

the ocean entirely changed in the northern zones, on the Mediterranean shores, and on the coasts of India and America. It is difficult to collect very certain evidence of the occurrence of general subterranean movements immediately after the completion of the chalk, though the great extent of sands, and pebbles, and lignitic beds which cover it, and the deep wasting on its surface, as seen beneath those sands and pebbles, leaves no doubt that what had been deep sea was converted to shallow water, and subject to inundations from the land. In many cases, these pebbles appear to be nothing else than broken and rolled flints, derived from the chalk itself; some of the white sands which form part of the tertiary series, when magnified, appear to be fragmentary particles of flint, very slightly worn by attrition; but, upon the whole, the great mass of tertiary deposits in every country can only be understood as derived from the older strata, and, in some cases, transported from considerable distances.

Clear proof of local disturbance of the chalk and older strata, before the production of any tertiary strata, can no where be given in England or Ireland, unless the pebble beds of the former country, and the basaltic eruption of the latter, be admitted in evidence. In the south-east of France De Beaumont ascribes to a late epoch in the cretaceous period the system of dislocations ranging from N. N. W. to S. S. E., which traverses Mont Viso, the French Alps, and the south-west extremity of the Jura. After the cretaceous period occurred the great disruptions of the Pyrenees and Apennines; but there is yet too little known of the geology of the Ghauts and the Alleghanies, to allow us to determine whether these ranges, which are rudely parallel to the same great circle as the Pyrenees and the Apennines, were (as De Beaumont supposes, and his speculation on the relation of age and direction among mountain chains requires) uplifted at the same geological epoch.