



Additions and corrections to Sternberg's San Juan Basin collection, Paleontological Museum, University of Uppsala, Sweden

Robert M. Sullivan and Thomas E. Williamson
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ADDITIONS AND CORRECTIONS TO STERNBERG'S SAN JUAN BASIN COLLECTION, PALEONTOLOGICAL MUSEUM, UNIVERSITY OF UPPSALA, SWEDEN

ROBERT M. SULLIVAN¹ and THOMAS E. WILLIAMSON²

¹Section of Paleontology and Geology, The State Museum of Pennsylvania, Third and North Streets, P.O. Box 1026, Harrisburg, PA 17108-1026; ²New Mexico Museum of Natural History and Science, 1801 Mountain Road, NW, Albuquerque, NM 87104-1375

Abstract—The Charles H. Sternberg fossil collection at the Paleontological Museum (Institute) of the University of Uppsala, Sweden is supplemented and revised. We correct errors introduced by Mateer (1981) and Hunt et al. (1992), include previously omitted material, and note discrepancies. Among the more notable corrections is the catalog number of the holotype of *Parasaurolophus tubicen*, a specimen previously unnumbered yet cited with a preoccupied collection number. Several theropod specimens are reported and documented in this collection for the first time.

INTRODUCTION

Recently, we had the opportunity to study the holotype of *Parasaurolophus tubicen*, and other fossil vertebrates collected by Charles H. Sternberg in the San Juan Basin of New Mexico, housed in the collections of the Paleontological Museum of the University of Uppsala (PMU), Sweden. During the course of our investigation, we came across omissions, discrepancies and errors that pertain to the numbering and identification of catalogued and uncatalogued specimens in this important collection reported by Mateer (1981) and Hunt et al. (1992). Here, we correct these records and report on important, previously overlooked, fossil vertebrates in the University of Uppsala collection made by Sternberg.

Owing to the present condition of the collection, some uncertainty remains regarding the corresponding field numbers and locality information of some of the specimens. However, we believe that this present contribution will help to clarify the data concerning this collection. In this article, Barrel Springs = De-na-zin Wash and Meyers Creek = Ah-shi-sle-pah Wash.

ADDITIONS AND CORRECTIONS

In 1981, Mateer reported on the large reptilian fossils collected by Charles H. Sternberg under the direction of Carl Wiman, Curator, Paleontological Museum (Institute) of the University of Uppsala, Sweden. Mateer (1981) and later Hunt et al. (1992) introduced numerous numbering errors in their reporting of this collection. Here we provide a list of additional specimens from the Upper Cretaceous and lower Paleocene of New Mexico in the Paleontological Museum's collection (Appendix 1) and figure selected specimens (Fig. 1). We also provide corrections to the numbering errors for catalogued specimens (Appendix 2) and uncatalogued specimens in this collection (Appendix 3).

Among the most significant numbering errors introduced by Mateer (1981, p. 52) and followed by Hunt et al. (1992), was the number PMU.R222 cited for the holotype of *Parasaurolophus tubicen*. During the course of our study of the Sternberg collection at the Paleontological Museum, we discovered that this number had been previously assigned to another specimen, a section of ceratopsid frill (*Pentaceratops?*). Moreover, the holotype of *P. tubicen* had never been numbered (catalogued). At our request, Dr. Solwieg Stuenes, Curator, Paleontological Museum, has given the number PMU.R1250, which we report here as the number of the holotype of *P. tubicen*.

DISCUSSION

Mateer (1981, p. 72) commented on the lack of specimens representing carnivorous dinosaurs, ankylosaurs and putative *Torosaurus* in the Sternberg collection, attributing this to collecting bias. Our survey of the collection (see appendices) revealed numerous specimens referable to theropods and one specimen referred to the Ankylosauria. Theropod specimens include numerous isolated teeth referable to tyrannosaurids and dromaeosaurids, a partial dentary referred to the Tyrannosauridae (Fig. 1C–D), and numerous dromaeosaurid phalanges (Fig. 1E). A single dermal armor fragment from the Kirtland Formation is referable to the Ankylosauria. No specimens can be referred to the ceratopsian *Torosaurus*. However, much of the ceratopsian material is fragmentary and cannot be identified beyond the level of family.

This revised description of the Sternberg collection in Uppsala, Sweden, indicates that in terms of taxonomic diversity, it resembles other vertebrate fossil collections from the Fruitland and Kirtland Formation made from surface collecting. This suggests that Sternberg did not significantly bias the collection by not collecting smaller or fragmentary specimens.

