

drift is wanting, as, for example, in the Wealds of Surrey, Kent, and Sussex.

Norfolk drift.—The drift can nowhere be studied more advantageously in England than in the cliffs of the Norfolk coast between Happisburgh and Cromer. Vertical sections, having an ordinary height of from 50 to 70 feet, are there exposed to view for a distance of about 20 miles. The name of diluvium was formerly given to it by those who supposed it to have been produced by the violent action of a sudden and transient deluge, but the term drift has been substituted by those who reject this hypothesis. Here, as elsewhere, it consists for the most part of clay, loam, and sand, in part stratified, in part devoid of stratification. Pebbles, together with some large boulders of granite, porphyry, greenstone, lias, chalk, and other transported rocks, are interspersed, especially through the till. That some of the granitic and other fragments came from Scandinavia I have no doubt, after having myself traced the course of the continuous stream of blocks from Norway and Sweden to Denmark, and across the Elbe, through Westphalia, to the borders of Holland. We need not be surprised to find them reappear on our eastern coast, between the Tweed and the Thames, regions not half so remote from parts of Norway as are many Russian erratics from the sources whence they came.

White chalk rubble, unmixed with foreign matter, and even huge fragments of solid chalk, also occur in many localities in these Norfolk cliffs. No fossils have been detected in this drift, which can positively be referred to the era of its accumulation; but at some points it overlies a freshwater formation containing recent shells, and at others it is blended with the same in such a manner as to force us to conclude that both were contemporaneously deposited.

Fig. 116.



The shaded portion consists of Freshwater beds.
Intercalation of freshwater beds and of boulder clay and sand at Mundesley.

This interstratification is expressed in the annexed figure, the dark mass indicating the position of the freshwater beds, which contain much vege-

Fig. 117.



Paludina marginata, Michaud. (*P. minuta*, Strickland.)
The middle figure is of the natural size.