Article III.—A PROVISIONAL CLASSIFICATION OF THE FRESH-WATER TERTIARY OF THE WEST.

By W. D. MATTHEW.

The table of formations immediately following was drawn up by the writer under the guidance of Prof. Osborn and Dr. Wortman, for the arrangement of the collections in the American Museum of Natural History, and submitted to the late Prof. Cope and to Prof. W. B. Scott for approval or amendment. The faunal lists appended are made up chiefly from the study of these collections, covering all the formations of the Western Lakes except the Pliocene horizons. A partial essay is made at a critical revision of the species; characteristic and well marked species are in special type, and those considered invalid are in roman. It is quite impossible to make this revision with any approach to completeness, from the fragmentary character of many types and the meagreness of descriptions. The object of the lists is to assist in the correlation and classification of the various basins by showing the characteristic fauna. The exact horizon and locality are therefore given as fully as possible; and to facilitate future comparison of species, the location of each type specimen is given, as far as known to the writer. No bibliography or complete synonymy of the species is included; it would be undesirable in this connection, as well as rendered superfluous by the excellent bibliography of mammals recently published by Prof. Trouessart.

In this preliminary attempt, errors will doubtless be numerous. The writer will be glad to have his attention called to any, that they may be corrected in a subsequent edition. The synonymy of genera and species is necessarily to a considerable extent provisional, and will require revision, especially in the Creodonta and Primates. Some of the results of Dr. Wortman's recent studies on the former group are embodied here.

New genera defined in this list: *Palæictops*, p. 35; *Phlaocyon*, p. 54; *Miolabi* Hay, p. 74.

New species defined: *Palæolagus intermedius*, p. 53; *Phlaocyon leucosteus*, p. 54; *Ictops bullatus*, p. 55; *Aceratherium profectum*, p. 71.

The following names not heretofore used will be defined in

forthcoming articles by Dr. Wortman and the writer : *Palæosinopa veterrima*, n. g. and sp., p. 31 ; *Procynodictis vulpiceps*, n. g. and sp., p. 49 ; *Oxyænodon dysodus*, n. g. and sp., p. 49 ; *Prodaphænus*, n. g., p. 49 ; *Paradaphænus* and *Nothocyon*, p. 62 ; *Pachyæna intermedia*, n. sp., p. 31.

DIVISIONS OF THE TERTIARY LAKE-BASINS.

PERIODS.		FORMATIONS.	THICKNESS.	FAUNAL DIVISIONS.	LAKE BASINS.
Pleistocene.		Sheridan.	100	Equus.	*Silver Lake* and other localities in Oregon, Nevada, and elsewhere.
Pliocene.		Blanco.	150	Pliauchenia.	
				Hippidium.	*Great Plains* (Niobrara Basin).
Miocene.	Upper.	Loup Fork.	400	Procamelus.	
		Deep River.	150	Cyclopidius.	*Deep River*, Montana.
	Middle.				
	Lower.	John Day.	1000	Diceratherium.	*John Day*, Oregon.
Oligocene.		White River.	800	Protoceras.	*Great Plains* (Sioux Lake).
				Oreodon.	
				Titanotherium.	
Eocene.	Upper.	Uinta.	800	Diplacodon.	*Uinta*, Utah.
				Telmatotherium.	
	Middle.	Bridger.	2000	Uintatherium.	*Upper Green River*, Wyoming. *Huerfano*, Colorado.
	Lower.	Wind River.	800	Bathyopsis.	*Wind River*, Wyoming.
		Wasatch.	2000	Coryphodon.	*Big Horn*, Wyoming.
	Basal.	Torrejon.	300	Pantolambda.	*San Juan*, New Mexico.
		Puerco.	500	Polymastodon.	

NOTES ON THE LAKE BASINS.

San Juan Basin.—In northwestern New Mexico, on the divide between the Rio Grande and San Juan Rivers. The beds conformably overlie the marine and brackish water Cretaceous (Laramie), and contain fossils confined in the Basal Eocene to three strata, two at the bottom of the Puerco beds, one in the Torrejon. The Wasatch is sparingly fossiliferous throughout.[1]

Big Horn Basin.—In northern Wyoming. No weighty faunal distinctions have been shown to exist in this great mass of sediment, which is sparingly fossiliferous throughout. Buffalo Basin is a subordinate basin, apparently somewhat later than the main basin.[2]

Wind River Basin.—In central Wyoming. Fossils are rather scarce in this basin. All the sediments are later than the Wasatch and earlier than the Bridger.[3]

Huerfano Basin.—In southern Colorado. Osborn has recently shown that the Wind River is represented here as well as the Bridger. There are also overlying sediments of ? Pleistocene age.[4]

Upper Green River Basin.—In southern Wyoming. This includes the Bridger and Washakie, with Middle Eocene fossil mammals, and much larger areas where Green River (= Wind River) and Vermillion Creek (= Wasatch) sediments are the only beds not washed away by the extensive erosion which has taken place. The Vermillion Creek sediments contain fossil mammals in a few localities (Evanston, Black Buttes, etc.), while the Green River shales contain fossil fish in abundance.[5]

Uinta Basin.—In northeastern Utah. The Middle and Upper Eocene beds are underlain by a considerable thickness of sediments, probably of Lower Eocene age, in which no fossils have been found. The three fossiliferous horizons are: *C*, the Upper or True Uinta, explored for fossils by Marsh in 1870 and the Princeton party of 1886; *B*, the Lower Uinta or Telmatotherium Beds; and *A*, probably equivalent to the upper part of the Bridger. The last two horizons were discovered by the American Museum Expedition of 1894.[6]

[1] Authority, Wortman. See Bull. Amer. Mus. Nat. Hist., 1892, 135; 1897, 259.
[2] Authority, Wortman, Bull. Amer. Mus. Nat. Hist., 1892, 135.
[3] Authority, Wortman, *l. c.*
[4] Bull. Amer. Mus. Nat. Hist., 1897, 247.
[5] Authority, Hayden Survey Reports, etc. Also Wortman (communicated).
[6] Authority, Peterson, Bull. Amer. Mus. Nat. Hist., 1895, 72; Marsh, Amer. Jour. Sci., March, 1871.

Basin of the Great Plains.—The precise relations of the fossiliferous horizons in different parts of this wide area stand in need of further study. The deposits are coëxtensive with the Neocene and Quaternary, but in no place has a continuous section been observed, and the series of fossiliferous horizons is still more incomplete.

The following table is an attempt at correlation of a number of typical sections with the section published by Hayden and Leidy thirty years ago. The proper identification of these divisions has been prevented by a confusion as to the fauna properly belonging to Horizon *D*. The descriptions given by Hayden of the character of the rocks in the several divisions of his section agree accurately with the corresponding divisions observed by the writer in Colorado. But the fauna which Hayden and Leidy ascribe to Horizon *D* was found by the writer in Horizon *C*, while *D* belonged stratigraphically and faunally to the Upper Miocene. The fauna which Leidy ascribes to *C* is a mixture of Oreodon and Protoceras Beds species.

The Middle Miocene does not appear to be represented in any of the sections. The faunal break is least serious in Colorado and Oregon, where a number of genera pass through without more than specific change. Such are, in Colorado, *Anchippus*, *Aceratherium* (sensu stricto), *Merycochœrus*, *? Canis*. In Oregon, *Mesohippus* and probably others.

Another break occurs in the Pliocene, partly if not completely bridged in Texas, but tolerably well marked elsewhere.

It is probable that the Protoceras Beds overlap to some extent on the Lower Miocene John Day. Further study of both and determination of the exact horizons of different species will be necessary to find the extent of the overlap. At present it seems that some lines of descent are more advanced in one basin, some in the other. The Rhinoceroses seem to have run into *Diceratherium* in the John Day, while continuing the line towards *Aphelops* in the Plains. The Camels are more advanced in the western basin, but the Horses are persistently primitive, while *Anchippus* had already appeared in the Leptauchenia Beds. Side branches of Canidæ appear in both basins, while the more direct line shows little difference in age between the two. *Merycochœrus* and *Eporeodon* appear in both, but the relations of

	Neb. & S. Dak. Hayden & Leidy, 1869.		S. Dakota. Wortman, 1895.	N. E. Colorado. Matthew, 1899.	N. W. Kansas & S. W. Nebraska. Matthew, 1899.	N. W. Nebraska. Wortman, 1897.	Deep R., Mont. Scott, 1894.	John Day R., Oregon. Wortman, 1880.	Llano Estacado, Texas. Cope & Cummins, 1892.
	Stratigraphy.	Faunal List.							
Pleistocene.					Prairie Marls.				
					Sand-hills.	Equus Beds.			Equus Beds.
Pliocene.									Blanco.
								Loose gravels.	Palo Duro.
Miocene.	F	F	Loup Fork.		Loup Fork.	Loup Fork.			Loup Fork.
	E			E	(Cretaceous, unconformable under the Loup Fork.)		Upper Beds. (*Ticholeptus*)	Cottonwood beds. (*Protolabis*)	
	?D			D					
	C	? E	Leptauchenia (*sub-zone*)	C			Lower Beds.	Up'r John Day. (*Merycochœrus*)	
		D	Protoceras.					L'r John Day. (*Diceratherium*)	
Oligocene.		C	Up'r Oreodon			(Barren white clays, probably White River.)			
	B	B	L'r Oreodon.	B					
	A	A	Up. Titanoth'm	A					
			Mid. "						
			Low. "						

the species to each other are not yet known. *Leptauchenia* is unknown in the John Day basin, and is very close to the Upper Miocene *Cyclopidius*, but if these genera were aquatic they may have had a peculiar and limited habitat, and their absence would not have much weight.

The so-called Loup Fork Beds are not all strictly of the same age. The more easterly and southerly deposits in Nebraska, Kansas, and Texas are uppermost Miocene or Pliocene. The species described by Leidy and Marsh came chiefly from these beds. The Colorado Loup Fork is a distinctly older horizon, Upper or perhaps in part Middle Miocene. Prof. Cope explored this region in 1873 and 1879 and described its fauna. He seems to have been less familiar with the eastern Loup Fork; and this may partly explain the discrepant views held as to the age of the Loup Fork Tertiary. Williston and some other recent writers entirely refuse to assign a definite age to the Kansas Loup Fork; and the present writer desires to avoid including with the beds to which a definite age is assigned, any but those in which a sufficient fauna has been found. The Colorado Loup Fork is here placed as equivalent to the Deep River of Montana, the Ticholeptus Beds of Cope—an unfortunate name, as *Ticholeptus* is a synonym of *Merychyus*, and *Merychyus* is equally characteristic of the typical Loup Fork or Procamelus Beds. Cope placed with the Deep River the Upper Miocene Beds of the John Day valley, and of Laramie Peak, Wyoming. Other beds on the western and northern margin of the Great Plains basin may be equivalent. Scott considers the Deep River as older than any of the beds above mentioned, laying especial stress on the occurrence of *Cyclopidius* in that basin only. *Cyclopidius*, however, occurs in the extreme west of Nebraska (Cheyenne Co.), and its absence elsewhere may be explained, as above noted, by its aquatic habitat. *Miolabis*[1] characterizes the Colorado Loup Fork and the Oregon beds, and stands well in opposition to *Procamelus* of the upper horizon. The lower beds have been called Cyclopidius Beds.[2] They show the following characteristic faunal differences:

[1] (= *Protolabis* Wortman, 1898, not Cope.)

[2] On account of its evident inconstancy a name derived from the fauna to designate a particular horizon is less suitable than a geographic term. Pawnee Creek Beds would be a better name for the lower horizon in Colorado, Deep River being used correlatively with Loup Fork for the general designation of the lower beds.

Procamelus Beds.	*Cyclopidius Beds.*
Pliohippus.	Pliohippus.
Protohippus.	Protohippus.
Hipparion.	Hipparion.
? Mesohippus. [1]	Desmatippus.
	Anchippus.
	Anchitherium.
	Mesohippus.
Pliauchenia.	
Procamelus.	Procamelus.
	Protolabis.
	Miolabis.
	Cyclopidius.
Teleoceras.	Aceratherium.
Cosoryx.	Blastomeryx.

