NEW YORK AND NEW JERSEY LOCALITIES

AN ADDENDUM TO MOORE'S COMPENDIUM OF MINERAL DISCOVERIES

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Prehnite, Lower New St., Paterson, NJ
Hershel Friedman collection & photo

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An Addendum to Moore's Compendium of Mineral Discoveries

Moore's Compendium of Mineral Discoveries is an exhaustive guide to documented mineral discoveries of minerals with crystals over one centimeter found since 1960. Completed in 2015 by Tom Moore, an editor for the Mineralogical Record and a prolific writer on mineral subjects, this is arguably the most detailed mineral book compiled in recent times. It contains two volumes, with a combined page count of 1,644 pages, describing each mineral locality in detail. There was only one publishing of this set, with only 500 copies, and there are no more plans for any additional editions to be published.

Moore has stated that since the publishing, he has received much feedback and information on localities that were not included in the compendium. He stated his intention to produce a new compendium volume with the new localities of minerals not mentioned in the original compendium.

Having an extensive background in the minerals of my native region of New York and New Jersey, I took the opportunity to fill in some missing gaps from my regional area. While the compendium was certainly very thorough in this region, there were still many important localities for mineral discoveries that were left out. There were also mineral discoveries in this region that were poorly documented, and require insider information from a local collector for a more thorough picture.

I, therefore, compiled a detailed document highlighting and describing localities for mineral discoveries not mentioned in the compendium, or requiring more information. My focus in this document is primarily New York and New Jersey, with special attention devoted to the Hudson Highlands/Ramapo Mountains in southwestern New York, and the New Jersey trap rock localities in Northern New Jersey. I also included a locality in Pennsylvania and another in Maryland that I am familiar with.

ALBITE

Paterson area Quarries, Passaic County, New Jersey

The Upper New Street Quarry in Paterson, and the nearby Prospect Park Quarry in Prospect Park, are known for their outstanding zeolite minerals and their associations such as prehnite and apophyllite. Albite is a lesser-known mineral from these quarries, but it does occur in beige to pink crystal aggregates associated with calcite, quartz, and zeolites. The most common habit is in rosette form, with crystal groups up to 1 cm. These quarries have been producing minerals for decades, and local freelance collectors continue to collect at these quarries even after they have ceased operations.

ALMANDINE

Barton Garnet Mines, Gore Mountain area, North River, Warren County, New York

The Barton Garnet Mines in the Adirondacks region of New York are among the world's largest garnet mines. The original Barton Mine is a quarry located on Gore Mountain, which shares its name with a well-known Adirondack ski resort to the east of the quarry. In 1983, the quarry management ceased operations in Gore Mountain, and shifted the industrial production to nearby Ruby Mountain, an active quarry where the hard material is mined for abrasive garnet paper.

The species of garnet at the Barton Mines are almandine, and its most prevalent form is in massive habit with crude parting faces. Some of garnets have gemmy zones, but parting planes divide the garnet crystals into thin sections. Very large opaque crystals, some over 15 cm in diameter, are crudely formed within the surrounding matrix. The Barton Garnet Mine on Gore Mountain is open to visitors during the summer season with a tour, and collectors can dig by paying an entrance fee and a per-pound charge for what they collect.

ANALCIME

Wesley Hills, near Suffern, Rockland County, New York

In 2006, in the far northern suburbs of New York City, Hershel Friedman discovered several zeolite minerals associated with prehnite and chrysocolla. The first location was a residential construction dump site of large single-family homes built in the 1990's, and the second site was a nearby construction area of an existing home extension. Analcime was by far the most common zeolite, with white crystal clusters and single trapezohedral crystals up to 1.5 cm. The location lies within the Ladentown basalt, a geologically similar region to the Watchung Mountains located nearby across the state line in New Jersey.

ANDRADITE

Noble Pit, Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

Andradite is main garnet type from the Franklin and Sterling Hill Mines. Large crude masses, as well as large, sharp dodecahedral crystals that are several centimeters large have been found there throughout the decades. Sharp andradite crystals to 2 cm can still be found in the Noble Pit behind the Sterling Hill Mine in Ogdensburg.

APOPHYLLITE

Prospect Park Quarry, Prospect Park, Passaic County, New Jersey

The basalts of Northern New Jersey have yielded some of the world's finest apophyllite crystals. The Prospect Park Quarry has produced particularly nice specimens throughout its lifespan. Prior to its

closure, local collectors such as Eric Stanchich have been collecting apophyllite crystals with sharp luster and good crystal form up to several inches in the 2000's and 2010's, including an exceptional find in 2014.

Upper New Street Quarry, Paterson, Passaic County, New Jersey

Apophyllite is one of the significant minerals this quarry is known for. Throughout its existence, the Upper New Street quarry has yielded exceptional apophyllite crystals together with other zeolites. Even after being closed for many years, this quarry site has continued to yield large and well-formed crystals of apophyllite.

Millington Quarry, Bernards Township, Somerset County, New Jersey

The Millington Quarry has produced exceptional apophyllite throughout its heyday, which started in the 1980's, through its closure in 2007. Apophyllite crystals from this quarry are distinctly more tabular, glassy, and transparent then other regional Watchung-area quarries where apophyllite has been found. Apophyllite crystals are often clustered closer together rather than being in distinct crystals, and may also form in dark green crystal plates. Small apophyllite crystals with a light pink color have occasionally been found.

ARAGONITE

Prospect Park Quarry, Prospect Park, Passaic County, New Jersey

Aragonite is an accessory mineral that has been found sporadically at Prospect Park. It forms as fragile, white to cream colored crystal sprays or as interconnected crystal groups. A particularly large cluster of fragile, interconnected crystals 7 cm in width resides in the collection of Hershel Friedman. Aragonite from Prospect Park is strongly fluorescent white to cream in shortwave light.

