

years, the distribution and association of the great beds of dolomite which occur in the Lower Silurian rocks of Canada and New England, can for a moment admit that these are the products of subsequent alteration. Repeated alternation of pure blue limestones with reddish ferruginous dolomites, interrupted beds and patches of these enclosed in the former, the line of demarcation sharply drawn, and finally conglomerates in which pebbles of pure limestone are enclosed in beds of dolomite, are incontrovertible evidences against the theory of the dolomitization of limestones, and in favor of the deposition of dolomites as magnesian sediments. (Geology of Canada, 1863, page 612).

Mr. Forbes, in a note, insinuates that I am unaware of the various speculations and theories which have been put forward to explain the supposed origin of dolomite by alteration. Although the stratigraphical relations of dolomite, as described above, completely contradict this hypothesis of its origin, at least in the great majority of cases, Mr. Forbes will find that the observations and speculations of Haidinger, Von Morlot, Marignac, and others, on this subject have been fully discussed and made the subject of multiplied experiments by me in a memoir published in 1859, (*Amer. Jour. Science*, [2] XXVIII. 170, 365,) and later in the paper quoted above, and that I have shown by many experiments that the action of sulphate of magnesia on carbonate of lime, alluded to by Haidinger and Von Morlot before Harkness or Regnault, does not give rise to dolomite, but to carbonate of magnesia, which remains mechanically intermingled with sulphate of lime and any excess of carbonate of lime.

Some of the results of my prolonged study of certain of the salts of lime and magnesia, which are, for the most part, set forth in the papers just referred to, were, says Mr. Forbes, by me considered worthy of being presented to the French Academy (*Comptes Rendus*, April 22, 1867), although he declares the reactions therein described, to have been for more than twenty years in general application, on a large scale in Great Britain for the manufacture of magnesia salts. Here it becomes difficult to admit the plea of ignorance which suggests itself for most of Mr. Forbes's previous errors and misstatements. I have, in the note to the French Academy, above referred to, pointed out the following facts, discovered by my investigations of the salts of lime and magnesia:—

- 1st. That bi-carbonate of lime, at ordinary temperatures, decomposes solutions of sulphate of soda and sulphate of magnesia, with formation of sulphate of lime and bi-carbonates.