ACKNOWLEDGMENTS

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REFERENCES

- Hunt, A. P., Lucas, S. G. and Mateer, N. J., 1992, Charles H. Sternberg and the collection of Late Cretaceous vertebrate fossils from the San Juan Basin, New Mexico: New Mexico Geological Society, Guidebook 43, p. 241–250.
 Mateer, N. J., 1981, The reptilian megafauna from the Kirtland Shale (Late Cretaceous) of the San Juan Basin, New Mexico; in Lucas, S. G., Rigby, J. K. Jr. and Kues, B. S. eds., *Advances in San Juan Basin paleontology*: Albuquerque, University of New Mexico Press, p. 49–75.

APPENDIX 1

Additions to the Paleontological Museum's catalogued specimens. The following specimens were not listed by Mateer (1981) or Hunt et al. (1992). They are listed here along with associated pertinent locality information. Those listed previously by a different number are noted accordingly.

ANKYLOSAURIA

PMU.R229, dermal armor fragment, Kirtland Formation, Barrel Springs

CERATOPSIDAE

- PMU.R76, rib, San Juan County
 PMU.R87, rib, San Juan County
 PMU.R220, left squamosal (*Pentaceratops* sp.)
 PMU.R221, incomplete right squamosal (*Pentaceratops* sp.)
 PMU.R222, right squamosal (*Pentaceratops* sp.) [this number was erroneously assigned to *Parasaurolophus tubicen* by Mateer, 1981, see above]
 PMU.R224, quadrate
 PMU.R225, right horn core
 PMU.R226, cf. *Pentaceratops* sp., left dentary fragment, San Juan County
 PMU.R227, right dentary fragment, south side of Alamo Wash, 3 mi south of Hunter's Store, San Juan County
 PMU.R228, left dentary, south side of Alamo Wash, 3 mi south of Hunter's Store, San Juan County
 PMU.R268, dentaries, articulars and postcranial skeleton referred to *Pentaceratops sternbergii*

HADROSAURIDAE

- PMU.R55, dentary fragment, 2 mi south of Kimbeto
 PMU.R56, right articular/surangular, 2 mi south of Kimbeto
 PMU.R57, dentary fragment, 2 mi south of Kimbeto
 PMU.R58, dentary, 2 mi south of Kimbeto
 PMU.R62, right surangular
 PMU.R63, left maxillary fragment
 PMU.R65, vertebra, Kirtland Formation, 3 mi south of Kimbeto
 PMU.R66, vertebra, Kirtland Formation, 3 mi south of Kimbeto

