of subterranean heat, vital action on the land and in the water, — these are the causes to which the formation of the whole carboniferous system is clearly traceable; and by comparing the effects of all these causes in that ancient period, with what happen at this day, we shall find modern effects precisely comparable in *kind*, but altogether inferior in *magnitude*.

Where then was situated that ancient land, from which, according to our view, were swept the materials of the 1000 yards of sandstones and shales which inclose the coal deposits in most parts of England, and the continent of Europe? And recollecting that in the series of millstone grit and carboniferous limestone in the north of England occur other beds of coal, and several hundred yards in thickness of other sandstones and shales, again we ask from what land were the plants and earthy sediments drifted in such abundance over this limited area? In the discussion of this important question, which appears in my "Illustrations of the Geology of Yorkshire," I have found it necessary to analyse the phenomena, so as to be able to inquire separately into the local origin of the three substances of principal importance — limestone, sandstone, shale: the former is of oceanic origin, for it contains only marine exuviæ, and when in greatest thickness and purity, was evidently deposited by water in a state of great tranquillity, or slow decomposition. In the same south-eastern direction that the limestone grows thicker from a certain point in the district, the sandstones and shales grow thinner: in the opposite direction they thicken, but not equally; the sandstones thicken toward the north, the shales toward the west, and in this direction certain limestones and sandstones totally vanish. With these sandstones the coal beds also vanish; where the sandstones thicken and grow numerous toward the north, the coal beds also augment in number and thickness; and the limestones change gradually from an undivided mass to many distinct members, separated by sandstones, shales, coal, and ironstone.