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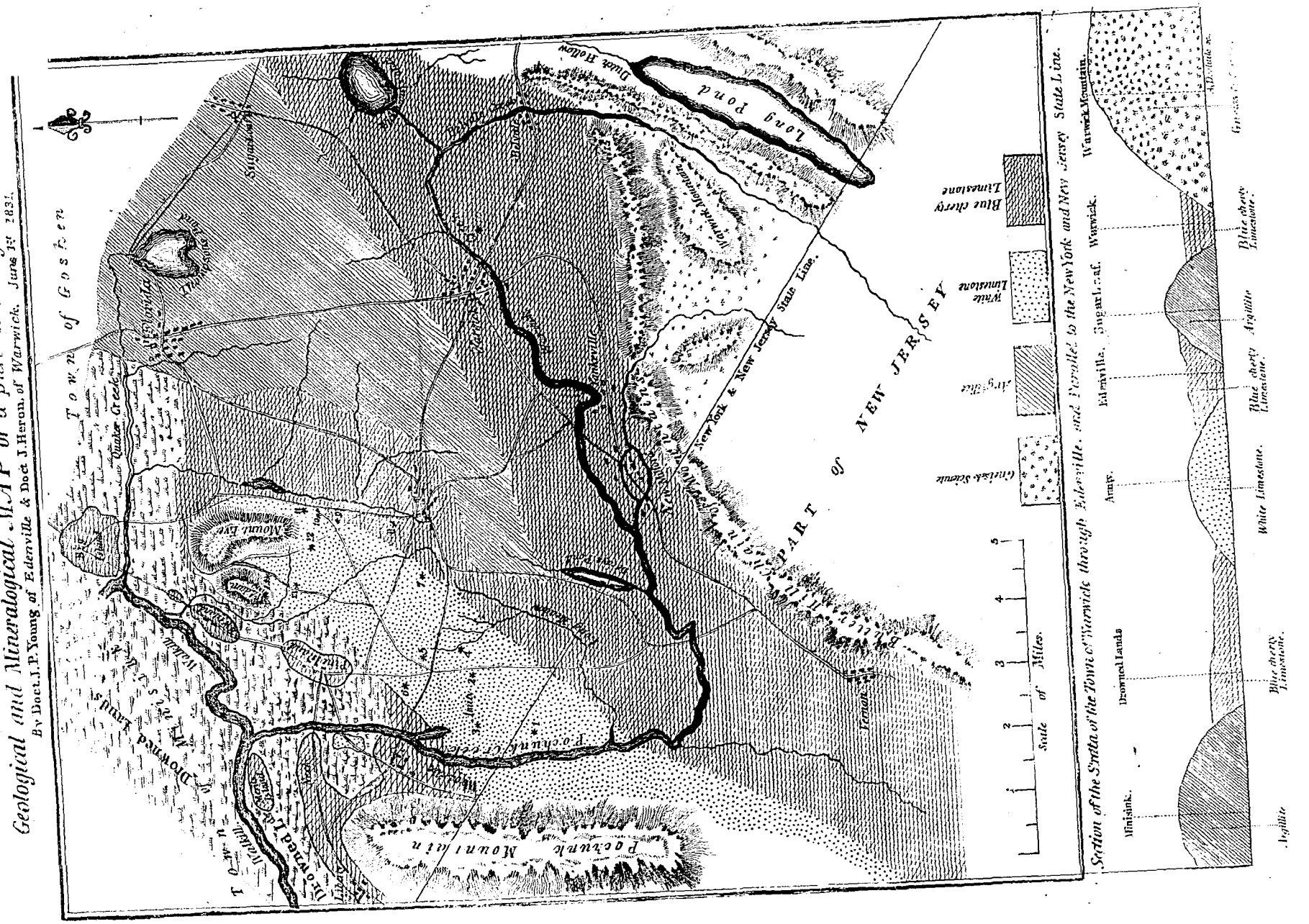


ART. XII. *A sketch of the Mineralogy and Geology of the Counties of Orange (N. Y.), and Sussex (N. J.); by* CHARLES U. SHEPARD, Lecturer on Botany in Yale College.

