*igneous fusion*; some appear the result of *electrical combinations*. All these latter are but forms of chemical processes among the elements of matter; and the sedimentary rocks, where their parts are clearly distinguishable, are found to be composed of grains or fragments, originally produced by aqueous, igneous, or electrical combination. Thus all the mineral masses of the earth known to us appear to have existed previously in a different state, when the elements were separated, so as to allow of their combination according to the forces of affinity, existing in definite proportions among the small portions of all material substance.

Take, for example, the very common rock sandstone; its component grains of quartz, felspar, and mica are, more or less, rolled or fragmented crystals of these substances, derived from rocks like gneiss, mica schist, &c., which are also composed of grains of the same kind, less affected by mechanical processes; or from granite, porphyry, &c., which are purely crystalline rocks. Such derivative sandstones are formed at this day from such crystallised granite, and other rocks. But the analysis goes further. Quartz is a compound of a metallic basis, silicium, and the air or gas oxygen. Felspar is a compound of silicium, calcium, potassium, &c., each united with its own proportion of oxygen. Mica is a compound of silicium, potassium, magnesium, calcium, &c. similarly combined with oxygen.

Under present physical conditions oxygen, being liberated from combination with these bases, would expand into 2000 times the bulk it occupies in the compound, and become a gas: and thus, since oxygen forms half the ponderable mass near the surface, half the crust of the globe, perhaps half its whole mass, would become an expansion or atmosphere round the diminished nucleus. It is evident that the tendency of all this inquiry is to lend some confirmation to the *speculations* of Herschel and Laplace, as to the condensation of the planetary masses from gaseous expan-