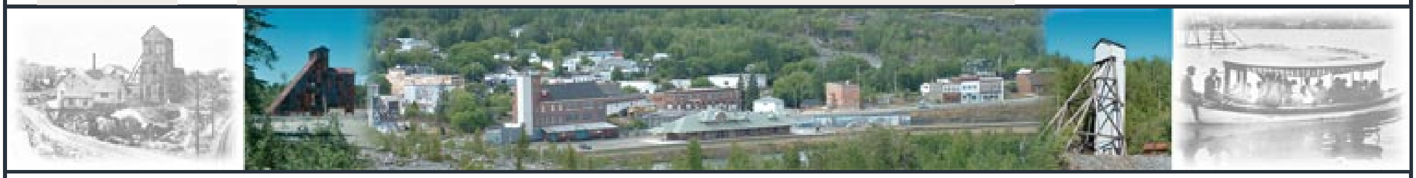


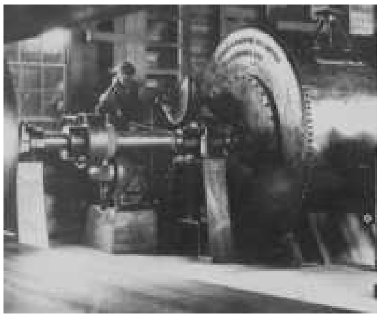
Power to the Mines

In the earliest mines in Cobalt, most of the power was provided by the miners themselves and a few horses. However, within a short time, as mines went deeper and as mills began to operate in Cobalt, power became essential to the operation of the mines. Underground, as drills operated by compressed air replaced hand drilling, air compressors were used to provide air to operate the drills. The hoists in headframes were powered by electricity, as was much of the machinery operating in the mills.

Initially, coal was the fuel of choice. Coal was used to power air compressors and generators for electricity. Train loads of coal were imported to feed the mines' growing thirst for power. In 1909, 100,000 tons of coal were used. However, coal was an expensive source of power, with a ton of coal costing $5.50 a ton, considerably more than a day's salary for the miners. One drill, operating 18 hours a day, could cost $250 a month to operate.

As operating costs rose, mine owners began to look for ways to cut costs. The Montreal River provided a perfect alternative to the trainloads of coal. Cobalt is just a few miles north of the Montreal River which drains into Lake Temiskamining. Rapids along the river made it ideal for producing hydro electric power.

Plans to supply hydro power to the camp began as early as 1906, when C.A. and B.C. Bead formed the Cobalt Power Company Ltd., for the purpose of producing, selling and distributing electricity. They acquired a lease to generate hydro power at Hound Chute Falls on the Montreal River, about 6 miles from Cobalt. Planning continued in 1907, but uncertainty about the long term future of the mining camp delayed and construction. The company did not want to invest money in a hydro dam, only to have the market for the power disappear. It soon became clear that there would be a stable market for the power, and construction of the dam and powerhouse started in 1908. The Hound Chute Generating Station opened in 1910, with an additional generating unit added in 1911, and the station continues to operate today.



In 1910 a plant unique in the world was also opened on the Montreal River, not far downstream from Hound Chute. This plant had no moving parts, and used falling water to produce enough compressed air to operate the many drills in the mines of Cobalt. The story of this amazing plant is of one of the many fascinating chapters in the story of Cobalt. Stories that today seem almost hard to believe.

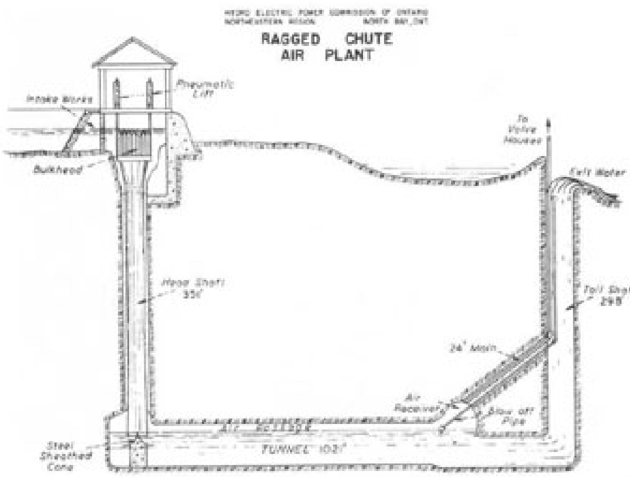
The plant was designed by Charles Taylor, an engineer and business man born in New Brunswick. Taylor was working on the construction of a dam in Buckingham, Quebec, near Ottawa, in 1895 when he made an interesting observation. During the winter, when water flowed over the dam spillway, Taylor noticed that air bubbles in the water were carried under the ice at the base of the fall and formed ice domes. When the he tried breaking the domes he realized that the air inside the domes was under pressure. Taylor concluded that as the water with air bubbles in it went under the ice at the base of the spillway, the air in the water was compressed, causing the air bubbles to separate out of the water and rise, creating the domes. Taylor realized that if he could develop a system to capture pressurized air in this way, it could be possible to produce compressed air from falling water.