Upper New Street Quarry, Paterson, Passaic County, New Jersey

Aragonite is fairly common at this overgrown quarry in Paterson, and it is often associated with stilbite. Aragonite from this location forms as small crystallized clusters with a white to cream color, and rounded crystal faces. Crystals up to 1 cm have been found at this quarry site, although they are usually an accessory mineral and not of much collector interest as collectors specimens. Aragonite from the Upper New Street Quarry is strongly fluorescent white in shortwave light.

AUGITE

Amity, Orange County, New York

Augite is fairly abundant at Amity, with finds throughout the area over the years producing large and small crystals of various sizes and habits. In 2010, Glenn Rhein, a home developer residing in Amity, excavated very large crystals while digging for home construction. Some of the augite crystals found by Glenn measured over a foot long. The largest crystals occurred at the contact zones of the granite and the marble. The color is an opaque dark green, and crystals are prismatic and may be clustered together. They frequently contain etchings or partially dissolved zones. Originally thought to be diopside, a similar member of pyroxene group, these have conclusively been identified as augite by Michael Hawkins of the New York State Museum.

AZURITE

Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

In 2007, a find of secondary copper minerals including azurite, malachite, and chalcopyrite was made in the Noble Pit at the Sterling Hill Mine. These minerals were collected by Hershel Friedman and other collectors from their source, and the blue material was confirmed as azurite by the Sterling Hill Museum staff. In late 2007-2008, the same material was found in the Mine Run Dump near the entrance to the visitor's center of the Sterling Hill Mining Museum. These secondary copper minerals were presumably

placed here from there source in the Noble Pit by the museum operators. The azurite generally occurs in scattered veins of sparkling micro crystals running along the marble matrix in association of malachite and chalcopyrite.

BABINGTONITE

Paterson area quarries, Passaic County, New Jersey

Moore's compendium, quoting J.J. Peters in his article "Triassic Trap Rock minerals of New Jersey" states that "Babingtonite and rosette-like crystal aggregates… have been found very rarely… in the basalt trap rock quarries near Paterson." Babingtonite is in fact not very rare at either the Upper New Street Quarry in Paterson or the Prospect Park Quarry in Prospect Park. It forms relatively frequently in single prismatic crystals, and even more often in rosette-shaped forms.

Moore's compendium also states that babingtonite forms in sharp black crystals at these localities. The reality is that babingtonite from Upper New Street and Prospect Park is rarely black. It is almost always altered to actinolite, resulting in a bluish or bronze colors that are quite different from other, more familiar forms of babingtonite that are in lustrous black crystals. While unaltered black crystals of babingtonite have been observed from these quarries, they are exceedingly rare and have been found only in small crystals.

BARITE

Prospect Park Quarry, Prospect Park, Passaic County, New Jersey

Barite is an uncommon mineral at Prospect Park. It has been found sporadically as tabular crystals that are usually opaque, and may be either thick or bladed. Crystals can be quite large; a large crystal plate over 23 cm currently resides in the Hershel Friedman collection from the former Paterson Museum collection. Barite from Prospect Park is usually associated with quartz. Its color ranges from white to light pink.

Braen's Quarry, Haledon, Passaic County, New Jersey

Barite is very rare at the Braen's quarry, but several specimens in both bladed form and as small rosettes up to 1 cm have been found in this active trap rock quarry. Prominent New Jersey collectors who have collected at this quarry and found barite at this location include Kurt Hennig, Brad Plotkin, and Eric Stanchich. The color ranges from white to beige, and is in rounded rosette form that resembles a brain in appearance. Most barite from the Braen's Quarry is associated with quartz.

BIOTITE

Eastern Concrete Materials Inc. Quarry, Hamburg, Sussex County, New Jersey

This quarry in the Precambrian gneiss, directly adjacent to the Franklin Marble, has produced interesting skarn assemblages. One of the minerals particularly prevalent at this mine is biotite, forming in large mica "books" several centimeters in length in the skarn zones.

CALCITE

Oxford Quarry, Oxford, Warren County, New Jersey

The Oxford Quarry is operated for asphalt and crushed stone. Quarrying began in 1923 until 1978. It was subsequently purchased and reactivated in the late 1980's, and remains an active quarry. The quarry is in the Precambrian highlands region in mostly a gneiss rock base. Elongated transparent needles of epidote are known from this locality, where they are often associated and even included within quartz and calcite crystals. Calcite crystals, which are white and somewhat dipyramidal in shape, can be several centimeters long.

Passaic Pit, Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

The Passaic Pit of the Sterling Hill Mine has produced chunks of orange “salmon” calcite in crystallized cleavages. These pieces can be very large and some are boulder-sized. Collecting in the Passaic Pit is allowed on the last Sunday of every month by the Sterling Hill Museum, the current owners and operators of the property. This salmon calcite is also brought to the front of the museum by museum staff in their “mine run dump” as well, where collectors can more easily prospect local and “salted” material after completing a mine tour at the museum.

Anthony’s Nose, Peekskill, Westchester County, New York

Anthony’s Nose, a steep mountain rising up from the Hudson River across from Bear Mountain, had produced well-formed calcite crystals during the railroad tunnel excavations along the side of the river, which dates back to the late 1840’s *[Michael Hawkins, personal communication]*. (The railroad track is currently used by Metro North serving commuters to New York City from the far northern suburbs.) Some exceptional “beehive” shaped crystals were found during the time, associated with a sprinkling of drusy quartz. Though these fine and classic pieces are relics of the past, rhombohedral crystals several centimeters in diameter can still be found along the railroad tracks alongside the river. John Betts has an online article describing this locality in more detail and explaining where minerals can still be found here today. *[http://www.johnbetts-fineminerals.com/jhbnyc/articles/anthys.htm]*

Tilcon Quarry, Tomkins Cove, Rockland County, New York

The Tilcon Quarry in Tomkins Cove is a limestone quarry alongside the Hudson River south of Bear Mountain. The quarry exposes a minor limestone formation sandwiched from the north by the Precambrian gneiss of the Hudson Highlands, and from the south by the Newark Basin Sandstones. This quarry has produced white scalenohedral calcite crystals, some several centimeters in size, which were collected during limited field trips of the North Jersey Mineralogical Society led by Jeff Wilson. These calcite crystals are fluorescent pink or purple under shortwave ultraviolet light.

