

followed; the causes that led thereto; the cost of mining and transportation to Montreal (the point of shipment to Europe); value of mineral, etc.:

#### ON THE APATITE DEPOSITS OF CANADA.

The presence of apatite in the Laurentian rocks of North America has long been known to mineralogists, and within a few years so much interest has been excited by the economic importance of deposits of this mineral found in certain parts of Canada that a brief history of our knowledge of these deposits may be acceptable to the members of the American Institute of Mining Engineers. It was in 1847 that the present writer was shown by a local collector of minerals some large crystals, which had been called beryl, found in North Burgess, Ontario. These were at once recognized as apatite; and after a visit to the locality, this was described in the report of the Geological Survey of Canada for that year as likely to furnish an abundant supply of a valuable fertilizer; the opinion being then expressed that the fact of "the existence of such deposits as these will prove of great importance."

I have, within the past few months, examined with some detail many of the apatite workings in Ontario, which have served to confirm the early observations, and to give additional importance to the fact already insisted upon in previous descriptions, that the deposits of apatite are in part bedded or interstratified in the pyroxenic rock of the region, and in part are true veins of posterior origin. The gneissic rocks, with their interstratified quartzose and pyroxenic layers, and an included band of crystalline limestone, have a general northeast and southwest strike, and are much folded; exhibiting pretty symmetrical anticlineals and synclineals, in which the strata are seen to dip at various angles, sometimes as low as 25 degrees or 30 degrees, but more often approaching the vertical. The bedded deposits of apatite, which are found running and dipping with these, I am disposed to look upon as true beds, deposited at the same time with the inclosing rocks. The veins, on the contrary, cut across all these strata, and in some noticeable instances, include broken angular masses of the inclosing rocks. They are, for the most part, nearly at right angles to the strike of the strata, and generally vertical, though to both of these conditions there are exceptions.

The beds and veins of apatite are often traced for from 500 to 1,000 feet and more, and there is reason to believe that they are continuous for long distances. The workings upon them have, however, as yet been very superficial, generally from twenty to forty feet, and rarely exceeding 100 feet. The deepest mine, which is in Ottawa county, is now about 200 feet.

The ordinary thickness of the bedded masses of apatite may be said to vary from one to three and four feet, though not infrequently expanding to eight and ten feet, and even more, and sometimes