

more to be regarded as natural objects for scientific study than are individual men or human societies. The laws governing the migrations of birds, or the geographical distribution of plants, or the movement of storms, or the elective affinities of chemicals, are not more the legitimate subjects of scientific investigation than are the individual or collective actions of men or the changes that take place in human opinions or public sentiment. From the scientific point of view, all phenomena are equally legitimate objects of study.

In the second place, nature presents the relation of progenitor of man. Man is not only a part of nature as a whole, but nature antedated him and has produced him. This, however, is true only in the sense that it is true of every other part of nature, every other object in the universe. Every animal, tree, rock, metal, or gas that we know is in precisely the same manner a product of nature. Time was when it had no existence as such an object, and, in the course of the eternity of changes which have been going on in matter, it has here and now assumed its present shape and character. Man is simply one of these many products. He, too, has been slowly evolved out of materials which have, indeed, always existed, but have but very recently assumed this form. The particular form, character, structure, and attributes which belong to the creature denominated "man" are such as they are in virtue of an inexorable necessity involved in the nature of things; they are the result of the intersection of coincident forces, the activities of molecular aggregates, possessing just such degrees and kinds of aggregation, and thrown into just such relations to one another, as were adapted to the development of just such a being. The necessity of his existence is, therefore, just equal to the impossibility of his non-existence. Both are absolute. Nature, therefore, occupies the relation to man of cause and effect, of antecedent to consequent. But the process of causation is of the strictly mechanical kind. He is the product of an infinite series of infinitesimal impacts in one general direction. He has, as it were, been gradually pushed into existence by a storm of pelting atoms continued through millions of years. Forces, as thus defined—and this is the only rational theory of force—have surrounded the elements out of which he was created on that spot, wherever it may have been, which was the true cradle of the race, and moulded him into human shape after having first compelled him to assume for ages successively the shapes of a long line of ancestral animal types. The same forces have impelled him on through advancing grades of physical and mental development to his present condition. If he tended to swerve to the right or to the left, these forces sustained the wayward tendency by increase of power on the faltering side. Tendencies to abort, revert, or retrograde were counteracted by persistent impulses, so that, in most parts of the great spreading tree which the human families present, the tendencies have been steadily, though slowly, forward in the scale of organization. But so, too, must we regard the small progress made by man, particularly by some of the ramifications, as due to counter or opposing forces, and the real progress achieved as representing only the resultant of all the classes of forces which have constantly affected his condition.