

thickness, as the process of solidification of the underlying liquid matter nearest to the surface proceeded. This state of tranquillity could not last long. The solid portion of the globe had not yet attained sufficient consistency to resist the pressure of the gases and boiling liquids which it covered and compressed with its elastic crust. The waves of this internal sea triumphed, more than once, over the feeble resistances which were opposed to it, making enormous dislocations and breaches in the ground—immense upheavals of the solid crust raising the beds of the seas far above their previous levels—and thus mountains arose out of the ocean, not now exclusively granitic, but composed, besides, of those schistose rocks which have been deposited under water, after long suspension in the muddy seas.

On the other hand the Earth, as it continued to cool, would also contract; and this process of contraction, as we have already explained, was another cause of dislocation at the surface, producing either considerable ruptures or simple fissures in the continuity of the crust. These fissures would be filled, at a subsequent period, by jets of the molten matter occupying the interior of the globe—by *eruptive granite*, that is to say—or by various mineral compounds; they also opened a passage to those torrents of heated water charged with mineral salts, with silica, the bicarbonates of lime and magnesia, which, mingling with the waters of the vast primitive ocean, were deposited at the bottom of the seas, thus helping to increase the mass of the mineral substances composing the solid portion of the globe.

These eruptions of granitic or metallic matter—these vast discharges of mineral waters through the fractured surface—would be of frequent occurrence during the primitive epoch we are contemplating. It should not, therefore, be a matter for surprise to find the more ancient rocks almost always fractured, reduced in dimensions by faults and contortions, and often traversed by veins containing metals or their oxides, such as the oxides of copper and tin; or their sulphides, such as those of lead, of antimony, or of iron—which are now the object of the miner's art.