

and the several departments of physics, the colloids and the ions of hydrogen and hydroxyl remain to be mentioned. It has been shown that the properties of water are exceptionally favorable to the existence and stability of colloidal systems; also that the properties of carbonic acid result in automatic regulation of the concentration of hydrogen and hydroxyl ions in the ocean and in the organism.

So far, then, as it is possible to judge by telling over the departments of physical science, our examination of physical and chemical properties has not been incomplete.

This conclusion may be further tested with the help of the ideas which underlie Willard Gibbs's "Phase Rule."¹ According to this rule, the condition of equilibrium in any material system depends upon the number of its components, the number of its phases, temperature, pressure, and, in general, the concentrations of all the components. Without entering upon an explanation of the exact mathematical notions which determine the meaning of the terms "component" and "phase" it will here suffice to say that in general the number of components increases as the number of separate chemical individuals increases,

¹ See, for instance, Findlay, "The Phase Rule and its Applications." London, 1911, 3d ed.