

clay; and the silica would, in a similar way, mix with other substances or form by itself beds of pure quartz.

If these views are correct, it appears that the mineral constituents of sea-water date from the primeval time. The table salt so familiar to our senses is a venerable product. The sodium had endured the heat of the molten globe and consolidated as a silicate in the first crust. The chlorine had drifted about, a constituent of the heterogeneous atmosphere, until the war of the elements came; when it was dragged down as an incident of the conflict. Here it found occasion for unwonted activity; and all over the world, chlorine atoms busied themselves in soliciting sodium atoms, to gratify a newly discovered liking, and create, in unlimited abundance, a substance destined to acquire unlimited usefulness. So our common salt, which knows so well how to grow old unchanged, is employed by us to assist other substances to grow old unchanged.

We may inspect, now, the oldest rocks accessible to investigation, and see if they are the kinds which should be expected, according to the above reasoning. Yes, in a general way they are. Feldspars are everywhere disseminated in the bottom rocks. There are great beds of crystalline limestone, and of argillites. There are micas, hornblende, and augite, all of which, like the feldspars, are essentially silicates of alumina and other bases. But here, also, are conglomerates, composed of rounded or angular fragments of *older* rocks. Here, indeed, are vast formations of *quartzites*, but they are formed of grains, instead of being those purely vitreous masses which would result from the precipitation of free silica. But each separate grain is such vitreous quartz, and it appears as a fragment of some rock in which the whole mass was purely vitreous. At some time then, earlier than the formation of these granular quartzites there *were* formed quartzites *not* composed of grains, but continuous like a mass of glass. We have to conclude that the oldest rocks accessible are *not* remnants of the primeval precipitates. This is the conclusion pointed out also by the presence of conglomerates.