the deinodonts and cœlurids, only the distal portion of metatarsal I was developed. As shown by its position in the rock, it was attached to the lower half of metatarsal II. Metatarsal V is preserved proximally as a small round splint about 60 mm. in length. It is not visible from the anterior view.

All of the phalanges are long and slender and the distal facets are moderately grooved, the superior surfaces of the distal ends are laterally compressed and the unguals are narrower above than below. The unguals are moderately high, long, sharply pointed and slightly curved. They are narrower inferiorly than those of *Struthiomimus* but broader than those of specimen No. 8539. All of the unguals have well defined lateral grooves. These grooves are quite narrow and deep in the distal portion but as they proceed backward they become shallower and broader and finally terminate before reaching the infero-proximal angle. The tips of the unguals were so frail and so badly cracked that it was not possible to save them. The measurements given for these bones are, therefore, the estimated lengths.

MEASUREMENTS OF PES

Width of three metatarsals proximally	56 mm.
Width of three metatarsals distally	70 mm.
Width of metatarsal III	35 mm.
Length of Mt. II	205 mm.
" " " III	230 mm.
" " " IV	212 mm.
" " articulated digit I	100 mm.
" " " " II	190 mm.
" " " " III	220 mm.
" " " " IV	200 mm.
" " phalanx 1 of digit I	58 mm.
Length of phalanx 1 of digit II	78 mm.
" " " 2 " " II	63 mm.
" " " 3 (ungual) of digit II about	60 mm.
" " " 1 of digit III	75 mm.
" " " 2 " " III	52 mm.
" " " 3 " " III	58 mm.
" " " 4 (ungual) of digit III about	60 mm.
" " " I of digit IV	59 mm.
Greatest height of ungual of digit II and III	23 mm.
Greatest breadth of ungual of digit II and III	16 mm.

Stenonychosaurus inequalis gen. et sp. nov.

Plate I, Fig. 2; Plates II and III

Type: No. 8539, Geological Survey of Canada, consists of distal end of tibia with astragalus; complete left hind foot ; left metacarpal I; distal end of (?) Mc. II; distal ends of three phalanges of the manus and six more or less complete caudal vertebrae.

Locality and Horizon: N.W. ¼ Sec. 21, T. 21, R. 12, W. of 4th principal meridian, about 2½ miles south-west of the mouth of Berry Creek (Steveville), Red Deer River, Alberta. About 160 feet below the top of Belly River formation, Upper Cretaceous.

It is quite evident that the greater part of the skeleton was buried intact as shown by the presence of fragments of different parts, but all but the left hind foot and the distal end of the tibia, with astragalus, had weathered out before discovery. The foot lay prone and was completely exposed and badly weathered on the upper surface but, except for the unguals of digits II and III, the elements were all naturally articulated. Plaster of Paris was mixed with water and poured over the foot. This kept all the bones in position and, when set, took the place of the rock. The specimen was then prepared from the other side and thus nothing was disturbed or lost and most of the important details were preserved. Most of the phalanges of digit IV were split longitudinally and there is a possibility that in mending these the proximal two may have been slightly broadened. Plate I, Fig. 2, shows the specimen very well, as it was found and is preserved, and Plate III is a drawing, in perspective, made by Mr. A. Miles. It is drawn at about three-quarter side view and gives a very good idea of the peculiarly specialized digit II.

Stenonychosaurus inequalis falls within the family Cœluridæ as shown by the slender proportions; the short, stout, divergent Mc. I with deeply grooved, ginglymoid, distal facet; the

long slender manus and the non-reduction, proximally, of Mt. III.

Characters. Slender proportions; bones of feet hollow but not extremely thin walled; Mc. I very short, strongly divergent distally, with deeply grooved ginglymoid distal facet; phalanges of manus elongate; Mt. III not reduced proximally; Mts. I and V present; Digit I short, Digit II much shorter than III or IV and peculiarly specialized; distal ends of penultimate phalanges deeply grooved; ungual of Digit II very large; unguals high proximally, laterally compressed and strongly decurved; distal caudal centra not hollow, but long and slender, inferior surface longitudinally grooved; articular faces of caudals amphiplatyan.

Stenonychosaurus appears to most nearly resemble *Ornitholestes* though there is no doubt as to its generic distinction as shown by the much greater size; thicker bone wall; unequal length of the digits of pes; compressed ungual phalanges of the pes and amphiplatyan caudal centra.