That is to say, Horses with short-crowned teeth and Camels with split metapodials persisted into the lower horizon, as did also the aquatic Oreodonts and more primitive Aceratheres. *Blastomeryx* characterized the lower, as *Cosoryx* did the upper horizon. The large *Teleoceras* (*Aphelops*) *fossiger*, unknown in the older horizon, is the most abundant fossil of the later one.

King [2] applied the names 'Sioux Lake' and 'Cheyenne Lake' to the supposed lakes of the Oligocene and Upper Miocene of the Plains (Miocene and Pliocene of older writers); and Marsh [3] has called the latter the Niobrara basin. The deposits cover to a great extent the same area, and a single geographical name may conveniently be used, as is done in the other Tertiary basins.

The White River sediments are usually considered as lacustrine. A similar origin has been assigned to all the later sediments, but recent studies of Gilbert in Arkansas, Williston and others in Kansas, and Darton in South Dakota, tend toward the view that the Loup Fork is chiefly flood-plain sediment while the Pleistocene is flood-plain and æolian deposit.[4] With this view the observations made by the writer in Colorado in 1898 entirely coincide.

John Day Basin.—In central Oregon. Two or three more or less separate basins in the valley of the John Day River. The Cottonwood basin, containing a higher fauna, equivalent to the

[1] Two lower molars referred to *Mesohippus* are described by Scott and Osborn as coming from the true Loup Fork of Nebraska. This is the only occurrence in the Procamelus Beds, as far as I am aware.
[2] 40th Parallel Survey Rep.
[3] Am. Ass. Adv. Sci., Ann. Address, 1872.
[4] Gilbert, 17th Ann. Rep. U. S. Geol. Survey, 1895-6, part II, 575. Williston, Kansas Univ. Geol. Survey, Rep. 1896.

Deep River (Cope and Wortman) or Loup Fork (Scott), is separated from the lower beds by a basaltic flow. Dr. Wortman has recently found sufficient differences in the true John Day to warrant its division into two horizons ; the upper, containing a great abundance of *Merycochœrus*, being exposed at Bridge Creek and elsewhere ; the lower, typical at the locality known as 'The Cove.' [1]

Deep River Basin.—In central Montana. It would seem to be an outlier of the Great Plains basin. The upper beds, containing the typical Deep River fauna, rest unconformably on beds containing a scanty fauna which Scott considers equivalent to the Upper John Day. The facies of the fauna does not seem, however, to forbid placing it as equivalent to the Leptauchenia fauna of the Great Plains.[2]

New Mexico Loup Fork Basins.—A number of small scattered areas, of which the *Santa Fé Basin* in the northern part of the state, and the *San Francisco Basin* in the southwest corner, are the most important. Some of these deposits may be Pliocene.

The PLEISTOCENE fossil beds are scattered over all parts of the West, and cannot be grouped into any definite areas. The Equus Beds, largely river sediments, contain abundant remains of *Equus*. The prairie loess, so far as the writer is acquainted with it, represents a later deposit, æolian, and still in progress. The wind cuts out all exposed places at a very considerable rate, as may be seen by the rapid hollowing out of roads and ploughed fields. The dust is caught by the sodded prairie and spread uniformly over it. The effects of this mode of deposition are characteristic and curious features of the plains. The deposits are over two hundred feet thick in places, and contain remains of *Equus* in the lower layers, but in the upper chiefly *Bison* bones in various stages of fossilization. In the Cordilleras are many dried-up lake basins of small size, in the deposits of which the Equus fauna has been found. Silver Lake in Eastern Oregon is the most noted of these.

[1] Authority, Wortman (communicated). [2] Scott, "Mammalia of the Deep River Beds."

Characteristic Fossil Mammals.

The more important or abundant species are in heavy type ; invalid species in roman. Present location of the type specimen is stated (under the formation in which it was found) as follows :

A. M.....American Museum of Natural History, New York.
U. S.....National Museum, Washington.
Ph.....Philadelphia Academy of Sciences.
Y .....Yale University, New Haven, Conn.
K.....Kansas University, Lawrence, Kan.
H.....Harvard University, Cambridge, Mass.
P.....Princeton University, N. J.
T.....Texas Geological Survey.
C. G. S.....Canadian Geological Survey.

I. *PUERCO.*

All the types and described specimens are preserved in the American Museum of Natural History. The localities of all are in northwestern New Mexico, west of the divide between the Rio Grande and San Juan Rivers.

MULTITUBERCULATA.[1]

PLAGIAULACIDÆ.

Catopsalis foliatus Cope.
Polymastodon taöensis Cope.
Polymastodon latimolis *Cope.*
Polymastodon attenuatus Cope.
" *selenodus* Osborn & Earle.
Neoplagiaulax americanus Cope.
Neoplagiaulax sp.

CREODONTA.

OXYCLÆNIDÆ.

Oxyclænus cuspidatus (Cope.)
" *simplex* (Cope.)
Protochriacus priscus (Cope.)
Protochriacus hyattianus Cope.
Loxolophus adapinus *Cope.*
Protochriacus attenuatus O. & E.

TRIISODONTIDÆ.

Triisodon quivirensis Cope.
" **heilprinianus** Cope.
Triisodon rusticus *Cope.*
Triisodon biculminatus *Cope.*
Conoryctes crassicuspis *Cope.*
Sarcothraustes coryphæus *Cope.*
Mioclænus bathygnathus *Cope.*
Triisodon gaudrianus (Cope).

INCERT. SED.

Oxyacodon apiculatus O. & E.
Oxyacodon agapetillus (Cope).
Carcinodon filholianus (Cope).

CONDYLARTHRA.

PERIPTYCHIDÆ.

Periptychus[1] **coarctatus** Cope.
Periptychus brabensis *O. & E.*
Ectoconus ditrigonus (Cope).
Hemithlæus kowalevskianus Cope.
Conacodon entoconus (Cope).
Anisonchus coniferus *Cope.*
Conacodon cophater (Cope).
Anisonchus gillianus Cope.
Hemithlæus apiculatus *Cope.*
? Zetodon gracilis *Cope.* (Indeterminate.)

PHENACODONTIDÆ.

Protogonodon pentacus (Cope).
Protogonodon stenognathus Matthew.

MIOCLÆNIDÆ.

Mioclænus turgidunculus Cope.

EDENTATA.

STYLINODONTIDÆ.

Hemiganus otariidens Cope.

CONORYCTIDÆ.

Onychodectes tissonensis Cope.
Onychodectes rarus O. & E.

INDETERMINATE SPECIES.

Mioclænus interruptus *Cope.*
" rütimeyeranus *Cope.*

II. *TORREJON.*

All the types and described specimens are preserved in the American Museum of Natural History. The localities are in northwestern New Mexico, on either side of the divide between the Rio Grande and San Juan Rivers.

[1] The name *Periptychus* is perhaps preoccupied by *Periptyches.* If this be the case, the name *Catathlæus*, proposed for the permanent dentition of the same species, takes its place, *C. rhabdodon* being the type.

MULTITUBERCULATA.

PLAGIAULACIDÆ.

Neoplagiaulax molestus Cope.
Ptilodus mediævus Cope.
Ptilodus trovessartianus Cope.

BOLODONTIDÆ.

Chirox plicatus Cope.

PRIMATES.

TARSIIDÆ.

Indrodon malaris Cope.

RODENTIA.

MIXODECTIDÆ.

Mixodectes pungens Cope.
Mixodectes crassiusculus Cope.

CREODONTA.

OXYCLÆNIDÆ.

Tricentes subtrigonus (Cope).
Mioclænus bucculentus *Cope.*
Phenacodus zuniensis *Cope.*
Tricentes crassicollidens Cope.
Chriacus pelvidens (Cope).
Chriacus stenops *Cope.*
Chriacus baldwini (Cope).
Chriacus truncatus Cope.
Chriacus schlosserianus Cope.
Deltatherium fundaminis Cope.

TRIISODONTIDÆ.

Goniacodon levisanus (Cope).
Sarcothraustes antiquus Cope.
Triisodon conidens *Cope.*

MESONYCHIDÆ.

Dissacus navajovius Cope.
Dissacus carnifex *Cope.*
Dissacus saurognathus Wortman.

VIVERRIDÆ.

Viverravus haydenianus (Cope.)
Didymictis primus *Cope.*

ARCTOCYONIDÆ.

Clænodon ferox (Cope).
Clænodon corrugatus Cope.
Clænodon protogonioides Cope.

CONDYLARTHRA.

PERIPTYCHIDÆ.

Periptychus [1] **rhabdodon** Cope.
Periptychus carinidens Cope.
Anisonchus sectorius Cope.
Anisonchus mandibularis (*Cope*).
Haploconus lineatus Cope.
Haploconus xiphodon *Cope.*
" angustus *Cope.*
Haploconus corniculatus Cope.

PHENACODONTIDÆ.

Euprotogonia [2] **puercensis** (Cope).
Phenacodus calceolatus *Cope.*
Protogonia subquadrata *Cope.*
" plicifera *Cope.*
Mioclænus floverianus *Cope.*
Euprotogonia minor Matthew.

MIOCLÆNIDÆ.

Mioclænus turgidus Cope.
Mioclænus zittelianus *Cope.*
Mioclænus lydekkerianus Cope.
Mioclænus lemuroides Matthew.
" **acolytus** (Cope).
Mioclænus inæquidens (Cope).
Mioclænus minimus *Cope.*
Protoselene opisthacus (Cope).
Hemithlæus baldwini *Cope.*

AMBLYPODA.

PANTOLAMBDIDÆ.

Pantolambda bathmodon Cope.
" **cavirictus** Cope.

EDENTATA.

STYLINODONTIDÆ.

Psittacotherium multifragum Cope.
Psittacotherium aspasiæ *Cope.*
" megalodus *Cope.*
Hemiganus vultuosus *Cope.*

CONORYCTIDÆ.

Conoryctes comma Cope.

[1] See note on p. 28.

[2] Dr. T. S. Palmer has kindly called my attention to the fact that the generic name *Euprotogonia* is antedated by *Tetraclænodon*, a genus of Creodonts founded by Prof. Scott on *Mioclænus floverianus* of Cope, a wrongly interpreted specimen of *Euprotogonia puercensis*. The generic description of *Tetraclænodon* is doubtfully valid, very misleading, and founded on error; the name is inappropriate in the extreme; and I have therefore retained *Euprotogonia* as a well known and appropriate name substituted for the original preoccupied name *Protogonia*.

III. *WASATCH.*

	Big Horn.	Buffalo Basin.	New Mexico.	Location of Type.
PRIMATES.				
Omomys (*Anaptomorphus*) *homunculus* (Cope)	×	×		
Hyopsodus paulus Leidy	×	×		
" **vicarius** Cope	×	×		
" **powellianus** Cope	?			A. M.
Hyopsodus lemoinianus Cope	×	×		"
" *miticulus* Cope			×	U. S.
" *laticuneus* [1] (Cope)	?			A. M.
Pelycodus frugivorus Cope	×		×	
Pelycodus nunienus *Cope*	×			
Pelycodus tutus Cope	×		×	
Pelycodus jarrovii Cope	×		×	
" *angulatus* Cope	×			A. M.
Microsyops? gracilis Leidy	×			
" *speirianus* Cope	×			A. M.
Cynodontomys latidens Cope	×			"
RODENTIA.				
ISCHYROMYIDÆ.				
Paramys buccatus Cope	×		×	
" **delicatior** Leidy		×		
" **delicatissimus** Leidy	×	×		
CREODONTA.				
VIVERRIDÆ.				
Viverravus [2] **protenus** (Cope)	×	×	×	U. S.
" **leptomylus** [3] (Cope)	×	×		
Viverravus curtidens (Cope)	×			A. M.
" *massetericus* (Cope)	×			"
" *gracilis* Marsh	×			
Uintacyon (Miacis [4]) **canavus** (Cope)	×			A. M.
Uintacyon (Miacis) *brevirostris* (Cope)	×	×		"
" " *sp*		×		"

[1] The premolars associated with the type and only specimen of *Diacodexis laticuneus* Cope, are those of *Hyracotherium index;* the upper and lower molars belong to *Hyopsodus*, closely allied to *H. powellianus.* See Wortman, Bull. Am. Mus. Nat. Hist., 1896.

