ART. XXII.—*Preliminary Description of New Tertiary Mammals;* by O. C. MARSH. Part I.

THE explorations of the Yale College party in the Rocky Mountain region, during the past season, brought to light, in addition to the extinct Birds and Reptiles already described by the writer, many interesting species of new fossil Mammals, and in the present communication a number of these from Wyoming Territory are briefly characterized. Others will be noticed in the succeeding numbers of this Journal, and it is intended, at an early day, to give a full description with illustrations of all the new fossil vertebrates discovered by the two Yale expeditions of 1870 and 1871.

Palæosyops laticeps, sp. nov.

An examination of the large collection of mammalian remains from near Fort Bridger, Wyoming, now in the Yale Museum, shows clearly that there are at least four well-marked species of large pachyderms represented, which have hitherto been referred to *Palæosyops paludosus* Leidy. This species was established on a number of teeth, more or less imperfect, which were all strongly rugose, although evidently belonging to an adult animal. Unfortunately no other portions of this skeleton were secured, so that it may be difficult if not impossible to determine with certainty its exact specific relations.

One of the treasures obtained by the Yale expedition of 1870, which first explored the Green River Tertiary basin, was the nearly complete skeleton of a species of *Palæosyops*, somewhat smaller than the one described by Dr. Leidy. The animal was adult, with the dental series in full perfection, although the epiphyses were not completely coössified with the vertebræ. The teeth in this specimen have apparently the same general structure as those in the type of *P. paludosus*, but differ in being nearly smooth; and this is not the result of age, as this individual was younger than the original of the larger species. The proportions, moreover, given for the molar described * ("22 lines fore-and-aft and 18 transversely"), would not apply to any of the series in the present specimen. The last upper molar of the latter has two well developed internal cones.

The cranium in *Palæosyops laticeps* is broad, and the zygomatic arches much expanded. The squamosal portion is especially massive. The nasals are narrow and elongated, and more like the corresponding bones in *Hyrax* than those in the larger pachyderms. They are prominently convex transversely, and strongly arched longitudinally. The inner edges are thickened

* Proceedings Philadelphia Academy, 1870, p. 113.

below at the suture, indicating a strong cartilaginous nasal septum. The anterior extremities are truncated, with the external angles rounded. The upper teeth form a complete series. The canine is large, and broadly oval at its base. The outer incisor is the largest, and at its posterior edge the premaxillary is subtriangular in transverse section. The sagittal and occipital crests are strongly developed, and the coronoid process of the lower jaw is short and recurved. The remaining portion of the skeleton, which will be described in detail in the full description, shows conclusively that *Palæosyops* belongs to the Perissodactyls, and not to the Artiodactyl group of mammalia, as supposed by Dr. Leidy.

Measurements.

	mm.
Length of entire upper molar series,	155·
Antero-posterior extent of three true upper molars,	94·
Antero-posterior diameter of last upper molar,	36·
Transverse diameter,	40·
Antero-posterior diameter of upper canine at base,	29·
Transverse diameter,	22·
Space occupied by three right upper incisors,	34·
Vertical extent of zygomatic process of squamosal,	51·
Transverse diameter of both nasals near anterior margin,	42·
Width between bases of upper canines,	49·
Width between bases of fourth upper premolars,	40·

This unique specimen was discovered in September, 1870, by Mr. A. H. Ewing of the Yale exploring party. The locality was near Marsh's Fork, about fifteen miles from Fort Bridger, Wyoming. The geological horizon was Eocene, or lower Miocene. Other specimens of the same species have since been found in the same region by members of both the expeditions.

Telmatherium validus, gen. et sp. nov.

A new genus of large mammals, allied to *Palæosyops*, is indicated by the greater portion of a skull with teeth, and portions of several other skeletons, obtained by the Yale party last year in the Tertiary deposits of the Green River basin. The dentition of this genus, so far as known, appears to be similar to that of *Palæosyops;* but the two may readily be distinguished by the anterior portion of the skull, which in the present genus has the premaxillaries compressed, with an elongated median suture. The zygomatic arch is also much less strongly developed, and the squamosal portion of it is comparatively slender.

The present species exceeded in size *Palæosyops paludosus*, and with the exception of *Titanotherium? anceps* Marsh,* is

* This Journal, vol. ii, July, 1871, p. 35. Additional remains of this animal, obtained during our explorations last year, show clearly that it belongs to the Proboscidea, as at first suspected. The species may therefore be called *Mastodon anceps.*

the largest mammal yet discovered in the Fort Bridger beds. The upper molar teeth have the inner cones more elevated and more pointed than in *Palæosyops*, and the basal ridge is well developed. The last upper molar has but a single internal cone. The upper canines are large, pointed, and have strong cutting edges. The outer incisors are the largest, and all these teeth have a strong inner basal ridge. The roof of the mouth is deeply excavated between the premolars. The nasals are decurved laterally, and much compressed.

Measurements.

