

The Castle Hayne formation that follows rests unconformably upon the Trent formation as well as upon the Cretaceous deposits. It was probably formed during a gradual submergence which permitted the ocean water to again encroach upon the land, and the advancing waves, acting upon the loose sediments of previous periods, were able to accomplish considerable destruction. At the base of the Castle Hayne formation many Cretaceous fossils are found that were evidently torn from their original position and redeposited by the waves of the Castle Hayne epoch. Conditions similar to those that prevailed during the Trent epoch continued and deposits of calcareous mud containing many bryozoan and molluscan shells were formed. There is an almost complete absence of any land-derived materials. During this period sharks must have lived in great numbers, as is shown by the large quantities of sharks' teeth found in the deposits. Echinoids were likewise very abundant, while one species of brachiopod, *Terebratula wilmingtensis*, is found represented by innumerable specimens.

So far as we can determine by the present distribution of the Castle Hayne formation, this later Eocene submergence did not extend over a wide area. The deposits are found in the extreme southeastern counties of the State, although it is not improbable that the sedimentation extended over a larger area and that the deposits have since been removed by erosion.

The Castle Hayne period was terminated by an elevation of the region that again caused erosion to succeed sedimentation. This next erosion interval was probably of long duration, for during this time in South Carolina, Georgia and the Gulf States extensive deposits of Oligocene strata were formed. In North Carolina the Oligocene seems to be wanting, although, perhaps, the Castle Hayne formation may eventually be referred to that period. The northern Coastal Plain likewise was evidently a land area, since Oligocene deposits have never been recognized in this region.

MIocene.

The advent of the Miocene period witnessed a depression of the Coastal Plain area along the Atlantic border. During the earlier epochs this was confined to the regions to the south and to the north of North Carolina. In Florida it was most pronounced, but it also affected the northern Coastal Plain district in New Jersey, Delaware, Maryland and northern Virginia. This northern Miocene depression represented by the Calvert and Choptank formations in the Chesapeake Bay region gradually extended southward until during the time that the St. Marys formation was being laid down in Maryland and Virginia the northern part of North Carolina also became involved and an extensive cover of