[2] *Viverravus* as defined by Marsh in 1872 covers *Didymictis* Cope, 1874. See note on p. 35.

[3] The type of *Didymictis leptomylus* of Cope may be the same as Marsh's *Limnocyon riparius* of the Bridger. This Wasatch species was referred by Cope to *leptomylus* but is probably distinct from the type.

[4] These species are considerably different in type from the Bridger species to which the name was originally given.

III. WASATCH.—*Continued.*

	Big Horn.	Buffalo Basin.	New Mexico.	Location of Type.
PROVIVERRIDÆ.				
Palæosinopa veterrima Wortman [1]	×			A. M.
Sinopa (Stypolophus) **hians** (Cope)	×		×	U. S.
" " **strenua** (Cope)	×		×	"
" " **whitiæ** (Cope)	×	×		
" " **viverrina** (Cope)	×		×	U. S.
Sinopa (Stypolophus) *multicuspis* (Cope)			×	"
" " *secundaria* (Cope)			×	"
" " *aculeata* (Cope)[2]				P.
OXYÆNIDÆ.				
Oxyæna lupina Cope	×	×	×	U. S.
" **forcipata** Cope	×		×	"
Oxyæna morsitans Cope			×	"
PALÆONICTIDÆ.				
Palæonictis occidentalis Osborn and Wortman	×			A. M.
Amblyctonus sinosus Cope			×	U. S.
MESONYCHIDÆ.				
Pachyæna[3] **ossifraga** (Cope)	×		×	U. S.
Pachyæna intermedia Wortman [1]	×			A. M.
Pachyæna gigantea Osborn and Wortman	×			"
Dissacus leptognathus O. & W	×	×		"
ARCTOCYONIDÆ.				
Anacodon ursidens Cope		×		A. M.
INCERTÆ SEDIS.				
Didelphodus absarokæ Cope	×			A. M.
Didelphys comstocki (Cope)[4]	×			"
Diacodon celatus Cope			×	U. S.
" *alticuspis* Cope			×	"
INSECTIVORA.				
LEPTICTIDÆ.				
Palæictops[5] *? bicuspis* (Cope)	×			
TILLODONTIA.				
ESTHONYCHIDÆ.				
Esthonyx[6] **burmeisteri** Cope	×	×	×	U. S.
Esthonyx acer Cope			×	"
" *bisulcatus* Cope			×	"
" *spatularius* Cope			×	"

[1] Unpublished.

[2] The original type from the Bridger was indeterminate. The species properly dates from Cope's description in 1884 (Tert. Vert.) of a specimen in the Princeton Museum referred to *S. aculeata.*

[3] Unworn molars of *Pachyæna* show that it possessed a vestigial metaconid, though less distinct than that of *Dissacus;* the original ground for the separation of the two therefore fails. I retain them separate however, believing that a careful comparison will show distinctions of generic importance between them.

[4] Generic position very doubtful.

[5] See note on p. 35.

[6] The species of *Esthonyx* need revision.

III. WASATCH.—*Continued.*

	Big Horn.	Buffalo Basin.	New Mexico.	Location of Type.
EDENTATA.				
STYLINODONTIDÆ.				
Calamodon simplex Cope	×		×	U. S.
Calamodon arcamœnus *Cope*			×	"
Calamodon novomehicanus *Cope*			×	"
Dryptodon crassus *Marsh*			×	"
CONDYLARTHRA.				
PHENACODONTIDÆ.				
Phenacodus primævus Cope [1]	×		×	A. M.
Phenacodus omnivorus *Cope*			×	U. S.
Phenacodus nunienus Cope [2]	×			A. M.
Phenacodus wortmani Cope [3]	×		×	
Phenacodus apternus *Cope*	×			A. M.
Phenacodus hemiconus Cope. [4]	×			"
Phenacodus brachypternus Cope	×	×		"
Phenacodus macropternus Cope	×			"
" *sulcatus* Cope			×	U. S.
" (Ectocion) *osbornianus* Cope	×			A. M.
Eohyus [5] distans *Marsh*			×	Y.
" robustus *Marsh*			×	"
MENISCOTHERIIDÆ.				
Meniscotherium chamense Cope			×	U. S.
" **terræ-rubræ** Cope			×	A. M.
Meniscotherium tapiacitis Cope			×	"
Hyracops socialis Marsh [6]			×	Y.

[1] Type from Evanston, Wyoming.

[2] Perhaps a small variety of *P. primævus.*

[3] See note on this species on p. 36.

[4] Doubtfully distinguishable from *P. nunienus.*

[5] *Eohyus* Marsh (nom. nud., 1877) is perhaps a synonym of *Phenacodus; E. distans* (figured, 1894) might be taken for the very uncharacteristic m^3 of that genus, and the description of *E. robustus* (1894) corresponds as far as it goes to the lower jaw of *P. primævus.* Wortman (Bull. Am. Mus. Nat. Hist., 1898, p. 101, foot-note) believes that *E. distans* is founded on the last upper molar of *Trigonolestes etsagicus;* but the tooth as figured by Marsh is too large for that species, even on the supposition that m^3 is unreduced, which, judging from the reduction of the heel of m_3, is not the case.

[6] *Hyracops*, which has been identified by Osborn with *Meniscotherium*, differs considerably in its foot structure if Marsh's figures are accurate. The large magnum, the entirely serial carpus, and the epicuneiform seen in Marsh's figures of *Hyracops* are not present in *Meniscotherium*, which has a carpal and tarsal structure very like that of *Eoprotogonia*, with small magnum, lunar supported partly on unciform, and other normal primitive features. The metapodials and phalanges are like those of *Hyracops.*

III. WASATCH.—*Continued.*

	Evanston, Wyo.	Big Horn.	Buffalo Basin.	New Mex.	Location of Type.
AMBLYPODA.					
CORYPHODONTIDÆ.					
Coryphodon (Bathmodon) *radians* Cope	×				A. M.[1]
Coryphodon (Metalophodon) **testis** (Cope)		×			"
Coryphodon repandus *Cope*		×			"
Coryphodon lobatus Cope		×	×	×	U. S.
Coryphodon anax *Cope*		×			A. M.
Bathmodon pachypus *Cope*		×			"
Coryphodon elephantopus Cope		×	×	×	U. S.
Coryphodon obliquus *Cope*				×	"
Coryphodon cuspidatus *Cope*		×		×	"
Coryphodon hamatus Marsh	×				Y.
Manteodon subquadratus *Cope*		×			A. M.
Coryphodon latidens Cope		×		×	U. S.
Coryphodon simus *Cope*				×	"
" molestus *Cope*				×	"
Coryphodon curvicristis Cope		×			A. M.
" (Metalophodon) *armatus* (Cope). Black Buttes, Wyo.					"
" (Ectacodon) *cinctus* (Cope)		×			"
Coryphodon latipes *Cope*.[2]	×				"
" marginatus *Cope*.[2]		×			"
PERISSODACTYLA.					
EQUIDÆ.					
Hyracotherium (Eohippus[3]) index Cope	×	×	×	×	A. M.
Hyracotherium angustidens *Cope*				×	U. S.
" cuspidatum *Cope*				×	"
Eohippus pernix *Marsh*	×				Y.
Hyracotherium (Eohippus) vasacciense Cope.	×	×			A. M.
Eohippus validus *Marsh*				×	Y.
Hyracotherium (Eohippus) tapirinum Cope		×		×	U. S.
Hyracotherium (*Eohippus*) *cristatum* Wortman		×			A. M.
" (*Pliolophus*) *cristonense* Cope			×	×	U. S.
" " *montanum* Wortman		×			A. M.
LOPHIODONTIDÆ.					
Heptodon posticus Cope		×			A. M.
" *singularis* Cope				×	U. S.

[1] Part of the same individual is in the Yale University Museum.

[2] Indeterminate types, synonymy doubtful.

[3] In *Hyracotherium* proper, p^2 has but one cusp; in all the American species, a trittocone is also present. "It may yet be found that there are other important differences between these groups which will necessitate recognizing a separate genus for the American forms, in which event the name *Eohippus*, proposed by Marsh, would have to be adopted." Wortman, Bull. Am. Mus. Nat. Hist., 1896, 101.

III. WASATCH.—*Continued.*

	Evanston, Wyo.	Big Horn.	Buffalo Basin.	New Mex.	Location of Type.
TAPIRIDÆ.					
Systemodon protapirinus Wortman		×	×		A. M.
Systemodon primævus Wortman		×			"
" *semihians* Cope		×			"
ARTIODACTYLA.					
HOMACODONTIDÆ.					
Trigonolestes chacensis Cope.[1]		×		×	U. S.
Trigonolestes brachystomus Cope		×			A. M.
" *nuptus* Cope		×			"
" *metsiacus* Cope		×			"
" *etsagicus* Cope		×			"
ACHÆNODONTIDÆ.					
Parahyus vagus Marsh	×				Y.
" *aberrans* Marsh	×				"

IV. *WIND RIVER.*

All the types and described specimens are in the American Museum of Natural History.

	Wind River, Wyoming.	Huerfano, Colorado.	Location of Type.
PRIMATES.			
Hyopsodus paulus Leidy	×		
" **vicarius** Cope	×		
Hyopsodus ? lemoinianus Cope	×		
" *? powellianus* Cope		×	
Pelycodus tutus Cope	×	×	
Pelycodus frugivorus Cope	×		
Pelycodus nunienus *Cope*	×		A. M.
Microsyops gracilis Leidy	×		
Microsyops scottianus Cope [2]	×		A. M.

[1] This is the common species of *Trigonolestes*. The others are founded on somewhat smaller or otherwise different individuals, but all very closely allied except *T. etsagicus*, which differs widely and may have to be separated generically, as Wortman has suggested (Extinct Camelidæ of North America, Bull. Am. Mus. Nat. Hist., 1898, p. 101, foot-note). I have seen no specimen of *Trigonolestes* proper (our collection contains 26) in which the paraconid is not present and twined with the metaconid in a peculiar way.

[2] Doubtfully distinguishable from *M. gracilis*.

IV. WIND RIVER.—*Continued.*

	Wind River, Wyoming.	Huerfano, Colorado.	Location of Type.
RODENTIA.			
ISCHYROMYIDÆ.			
Paramys delicatior Leidy	×	×	
" **delicatissimus** Leidy	×		
CREODONTA.			
VIVERRIDÆ.			
Viverravus[1] (Didymictis) **altidens** (Cope)	×		A. M.
Viverravus (Didymictis) *protenus* (Cope)	×	×	
" (Limnocyon) *riparius* (Marsh)			
? Didymictis leptomylus *Cope*, type only	×		A. M.
Viverravus gracilis Marsh	×	×	
Didymictis dawkinsianus *Cope*	×		A. M.
Uintacyon (Miacis) **canavus** (Cope)	×		"
" " **brevirostris** (Cope)	×		"
Uintacyon (Miacis) *cf. vorax* Leidy	×		
Uintacyon sp. minima		×	
PROVIVERRIDÆ.			
Sinopa (Stypolophus) **whitiæ** (Cope)			A. M.
Sinopa, cf. viverrina (Cope)[2]			"
OXYÆNIDÆ.			
Oxyæna huerfanensis Osborn		×	A. M.
Patriofelis tigrinus (Cope)	×		"
INSECTIVORA.			
LEPTICTIDÆ.			
Palæictops[3] *bicuspis* (Cope)	×		A. M.
" *didelphoides* (Cope)[4]	×		"
CHIROPTERA.			
Vesperugo anemophilus Cope	×		[5]
? Chiropter indet		×	A. M.

