

At what periods the Weald valley was denuded.—We may next inquire at what time the denudation of the Weald was effected, and we shall find, on considering all the facts brought to light by recent investigation, that it was accomplished in the course of so long a series of ages, that the greatest revolutions in the physical geography of the globe, yet known to us, have taken place within the same lapse of time. It has now been ascertained, that part of the denudation of the Weald was completed before the British Eocene strata, and consequently before the nummulitic rocks of Europe and Asia were formed. The date, therefore, of part of the changes now under contemplation was long antecedent to the existence of the Alps, Pyrenees, and many other European and Asiatic mountain-chains, and even to the accumulation of large portions of their component materials beneath the sea.

M. Elie de Beaumont suggested, in 1833, that there was an island in the Eocene sea in the area now occupied by the French and English Wealden strata, and he gave a map or hypothetical restoration of the ancient geography of that region at the era alluded to.* Mr. Prestwich has since shown that the materials of which the lower tertiary beds of England are made up, and their manner of resting on the chalk, imply, that such an island, or several islands and shoals, composed of Chalk, Upper Greensand, Gault, and probably of some of the Lower Cretaceous rocks, did exist somewhere between the present North and South Downs. The undermined cliffs and shores of those lands supplied the flints, which the action of the waves rounded into pebbles, such as now form the Woolwich and Blackheath shingle-beds below the London Clay. It is supposed, that the land referred to was drained by rivers flowing into the Eocene sea, and whence the brackish and freshwater deposits of Woolwich and other contemporaneous strata† were derived. The large size of some of the rolled flints (eight inches and upwards in diameter) of the Blackheath shingle demonstrates the proximity of land. Such heavy masses could not have been transported from great distances, whether they owe their shape to waves breaking on a sea-beach, or to rivers descending a steep slope.

In the annexed diagram (fig. 329) Mr. Prestwich has represented a section from near Saffron Walden, in Essex, to the Weald, passing north and south through Godstone, in which we see how the chalk, *c*, had been disturbed and denuded before the lower Eocene beds, *b*, were deposited. Some small patches of the last-mentioned beds, *b'*, consisting of clay and sand, extend occasionally, as in this instance, to the very edge of the escarpment of the North Downs, proving that the surface of the white chalk, now covered with tertiary strata, is the same which originally constituted the bottom of the Eocene sea.

* Mém. de la Soc. Géol. de France, vol. i. part i. p. 111, pl. 7, fig. 5.

† See p. 220, above.