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TRIP TO MILLADORE AND VICINITY

by

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TRIP TO MILLADORE AND VICINITY

May 24 - 25, 1928

H. R. Aldrich

At the request of Mr. C. S. Toay of Stoughton I drove north with him leaving Madison around noon May 24 and arriving at the Rapids at 2:30. Necessity to have the car attended to by mechanics caused a loss of some time, but a car was rented and we drove to Milladore for a talk with Bert Howland, Dr. Nutt's foreman.

Howland was asked concerning the underground developments. He spoke at length but in the miners' lingo about the lay of the rock, the trends, the variations in composition of the rock etc. etc. He maintains that the veins of the whiter talc are either making abrupt southward turns to then resume a westward trend or else there are more or less north-south slip planes setting the veins south as development is carried westward. The ground varies in hardness and color, but all is soapstone excepting for the veins of "quartz." See sketch from underground observations. These variations affect wedge-like or lens-like masses. That is harder, darker material occurs in lenticular "horses". They appear to lens in all directions, but they are not increasing in volume with depth so far as can be seen. This would bear upon the question of origin. He states also that the reddening has decreased with depth and has practically disappeared.

The hole makes no water excepting in the south drift which underlies the old surface pit. The present workings are practically dry and the appearances are that surface waters are not responsible for the talc.

Bert has the idea that his two main "veins" of whiter soap or talc are but offshoots from a single larger body but has no idea whether they

Milladore (continued)

will coalesce to east or west or in depth. Save for a quartz vein crossing just east of the shaft they have found no limits to the soap. Nor have they attempted to find these. At present therefore there is a block 85 feet deep, about 150 feet east-west, and 75 feet north-south of solid soap with veins of talc which pinch and swell but are 4 - 5 feet wide. The entire mass qualifies for shipment. We returned to the Rapids for the night.

On the morning of May 25 we drove to Milladore and met the 9:39 Soo train bringing Stevenson and Franc Gardner of the Gardner Chemical Company. Gardner is a chemical engineer with experience among other things in salvaging waste for the Hawaiian Pineapple Company and in brick manufacture. He is a man about 50 - 55 years old, a past President of the <sup>South</sup> Park Board of Chicago and with other Civic Credits. Dr. Nutt also met the train.

We drove to the Trowbridge farm shaft. Mrs. Nutt, Mrs. Lee, and Mrs. Howland put in their appearance. With Howland I went underground for a stay of a half hour or so. The following is a brief statement of high points. See sketch.

1. The formation is a talcose schist throughout. Secondary structure stands about N.  $75^{\circ}$ , striking about  $30^{\circ}$  S. of W.
2. There is more or less narrow color banding parallel to the schistosity.
3. On a larger scale there is variation in color and hardness agreeing with secondary structure in general.

Note: These observations suggest original variation of composition as <sup>an</sup> a sediment.

4. There are two rather distinct slip planes carrying 1/2 inch of gummy gouge and followed by a vein of white mineral possibly carbonate. (See later determinations. Material seems to be too hard for carbonate but has rhombic cleavage. It is not quartz.) These slips trend about  $30^{\circ}$  S. of W. and dip steeply N. They are roughly parallel to schistosity but locally latter is complicated. Groovings on the slips show vertical movement strongest component. For illustration of complex schistosity see specimen. The vein of white mineral proved to be ferro-dolomite.

Milladore (continued)

Following visitation at the Trowbridge Property we drove north over "S" and "C" to Halder, east to the Marathon Road to show disintegrated granite to Mr. Gardner - who was impressed favorably - and then north and east into Wausau for lunch.

