# The County Historian

News from the Ontonagon County Historical Society

Dean Juntunen, Editor

Autumn 2020

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## WHAT'S HAPPENING

Greetings everyone. We had a non-eventful summer in the UP due to Covid-19, and our Museum and Lighthouse have been closed for the duration, and will remain closed through the winter.

However the lack of business is not the worst thing that happened to OCHS. Rather, it was a corollary.

Our air conditioning system in the museum operated as usual this summer, which kept the humidity down in the museum, plus we had two summer employees, Coriane Penegor and Ryszard Olszewski, working on our collection, per our KNHP grant, utilizing Covid-safe practices of course. Also, we had a few OCHS volunteers coming and going, such as our curator, Carol Maass, and our IT specialist, Steve Maass. All was well.

Then the summer employees finished, and in September the museum was mostly dormant, and since it was neither the cooling or heating season, and we didn't have air exchange occurring, the humidity in the museum crept up over 70%. This fostered a mold bloom.

Thus, we are in the mold remediation process. We borrowed large warehouse fans from the KNHP, installed data loggers to monitor humidity, brought several loads of moldy items to the KNHP mold freezer, and upgraded our furnace filters. We also had a mold study done by UP Engineers and Architects.

Our efforts paid off. We've been keeping museum humidity around 50% or less, which prevents mold from growing. We're also seeking an estimate from ServPro of Houghton who does mold-specific cleaning of facilities. When the ServPro representative visited our museum, he commented that he's seen much worse. We do have carpeting in the front half of the museum, which ServPro said is cleanable.

Also, we've long talked about having additional storage space

Our highlight for the year is this mural depicting the history of Ontonagon County, on our museum wall facing RICC Park and the Aspirus Fitness Center. See article in this newsletter.

available rather than having all of our storage on display in the museum. So, we've made long-term arrangements with Greenland Township to store things in a room in the old school in Mass City, which is excellent, climate-controlled storage. For the short term, we'll utilize a second room in Mass City to store large items while the mold cleaning is proceeding at the museum this winter.

Considering that we've been in Covid Shutdown for this year, our income has shut down, too. **Donations to help with mold remediation are most welcome.** If you prefer to use a credit card, we now have a PayPal option on the OCHS website. Go to https://ontonagonmuseum.org/ Click on "How You Can Help" at the top of the page. Then scroll down to the "Donate" button.

## JON RIEGER DIES, AND LIVES ON

Back in 1970, Dr. Jon Rieger, a sociologist from the University of Louisville, KY, began a repetitive photographic survey of businesses and events in Ontonagon County to document change over time, and settled upon a quinquennial survey, during years ending in zero or five.

Due to his aging, Dr. Rieger set up a foundation to perpetually allow OCHS to hire a photographer to conduct the photo documentation. Since 2020 is a quinquennial survey year, we hired photographer Nathan Miller of Chassell to cover it, and he completed his work this fall, turning the digital photos over to our IT guy, Steve Maass, who input them into our Past Perfect program. In time, these photos, which are backed up in the cloud, will be browsable by the public via the Internet.

Alas, Dr. Rieger, an octogenarian, met his demise in the summer of 2020. He had been a benefactor of multiple Ontonagon endeavors, including OCHS, the Theater, and the Scholarship Foundation.

OCHS lost a champion this year: Dr. Jon Rieger 1936-2020

While we will no longer enjoy his steadfast presence in person, he will always be remembered through our quinquennial surveys.

Once Covid-19 has been ameliorated, Nathan Miller plans to give us a presentation on the project, including some of the new 2020 photos.

While we will miss Jon Rieger's irrepressible personality, we take comfort in knowing that he will live on through the photo-documentary project. RIP Jon Rieger. It has been a privilege and an honor to know you, and you've enriched all of our lives.

## LIGHTHOUSE NEWS

While our Lighthouse was not open for regular tours this summer, John Doyle and Ralph Workman kept everything ship-shape. After the mold bloom in the museum, we checked the Lighthouse, and found mold only in the "basement" where some junk materials were stored. John Doyle and company cleaned it up.

Some debris and rocks managed to wash up out of the river onto the edge of our lawn again, though not quite as bad as last spring.

As always, if you are interested in being a lighthouse philanthropist, we still have the

## REQUEST

You can save us money and resources if you opt to receive your newsletter electronically in pdf format. Your computer is probably already equipped with the Adobe Acrobat Reader, but if not, you can go to the Adobe website and download it. So far, over 100 people have signed up for e-newsletters. Graphics are better in pdf, and you can zoom to your preferred font size. If you're interested, please send an e-mail request to deanjunt@jamadots.com.

following gleaming rooms or structures available for sponsorship.

