

GYPSUM
 $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$



Figure 86: A 8.6 cm gypsum crystal from the Alabastine mine, Grand Rapids, Kent County. A. E. Seaman Mineral Museum specimen No. DM 23027, Jeffrey Scovil photograph.

One of the most common sedimentary evaporite minerals, and as such it is widespread in sedimentary rocks mainly in the Southern Peninsula but also in the eastern part of the Northern Peninsula. Gypsum can also be a low-temperature hydrothermal mineral, as, for example, a rare constituent of the native copper lodes. Much gypsum is supergene in origin (soft iron formation, puddles of mine waters, and hydration of anhydrite). Selenite is a varietal name referring to colorless, transparent crystallized gypsum. Southern and Northern Peninsulas.

Antrim County: W $\frac{1}{2}$ NE $\frac{1}{4}$ section 3, T31N, R6W: Small gypsum crystals have been found in a 31.5 meter-deep shaft sunk in the Antrim-Bedford Shale.



Figure 87: The fresh wood "matrix" for these crystals of gypsum from the Bristol mine near Crystal Falls, Iron County, provides clear evidence of their post-mining origin. 9 x 12 cm. A. E. Seaman Mineral Museum specimen No. DM 23129, Jeffrey Scovil photograph.

Arenac County: Approximately 1.6 km east of Turner, near Twining and Harmon City: A persistent bed of gypsum 15 to 30 meters above the Alabaster bed (Iosco County) has been discovered in wells. This is known as the Turner bed. It is of mineable thickness near Turner and also in the northeastern part of the county. The combined mineable areas aggregate a minimum of 50 to 65 square kilometers (Smith, 1912, 1915a). Shallow wells dug in glacial till near Turner revealed large boulders of gypsum.

Baraga County: Ohio mines (Imperial and Webster mines), Imperial Heights, near Michigamme: Associated with various sulfides, goethite, apatite, hematite, calcite, and several silicates (Morris, 1983).

Delta County: Old quarry east of Federal Forest Road 13, Isabella, near Nahma Junction: Varieties satin spar and selenite (Morris, 1983).

Dickinson County: Menominee iron range: White to pink, massive gypsum and locally occurring crystals (selenite) are common in oxidized iron ores (Brower, 1968; Dutton and Zimmer, 1968).

Eaton County: 1. Bellevue: Beds 1.8 to 3.6 meters thick. 2. Eaton Rapids: Beds of similar thickness (1, 2, Smith, 1918). 3. Lincoln Brick Park: As iron-stained microcrystals to 2 mm long on bedding planes in shale (Saginaw Formation) exposed in an old clay pit along the Grand River (A. R. Blaske, written communication, 1996). Identification confirmed by energy dispersion X-ray spectrometry (S. M. Carlson, written communication, 1996).

Gogebic County: Gogebic district: Secondary gypsum occurs locally in oxidized iron formation.

Houghton County: 1. Isle Royale copper mine: "It seems to have been formed from anhydrite" (Butler and Burbank, 1929, page 62). Vugs of calcite filled by gypsum with cores of anhydrite (Lane, 1911). 2. Kearsarge amygdaloid: Locally in small vugs (Stoiber and Davidson, 1959). 3. Many deposits: Occurs sparingly in fissures and lodes (Butler and Burbank, 1929). 4. *Champion mine*, 13th level: One specimen 7.5 x 25 cm from a vein in the Baltic lode showed the paragenetic sequence: chlorite → epidote → calcite → gypsum (Lane, 1911). Large cleavages of selenite were found on the 18th level of the North Champion mine.

Huron County: 1. Section 26 in Caseville Township: Large blocks of gypsum found in drift (Lane, 1900). 2. Wallace Stone Co. quarry, at Pigeon, near Bay Port, variety selenite. Associated species are calcite, glauconite, pyrite, quartz, and rare millerite (Morris, 1983).

Ionia County: Near Ionia: Thick beds reported in wells (Smith, 1918).