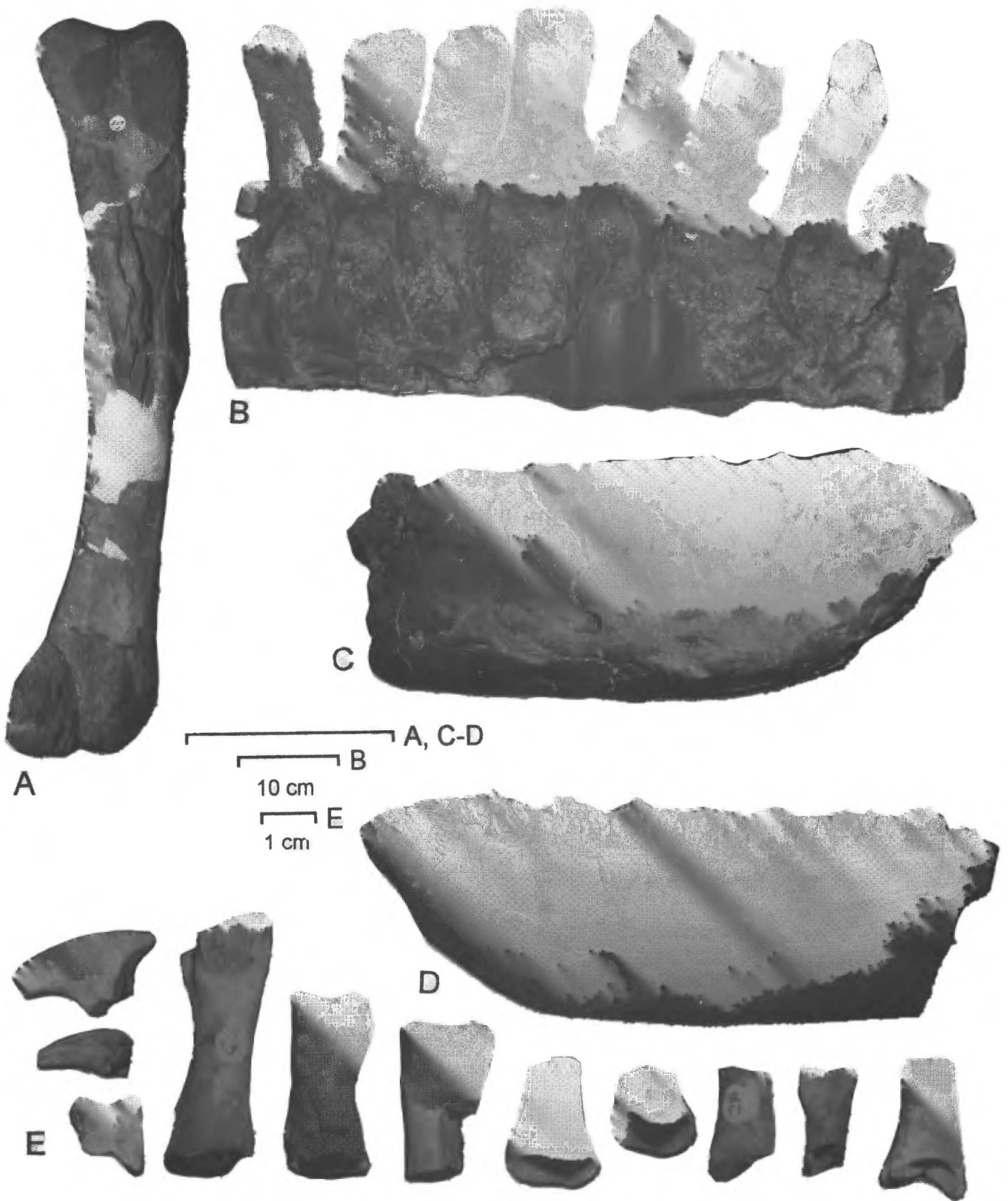


FIGURE 1. Selected specimens from the Charles H. Sternberg fossil collection from the San Juan Basin, New Mexico at the Paleontological Museum (Institute) of the University of Uppsala, Sweden. A, PMU.R207, right juvenile hadrosaur? femur in posterior view. B, PMU.R67, hadrosaur sacrum in left lateral view. C–D, PMU.R35, tyrannosaurid partial right dentary in lateral (C) and medial (D) views. E, miscellaneous, dromaeosaurid pedal phalanges.

- PMU.R67, sacrum, San Juan County (Fig. 1B)
 PMU.R68, vertebra
 PMU.R69, R71, & R72, incomplete vertebrae (no locality data)
 PMU.R73, vertebra, Kirtland Formation, 2 mi south of Kimbeto
 PMU.R74, vertebra, Kirtland Formation, 2 mi south of Kimbeto
 PMU.R75, caudal vertebra, south side of Meyers Creek, 4 miles above cattle ranch
 PMU.R76-R87, (?Hadrosauridae) incomplete ribs
 PMU.R88, chevron, Kirtland Formation, 2 mi south of Kimbeto, San Juan County
 PMU.R89, chevron, south side of Meyers Creek, 4 mi above cattle ranch
 PMU.R90,R91, two chevrons, Kirtland Formation, 2 mi south of Kimbeto, San Juan County
 PMU.R93, sternum (previously listed as PMU.R245 by Mateer, 1981, p. 57, pl. 3.2, fig.5.)
 PMU.R94, pubis, south side of Meyers Creek, 4 mi above cattle ranch (previously listed as PMU.R244 by Mateer, 1981, p. 57, pl. 3.2, fig. 1)
 PMU.R95, left ischium, 2 mi south of Kimbeto, San Juan County (previously listed as PMU.R236 by Mateer, 1981, p. 57, pl. 3.2, fig. 2)
 PMU.R96, left humerus (previously listed as PMU.R223 by Mateer, 1981, p. 57, pl. 3.2, fig. 4)
 PMU.R201, left femur (juvenile) [not the phalange figured in Hunt et al., 1992, p. 244, fig. 1d]
 PMU.R203, metatarsal
 PMU.R207, right femur (juvenile) ?hadrosaur, Kirtland Formation (Fig. 1A)
 PMU.R209, metatarsal
 PMU.R211, phalanx
 PMU.R213, vertebra, Barrel Springs, 2 mi south of trading post
 PMU.R214, vertebra, Kirtland Formation, San Juan County
 PMU.R215, vertebra, Kirtland Formation, San Juan County
 PMU.R216, right ilium (previously listed as PMU.R231 by Mateer, 1981, p. 57, pl. 3.2, fig.3.)
 PMU.R217, (?hadrosaur), partial right scapula, Kirtland Formation, 2 mi south of Kimbeto
 PMU.R218, (?hadrosaur) phalanx, Kirtland Formation, San Juan County
 PMU.R219, (?hadrosaur) phalanx 3 mi west of Kimbeto

TESTUDINATA

- PMU.R24j-k, *Neurankylus*, caudal vertebrae
 PMU.R24l & m, *Neurankylus*, ?fragments of left pelvis
 PMU.R24n, complete right femur
 PMU.R24o, pectoral girdle
 PMU.R24p, distal end of humerus
 PMU.R24q, right pelvis
 PMU.R34, plastron (in jacket)