After lunch Mr. Everest, Vice President and General Manager of the Marathon Paper Company, was introduced. He discovered that Gardner's son is Sales Manager of the Menasha Carton Company, a subsidiary controlling the converted products of the Marathon Company. Discussion ensued as to the incidents leading to the use of the local talc and soap in blocks for roofing furnace at Ontonagon. These furnaces are used to melt down and reduce salt cake. Chrome brick had been used but had a life of only 3 - 4 months. A soap slab from "Alberine" Carolina was used having a life of 8 months. Then they tried some from Milladore and had a life of 14 months. He is obviously interested deeply in development of deposit. They used some spalls mixed with some kind of cement for a mortar to set the blocks. The possibility of making a cast block from the soap seemed to attract Gardner's interest. Paper manufacture in Wisconsin could use up to 50,000 tons annually but should be white. Grit objectionable on account of damage to knives, screens, etc.

Drove back via Mosinee to new Nutt shaft. Same sort of material here as at Trowbridge property. Shaft down 55 feet. Vein of talc in bottom.

Then to Marathon Mining and Milling Company. Asbestos attracted attention here.

Arrived Rapids for supper and Madison 10:00 P.M.

Summarizing the geology of the vicinity as a whole, the talc occurs in the belt of chloritic, biotitic schists. The latest igneous formation of the region is a pink granite having syenite phases. Between the schist

Milladore (continued)

belt and pink granite is a gray granite. There are sediments of pre-igneous age as seen north of Junction City, carrying "graphite." There are also large areas of gabbro diorite, one lying not far north of the talc location. Suggestions arise therefore that the talc schists represent either the old sediments or the gabbro diorite which has been intruded by pink granite. The gray granite may represent the metamorphosed sediments or diorite.

Associated with talc are:

1. Chloritic schists
2. Biotitic schists
3. Actinolitic schists - rosettes of actinolite
4. Brecciated massive soapstone with ferro-dolomite cement
5. Quartz veins or seams
6. Large loose chunks of quartz
7. Magnetite and sulphides are not infrequent in soap
8. Some short fiber amphibole asbestos.

The talc is irregularly blended in the green soapstone. It has been deformed since formation.

According to Gillson, Ec. Geol. Vol. XXII #3, May 1927, p. 286:

- "1. Talc deposits are commonly lens-shaped, of irregular occurrence and extent.
2. Talc deposits are replacements in limestone, schists, gneisses, and altered basic intrusions.
3. The country rock is invariably old, one time deeply buried probably at the time of the talc formation. In most cases, however, dynamic stress was not active during talc formation.
4. The type of solutions that formed talc, whatever was the original rock replaced, first formed an amphibole, a serpentine, or a chlorite. In many dolomite, magnetite, pyrrhotite formed at about the same time as the talc, or later. These solutions were hot, alkaline, and were at first siliceous, and carried iron and calcium and some aluminum in addition to magnesium. Later the solutions became less siliceous and rich in magnesium.

Milladore (continued)

5. In many cases, if not in all, these hot solutions were emanations from granitic or dioritic rocks, or from the acid differentiates of basic intrusions.

The conditions of depth, high temperature, and character of solutions had to be fulfilled in order that talc might form."

The situation at Milladore would appear to classify well with the general run of deposits studied by Gillson. But whether the deposits represent the old sediments or phases of the gabbro diorite remains to be seen. Around the many boulder piles one sees a quantity of quartz, which may be quartzite, and also a lot of banded quartz schist which may, however, be vein matter. As yet there is little definite evidence whether the talc has a sedimentary or igneous ancestry.

The finding of the talc at the three points indicates either a wide distribution or a contorted or discontinuous narrow belt.

## TALC EXPLORATION - MILLADORE

November 21, 1927

With E. F. Bean, Dr. C. S. Toay of Stoughton, Maurice Field, attorney of Madison, Mr. Stevenson, financier of Chicago.

Went north from Milladore at 9:30 Monday, November 21. First visited field stone in SW. of 1, T. 25, R. 5 E. An excavation for foundation hit rock, and fragments are of varied composition. Some green chloritic talcose "F" schist but far from dominant. Toay represented that the "lode" strikes through here. Possibly it does, but evidence not weighty.