[1] *Viverravus* Marsh antedates *Didymictis* Cope, and refers to the same genus. The generic description appears to the writer to be a sufficient one, although Marsh in this as in other descriptions uses the term "tubercular" to describe a tuberculo-sectorial tooth.

[2] Apparently a different species from the Big Horn specimens referred to *S. viverrina*. I have not compared either with the type, from New Mexico.

[3] Referred by Cope to *Ictops*, an Oligocene genus closely allied to *Leptictis* Leidy. Though not distinguishable by the dentition from *Ictops*, there are important and very constant differences in the skull characters, among which I select for generic definition the backward extension and broadening of the posterior ends of the nasal bones, and the presence of a single median crest on the cranium instead of the two parallel crests of *Ictops* and *Leptictis*.

[4] Pertinence of this species to the genus very doubtful.

[5] Type lost.

IV. WIND RIVER.—*Continued.*

	Wind River, Wyoming.	Huerfano, Colorado.	Location of Type.
TILLODONTIA.			
ESTHONYCHIDÆ.			
Esthonyx acutidens Cope	×		A. M.
Esthonyx spatularius Cope	×		"
EDENTATA.			
STYLINODONTIDÆ.			
Stylinodon (*Calamodon*) *cylindrifer* (Cope)	×		
CONDYLARTHRA.			
PHENACODONTIDÆ.			
Phenacodus ? primævus Cope [1]	×		
Phenacodus wortmani Cope [2]	×		A. M.
Phenacodus (Ectocion) **osbornianus** Cope	×		
AMBLYPODA.			
CORYPHODONTIDÆ.			
Coryphodon ventanus Osborn	×	×	A. M.
Coryphodon wortmani Osborn	×		"
" *? singularis* Osborn	×		"
UINTATHERIIDÆ.			
Bathyopsis fissidens Cope	×		A. M.
PERISSODACTYLA.			
EQUIDÆ.			
Hyracotherium craspedotum Cope	×		A. M.
Protorohippus (Hyracotherium) venticolus (Cope).	×	×	"
Lambdotherium popöagicum Cope [3]	×	×	"
LOPHIODONTIDÆ.			
Heptodon calciculus Cope	×		"
Heptodon ventorum Cope	×		"
TITANOTHERIIDÆ.			
Telmatotherium (Palæosyops) boreale (Cope)	×		
Lambdotherium brownianum *Cope*	×		
ARTIODACTYLA.			
HOMACODONTIDÆ.			
Trigonolestes secans Cope [4]	×	×	A. M.

[1] The single jaw fragment referred to this species differs in several particulars from the Wasatch specimens.

[2] Two or three species are apparently included under this name, but the material is too fragmentary for their separation. The Wind River specimens, including the type, are, I believe, distinct from those of Wasatch age, including the complete skeleton described by Cope in 'Tertiary Vertebrata.' Two points of difference are the internal instead of postero-internal position of *de* on p^3, and the more compressed p^4—both points approximating the Wind River species to *Ectocion*, the most advanced of the Phenacodonts.

[3] See Osborn, Am. Nat., 1897.

[4] Upper molars being unknown this species can be placed in *Trigonolestes* only provisionally.

V. *BRIDGER*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
? PRIMATES.																
Hyopsodus paulus Leidy		×		×	×		×				×	×		×	×	U. S.
Lemuravus distans *Marsh*																Y.
Hyopsodus vicarius Cope							×									A. M.
Hyopsodus gracilis Marsh																
" *minusculus* Leidy						×										Ph.
Microsus cuspidatus Leidy								×								U. S.
Microsyops gracilis Leidy																
Microsyops (Limnotherium) **elegans** Marsh	×			×	×											Y.
Notharctus tenebrosus Leidy [1]								×								U. S.
Tomitherium rostratum *Cope*					×		×	×								A. M.
Notharctus (Limnotherium) *tyrannus* (Marsh)						×										Y.
" " *affinis* (Marsh)				×												"
Hipposyus formosus Leidy			×	×												Ph.
" *robustior* Leidy					×											U. S.
Thinolestes anceps Marsh											×					Y.
Telmatolestes crassus Marsh					×											"
Bathrodon typus Marsh				×												"
" *annectens* Marsh					×											"

[1] *Notharctus*, *Limnotherium*, and *Tomitherium* are probably synonymous, *Notharctus* having priority. The specific synonymy has not been cleared up.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
Antiacodon venustus Marsh					×											Y.
Hemiacodon nanus Marsh [1]					×											"
" *gracilis* Marsh					×											"
" *pucillus* Marsh				×												"
Omomys carteri Leidy										×						Ph.
Anaptomorphus æmulus Cope									×							A. M.
Washakius insignis *Leidy*											×					Ph.
Palæacodon verus Leidy																"
" *vagus* Marsh					×											Y.
Mesacodon speciosus Marsh					×											"
Sarcolemur pygmæus Cope							×									A. M.
Sarcolemur furcatus *Cope*											×					"
Prosinopa [2] (*Sinopa*) *eximia* (Leidy)				×												Ph.
RODENTIA.																
ISCHYROMYIDÆ.																
Paramys [3] **delicatus** Leidy			×					×								Ph.
" **delicatior** Leidy			×				×									"

[1] Marsh states that *Antiacodon nanus* (? = *Hemiacodon nanus*) is synonymous with *Anaptomorphus æmulus;* but the description and measurements of *H. nanus* do not bear out this statement. It is possibly a synonym of *Omomys carteri*, but the synonymy of these Bridger Primates is very uncertain, as the descriptions are inadequate, and the types have not been compared.

[2] Proposed by Trouessart, Cat. Mam.

[3] The number of species should probably be reduced.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
Paramys delicatissimus Leidy			×													Ph.
" **robustus** Marsh				×	×											Y.
Paramys buccatus (Cope)																A. M.
" *superbus* S. & O							×									P.
" *hians* (Cope)							×									A. M.
" *leptodus* Cope													?			"
Paramys (Sciuravus) **undans** (Marsh)				×				×								Y.
Paramys (Sciuravus) *nitidus* (Marsh)				×												"
" " *parvidens* (Marsh)				×	×											"
Tillomys senex Marsh					×											"
" *parvus* Marsh				×												"
Taxymys lucaris Marsh					×											"
Colonomys celer Marsh					×											"
Apatemys bellus Marsh											×					"
" *bellulus* Marsh											×					"
Mysops (*Syllophodus*) *minimus* Leidy				×												Ph.
" " *fraternus* Leidy											×					"
CREODONTA.																
VIVERRIDÆ.																
Vulpavus palustris Marsh			×													Y.
Miacis parvivorus Cope							×									A. M.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
Uintacyon edax Leidy					×						×					Ph.
" *vorax* Leidy																U. S.
" (Miacis) *bathygnathus* (Scott)																P.
Viverravus gracilis Marsh				×												Y.
Viverravus nitidus Marsh					×											"
Viverravus (Limnocyon) **riparius** (Marsh)				×												"
Ziphacodon rugatus Marsh					××											"
Harpalodon sylvestris Marsh					××											"
" *vulpinus* Marsh					×											"
"*Canis*"[1] *montanus* Marsh				×												"
PROVIVERRIDÆ.																
Sinopa rapax Leidy			×													Ph.
Sinopa (Limnocyon) **vera** (Marsh)				××												Y.
" " **agilis** (Marsh)				××												"
Stypolophus brevicalcaratus *Cope*								×								A. M.
Sinopa (Stypolophus) **pungens** (Cope)							×									"
Stypolophus insectivorus *Cope*.[2]								×								"
Proviverra americana Scott											××					P.
Thinocyon velox Marsh											××					Y.

[1] Probably *Viverravus* or *Miacis*.

[2] Indeterminate type.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
OXYÆNIDÆ.																
Patriofelis ulta Leidy	×		×													U. S.
" (Limnofelis) **ferox** (Marsh)				×												Y.
Patriofelis (Limnofelis, Oracodon) *latidens* Marsh				×												"
? PALÆONICTIDÆ.																
Ælurotherium (*Patriofelis*) *leidyanum*, O. & W																U. S.
MESONYCHIDÆ.																
Mesonyx obtusidens Cope			×							×						A. M.
" (Synoplotherium) *lanius* Cope													×			"
" (Dromocyon) *vorax* (Marsh)[1]																Y.
INDET.																
Triacodon[2] *fallax* Marsh				×												Y.
" *grandis* Marsh					×											"
" *nanus* Marsh				×												"
INSECTIVORA.																
Centetodon pulcher Marsh				×												Y.
" *altidens* Marsh				×												"

[1] Scott identifies this species with *Mesonyx obtusidens*. It probably represents a distinct species, as the last lower molar is very much reduced, according to the measurements given.

[2] Probably Proviverridæ or Viverridæ.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	BRIDGER BASIN.												WASHAKIE.						Location of Type.
		Fort Bridger.	Spanish John's.	Big Bone Buttes.	Sage Creek.	Cat-tail Spring.	Grizzly Buttes.	Dry Creek.	Henry's Fork.	Cottonwood Creek.	Camp Spring.	Tule Spring.	Twin Buttes.	Unrecorded.	Barrel Spring.	Dug Spring.	Mammoth Buttes.	Haystack Mtn.	La Clede.	Unrecorded.	
Passalacodon littoralis Marsh									×												Y.
Anisacodon elegans Marsh									×												"
Centracodon delicatus Marsh									×												"
Entomodon comptus Marsh									×												"
Entomacodon minutus Marsh								×													"
" *angustidens* Marsh								×													"
Euryacodon lepidus Marsh									×												"
Talpavus nitidus Marsh									×												"
CHIROPTERA.																					
Nyctitherium velox Marsh									×												"
" *priscum* Marsh									×												"
Nyctilestes serotinus Marsh								×													"
TILLODONTIA.																					
ESTHONYCHIDÆ.																					
Anchippodus riparius Leidy																					[1] Ph.
" *vetulus* Leidy		×																			"
" *minor* (Marsh)														×							Y.
Trogosus castoridens *Leidy*		×																			"
Tillotherium hyracoides Marsh														?							Y.

[1] Type from Monmouth Co., N. J.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.												Washakie.						Location of Type.
		Fort Bridger.	Spanish John's.	Big Bone Buttes.	Sage Creek.	Cat-tail Spring.	Grizzly Buttes.	Dry Creek.	Henry's Fork.	Cottonwood Creek.	Camp Spring.	Tule Spring.	Twin Buttes.	Unrecorded.	Barrel Spring.	Dug Spring.	Mammoth Buttes.	Haystack Mtn.	La Clede.	Unrecorded.	
Tillotherium fodiens Marsh	×													?						Y.
Tillotherium latidens Marsh														?						"
EDENTATA.																				
STYLINODONTIDÆ.																				
Stylinodon mirus Marsh														?						Y.
AMBLYPODA.																				
UINTATHERIIDÆ.																				
Uintatherium[1] **robustum** Leidy								×	×											Ph.
Uintamastix atrox *Leidy*																				"
Uintatherium (Dinoceras) mirabile (Marsh)				×	×		×		×		×	×		×		×		×	×	Y.
Uintatherium (*Dinoceras*) *agreste* (Marsh)			×																	"
" " *cuneum* (Marsh)				×																"
" " *distans* (Marsh)														×				×		"
" " *laticeps* (Marsh)									×											"
" " *lucare* (Marsh)				×																"
" " *reflexum* (Marsh)												×								"
" (*Tinoceras*) *anceps* (Marsh)					×															"
" " *affine* (Marsh)																×				"
" " *annectens* (Marsh)																		×		"
" " *crassifrons* (Marsh)						×														"

[1] Pending a revision of the genera and species of this family, it is convenient to group them provisionally under the first described genus, *Uintatherium* Leidy.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.												Washakie.						Location of Type.
		Fort Bridger.	Spanish John's.	Big Bone Buttes.	Sage Creek.	Cat-tail Spring.	Grizzly Buttes.	Dry Creek.	Henry's Fork.	Cottonwood Creek.	Camp Spring.	Tule Spring.	Twin Buttes.	Unrecorded.	Barrel Spring.	Dug Spring.	Mammoth Buttes.	Haystack Mtn.	La Clede.	Unrecorded.	
Uintatherium (Tinoceras) grande (Marsh)															×						Y.
Uintatherium (*Tinoceras*) *hians* (Marsh)						×															"
Uintatherium (Tinoceras) ingens (Marsh)														×				×		×	"
Uintatherium (*Tinoceras*) *jugum* (Marsh)																					"
" " *lacustre* (Marsh)			×														?				"
" " *latum* (Marsh)																					"
Uintatherium (Tinoceras) longiceps (Marsh)[1]																				×	"
Uintatherium (*Tinoceras*) *pugnax* (Marsh)																		×			"
" " *stenops* (Marsh)[2]																		×			"
" " *vagans* (Marsh)[1]																					"
Uintatherium (Loxolophodon) cornutum Cope																	×				A. M.
Uintatherium (*Loxolophodon*) *galeatum* Cope																	×				"
" " *speirianum* S. & O																					P.
" (*Eobasileus*) *furcatum* Cope																	×				A. M.
" " *pressicorne* Cope																	×				"
" (*Elachoceras*) *parvum* Scott																					P.
Uintatherium alticeps S. & O.														×							"
Uintatherium princeps S. & O.																					"
" *latifrons* Marsh				×																	Y.
" *leidianum* S. & O.								×													P.
" *segne* Marsh		×																			Y.