CHALCOPYRITE

Laurel Hill (Snake Hill) Quarry, Secaucus, Hudson County, New Jersey

This quarry had a sulfide-rich zone in which the predominant mineral was chalcopyrite. Heavily tarnished and in crude, massive form, these chalcopyrite chunks measured several centimeters in diameter. The rare mineral Petersite-(Y) was found embedded in massive chalcopyrite.

Lower New Street Quarry, Paterson, Passaic County, New Jersey

Prehnite is the most important mineral from the Lower New Street Quarry. Much of the prehnite at this locality is associated with minor chalcopyrite, which sometimes forms as an aesthetic color enhancement to the fine prehnite formations produced from this quarry. Long closed, this quarry is still visited frequently by freelance collectors, with important finds into the 2000's.

Moore's Station Quarry, Hopewell Township, Mercer County, New Jersey

The Moore's Station Quarry is best known for its bright orange stilbite, but has also produced very distinct and well-formed calcite crystals. Chalcopyrite often forms a sparkling metallic sprinkling on large calcite crystals from this location. Occasionally, larger, well-formed tetrahedral crystals are also found.

Prospect Park Quarry, Prospect Park, Passaic County, New Jersey

Chalcopyrite is a minor accessory mineral at Prospect Park, and is fairly common in small crystals. However, larger crude crystal chunks, up to 2.5 cm, have been found in sulfide-rich zones without any visible crystal faces.

Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

In 2007, a copper-rich area was dug in the Noble Pit area of this famous mine. This area produced azurite, malachite, and chalcopyrite crusts. The area was excavated and brought forward to the mine run dump area in 2008.

CHONDRODITE

Amity, Orange County, New York

Sporadic finds of chondrodite were found throughout the years in Amity by various local collectors. However, in 2010, Amity native Glenn Rhein made a fascinating discovery of a host of large crystals while excavating on his property in a marble/granite contact zone, and subsequently searched throughout the area for more minerals. One of the minerals he found is red chondrodite, often crudely formed, in marble. It is almost always associated with spinel.

CHROMITE

Bare Hills, Baltimore County, Maryland

The area north of Baltimore has several significant serpentine deposits. The Bare Hills are located immediately north of the Baltimore City line in Baltimore County. The Bare Hills are aptly named due to the serpentine barrens which restrict tree growth relative to the surrounding area due to the serpentine-rich soils. A quarry and prospecting pit in the vicinity of Lake Roland were mined in the 1890's through the 1920's for serpentine. Crude chromite crystals can still be found in this location.

CHRYSOCOLLA

Chimney Rock Quarry, Bound Brook, Somerset County, New Jersey

Chrysocolla forms at the Chimney Rock Quarry as a blue to bluish-green alteration of chalcocite and native copper. It may also form in thick chunks, and some facetable material has been cut and polished by Jason Baskin into cabochons after being stabilized.

Montclair, Essex County, New Jersey

Chrysocolla has been found at Montclair/Little Falls in the old quarries that are now part of the Montclair University campus. It is associated with other secondary copper minerals such as chalcocite and malachite. Thick blue chrysocolla crusts were found during the construction of a garage on campus.

Paterson area quarries, Passaic County, New Jersey

Chrysocolla has been found as greenish crusts as an alteration of chalcopyrite, and less commonly chalcocite at both the Prospect Park Quarry in Prospect Park and at the Lower New Street Quarry in Paterson. The combination in both these localities is usually associated with prehnite as well.

Wesley Hills, near Suffern, Rockland County, New York

Botryoidal bluish-green crusts of chrysocolla associated with prehnite were discovered by Hershel Friedman in 2006 in the Ladentown Basalt outcroppings in a suburban construction zone north. These were confirmed as Chrysocolla by Michael Hawkins of the New York State Museum via EDAX.

CORUNDUM

Amity, Orange County, New York

Corundum has historically been found in the Franklin marble exposures at Amity. In 2010, Glenn Rhein, a local property developer, discovered large scapolite and augite crystals while excavating, and went about exploring the area for additional minerals. Among his finds are several highly fluorescent corundum crystals up to 2 cm with a pink color.

DIOPSIDE

Amity, Orange County, New York

Diopside from Amity forms in a white to gray, radiating, curved crystal clusters. This habit is fluorescent with a bright greenish-blue color. This material was originally thought to be tremolite, but analysis conducted by Tony Nikischer of Excalibur Minerals determined it to be diopside.

Brooks Hollow, Hudson Highlands, Orange County, New York

Brooks Hollow is a deep valley in the northern fringe of Harriman State Park, one of the largest protected and undeveloped areas in New York State. This valley contains several rock exposures with interesting mineral assemblages, traversing a northeastern direction starting from the Twin Lakes past Lake Massawippa Dam. The most prevalent minerals of the area are pink to orange calcite, diopside, and scapolite. The diopside of this area ranges from opaque small to large dark crystals, to more translucent light green crystals.

Forest of Dean Mine, Fort Montgomery, Orange County, New York

The Forest of Dean Mine was one of the most prolific iron mines of the Hudson Highlands region, having produced over 2 million tons of ore. Presently within West Point Military Academy property, the mine is inaccessible to the public.

