

MINES AND MINING.

The Geological Position and Conditions of the Apatite Deposits of Canada Simply Described.

There are two distinct and separate sections in Canada in which phosphate of lime occurs. The most southerly of these is reached north of Kingston, Lake Ontario, in the townships of Sydenham, Loughboro, Bedford and North Burgess, and in the direction of the little town of Perth. The other and most northerly commences a short distance to the north of the city of Ottawa in Hull township and runs northward along and between the Gatineau and DuLievres rivers for a great number of miles, embracing upwards of one dozen townships. The former of these—best known as the Perth and Burgess district—has been more or less mined for a period of thirty years or more, whilst in the latter, mining operations, of any importance, do not date much further back than the year 1872. Separated, however, as are these mining sections, they are both traversed by the same set or series of rocks, those of Ottawa county being but the northward extension of those in the Perth and Burgess district; the explanation of the apparent break or gap between Perth and Ottawa city being simply the coming in of the lower Silurian division—limestones and sandstones—horizontally arranged on top of the older and tilted metamorphic series.

Ottawa city stands on these flat-lying Lower Silurian rocks, but on crossing to Hull township, immediately on the opposite side of the Ottawa river, the old crystalline rocks again come into view, and here at once the iron ores and phosphate deposits also reappear. In both sections named, besides phosphate of lime, there occur numerous deposits of iron ore and plumbago in large and workable quantities. The iron-ore horizons are invariably the lowest, while the apatite and plumbago are very intimately associated, but in distinct horizons. There are, however, occasionally small deposits of red hematite found in the apatite horizon, in a condition which explains the origin of "red phosphate."

Everywhere throughout both phosphate sections there exists great volumes of garnet-bearing gneiss and quartzite, pyroxene rock (not a gneiss) and important bands of crystalline limestone containing a considerable amount of serpentine and phosphate in crystals of all sizes. The economic deposits of phosphate of lime, however, do not occur in the limestone belts, but rather in the pyroxenic rock interposed between these. The mineral does not occur in fissure vein-forms as a general rule, but rather as great lenticular-shaped masses along certain lines of stratification. Occasionally a ramification of small veins connects one deposit with another in different planes of stratification, but these in all probability have been more recent infiltrations. In fact, when I say that the mineral occurs in similar conditions to those of magnetic iron ore, all practical miners will understand me.

In the Perth and Burgess section, and all the way through towards Kingston on the St. Lawrence, the phosphate rocks lie in shallow and oft-repeated trough or synclinal forms; consequently there is a great display of surface mineral and but little deep mining. The only shaft of any depth is situated in North Burgess, and is, or was at the date of my last notes, 110 feet deep. This shaft has now been abandoned for a number of years. In Ottawa county, on the contrary, the rocks incline steeply, and, though arranged in a trough or synclinal form, this is of much greater depth than any in the Burgess section. There is, for example, one continuous outcrop of phosphate rocks extending northward up the Gatineau valley for upwards of fifty miles, along the western margin of the trough form, and another and similar outcrop along the course of the DuLievres river valley on the eastern margin. Between these two outcrops higher rocks come in filling up the centre of the synclinal form.

So far, only the southern portions of these two belts of phosphate rock have been tested by miners; namely, in the townships of Hull, Templeton, Buckingham, Wakefield and Portland. Prospectors, however, have discovered numerous other valuable deposits in the townships to the northward. In the townships just named the rocks are everywhere intersected by a series of black weathering

trap dykes, which seem to be in some way connected with the more important of the mineral deposits; and as these dykes have not been met with to any great extent beyond a comparatively few miles to the northward of the Ottawa river, I am inclined to the opinion that no very extensive deposits of phosphate of lime will be met with in this direction. Specimens of the mineral, however, have been discovered and brought from points fifty and more miles up the Gatineau, and I have myself come upon phosphate-bearing rock upwards of ninety (90) miles from the mouth of the same river. *There is but one true productive horizon of phosphate rock, and this we have recently succeeded in tracing and mapping in considerable detail throughout Ottawa county.*

CONDITIONS OF MINERAL.

There has been a great deal said and written about the mining of phosphate of lime in granite and limestone rock, and the mineral has been frequently referred to as occurring in the form of crystals imbedded in limestone. Now, whilst it is true that crystals of phosphate do occur in one or more of the limestone bands of Ottawa county, this form of deposit is by no means the chief or most important; on the contrary it is the most irregular and unimportant. Practical and experienced miners abhor the "coming in" of limestone, as in this matrix the mineral becomes mixed or associated with many impurities. In the granite I have never yet discovered a single trace of phosphate, and indeed granite is of very exceptional occurrence in the true phosphate-bearing series of rocks. What, however, has been called granite is undoubtedly the granite-like pyroxenic rock which is interstratified between the bands of limestone. In the chief and most profitably worked mines of Ottawa county but very little limestone has been met with. Occasionally a nest-like aggregation of flesh-red or salmon-colored calc-spar with large crystals of mica is struck in the body of the pyroxene rock, but this, in most instances, is speedily shot off. When, however, these calcareous nests continue to make their appearance, it is an almost sure indication that the miner has lost the "thread of his discourse," and there is nothing left for him but to "back water." We also hear occasionally of "picking out the phosphate" on the surface of the hills at but very trifling cost beyond that of the laborers' wages, but such instances are indeed of very rare occurrence. The rock in which the greater number of deposits occur is of the toughest description, and the continual sharpening of the drills forms a very considerable item in the expenditure. On the average, perhaps, calculating from records before me of actual mining operations extending over a period of several years, the cost of extracting the phosphate may be set down at from six to eight dollars per ton.