[1] From Red Dog Buttes.

[2] Cf. *U. ingens.*

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
PERISSODACTYLA.																
EQUIDÆ.																
Hyracotherium osbornianum Cope								×								A. M.
" *procyoninum* Cope							×									"
Helohippus pumilus Marsh																Y.
Orohippus uintanus (Marsh)					×											"
" *major* Marsh											? ×					"
" *pumilus* Marsh				×			×				? ×					"
Orohippus agilis Marsh											? ×					"
Orohippus sylvaticus (Leidy)					×											U. S.
Anchitherium ballardi *Marsh*				×												Y.
Oligotomus cinctus Cope							×									A. M.
LOPHIODONTIDÆ.																
Helaletes böops Marsh,				×				×							1	Y.
" *guyoti* (Scott)																P.
" *minusculus* (Scott)																"
" *nanus* (Marsh) Leidy		×			×		×									
TAPIRIDÆ.																
Isectolophus latidens (S. & O.)					×											P.

[1] Dug Springs.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
HYRACODONTIDÆ.																
Hyrachyus agrarius Leidy	×	×	×	×	×	×	×	×		×	×					U. S.
Hyrachyus agrestis *Leidy*								×								"
Hyrachyus eximius Leidy					×	×	×									Ph.
Lophiodon bairdianus *Marsh*[1]																Y.
Hyrachyus princeps Marsh					×								×			"
" *modestus* Leidy			×													U. S.
" *imperialis* Scott, Speir & Osborn,					×		×									P.
" *paradoxus* " " "																"
" *implicatus* Cope													×			A. M.
Hyrachyus intermedius *S. & O.*							×									P.
" crassidens *S. & O.*					×											"
Triplopus cubitalis Cope															[2] ×	A. M.
" *amarorum* Cope															[2] ×	"
Colonoceras agrestis Marsh																Y.
AMYNODONTIDÆ.																
Amynodon antiquus (S. & O.)															×	P.
TITANOTHERIIDÆ.																
Palæosyops paludosus Leidy	×				×		×	×		×	× [3]					U. S.
Limnohyus robustus *Marsh*					×											Y.

[1] Recorded as from Bridger and Uinta beds. Size = *H. eximius.*

[2] South Bitter Creek.

[3] Type from Church Buttes.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	Bridger Basin.										Washakie.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
Limnohyus diaconus *Cope*					×											A. M.
Palæosyops major *Leidy*						×										
Palæosyops laticeps Marsh										×	[1]	×			×	Y.
Palæosyops lævidens *Cope*							×						×			A. M.
" minor *Earle*																
Palæosyops manteoceras Osborn MS					×					×	×	×		×		A. M.
(Palæosyops vallidens *Osborn*,[2] not Cope)																
Telmatotherium validum Marsh[3]															×	Y.
Telmatotherium hyognathum *S. & O.*															×	P.
Telmatotherium vallidens (Cope)													×			A. M.
" *cultridens* S. & O					×					×						P.
Telmatotherium megarhinum Earle					×					×	×			×	×	"
? Palæosyops fontinalis *Cope*[4]											×					A. M.
? " longirostris *Earle*											×					P.
? Palæosyops humilis Leidy[5]																
? " *junius* Leidy[5]																Ph.
ARTIODACTYLA.																
? CAMELIDÆ.																
Ithygrammodon cameloides S. & O																P.

[1] Type from Marsh's Fork. [2] Bull. Am. Mus. Nat. Hist., 1895, 87. [3] *Telmatherium validus* in the original description.
[4] Indeterminate. Milk dentition, probably of *T. megarhinum*. [5] Indeterminate. May be dwarfed or milk teeth of this or some other species.

V. BRIDGER.—*Continued.*

	Huerfano Basin.	BRIDGER BASIN.										WASHAKIE.				Location of Type.
		Lodge Pole Trail.	Fort Bridger.	Grizzly Buttes.	Henry's Fork.	Dry Creek.	Cottonwood Creek.	Black's Fork.	Ham's Fork.	Twin Buttes.	Unrecorded.	Haystack Mtn.	Mammoth Buttes.	La Clede.	Unrecorded.	
HOMACODONTIDÆ.																
Homacodon vagans Marsh[1]																Y.
Nanomeryx caudatus Marsh																" "
Helohyus plicodon Marsh																" "
" *validus* Marsh																" "
" *lentus* Marsh																" "
Stenacodon rarus Marsh					×											Y.
ACHÆNODONTIDÆ.																
Achænodon insolens Cope																A. M.
" *robustus* Osborn																P.
"*Platygonus*" *Ziegleri* Marsh																Y.
INDET.																
Pantolestes longicaudus Cope[3]								×								A. M.

[1] Aug. 3, 1872. If *Pantolestes* is an Artiodactyl, it may be a synonym of this genus.
[2] South Bitter Creek.
[3] Aug. 7, 1872. The supposed position of this species among the Artiodactyla rests entirely on the general resemblance of the teeth (much worn in the type specimen), and especially of p_4, to those of *Trigonolestes*. Characters of associated fragments do not favor the reference, tending rather to place it where Cope originally referred it, among the Primates,

VI. *UINTA.*

	Horizon A.	Horizon B.	Horizon C.	Location of Type.
PRIMATES.				
Hyopsodus gracilis Marsh			×	
Hyopsodus sp.			×	
Microsyops uintensis Osborn		×		A. M.
RODENTIA.				
Paramys sciuroides S. & O.			×	P.
Paramys uintensis Osborn		×		A. M.
Protoptychus hatcheri Scott				P.
CREODONTA.				
CANIDÆ.				
Miacis vulpinus Scott			×	P.[1]
Prodaphænus scotti[2]				
Prodaphænus (Miacis) **uintensis** (Osborn)		×	×	A. M.
Procynodictis vulpiceps[2]				"
OXYÆNIDÆ.				
Oxyænodon dysodus[3]		×	×	"
MESONYCHIDÆ.				
Mesonyx, cf. *obtusidens* Cope		×		
Mesonyx uintensis Scott		×	×	P.
AMBLYPODA.				
UINTATHERIIDÆ.				
Uintatherium sp.	×	×		
PERISSODACTYLA.				
EQUIDÆ.				
Epihippus uintensis Marsh			×	Y.
Epihippus gracilis (Marsh)			×	"
LOPHIODONTIDÆ.				
Helaletes guyotii Scott		×		P.
TAPIRIDÆ.				
Isectolophus annectens S. & O.			×	"

[1] Type mislaid or lost.

[2] Unpublished.

[3] Unpublished. See Osborn, Bull. Am. Mus. Nat. Hist., 1896, 78, fig. 3 (*Hyænodon*).

VI. UINTA.—*Continued.*

	Horizon A.	Horizon B.	Horizon C.	Location of Type.
HYRACODONTIDÆ.				
Triplopus obliquidens S. & O.			×	P.
Prothyracodon intermedium *S. & O.*				
Triplopus sp. (? = *Lophiodon bairdianus* Marsh, part).			×	
AMYNODONTIDÆ.				
Amynodon advenus Marsh.			×	Y.
Amynodon intermedius S. & O.			×	P.
TITANOTHERIIDÆ.				
Telmatotherium cornutum Osborn.		×		A. M.
Telmatotherium diploconum Osborn.		×		"
Telmatotherium ? diploconum, var. **minus** [1].		×		"
Telmatotherium hyognathum S. & O.		×	×	P.
Palæosyops manteoceras Osborn [2].	×	×	×	A. M.
" **ultimus** Osborn [2].			×	"
Diplacodon elatus Marsh.			×	Y.
Diplacodon emarginatus Hatcher.			×	P.
Diplacodon sp. indesc.			×	A. M.
ARTIODACTYLA.				
HOMACODONTIDÆ.				
Bunomeryx montanus Wortman.			×	A. M.
Bunomeryx elegans Wortman.			×	"
CAMELIDÆ.				
Protylopus petersoni Wortman.			×	A. M.
Leptotragulus proavus S. & O.		×	×	P.
Parameryx lævis Marsh.			×	Y.
" *sulcatus* Marsh.			×	"
Camelomeryx longiceps Scott.			×	P.
OREODONTIDÆ.				
Leptoreodon marshi Wortman.		×	×	A. M.
Merycodesmus gracilis *Scott.*			×	P.
Eomeryx (Protoreodon) **parvus** (S. & O.).			×	"
Eomeryx sp. major indesc.			×	
" *pumilus* Marsh.			×	Y.
Agriotherium paradoxicum Scott.			×	P.
Hyomeryx breviceps Marsh.			×	Y.
Oromeryx plicatus Marsh.			×	"
ACHÆNODONTIDÆ.				
Protelotherium uintense (Osborn).		×		A. M.
Achænodon sp. (*A. insolens,* fide Osborn).		×		
INCERTÆ SEDIS.				
Sphenocœlus uintensis Osborn.		×		A. M.

[1] Unpublished. Heretofore confounded with *T. megarhinum.*

[2] Unpublished.

VII. *WHITE RIVER.*

The localities tabulated below are :

1. *Colorado.* — Headwaters of Cedar, Lewis, Horsetail, and Pawnee Creeks in northeast Colorado. Fauna described by Cope in 1873 and later. The Lower, Middle, and Upper White River are represented. Cope's collections were from the lower and middle beds, Horizons *A* and *B* ; the fauna of Horizon *C* is determined from collections by the American Museum Expedition of 1898.

2. *Nebraska.* — Hat Creek Basin, adjoining the S. Dakota White River. Lower, Middle, and Upper White River are present.

3. *South Dakota.*—This is the largest and best known area. It lies between and about the White and Cheyenne Rivers, and furnishes the typical section. The Lower or Titanotherium Beds are divisible into three subzones, the Middle or Oreodon Beds into two subzones, and the Upper or Protoceras Beds probably into two subzones of which the uppermost one bears a generally scanty fauna.

4. *North Dakota.*—A small area near White Buttes contains a fauna apparently near to the Protoceras fauna in age.

5. *Montana.*—I have here included the lower beds of the Deep River valley, which Prof. Scott considers as Upper John Day. That they are later than the uppermost part of the White River (Horizon *C*, Leptauchenia Beds) is, I think, not proven, and they belong geographically to the White River.

6. *Canada.*—Swift Current Creek in the Cypress Hills, N. W. T. The area is limited and the rocks conglomeritic, so that the specimens were largely fragmentary. They are preserved in the Museum of the Geological Survey of Canada.