**28 Spiral Steps**
**$300 ea.**

**Master Bedroom $5,000**

**1st-flr 1890's kitchen $6,000**

## NEW MURAL

As noted on page 1 of this newsletter, one stellar bright spot in our summer of 2020 is the new mural on our exterior museum wall, facing RICC Park and the Aspirus Fitness Center.

This project was started a couple years ago when our curator Carol Maass wrote a MCACA grant and then spearheaded a fundraising campaign through the MEDC and their Patronicity Internet program. We contracted with artist Sue Martinsen of Ashland, WI to produce our mural. Ms. Martinsen has painted numerous murals in Ashland. She completed the painting of our mural in her studio this summer, and we installed it in September.

**BIG THANKS** go to our intrepid volunteers who installed the mural, and construction photos follow. We hired Kaikko Construction for one day to help our volunteers install the studwall and treated 2x4's to which the mural panels were installed.

**BIG THANKS** also go to the Ontonagon Theater for lending us their scissors lift. The top of the mural is 14 feet above grade, so that scissors lift was "the bomb."

Volunteers were Dave Bishop, Don Helsel, John Doyle, John Vercillo, and Steve Maass. Bruce Johanson wrote an in-depth article about it for The Ontonagon Herald, which we will run in a future edition of The County Historian.

Also, after our guys attached all the mural panels, artist Sue Martinsen touched up the screw heads with paint to match the mural.

Al Kaikko and Brian Pence attach steel studs, which minimize warpage. Side benefit: The mural covers spalling paint.

John Doyle and John Vercillo head to the trailer to pick up another panel while Steve Maass and Dave Bishop attach a panel, and Don Helsel picks up dropped fasteners.

## BOARD ELECTION

Due to all dinner meetings being canceled in the summer of the virus, we held our annual election of board members via mail. We had five seats up for election. Incumbents Dean Juntunen and Jerry Koski were reelected. We also welcome returning board member John Doyle, and new board members Steve Maass and Kristin Ojaniemi.

Board officers for this year are President Dean Juntunen, Vice President Diane Penegor, Secretary Sally Berman, and Treasurer Dave Bishop.

As we proceed through the cleaning of the mold, the board is looking forward to using our 2017 Interpretive Plan written by KNHP's Katie Keller as a guiding document. We'll also utilize input from KNHP's Abby Sue Fisher who had done our initial Heritage Site Assessment in 2006.

By the time we open next spring (assuming Covid-19 is minimized), we hope to have our museum looking better than ever.

**Editor's Note**:

The following is the fourth and final installment of a research paper written by SHIP Intern Ryszard Olszewski in the summer of 2018. In our last issue, you read details about the operation of the Taylor Hydraulic Air Compressor which powered the Victoria Mine. In this issue, we learn how the Bernoulli Equation and Venturi Effect enabled the compressor to function, and we close out the story.

**The Venturi Action**

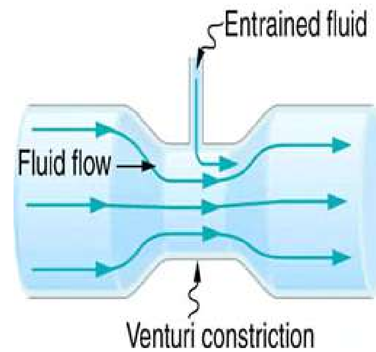
Venturi action was a major factor of the Taylor Air Compressor. By definition, venturi action occurs when a fluid flows through a constricted area of a pipe: a fluid's velocity increases and its static pressure decreases. This definition, however, does not give a good explanation of what exactly happens and how it was applied to the Taylor Compressor.

Before one goes into depth about how the venturi action applied to the compressor, one must get a more general explanation of it.

One very important thing to make clear is that venturi action (also known as the venturi effect) only works with fluids that are incompressible. In other words, a difference in pressure does not affect the fluid density, keeping it the same.

Before any examples of this phenomenon can be presented, a general explanation of the venturi effect must be given. In the venturi effect, a fluid is started in a wider channel or tunnel. At a point, the channel or tunnel becomes constricted. This results in the increase of the liquids flowing speed. Because of the increase of the speed of the liquid, the static pressure drops at the point of the constriction. According to the Bernoulli's principle (A principle that was published by Daniel Bernoulli, a Swiss mathematician and physicist, in his book Hydrodynamica in 1738) the speed of the fluid's flow and the static pressure are inversely proportional. This simply means that when the speed of the fluid's flow increases, the pressure decreases, and when the speed of the fluid's flow decreases, the pressure increases. The venturi effect is a version of the Bernoulli principle.

