

careful to do his work correctly. His plans filed at the proper offices are required to show where the claim posts are located, as well as north and south. That however, does not seem to be required in Ontario, judging from a copy of a plan, just received from the Department, that lacks this very essential detail.

Yours, etc.,

L. O. Hedlund.

West Shiningtree, Ont., July 22, 1917.

The Phosphate Discussion.

To the Editor of the Canadian Mining Journal:

Sir,—After the amusing and somewhat pyrotechnic correspondence which has recently taken place in the Mining Journal with reference to the discovery of phosphate of lime in the Canadian Rockies, it is perhaps advisable that an independent statement should be made in order that your readers, who are not conversant with the animosities underlying the correspondence, may be put in possession of the facts of the case.

The need for phosphate of lime, which will arise as years go on and more intensive methods are employed in connection with agriculture in the Northwest, naturally leads any one interested in conservation in the Dominion, to think of the sources of raw material for the manufacture of phosphatic fertilizer in that part of Canada.

Now it happens that some of the greatest deposits of this mineral which are known in the world lie in Idaho, Utah and Montana. They occur at a certain definite geological horizon and are found in beds. It, therefore, seemed to be a matter of interest and importance to ascertain whether it was possible to locate this same geological horizon several hundred miles further north in the Dominion of Canada, and if so, to ascertain whether in this northern extension, phosphate beds occurred at the same horizon.

In the summer of 1915, having a month in which I could absent myself from University work in the east, I placed my services at the disposal of the Commission of Conservation and with Mr. Dick of the Commission went to the West to see whether we could succeed in discovering such a deposit.

The successive steps by which, applying the principles of geological field work, the looked for horizon was found near Banff, need not here be detailed, since they have been described in our report issued by the Commission of Conservation. (Discovery of Phosphate of Lime in the Rocky Mountains," by Frank D. Adams and W. J. Dick, Ottawa, Dec. 1st, 1915), and also in a paper read before the Canadian Mining Institute three months later in March, 1916, and published in the Transactions of the Society.

In carrying out the investigation the excellent maps issued by the Geological Survey of Canada were invaluable, and fortunately the Survey had published an especially detailed map of the district about Banff surveyed by Professor Allan. After a careful study of this map it was decided to look for phosphate beds along Forty Mile Creek, since this stream, three times in its course, cuts through the beds in which the phosphate might be expected to occur.

The detritus in the valley of this stream was found to contain much chert, like that associated with the American deposits, and this chert was found to contain phosphoric acid. On carefully examining the section on Stony Squaw Mountain, phosphate rock was found in place at one point, the exact locality being indicated

on the photograph shown on plate VII. of the report in question, and also reproduced in the paper published in the Transactions of the Canadian Mining Institute. This phosphate rock, however, was very low in grade, and the search was, therefore, continued in the stream for float derived from other and richer deposits. This search was rewarded by finding a large mass of float which weighed over 30 pounds, in the stream at the foot of Stony Squaw Mountain. This material had all the characters of one variety of the Montana phosphate and was found to contain 53.95 per cent. of phosphate of lime, indicating a material of fair grade.

This afforded direct proof that higher up the stream a heavier and richer deposit of mineral occurred in the form of one or more beds which had been cut through by the stream. It was, however, impossible for us to prosecute the search further, since the time at my disposal was now exhausted.

Upon returning to Ottawa an announcement was published to the effect that a deposit of phosphate of lime occurred in the Canadian Rockies near Banff, which, there was reason to believe, from the size and character of the float, would be of economic value. This was the first announcement ever made of the occurrence of phosphate of lime in the Canadian Rockies.

The result of the investigation, together with the specimens collected, were then laid before Dr. R. J. McConnell, the Deputy Minister of Mines, and Mr. Hugh S. de Schmid of the Mines Branch was at once sent to Banff to continue the work. This was prosecuted by him until the snow fell. Mr. de Schmid located the second bed, from which the float was derived, a few hundred yards up the creek from the point at which the float was discovered. The bed, however, was only about one foot in thickness. He then traced the bed along its strike for over thirteen miles and on the flank of Mount Norquay found that it had increased in thickness to two feet. On his return to Ottawa, Mr. de Schmid presented the results of his investigation, which were embodied in an excellent report (Hugh S. de Schmid—"Investigation of a Reported Discovery of Phosphate in Alberta, Bulletin No. 11, Mines Branch, Department of Mines, Ottawa, 1916.") The following extracts from this report will summarize some of Mr. de Schmid's conclusions:

"These phosphate deposits can scarcely be regarded as of particularly economic importance, since there is only one phosphate horizon of any consequence. This bed possesses an average thickness of about twelve inches. On the other hand, in the event of any attempt to exploit these deposits, there are at least two localities in the Banff district where phosphate outcrops are situated favorably for working; one of these, the Mount Norquay outcrops, lies three-quarters of a mile from the main road, though the railway runs within about one mile of the southern exposure."

As above remarked, at these latter outcrops the bed is two feet in thickness.

With reference to the amount of phosphate of lime present in the area in question, Mr. de Schmid makes the following statement: "With an average bed thickness of one foot and a depth limit for working of half a mile, this would give ten square miles of bed, or 26,137,600 short tons of phosphate rock for the area."

It may be safely stated that there is no other area in Canada at present known and of the same size which can be asserted to contain an equal amount of phosphate of lime.