Taylor began making models to better understand the process, and to find a way to capture compressed air. Taylor was able to get support from investors to develop his idea, and the first working plant was built in Magog, Quebec, south east of Montreal. The plant produced compressed air at 52 pounds per square inch (PSI), and successfully operated until 1953. Another, larger plant was then built for a mine in British Columbia, though this plant was soon shut down because the mine did not go into operation as planned. Other plants were built early in the 20th century, further perfecting the technology.

Taylor first visited Cobalt in 1905, and concluded that his compressed air technology could be used by the mines there. Taylor began seeking financial backers to support the construction of a compressed air plant on the Montreal River. He promised a plant that would be able to deliver a steady supply of air at 120 PSI to mines throughout the Cobalt camp. The plant would be able to operate indefinitely, and with no moving parts. With such bold claims it is not surprising that many thought he was crazy, and many doubted his idea would work.

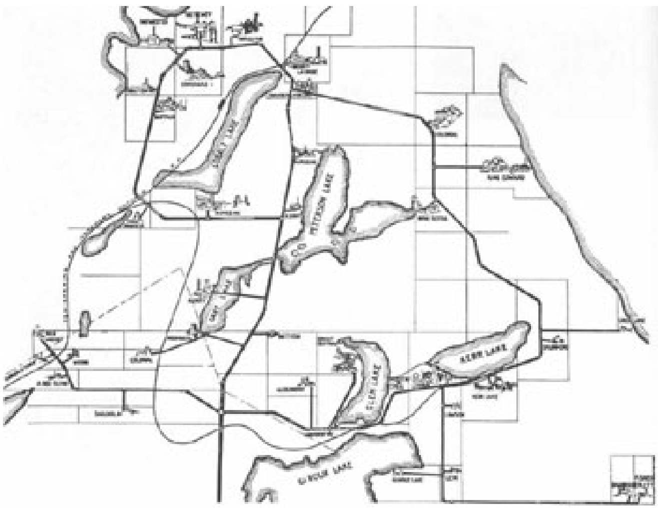
Nevertheless, Taylor was able to get enough backing for the project, which was by far his most ambitious. Construction was a complex process, requiring very exacting work from Cobalt's best mining crews. A dam was constructed on the river, and water was directed down a shaft blasted from the hard rock along the shoreline. Special blasting methods were developed, and cement was used to make the walls of the tunnels as smooth as possible.

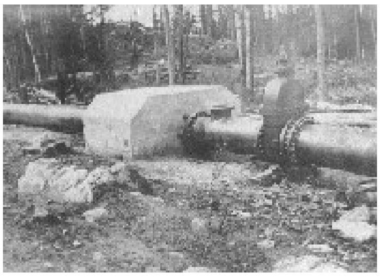
In accordance with Taylor's careful calculations, the shaft was exactly 351 feet deep and 91/2 feet in diameter. Intake pipes at the top of the shaft increased the air content in the water as it entered the shaft. At the bottom of the shaft there was a wider chamber, reducing the pressure, and the falling water struck a concrete cone sheathed in steel, designed to help separate the air bubbles from the falling water. The water then entered a 1021 foot long horizontal tunnel. As water flowed through the tunnel compressed air collected in an air space along the roof of the tunnel. Partway along this tunnel, there was a higher area in the roof where the compressed air entered a 24 inch diameter pipe which carried the air out of the shaft and into the pipes that distributed the air to the mines. A second pipe in this part of the tunnel provided an exit for compressed air when the pressure in the tunnel became too great. Venting of air from this pipe produced a spectacular geyser up to 200 feet high which became a popular local attraction.



Once the compressed air was collected, the water in the tunnel then returned to the river by a 298 foot tail shaft.

Once at the surface, the compressed air entered a valve house for distribution to the mines. Special seemless steel pipes, imported from Germany, were used to distribute the compressed air to the mines. The main distribution pipes were 20 inches in diameter, and had special expansion joints every half mile (800 metres) to allow the pipe to expand in hot weather.



The Ragged Chutes Air Plant opened in 1910, and operated exactly as Taylor had predicted. The plant operated at 82% efficiency, required no fuel, and cost almost nothing to operate. The compressed air from the system had the added advantage of actually being drier and cleaner than air from conventional compressors which reduced the need for maintenance for the drills.

The plant operated continuously until 1950 when it was temporarily shut down to overhaul the intake pipes. The plant was shut down again in 1961 to repair the air intake pipe. The plant is now owned by Ontario Hydro, and the valve house has burned down. The plant no longer operates, though the shafts needed to produce the compressed air still exist.

The Ragged Chutes Air Plant was a technological marvel in its day, and remains a unique piece of technology, and a tribute to its designer.