

THE PALEONTOLOGY OF THE DENVER QUADRANGLE COLORADO

J. HARLAN JOHNSON¹

INTRODUCTION

During the seventies, eighties, and early nineties of the last century, a number of publications appeared containing information on the paleontology and geology of the region around Denver. The Denver monograph of Emmons, Cross and Eldridge² assembled the information as known up to about 1890. Since that time numerous new fossils have been collected and much has been learned about the stratigraphic range and occurrence of many forms.

The object of this paper is to present lists of all the fossils known from the Denver quadrangle, arranged according to the formations in which they were found, and to discuss interesting and important facts concerning some of them.

The information presented has been obtained from published literature, from material in the collections at the University of Colorado, Colorado School of Mines, the Colorado Museum of Natural History, and United States National Museum. The writer wishes to thank Junius Henderson, F. M. Van Tuyl, Harold Cook, E. W. Berry, J. B. Reeside, Jr., C. W. Gilmore and H. Koener for information supplied and courtesies shown.

LOCATION AND GENERAL GEOLOGY

The area considered is that included in the U. S. Geological Survey topographic sheet of the Denver quadrangle. The table given below shows the formations present, their sequence, thickness, and general character.

¹Associate Professor of Geology, Colorado School of Mines, Golden, Colorado.

²Eldridge, G. H., Emmons, S. F., and Cross, W., Geology of the Denver Basin: U. S. Geol. Survey, Mon. 27, 1896.

AGE	FORMATION	THICKNESS	GENERAL CHARACTER	
Recent			Gravels along streams.	
Quaternary			Alluvium and terrace gravels, and loess.	
Eocene (?)	Denver	1400	Sandstone, conglomerate, chiefly andesitic debris.	
	Arapahoe	600	Sandstone, conglomerate, and clay. [Disconformity] _____	
Upper Cretaceous	Laramie	600+	Sandstones, shales, clays and lignite seams.	
	Fox Hills	800+	Friable sandy shales. Sandstone at the top.	
	Pierre	4500	Lead-gray shales, sandy near the top. Lenticular limestone and sandstone layers.	
	Niobrara	450	Gray calcareous shales, thin chalky limestone, yellow to buff shales near the top.	
	Benton	400	Dark, lead-colored shales.	
	Dakota		50	Hard, massive sandstone, hard with fissile shale.
			150	Conglomerate at base, hard massive sandstones, sandy shales, and fire clays. [Disconformity] _____
	Jurassic	Morrison	200	Green to gray shales, lenticular limestone and friable sandstone.
Permian (?)	Lykins	600	[Disconformity] _____ Brick red sandy shales and sandstone. Thin limestone and gypsum beds.	
Pennsylvanian	Lyons	200	Massive cross-bedded, cream-white sandstone.	
	Fountain	1200—	Red sandstones and conglomerate with interbedded shales. [Unconformity] _____	
Algonkian and Archean			Gneisses, schists, and granites.	

PALEONTOLOGY

Fountain Formation—To date no fossils have been found in this formation within the limits of the Denver quadrangle. Marine fossils of Pennsylvanian age are known from the western part of the Fort Collins quadrangle about 75 miles to the north, and both land plants and marine fossils have been obtained in the area west of Colorado Springs to the south.

Lyons Sandstone—No fossils have been obtained in the Lyons in the Denver quadrangle. A few footprints of Amphibians have been found north of Boulder near the town of Lyons.

Lykins Formation—A few marine fossils of Permian age have been found in the Lykins in northern Larimer County, but none have been obtained in the area considered in this paper.

Morrison Formation—The Morrison formation is a continental deposit. The fossils found in the Denver quadrangle include plants and vertebrates. In adjoining areas, fresh water invertebrates have been obtained.

Numerous plant fragments can be found in some of the shales around Golden and Morrison. No determinable specimens have been collected from the lower portions to the writer's knowledge. A number of years ago, W. T. Lee obtained a small collection of plants from beds which Cannon declared were included in the upper portion of the type section at Morrison as originally divided. However, Knowlton, who studied the plants, declared that they were typically Dakota, and Lee on stratigraphic grounds has questioned the Morrison age of these beds. The plants will be discussed under the Dakota flora.

The outcrops at Morrison were early famous for their dinosaurs, this being one of the first localities in which large dinosaurs were found in the West.