Extent of upper molar series,	224·	mm.
Extent of upper true molars,	130·	
Antero-posterior diameter of last upper molar,	54·	
Antero-posterior diameter of last upper premolar,	28·	
Transverse diameter,	33·	
Space occupied by three right incisors,	47·5	
Antero-posterior diameter of upper canine at base,	27·	
Transverse diameter,	22·	
Vertical diameter of zygomatic process of squamosal,	34·	

The specimen on which this description is mainly based was discovered in September last by Mr. J. F. Quigley of the Yale party. The locality was near Henry's Fork of the Green River, in Wyoming, and the geological formation the same essentially as that near Fort Bridger, which contained the previous species.

Limnohyus robustus, gen. et sp. nov.

Among the other remains of large mammals in the Yale Museum, which resemble *Palæosyops paludosus*, in their dentition at least, are portions of several skeletons with the more important parts well preserved. These remains show conclusively that there are two genera represented among them. One of these is doubtless *Palæosyops*, but the type of that genus is too imperfectly known to determine its more important characters. These two genera agree apparently in the structure of the anterior portion of the skull, but differ somewhat in their dentition. In some specimens, which agree best with Dr. Leidy's original description of *Palæosyops paludosus*, the last upper molar has two inner cones, and to this group the name *Palæosyops* may in future be restricted. The other specimens have but a single internal cone on the last upper molar, and for the genus thus represented the name *Limnohyus* is proposed. These genera may be distinguished from *Telmatherium* by the premaxillaries, which are short, stout and depressed, with a small median suture. Other distinctive characters of the three genera will be given in the full description.

The present species may be distinguished from those above described, especially by the strong basal ridge of the molars.

On the last lower molar it extends entirely around the posterior lobe. The first of the upper true molars has the two inner cones nearly of the same size. The small intermediate median tubercles are well developed on the upper molars, and all the teeth are strongly rugose, even in fully adult animals. The nasal bones contract anteriorly and are rounded in front. The outer margin is decurved and thickened. The premaxillaries unite by a very short median suture, similar to that in *Palæosyops laticeps*. The zygomatic process of the squamosal is stout, but much compressed, thus differing widely from both the species already described.

Measurements.

Antero-posterior extent of last three upper molars,	110·	mm.
Antero-posterior diameter of last upper molar,	41·	
Transverse diameter,	43·5	
Antero-posterior diameter of last upper premolar,	20·	
Transverse diameter,	26·5	
Antero-posterior diameter of last lower molar,	51·	
Vertical diameter of zygomatic process of squamosal,	34·	

The specimen on which the above description is chiefly based was discovered, in September last, by Mr. F. Mead, Jr., near Henry's Fork, Wyoming. Other specimens of the same species were found in the same deposits by Mr. G. G. Lobdell, Jr., Mr. G. M. Keasbey, Mr. O. Harger, and the writer. The geological formation was lower Miocene, or Eocene.

Hyrachyus princeps, sp. nov.

This well-marked species includes the largest of the Tapiridæ yet found in this country. The remains representing it indicate an animal nearly three times the bulk of *Lophiodon Bairdianus* Marsh, and probably twice that of the individual named *Hyrachyus eximius* by Dr. Leidy. The specimens on which the species is based consist of a nearly complete series of upper teeth, and several lower molars, with the more important parts of the skeleton, all pertaining to one animal, and remarkably well preserved. The last two upper molars are unusually large in proportion to the rest of the series, and have the antero-external lobe quite separate, and with its apex incurved.

Measurements.

Extent of entire upper molar series,	134·	mm.
Extent of upper true molar series,	76·	
Antero-posterior diameter of last upper molar,	21·2	
Transverse diameter,	31·	
Antero-posterior diameter of penultimate lower molar,	28·75	
Transverse diameter,	17·	

The remains here described were found by the writer, last autumn, near Henry's Fork, Wyoming, in the same Tertiary deposits that yielded the specimens already noticed.

Homacodon vagans, gen. et sp. nov.

A new and very small suilline pachyderm is well represented by the greater part of the skull and skeleton, in excellent preservation. The animal was apparently allied to *Hyopsodus*, and was somewhat larger than *H. paulus*. From that species, it may readily be distinguished by the lower true molars, which have the constituent cones isolated, not alternate, and of nearly equal size. The inner anterior cone is, however, somewhat the largest, and is slightly bifid. The upper molars, likewise, have their cusps conical, and of similar size. The lower premolars are compressed, and resemble those of some carnivors. The skull has a well developed sagittal crest. The astragalus is of the suilline type.

Measurements.

Antero-posterior extent of the three lower true molars,	17·5 mm.
Antero-posterior diameter of last lower molar,	7·3
Transverse diameter in front,	4·
Antero-posterior extent of three upper molars,	15·2
Antero-posterior diameter of last upper molar,	5·5
Transverse diameter in front,	6·4
Length of astragalus,	14·

This very perfect specimen was discovered, in September last, by Mr. G. G. Lobdell, Jr., of the Yale party, near Henry's Fork, Wyoming, in the *Mauvaises terres* Tertiary deposits of that region.