Iosco County: 1. *U.S. Gypsum Company quarries* at Alabaster, NE ¼ section 2, T7N, R12W: The gypsum is found as 1) white, pink, or red massive, 2) white pencil form, and 3) crystalline and salmon-colored selenite crystals in nodules in impure gypsiferous clay. In some cases good crystals are to be found in cavities between the upper (roof) shale and the next bed of gypsum that overlies this shale. Large amounts of anhydrite also remain as waste in the mine, which comprised nearly 10 kilometers of tunnels by 1972 (Squire, 1972). 2. National City, about 2.5 km south of the National Gypsum Company quarry, section 16, T21N, R6E: Massive, orange selenite in transparent plates 2 to 10 mm across. 3. Headwaters of the AuGres River.

Iron County: 1. Mansfield iron mine in the Crystal Falls district: Fine granular massive to coarsely crystalline selenite. 2. *Bristol iron mine* in the Crystal Falls district: Gypsum occurs as large cleavages of selenite filling voids in hematite ore. However, a far more spectacular occurrence of post-mining origin was encountered in 1948, when the mine was dewatered after being flooded for fifteen years (Mortenson, 1975; DeMark, 2000). Extensive thicknesses of gypsum crystals were found coating floors and walls of the workings, especially in the pyritic slate area (K. Spiroff, personal communication). Fragile, radial groups of slender crystals were found growing not only on walls, floors, and timbers, but even on discarded tools (Johnstone, 1979, page 200). "Fishtail" twinned crystals were common. Many attractive specimens were stained pink by iron oxides. 3. Hiawatha Number 2 mine: Pockets in goethite ore with kaolinite and alunite (Bailey and Tyler, 1960). 4. Cannon mine: In Youngs ore body in the Riverton Iron Formation associated with secondary manganese minerals (Kustra, 1961). 5. Great Western and other iron mines: Gypsum masses up to several centimeters across. In some ore deposits it is found as clear pink or white cavity fillings. Widespread occurrence as a fine-grained constituent of ore. All occurrences are of post-ore age (James et al., 1968). 6. Fairbanks mine, Crystal Falls: Transparent crystals of selenite to 2 mm associated with minor sulfur coating rock were noted by A. E. Seaman as having formed "from combustion."

Kent County: 1. *Grand Rapids*: Quarries have been operated at various times in the NE ¼ section 2, T6N, R12W; NW ¼ section 2, T6N, R12W (Alabastine quarry); E ½ section 35, T7N, R12W (Old Godfrey quarry); NW ¼ section 35, T7N, R12W; two in NE ¼ section 34, T7N, R12W; and the NE ¼ section 25, T7N, R12W (Powers mine). The quarries in section 34 and the NW ¼ section 35 were those of the Grand Rapids Plaster Company. Most of the gypsum is massive, white, salmon, pink, or red. A columnar variety known as "pencil ore" also is present. The variety selenite occurs locally as colorless crystals and in vugs. Some crystals have golden cores. One selenite crystal in the Grand Rapids Museum is 60 cm in diameter and 120 cm long. 2. Grandville: Quarries are located in the NW corner section 20, T6N, R12W and the NE corner of section 19,

T6N, R12W. Most varieties of gypsum listed above as well as brown selenite crystals and veins of fibrous “satin spar” have been found here.

Keweenaw County: 1. Mohawk mine: On domekite in ankerite veins (Williams, 1963a; Moore and Beger, 1963). 2. Many locations: Found sparingly in copper lodes and veins (Butler and Burbank, 1929). 3. Cliff mine: Replacing prehnite along with chlorite (“delessite”) and anhydrite (Williams, 1966). Chalcocite crystals occur on the prehnite. 4. North side Keweenaw Peninsula: In Nonesuch Shale as flattened lenticular or lath-like crystals (Elmore, 1981). 5. Iroquois mine.

Mackinac County: 1. Road cuts and an old quarry near Pointe Aux Chenes: Brown to white, mottled, massive gypsum and satin spar. 2. On Saint Martins Islands. 3. Rabbit’s Back Peak.

