

are very similar to those of the Yorktown and consist largely of sands, arenaceous clays and shell marls, the latter much broken by wave action.

The fossils are numerous, the mollusca especially being well represented. The most extensive collections have been made from the Natural Well in Duplin County. There is also a large admixture of later forms, but the presence of many characteristic Miocene species forbids it being considered as later than Miocene. In South Carolina some of the beds in Darlington, Florence, and Sumter counties seem to belong to the same formation, although this cannot be known definitely to be the case until collections from those localities are more carefully studied. North of the Neuse River the Duplin formation does not seem to have been deposited, or, if originally present, has since been removed. The Yorktown formation may be its correlative, in part at least, though the more tropical character of the Duplin fauna is considered sufficient reason for not considering them entirely contemporaneous.

No fauna since collected approaches in profuseness and excellence of preservation that from the Natural Well and its environs. Outside of Duplin County the most promising fossiliferous localities are along the Lumber River in the vicinity of Lumberton and Fairmont in Robeson County. Very little determinative work, however, has been done upon these forms. The best collection from the Natural Well is that made by Mr. Burns and studied by Dr. Dall, which is now in the Smithsonian Institution. From it Dr. Dall determined 331 species of Mollusca exclusive of the new species. Of these there are many gastropods, mainly minute species of *Drillia*, *Marginella*, *Nassa*, and *Scala* and a slightly smaller number of pelecypods. The subtropical aspect of the fauna sharply separates it from the Yorktown, which is not known to occur south of the Hatteras axis and allies it to the succeeding warm-water Waccamaw. There are, however, distinctions which will be brought out in the discussion of the latter formation. Dr. Dall,¹ who has studied the fauna, says:

"A study of these [fossils from the Natural Well] indicates their general parallelism with the upper or Yorktown Miocene of Virginia, with which their deposition may have been partially synchronous. The fossil species are, however, largely distinct from those of the Yorktown beds and of a more tropical aspect. It is probable that in Miocene times, as at the present day, there was a difference in the marine faunas of the two regions, that at Yorktown and Suffolk being more allied to the subjacent temperate fauna of the older Miocene of Maryland and Virginia, while that in North Carolina contained more southern types. Yet even this seems hardly sufficient to account

¹Wagner Free Institute Transactions, vol. 3, pt. 6, pp. 1598-1603.