

In North Carolina these deposits are much thinner than in Maryland and Virginia, and in South Carolina they usually occur in isolated basins or sinks in the subjacent Eocene or Cretaceous strata; they often show a reworking or rearrangement of material, so that Miocene, Pliocene, and even Cretaceous fossils occur in one and the same bed. The component materials are sand, clay, and comminuted shells.

There are deposits in Georgia of limestone, buhrstone, and conglomerates that belong to the older Miocene series, but their geographical extent is not well determined.

Florida presents the most complete section of American marine Miocene and Pliocene formations. Immediately above the Eocene along the Chattahoochee River occur beds of limestone, clay, and marl, — the *Chattahoochee group* of Langdon, — having a thickness of about 200 feet. Higher still are the fossiliferous Chipola sands, succeeded in turn by the Alum Bluff sands, 40 feet thick, containing few organic remains save lignite and plants. Above these occurs a gray marl having a Yorktown fauna 35 feet thick. These Miocene deposits occupy much of the northern portion of the state. To the south the Peace Creek lacustrine deposits and Caloosahatchie beds of Pliocene or Pleistocene age are probably well developed, though their exact limits are not definitely determined.

The Neocene beds of Mississippi as well as Alabama and Louisiana — *Grand Gulf group* of Hilgard — contain but few animal remains, and their horizon has been, and still is to some extent a matter of dispute; but the labors of L. C. Johnson and Langdon in southeastern Mississippi, southern Alabama, and northwestern Florida tend to show that they should be correlated with the lower Miocene of the Floridian section. They are well developed in Mississippi, and although concealed to the south, doubtless underlie the greater part of the state south of a line roughly drawn through Vicksburg, Raymond, Byram, Brandon, Raleigh, and Waynesboro, or, in other words, south of the Vicksburg formation. Below and to the east these beds are clayey, lignitic, and gypsiferous; above and to the west the arenaceous material predominates, and when indurated gives a rugged topography to the region in which it occurs. No traces of similar deposits have been found in Tennessee or Arkansas; but in Louisiana they occur resting upon the Vicksburg limestone and extending in a southwestern direction toward the Sabine River.

Certain deposits of clay, lignite, and sandstone in Texas — the *Lafayette beds* of Penrose — have been correlated with the *Grand Gulf* rocks of Mississippi; but the presence of Lower Claiborne species — although rare — throughout much of their vertical range, renders it quite probable that all should be referred to the Eocene period. To the seaward marine Neocene beds are unknown at the surface; yet borings from the Deep Well at Galveston show that at no great depth such deposits do occur with a thickness of 1500 feet or more. Many lacustrine deposits are found at the surface bearing Vertebrate remains of a late Tertiary age.