

doubtful one, respects their formation. In what form, and under what circumstances, it has been often asked, and very variously answered, were these stratified primary rocks deposited?

They exhibit with almost equal prominence two distinct classes of phenomena,—an igneous class and an aqueous class; and are as intimately associated with the Pleistocene rocks by the one, as with the sedimentary rocks by the other. I have seen in the same quarry of quartz-rock, one set of strata as decidedly chemical in their texture as porphyry or hypersthene, and another intermingling set as decidedly mechanical as grauwacke or conglomerate. I have seen, too, in the same gneiss rock, the minute plates of mica, so abundant in this formation, arranged between the layers as decidedly on the sedimentary principle as in a micaceous sandstone, and in the layers themselves as decidedly on the crystalline principle as in granite. And this compound character of the gneiss may be regarded as the general one, with, of course, certain exceptions in all the primary stratified rocks: the condition of their stratification is mechanical and sedimentary, but the condition of the strata themselves igneous and chemical. How were these variously-blended characters first induced? The geologists of one school tell us that the primary formations originally existed as ordinary sedimentary rocks, but that they have since been altered by the action of intense heat, and that, while the stratification remains as an evidence of their first condition, the texture of the strata indicates the igneous change which has passed over them; while the geologists of another school hold that their first deposition took place under circumstances essentially unlike any which now exist, on at least the surface of our planet, and that their mineralogical conditions were, in consequence, originally different from those of any deposition taking place at the present time, or in any of the later geological ages. I