



MICHIGAN'S  
KEWEENAW  
PENINSULA

# An Evolution of Human Ingenuity

*What began in the earth over one billion years ago set the landscape for what the Copper Country would become world-renowned for in the 19th century. The seemingly endless native copper lodes that formed were known 7,000 years ago to early people of the Keweenaw, and word of the region's richness—and the knowledge of how to mine it—was passed down from American Indian peoples to the Europeans who came in the 17th century. As mines went ever deeper—some of them exceeding one mile—new technologies requiring even more capital enabled the profitable extraction of copper.*

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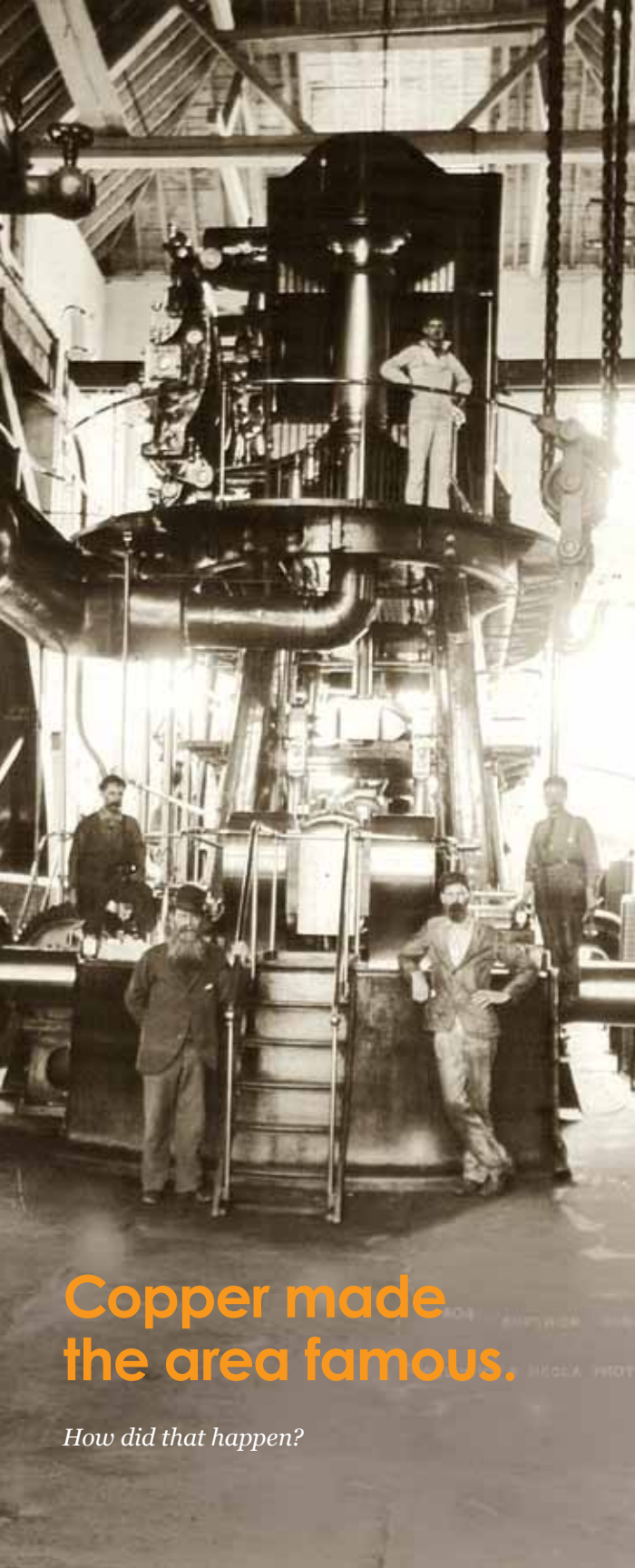
## Mining Technology & Engineering



Lake Superior Smelting Works, Dollar Bay  
Photo Courtesy of Wm. John Jack Foster Collection

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## Copper made the area famous.

How did that happen?

### • 7,000 years ago

Early American Indians dig pits and use hammerstones and fire to break rock away from copper.



Nordberg Steam Hoist Tour 2013  
Photo Courtesy NPS Photo: D. Savela

### • 1852

To increase output, the Cliff Mine installs a 45-ton steam engine for stamping rock and pumping water out of the mine.

### • 1879

The Rand drill, which is powered by compressed air, makes mining easier. Nitroglycerin explosives begin replacing black powder. Erasmus Darwin Leavitt designs the “Superior” steam engine for Calumet & Hecla, the largest of the mining companies.

### • 1920

The Quincy Mining Company installs the largest steam hoist in the world. This helps the company dig deeper and keep costs down.

### • 1968

Calumet & Hecla closes down its last mine, which was the last native copper mine on the Keweenaw.

Superior Steam Engine (left)  
Photo Courtesy of A. LaMuth Collection



Ahmeek Stamp Mill  
Photo Courtesy Michigan Tech Archives

## FROM COPPER ROCK TO INGOT

Copper production in the Keweenaw consisted of three basic processes:

### MINING

The process of obtaining minerals from the earth. In the Copper Country, miners used hand-powered or pneumatic drills combined with explosives to obtain copper from deep underground mines.

- Quincy Mine & Hoist / *US-41, North of Hancock*
- Delaware Mine / *US-41, Delaware*
- Cliff Mine / *Cliff Drive, Ahmeek to Phoenix*

### STAMPING

The process of separating valuable copper from the surrounding rock. Mining companies located their stamp mills on shorelines because they used water to transport the mineral through the refining process. Companies also used the adjacent water bodies as a place to deposit waste stamp sand.

- Quincy Stamp Mill / *M-26, Mason*
- The Dredge / *M-26, Mason*
- Ahmeek Stamp Mill / *M-26, Tamarack City*

### SMELTING

The process of using heat to remove any remaining impurities in the copper. The final step in the process involved pouring the refined copper into ingots or large cakes for shipment.

- Quincy Smelting Works / *M-26, Ripley*