The following list shows the known vertebrate fossils from the Denver quadrangle:

Antrodemus atrox (Marsh) ("Creosaurus")
Apatosaurus ajax Marsh
Apatosaurus laticollis Marsh
Atlantosaurus immanis Marsh
Atlantosaurus montanus Marsh
Camarosaurus agilis (Marsh) ("Morosaurus")
Camarosaurus grandis (Marsh) ("Morosaurus")
Camarosaurus sp? ("Morosaurus")
Diplodocus lacustris Marsh
Diplodocus longus Marsh
Diplosaurus felix Marsh
Stegosaurus armatus Marsh
Stegosaurus stenops Marsh
Stegosaurus unguatus Marsh

In general this represents a somewhat localized fauna of dinosaurs and crocodiles. Several members of the group deserve mention.

The first specimen of *Atlantosaurus* discovered was found by Captain H. C. Beckwith and Arthur Lakes in 1877. It was found in place in the upper Morrison along the hogback south of Golden. During the following ten years, other specimens and species were found near the same locality and southward to Morrison, where the largest known species of *Atlantosaurus* was discovered (in 1888). This animal reached a length of about 70 feet and a height of about 20 feet.

Species of *Brontosaurus* roamed in the Denver region at this time which represented the largest land animals known from North America.

Dakota Formation—Land plants represent the fossils commonly found in the Dakota in this region. Plant fragments may be obtained in practically all beds, but good specimens seem to have been found at only two horizons, one near the base and another about the middle of the formation. A careful search of good outcrops would probably disclose other horizons, especially in the lower and upper portions.

Knowlton³ gives the following list from "the hard white sandstone at Morrison" apparently about the middle of the formation.

³Knowlton, F. H., The fossil plants of the Denver Basin: U. S. Geol. Survey, Mon. 27, pp. 463-473, 1896.

Abietites dubius? Lesquereux
Aralia formosa Heer
Aralia concreta Lesquereux
Bambusinum sp.
Carpites liriophylli Lesquereux
Ficus beckwithii Lesquereux
Ficus magnoliaefolis Lesquereux
Inga cotta? Ettingshausen
Laurus nebrascensis Lesquereux
Laurus proteaefolia Lesquereux
Laurus modesta Lesquereux
Laurus primigenia? Ung
Leguminosites cultriformis Lesquereux
Liriophyllum populoides Lesquereux
Liriophyllum beckwithii Lesquereux
Liriophyllum obcordatum Lesquereux
Lomatia saportanea longifolia Lesquereux
Magnolia speciosa Heer
Magnolia capellini Heer
Magnolia sp. (fruit)
Proteoides daphnogenoides Heer
Quercus morrisoniana Lesquereux
Salix proteaefolia Lesquereux
Sapindus morrisoni Lesquereux
Sequoia reichenbachi Heer
Sequoia condita Lesquereux
Sterculia aperta Lesquereux
Torreya oblanceolata Lesquereux

Of this group, about one-third have not been found outside the Denver Basin; others are known from Kansas, New Jersey, and the northern Mississippi Valley. In general, the flora is very similar to the large flora known from Kansas and Nebraska and is a typical Dakota flora.

Lee collected a number of plants at Morrison from beds included in the Upper Morrison as originally divided. They were:

cf. Eucalyptus dakotensis Lesquereux
Ficus daphnogenoides (Heer) Berry
Ficus magnoliaefolia Lesquereux
Phyllites sp.
Phyllites sp.
Salix sp. *cf. S. protoaefolia* Lesquereux

Knowlton, who studied the plants, says, "I do not think there is any doubt about the 'Morrison' plants being in the Upper Cretaceous flora."⁴ They are common Dakota plants.

⁴Knowlton, F. H., A dicotyledonous flora in the type section of the Morrison formation: *Am. Jour. Sci.*, 4th Ser., Vol. 49, pp. 189-194, March, 1920.

Lately, a number of specimens of leaves have been obtained from the outcrops and old quarries along Coon Creek by students at the Colorado School of Mines. This material has not yet been studied.

Several finds of dinosaur remains from the Dakota have been reported but the statements were very general and the writer has not been able to confirm them. However, dinosaurs are known from the Dakota at several points in the Rocky Mountain Region. In 1926, Professor H. W. Gardner, of the Colorado School of Mines, discovered some large dinosaur tracks in the upper Dakota at the Bear Creek water gap just east of Morrison. These were three-toed and about fifteen inches long. Unquestionably, dinosaurs were present in the region during Dakota time.