THEROPODA

- PMU.R35, (tyrannosaurid) partial right dentary, San Juan County (Fig. 1C-D)
 PMU.R36, (tyrannosaurid) tooth, San Juan County
 PMU.R37, caudal centrum, Kirtland Formation, Kimbeto, San Juan County
 PMU.R38, (dromaeosaurid) phalanx, Meyers Creek (near *Pentaceratops* locality)
 PMU.R39, (dromaeosaurid) phalanx, 2.5 mi south of Barrel Springs Trading Post
 PMU.R40, (tyrannosaurid) ungual phalanx from pes, Kirtland Formation, Kimbeto Wash, San Juan County
 PMU.R41, phalanx, south side of south branch of Alamo Wash (3 mi from Hunters Store)
 PMU.R42, incomplete caudal centrum, south side of south branch of Alamo Wash (3 mi from Hunters Store)
 PMU.R47, R48, R51, R52 (dromaeosaurid) miscellaneous pes phalanges, San Juan County (Fig. 1E)

TITANTANOSAURIDAE (=Alamosaurus sanjuanensis)

- PMU.R172, sacral and caudal vertebrae, near Barrel Springs (previously listed as PMU.R280 by Mateer, 1981, p. 58, text-fig 3.2, [left figure] and Hunt et al., 1992, p. 250)
 PMU.R173, cervical vertebrae, near Barrel Springs
 PMU.R174, left ilium, near Barrel Springs (previously listed as PMU.R281 by Mateer, 1981, p. 58, text-fig. 3.2, [right figure] and Hunt et al., 1992, p. 250).

INDETERMINATE MATERIAL

- PMU.R76, rib, San Juan County
 PMU.R87, rib, San Juan County
 PMU.R92, chevron

UNCATALOGUED MATERIAL

- Paleocene gar scales
 Paleocene alligator scutes, 3 mi north of Kimbeto
 Cretaceous (Kirtland Formation) *Myledaphus* sp. teeth
 Cretaceous *Amia* (4 vertebrae), south side of Meyers Creek, 4 mi of above cattle ranch

APPENDIX 2

Corrections to the Paleontological Museum's catalogued specimens. The following specimens, listed by Hunt et al. (1992) in their Appendix 4, need to be corrected and are annotated accordingly. Corrections are placed in brackets. Misnumbered specimens have been noted above and are not repeated here, nor are the corresponding specimen citations provided by Hunt et al. (1992).

- PMU.R18[b], plastron
 PMU.R19, plastron [and carapace]
 PMU.R20a, [carapace] [20b plastron]
 PMU.R22[a], carapace
 PMU.R24c-[i], cervical vertebrae
 PMU.R26a, carapace [and plastron]
 PMU.R26b, [pelvic girdle]
 PMU.R28 [carapace]
 PMU.R201, [femur]

APPENDIX 3

Corrections to the Paleontological Museum's uncatalogued specimens. The following is an annotated list of those uncatalogued fossil specimens listed by Hunt et al. (1992) in their Appendix 3, whose description and/or identification differs from their published account. Annotations are bracketed. In addition to the specimens listed below, are numerous unnumbered specimens among which include *Amia* vertebrae, hadrosaur phalanges, a dromaeosaurid tooth, and gar scales.

- [No. 5. *Baena nodosa* (carapace and plastron), Ojo Alamo]
 [No. 6. *Baena nodosa* (carapace and plastron) Barrel Springs, 2.5 mi south of trading post; *Aspideretes* fragments, on the wash near No 62.]
 No. 8. [turtle fragments, 2 boxes]
 No. 16. several large vertebrae (dorsal) [and rib]
 No. 17. [*Baena nodosa*]
 No. 18. [hadrosaur caudal centrum (2 boxes) and turtle]
 No. 25. [plastron]
 No. 27. [turtle]
 No. 30. [hadrosaur] dorsal and sacral centra
 No. 31. [turtle scrap]
 No. 34. [petrified wood]
 No. 36. [ceratopsian vertebral centra (two boxes)]
 No. 43. *Baena nodosa* 2/3 of carapace and plastron. Same loc. [near No. 49]
 No. 44. turtle [plastron] fragments [Barrel Springs, 2.5 mi south of trading post]
 No. 52. [crocodilian mandible]
 No. 54. metatarsal [near No. 42]
 No. 66. [hadrosaur phalanx]
 No. 73. [near No. 68]
 No. 77. turtle fragments, locality 1/4 mi below 60 loc. [centrum, Alamo Wash]
 No. 78. [also theropod phalanx, crocodilian vertebrae and *Amia* vertebrae]
 No. 98. [centrum]
 No. 100. hadrosaur metatarsal, caudal vertebra [and phalanx]
 No. 103. hadrosaur femur and other bones [=centra]
 No. 112. [turtle]
 No. 113 [fossil plants]