FRONT FOOT

Metacarpal I (Pl. II, fig. 1) resembles that of *Ornitholestes hermani* as figured by Osborn[10]. It was closely appressed to Mc. II throughout most of its length but the distal facet was strongly divergent The main shaft of the bone is roughly triangular in cross section with the apex directed outward. The distal end is enlarged and has a deeply grooved ginglymoid facet. This metacarpal differs from Mc. I of *Chirostenotes pergracilis* in being much shorter and stouter, having a more greatly enlarged and more divergent distal end and a thicker bone wall.

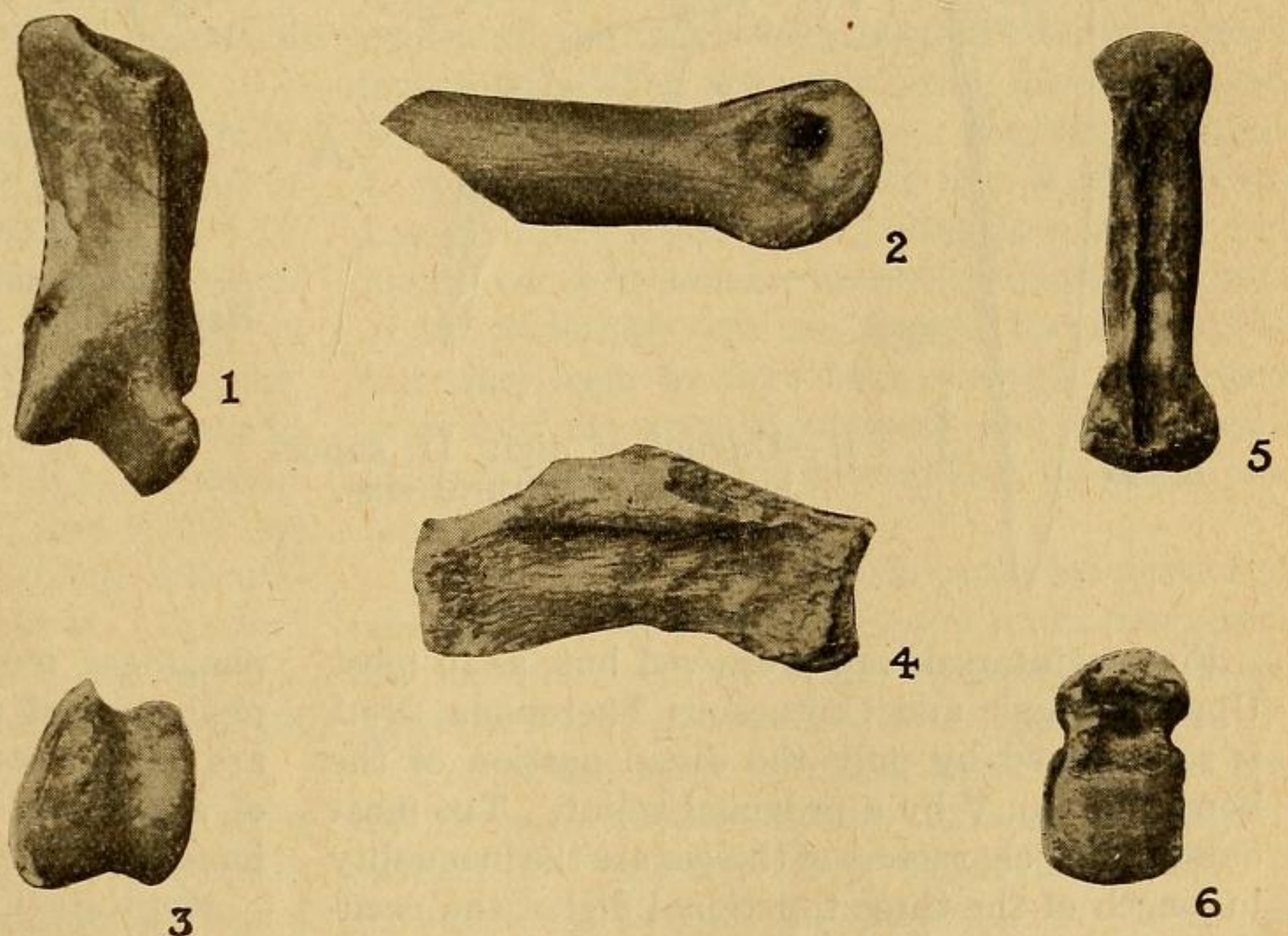
The distal ends of three phalanges and one (?) metacarpal are preserved and indicate a long slender manus. One of these is larger than the others and more deeply grooved. It probably represents the distal extremity of Mc. II. It is possible that digit III was reduced as in *Ornitholestes* and *Chirostenotes* and that no parts of it are preserved with the specimen but there are no very slender phalanges present. The most complete of these phalangial fragments (Pl. II, Fig. 2) resembles phalanx 2 of digit II of *Chirsotenotes pergracilis* but is slightly larger and has a much thicker bone wall. It probably was fully as long as in *Chirsotenotes*. The distal facet is not so deeply grooved as in the metacarpal but the articulating surface extends well down and back as in *Chirostenotes* ,and suggests considerable grasping power. Fig. 3 of Pl. II shows the distal end of another phalanx which may represent No. 1 of digit II. As in No. 2 of this digit, it is not as deeply grooved as the metacarpal. The articulating surface extends farther back on the superior face but not so far inferiorly. It is slightly broader than No. 2 but considerably narrower than what is regarded as Mc. II.

