endless motion. But until you introduce chemical agencies, every thing in the individual worlds would be compacted by gravity into one dead mass of matter, destined to no resurrection. But let chemical agencies leaven that mass, let affinity and cohesion commence their segregating processes, and constant motion and change would follow, with a thousand new and splendid forms. Especially when the Deity had infused the living principle into portions of that matter, and put chemistry, and her handmaid electricity, under the control of the vital power, would these worlds teem with animation, and countless exhibitions of beauty.

And in all known worlds, these chemical changes are at work unceasingly. We know not whether those worlds are all inhabited, but we have evidence that all are undergoing the transmutations of chemistry; not on their surface merely, but in their deep interior. The consequence is, universal change; change often upon a vast scale; change extending through thousands and millions of years, and through the entire mass of immense worlds. We have glanced, in these lectures, at the most important of those changes which this world has undergone, and we have seen it to be almost universal. We have found that the entire crust of the globe, many miles in thickness, and probably to its centre, has been dissolved by heat, and much of it also by water; that a large part of it, at least, has, by the same chemistry, been made to constitute portions of the animal frame; that, even now, much of its interior is held in igneous solution, and that probably the time was when its entire mass was a molten, self-luminous world. Indeed, the conjecture is not without some foundation, which carries back this chemical action one step farther, and makes the world originally a diffused mass of nebula.

At this point of the argument, geology appeals to astronomy, to show how widely this principle of chemical change has operated, and still operates, in the universe. We look first at the nebulæ; for here we probably find matter in its most chaotic and attenuated form, constituting self-luminous, diffused masses of vapour. In some of them, however, that matter has begun to condense, doubtless by the radiation of its heat. In the comets, we find probably similar matter, some of it still farther advanced in the process of condensation, so that perhaps a nearly solid nucleus may exist. In the sun