THE adjoining counties of Orange and Sussex constitute a mineralogical district, second in interest to no other in the United States. The variety and rarity of its productions began to attract attention as early as 1820; since which period, it has received frequent visits from mineralogists from abroad, and has been examined with a high degree of zeal and success by its own inhabitants: the result of which investigations is, that, in a mineralogical point of view, no region of the same extent in our country, is at present better understood. The individuals who deserve to be mentioned as having taken the lead in these researches, are Mr. Nuttall of Cambridge, Dr. Torrey and Baron Lederer of New York, Dr. Fowler of Franklin, N. J., Dr. Young, of Edenville, Dr. Horton, of Goshen, and Dr. Heron, of Warwick, N. Y. The principal information hitherto presented to the public concerning this district, is contained in a description of the mineralogy of Franklin and Sparta, by Mr. Nuttall, in this Journal, (Vol. V, p. 239.) a list of the minerals of Warwick, by the same gentleman, in the appendix to Robinson's catalogue of American minerals, (p. 296,) and some notices by Dr. Torrey in the Annals of the New York Lyceum of Natural History, (Vol. III, p. 8.)

A geological and mineralogical map of the district above alluded to, having been forwarded to Prof. Silliman, by Drs. Young and Heron, for publication in the American Journal, accompanied with a request that I would undertake to give a more detailed account of the mineralogy of the region than has hitherto been published, is the occasion of the present sketch. My visit to these counties, which was made last year, was unfortunately of too short duration to allow of the personal inspection of each locality of which I shall speak; but the statements concerning such deposits as I was prevented from seeing, are founded upon specimens and information furnished me since, by Dr. Young, to whose correspondence I am much indebted in the preparation of these notices.

I shall commence with that part of the country which first fell under my observation. Leaving the village of Goshen, which is situated upon the same Argillite that had characterized the whole country, as seen in my ride from Newburgh to that place, my road lay

over an undulatory country, under a high state of cultivation, until I entered the *Drowned Lands*. The country thus denominated is a morass of unusual extent for the Northern States, and celebrated for the yearly inundation to which it is subject, and the malaria to which it gives rise during the latter part of summer. Its length is twenty miles, and its breadth, in different places, varies from one mile to five. Through it, flows the Walkill with a scarcely perceptible current; to whose waters, when swollen by the spring freshets, it owes its annual inundations. It consists of an immense accumulation of vegetable matter, whose surface is imperfectly converted into a soil, abounding with carbonaceous matter, empyreumatic oil, and gallic acid, and covered, in midsummer, with a rank and luxuriant vegetation. Wherever it has been ditched to any considerable depth, as has been the fact in several places in the construction of the roads that cross it, peat of an excellent quality has been brought to light. Several islands rise at various intervals above its surface, the largest of which is two hundred acres or more in extent, consisting of excellent land, which is improved for agricultural purposes; the smaller islands are uninhabited and, for the most part, covered with wood, among which I observed the beautiful flowering shrub, *Rhododendron maximum* growing in the greatest abundance. The rocks in view upon these islands, as well as those observed about the borders of this extensive morass, reveal the formation on which it reposes to be, the Blue, cherty Limestone. The small island near Woodville (see map) is the only exception to this remark, which consists of primitive Limestone, the rock of the adjoining country.

In an economical point of view, it is doubtful whether the Drowned Lands have received the degree of attention which they merit. At present, with the exception of here and there a strip bordering upon the high land, they are abandoned as mere pasturing ground to cattle, which, on the subsidence of the spring inundation, range over its wide surface for a few weeks only, leaving it for the rest of the year a desolate waste. The canal of three miles in length, now cutting at immense expense, with a view, primarily, to avoid a bar of rocks in the Walkill, it is confidently believed will redeem a large portion of these lands from inundation,—a result to be desired, no less on account of its bearing upon the health of the vicinity, than upon the agricultural resources of the country. Nature herself offers an inducement of no small consideration to the completion of this enterprize, in the facility with which she will enable the agriculturalist to command the mate-

rial requisite in subduing these lands to useful purposes; for limestone of the best quality is every where at hand in that vicinity, as well as wood and Peat for converting it into quick lime.