The magnetite ore was shipped along a route parallel to Popolopen Creek, adjacent to what is now Mine Road, and loaded onto ships at the Hudson River at the landing at Fort Montgomery. Diopside, associated with magnetite, in a pink or orange calcite matrix, can still be found along the trails and paths adjacent to Mine Road, some of which are within the boundaries of Bear Mountain State Park. More significantly, diopside can also be found in the same assemblage along the shore of the Hudson River at the Mine Dock Park, the location where the ore was shipped out from the river. The diopside is dark green, and is mostly massive and embedded in calcite. Partially dissolving some of the calcite in acid exposes distinct diopside crystals.

Hogencamp Mine, Tuxedo, Orange County, New York

The Ramapo Mountain and Hudson Highlands region was a significant iron producer in the 1700 and 1800's, with many old mines and quarries throughout the area. Many of these mines and the dumps are still accessible in state parks such as Harriman State Park and Bear Mountain State Park. One significant and abandoned mine complex is the Hogencamp Mine in Harriman State Park, which has extensive dumps where minerals can still be found. One of the more prominent minerals from here is dark green and opaque diopside, forming in distinct crystals over 6 cm. While many of the crystals are deeply etched or have hollow zones, there are some which are well-formed. The diopside is associated with white calcite and magnetite.

EPIDOTE

Oxford Stone Co. Quarry, White Township, Warren County, New Jersey

The Oxford Quarry is located in the Jersey Highlands region in Precambrian gneiss. It was opened by the Oxford Stone Co. in the 1960's, and was worked under that name until about 1978. It lay dormant until 1988, when it was purchased by the Millington Quarry Co. and then subsequently absorbed by Tilcon New Jersey. As of 2016, the quarry is still active, and several local collectors have maintained access to the quarry collection over the past several years.

The most noteworthy mineral this quarry has produced is epidote, occurring in dark green, elongated transparent crystals up to several centimeters in length. The epidote crystals are usually associated with quartz, calcite, and albite, and are sometimes embedded within the quartz and calcite crystals as inclusions.

Tomkins Cove Quarry, Stony Point, Rockland County, New York

The Tomkins Cove Quarry is owned by Tilcon, a major quarry operator in the New York/New Jersey metropolitan area. It is adjacent to the Hudson River in northern Rockland County, several miles south of Bear Mountain. This quarry contains an isolated exposure of Balmville limestone, and has been known to have produced scalenohedral calcite crystals. Epidote in small acicular clusters with a dark green color, associated with albite and calcite, was collected in 2015 in an assumed contact zone with the Highlands Precambrian Gneiss by Jeff Wilson, who organized a collecting group into this quarry on behalf of the North Jersey Mineralogical Society.

FAYALITE-FORSTERITE SERIES

O'Neil Mine, Monroe, Orange County, New York

The O'Neil Mine is an abandoned iron mine in the Precambrian gneiss region at the northern extent of the Ramapo Mountains. Closed in 1880, it is very overgrown, but the dumps still contain the primary iron ore, magnetite, in tiny octahedral crystals clustered together in drusy formation. A unique mineral

that this locality has produced is fayalite-forsterite ("olivine") in a variety known as "hortonolite". Hortonolite describes a member of the Fayalite-Forsterite series closer to Fayalite, with a domination of iron, but also containing some magnesium, as well as some manganese. Massive "Hortonolite" and blebs found in calcite can still be found in the dumps. *[Michael Hawkins, personal communication]*

FLUORAPATITE

Amity, Orange County, New York

Fluorapatite is one of the many interesting mineral finds in 2010 by Amity resident and home developer Glenn Rhein. Prismatic crystals up 10 cm, with a bluish-gray color and streaking, were found here. The fluorapatite is found in marble and marble contact zones associated with diopside and meionite.

FLUORITE

Amity, Orange County, New York

Fluorite was discovered by Glenn Rhein in a pit in his backyard in 2013 during his exploration of the area. The fluorite is a deep purple color, cubic in habit, and is associated with Franklin marble and graphite. Fluorite crystals up to 1 cm have been found. Purple fluorite embedded within silvery phlogopite crystals have also been found nearby in the old Rudy Farm locality near the former Rhein property.

FLUORO-POTASSICHASTINGSITE

Greenwood Mine, Town of Tuxedo
Orange County, New York

Renamed by the IMA as Potassic-fluoro-hastingsite, this is a complex member of the amphibole group that, to date, has been found only at the Greenwood Mine. Now an overgrown area within Harriman State Park along the Appalachian Trail, the Greenwood Mine was operational in the 1800's for its production of iron ore (magnetite.) The old mine dumps are still present, and the dark amphibole

abundant at the dumps has been identified as Fluoro-potassichastingsite, a valid species determined as an individual mineral in 2005. Fluoro-potassichastingsite occurs in clusters of small black crystals with lustrous crystal faces.

GEIKIELITE

Amity, Orange County, New York

Geikielite is a rare magnesium analogue of ilmenite. Small crystals up to 1 cm with a metallic luster and often rounded shape were found in a pit excavated by Amity native Glenn Rhein in 2013, associated with dark red spinel, magensio-hastingsite, and graphite. This first finding of geikielite from New York State was confirmed by Michael Hawkins of the New York State Museum in Albany.

GOETHITE

Oreland, Springfield Township, Montgomery County, Pennsylvania

Lustrous, botryoidal masses of black goethite are well-know at this location, where collectible specimens of Goethite are relatively easy to find. Crystal masses up to 15 cm have been found at this location.

GRAPHITE

Amity, Orange County, New York

Graphite is fairly abundant throughout the Franklin marble, and is especially prevalent in Amity as small crystal flakes within white calcite. Some exceptional crystal masses were found by Glenn Rhein from 2010 through 2015 while excavating areas of his property and nearby. A few unusual crystal masses in ball-like rounded formations embedded in calcite were also found by Rhein.

