a true natural system can exclude none. To the establishment of such a system, a clearer view of the nature and relations of physical and chemical phenomena than that generally received will materially aid us.

§ 2. Matter is susceptible of changes of volume of two kinds. (1) Those produced from without, by variations of temperature and of pressure, which changes are constant and regular. Effecting no essential alteration in species, they may be called *extrinsic* or, as the result of external dynamic agencies, *mechanical* changes. (2) Those which have been described as due to "internal disturbances," which effect specific alterations in character. These constitute *chemical* or what may be called *intrinsic* changes, and differ from the last in that, instead of being constant and regular, they are periodic and subordinated to definite and unforeseen relations of volume. Intrinsic changes of volume in matter connote chemical as distinguished from dynamical processes. In chemical union we have intrinsic contraction or condensation (variously designated as interpenetration, compenetration, identification, integration, unification); and in chemical decomposition, intrinsic expansion or division. These changes may be either homogeneous, involving one species of matter, or heterogeneous, involving two or more species. The first includes so-called polymerization and depolymerization, which may be described as homogeneous intrinsic union and homogeneous intrinsic division; constituting what we have called collectively *chemical metamorphosis.* Those intrinsic changes which involve two or more species we have included under the title of *chemical metagenesis;* the process being one of heterogeneous intrinsic union or of heterogeneous intrinsic division. In the former, intrinsic contraction involves volumes of unlike species, and in the latter, intrinsic expansion resolves a species into two or more unlike species. The relations to volume of all such changes are most simple and evident in the case of gases and vapours; but the same laws of intrinsic contraction and expansion by volumes apply alike to gases and to the liquid and solid species