

observe, that the discoveries of geology are no less vast ; they extend through time, as those of astronomy do through space ; they carry us through millions of years, that is, of the earth's revolutions, as those of astronomy do through millions of the earth's diameter, or of diameters of the earth's orbit. Geology fills the regions of duration with events, as astronomy fills the regions of the universe with objects. She carries us backwards by the relation of cause and effect, as astronomy carries us upwards by the relation of geometry. As astronomy steps on from point to point of the universe by a chain of triangles, so geology steps from epoch to epoch of the earth's history by a chain of mechanical and organical laws. If the one depends on the axioms of geology, the other depends on the axioms of causation.

“So far, then, geology has no need to regard astronomy as her superior, and least of all when they apply themselves together to speculations like these. But, in truth, in such speculations geology has an immeasurable superiority. She has the command of an implement in addition to all that astronomy can use, and one, for the purpose of such speculations, adapted far beyond any astronomical element of discovery. She has for one of her studies,—one of her means of dealing with her problems,—the knowledge of life, animal and vegetable. Vital organization is a subject of attention which has in modern times been forced upon her. It is now one of the main points of her discipline. The geologist must study the traces of life in every form ; must learn to decipher its faintest indications and its fullest development. On the question, then, whether there be in this or that quarter evidence of life, he can speak with the confidence derived from familiar knowledge ; while the astronomer, to whom such studies are utterly foreign, because he has no facts that bear upon them, can offer on such questions only the loosest and most arbitrary conjectures ; which, as we have had to remark, have been rebuked by eminent men as being altogether inconsistent with the acknowledged maxims of his science.

“When, therefore, geology tells us that the earth, which has been the seat of *human* life for a few thousand years only, has been the seat of *animal* life for myriads, it may be, millions, of years, she has a right to offer this as an answer to any difficulty which astronomy, or the readers of astronomical books, may suggest, derived from the consideration that the earth, the seat of human life, is but one globe of a few thousand miles in diameter, among millions of other globes at distances millions of times as great. Let the difficulty be put in any way the objector pleases. Is it that it is unworthy of the greatness and majesty of God, according to our conception of Him, to bestow such peculiar care on so small a part of his creation ? But we know from geology that He has bestowed upon this small part of his creation—mankind—this special care. He has