It is possible that, when more is known of this genus and of *Chirostenotes*, they may prove to be congeneric but this is not considered probable because the great difference in Mc. I, and the thickness of the bone wall of the phalanges of the manus, would suggest a very different manus in the two genera and probably when more homologous parts are discovered they will show many other differences.

HIND FOOT

The distal end of the tibia is of somewhat lighter

PLATE NO. II



Stenonychosaurus inequalis, Type No. 8539, Geological Survey, Canada. Natural size.

FIGURE 1.—Metacarpal I. Superior view.
FIGURE 2.—Phalanx of manus. Side view.
FIGURE 3.—Distal end of phalanx of manus.
FIGURE 4.—Distal caudal centrum. Side view.
FIGURE 5.—Distal caudal centrum. Inferior view.
FIGURE 6.—End view of distal caudal centrum.

[10] Osborn, H. F. Skeletal Adaptations of *Ornitholestes, Struthiomimus, Tyranosaurus*. Bull. A. M. N. H., Vol. 35, 1916, Fig. 3.B.

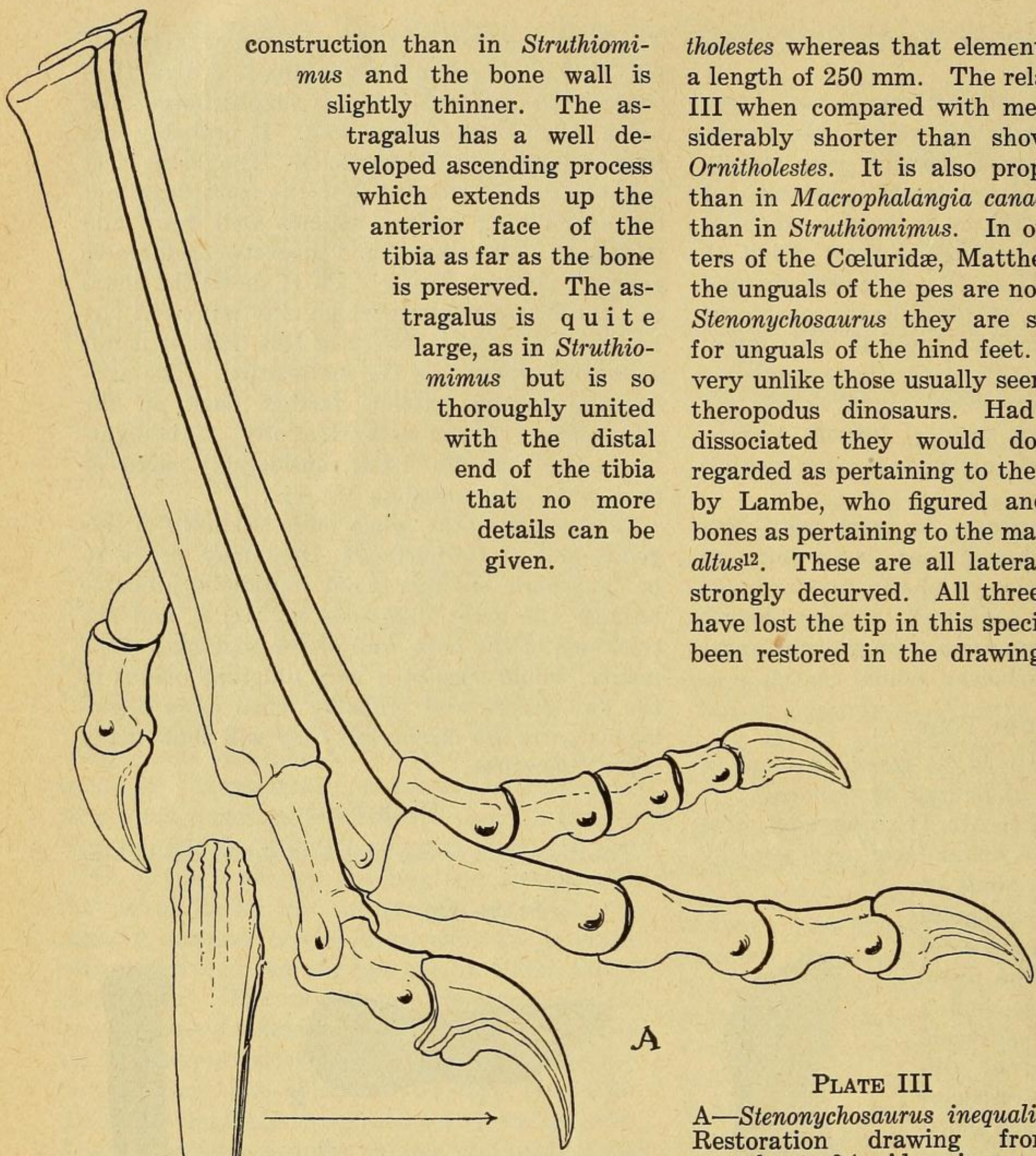


PLATE III

A—*Stenonychosaurus inequalis*. Restoration drawing from about ¾ side view. ½ natural size.

B—Ungual of digit II, superior view. Natural size.

construction than in *Struthiomimus* and the bone wall is slightly thinner. The astragalus has a well developed ascending process which extends up the anterior face of the tibia as far as the bone is preserved. The astragalus is quite large, as in *Struthiomimus* but is so thoroughly united with the distal end of the tibia that no more details can be given.

Five metatarsals are preserved but, as in most Upper Jurassic and Cretaceous Theropoda, No.I is represented by only the distal portion of the bone and No. V by a proximal splint. The most outstanding characters of the pes are the inequality in length of the three functional digits, the peculiar specialization of the second digit and the lateral compression of the ungual phalanges to which the generic name alludes.