This explanation, however does not yet give too much information on how the venturi effect is used. To understand this, one must know that the pressure in the non constricted part of the pipe is far greater than in the point of constriction. Consequently, the fluid in the non-constricted pipe wants to flow into the constricted part of the pipe. This can be exploited by adding an opening right at the point of constriction that contains another fluid. Because of the vacuum created by the venturi effect, the other liquid is also pulled into the point of constriction and is mixed with the original liquid.




A good example of this being used in our everyday lives is spray nozzles. In a paint gun for example, pressing the nozzle results in pressurized air being released through a constriction. A container of paint is connected to this chamber, and the resulting low pressure causes paint to be forced out along with the air. In non-aerosol perfume bottles, pressing of the nozzle causes compressed air to be ejected out of a narrow opening at a high speed. The perfume chamber is connected to this zone, and the low pressure developed causes the liquid molecules to get mixed with the air and get forced out.

The real question that is presented by all of this is how does any of it have anything to do with the Taylor Compressor. The solution is quite simple. The fluid that is used in the Taylor compressor is the water from the river. The non-compressed part of the "pipe" is the canal that leads to the three shafts. The compressed section is the entrance to the shafts. As the water goes down the headers and into the shaft, it speeds up and the vacuum draws the air in through the eight atmospheric intakes which projected above the water line. The air then becomes mixed with the water and is pulled down the shafts to the air chamber.

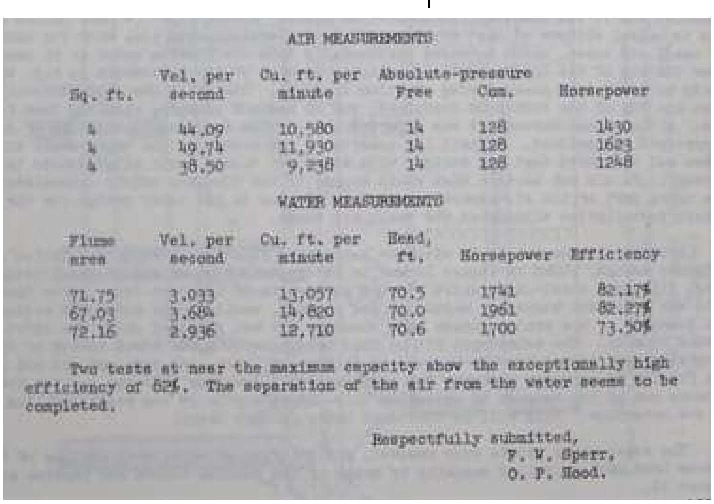
Effects of the Taylor Compressor

As mentioned earlier, Before building the compressor, Taylor had made several promises about the effectiveness of the compressor. He had promised, at the minimum, 70 percent efficiency from the compressor, and an output of at least 4,000 horsepower. After the construction of the compressor, two members of the staff of the Michigan Technological University were brought down to test the compressor. The two men were F. W. Sperr and O. P. Hood. After running several tests on the compressor, the two men came back with astounding results. They showed that the compressor ran at 82 percent efficiency and that the power generated by the compressor was over 5,000 horsepower! This was far better than was ever expected. Taylor received his full pay.

The effect of the compressor was shown immediately. Because the compressor supplied all of the power, the mine did not need to use nearly as much fuel. The result was an annual saving of about 20,000 dollars. Because the compressor had cost around 200,000 dollars to build, the mine would start to bring in profit in roughly 10 years. Furthermore, the compressor produced so much power that only one of the shafts was needed to power all of the mining operations and the inclusion of the other two would result in an excess of power. Because of this, the mine tried to sell their excess power to other mines and businesses. This, however, never became a reality.

Because Victoria was never serviced by railroad and all of the other mines in the area were, Victoria costs were far greater to the mine than all of the others. However, because they had the savings from the compressor, they were able to compete with all of the other mines in the area.

Now that these things have been discussed, it is fit to show the compressor's history after it was constructed.



AIR MEASUREMENTS

| Sq. ft. | Vel. per second | Cu. ft. per minute | Absolute-pressure Free | Com. | Horsepower |
|---|---|---|---|---|---|
| 4 | 44.09 | 10,580 | 14 | 128 | 1430 |
| 4 | 49.74 | 11,930 | 14 | 128 | 1623 |
| 4 | 38.50 | 9,238 | 14 | 128 | 1248 |

WATER MEASUREMENTS

| Flume area | Vel. per second | Cu. ft. per minute | Head, ft. | Horsepower | Efficiency |
|---|---|---|---|---|---|
| 71.75 | 3.033 | 13,057 | 70.5 | 1741 | 82.17% |
| 67.03 | 3.684 | 14,820 | 70.0 | 1961 | 82.27% |
| 72.16 | 2.936 | 12,710 | 70.6 | 1700 | 73.50% |

Two tests at near the maximum capacity show the exceptionally high efficiency of 82%. The separation of the air from the water seems to be completed.

