

ing the constitution of the earth : geology, as such, can penetrate no farther than this small fraction of the radius of the earth. But the far-searching power of mathematical science is capable, by correct interpretation of astronomical observations, and refined experiments on the specific density of the globe, of giving us some further information as to the nature and arrangement of even the central masses of our planet.

Direct observation of organic remains is the only source of information concerning the ancient orders of living beings, which were in existence at or previous to the deposition of the several strata : no reasoning *à priori* can be, in this inquiry, of the smallest service ; but may be exceedingly injurious by infusing error and prejudices. It would be a gross error, for instance, to assume that the earlier forms of life were less complex in visible structure than those which now exist — that the lower orders only of animals and plants had been called into being ; for since the forms of life are most certainly made dependent on physical conditions, unless these latter can be known beforehand, there can be no *reasoning* on the matter, and there ought to be no *speculation* in inductive geology.

Means of Interpretation of Phenomena.

Admitting that by direct observation and the aid of higher science, geology has collected the evidence of the nature and arrangement of the mineral masses and organic reliquiæ, we may proceed to point out the method of interpretation which must be applied to the phenomena, in order to discover the physical conditions which prevailed in the several successive periods of the earth's structure in the situations observed. From the known to the unknown, through some common relations, has ever been the march of philosophical discovery : the skill of the general reasoner consists in the selection and use of these common relations for the determination of the principal conditions or agencies. It is