Bear Mountain, Orange County, New York

The Hudson Highlands region contains several areas where graphite occurs. Most graphite occurs as small flakes associated with feldspar or gneiss. Other habits are in more massive formation. The Trailside Museum at Bear Mountain contains several examples of graphite found during the construction of the pool at the park. Crystal flakes up to several centimeters can still be seen in the vicinity of the Appalachian Trail where it intersects Perkins Memorial Drive.

Sugar Loaf Hill, Hudson Highlands State Park, Putnam County, New York

While hiking Sugar Loaf Hill in 2011, Hershel Friedman observed graphite crystal flakes up to 2 cm. scattered along the Sugar Loaf Trail about two-thirds up the mountain. The graphite flakes are often associated with biotite. Additional crystals have been observed on subsequent hikes in the area.

West Mountain, Orange/Rockland Counties, New York

West Mountain, directly south of Bear Mountain, lies within both Harriman and Bear Mountain State Parks. The area has several exposures of graphite, some in relatively large flaky crystals 3 cm and up. Exposures occur along many of the hiking trails traversing the upper and lower portions of the mountain, including an old mining pit which the Ramapo-Dunderberg hiking trail goes through, as well as the Beechy Bottom Mine at the foot of the mountain.

HASTINGSITE

O'Neil Mine, Town of Monroe, Orange County, New York

Iron ore was extensively mined in the Hudson Highlands and Ramapo Mountain regions of lower New York State. The O'Neil Mine in Monroe, closed in 1880, was a relatively large mine for the region.

Amphiboles can still be found here in the overgrown pit and dumps, with large masses of ugly black hastingsite frequently showing distinct crystal faces.

Ramapo Mountain Iron Mines, Harriman State Park, Orange/Rockland Counties, New York

The Ramapo Mountains in lower New York are rich in iron ore deposits. These deposits were extensively mined in the 1700's and 1800's for iron ore, as evidenced by the dozens of old iron mines in the region, many of them still accessible in Harriman State Park. The main ore material is magnetite, and it is frequently associated with black shiny amphibole crystal aggregates which can be either hastingsite or magnesiohastingsite, depending on the specific mine. Mines in this region that have produced hastingsite include the Daters Mine, Hasenclever Mine, and the Hogencamp Mine. This material is still visible and accessible within the old mine dumps.

HEMATITE

Prospect Park Quarry, Prospect Park, Passaic County, New Jersey

Hematite is a minor mineral at several of the New Jersey trap rock quarries, occurring in very small crystals associated with quartz. However, its presence is most notable at Prospect Park, where it is more common in small metallic-lustered crystals and occasional rosettes associated with quartz. In the 1960-1970's, local collector Hobart Jones collected large smoky quartz crystal points with many hematite crystals on the crystal faces. A few examples of remarkable hematite rosettes collected by Jones features a lustrous hematite rosette over 2 cm. on matrix with quartz. One of these specimens resides in the Hershel Friedman collection. Nearby, at the Upper New Street quarry, hematite is known to form a distinctive red coating over quartz crystals, resulting in quartz crystals that are red in color.

MAGNESIOHASTINGSITE

Amity, Orange County, New York

Magnesiohastingsite is one of the amphibole minerals present in the Franklin marble in the Amity area. In 2013, Glenn Rhein of Amity was digging in a marble zone on his property, and discovered an area that produced large, well-formed crystals of magnesiohastingsite, to 10 cm in size. These crystals were dark gray to brownish gray in color, in weathering marble, and associated with small crystals of geikeilite and dark red spinel. The magnesiohastingsite determination was confirmed by Michael Hawkins of the New York State Museum, and these are among the best of species.

Ramapo Mountain Iron Mines, Harriman State Park, Orange/Rockland Counties, New York

The Ramapo Mountains in lower New York are rich in iron ore deposits. These deposits were extensively mined in the 1700's and 1800's for iron ore, as evidenced by the dozens of old iron mines in the region, many of them still accessible in Harriman State Park. The main ore material is magnetite, and it is frequently associated with black shiny amphibole crystal aggregates which are hastingsite and magnesiohastingsite, with the exact determination specific to each mine. Mines that have produced magnesiohastingsite, in platy black crystals with shiny sub-metallic surfaces, include the Boston Mine, Pine Swamp Mine, and the Hasenclever Mine. This material is still present in the old mine dumps.

MAGNETITE

Buckwheat Dump, Franklin, Sussex County, New Jersey

Magnetite has been found both at Franklin and Sterling Hill, and is distinguished from Franklinite by its stronger magnetism. Crude crystals masses, as well as some rough octahedrons, have been found by collectors foraging in the Buckwheat Dump over the years.

Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

Magnetite has been found sporadically in the Sterling Hill Mine over the years. Less common at this mine than its cousin Franklinite, it can be distinguished by its stronger magnetism. In 2012, large octahedral magnetite crystals, at least 8 centimeters, were found by collectors in the Noble Pit. These were determined to be rich in zinc, thus resembling franklinite, but not rich enough in zinc to be classified separately as franklinite.

Ramapo Mountains and Jersey Highlands Iron Mines, Passaic/Sussex Counties, New York

The Highlands region of southern New York and northern New Jersey was once a productive source of iron ore, and was extensively mined. Hosted in Precambrian gneiss, the many historical iron mines throughout the area are rich in magnetite, the main ore of the region. Crudely formed magnetite, mostly massive in form, can still be found in many of the old mine dumps, sometimes in fairly large and heavy pieces. While most of the mines had closed by the 20th century, the Peter's Mine in Ringwood remained open well into the 20th century as a major iron ore producer.

