

and float upon the liquid portions. This apparent exception to the law of expansion by heat is accounted for by supposing that, when the molecules of a solidifying fluid arrange themselves in a regular crystalline manner, they inclose certain minute spaces, so that the resulting crystal is a little more bulky than the unarranged molecules from which it was constructed. And this may be the case, even though a cooler temperature has caused them to shrink into closer proximity (for they are never in contact) than before crystallization. If this law applies to the refrigeration of water, type-metal, iron, and other substances, we may reasonably infer it to be a general law of matter. We should expect, then, that crystals of quartz would float upon molten quartz, or solid trap upon molten trap, just as solid iron floats upon molten iron, or solid ice upon molten ice. We have, therefore, not only evidences of the fact of a forming crust, but also a probable means of accounting for it.

We may conclude, then, that a solid film began to form over the surface of the molten sea. But the earth was even then, as from the beginning, obedient to the law of axial rotation; and the sun and moon reached forth, with their attractive influences, to solicit the mobile rocks into tidal elevations. As the wave pursued the moon around the earth, it daily ruptured the forming film, and only a wilderness of floating fragments remained, strewn over the surface of the fiery abyss. In due time, however—let us be liberal in our concessions of time—the rocking and jostling fragments became permanently frozen together, as the broken ice of Arctic seas, after being worried by winds and currents, seizes an interval of calm to consolidate into a vast and rugged floe. So the rock-floe of this fiery ocean formed, at length, a bridge of rough and sturdy strength. It was a mixed conglomerate of crystalline fragments, such