The other known fossils from the district include some fish scales from the fire clays near the middle of the formation found about four miles south of Golden, and some very poorly preserved casts of bivalves seen on the uppermost sandstones just north of Bear Creek.

Cannon⁵ (p. 247-248) mentions small reptilian footprints and some marine and brackish water shells but gives no reference or locality.

Benton Formation—In the Denver region, the Benton usually is not subdivided lithologically as it is south of Colorado Springs. In general, it consists of black shales. However, a thin limestone bed has been noted above the middle of the formation which may represent the upper Greenhorn, and a sandy layer about a foot thick occurs at the top, apparently corresponding to the Carlile.

Fossils are rare in the Benton in this district and are poorly preserved. They are listed below:

Inoceramus fragments
Inoceramus labiatus Schlotheim
Ostrea fragments
Prionotropis woolgari (Wantell)?
Selachian teeth.

All of these are marine and all but the second came from the upper sandstone.

⁵Cannon, G. L., The geology of Denver and vicinity: Colo. Sci. Soc. Proc., Vol. 4, pp. 235-270, 1893.

Niobrara Formation—The Niobrara is well exposed east of the hogbacks. Years ago numerous quarries were opened in the lower limestones. Many fossils were obtained from these.

The forms known from this area are given in the following list:

Baculites sp? (Upper)
 Discina sp?
 Fish scales
 Fish teeth, vertebrata, etc.
 Foraminifera
 Inoceramus deformis
 Inoceramus sp?
 Inoceramus stantoni Sokolow?
 Ostrea congesta Conrad
 Ostrea fragments
 "Radiolites" austinensis Roemer

All of these except the baculite, fish scales, and foraminifera are from the lower part. The fish teeth are very common in the basal layer of the formation. *Inoceramus deformis* and *Ostrea congesta* are common in the limestones, especially 15 to 30 feet above the base. The other forms are known from single specimens. Foraminifera are abundant in the upper shales. Mr. W. A. Waldschmidt, of the Colorado School of Mines, is doing some work on these but so far as the writer knows, nothing has been written on foraminifera from this area.

In 1891, a specimen of "*Radiolites*" *austinensis* was found in the quarry half a mile north of Bear Creek.⁶

Pierre Formation—The Pierre outcrops over considerable areas in the Denver quadrangle. From time to time fossils have been collected and studied. Most of them come from the upper third of the formation, where calcareous concretions occur which are often highly fossiliferous.

Eldridge⁷ (p. 78-79) in his paper gives a table of the species known up to about 1888. Unfortunately, he does not state the localities from which they were collected. The Colorado School of Mines has a number of good specimens from

⁶Cannon, G. L., Notes on a discovery of *Radiolites austinensis* Roemer (?); Colo. Sci. Soc. Proc., Vol. 4, pp. 75-76, 1892.

⁷Op. Cit.

Ralston Creek. The writer visited this locality and found numerous fragmentary concretions scattered around on the north side of the creek almost opposite the northeastern end of Ralston dike. Similar concretions were found along the east side of the dike. This horizon is well up in the Pierre. Other material has been obtained at a slightly lower horizon, about half a mile north of Van Bibber Creek, and about the same distance east of the Dakota hogback.

The following list shows the total reported fauna from the district:

- (M) *Anchura americana* Evans and Shumard
- Baculites* sp.
- (1) *Baculites anceps* Lamarck
- (M-U) *Baculites compressus* Say
- (U) *Baculites ovatus* Say
- (U) *Callista* sp?
- Callista dewyi* Meek and Hayden
- (U) *Caryophyllis* sp?
- (U) *Dentalium* sp?
- Eutrephoceras dekayi* (Morton)
- (U) *Haminea ? occidentalis* Meek and Hayden
- (U) *Heliolites* sp?
- Inoceramus* sp.
- Inoceramus (actinoceramus) fibrosus* (Meek and Hayden)
- (U) *Inoceramus altus* Meek
- (M U) *Inoceramus barabini* Morton
- (U) *Inoceramus proximus* Thomey
- (U) *Inoceramus sublaevis* Hall and Meek
- (U) *Lingula nitida* Meek and Hayden
- Lucina* sp?
- (U) *Lucina occidentalis* Morton
- (U) *Mactra* sp?
- (U) *Mactra canonensis* Meek
- (U) *Mactra holmesii* Meek
- (U) *Nucula* sp?
- (1) *Ostrea congesta*
- Pteria haydeni* Hall and Meek
- (U) *Scaphites cheyennensis* Owen
- (U) *Scaphites nodosus* Owen
- Serpula* sp?
- (U) *Solen* sp?
- (U) *Sphaeriola* sp?
- Fish teeth, scales and bones.