Ramapo Mountain and Hudson Highland Iron Mines, Orange/Rockland/Putnam Counties, New York

As described above in the entry for the Ramapo Mountains and Jersey Highlands, the many historical iron mines throughout the area in both New York and New Jersey are rich in magnetite, the main iron ore of the region. The mines of the region vary in size from small pits, to some larger, more extensive complexes. Virtually all of the mines had closed by the turn of the 20th century, as iron production moved to the Lake Superior Region, especially the Mesabi Range of Minnesota.

Many of these old mines are located in Harriman State Park and are still accessible, with crude magnetite still able to be found in the dumps. Some of the better-known mines in the park, popular among hikers, include the Bradley Mine, Boston Mine, Greenwood Mine, Hasenclever Mine, Hogencamp Mine, and Pine Swamp Mine. Some of these mines date back to the 1700's. Crudely formed magnetite, mostly massive in form, can still be found in many of the old mine dumps, and sometimes in fairly large pieces. Octahedral crystal faces are present on magnetite from some of the mines, including the Hogencamp and Pine Swamp Mines.

A very important mine in the Hudson Highlands region was the Forest of Dean Mine, in Fort Montgomery, Orange County. This was one of the largest and most productive iron mines at the time, producing over two million tons of iron ore. Now located on restricted land on the property of West Point Military Academy, this mine is not accessible to the public. However, magnetite can still be found at the old loading dock from this mine on the Hudson River in Fort Montgomery, as well as some of the trails in Fort Montgomery and in Bear Mountain State Park leading from the old mine to the mine dock. Magnetite from this mine is associated with diopside and orange to pink calcite. The host calcite can be dissolved with acid, producing unusual skeletal and interconnected veins of magnetite.

Another very significant mine in the area is the Sterling Mine, now located in Sterling Forest State Park, in Orange County. This was a big mining complex, with several regional sub-mines, and some of the old mining structures are still present. Mining was extensive in the 1800's, and production stopped in the early 1900's. There are extensive dumps in the area where crude magnetite can still be found.

The O'Neil Mine in Monroe, Orange County, has one of the largest pits mines in the region. Closed in 1880, it is overgrown, but the dumps still contain magnetite, in the form of tiny octahedral crystals clustered together in drusy formation, forming sparkling masses.

MALACHITE

Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

In autumn of 2007, collectors in the Passaic Pit area of the Sterling Hill Mine noticed a copper-rich zone containing malachite, azurite, and chalcopyrite on the top area of the hill. The malachite formed in green crusts and was usually associated with azurite. As described above under "azurite" from the Sterling Hill Mine, much of this material was brought in the spring of 2008 to the mine run dump, which is a dump for collectors to forage through right near the museum entrance.

MEIONITE (SCAPOLITE)

Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

Collectors are allowed to collect in the Passaic and Noble Pits of the Sterling Hill Mine on the last Sunday of the month for a fee. Many interesting minerals are still being found by freelance collectors in the area. In the Noble Pit, at the back edge of the quarry area, lies a contact zone of the marble with the surrounding metamorphic rock. The zone contains pyroxenes, fluorapatite, and meionite. Meionite crystals over 3 cm. were collected by Hershel Friedman in 2012.

Amity, Orange County, New York

Meionite is one of the more abundant minerals found at Amity. Sporadic finds throughout the area have produced white to tan crystals, sometimes fairly large, almost always associated with dark-colored diopside. In 2010, Amity native Glenn Rhein excavated very large crystals while digging in the area during a new home construction. Some of these crystals were over 30 cm, with crystal clusters over 2 feet! The crystals are stubby with well-formed interesting termination, and often have dendritic growth patterns on their outer layer. The meionite at this locality is often fluorescent dark crimson-red.

Twin Lakes, Woodbury, Orange County, New York

The Twin Lakes area is located within the confines of Harriman State Park. There is a mineralized zone in this area running north to south, starting from the outlet of Upper Twin Lake, crossing Route 6 by the road cut, and extending towards the Brooks Hollow Dam. Large, cream-colored meionite crystals were found at the Route 6 road cut, and a very good example can be seen in the Bear Mountain Trailside Museum, which is part of the Bear Mountain Zoo. Large meionite crystals associated with diopside, titanite, and pink calcite can still be found in various spots in the woods in the vicinity in outcrops, although the crystals are usually heavily damaged.

NORBERGITE

Whispering Woods Lane, Sterling Hill, Ogdensburg, Sussex County, New Jersey

A residential housing development, very close to the Sterling Hill Mine, was responsible for a new but limited find of excellent fluorescent norbergite during the excavation prior to the construction. This locality, at the corner of Whispering Woods Lane and Passaic Ave, is now covered by landscaping.

PECTOLITE

Rockland Lake area near Haverstraw, Rockland County, New York

The diabase sill of the Palisades escarpment forms a line along the Hudson River from Bergen Hill in Jersey City to north of Haverstraw, where it bends inland and then ends at Mount Ivy in Rockland County. With the exception of the findings at Bergen Hill in the early 20th century, and the Ft. Lee Bridge expansion construction completed in the 1962, the known mineralized zones are very sporadic. However, there are still several areas in Rockland County where seams in the diabase have produced mineralized zones which contain pectolite, prehnite, calcite, natrolite, and stilbite. One particular occurrence is near Rockland Lake, where the old trap quarries facing the Hudson River have produced these minerals, and where such minerals can still be found in the overgrown dumps. Of particular interest is pectolite, which occurs in white radiating veins filling seams, as well as in sprays, usually associated with prehnite. Some of these pectolite crystal groups are over 20 cm. This material closely resembles pectolite that was once found further south at Bergen Hill.