Marquette County: 1. Some soft iron ore of the Negaunee Formation is impregnated with gypsum, yielding sulfur analyses of from 0.2 to over 3.0% (Anderson, 1968). 2. Tracy iron mine: It occurs with aluminous serpentine in pockets lined with specular hematite in a porous goethite ore (Bailey and Tyler, 1960). 3. *Champion iron mine*: Large, tabular, well-formed crystals of selenite were encountered on the 800’ level (specimen DM 23005, Seaman Mineral Museum, Michigan Technological University). 4. Beacon iron mine: Reddish orange, platy coatings (Mandarino, 1950). 5. South Jackson pit: With barite and manganite (Mann, 1953). 6. Lucy (McComber) mine, Negaunee: With goethite, Mn-oxides, barite, and kaolinite (Morris, 1983). 7. Republic mine: With goethite, hematite, carbonates, quartz, and iron silicates (Morris, 1983); some selenite. 8. Mackinaw Gardner mine, Gwinn: Selenite. 9. Cambria mine, Negaunee: Pinkish-orange granular gypsum cementing fragments of hematitic iron formation. 10. Champion: As 1 to 2 cm thick seams of “satin spar” and selenite crystals of similar size filling fractures in massive magnetite at a road cut on US41 - M28 in the NW ¼ SE ¼ section 25, T48N, R30W, approximately 0.4 km east of the Peshekee River bridge (M. Basal, personal communication, 1999). 11. Archibald mine, Gwinn: Large crystals on hematite (Zeitner, 1964).

Monroe County: 1. *General*: Perfectly formed, doubly terminated crystals of colorless selenite up

to 5 cm long are in the collection of the A. E. Seaman Museum, Michigan Technological University (e.g., specimens DM 10907, DM 12024). They appear to have formed in clay. Also represented are hemispherical nodules of granular gypsum up to 15 cm in diameter. 2. Woolmuth quarry, NW ¼ section 29, T5S, R8E: Sparse crystals in fissures and cavities in dolostone. Associated are calcite, dolomite, celestine, and native sulfur (Sherzer, 1895, 1900; Kraus, 1905a; Kraus and Hunt, 1906a, b).

Newaygo County: Drill core from section 11, T12N, R13W: Scattered grains in anhydrite and as veinlets in halite-anhydrite rock (Dellwig, 1955).

Ogemaw County: Southern part of the county; numerous outcrops.

Ontonagon County: 1. Victoria copper mine: In puddles of salt water (Butler and Burbank, 1929). 2. Lake mine: Small cleavages of selenite occur as a late-stage cavity-filling mineral. 3. Mass mine: “Fine pieces” (Lane, 1911). Pink alabaster (Spiroff, 1964).

Wayne County: 1. International Salt Company mine, Detroit. Scattered grains and veinlets in halite-anhydrite rock (Dellwig, 1955). 2. Sibley quarry, Trenton: Variety selenite, with calcite, celestine, fluorite, epsomite, and rare sulfur (Morris, 1983).

FROM: Robinson, G.W., 2004 Mineralogy of Michigan by E.W. Heinrich updated and revised: published by A.E. Seaman Mineral Museum, Houghton, MI, 252p.

UPDATE

Baraga County: South Taylor (Detroit Graphite) mine north of Plumbago Creek in the S ½ SW ¼ SE ¼ section 9, T49N, R33W: As a post-mining efflorescence of gray-white microcrystals on graphitic slate. Verified by X-ray diffraction.

Eaton County: Cheney Quarry at Bellevue: As colorless to white prismatic crystals (sometimes twinned) to 3 mm associated with decomposing pyrite and calcite in vugs in dolomitic limestone (A. R. Blaske, personal communication, 2009).

UPDATE FROM: Robinson, G.W., and Carlson, S.M., 2013, Mineralogy of Michigan Update: published online by A.E. Seaman Mineral Museum, Houghton, MI, 46p.