Limnocyon verus, gen. et sp. nov.

An interesting new carnivor, somewhat larger than a fox, is indicated by the remains of several individuals, which agree closely in all respects excepting size. One series of these remains includes the greater portion of a skull with most of the upper teeth well preserved. The premolars in this specimen are compressed and obtuse, as in the Canidæ. The first upper premolar is large, and near the canine. There are no true sectorial teeth. The crowns of the first and second upper molars are triangular. The first has a tubercle at each angle, and a large compressed one near the center. The second molar, which is the largest of the series, has an angular tubercle at each corner, and a large bifid cusp near the middle of the crown. The last upper molar is very narrow and elongated transversely. Its straight anterior margin is at right angles to the axis of the skull. The affinities of this genus appear to be with the Viverridæ.

Measurements.

Extent of last three upper molars,	23·	mm.
Antero-posterior diameter of first upper true molar,	9·6	
Transverse diameter,	8·8	
Antero-posterior diameter of penultimate upper molar,	10·75	
Transverse diameter,	11·	
Antero-posterior diameter of last upper molar,	4·5	
Transverse diameter,	12·5	

The specimens on which this species is established were discovered at Grizzly Buttes, near Fort Bridger, in September last, by Mr. J. F. Quigley and the writer.

Viverravus gracilis, gen. et sp. nov.

A much smaller carnivor, about the size of the common mink, is represented in our collections by two lower jaws with teeth, and a sectorial upper molar of one individual, and portions apparently of several others. The lower jaws in this genus are long, very slender, and compressed; the last two lower molars are tubercular. Both have the posterior part of the crown quite low, and the anterior half elevated, and composed of three angular cusps. The four teeth anterior to these are much compressed. The upper flesh tooth closely resembles that in some of the Viverridæ, and the genus should probably be referred to that group.

Measurements.

Extent of pre-molar and molar series of lower jaw,	28·	mm.
Extent of last three lower teeth,	15·	
Antero-posterior diameter of last lower molar,	4·5	
Greatest transverse diameter,	2·5	
Antero-posterior diameter of penultimate lower tooth,	5·2	
Greatest transverse diameter,	3·4	
Antero-posterior diameter of upper sectorial molar,	7·	

The type specimen of this species was discovered at Grizzly Buttes, Wyoming, last autumn, by G. G. Lobdell, Jr., of the Yale party.

Nyctitherium velox, gen. et sp. nov.

One of the most interesting discoveries of the last Yale expedition in the Tertiary of Wyoming, was the remains of a species of bat, which is of special importance, as no fossil specimen of Cheiroptera has hitherto been detected in this country. The most characteristic specimen obtained is part of a lower jaw, with the last three molars in perfect preservation. This fragment indicates an animal about the size of *Scotophilus fuscus*, and the teeth resemble those in that genus, but are not so wide. They have a distinct basal ridge externally. The jaw below the teeth is much compressed, and its lower border slightly convex longitudinally.

Measurements.

Antero-posterior extent of last three molars,	5· mm.
Antero-posterior diameter of last lower molar,	1·75
Transverse diameter,	1·
Antero-posterior diameter of penultimate lower molar,	1·85
Transverse diameter,	1·1
Depth of jaw below last molar,	2·

The remains on which this species is based were found by the writer, in September last, near Henry's Fork, Wyoming. The formation is Eocene, or lower Miocene.

Nyctitherium priscus, sp. nov.

A somewhat larger species, apparently of the same genus, is indicated by part of a lower jaw, with the penultimate molar perfect. The jaw is less compressed, and the tooth proportionally larger than in the above species. There is no external basal ridge.

Measurements.

Antero-posterior extent of last three lower molars,	5·5 mm.
Antero-posterior diameter of penultimate lower molar,	2·
Transverse diameter,	1·5
Depth of lower jaw below last molar,	2.5

This interesting specimen was found by Mr. G. G. Lobdell, Jr., last autumn, at the same locality as the preceding species.

Talpavus nitidus, gen. et sp. nov.

A very small insectivor, apparently allied to the moles, is well represented by several fragments of lower jaws with teeth, and probably by some isolated upper molars. Two characteristic specimens of these remains were found together, and doubtless belonged to the same animal, which was about the size of a mouse. One of these is part of a lower jaw, containing the first and second true molars; the other is an anterior portion with only the last premolar in position. The lower molars resemble externally those of *Talpa*, but on the inner side are more like those of *Scalops:* they have no external basal ridge. The lower jaws are more slender and compressed than those in most recent insectivors. The last premolar is compressed and pointed.

Measurements.

Antero-posterior extent of first two lower molars,	2·9 mm.
Antero-posterior diameter of penultimate lower molar,	1·5
Depth of jaw below penultimate molar,	2·
Depth of jaw below last lower pre-molar,	2·

The type specimen of this species was found by the writer, in September last, near Henry's Fork, Wyoming.

Yale College, New Haven, July 18, 1872.