

clearly how what he calls the Hudson River group came to be conformable to the gneiss, with two unconformable and widely different strata of great thickness interposed. Mr. Logan is of the same opinion as Dr. Bigsby on the age of the strata in the vicinity of Quebec, and moreover he gives an explanation of what puzzled the Dr. so much. In his "*Report of Progress for the year 1852-3*," p. 35 and 36, Mr. Logan explains the discordance of stratification between the Trenton limestone and the Quebec bituminous black and gray slates, by an *anticlinal axis* complicated by a *fault*. It must be observed that Mr. Logan admits that he cannot give any precise facts by which to determine the position of the anticlinal. I quote his description of the Montmorency Falls section.

"The details of the fault are well displayed at Montmorency Falls; here the channel of the river is cut down through the black limestone beds of the Trenton formation to the gneiss of the anticlinal ridge, and the water at and below the bridge flows down and across the gneiss, and leaps at one bound to the foot of a precipice, which, immediately behind the water, is composed wholly of this rock. At the summit of the cascade, the Trenton beds on each side have a thickness of almost fifty feet, and they are marked by *Trinucleus concentricus*, *Calymene senaria*, *Conularia quadrisulcata*, *Leptaena sericea*, *L. deltoidea*, *Orthis testudinaria*, and *Lingula*. The dip of these beds is down the stream at a very small angle; but at the foot of the precipice, and in immediate contact with the gneiss, about the same thickness of limestone is tilted up to an angle of fifty-seven degrees; it is followed by a similar amount of black bituminous shale with the same slope; in this attitude these rocks climb up the face of the precipice, presenting their edges to the chasm on each side. They are followed by about eight feet of strong hard gray sandstone, weathering brown, in beds of ten to eighteen inches, interstratified with black shales, to which again succeed gray arenaceous-argillaceous shales, composing the sides of the chasm, out to the waters of the St. Lawrence. The limestones belong to the Trenton, the black shales to the Utica formation, and the gray to the Lorraine shales."

When at Montmorency Falls, 28th Sept. 1849, I made the following notes. The fall is formed by a quartzite rock passing to mica-schist (gneiss of Messrs. Logan and Bigsby) with traces of substratification, and running east 20° north, to west 20° south; at the foot of the fall and in contact with the quartzite there is a