In 1925 the operators of the clay pits at Golden drove an exploratory drift into the strata lying to the west of their workings. In the course of their work they encountered a dark gray shale bearing mollusks which still retained much of the original pearly shell. A number of these were obtained

for the Colorado School of Mines collections, and a representative collection was sent to Dr. J. B. Reeside, Jr., for identification. He reported the following species:

Anchura americana Evans and Shumard
 Discoscaphites conradi (Morton) var. intermedius Meek.
 Haminea aff. H. subcylindrica Meek
 Inoceramus (actinoceramus) n. sp.
 Lunatia dakotensis Henderson
 Nucula cancellata Meek and Hayden

and made the following statement concerning the collection:⁸

"The most significant species in the lot is the *Discoscaphites*. Its usual stratigraphic position is in the Fox Hills formation, though at a number of localities it has been found just beneath the Fox Hills in a thin transition zone associated with some of the normal Pierre species like *Scaphites nodosus* and the large baculites. We have no species of *Inoceramus (actinoceramus)* on record from the later Montana beds except *I. fibrosus* Meek and Hayden (*Pteria fibrosa* of literature), which is a more slender shell than your specimen. It occurs in the latest Pierre and Fox Hills. The other species are known in both Pierre and Fox Hills. I suspect this collection to be of very late Pierre age, though it could be Fox Hills."

In 1928, Messrs. B. S. Butler and T. S. Lovering of the U. S. Geological Survey, engaged in co-operative geologic work, discovered some interesting fossils along the east side of the hogback at Coon Creek about two and one-half miles south of Golden. These occurred in a black shale about 60 feet above the Dakota sandstone, supposedly in the Benton. The material was turned over to the writer, who also, on a casual inspection, considered it to be of Benton age. However, more material was collected which later was studied carefully and then submitted to Dr. Reeside for check. He reported most of the fauna were distinctly middle to upper Pierre. A careful study of the quarry, where new excavations had been made, showed that actually a fault passed through the pit and Pierre was in contact with lower Benton.

Fox Hills Formation. Several fossiliferous outcrops of the Fox Hills formation are known to the west and north of Golden. A list of the forms known to date is given below:

Anchura americana Evans and Shumard
 Baculites sp.
 Callista deweyi Meek and Hayden
 Callista (Dositopsis) owenana Meek and Hayden

⁸Personal communication, October 5, 1925.

Cardium whitei Dall
 Crenella elegantula Meek and Hayden
 Cylichna sp?
 Dentalium sp?
 Fasciolaria cheyennensis Meek and Hayden
 Fusus sp?
 Liopistha (Cymella) montanensis Henderson
 Mactra alta Meek and Hayden
 Mytilus subarcuatus Meek and Hayden
 Nucula cancellata Meek and Hayden
 Pseudobuccinum nebrascense Meek
 Pyropsis bairdi Meek and Hayden
 Sphaeriola cordata Meek and Hayden
 Seleya subplicata Meek and Hayden
 Tancredia americana Meek and Hayden
 Tellina scitula Meek and Hayden
 Turitella sp?
 Veniella humilis Meek and Hayden
 Halymenites major Lesquereux

Along the irrigation ditch about one-third mile west of the School of Mines at Golden, Colorado, a yellow sand of Fox Hills age outcrops. From this outcrop numerous fossils are collected annually. The variety is rather small but the locality has added a number of species to the list published by Eldridge.

Laramie Formation. Fossil plants are abundant in the Laramie in the Denver Quadrangle. Collections, some of them quite large, have been obtained from the following localities:

1. Clay pits at west end of 12th Street, Golden.
2. Clay pits at west end of 20th Street, Golden.
3. Clay pits about one mile north of Golden on east side of road to brick yard.
4. Clay pits on east side of road about one mile south of Golden.
5. Outcrops along road about one and one-half miles south of Golden.
6. Murphy coal mine on Ralston Creek five and one-half miles north of Golden.
7. Hoyt's coal mine one mile south of Golden.
8. Leyden Gulch six and one-half miles north of Golden.
9. Coal mines at Leyden.
10. Cut of Denver and Salt Lake Railroad about eight miles north of Golden.
11. Outcrops of sandstone about three miles south of Golden.
12. Pits to south of road from Rock Rest to Morrison, about one-half mile east of Dakota Hogback.
13. Mount Carbon, about three miles east of Morrison, Colorado.
14. Associated Industries coal mine on southwest side of Green Mountain, about six miles south and two miles east of Golden.
15. Coal mines north of Clear Creek near Golden.