Comparison of the hind feet, would suggest that *Stenonychosaurus inequalis* was about twice as large as *Ornitholestes hermani*. Osborn[11] gives a length of 117 mm. for metatarsal III of *Ornitholestes* whereas that element in *S. inequalis* has a length of 250 mm. The relative length of digit III when compared with metatarsal III is considerably shorter than shown by Osborn for *Ornitholestes*. It is also proportionately shorter than in *Macrophalangia canadensis* but is longer than in *Struthiomimus*. In outlining the characters of the Cœluridæ, Matthew and Brown state the unguals of the pes are not compressed but in *Stenonychosaurus* they are strongly compressed for unguals of the hind feet. These unguals are very unlike those usually seen in the hind feet of theropodus dinosaurs. Had they been found dissociated they would doubtless have been regarded as pertaining to the manus as was done by Lambe, who figured and described similar bones as pertaining to the manus of *Ornithomimus altus*[12]. These are all laterally compressed and strongly decurved. All three functional unguals have lost the tip in this specimen but these have been restored in the drawing. The lateral compression is about the same throughout the depth of the unguals thus differing from *Macrophalangia*, *Struthiomimus* and *Gorgosaurus* in all of which the unguals are much broader at the base. The lateral grooves are very shallow and run from the inferoproximal angle to the tip. The distal facets of the penultimate phalanges are deeply grooved but in the other phalanges of digits III and IV the distal facets are gently concave laterally. The foot was not of a strongly developed cursorial type but must have had considerable grasping power.

Metatarsal I is quite small. There is no sign of a facet on Mt. II for its attachment but it is probable that it is not much displaced in the specimen and that in life it occupied a position on the postero-external side of Mt. II as in the

[11] Osborn, H. F. Bull. A.M.N.H., Vol. 35, p. 737, 1916.