VII. WHITE RIVER.—*Continued.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
MARSUPIALIA.													
Didelphys pygmæa Scott		×											P.
? **Didelphys** (Peratherium) **fugax** (Cope)		×											A. M.
? " " **huntii** (Cope)		×											"
? *Didelphys* (Peratherium) *alternans* (Cope)		×											"
? " " *scalaris* (Cope)		×											"
? " " *marginalis* (Cope)		×											"
RODENTIA.													
ISCHYROMYIDÆ.													
Ischyromys typus Leidy		×			×			×	×				Ph.
SCIURIDÆ.													
Sciurus relictus Cope		×											A. M.
Sciurus cf. *wortmani* Cope		×											
CASTORIDÆ.													
Steneofiber nebrascensis Leidy						×			×	×			Ph.
Steneofiber montanus Scott											×		P.
GEOMYIDÆ.													
Gymnoptychus minutus Cope		×											A. M.
Gymnoptychus trilophus Cope		×											"
Heliscomys vetus Cope		×											"

VII. White River.—*Continuea*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
CRICETIDÆ.													
Eumys elegans Leidy		×			×			× ×					Ph.
LEPORIDÆ.													
Palæolagus haydeni Leidy		×	×		×			× ×					"
" **intermedius** sp. nov.[1]		×	×										A. M.
" **turgidus** Cope		×										×	"
Palæolagus triplex Cope		×											"
CREODONTA.													
HYÆNODONTIDÆ.													
Hyænodon horridus Leidy								×					
" **cruentus** Leidy		×						×					
" **crucians** Leidy		×						× ?					
Hyænodon leptocephalus Scott													H.
" *paucidens* O. & W.								×					A. M.
Hemipsalodon grandis Cope												×	C. G. S.
CARNIVORA.													
CANIDÆ.													
Daphænus (Amphicyon) vetus (Leidy)		×						×					U. S.
Daphænus (Amphicyon) hartshornianus (Cope)		×						×					A. M.
" *felinus*, Scott					×								P.
" *dodgei* Scott				×									P.

[1] A species intermediate in size between *P. haydeni* and *P. turgidus*. The size in these species appears to be fairly constant, and there may be other characters to separate this form.

VII. White River.—*Continued.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
Cynodictis (*Canis*, *Galecynus*) **lippincottianus** Cope		×						× ×					A. M.
Amphicyon gracilis *Leidy* (nom. preoc.)								×					Ph.
" angustidens *Marsh*													Y.
Cynodictis (Galecynus) gregarius (Cope)		×						× ×		?			A.M.
? Cynodictis sp. maj			×						×				
Cynodesmus thöoides Scott													P.
PROCYONIDÆ.													A. M.
Phlaocyon leucosteus n. g. & sp.[1]			×										
MUSTELIDÆ.													
Bunælurus lagophagus Cope		×											"
Canis osorum *Cope*		×											"
FELIDÆ.													
Dinictis felina Leidy							?	× ×	?				"
Dinictis squalidens Cope		×						?					"
" *fortis* Adams							×	×					
Dinictis bombifrons *Adams*													
Dinictis paucidens Riggs													K.
Hoplophoneus (Drepanodon) primævus Leidy								×					U. S.
" " **occidentalis** Leidy								×					Ph.

[1] Generic characters: skull short and wide with thick, blunted low-cusped teeth; p^4 with postero-internal cusp. and strong, well separated antero-internal. Dentition $\frac{3.1.4.2}{3.1.4.3}$. Limbs and feet shorter than in *Cynodictis*, claws small and short. Apparently ancestral to the Procyonidæ. *P. leucosteus* is somewhat larger than *Cynodictis gregarius*. Length of skull 93.5 mm.; width 64.2; length of upper dentition 46.3; width across palate at posterior end of p^4, 34; length of tibia 84.5. The claws have a rudimentary basal sheath; the upper surfaces of the second phalanges are hollowed out as though the claws were slightly retractile.

VII. WHITE RIVER.—*Continued.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
Dinotomius atrox *Williston*													K.
Hoplophoneus (*Machærodus*) *oreodontis* (Cope)		×											A. M.
Hoplophoneus robustus Adams		?			×			×					
" *insolens* Adams								×	×				
" *crassidens* Cragin													
Eusmilus dakotensis Hatcher									×				P.
INSECTIVORA.													
LEPTICTIDÆ.													
Leptictis haydeni Leidy													Ph.
Ictops dakotensis Leidy								×	×				"
Ictops bullatus sp. nov.[1]								×	×				A. M.
Mesodectes caniculus Cope [2]		×											"
INCERTÆ SEDIS.													
Geolabis rhynchæus Cope		×											"
Domnina[3] *gradata* Cope		×											"
" *crassigenis* Cope		×											"
Protosorex crassus Scott													[4]
PERISSODACTYLA.													
EQUIDÆ.													
Mesohippus[5] **(Anchitherium) bairdi** Leidy		×			×		×	×	×				

[1] Distinguished from type species by presence of small auditory bulla, m^3 reduced without metacone, longer skull and somewhat larger size.
[2] Validity of this genus somewhat doubtful. The only character separating it from *Ictops* is absence of trittocone on p^3, which is partly due to wear. The only character separating *Ictops* from *Leptictis* is absence of deuterocone and trittocone from p^3; they would otherwise be identical.
[3] Doubtfully separable from *Geolabis*. [4] Type in Mus. Chic. Univ. [5] *Vide* Farr, Am. Phil. Soc. Proc., 1896, 147.

VII. White River.—*Continued.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
Anchitherium exoletum *Cope*		×	×										A. M.
" cuneatum *Cope*		×											"
Mesohippus intermedius O. & W.			?			×			×				"
" **copei** O. & W.								×	×				"
Mesohippus gracilis Marsh													Y.
" *celer* Marsh													"
" *westoni* (Cope)												×	C. G. S.
" (*Miohippus*) *? equiceps* (Cope.) [1]											×		
" " *? annectens* Marsh [1]											×		
Anchippus texanus Leidy [2]			?										? U. S.
Anchitherium agreste *Leidy*													"
LOPHIODONTIDÆ.													
Colodon (Lophiodon) occidentalis (Leidy)							×	×					Ph.
Colodon luxatus Marsh								×					Y.
" *dakotensis* O. & W.								×					A. M.
" *procuspidatus* O. & W.								×					"
? " (*Mesohippus*) *longipes* (O. &. W.)									×				"
TAPIRIDÆ.													
Protapirus simplex W. & E.								×					"
" **obliquidens** W. & E.									×				"
Protapirus validus Hatcher													P.

[1] Determination provisional, by Prof. Scott.

[2] See note (1) on p. 69.

VII. WHITE RIVER.—*Continued.*

	Colo.			Neb.			S. Dakota.				N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.					
HYRACODONTIDÆ.														
Hyracodon (Rhinocerus) nebrascensis Leidy		×	?	?	×	?	?	×	×	?				U. S.
Hyracodon arcidens Cope		×												A. M.
Hyracodon major S. & O.														H.
Hyracodon planiceps S. & O.														"
AMYNODONTIDÆ.														
Metamynodon planifrons S. & O.								×						H.
RHINOCEROTIDÆ.														
Leptaceratherium trigonodum O. & W.							×							A. M.
Aceratherium mite Cope		×							×					A. M.
Cænopus pumilus *Cope*													×	C. G. S.
Aceratherium copei O. & W.							×							A. M.
" **occidentale** (Leidy)		×			×			×	×				×	U. S.
" **tridactylum** Osborn									×		×			A. M.
Diceratherium proavitum *Hatcher*						×								"
Aceratherium platycephalum O. & W.				×					×					U. P.
Aceratherium simplicidens (Cope)					×									A. M.
" *quadriplicatum* (Cope)		×												
TITANOTHERIIDÆ.														
Titanotherium[1] **(Teleodus) avum** Marsh							×							V.
Titanotherium (*Megaceratops*) *coloradense* Leidy.[2]							×						×	Ph.

[1] For synonymy of species of *Titanotherium*, see Osborn, Bull. Am. Mus. Nat. Hist., 1896, pp. 174–196.

[2] Denver Basin.

VII. WHITE RIVER.—*Continued.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
Titanotherium (Symborodon) **trigonoceras** Cope.	×						×						A. M
" (Brontotherium) **ingens** Marsh	×						×						Y.
Titanotherium (Symborodon) *heloceras* Cope	×												A. M.
" " *torvum* Cope	×						×						"
Titanotherium (Symborodon) **acre** Cope	×			×			×					×	"
Titanotherium (Diconodon) *montanum* Marsh							×						Y.
" (Haplacodon) *angustigenis* Cope												×	C. G. S.
" " *peltoceras* Cope							×						U. P.
Titanotherium (Brontops) **robustum** Marsh							×						Y.
Titanotherium (Menodus) *tichoceras* S. & O.							×						H.
" " *dolichoceras* S. & O.							×						"
Titanotherium (Titanops) **elatum** Marsh							×						Y.
Titanotherium (Titanops) *curtum* Marsh	×												"
Titanotherium (Menodus) **platyceras** S. & O.							×						H.
Titanotherium ramosum Osborn							×						A. M.
" (Menodus) *selwynianum* Cope												×	C. G. S.
ANCYLOPODA.													
CHALICOTHERIIDÆ.													
Chalicotherium bilobatum Cope												×	"
ARTIODACTYLA.													
ANTHRACOTHERIIDÆ.													
Anthracotherium (Heptacodon) *curtum* (Marsh)													Y.
Anthracotherium occidentale *O. & W.*							×	×					A. M.

VII. WHITE RIVER.—*Continued.*

	Colo.			Neb.			S. Dakota.							
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Proteceras.	Titanoth'm.	Oreodon.	Protoceras.	N. Dakota.	Montana.	Canada.	Type.
Anthracotherium (Heptacodon) *gibbiceps* (Marsh)													Y.
" " *karense* O. & W.									×				A. M.
Octacodon valens *Marsh.*													Y.
Elomeryx (Heptacodon) armatus *Marsh.*													"
Anthracotherium (Elomeryx) *mite* (Marsh)													"
Hyopotamus americanus Leidy								×					
" **brachyrhynchus** O. & W.									×				A. M.
Hyopotamus deflectus Marsh.....S. Dakota.										?			Y.
ELOTHERIIDÆ.													
Elotherium mortoni Leidy	×				×		×	×					Ph.
" **crassum** Marsh	?	?						×	×				Y.
" **ingens** Leidy								×	×				
Elotherium robustum *Leidy.*													? U. S.
Elotherium (Pelonax) *ramosum* Cope		×								×			A. M.
" *arctatum* Cope												×	C. G. S.
" (Ammodon) *bathrodon* Marsh.													Y.
" " *potens* Marsh													"
" " *clavum* Marsh													"
INDET.													
Leptochœrus spectabilis Leidy.[1]								×	×				
Laopithecus robustus *Marsh*													Y.

[1] Marsh has described this genus as possessing artiodactyl feet. In the teeth it does not resemble any known Artiodactyl, and Marsh makes it the type of a new (undefined) family.

VII. White River.—*Continued.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
Leptochœrus (Menotherium) *lemurinus* (Cope)		×											A. M.
" *gracilis* Marsh		?						?					Y.
SUIDÆ.													
Thinohyus robustus Marsh									×				
" *nanus* Marsh								×					
Perchœrus probus Leidy								×					
" *antiquus* Marsh													
Nanohyus porcinus Leidy													
Bothrolabis (*Hyotherium*) *americanus* S. & O.													H.
" (*Palæochœrus*) *platyops* Cope									?				A. M.
OREODONTIDÆ.													
Agriochœrus antiquus Leidy							×	×					
" **latifrons** Leidy							×	×					
" **major** Leidy									×				
Agriochœrus (Agriomeryx) *migrans* Marsh									×				
Oreodon culbertsoni Leidy		×			×			×					
" **gracilis** Leidy		×			×	?		×	×				Ph.
" **bullatus** Leidy									×				"
Eporeodon major (Leidy)						×			×	×			
" **sp.**			×										
Mesoreodon chelonyx Scott			?								×		P.
Mesoreodon intermedius Scott											×		"
Merycochœrus sp.			×						?				

