

That the plant and the animal are living, is evident to them, but they assume that the air, the water and the earth, the elements from which the plant grows and is fed, are dead; that life is a mysterious something which comes from without, and is extraneous to the organism. Perhaps we may trace the origin of this conception to the ancient legend, which appears in more than one form, of a human body fashioned out of dead matter and waiting for vivifying breath or fire. The student of inorganic nature, however, soon learns to recognize the fact that all matter is instinct with activities and finds that a great number of those processes which were formerly regarded as functions of organized bodies are really common to these and to inorganic matter. The phenomena of gravitation, of light and of electricity, the diffusion and transpiration of gases and liquids, the crystallogenic process, and the peculiar relations of colloids, are all, when rightly understood, manifestations of energies and activities which forbid us to speak of matter as dead. To all of these dynamical (or as they are generally called, physical) activities of matter, supervene those processes which we name chemical, and which give rise to new and specifically distinct inorganic forms. The attaining of individuality by matter, which has always seemed to me the greatest step in the progress of nature, is first seen in the crystal, but therein the forces of matter are in a static condition, except so far as certain dynamical relations are concerned. It is not until solid matter rises from the crystalline to the higher condition of the colloid, that it becomes capable of absorption, diffusion and even of assimilation; that, in a word, it assumes relations to the external world which show that it possesses an individuality higher than the crystal, and is, in fact, endowed with many of the activities belonging to those masses of colloidal matter which biologists have agreed to call living.

In these phenomena we have the first developments of individuality and of organization, and I think that the careful student who endeavours with a strong mental grasp to seize the true relations of things will see that we have here to do, not with a new activity from without, but with a new and higher development of a force which is inherent in matter, and thus manifests itself at a certain stage in chemical development. He will then, in the words of a philosophic poet,

- See through this air, this ocean and this earth,
All matter quick, and bursting into birth."