The mines forming Localities 6, 7 and 15, have been abandoned and caved in for years so are no longer available to collectors.

Most all of the material obtained in recent years has come from Localities 1, 2, 3, 4 and 12.

It is interesting to note that Knowlton did not know of these newer localities and did not have any material from them to use in preparing his monograph on the Laramie Flora of the Denver Basin.

The writer has obtained several hundred specimens from Localities 1 and 2. The leaves obtained come from a horizon near the top of the Laramie.

The following list names the described forms:⁹

- Delesseria fulva* Lesquereux
- Onoclea fecunda* (Lesquereux) Knowlton
- Dryopteris georgei* Knowlton
- Dryopteris laramiensis* Knowlton
- Dryopteris lesquereuxii* Knowlton
- Dryopteris carbonensis* Knowlton
- Phanerophlebites pealei* Knowlton
- Asplenium martini* Knowlton
- Pteris goldmani* Knowlton
- Pteris*, sp.
- Anemia elongata* (Newberry) Knowlton
- Anemia supercretacea* Hollick
- Anemia* sp?
- Lygodium?* *compactum* Lesquereux
- Equisetum perlaevigatum* Cockerell
- Dammara* sp.
- Sequoia acuminata?* Lesquereux
- Sequoia reichenbachi* (Geinitz) Heer
- Sequoia longifolia* Lesquereux
- Cycadeoidea mirabilis* (Lesquereux) Ward
- Cyperacites?* *hillsii* Knowlton
- Cyperacites?* *tessellatus* Knowlton
- Cyperacites?* sp.
- Phragmites laramianus* Cockerell
- Smilax?* *inquirenda* Knowlton
- Sabal montana* Knowlton
- Juglans leydenianus* Knowlton
- Juglans newberryi* Knowlton
- Juglans laramiensis* Knowlton
- Juglans leconteana* Lesquereux
- Juglans praerugosa* Knowlton
- Hicoria angulata* Knowlton
- Hicoria minutula* Knowlton
- Myrica torreyi* Lesquereux

⁹Knowlton, F. H., The Laramie flora of the Denver Basin, with a review of the Laramie problem: U. S. Geol. Survey Prof. Paper 130, 175 pp., 1 fig., 28 plates, 1922.

Myrica dubia Knowlton
 Myrica oblongifolia Knowlton
 Salix myricoides Knowlton
 Salix wyomingensis Knowlton
 Salix brittoneana Knowlton
 Populus? distorta Knowlton
 Quercus praeangustiloba Knowlton
 Quercus stramineus Lesquereux
 Quercus eximia Knowlton
 Quercus viburnifolia? Lesquereux
 Artocarpus lessigiana (Lesquereux) Knowlton
 Artocarpus liriiodendroides Knowlton
 Ficus? smithsoniana (Lesquereux) Knowlton
 Ficus pealei Knowlton
 Ficus planicostata Lesquereux
 Ficus cockerelli Knowlton
 Ficus planicostata magnifolia Knowlton
 Ficus praeplanicostata Knowlton
 Ficus impressa Knowlton
 Ficus coloradensis Cockerell
 Ficus dalmatica Ettingshausen
 Ficus neodalmatica Knowlton
 Ficus? leyden Knowlton
 Ficus posttrinervis Knowlton
 Ficus cannoni Knowlton
 Ficus navicularis Cockerell
 Ficus multinervis? Heer
 Ficus denveriana? Cockerell
 Ficus crossii Ward
 Ficus cowanensis Knowlton
 Ficus berryana Knowlton
 Ficus arenacea Lesquereux
 Ficus? apiculatus Knowlton
 Aristolochia brittoni Knowlton
 Nelumbo tenuifolia (Lesquereux) Knowlton
 Magnolia marshalli Knowlton
 Magnolia lakesii Knowlton
 Anona robusta Lesquereux
 Anona coloradensis Knowlton
 Laurus lanceolata Knowlton
 Laurus lakesii Knowlton
 Laurus wardiana Knowlton
 Malapoenna louisvillensis Knowlton
 Cinnamomum affine Lesquereux
 Cinnamomum laramiense Knowlton
 Platanus platanoides (Lesquereux) Knowlton
 Leguminosites? coloradensis Knowlton
 Leguminosites? columbianus Knowlton
 Leguminosites? laramiense Knowlton
 Mimosites marshallensis Knowlton
 Cassia? laramiense Knowlton
 Cercis eocenica Lesquereux
 Celastrinites alatus Knowlton
 Celastrinites eriense Knowlton
 Celastrinites cowanensis Knowlton

