## ON THE PHYSICAL ASPECT OF COLLOIDAL SOLUTION 79

A circumstance which has often been advanced as an obstacle in the way of accepting any given theory is the difficulty of explaining why many irreversible colloids coagulate when frozen and then thawed. If the particles are held in solution by the mutual action on one another, due to charges of electricity or otherwise, then, as a frozen mass thaws, the particles in the very thin layer of solution on the outside at any instant, as the ice surface melts and the water runs away, are carried down by the stream and do not remain in suspension on account of the cessation, for the time being, of the action of their neighbouring particles. That is, by the process of thawing the particles are taken from solution one by one, as it were, and the suspended mass coagulates.

All of these questions, together with others of the greatest practical importance, await future developments in this study. In colloidal solutions we have an unlimited scope for the many workers now engaged in the problems presented by them. The solving of these problems will undoubtedly add greatly to our knowledge of the structure and action of matter in its various states.