boulders of quartz, liberated from its ancient combinations and precipitated in the bottom of the sea. Here are boulders of sandstone—vitreous, half-fused sandstone—better known as "hard-heads," which consist of grains of quartz produced by the grinding up of some more ancient quartz rock. These grains have been again cemented together, and a convulsion of Nature has sent them a second time vagrants over the surface of the earth. Here, too, are fragments of those ancient marbles, precipitated at the time when the partners of the ancient chlorides and carbonates formed new copartnerships for life. These all, rounded and battered by long travel, have come from their ancient homes in those northern regions where our continent first raised its head to scowl defiance at the supremacy of tempest and flood. They constitute, with numberless specimens of rocks of every other age, a grand museum, where every student of Nature may roam and study at his pleasure.

The chemical reactions, and precipitations, and sedimentary accumulations to which I have referred extended over an immense interval of time. During this long period materials accumulated at the bottom of the sea to the thickness of more than twenty-five thousand feet. Their geographical extent corresponded with that of the primeval sea. We find these rocks on every side of the globe, perforated here and there by the original granitic summits, which serve to point out to us the sites of the oldest islands. For our knowledge of the vast thickness of these older strata, their composition, and their wide American distribution, we are indebted to Sir William Logan and his associates of the Geological Commission of Canada. Sir William has ascertained that this stupendous pile of strata is properly divisible into two great systems, the lower of which he styles the "Laurentian," from the great