The Maine Coast.

The influx of visitors at Maine summer resorts is, to the surprise of many, in excess of any previous year. The hotels and boarding houses at the seaside and at the lakes are all full, and at the former places the proprietors will, generally speaking, more than make up for the dullness of the early summer. The warm weather of the past few weeks has given a great impetus to summer travel, and the trains and steamboats which bring strangers into Maine are all well filled. Probably there has been no season for several years when the Maine coast has been so free from fog during the month of July as the present, and in fact everything has seemed to favor the pleasure-seeker. The fish are biting well, also, at the lakes, and many are the visitors that have been made happy by a fine "catch" of fresh water fish. Truly there is no place like Maine for the summer tourist, for nowhere else can he find so many varied attractions within easy reach of each other and the great commercial and business centres; the hotels throughout the district are first-class in every respect, and the scenery on coast and river is unsurpassed.—*Maine Mining News.*

Philosophy is a good horse in the stable, but an errant jade on a journey.—Goldsmith.

The bell never rings of itself, unless some one handles or moves it; it is dumb.—Plautus.

August Northern Lights.

A very brilliant display of the AURORA was observed on the night of the 4th August from Old Orchard Beach. It was said to be the most brilliant that had occurred since the grand display of April last. At Hudson, N. Y., the *Register* referred to this display as follows:

A BEAUTIFUL AURORA.

A display of the aurora borealis, the most brilliant that has been seen here since the great spectacle of April, attracted much attention from the crowds in the streets last night. Streamers at times shot up to the zenith from a broad, bright arch of light in the north. The arch occasionally faded out and then grew brighter again, and sometimes a second fainter arch was visible above it, while below a straight band of light ran along a few degrees above the horizon. One of the most singular appearances was a series of short, crescent-shaped, cloud-like objects ranged one above another, reaching from the northeastern horizon more than half way to the zenith. Their light flickered and pulsed, and the stars shone through them. While the auroral display was yet visible, at about 11.15 o'clock, a fiery meteor shot through the sky, passing from east to west, and leaving a long trail of a reddish color behind it.

MONTREAL STAR.

Last evening the heavens were wonderfully illuminated with as splendid an exhibition of the Aurora Borealis or Northern Lights, as has been seen for years, in fact many people say they have never seen it surpassed. The greatest brilliancy was reached about 9 p.m., the auroral arch, which then seemed to stretch from north to east with brilliant rays jutting forth, suddenly broke, and a marvellous transformation took place difficult to describe. Various theories have been advanced as to the cause of these displays, but that which receives the most acceptance at present is that it is an electric discharge connected with magnetic disturbances. In high altitudes a loud noise is said to accompany the display. It has been related that in Siberia this noise resembles that attending the discharge of fireworks, and that the dogs of the hunters, when overtaken by such an aurora, lay themselves with terror on the ground. About the same time last evening numerous falling stars were noticed towards the south-west, their colors being exceedingly beautiful.

SOUTH NORWALL, Ct. Aug. 4, 1881.—There was a fine display of aurora borealis here to-night, waves and streaks of light from the north-east, north-west, advancing and receding. There was also a broad electric belt which was from east to west across the zenith, making a grand display of meteors shooting from beneath the belt like rockets.

The Climate.

Figures gleaned from the observation points of forty-nine States and Territories show that the hottest places in the Union are Florida, Louisiana and Arizona, the mean annual temperature of which is 69. Texas ranks next at 67, Alabama 66, Mississippi 64, Arkansas 63, South Carolina 62, Indian Territory 60, North Carolina 59. Georgia and Tennessee stand on a par at 58, Virginia 57, Kentucky 56. The mean temperature of 55 prevails in California, Missouri and the District of Columbia; 54 in Maryland and Pennsylvania, 53 in Delaware, Ohio and Oregon, 52 in Idaho, Utah and West Virginia. 51 in Indiana, Kansas, New Mexico and Washington Territory, 50 in Connecticut, Illinois, Nevada and New Jersey, 49 in Iowa and Nebraska; Massachusetts ranks with Rhode Island, New York and Colorado at 48; Michigan and Dakota are equal at 47; Alaska is not the coldest part of the Union, as is commonly supposed, but stands with New Hampshire at 46; colder than these are Maine and Wisconsin at 45, Montana and Vermont at 43, Minnesota at 42, and coldest of all, Wyoming at 41.

"An old lady friend says she can very well tell when the election will be held and when spring chickens are fit to fry, but she can't tell when these heavy rains will stop. Can you tell her? [She should ask Mr. Vennor.] Ed.] H.C."