

part formed by a union of silicon, oxygen, and aluminum. By far the greater part of the earthy crust is thus compounded of a few elementary substances.

Such is Professor Tyndall's view of the universe, rising incidentally out of his theory of heat, his main object being to elucidate his theory of heat and light.

#### MODIFICATIONS OF THE SURFACE OF THE GLOBE.

As a consequence of the hypothesis of central heat, it is admitted that our planet has been agitated by a series of local disturbances ; that is to say, by ruptures of its solid crust occurring at more or less distant intervals. These partial revolutions at the surface are supposed to have been produced, as we shall have occasion to explain, by upheavals or depressions of the solid crust, resulting from the fluidity of the central parts, and by the cooling down of the external crust of the globe.

Almost all bodies, in passing from a liquid to a solid state, are diminished in size in the process. In molten metals which resume the solid state by cooling, this diminution amounts to about a tenth of their volume ; but the decrease in size is not equal throughout the whole mass. Hence, as a result of the solidification of the internal parts of the globe, the outer envelope would be too large ; and would no longer fit the inner sphere, which had contracted in cooling. Cracks and hollows occur under such circumstances, even in small masses, and the effect of converting such a vast body as the earth from a liquid, or rather molten condition, to a solid state, may be imagined. As the interior became solid and concrete by cooling, furrows, corrugations, and depressions in the external crust of the globe would occur, causing great inequalities in its surface ; producing, in short, what are now called *chains of mountains*.

At other times, in lieu of furrows and irregularities, the solid crust has become ruptured, producing fissures and fractures in the outer envelope, sometimes of immense extent. The liquid substances contained in the interior of the globe, with or without the action of the gases they enclose, escape through these openings ; and, accumulating on the surface, become, on cooling and consolidating, *mountains* of various heights.

It would also happen, and always from the same cause, namely, from the internal contraction caused by the unequal cooling of the globe, that minor fissures would be formed in the earth's crust ; incandescent liquid matter would be afterwards injected into these