

be true, or neither; but it is logically impossible that both of these can, for the simple reason that the waters of the equator cannot at the same time be both lighter and heavier than the water at the poles." "So long as the two causes continue in action, no current can arise unless the energy of the one cause should happen to exceed that of the other, and even then a current will only exist to the extent by which the strength of the one exceeds that of the other."¹

It seems scarcely necessary to enter further into detail in reference to Captain Maury's theory of ocean currents, which is really chiefly remarkable for its ambiguity, and for the pleasant popular style in which it is advocated; since my friend and colleague Dr. Carpenter has latterly brought into great prominence what appears to be a modification of the same view, put in a more definite form.

Professor Buff, in his excellent little volume on the *Physics of the Earth*, speaking of the layer of cold water derived from the Arctic seas which underlies the tropical ocean, and its method of transport, says: "The following well-known experiment clearly illustrates the manner of the movement. A glass vessel is to be filled with water with which some powder has been mixed, and is then to be heated at bottom. You will soon see, from the motion of the particles of powder, that currents are set up in opposite directions through the water. Warm water rises from the bottom, up through the middle of the vessel, and spreads over the surface; while the colder, and therefore heavier liquid, falls down at the sides of the

¹ James Croll, *op. cit.*