

buoyancy of ice. The coldest water would continually sink to the bottom and there freeze. The ice, once formed, could not be melted, because the warmer water would stay at the surface. Year after year the ice would increase in winter and persist through the summer, until eventually all or much of the body of water, according to the locality, would be turned to ice. As it is, the temperature of the bottom of a body of fresh water cannot be below the point of maximum density; on cooling further the water rises; and ice forms only on the surface. In this way the liquid water below is effectually protected from further cooling, and the body of water persists. In the spring the first warm weather melts the ice, and at the earliest possible moment all ice vanishes.

Such are the important thermal properties of water, and in briefest outline their unique fitness for the living mechanism. No other known substance could be substituted for water as the material out of which oceans, lakes, and rivers are formed, and as the substance which passes through the meteorological cycle, without radical sacrifice of some of the most vital features of existing conditions. Ammonia in these respects is the only substance now known which approaches the