

*Ischyrosaurus antiquus*, both described by Leidy in 1873. Nothing of the Laramie is recognized in Kansas.

The Reptiles and other fossils in the beds referred to as Upper Laramie indicate not only their Cretaceous age, but also their close relations to the Lower Laramie. At present the line between the two divisions cannot be definitely drawn.

The subdivisions of the Rocky Mountain Cretaceous, including the Laramie, were first described by Hayden and Meek. Their papers commenced in 1856, and appeared at intervals for 20 years. Meek's Report on the fossils, in which the stratification is reviewed, constitutes vol. ix. of the Reports of the Hayden Expedition (1876). Their subdivisions were the Dakota, Fort Benton, Niobrara, Fort Pierre, and Fox Hills. The Tertiary section in the "Upper Missouri region," described by Meek and Hayden, contained: (1) Dakota group, 400'; (2) Fort Benton, 800'; (3) Niobrara, 200'; (4) Fort Pierre, 700'; and (5) Fox Hills, 500'. G. H. Eldridge in 1889 grouped the divisions into the three: (1) Dakota; (2) Colorado, and (3) Montana. C. A. White had earlier recognized (1876) the same grouping under the names Dakota, Colorado, and Fox Hills.

The Colorado formation and its relations to the other divisions of the Cretaceous have been reviewed in detail by T. W. Stanton; and from his report of 1893 many of the following facts are taken. The thickness of the Upper Cretaceous series at the Black Hills is less than 1000': (1) the Dakota, 250'–400'; (2) the Colorado, 300'–500'; (3) the Montana, 150'–350' (H. Newton). In Cinnabar Mountain, Montana, the total thickness, according to Weed, is about 4300': (1) the Dakota, 526'; (2, 3) the Colorado and Montana, 2850'; (4) the Laramie, 935'. East of the Front Range, in Colorado, the Dakota outcrops at the base of the range, and, outside of this, the other later groups in succession, as first shown by Marvine. In the Denver region there are: (1) Dakota, 300'; (2) Colorado, 1100', of which 400 is Fort Benton and 700 Niobrara; (3) Montana, 8700', of which the Fort Pierre, 7700', and Fox Hills, 800'–1000'; (4) the Laramie with the Denver group, 2000'. The thickness diminishes southward, and between Cañon City and Pueblo, on the Arkansas River, the Montana group is but 3000' thick. The section at Coalville, in Utah, according to Stanton, which is peculiar in containing a great coal-bed in the Colorado portion, consists as follows: (1) Dakota, 5000'?; (2) Colorado, 1560'–1660', mostly sandstone and fossiliferous, but with a heavy bed of coal at the top of the lower stratum of 500' to 600'; (3) Montana, about 2900', of sandstone and shales, with probably 1500' of beds above; and in the part referred to the Montana group on account of the marine fossils, there are some thin plant beds, the fossil plants of which are in part Laramie.

The Kansas Cretaceous consists, according to S. W. Williston, of 350' to 400' of Dakota beds, 300' to 400' of overlying shales and limestone of the Benton group, and 400' to 450' of chalk and other beds of the Niobrara, making the Colorado series 700' to 850' in thickness; and above these, 50' to 100' of beds of the Montana group. The Laramie is absent, the next beds above being those of the Loup Fork Miocene Tertiary.

Newberry divided the Cretaceous of New Mexico into: (1) Dakota, 250' to 400'; (2) Colorado, 1200' to 1500'; and (3) Montana, 1500', part of the Laramie being here probably included. (Macomb's *Expl. Exp.*, with a review by Newberry of the conclusions he presented in Lieutenant Ives's Rep. on the Colorado River of the West.)

The age of the Laramie beds (or the Lignitic, as they were called), whether Tertiary or Cretaceous, was left undecided by Meek in his report of 1870. To the Lignitic horizon he referred the *Judith River* group, occurring at the mouth of Judith River in Montana, having there a thickness of about 415' and consisting, beginning below, of sands and clays with *Unio*, 100'; impure lignite, 25'; sand and clay-beds with shells and Dinosaurian remains, 100'; sand and clay, 100'; impure lignite with *Ostrea*, 10'; sandy marl with some lignite and species of *Ostrea*, *Corbicula* (3 species), *Goniobasis*, salt-water species, 80'.