

beneath the sea until the oldest tertiary beds had begun to accumulate.

A strait of the sea separating England and Wales has also been introduced, on the evidence afforded by shells of existing species found in a deposit of gravel, sand, loam, and clay, called the northern drift, by Sir R. Murchison.* And Mr. Trimmer has discovered similar recent marine shells on the northern coast of North Wales, and on Moel Tryfane, near the Menai Straits, at the height of 1392 feet above the level of the sea!

Some raised sea-beaches, and drift containing marine shells, which I examined in 1843, between Limerick and Dublin, and which have been traced over other parts of Ireland by different geologists, have required an extension of the dark lines so as to divide that island into several. In improving this part of my map I have been especially indebted to the assistance of Mr. Oldham, who in 1843 announced to the British Association at Cork the fact that at the period when the drift or glacial beds were deposited, Ireland must have formed an archipelago such as is here depicted. A considerable part of Scotland might also have been represented in a similar manner as under water when the drift originated.

A portion of Brittany is divided into islands, because it is known to be covered with patches of marine tertiary strata chiefly miocene. When I examined these in 1830 and 1843, I convinced myself that the sea must have covered much larger areas than are now occupied by these small and detached deposits. The former connection of the White Sea and the Gulf of Finland is proved by the fact that a multitude of huge erratic blocks extend over the intervening space, and a large portion of Norway, Sweden, and Denmark, as well as Germany and Russia, are represented as sea, on the same evidence, strengthened by the actual occurrence of fossil sea-shells, of recent species in the drift of various portions of those countries. The submergence of considerable areas under large bodies of fresh water, during the tertiary period, of which there are many striking geological proofs in Auvergne, and elsewhere, has not been expressed by ruled lines. They bear testimony to the former existence of neighbouring lands, and a certain elevation of the areas where they occur above the level of the ocean; they are therefore left blank, together with all the space that cannot be demonstrated to have been part of the sea at some time or other, since the commencement of the Eocene epoch.

In compiling this map, which has been entirely recast since the first edition, I have availed myself of the latest geological maps of the British isles, and north of Europe; also of those published by the government surveyors of France, MM. de Beaumont and Dufresnoy; the map of Germany and part of Europe, by Von Dechen, and that of Italy by M. Tchihatchoff (Berlin, 1842). Lastly, Sir R. Murchison's important map of Russia, and the adjoining countries, has enabled me

* See Proceedings of Geol. Soc. vol. ii. p. 334.