

same manner with those below them ; but we find these now associated with great beds of limestone and dolomite, which must have been formed by the separation of calcium and magnesium carbonates from the sea water, either by chemical precipitation or by the agency of living beings. We have also quartzite, quartzose gneisses, and even pebble beds, which inform us of sandbanks and shores. Nay, more, we have beds containing graphite which must be the residue of plants, and iron ores which tell of the deoxidation of iron oxide by organic matters. In short, here we have evidence of new factors in world-building, of land and ocean, of atmospheric decay of rocks, of deoxidizing processes carried on by vegetable life on the land and in the waters, of limestone-building in the sea. To afford material for such rocks, the old Ottawa gneiss must have been lifted up into continents and mountain masses by bendings and foldings of the original crust. Under the slow but sure action of the carbon dioxide dissolved in rainwater, its felspar had crumbled down in the course of ages. Its potash, soda, lime, magnesia, and part of its silica had been washed into the sea, there to enter into new combinations and to form new deposits. The crumbling residue of fine clay and sand had been also washed down into the borders of the ocean, and had been there deposited in beds. Thus the earth had entered into a new phase, which continues onward through the geological ages ; and I place in the reader's hands one key for unlocking the mystery of the world in affirming that this great change took place, this new era was inaugurated in the midst of the Laurentian period, the oldest of our great divisions of the earth's geological history.¹

¹ I follow the original arrangement of Logan, who first defined this succession in the extensive and excellent exposures of these rocks in Canada. Elsewhere the subject has often been confused and mixed with local details. The same facts, though sometimes under different names, are recorded by the geologists of Scandinavia, Britain, and the United States,