PHLOGOPITE

Amity, Orange County, New York

Phlogopite is an abundant mineral at the Franklin marble exposures in the Amity area. While mostly in small flakes, it has been found in large crystal books in excess of 20 cm. Recent findings by Glenn Rhein starting in 2010 exposed many more sources of phologopite in this area. (See the entry on diopside for more information.) The phlogopite in the Amity area is generally brownish-red, but a metallic silvery color is present at the Rudy Farm area vicinity. Some noteworthy examples of well-formed, triangular-shaped crystals have been found by Glenn Rhein and Hershel Friedman.

Ramapo Mountains & Hudson Highlands, Rockland & Orange Counties, New York

The old iron mines in the Ramapo Mountains and Hudson Highlands are abundant with mica, including phlogopite and biotite. These mines produced iron ore in the form of magnetite from dozens of mines throughout the area, now mostly preserved in Harriman and Bear Mountain State Parks. Phlogopite is present in the general region in small sparkly crystals throughout the Precambrian gneiss it occurs in. Several of the regional mines, particularly the Hogencamp and Beechy Bottom Mine, still have fairly large crystals in the dumps. Phlogopite crystal books may range from just a few centimeters to 20 cm. The Bear Mountain Trailside museum contains a geology exhibit with a large crystal book of phlogopite from the Beechy Bottom Mine on display.

PREHNITE

Rockland Lake area near Haverstraw, Rockland County, New York

The diabase sill of the Palisades contains mineralization in seams. The sill extends along the western flank of the Hudson River from New Jersey across the state line in New York. At Haverstraw, New York, the sill reaches its highest elevation at 797 feet above sea level, and moves inland away from the river. Several old quarries can be found in the diabase near Haverstraw, where some minerals can still

be found in the talus of the cliff walls of the quarries. After pectolite, the most prominent mineral is prehnite, in green clusters several centimeters in size, often associated with the pectolite. The color is usually light green. For additional information on this locality, see the entry for pectolite.

Wesley Hills, near Suffern, Rockland County, New York

In 2006, at a residential construction dump site, and in a nearby home extension site in the far northern suburbs of New York City, Hershel Friedman discovered several zeolite minerals associated with prehnite and chrysocolla in the Ladentown basalt formation. The prehnite from this area forms in bubbles-shaped aggregates in a typical green coloring, and is often associated with chrysocolla. Prehnite specimens in excess of 5 cm have been found at the site. They may be standalone aggregates or individual hemispherical formations on basalt. The home extension site, which has been covered over since 2008, had lighter colored prehnite that contained casting in the form of anhydrite epimorphs, reminiscent of the nearby New Jersey prehnite formation of the Watchung Mountains.

PSEUDOMALACHITE

Schuyler Copper Mine, North Arlington, Bergen County, New Jersey

The Schuyler Copper Mine is possibly the oldest mine in the United States. It was first opened in the early 1700's as a copper mine, and the ore was shipped to England for smelting. The mine was located in a small diabase sill, which is an isolated extension of the larger Palisades sill several miles to the east. One of the best-known minerals in this mine was pseudomalachite, forming green botryoidal masses and crusts. The mine, now long abandoned and currently located under a residential area of North Arlington, still has areas in its immediate vicinity where minerals from the old dumps have been found, particularly pseudomalachite formations.

PYRITE

Bulls Ferry Road, North Bergen, Hudson County, New Jersey

Well-formed pyrite octahedrons were found in an apartment construction site on the Hudson Palisades in 1989-1990. Some labels attribute the locality to Edgewater, in Bergen County, but the site is actually across the county line in North Bergen. Bradley Plotkin was one of the main collectors at this site, which was a one-time find that is now all built up as condominiums. The pyrite from this locality is very distinctive, and is usually associated with fine white quartz crystals in a nicely contrasting combination.

PYRRHOTITE

Hasenclever Mine, near Stony Point, Rockland County, New York

The Hasenclever Mine is one of the oldest iron mines in the Ramapo Mountain/Hudson Highlands region. This area was known for its prolific production of iron ore in the 1700's and 1800's. Most mine production had ceased in the area by 1900, though a few mines, such as the Forest of Dean Mine, continued until the early 1900's. The iron ore of the region was predominantly magnetite, and crude magnetite masses can still be found in the old dumps. However, pyrrhotite, another iron ore, is also present in the old dumps at this mine, and can be distinguished from magnetite by its weaker magnetism and by the appearance of a greenish oxidation.

Philips Mine, Anthony's Nose Mountain, Putnam County, New York

The Philips Mine is an old iron mine in the Hudson Highlands region, on the northern part of the Anthony's Nose, a distinctive mountain jutting above the Hudson River in a nose-shaped formation across Bear Mountain. John Betts describes the locality in detail in an article in his website. *[http://www.johnbetts-fineminerals.com/jhbnyc/articles/anthys.htm]*

The old mine dumps still contain pyrhottite, with an occasional apatite crystal found in association with the pyrhottite. The pyrhottite is crudely formed without visible crystal faces, and can be diseased with pyrite's disease, causing it to form a white film and crumble.

Amity, Orange County, New York

Pyrrhotite was one of the minerals found by home builder Glenn Rhein during his mineral searches in Amity in the vicinity his property. The identification of the pyrhottite has been confirmed by Michael Hawkins of the New York State Museum. Pyrrhotite in Amity occurs in silvery-metallic masses that are strongly magnetic. Masses up to 6 cm have been found.

QUARTZ

Millington, New Jersey

Local New Jersey collectors collecting in Millington in the 1990's and early 2000's have found excellent minerals, though rarely has quartz been one of those minerals. However, quartz crystals have been occasionally found, in clusters of both amethyst and smoky quartz in matrix.

