by 24 feet high. The lenses alone would cost £8,400, an expenditure which would only be justified by the necessity for an exceptionally powerful light.

Mr. D. A. Stevenson, Engineer to the Northern Lighthouse Board, in a report on electric light as an illuminant, claims that the complaints against the penetration of this light in fogs are not well founded, and that many criticisms of its power are due to prejudice, partly owing to the persistent way in which it is decried as a lighthouse illuminant by certain writers to the press, partly from a misunderstanding of the fact that, being very rich in the most refrangible rays of the spectrum, that is, very white, it suffers a greater percentage of diminution in passing through fog than oil or gas light, which is redder, but nevertheless, owing to its enormously greater initial power, the electric light is always a better penetrator of fog than the others. He claims that sailors, on their ordinary courses, are never in a position to form an opinion of the subject that is worth anything, because they cannot see different lights in the same conditions of atmosphere. He adduces observations made by keepers in his service on each other's lights, which go to prove that the electric light is in all cases the more powerful. These are observations from one station burning an oil light to another electrically lighted, and the reverse. Three pairs of such stations are instanced; in every case the electric light being visible in fog that totally obscured the oil lamp.

THE COLLECTION OF FOSSIL MAMMALS IN THE AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK.

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THE third expedition from the Museum is now in the field, and the collections of fossil mammals made under the direction of Dr. J. L. Wortman during the summers of 1891 and 1892, are being rapidly prepared for exhibition upon the geological floor of the museum. The first year's work was in the Wahsatch beds of the Big Horn Mountains, a country which had been very thoroughly explored for Professor Cope. This yielded rather disappointing results, although exceptionally fine material of *Coryphodon* was procured, including very considerable portions of the skeleton, which will soon be mounted for exhibition in the museum. The most unique discovery in this horizon was the skull of *Palæonictis*, an ancient carnivore which has hitherto been represented only by two lower jaws found in the Suessonian of France, the horizon contemporary with the Wahsatch.

Early in 1892 Dr. Wortman, accompanied by Mr. Peterson, who had been for several years on the U. S. Geological Survey, started into the Puerco or basal Eocene beds of northern New Mexico, and by the most energetic and careful search in fields which had also been explored for Professor Cope, succeeded in procuring a very valuable collection of these Lower Eocene types. Among the most unique specimens of this series are the upper and lower jaws of *Polymastodon*, a large-sized successor of the ancient *Plagiaulax* of the Middle Jurassic beds. Another discovery was the skull of *Pantolambda*, an ancestor of Coryphodon. Altogether nearly five hundred specimens were shipped East from this tour. The party then went into the Laramie, in search of the Triceratops, but were unsuccessful. They secured later in this horizon a large collection of the minute teeth of the Cretaceous mammals, which is paralleled only by that in the U. S. Geological Survey collection.

The richest results obtained thus far, however, are from the White River Miocene of South Dakota. Here the beds are 800 feet thick, and a thorough exploration was made from the bottom series in which the huge *Titanotherium* is found, to the top in which the new forms *Protoceras*, *Artionyx* and *Aceratherium tridactylum* were found. These top beds were practically a discovery, for nothing has been recorded from this stratum before, excepting the skull of a female *Protoceras*, which is in the U. S. Geological Survey collection. The male *Protoceras* presents four pairs of protuberances upon the skull, the most exceptional being the large vertical plates upon the maxillaries. This White River Miocene is the classic ground of Leidy's memoirs, but in these and by far the greater part of the literature of this horizon, the animals only of the so-called "Oreodon" stratum have been described, together with the forms from the lower "Titanotherium" stratum. This has been due to the fact that these strata at once attract the ordinary collector by the profusion of bones which are washed out from them. An intervening stratum between the "Oreodon" and "Titanotherium" layer, appears, also, to have been generally overlooked, because of its unpromising exterior. Mr. S. Garman, collecting for the Museum of Comparative Zoölogy, some years ago secured one specimen of the very unique Rhinoceros-like form, *Metamynodon*, the type specimen and the only one which has hitherto been known. Dr. Wortman directed his attention, therefore, especially to the location of this stratum, and succeeded in finding a seam about thirty feet in thickness, which proves to be especially characterized by abundant remains of Metamynodon. The party secured four or five skulls, and one nearly complete skeleton. This animal is distinguished by huge canine tusks in the anterior portion of the head, which give it an appearance quite different from that of the rhinoceros; in fact, the skull and skeleton are entirely peculiar, and unlike any perissodactyl which has been found hitherto. Yet this animal flourished in the midst of large herds of true rhinoceroses, for the diligent search made by the museum party has resulted in the discovery of a whole series of hornless rhinoceroses, from the bottom of these beds to the top. They increase gradually in size, and in the evolution of the teeth, in the loss of the lateral fifth toe in the fore foot, and reach a culminating point in the new species, *Aceratherium tridactylum*. As the name indicates, this species is mainly characterized by the presence of but three toes in the fore foot. It is represented in the museum collection by one of the most remarkable specimens which has ever been found. This is a complete skeleton from the tip of the nose to the tip of the tail, lacking only the fore limb of the left side, and a few of the ribs and sternal bones. It is over seven feet long and four feet high, and has been mounted upon a large panel of sandstone and plaster, giving the impression that it has been simply hewn out of the matrix. The animal appears to be of about the same size and proportions as *Ceratorhinus* or the rhinoceros of Sumatra; in fact it has very nearly the same proportions and form, except that it lacks the small horns upon the nasals and frontals. Among American species its affinities are with the *Aphelops megalodus* Cope of the top of the Miocene.

A third specimen of note is the hind foot of *Artionyx*. As Leidy called Oreodon a ruminating hog, so this animal might be called a clawed hog, for the foot closely resembles that of the pig or peccary, until we reach the phalanges, which have articulations and large terminal claws somewhat similar to those seen in the bears, while the ankle-joint is of the artiodactyl type, and the four toes are set in pairs on either side of the median line, there being also the rudiment of a fifth. The name given this fossil refers to its combination of the artiodactyl and unguiculate character. This is possibly a relative of the clawed Ungulate — *Chalicotherium* — which presents such a remarkable combination of characters, and is now known to have been distributed over North America, Europe, and Asia, during Miocene times. The contrast between these two types is very striking; for while Artionyx combines an artiodactyl foot with uncleft claws, Chalicotherium combines a perissodactyl foot with cleft claws. One of the most interesting problems of the future will be clearing up the relations between these two forms and their relations to other groups.

CURRENT NOTES ON ANTHROPOLOGY.—XXVII.

[*Edited by D. G. Brinton, M.D., LL.D.*]

Theories in Criminal Anthropology.

TWO articles which appeared almost simultaneously in February last present with sharpness and brevity the conflicting views of the two leading schools of criminal anthropology.

One is by Dr. Sorel, in the *Revue Scientifique*. It is a warm defence of the doctrines so strenuously urged by Professor Lombroso, and which were substantially repudiated at the Congress of Brussels last year (see *Science*, Nov. 18). Sorel maintains