

rostra, which during the Chesapeake was almost equally abundant, occurs less frequently. The Arcas have increased in numbers and species. *Arca idonea*, however, seems to have become extinct. *Arca incile* persists, but is not plentiful. *A. lienosa*, though reported from the upper bed at Alum Bluff, makes its first appearance in the Middle Atlantic Coast in this formation. The Astartes change quite radically in general aspect. The St. Marys species *Astarte symmetrica* has not been reported from the formation. *Astarte exaltata* and *Astarte obruta* are rare or absent altogether. *A. undulata*, so abundant in the St. Marys, is on the decrease, while *A. concentrica* is much more prominent. Evolution is also evident among the Cardiums. *Cardium laqueatum* and *C. acutilaequetum* still continue, though in greatly diminished numbers. This period, however, marks the advent of two new species of this genus, *C. sublineatum* and *C. robustum*, the former profuse in the Pliocene, the latter still persistent. *Glycymeris americana* is more abundant than in the preceding epoch, while *Glycymeris subovata* continues to be a prominent form. The genus *Phacoides* is represented by a great number of species, all of which are widespread in their occurrence. These include *P. anodonta*, *P. crenulatus*, *P. radians*, and *P. trisulcatus*. *Venericardia granulata* is everywhere present, while the smaller species *V. tridentata* and *V. perplana* are less abundant. The smaller pelecypods are most of them undetermined, but it is certain that they will show a notable increase both in species and individuals.

"The Yorktown fauna in its occurrence at the type locality is conspicuous for the number of large and well-preserved Fulgurs. Though fragments are found at the localities along the Chowan and Neuse, conditions of deposition were not such as to allow their satisfactory preservation. *Turritella* is still richly represented by the species *variabilis* and its varieties. At Yorktown one bed is made up almost entirely of the variety *allicostata*. *Ecphora quadricostata* retains approximately the same relative position in the fauna as in the St. Marys. The *Buccinidae* and the *Nassidae* are somewhat more numerous. *Crepidula fornicata* and *Polynices duplicatus* are reported from nearly every locality where representative collections have been made, while *Crepidula aculeata*, *C. plana* and *C. heros* are more rare. *Calliostoma* is represented by eight species at Yorktown alone, but by few individuals. *Crucibulum* and *Fissuridea* are present in meager numbers. The smaller gastropods are quite numerous and include many late Miocene species. The gastropods as a whole do not, however, attain in North Carolina the same relative abundance which characterizes the Virginia Yorktown, especially in the vicinity of Suffolk.

"The Yorktown fauna is closely allied to that of the Duplin beds, and under the correlation of the latter will be quoted Dr. Dall's discussion of their relationship."

DUPLIN FORMATION.

The Duplin formation is in North Carolina the only representative of the Miocene to the south of the Hatteras axis, where it is found in isolated outcrops unconformably overlying the Cretaceous and Eocene deposits. This fragmentary occurrence is evidently due to erosion, the strata, as already pointed out, formerly covering in all probability wide areas throughout the region. The materials of the Duplin formation