The road by which I crossed the Drowned Lands lay across Big Island, from which it takes a southerly direction over a small stream, called Quaker Creek, and enters Edenville just at the northern base of Mount Eve, a fine elevation four hundred feet in height, of a conical form, and visible for ten or fifteen miles up and down the valley in which it is situated. Here the mineralogical district may be said to commence; but before entering upon the enumeration of localities, I shall allude for a moment to the geological features of the country.

The general character of the country is primitive; consisting of lengthened swells of high land with broad valleys, whose direction is from north-east to south-west. A correct idea of it may be obtained from a cross section, as delineated on the accompanying map of Messrs. Young & Heron. The section coincides with the New York and New Jersey states' line. The Argillite is far removed in its character from Mica Slate, or even that of the glazed Roofing Slate, nor has it any intermixture of Anthracite, like the same rock in many places in New England; but, it is every where dull, soft, and extremely liable to decomposition. The White Limestone is highly crystalline throughout, and although its association with the Blue Limestone, might tend to confound it with more recent rocks, yet its imbedded minerals, hereafter to be mentioned, clearly demonstrate its primitive character. The Blue Limestone abounds with Hornstone, and in some places with distinct fossils. At one spot, No. 8 on the map, it has exhibited the oolitic character which belongs to the same formation in the vicinity of Saratoga. The juncture of the White Limestone with the Argillite has no where been observed, as the Blue Limestone, or soil every where intervenes between these two rocks at the surface. That it is a contemporaneous formation however, with the gneissoid Sienite and the Argillite, scarcely admits of any more doubt than that the Blue Limestone of Warwick belongs to the same period with that in the corresponding valley of Edenville. The inclination and direction of the strata of these different rocks, I have not been able to determine with that degree of precision I could wish. The general direction of the primitive strata is coincident with the elongation of the chains of mountains, or swells, to which they severally

belong, and the dip is uniformly to the west, varying from 40° and sometimes under, to a position nearly vertical. The Blue Limestone is nearly horizontal, though occasionally thrown up at a pretty high angle, as in one or two spots south of the village of Edenville. The superficial extent of these formations within the district under consideration, may be viewed from a glance at the geological map. Suffice it to say of the White Limestone, (the only rock which here interests the mineralogist) that it commences at Mount Eve, and extends in an uninterrupted line twenty-five miles south-east to Byram, with a width varying from two and a half miles to that of a few rods. Its greatest breadth is at the states' line. Its elevation, except at its northern extremity, upon Mts. Adam and Eve, is low, often falling below the adjoining Limestone of a more recent date. It crops out only here and there in large masses, and its continuity is often to be made out solely by scattered bowlders and loose stones of a smaller size, scattered over the surface of the ground. Although Byram is spoken of generally, as the southern limit of the formation, yet it is highly probable it extends, with occasional breaks perhaps, to Easton upon the Delaware.

The first mineral deposit, of which I have to speak, is situated upon the southern base of Mount Eve, on the land of Isaac Allison. It is marked No. 12 on the map. Like another locality to which I shall have occasion to allude in this paper, and indeed many others in our country, it owes its discovery to the want of mineralogical information. An ignorant foreigner, calling himself an old countryman, (a declaration which has until lately been too sure a passport to confidence among our people in all matters relating to metallurgy,) persuaded some persons in the neighborhood to commence mining operations here, under the idea of obtaining gold and silver. The only metallic substance afforded by the place was Iron Pyrites. A pit was accordingly sunk to a very considerable depth, and a reduction forge erected. How long their operations were persevered in, I am unable to say, but the degree of success it is easy to imagine. The result was, that immense heaps of Limestone, abounding with crystallized minerals, were thrown out; and though they have been considerably culled, they still continue to reward the mineralogist with many substances worthy of his attention. The principal of these in interest is a distinctly *crystallized Hornblende*, disseminated through an aggregate of Limestone and Scapolite. The crystals vary

