

above described, for they contain boulders of tertiary sandstone, and breccia; while, in the older tertiary, the remains of the elephant have not been discovered. The perfect state of the teeth in the deposits at Brighton, forbids the supposition that they were transported from a distance: and we have, too, the remarkable fact, that while the shingle on which the elephant bed reposes, is composed not only of chalk pebbles, but of boulders of granite, porphyry, and other primary rocks which must have been brought from a distant part of the country, and of tertiary sandstone and breccia, and the sand beneath contains the bones of whales, no remains of elephants have been found therein. It would seem, therefore, that the sand, and the shingle, were formed in an estuary, and that when the upper beds were deposited, all communication with the ocean was cut off; for neither the bones, nor the materials of which the bed is composed, appear to have suffered from attrition, nor is there any intermixture of marine exuviae. These deposits were evidently of considerable extent: there are outlying patches on the chalk along the coasts of Sussex and Kent, and also at Etables, and other points on the opposite shores of France. Similar beds occur on the banks of the Loire, and probably the same series is represented by the *Crag*, overlying the London Clay, on the eastern shores of England; facts which tend to prove that the estuary once extended over a considerable portion of the area now occupied by the British Channel.* The geological relations of this group of deposits are as yet but imperfectly known. The zoological characters which distinguish them from the older tertiary strata, are the absence of the *palæotheria*, and the occurrence of the remains of the mammoth, rhinoceros, and other mammalia, whose bones are so constantly found in the superficial gravel of Europe, intermixed with those of recent species.

To this epoch we may probably refer the existence of hyenas, tigers, and other carnivorous animals, whose skeletons are entombed in such immense numbers in caverns, and fissures, and in beds of superficial gravel, in various parts of England, and the continent. One solitary instance only is known of the occurrence of remains of this kind in the south-east of England. The lower jaw and a few fragments of other bones of a hyena were discovered, a few years since, in a chasm in a stone quarry at Boughton, near Maidstone.

The next era is that during which the *Crag*, and the tertiary strata, and the chalk on which they repose, were lifted up to their present situations; the channel which separates England from France was broken through, and the transverse valleys of the North and South Downs were produced or enlarged; for, although these valleys are now river courses, yet it is obvious that they originated in disruption, for the strata, in every instance which I have observed, diverge from

* Mr. Samuel Woodward, of Norwich, the author of the 'Synoptical Table of British Organic Remains,' (a work indispensable to the practical geologist) states, that in the *crag* on the coast of Norfolk, the remains of Mammoths are so abundant, that on the oyster-ground off Harborough, the grinders of these animals which have been found must have belonged to upwards of 500 individuals.