VII. WHITE RIVER.—*Concluded.*

	Colo.			Neb.			S. Dakota.			N. Dakota.	Montana.	Canada.	Type.
	Horizon A.	Horizon B.	Horizon C.	Titanoth'm.	Oreodon.	Protoceras.	Titanoth'm.	Oreodon.	Protoceras.				
Leptauchenia major Leidy									×				
" **decora** Leidy			×						×				Ph.
Leptauchenia nitida Leidy									×				
CAMELIDÆ.													
Pöebrotherium wilsoni Leidy		?			×			×					Ph.
" **labiatum** Cope		×			×			×					A. M.
Pöebrotherium sp.	×												"
Protomeryx halli Leidy			×						×		?		
Stibarus obtusilobus Cope		×											A. M.
TRAGULIDÆ.													
Leptomeryx evansi Leidy		×	?		×			×	?	×		×	
Leptomeryx mammifer Cope		×						×				×	C. G. S.
" *semicinctus* Cope												×	"
" *esulcatus* Cope												×	"
Hypertragulus calcaratus Cope		×						×			×	×	A. M.
Hypertragulus tricostatus Cope		×											"
" *transversus* Cope												×	C. G. S.
Hypisodus minimus Cope		×											A. M.
PROTOCERATIDÆ.													
Protoceras celer Marsh									×				Y.
Protoceras comptus Marsh									×				"
" *nasutus* Marsh									×				"
Calops cristatus Marsh									×				"
" *consors* Marsh									×				"

VIII. *JOHN DAY.*

The level at which each species occurs is known only in a few cases, as noted.

RODENTIA.

SCIURIDÆ.

	Type.
Sciurus wortmani Cope	A. M.
Sciurus ballovianus Cope	"
Allomys nitens Marsh	Y.
" (Meniscomys) **hippodus** Cope	A. M.
Allomys (Meniscomys) *multiplicatus* Cope	"
" " *liolophus* Cope	"
" " *cavatus* Cope	"

CASTORIDÆ.

Steneofiber gradatus Cope	A. M.
" *peninsulatus* Cope	"

GEOMYIDÆ.

Pleurolicus sulcifrons Cope	A. M.
" *leptophrys* Cope	"
" *diplophysus* Cope	"
Entoptychus planifrons Cope	"
" **cavifrons** Cope	"
" **minor** Cope	"
Entoptychus lambdoideus Cope	"
" *crassiramis* Cope	"

MURIDÆ.

Hesperomys nematodon Cope	A. M.
Paciculus lockingtonianus Cope	"
Paciculus insolitus Cope	"

LEPORIDÆ.

Lepus ennisianus Cope[1]	A. M.

CARNIVORA.

CANIDÆ.

Paradaphænus[2] **(Amphicyon) cuspigerus** (Cope)	A. M.
Paradaphænus sp. indesc	"
Amphicyon hartshornianus *Cope* (part)	"
Nothocyon[2] **(Galecynus) geismarianus** (Cope)	"
" " **lemur** (Cope)	"
" " **latidens** (Cope)	"
Temnocyon altigenis Cope	"
Temnocyon wallovianus Cope	"
" *ferox* Evermann	P.

[1] Includes all specimens from John Day referred by Cope to *Palæolagus.*

[2] Unpublished.

VIII. JOHN DAY.—*Continued.*

	Type.
Hypotemnodon (Temnocyon) coryphæus (Cope)	A. M.
Hypotemnodon (*Temnocyon*) *josephi* (Cope)	"
Hyænocyon basilatus Cope	"
" *sectorius* Cope	"
Oligobunis crassivultus Cope	"
Enhydrocyon stenocephalus Cope	"

MUSTELIDÆ.

Paractis primævus Scott	P.

FELIDÆ.

Dinictis cyclops Cope	A. M.
Archælurus debilis Cope	"
Nimravus gomphodus Cope	"
Nimravus confertus Cope	"
Pogonodon platycopis Cope	"
Pogonodon brachyops Cope	"
Hoplophoneus cerebralis Cope	"
Hoplophoneus strigidens *Cope* (sp. indeterm.)	"

PERISSODACTYLA.

EQUIDÆ.

Mesohippus (Anchitherium) præstans (Cope)[1]	A. M.
" " **equiceps** (Cope)	"
Mesohippus (*Anchitherium*) *brachylophus* (Cope)	"
" " *longicristis* (Cope)	"
" " *condoni* Leidy[2]	U. S.
" (*Miohippus*) *annectens* (Marsh)	Y.
" " *anceps* (Marsh)	"

LOPHIODONTIDÆ.

? *Colodon* (*Lophiodon*) *occidentalis* Leidy[2]	U. S.

RHINOCEROTIDÆ.

Aceratherium pacificum Leidy	U. S.
" ? *hesperium* Leidy	"
Aceratherium tubifer *Cope* (indet. sp.)	A. M.
Aceratherium truquianum Cope	"
" *annectens* Marsh	Y.
Diceratherium armatum Marsh	"
" **nanum** Marsh	"

INDETERMINATE.

Dæodon shoshonensis Cope	A. M.

? CHALICOTHERIIDÆ (aut EDENTATA).

Moropus distans Marsh	Y.
" *senex* Marsh	"

[1] Bridge Creek (Merycochœrus Beds). [2] Bridge Creek.

VIII. JOHN DAY.—*Concluded.*

ARTIODACTYLA.

ELOTHERIIDÆ.

	Type.
Boöchœrus humerosus Cope[1]	A. M.
Elotherium imperator Leidy[2]	U. S.

SUIDÆ.

Bothrolabis (Dicotyles) pristinus Leidy[2]	U. S.
Bothrolabis trichænus Cope	A. M.
" *rostratus* Cope	"
" *subæquans* Cope	
Chœnohyus decedens Cope	
Thinohyus lentus Marsh	Y.
" *socialis* Marsh	"

OREODONTIDÆ.

Agriochœrus trifrons Cope	A. M.
" **guyotianus** Cope	"
Agriochœrus ryderanus Cope	"
Agriochœrus (Coloreodon) *ferox* (Cope)	"
" " macrocephalus (Cope)	"
Eporeodon occidentalis Marsh	Y.
Eucrotaphus jacksoni *Leidy*, part	
" major *Leidy*, part	
Eporeodon occidentalis var. **leptacanthus** (Cope)[3]	A. M.
" " var. **pacificus** (Cope)[3]	"
Eporeodon trigonocephalus (Cope)	"
" *socialis* Marsh	Y.
" *major* var. *longifrons* (Cope)[3]	A. M.
Merycochœrus (Oreodon) superbus Leidy[4]	U. S.
" **chelydra** Cope[4]	A. M.
Merycochœrus leidyi Bettany[4]	
" *macrostegus* Cope[4]	A. M.

CAMELIDÆ.

Protomeryx (Gomphotherium) **sternbergi** Cope	A. M.
" " **cameloides** Wortman[4]	"
Hypertragulus calcaratus Cope	"

[1] Perhaps the same as *Elotherium imperator* Leidy.
[2] Bridge Creek.
[3] These may probably be distinct species.
[4] Bridge Creek Beds.

IX. *LOUP FORK.*

The localities tabulated below are as follows:

1. *Northeastern Colorado.* Headwaters of Cedar, Horsetail, and Pawnee Creeks, in Logan and Weld counties, north of the South Platte River. Sands and gravels overlying the White River clays, usually unconformably with heavy conglomerates at or near the base. Another unconformity of erosion occurs sometimes within the formation dividing it into horizons D and E (p. 23); but no important faunal distinctions appear. These unconformities of erosion in fluviatile beds are not of much importance. Collections made by Prof. Cope in 1873 and 1879, and Amer. Mus. Exped. of 1898.

2. *Laramie Peak, Wyoming.* A small collection chiefly of *Merychyus*, made for Prof. Cope in 1880.

3. *Deep River, Montana.* A limited area in the valley of Deep Creek or Smith River, near Great Falls. Collections made for Prof. Cope in 1877, and Princeton Expedition of 1892.

4. *Cottonwood, Oregon.* Cottonwood Creek in the valley of the John Day River. Collection made for Prof. Cope in 1879 by Dr. J. L. Wortman.

5. *Oregon Desert.* See foot-note, p. 70.

6. *Nebraska.* In the basins of the Loup River (Loup Fork) and Niobrara River, and elsewhere in the central and northern part of western Nebraska. The fauna, described mainly by Leidy and Marsh, is the typical and largest Loup Fork fauna.

7. *New Mexico.* This fauna was described by Cope in 1874 from the collections made by the Wheeler Survey, and now preserved in the National Museum. Most of the species came from the Santa Fé basin.

8. *Kansas–Nebraska.* Northwestern Kansas and southwestern Nebraska in the drainage basin of the Republican River. The latest of the Loup Fork faunas, some of it Pliocene according to Prof. Scott. The short-legged Rhinoceroses are the most abundant fossil.

9. *Texas.* In northern Texas, near the head of the Red River, along the northeastern border of the Llano Estacado.

IX. *LOUP FORK.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
RODENTIA.										
SCIURIDÆ.										
Arctomys vetus Marsh						×				
Cynomys sp.								×		
MYLAGAULIDÆ.										
Mylagaulus sesquipedalis Cope								×		A. M.
Mylagaulus monodon Cope[1]	×							×		"
CASTORIDÆ.										
Steneofiber pansus Cope							×			U. S.
" sp.								×		
Eucastor tortus Leidy						×				
Sigmogomphius lecontei Merriam ..... Pliocene, California.										
GEOMYIDÆ.										
Geomys bisulcatus Marsh[2]						×				Y.
Hesperomys loxodon Cope							×			U. S.
" sp.								×		

[1] A skull and jaws of this species, collected in Colorado in 1898, show that Cope was justified in placing it in a separate family. It is partly intermediate between *Castoridæ* and *Sciuridæ*, but has many peculiar characters.

[2] Also from Blue Creek; identification uncertain; associated with *Cyclopidius*.

IX. LOUP FORK.—*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
LEPORIDÆ.										
Panolax sanctæfidei Cope							×			U. S.
Lepus sp.								×		
CARNIVORA.										
CANIDÆ.										
Ælurodon compressus Cope						×				A. M.
Ælurodon sævus Leidy						×	×	×		U. S.
" **haydeni** Leidy										"
" **wheelerianus** Cope						×	×			"
" **hyænoides** Cope								×		A. M.
Ælurodon taxoides Hatcher								××		P.
" *mæandrinus* Hatcher								×		"
" *ursinus* Cope						×	×			U. S.
? *Canis montanus* Marsh										Y.
" *vafer* Leidy						×				U. S.
" *temerarius* Leidy	×					×				"
" *brachypus* Cope		×								A. M.
" *anceps* Scott			×							P.
PROCYONIDÆ.										
Leptarctus primus Leidy						×				

IX. Loup Fork.—*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
MUSTELIDÆ.										
Mustela parviloba (Martes mustelinus *Cope*)	×					×				A. M.
" sp	×									"
Putorius nambianus Cope							×			U. S.
? *Stenogale robusta* Cope						××				A. M.
Brachypsalis pachygnathus Cope				×						"
Lutricitis lycopolavicus Cope	×									"
Tomarctus brevirostris Cope	×					×		×××		U. S.
FELIDÆ.										
Pseudælurus intrepidus Leidy	×									A. M.
Machærodus catocopis Cope									×	H.
? *Felis maxima* S. & O. (= *Machærodus*, fide Adams)										U. S.
? " *augustus* Leidy										
PROBOSCIDEA.										
ELEPHANTIDÆ.										
Tetrabelodon angustidens (Cuvier)	?		×				×	×		A. M.
" *brevidens* Cope										
" *serridens* Cope							×			U. S.
" *productus* Cope										A. M.
" *cumbopodon* Cope								××		"
" *campester* Cope										

IX. LOUP FORK.—*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
Dibelodon mirificus Leidy						×				
" *præcursor* Cope									×	
PERISSODACTYLA.										
EQUIDÆ.										
Mesohippus (*Miohippus*) sp.			×							
" (*Anchitherium*) *ultimus* Cope				×						A. M.
Anchitherium equinum Scott	?		×							P.
Anchippus texanus Leidy	×								[1] ×	
Anchitherium australe *Leidy*									[1] ×	
Anchippus (*Desmatippus*) *crenidens* (Scott)			×							P.
Anchippus brevidens Marsh				×						Y.
Protohippus[2] **perditus** Leidy	×	×		×		×		×	×	U. S.
Protohippus profectus *Cope*								×		
? " labrosus *Cope*	×									A. M.
Parahippus cognatus *Leidy*										
Protohippus placidus Leidy						×		×	×	
Hipparion gratus *Leidy*										
Protohippus (Equus) parvulus *Marsh*										
Protohippus medius Cope				×		×		×		
? Merychippus insignis *Leidy* (Indet. sp.)										
Protohippus sejunctus Cope	×		×			? ×	? ×			A. M.