in dimensions from one line to half an inch in diameter, are terminated at both extremities by dihedral summits, reposing on the lateral solid angles, and very often modified by the truncation of the lateral edges. They are short, in proportion to their length; and possess unusually brilliant cleavages, which take place, not only parallel with the lateral, but with the terminal planes. Their colors are a leek-green, grass-green and hair-brown. Next to the Hornblende, the crystals of *Zircon* are worthy of mention. These are contained in the same aggregate as the Hornblende, though for the most part imbedded in the Scapolite. They are very small, but eminently perfect, and possessed of the highest finish, as respects their lustre. The form is that of four-sided prisms, surmounted by four-sided pyramids, having the edges between the pyramid and prism truncated. Their color is a chocolate-brown. The *Scapolite* is always massive, and usually without discernible cleavages. The other minerals which occur at this spot, are *Augite*, *Brucite*, *Spinel* and *purple Fluor;* but these last in specimens, for the most part, undeserving of regard.

The next locality south of the one just described, is upon land owned by H. W. Raynor, and situated three quarters of a mile north of the village of Edenville. It is marked No. 9 on the map. This spot affords a handsome hair-brown *Hornblende*, in highly perfect crystals of the form above described, though occasionally with terminations more complicated, among which may be found the modification denominated *Amphibole accelére* of Haüy. The prisms are sometimes very short, insomuch that the terminal faces come into contact. The crystals are disseminated through an aggregate of White Limestone and brown Mica, and vary in size from very small to an inch in diameter. Dr. Young possesses a crystal from this place, four inches long by three in breadth. So peculiar is this Hornblende in its color, that it has obtained in collections, the distinctive name of *Edenite*, from its locality. In some specimens, it is nearly white and semi-transparent.

No. 10 upon the map is upon the land of H. W. Houston. The most interesting substances it affords are *Brucite* and *Rutile*. The Brucite is thickly disseminated through Limestone bowlders, in grains of large dimensions and very handsome colors, as orange-yellow and garnet-red; the same masses frequently embracing crystallized, greenish Hornblende, which has been designated *Pargasite*. Associated with the Brucite, in the same aggregate, is found a well

crystallized, *reddish brown Mica*. This vicinity also affords the Edenite in loose blocks, with which, Dr. Young has found large and brilliant crystals of Rutile, possessed of numerous geniculations.

Distant about forty rods from the last mentioned spot, upon the land of B. Hopkins, is found the locality marked No. 11 upon the map. It consists of a vein of Arsenical Iron, situated in the White Limestone, but which here abounds with grey, massive Hornblende and Augite. The vein has been explored to the depth of eight or ten feet. The only mineral worthy of attention here is the *Arseniate of Iron*, or *Cube Ore*, which occurs upon one side of the vein. This interesting substance forms druses of considerable size, which, when examined with the microscope, present extremely minute facets, whose form cannot be detected with certainty in any specimens I have seen. Its color is a dark green, with a tinge of yellow and blue. It has formerly been regarded as Arseniate of Copper. In connection with this vein, is found the Flos ferri variety of *Arragonite*, in seams of moderate extent. The branches or stalactites are short, but possessed of a pure white color, and sometimes handsome. Scapolite, Augite and Sphene, have also been found in the immediate vicinity.

The minerals next to be described, No. 5 on the map, are of a still more interesting character. The spot where they occur is a small field owned by William Raynor, situated about fifty rods northeast of Amity meeting house. It is partly cultivated and partly covered by wood. On an elevated knoll upon the border of the wood, and where the limestone comes into view in patches of limited extent, the diggings for minerals have been made. These are scattered over about a quarter of an acre of ground. The Limestone rocks have been blasted only in one or two places at this spot; the loose stones and crystals found in the soil constituting the chief objects of research. *Bronzite*, *Spinel*, *Hornblende*, *Augite*, and *Plumbago* are the substances here found. The Bronzite has been described by Mr. Finch in Vol. XVI, p. 185 of this Journal. It is now no more obtained in large plates, by following the rock which originally afforded it; but handsome foliæ, many inches across, are still procured loose in the soil, or attached to masses of Hornblende. The Hornblende is rarely found in regularly terminated prisms, but occurs in otherwise very regular and well finished crystals, sometimes half an inch in diameter, and one and a half in length. It is found both in loose crystals, imbedded in Limestone, and contained in veins and cells in the

