

series extends as far upward in the geological formations as the remains of Mammals are of the oviparous kinds, with none of the ordinary or placental Mammals, and as far as the remains of Reptiles include the Mesozoic types of Dinosaurs and Mosasaurs; and, moreover, until the epoch of mountain-making, which closed Mesozoic time, had reached its climax. No marine fossils of the Cretaceous beds, or remains of Cretaceous Vertebrates, are positively known to be continued from the Cretaceous into the Tertiary formation.

ROCKS—KINDS AND DISTRIBUTION.

1. LOWER CRETACEOUS.

Atlantic border. — The Potomac formation. — The Lower Cretaceous beds of the Atlantic border are those of the fresh-water Potomac formation, so named by W. J. McGee in 1888. It consists mostly of granitic sandstones and conglomerates, loosely aggregated and irregularly bedded, with clay-beds chiefly in the upper portion. It occurs on the Atlantic border near the inner limit of the Cretaceous, in an interrupted belt, passing through Delaware, Maryland, the District of Columbia, Virginia, and beyond to Weldon in North Carolina. The thickness is 600 feet and less. The width of the belt where continuous is seldom over 10 miles; but outliers make its probable original width in some parts perhaps 40 or 50 miles. The coarser conglomerates occur in the vicinity of the larger rivers, the Delaware, Schuylkill, Susquehanna, Potomac, and James River, showing that the rivers had then their place over the Atlantic border, and also that their floods were concerned in the coarser deposition, while the finer materials and clays mark off the relatively quiet areas and intervals. The presence of a rare marine shell shows that the sea was not far away. The granitic material is that of the rocks over much of the region adjoining, and of the Triassic, which in some cases they overlie. But the other sands are probable evidence that the drainage over the Atlantic border had now its head in the Appalachian Mountains.

According to Fontaine, its plants, which include Cycad stumps and leaves, Conifers, and Angiosperms, range in types through the whole of the Lower Cretaceous of Europe, and include some species that are related to those of the first division of the Upper Cretaceous.

According to L. F. Ward, the Cycad stumps occur in the lower part of the Potomac group, the same that includes the Rappahannock freestones. He states, also, that on James River, Virginia, the beds contain Cycads and Sequoian trunks without Angiosperms, suggesting the idea that they are perhaps lower in the series.

Northern Gulf border. — The Tuscaloosa group in Alabama — so named by E. A. Smith and L. C. Johnson — consists of clay-beds and sand-beds, containing impressions of leaves. The *Eutaw group*, in Mississippi, 300 to 400 feet thick, has similar characters, and contains some lignite (Hilgard, 1860).