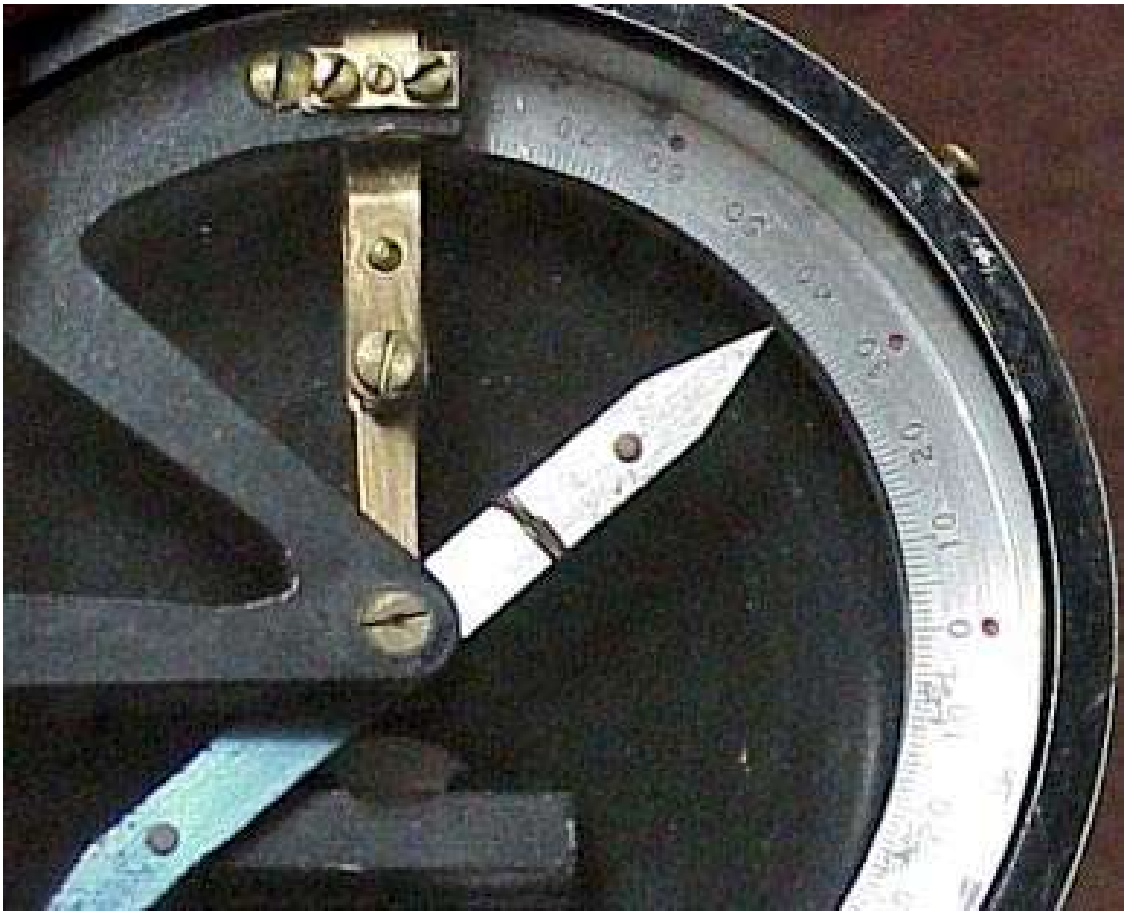
Lake Superior Model Miners' Dip Needle

by Dave Johnson

Most collectors of mining artifacts are at least nominally familiar with miners' dip needles. A dip needle measures the angle of declination of the earth's magnetic field and consists of a highly magnetized needle mounted on a horizontal pivot in a round frame with a graduated arc. The miners' dip needle was used by holding it vertically, in line with magnetic north, and when the needle dipped down one was alerted to the presence of ferrous minerals such as hematite. The dip needle could be used to establish the outline of a ferrous mineral deposit. However, it was of no value in determining the quality of the mineral deposit, that required the sinking of test pits or core drilling and sampling of the ore.

One of the principle manufacturers of dip needles was W. & L.E. Gurley of Troy, NY. William E. and Lewis E. Gurley were brothers, born in Troy, NY; William in 1821 and Lewis in 1826. William graduated from the Rensselaer Institute, in 1839, as a civil engineer. Traveling as far west as Michigan unsuccessfully seeking employment, William returned to Troy, going to work as a foreman for surveying instrument maker Oscar Hanks.

After five years with Oscar Hanks, William went into partnership with Jonas Phelps under the name Phelps & Gurley in 1845. Lewis Gurley had been apprenticed to Phelps in 1844 and in the Fall of 1851, Lewis was taken into the partnership which then became known as Phelps & Gurleys. In 1852, the brothers bought Phelps' interest in the firm and changed the name to W. & L.E. Gurley. Gurley was to become the largest manufacturer of engineering and surveying instruments in the United States. They established a true factory, rather than the usual craft workshop of instrument makers. They practiced a strict division of labor, allowing them to produce a greater volume of instruments at very competitive prices. They hired unskilled and semi-skilled labor and taught them specific tasks rather than having them go through a long apprenticeship. Gurley was the first instrument manufacturer to utilize aluminum in the manufacture of engineering and surveying instruments. Gurley continued to manufacture surveying instruments until 1980. Today they remain a prominent worldwide provider and developer of encoders, measuring devices used in MRI, X-ray and ultrasound imaging, as well as equipment used in the aviation and defense industries.



The miners' dip needle shown here, manufactured by Gurley, is unique in that it is labeled as a "Gurley Dip Needle Lake Superior Model". It is the only dip needle model I am aware of that has a regional designation. The origin of the model name is not difficult to surmise, the Michigan, Minnesota and Wisconsin iron mines were all in the Lake Superior region. This piece is also unusual in that it is manufactured of both aluminum and brass, the case being made of machined aluminum except for the back plate which is brass. My other dip needles are either all brass or all aluminum. Unlike other dip needles I have seen, this one has a bubble level above the name stamping on the face plate. No one I have talked to has been able to find this piece listed in a Gurley catalog. This is an ultra-rare instrument.