[12] Osborn and Lambe. Cont. to Can. Pal., Vol. 3, Pt. II, 1902. Pl. 14, Fig. 10-11.
Lambe, L. M. The Grasping Power of the Manus of *Ornithomimus altus*. *The Ottawa Naturalist*, Vol. 18, oN. 2, 1904.

Deinodontidæ. When compared with *Macrophalangia* the first phalanx of digit I is very short and stout. The ungual is of moderate size slightly curved and laterally compressed.

Metatarsal II is much shorter than Mt. III or IV. It is only 210 mm. long whereas III is 250 mm. and IV 240 mm. in length. Phalanx 1 of digit II is of moderate length, the distal end has a deeply grooved facet and is slightly rotated outward. As a result of the great development, well up on the anterior face, of the distal articulating facet the anterior face of this phalanx is concave. In the walking position this bone must have been almost perpendicular for when articulated it extended only a short distance below the distal end of metatarsal III. Phalanx 2, when naturally articulated, was almost at right angles to No. 1 and carried all the weight of digit II, phalanx 1 of this digit scarcely touching the ground. The lower part of the proximal articulating surface of phalanx 2 is continued backward as a long lip, making the lower surface of this bone much longer than the upper. This bone is slightly compressed superiorly and the distal end is deeply grooved. Phalanx 3 is much larger than the other unguals, is strongly curved and laterally compressed.

Digit II of the pes of this species has been very well illustrated and described by Lambe in *The Ottawa Naturalist* for May, 1904. Lambe regarded his specimen as pertaining to the manus of *Ornithomimus* (*Struthiomimus*) *altus* and described its grasping power.

Metatarsal III is the longest bone of the foot. It is not reduced in its proximal portion but is of about the same dimensions as Mts. II and IV except the distal end which is somewhat larger than in the others. The distal end is not as broad as in the Ornithomimidæ or Deinodontidæ. Phalanges 1 to 3 of digit III gradually decrease in length and thickness but not to the same extent as in *Struthiomimus*. Phalanges 1 and 2 are low and moderately broad and their distal articulations resemble those of *Struthiomimus*. Phalanx 3 is somewhat narrower and the distal facet is deeply grooved. Phalanx 4 resembles the ungual of digit II but is much smaller.

The phalanges of digit IV are proportionately longer than in *Struthiomimus* and shorter than in *Macrophalangia*. They are moderately broad and low. The ungual is smaller than that of digit III and slightly less curved.

MEASUREMENTS OF PES

Length of Mt. I	85 mm.
" " " II	210 mm.
" " " III	250 mm.
" " " IV	240 mm.
" " digit II (articulated)	125 mm.
" " " III	190 mm.
" " " IV "	150 mm.
" " ungual of digit II (tip restored) about	55 mm.
Height of " II proximally	30 mm.
" " " III "	27 mm.
Greatest thickness of ungual of digit II	12 mm.
" " " III	12 mm.

CAUDAL VERTEBRAE

Pl. II. Fig. 4, 5, 6

Six partly complete distal caudal vertebrae are preserved with the specimen. The centra are long, slender and subrectangular in cross section. None of these vertebrae is hollow and the dense outer portion of the bone is quite thick. When viewed from the side (Pl. II, Fig. 4) the caudal centrum is quite flat-sided and concave below. On the inferior surface a well developed, longitudinal trench extends the whole length of the centrum (Pl. II, fig. 5). As they proceed forward and the bodies of the centra broaden this trench widens but is of about the same depth and the thickness of the side walls does not vary much. This trench or groove is of uniform depth and continues the whole length of the centrum shallowing only when the articulating face is reached. The articular ends are square or very slightly higher than broad. The anterior face is flat and the posterior face is flat or very slightly convex. The neural canal is circular and very small. In none of the vertebrae are the zygapophyses complete but they seem to have been strongly developed, especially the prezygapophyses, and the posterior caudals were probably interlocked by these prolongations.

The main movement in the posterior portion of the tail was probably an up and down movement as the interlocking of the zygapophyses would prevent freedom of action from side to side.

The structure of both the front and hind feet of *Stenonychosaurus* seems to suggest that it should be regarded as a direct descendant of *Ornitholestes* though the difference in the caudal vertebrae might be against this suggestion. The caudal vertebrae of *Ornitholestes* are given as amphicœlus while those of *Stenonychosaurus*, in the distal region at least, are amphiplatyan. More complete specimens of this Belly River form should assist greatly in determining its relationships.