

and *Oliva litterata* a maximum longitude of 82 mm. The old species present many and numerous variations and new species seem to be in the process of evolution.

"The facies presented in the Cape Fear region can be readily interpreted by the hypothesis which Dr. Paul Bartsch from his extensive study of the Pyramidellidae¹ believes to hold good—that it is the 'optimum condition that weakens specific bonds and tends to throw an organism into the so-called "state of flux."'

"It seems not improbable that, with the initiation of the Pliocene and the consequent warming of the waters, conditions for marine life became too favorable for the equilibrium of a fauna adapted to the cooler waters of the Miocene. Rapid development ensued, and these localities became a center of radiation of later Pliocene faunas. If this hypothesis be correct, a careful study of the fauna should reveal many precursors of later Pliocene forms. Some have already been found, and it seems rather certain that future study will yield results interesting both to the geologist and biologist."

Dr. William H. Dall of the Smithsonian Institution in the Wagner Free Institute Transactions, vol. 3, pt. 2, pp. 213-217, has given the results of his study of the Croatan fauna. Although small collections have subsequently been made from the Slocum's Creek locality, no determinative work has been done upon them. Dr. Dall's list includes 96 molluscan species. Among the diagnostic post-Waccamaw species may be noted *Plicatula gibbosa* Lamarck, *Arca pexata* Say, *Arca ponderosa* Say, *Arca campechiensis* Dillwyn, *Diplodonta subglobosa* C. B. Adams, *Ensis americana* Gld., *Rangia grayi* Conrad, *Labiosa canaliculata* Say, *Barnea costata* L., and *Urosalpinx cinereus* Say. Of the significance of their range he writes:

"In the case of the Croatan beds we find 35 uncharacteristic (Miocene to recent) species, with 6 new or doubtful forms. We have 2 characteristic Pliocene species, with 11 hitherto known as recent. Of the 55 with known range, 47 are known as Pliocene or younger, and 8 as of Pliocene or older horizons.

"The Croatan beds are obviously newer than those of the Waccamaw, yet when compared with the admitted Pleistocene beds of South Carolina, such as those of Simmon's Bluff, the presence on the Neuse of 41 out of 96 species which have not been known later than the Pliocene forbids us to regard the fauna as later than Pliocene."

LAFAYETTE FORMATION.

The Lafayette formation of North Carolina is poorly developed and the deposits are largely confined to a relatively narrow belt along the eastern margin of the Piedmont Plateau, where they are found, as has already been described, in somewhat isolated and highly dissected

¹Pyramidellidae of New England and the Adjacent Region. Proc. Bos. Soc. Nat. Hist., vol. 34, No. 4, p. 91.