Montague Township, Sussex County, New Jersey

Montague Township is a small hamlet across the state line from Port Jervis, New York. The locality lies less than a mile from the state line in the Kittatinny Mountains, not far from New Jersey's tallest point at High Point. The Montague locality is in a steep hillside across the valley from High Point on New Jersey state land. Quartz crystal points up to 6 cm have come from this locality frequented by local freelance collectors and club trips. Crystals are classical prismatic quartz points that are colorless, or may have a yellow coating from iron oxide staining.

Oxford Stone Co. Quarry, White Township, Warren County, New Jersey

Also known as the Oxford Quarry, this complex locality has produced the best epidote in New Jersey, and likely the best in the Northeast United States. The epidote occurs in association with quartz, albite, and calcite. It sometimes forms as crystals embedded directly within the quartz crystals, forming aesthetic and unique elongated epidote in colorless quartz crystals.

Stirling Brook, Warren Township, Somerset County, New Jersey

This creek in the volcanic basalt of northern New Jersey's Watchung's Mountains is a well-known source of quartz var. carnelian. Also known as "Carnelian Brook," this brook and its surroundings have produced botryoidal and rounded masses of dark red to orange carnelian, with some larger pieces upwards of 10 cm. Specimens often have good transparency, and banding is present in some of the carnelian. The locality is in the woods and not part of any mining complex. Freelance miners have been mining the brook and have created pits in the surrounding area for many decades

Wesley Hills, near Suffern, Rockland County, New York

In 2006, Hershel Friedman discovered several zeolite minerals associated with prehnite and chrysocolla in the Ladentown Basalt formation at a residential construction dump site. The Ladentown Basalt is an extension of the Watchung Mountains of New Jersey that extends over the state line into New York. Further exploration of the area by Hershel in 2009 led to the discovery of a new area in the basalt with good chalcedony, agate, and quartz crystals.

While exploring the hilly area of exposed basalt bedrock, Hershel discovered a fragment that looked like glass. It turned out to be translucent chalcedony, and searching the area led to many more such pieces, mostly in small fragments. They were on undisturbed rock, with pieces popping out where large trees had broken through the bedrock. Subsequent digging in the area revealed larger agates, often with a rind of quartz in the center, and an occasional calcite crystal. Some of the calcite crystals are dissolved, leaving hollow casts within the agate or quartz.

Chalcedony colors are white to gray, with an occasional light blue, and exhibit good translucency. Chalcedony is often nodular within a basalt matrix. Agates are banded white and gray, and rarely light blue. Drusy quartz crystals are also found in the area, with short-stubbed colorless crystals sparkling on a basalt matrix.

Saratoga County, New York

Quartz crystals with green chlorite inclusions were collected in 2015-2016 by Bill Lombard, a New York State collector. The crystals are prismatic with typical quartz terminations, but they also form interesting aggregates and intersecting crystals. The chlorite inclusions make the specimen opaque, but in a few zones the inclusions are lacking, leaving colorless, transparent areas. This deposit was discovered by Bill Lombard, but Bill was intentionally vague about the locality to Hershel Friedman and other local collectors, and would not share any additional locality information other than Saratoga County, New York.

RIEBECKITE

Stirling Brook Area, Warren Township, Somerset County, New Jersey

The Stirling Brook area, well-known for carnelian, has also produced another, lesser-known mineral from this area as a unique form of riebeckite. Riebeckite at this locality forms in black masses, and is known locally as Touchonite. “Touchonite” is sometimes polished or cut into slabs to form beautifully formed zoned cabochons and slabs.

SPHALERITE

Sterling Hill Mine, Ogdensburg, Sussex County, New Jersey

Sphalerite is one of the zinc minerals that have been found at the Franklin and Sterling Hill deposits, and it is generally unremarkable in mineral specimens. In 2017, at the Sterling Hill periodic garage sale, a flat of crudely formed, yet aesthetic and relatively large crystals were offered for sale for about $10 - $15 per piece. These were from a recent find, but no specific data on its occurrence was mentioned by museum staff selling the material. The material is presumably from the Passaic or Noble Pits, where new material can still be found.

STELLERITE

Millington Quarry, Bernards Township, Somerset County, New Jersey

The Millington Quarry, in the Third Watchung Mountain of the northern New Jersey basalt ridges, produced an excellent array of trap rock minerals. Stellerite is one of the rarest zeolites from that location, in the form of rounded globules of radiating crystals. The stellerite from Millington is quite different from that of the Braen's Quarry, Haledon, which is a more popular New Jersey occurrence of stellerite and further described in Moore's Compendium. Stellerite from Haledon is fully transparent with a jelly-like appearance, in contrast to Millington stellerite, which is translucent to opaque, and has a more creamy color. Millington stellerite may be in grouped of rounded crystals or in singular rounded balls. They are often associated with contrasting white natrolite balls. Hershel Friedman, a collector of Northern New Jersey minerals, has several Millington stellerites from prominent New Jersey collectors Frank Imbraccio, Robert Drift, and James Zigras; all have presumably been collected in the past 30 years.

TITANITE

Amity, Orange County, New York

Titanite has been found in Amity in large, brown crystals in typical wedge-shaped habit. Its occurrence is almost always in association with scapolite (meionite) and diopside in marble contact zones. In 2010, Glenn Rhein, a local homeowner in Amity, excavated superb titanite crystals while digging in the area for home construction. The crystals are large for the species, in some cases measuring over 5 cm in sharp, lustrous, opaque brown crystals.

Twin Lakes, Woodbury, Orange County, New York

The Twin Lakes area is located within the northern confines of Harriman State Park. There is a mineralized zone in this area running north to south, starting from the outlet of Upper Twin Lake, crossing Route 6 by the road cut, and extending towards the Brooks Hollow Dam. Brown titanite crystals up to 3 cm, associated with meionite, have been observed by Hershel Friedman. Most crystals are crude or highly fractured, though the occasional crystal with good faces is less commonly encountered.