massive Hornblende. Delicate six-sided tables of Graphite are often found implanted upon the Hornblende crystals, especially where the Hornblende occurs shooting into cavities with Calcareous Spar. The Augite, found in like manner, in loose masses and disseminated through the Limestone in place, is not remarkable for its crystals, but for the variety of colors it exhibits. The prevailing hue is an hair brown, often deeply tinged with red. It is either in small rounded grains disseminated through the Limestone, or in entire masses, the grains of which are sharply angular. It was called for a time Pyrallolite, and afterwards Hornblende; but the cleavages it presents leave no doubt concerning its true character. It is in breaking up masses of this rock, that we sometimes meet with seams of Calcareous Spar filled with small octahedral Spinels of a black color and a very high degree of lustre. Spinels of a dull, greenish black hue in single crystals, having triangular cavities upon their faces are found loose in the soil. These are often upwards of an inch in diameter, and sometimes hemitropes in form. Brucite is also found here, possessed of a garnet red tinge, diffused through the Limestone along with Mica in small crystals of the same color, and liable, at first view to be confounded with Bronzite.

Following the knoll through the wood to the northwest, for the distance of five or six rods from the spot above described, we come to a place where the Limestone crops out, and where the marks of considerable labor appear. The blasting has been confined to one spot of not above ten or twelve feet in length, and of about half this width. Upon one side of the trench, the White Limestone affords *Spinel*, and upon the other *Pargasite* and *Idocrase*. The Spinel is distinguished for the perfection and distinctness of its crystallization. The form of its crystal is the octahedron with equally produced faces. The most frequent color is a dark greenish black, from which it passes through bluish tinge to purplish grey. The crystals are opake, or but slightly translucent. They vary in size from that of a pea to that of a hazle-nut and being thickly interspersed through the snow-white Limestone, which is here in large foliated concretions, and equally penetrated, also, by large grains of wax colored crystals of Brucite, the specimens they form are possessed of unusual beauty and interest. Upon the other side of the excavation, the Brucite and Spinel are replaced by Pargasite and Idocrase, the one predominating to the exclusion of the other, and occurring so plentifully as to form the major part of the rock. This Pargasite has generally been called Cocco-

lite, but it is easy to detect in it the peculiar crystallization of Hornblende, the form of the crystal being that of the Mount Eve variety of the same mineral, except that the angles of the crystals are more rounded. Its color is a bottle-green, and it resembles in every respect the same variety of Hornblende, from Pargas in Finland. The Idocrase is for the most part massive; the individuals presenting a granular or columnar structure. Its color is a yellowish green. The granular variety is undoubtedly the substance described and analyzed by Dr. Thomson, under the new denomination of Xanthite, an account of which is contained in the Annals of the Lyceum of Natural History of New York. Although, as respects its hardness, it does not agree with that description, the words of which are, "easily crushed to powder by the nail of the finger. It is therefore soft: it does not scratch calcareous spar." It consisted of

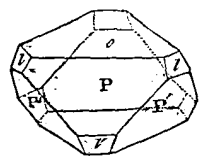
| | |
|---|---|
| Silica, | 32.708 |
| Lime, | 36.308 |
| Alumine, | 12.280 |
| Per ox. Iron, | 12.000 |
| Protox. Manganese, | 3.680 |
| Water, | .600 |
| | 97.576 |

Of late, some distinct, nearly transparent crystals, from one fourth of an inch to more than one inch in length, have been found at this spot, having their lateral and terminal edges truncated. Associated with them, occur small grains of dark green Pargasite, and white, massive Scapolite. Just above this trench, a digging has been made, also, from whence handsome crystals of *Zircon* have been obtained. It likewise affords a reddish *Garnet*, *Sphene* and *Phosphate of Lime*. But these last mentioned substances are not found plentifully, or in valuable specimens with the exception of the Zircon, which, though rare, is in large and highly colored crystals.

