

The earliest or Laurentian rocks form what we may call the backbone of our continent. They are all crystalline, and consist for the most part of gneisses, granites, limestones, schists, labradorites, quartzites and in some places altered slates. They contain, prominently among minerals, apatite, graphite and mica with great beds of iron ore and many others of great interest to the mineralogist. These rocks are well developed in the Chelsea hills and the country to the north. Geographically and roughly speaking, they may be said to extend from Labrador along the north side of the St. Lawrence to Lake Superior and Lake of the Woods, whence they trend away north-westerly and reach almost the Arctic Ocean. Various theories as to the origin of these different kinds of rocks have been put forth. For many years they were regarded by most geologists as altered sediments entirely, which had been recomposed from the debris resulting from the disintegration of the first existing crust of the earth, through the agency of water or the atmosphere, as well as by the action of the ocean, by which the sands, etc., were redistributed and formed sedimentary layers, which subsequently became metamorphosed into the gneisses, limestones, etc. By others it is held that a great part of these rocks was formed by deposition from a semi-fluid magma, and that they represent the true crust of the earth without the agency of water, while other portions are true altered sediments. Still others again hold that all *Archean* rocks, by which term is meant generally, though the phrase is somewhat ambiguous, all rocks devoid of organisms, thus including Huronian as well as Laurentian, were formed of sedimentation, and that they are originally crystalline rocks, in part at least due to chemical agencies, their crystalline character not being a superinduced but an original property. In such a variety of opinions it seems hard to decide which should have the preference, and while it is scarcely possible that the old wars of the Neptunists and Vulcanists will ever revive in all the intensity of early days, there is yet to be found in the statements of the advocates of either theory plenty of food for discussion. In solving such problems the microscopist plays an important part by the examination of thinly-sliced rock sections, from which their characters are in many cases readily deciphered and their igneous or aqueous origin easily determined. It is probable that both agencies have been largely exerted. Certainly