Negundo brittoni Knowlton
Pistacia eriensis Knowlton
Pistacia hollicki Knowlton
Ilex laramiensis Knowlton
Ceanothus eriensis Knowlton
Rhamnus goldianus? Lesquereux
Rhamnus salicifolius Lesquereux
Rhamnus minutus Knowlton
Rhamnus marshallensis Knowlton
Rhamnus belmontensis Knowlton and Cockerell
Rhamnus brittoni Knowlton
Rhamnus? *pealei* Knowlton
Rhamnus sp.
?Paliurus zizyphoides Lesquereux
Zizyphus coloradensis Knowlton
Zizyphus hendersoni Knowlton
Zizyphus corrugatus Knowlton
Zizyphus minutus Knowlton
Apeibopsis? *laramiensis* Knowlton
Cornus suborbifera Lesquereux
Cornus praeimpresca Knowlton
Cornus sp.
Hedera lucens Knowlton
Diospyros berryana Knowlton
Fraxinus? *princetoniana* Knowlton
Apocynophyllum taenifolium Knowlton
Dombeyopsis obtusa Lesquereux
Dombeyopsis trivialis Lesquereux
Dombeyopsis? *sinuata* Knowlton
Dombeyopsis ovata Knowlton
Carpites lakesii Knowlton
Carpites lesquereuxiana Knowlton
Carpites rhomoidalis Lesquereux
Phyllites leydenianus Knowlton
Phyllites marshallensis Knowlton
Phyllites trinervis Knowlton
Phyllites dombeyopsoides Knowlton
Phyllites sp.
Phyllites sp.
Phyllites sp.
Palaeoaster? *similis* Knowlton

Besides these there are a number of undescribed forms in local collections.

In looking over a collection of these plants, one is struck by the familiar appearance of many forms such as poplar, hickory, beech, and other very modern temperate zone forms, together with a surprising abundance of figs, palms, magnolias, and similar tropical and subtropical types. Palm leaves up to five feet long are found every year in the clay pits outside of Golden. Very plainly they indicate conditions of cli-

mate and physiography for the region vastly different from those now existing, or, less likely, a very different adaptability of the organisms.

Very little trace has been found of the animal life of Laramie time in this area. To date, a piece of amber containing an insect fragment, has been found near Golden. A fragment of an unio, and some specimens of *Ostrea glabra* have been reported from north of Leyden, while Eldridge mentions an undetermined dinosaur but gives no locality.

Arapahoe Formation. There is considerable doubt in the mind of the writer as to the justification for considering the Arapahoe as a distinct formation. He would consider it as merely a portion of the Denver. However, the term has been in use for forty years and a number of fossils have been reported from it. These are remains of land plants and dinosaurs.

The dinosaurs reported are:

Thespesius occidentalis (?) Leidy
Triceratops Alticornis Marsh
Triceratops galeus Marsh
Ceratops montanus Marsh

The localities from which the dinosaurs were obtained is not known, but it is believed to have been from the general vicinity of Golden. Specimens have been found in the Denver formation near Green Mountain.

Dr. Gilmore says of these:

"The specimen of *Thespesius occidentalis* (?) Leidy was originally given the name *Agathaumas milo*, but later the materials were identified as pertaining to the *Hadrosauridae* * * * It is extremely doubtful if the specific determination of *occidentalis* is to be relied upon, as the specimen was quite fragmentary."¹⁰

The exact locality is unknown.

The type specimen of *Triceratops galeus* Marsh was found near Brighton.

The identity of the specimen referred to as "*Ceratops montanus* Marsh" is open to considerable question as the type of this species is of Montana age.

Several years ago, Messrs. E. Russell Lloyd and Chas. W. Henderson called the attention of the writer to portions of a

¹⁰C. W. Gilmore. Personal communication, April 24, 1930.