Then to Trowbridge-Nutt mine, evidently in SW. or SE. of NW. of 11. This mine has a shaft 85 feet deep. Covered shaft house, gasoline hoist, two compartment, bucket equipped. About 150 feet south is large pit filled with water, original effort at mining. On dumps are great range of material beautifully crystallized talc <sup>43611, 43612</sup> "C", massive varieties <sup>43613, 43614, 43615</sup> "D", and green types <sup>43616, 43617</sup> "E" of variable intensity of color. Some exceedingly dense. Some has worm eaten appearance due probably to leaching of sulphide including chalcopyrite, copper carbonate being prominent. Considerable dense quartz seams with green chlorite.

Eart Howland, foreman, from lead and zinc district, in charge. Seems very capable as a miner. No maps, sections, no survey evidently. Footwall described vaguely, specimen <sup>43608, 43609</sup> "A" said to represent this; hanging wall more vaguely, specimen <sup>43610</sup> "B" said to represent this. "Lode" evidently strikes roughly northeast-southwest. Within this are "veins" cutting more nearly north-south. Greatest extent northeast evidently not much over 50 feet from shaft. Howland reports that here he encountered quartz rock and has

Talc Exploration - Milladore (cont.)

not cut it. No report on southwest extent. New cross cutting south. Howland describes the situation as a "bunch of envelopes in a box". I interpret this to mean fracture cleavage crossing the "lode." See "B" and "A".

There is no exploration going on. Shipments are made when the purchaser, Shindler of Joliet, Illinois, a grinder, places his orders. The taking of material to meet these orders constitutes only operation.

Then to Toay's pit in SE. of SE. of sec. 10. Soapstone and talc here. A "sand cap" described as always present appears to be a fine grained basic igneous rock well disintegrated.

Then to road between 16 - 15. In the SW. of 15, approximately on line between NW. and NE. of SW. of that section, the Wausau group dug a pit and drilled holes with diamond drill. We did not go in here.

On rechecking magnetics of the 1919 party it would appear:

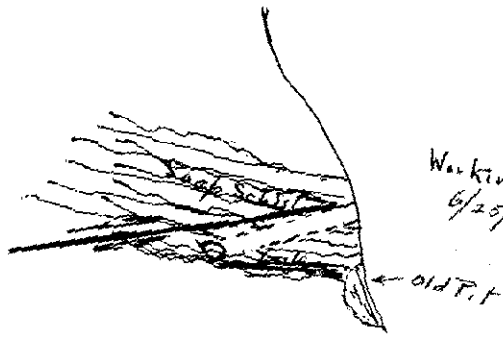
1. That the Trowbridge operations are north of the zone of attraction.
2. That the Wausau operations are either upon or north of the attraction.
3. The attraction covers quite an area, irregular and having both northeast-southwest trends as well as northwest-southeast.

It does not appear that the attraction correlates directly with the soapstone. Further work should be done with the dip needle to establish relationships. It would appear that the instrument may be of great assistance in tracing the continuous lode, or picking up the scattered deposits whichever is the actual condition.

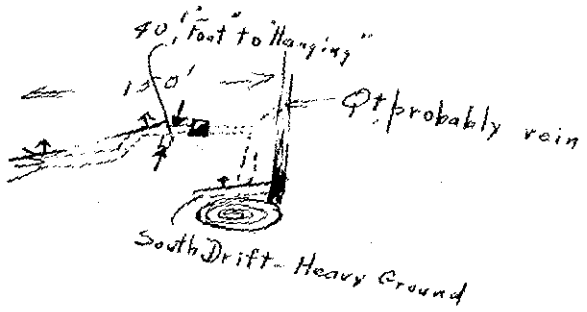
Mr. Stevenson is being sought for to finance a large scale operation of mining and milling. From his reactions and remarks it would seem that he had taken considerable interest in the possibilities.



Vertical Cross Section  
↓



Working Face  
6/25/28



Long. Proj.