Respectfully submitted,
F. W. Sperr,
O. P. Hood.

**The Aftermath**

During operation, the compressor did not have too many incidents or accidents that were anything to draw attention. The emptying off of the blow off pipe, however, made an artificial geyser. This geyser drew much attention and many people came to the mine to see it. In the winter, the expended water would freeze and form a sizable glacier. This however caused some trouble. If the blow off was completely blocked off, excess pressure and water would not be able to escape and this would result in a back up. When this happened, there would be a catastrophic blow back up the intake tubes with a power of up to 4,000 horsepower. This happened on two occasions: Once in 1916 and in 1930.

In 1906, The Village of Ontonagon went black. The village at the time was completely dependent on its electricity from the local power plant which had burned out. The Victoria Company was quick to offer the use of its compressor, which would be able to provide electrical power to the Village for a reasonable price. This offer was, however, turned down because the Village would have to pay for the transmission lines and those were estimated to cost about 1,000 dollars per mile (12,000 dollars). Instead, the Village power plant was replaced for a cost of 8,165 dollars. The same year, Thomas Hooper retired and his son, George Hooper, continued as superintendent.

In 1904, about 10,322 dollars worth of copper was produced and sold, but none in 1905 because all work was put into the compressor. When the stamp mill and air compressor went into operation in 1906, 546,334 pounds of fine copper were sold for 114,870 dollars, resulting in a profit of 34,829 dollars. The next year yielded 1,207,337 pounds of copper which sold for 343,597 dollars to net a profit of 48,666 dollars. Things were looking very good for the company. In 1908, however, there was a serious drought that resulted in a lack of water to produce compressed air, which cut ore production badly.

In 1909, the J. G. White & Co. engineers studied and made recommendations for the development of additional water storage. Another dry fall in 1910 resulted in the compressor working only part time from August to January. The mine received losses from 1910 through 1913. The start of the Great War caused a spurt in copper demand and the whole situation was turned around. In fact, ambitious plans were considered to make a second air compressor at a point down river. A Nordberg hoist was installed to service a second mine shaft. The operation of this started in 1916. Copper demand dropped again after the end of the war in 1918 and in 1921, management ordered a total stop in operation.

In 1921 to 1929, the Victoria Dam was built when the power site was bought by the Copper District Power Co. The Taylor Compressor was sufficiently reconditioned to supply all the air needed during the construction of the dam and powerhouse.

Throughout the compressor's operation, several problems were encountered. One of these was the result of the severity of the winters in the Upper Peninsula. Because of the cold, "frazil" ice formed in the flowing river. When this ice was carried down the canal, it would lodge between the rows of 3/8-inch air tubes. Because it seemed impossible to keep the ice from forming, the segment containing the tubes was removed. The water was then free to flow over the lip of the cast iron headpiece. Although it was never tested, it was reported that there was a very slight decrease in quantity of air compressed. In late models of his compressors, Taylor eliminated the small air tubes.

Another problem that came about was with the automatic, floating, headpiece. Taylor's original design had a steel-plate skirt riveted to the rim of the cast iron intake head. This was done to create buoyancy, which would allow for automatic raising or lowering of the intake unit when air was admitted under the skirt or vented from it. The telescopic fit of this headpiece into the fixed sleeve of the downfall shaft caused problems because of distortion, dirt, and rust. The steel-plated skirts were removed and the flow of the water over the lip of the intake head was controlled manually using a running thread and a capstan nut.

**After the Fact**

The air compressor worked on and off until it was shut down for good in 1939. At that time, the compressor and the blow off geyser had become a huge tourist attraction. The reason that it shut down was because, while visiting the compressor and walking across the canal on a bridge, a drunk man had his son on his back and fell off into the water. Both of them drowned. There was fear that they would be caught by the compressor, but the bodies were recovered in the canal. The power company that was running the compressor at the time was sued and they shut the flood gates for good.

The compressor was put into motion only once more in 1951. Two workers of the power company wanted to see the compressor in action. Without authorization or permission of any kind, they opened the gates of the dam and the compressor went to work. After two eruptions of the blow-off pipe, they shut it off. This time, the compressor was truly shut off for good, never to be operated again.

The Taylor Compressor was never filled in and the intake heads were never torn down. In fact, the entire compressor is still intact. A new dam was built which submerged the old Hooper Dam and most of the canal. However, the working end of the canal is below the modern dam and has grown in with brush. The intake heads still remain, but are also completely grown in. If one looks hard enough, they can still be seen. The internals and underground work of the compressor remain untouched, and if needed at any time, the Taylor Hydraulic Air Compressor of the Victoria mine, one of the eight wonders of the industrial world, could be brought back to life.

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