

agents ; by rains, torrents, and inundations ; at that time probably acting with intense violence, and washing down and spreading forth, in the form of mud and sand and gravel, upon the bottom of the then existing seas, the materials of primary stratified rocks, which, by subsequent exposure to various degrees of subterranean heat, became converted into beds of gneiss, and mica slate, and hornblende slate, and clay slate. In the detritus thus swept from the earliest lands into the most ancient seas, we view the commencement of that enormous series of derivative strata which, by long continued repetition of similar processes, have been accumulated to a thickness of many miles.*

The total absence of organic remains through-

* Mr. Conybeare (in his admirable Report on Geology to the British Association for the Advancement of Science, 1832, p. 367) shows, that many of the most important principles of the igneous theory, which has been almost demonstrated by modern discoveries, had been anticipated by the universal Leibnitz. " In the fourth section of his *Protogæa*, Leibnitz presents us with a masterly sketch of his general views, and, perhaps, even in the present day, it would be difficult to lay down more clearly the fundamental positions which must be necessarily common to every theory, attributing geological phenomena in great measure to central igneous agency. He attributes the primary and fundamental rocks to the refrigeration of the crust of this volcanic nucleus ; an assumption which well accords with the now almost universally admitted igneous origin of the fundamental granite, and with the structure of the primitive slates, for the insensible gradation of these formations appears to prove that gneiss must have undergone in a greater,