[1] Type from Washington Co., "Miocene." May be White River.

[2] Strictly speaking, *Protohippus* is preoccupied by *Merychippus*, the type of which is generically though perhaps not specifically determinable. Cop (Tex. Geol. Sur., 1892) has stated the reasons for preferring the name *Protohippus*.

IX. LOUP FORK—*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
Protohippus castilli Cope [1]										A. M.
" *avus* Marsh				?						Y.
Pliohippus pernix Marsh						×				"
" *robustus* Marsh						×				"
Pliohippus (Merychippus) mirabilis (Leidy) [2]	×					×			×	
Protohippus supremus *Leidy*										
Pliohippus (*Protohippus*) *pachyops* (Cope)								?	×	T.
" " *fossulatus* (Cope)								×		"
" (*Hippidium*) *spectans* (Cope)				×						A. M.
Hipparion (Hippotherium) isonesum (Cope)	×		×	×						"
" **speciosum** (Leidy)						×		×		
" **occidentale** (Leidy)				× [3]						
Hipparion sinclairii (Wortman)				× [3]						A. M.
" *montezumæ* (Leidy) [4]										
" *peninsulatum* (Cope) [5]										A. M.
" *paniense* (Cope)	×									"
" *calamarium* (Cope)	×						×			

[1] Type from Tehuichila, Vera Cruz, Mexico.

[2] It is probable that a more complete knowledge of the one-toed Horses of the Loup Fork would show them to be generically distinct from *Hippidion*. In this case Marsh's name *Pliohippus* can properly be used. They are much smaller, very much slenderer than *Hippidion;* the skulls are like *Protohippus* as far as known, and the nasals are probably as in that genus and very different from *Hippidion*. *Protohippus mirabilis* Leidy may, according to Cope, belong in this genus, a suggestion confirmed by a skeleton found recently in Colorado. *P. pachyops* and *P. fossulatus* are very similar. All are distinguished from *Protohippus* by large size, unusually large cement lakes, and very little complication of the enamel.

[3] From the loose gravels overlying the Cottonwood beds. [4] Mexico. [5] Tehuichila, Vera Cruz, Mexico.

IX. LOUP FORK —*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
Hipparion relictum Cope[1]					×					A. M.
H. seversum, H. sphenodus *Cope* (sp. indeterm.)	×									"
TAPIRIDÆ.										
Tapiravus rarus Marsh[2]										Y.
RHINOCEROTIDÆ.										
Aceratherium profectum n. sp.[3]	×									A. M.
" **(Aphelops) megalodum** (Cope)[4]	×		?							"
? Rhinoceros crassus *Leidy*										U. S.
Teleoceras fossiger (Cope)								×		A. M.
Teleoceras major *Hatcher*								×		P.
Aceratherium acutum *Marsh*								×		Y.
? Teleoceras malacorhinus (Cope)										A. M.
? Rhinoceros meridianus *Leidy*										
Teleoceras superciliosus (Cope)								×		A. M.
Aceratherium (*Aphelops*) *jemezanum* (Cope)							×			U. S.
" (*Rhinoceros*) *oregonensis* (Marsh)[5]				?						Y.

[1] Teeth found in the Oregon Desert, along with bones of *Aphelops* (cf. *fossiger*), undetermined Proboscidea and a large Camel, in size equal to *Procamelus robustus* Leidy. Prof Cope referred these specimens to the Pliocene (= Blanco), but they do not seem separable from the Kansas Loup Fork fauna.

[2] " Lower Pliocene, east of the Rocky Mountains."

[3] Dentition and proportions of teeth as in *A. occidentale*. Jaw shorter, deeper, and more rounded than *A. occidentale*, angle as in *A. megalodus*.

[4] In the synonymy of the Loup Fork Rhinoceroses, I have followed Prof. Osborn's provisional use of Cope's specific names based on complete skulls, etc., rather than Leidy's earlier names based on fragmentary specimens.

[5] " Pliocene . . . . about two thirds the size of *R. crassus* Leidy."

IX. Loup Fork.—*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
? CHALICOTHERIIDÆ aut EDENTATA.										
Moropus elatus Marsh[1]	?					×				Y.
ARTIODACTYLA.										-
SUIDÆ.										
Dicotyles serus Cope								×		A. M.
Platygonus striatus Marsh										
SUINÆ INDET.										
OREODONTIDÆ.										
Merycochœrus rusticus Leidy, Wyoming.										U. S.
" *proprius* Leidy	?					×				"
" *cenopus* S. & O						×				H.
" *montanus* Cope			×							A. M.
" *obliquidens* Cope				××						"
" sp				×						
Merychyus elegans Leidy	?					×				U. S.
" **medius** Leidy	×					××	×			"
" **major** Leidy	×					×				"

[1] Prof. Marsh (A. J. S., May, 1892, p. 448, foot-note) states that *Moropus* is distinct from *Chalicotherium*, with which it was identified by Scott and Osborn, but gives no reasons for the separation. The Colorado specimen indicated above has metatarsals and toes closely resembling *Ancylotherium*, and should be renamed if *Moropus* is edentate; the reference is only provisional. An undoubted chalicothere from Nebraska was referred by Scott and Osborn to Marsh's species.

IX. LOUP FORK.—*Continued.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas–Nebraska.	Texas.	Type.
Merychyus zygomaticus (Cope)			×							A. M.
" *pariogonus* (Cope)			×							"
" *arenarum* (Cope)		×								"
" *euryops* (Cope)		×								"
Cyclopidius emydinus Cope			×			1				"
" **simus** Cope			××							"
Pithecistes brevifacies *Cope*[2]			××							"
Cyclopidius incisivus Scott			××							P.
Cyclopidius (Pithecistes) **decedens** (Cope)			××			1				A. M.
? Pithecistes heterodon *Cope*			×							"
CAMELIDÆ.										
Procamelus robustus Leidy					?	×	×	×	×	U. S.
Protolabis prehensilis *Cope*								×		A. M.
Procamelus altus *Marsh*						×				Y.
Procamelus occidentalis Leidy						×	×	×	×	U. S.
Homocamelus caninus *Leidy*						×				"
Procamelus gracilis Leidy						×	×	×	×	"
Procamelus leptognathus Cope									×	T.

[1] Blue Creek, Cheyenne Co., associated with *Merychyus* and ? *Merycochœrus*.

[2] *Pithecistes* was distinguished by Cope from *Cyclopidius* by: (1) lower incisors reduced to one on each side; (2) canine not incisiform; (3) p_1, absent. These characters are shown only in the single known specimen of the type species *P. brevifacies*, a very old individual. Careful comparison and more complete removal of the matrix show that: (1) the alveoli of two small incisors are present on each side; (2) the canine, mistaken by Cope for an incisor, is present and worn to a stump; (3), the first pre-molar, mistaken for canine by Cope, is present and caniniform; (4) there are no distinctions whatsoever from *Cyclopidius simus* except those due to age of the individual. *Pithecistes decedens* is the permanent and *P. heterodon* probably the milk dentition of a smaller species of *Cyclopidius;* both are founded on upper teeth.

IX. Loup Fork.—*Concluded.*

	N. E. Colorado.	Laramie P'k, Wyo.	Deep River, Mont.	Cottonwood, Ore.	Oregon Desert.	Nebraska.	New Mexico.	Kansas-Nebraska.	Texas.	Type.
Protolabis heterodontus Cope [1]	×		?							A. M.
" **(Procamelus) ? angustidens** Cope	××									"
Miolabis (Procamelus) ? fissidens Cope	×									"
" **(Protolabis) ? transmontanus** Cope				×						"
" sp.	×									"
Pliauchenia humphresiana Cope							×	×		U. S.
Pliauchenia vulcanorum *Cope*							×			"
Pliauchenia minima Wortman								×		A. M.
CERVIDÆ.										
Blastomeryx gemmifer Cope	×					×	×			A. M.
" **borealis** Cope	?		×	×						"
Blastomeryx antelopinus Scott			×							P.
Cosoryx furcatus Leidy						×	×	×		
Cosoryx ramosus *Cope*										
Cosoryx necatus Leidy						×		×		A. M.
Cervus warreni *Leidy*						×				U. S.
Cosoryx teres Cope								×		"
" *trilateralis* Cope								×		"
" *tehuanus* Cope								×		"
BOVIDÆ.										
Bison ferox Marsh [2]						×				Y.
" *alleni* Marsh [2]								×		"

[1] Additional and more complete material from Colorado shows that the Camels of that region are not *Procamelus*, but belong to two distinct genera. For one of these *Protolabis* Cope can probably be used; the other, if distinct from *Protomeryx*, may be called *Miolabis*, a name suggested by Dr. O. P. Hay in a recent letter to Prof. Osborn. The genera will be more fully defined in a forthcoming article on the Colorado Miocene. At present the distinctions appear to be: *Procamelus*. Dentition $I\frac{1}{3}$, $C\frac{1}{1}$, $P\frac{4}{4}$, $M\frac{3}{3}$; metapodials united. *Protolabis*. Dentition $I\frac{3-1}{3-1}$, $C\frac{1}{1}$, $P\frac{4}{4}$, $M\frac{3}{3}$; metapodials united; neck and legs greatly elongated, as in the Giraffe. *Miolabis*. Dentition $I\frac{3}{3}$, $C\frac{1}{1}$, $P\frac{4-3}{4-3}$, $M\frac{3}{3}$; metapodials separate.

[2] "Lower Pliocene."

X. *PLIOCENE.*

A. Palo Duro.

(GOODNIGHT BEDS.)

This fauna, except for the presence of *Equus*, corresponds with the later Loup Fork fauna, which may also be Pliocene according to Prof. Scott. It is too scanty for certain correlation. The formation overlies the Texas Loup Fork unconformably.[1]

PERISSODACTYLA.

RHINOCEROTIDÆ.

Aphelops sp.....

EQUIDÆ.

Protohippus lenticularis Cope..... T.
" *perditus* Leidy.....
" sp.....
Pliohippus (*Hippidium*) *interpolatus* (Cope)..... T.
" " *spectans* (Cope).....
Equus eurystylus Cope..... T.
" ? *simplicidens* Cope.....

B. Blanco.

CARNIVORA.

CANIDÆ.

Canimartes cumminsii Cope..... T.
Borophagus diversidens Cope..... "
Felis hillanus Cope..... "

EDENTATA.

Megalonyx leptostomus Cope..... T.

PROBOSCIDEA.

Dibelodon humboldtii (Cuvier).....
" *tropicus*.....
" *præcursor* Cope..... T.
Tetrabelodon shepardii (Leidy)[2].....

PERISSODACTYLA.

EQUIDÆ.

Equus simplicidens Cope..... T.
" *cumminsii* Cope..... "
" *minutus* Cope..... "

ARTIODACTYLA.

SUIDÆ.

Platygonus bicalcaratus Cope..... T.

CAMELIDÆ.

Pliauchenia spatula Cope..... T.

[1] Texas Geol. Sur. Rep., 1892.
[2] One specimen in American Museum of Natural History.