

no evidence of the weathered or eroded dikes to which Bell ascribed the rectilinear channels of this region and of many other parts of Canada, and in connection with which he has assumed such an exceptional amount of weathering and subsequent glacial erosion.⁴

University of Michigan,
February 8, 1921.

⁴ Robert Bell, *Bull. Geol. Soc. Am.*, vol. 5, pp. 364-366, 1894.

ART. XXXIX.—*A Note on the Cernaysian Mammal Fauna*; by W. D. MATTHEW.

M. Teilhard de Chardin is the author of an admirable revision of the Carnivora of the Quercy Phosphorites of France. He has recently been engaged upon a revision of the Cernaysian fauna, the oldest Tertiary mammals of Europe, and has just published¹ a brief note of his preliminary conclusions, especially as to the correlation of the fauna. The following translation of his observations may be of interest to American palæontologists:

“The revision of the Victor Lemoine collections preserved in the Paris Museum, researches in various museums in France and abroad and excavations made at Cernay-les-Reims, have led me to a better understanding of the evolution of the Lower Eocene mammal faunas of Europe.

“1. *Age of the Cernaysian Fauna.* The Cernaysian fauna belongs not at the base nor in the middle (as has sometimes been supposed) but at the extreme summit of the Paleocene. The study of the Multituberculates, the Oxyelænidæ (*Arctocyonides*), the Cheiromyidæ (*Plesiadapis tricuspidens* Gerv.), etc., that it contains, shows that the conglomerate of Cernay (and with it, probably, all our Thanetian) correspond exactly to the ‘Tiffany beds’ of New Mexico, a formation intercalated between the upper Torrejon and the Wasatch. *Plesiadapis tricuspidens*, notably, may be specifically identical with *Nothodectes gidleyi* Matthew of the Tiffany beds. The Cernaysian fauna differs principally from that of the

¹ *Comptes Rendus Acad. Sci. France*, 1920, seance de 6 Dec., pp. 1161-2.

Tiffany beds by the dominance of very modernized *Condylarthra*, *Pleuraspidothorium* and *Orthaspidotherium*, which may be related to the *Meniscotheriidae* of Cope. *Meniscotherium* does not appear in America until the Wasatch.

“2. *Distinctness of the Sparnacian fauna.* Although it must be placed at the summit of the Paleocene, the Cernaysian fauna remains absolutely distinct from the Sparnacian fauna. The latter, characterized by the association *Coryphodon-Hyracotherium-Paramys*, and by species of the *Plesiadapis daubrei* group, appear suddenly, as a unit, with the Meudon conglomerate. The same faunal association also appears in the fluvatile Landenian of Belgium (*Coryphodon-Hyracotherium-Paramys*), and in the London Clay of Sheppey (*Hyracotherium Plesiadapis* = *Platychoerops* Charlesworth). It exists, mixed with elements of later geologic age, in the Agéian of Lemoine (*Hyracotherium* = *Lophiodochærus*, *Paramys* = *Decticadapis*, *Plesiadapis*). Typical *Phenacodus* is found in France and in Belgium. In sum, the Sparnacian fauna appears as suddenly in Europe as the Wasatch fauna in America, and like the latter, it is characterized by the arrival of Perissodactyls and Rodents. But while in America undoubted Primates and Artiodactyls are found from the beginning of the Wasatch, these two groups are not recognized in Europe until the beginning of the Cuisian.

“3. *Existence of a Cuisian fauna distinct from the Sparnacian.* Separated from the Sparnacian elements which were improperly associated with it, the Agéian fauna is composed of Primates (*Protoadapis*), of Artiodactyls with very simple upper molars (*Protodichobune* Lem. analogous with *Diacodexis* = *Trigonolestes* Cope of the Wasatch), of Perissodactyls (*Parapachynolophus* Lem.), clearly distinct from *Hyracotherium*, and of Lophiodonts. These forms, obtained at an exact geological level (the Teredina sands), represent the Cuisian fauna properly so-called. This is then characterized by the appearance of Primates and Artiodactyls and by a particular stage in the evolution of the Perissodactyls.

“4. *Persistence up to the Ludian [Upper Eocene] of a fauna of Sparnacian and of American affinities.* The study of the Mammalia, especially the ungulates, proves that a separation between Europe and America took

place at the end of the Lower Eocene and that it endured up to the Oligocene. It is therefore more remarkable under these circumstances to encounter in the Quercy Phosphorites (especially at Memerlein, Dep't Lot) a small fauna of clearly American affinities. This fauna, which can be fixed as of Bartonian or Lower Ludian age by the occurrence of the same forms in the stratified sequence (Hordwell, Euzet, Bouxviller), includes, besides a Sparnacian genus *Protoadapis* already noticed by Stehlin, the adaptive Creodont genera *Miacis* and *Viverravus*, Chiromyidæ (two species of *Necrosorex* Filh.), and Tarsiids (*Pseudoloris*, Stehl.), all quite nearly related to *Miacis*, *Viverravus*, *Apatemys* and the Anaptomorphids of the American Middle Eocene. So close a resemblance between [these types of] the Bartonian of Europe and the Bridger of America proves that long after the separation of the two continents a common residual fauna, mixed with new elements proper to each region, was able to maintain itself and continued to evolve along parallel lines, on the two sides of the ocean.

"The Tarsiids of the Phosphorites, of which I have at hand unpublished specimens showing the upper dentition and the bones of the face, are remarkable as showing a closer resemblance to the living Tarsier than any known fossil form."

The principal collection of the Cernaysian fauna, including the fossils obtained and described by Lemoine in 1878-1893, and important later collections undescribed, are in the Muséum de Paléontologie in Paris, and Père Teilhard's revision was undertaken at the instance of the Director, Prof. Marcellin Boule. On a recent visit to the Paris Museum the writer had the privilege of examining this unique collection, and was much impressed both with the interest of the fauna and with the admirable thoroughness and insight of Père Teilhard's studies upon it. The Tiffany fauna to which he compares the Cernaysian has been only in small part described, but it appears probable that his conclusions will be confirmed by the more complete comparisons to be made later.