The next place to be described is one which has afforded those specimens of *Black Spinel* that have excited, by their extraordinary dimensions and perfection of form, the astonishment of the whole mineralogical world. It is situated in the road contiguous to the farm of J. Layton, one mile southwest of Amity meeting house, and is marked No. 2 upon our map. We owe its discovery to Dr. Fowler, of Franklin, who observed, about nine years ago, the first specimens lying loose in, or near, the cart-path. His observation led to

repeated researches in the soil, until at length a space sixteen feet long, eight wide and seven deep, has been completely dug over and examined. This space was occupied by earth, through which were interspersed loose blocks of an aggregate of Limestone Brucite and Serpentine, Spinel in single crystals and in groups, crystals of *Brown Hornblende* and of *Specular Iron Ore.* These substances appear to have constituted, originally, a series of crystalline cavities in the Limestone, into which water and soil having freely infiltrated from above, they at length became changed to the condition of loose materials.

The Spinel is possessed of the following colors: black, greyish black, bluish black and reddish brown. The former color has been the most abundant: the latter has never been noticed until lately, and occurs only in one particular spot in this digging; its gangue is white Limestone. The first mentioned colors belong to crystals either found loose or associated with the Serpentine and Brucite, and are often penetrated by crystals of Specular Iron Ore; whereas the reddish brown crystals are penetrated by a crystallized mica of the same color, the plates of which are disposed parallel with the octahedral faces of the Spinel. Nearly all the Spinels of this place are possessed of extraordinary dimensions, varying from one to sixteen inches round the base. A very common size has been from six to eight inches. Nor, as is generally true, is the size at the expense of the perfection of the crystal, the largest being equally perfect, as respects the smoothness and lustre of the faces, with the smallest. We frequently observe a tendency of smaller crystals to unite to form a large one, or of a great number of crystals connected in such a manner that their similar faces are parallel. The only form beside the primitive, in this mineral, is the ordinary hemitrope; of which several of enormous size are said to have been found. But they have not often been met with of late at this locality.




The crystals of Specular Iron, above alluded to, and which are almost invariably found penetrating the Spinel, are extremely interesting on account of their size and form. For a long time their true character appears to have been misunderstood; and they are still often found in cabinets under the name of Titaniferous Iron, or believed to be some undescribed ore of Co-

lumbium. The annexed diagram illustrates their figure, which is that of the *Fer Oligiste imitatif* of Haüy. They have been found one inch in diameter, though their average size is considerably less. The Hornblende of this place is of a reddish brown color, often in very large and perfect six-sided prisms, with three and four sided terminations.

Three quarters of a mile south-west of the above locality, in the middle of a bye-path leading west from the main road, and distant about forty rods from it, (No. 1. on the map,) are found handsome beryl colored crystals of *Apatite*, associated with a purplish brown *Augite*, which is sometimes in distinct crystals of considerable size, but more frequently in granular concretions. In the same connection, also occurs, a snowy white Scapolite, not well crystallized, together with crystals of Plumbago. These minerals are imbedded in the Limestone, in a vein-like cavity which has been pursued down to the depth of a man's head, and for a length of six or eight feet, and a breadth of about half this extent. The vein in which the minerals occur is said to have narrowed finally to about the width of two feet, and is probably near being exhausted. It is not improbable, however, that similar nests will be discovered on examination; for it is not rare to find in the Limestone, partial veins of the Scapolite in this vicinity.

About half a mile north of the last mentioned deposit, No. 3, on the land of Daniel Layton, are a number of interesting substances. I did not visit the spot, nor am I informed of their mode of occurrence, but from the account furnished me by Dr. Young, I should imagine, that they are found in loose masses distributed through the soil, in conformity with the usual circumstances under which the minerals of this region occur. These minerals are *Spinel*, in greyish red octahedrons and hemitropes, from one to four inches in circumference, whose crystals are often coated with steatite, and present various shades of green, yellow and black. Associated with them are tabular crystals of Serpentine, destitute of lustre, and in a commencing state of decomposition; also, Sphene and Augite,—these last resembling specimens from Roger's Rock on Lake George.

Locality No. 4, which is half a mile south-east of Amity meeting house, on the land of Moses Post, affords brown *Spinel* in large octahedral crystals, but inferior in perfection to those of the Layton locality. Dr. Heron possesses a single crystal from this place, weighing fifty-nine pounds. A portion of one of its pyramids is detached

by a fracture, and reveals a small cavity that contains crystals of Corundum. This spot has furnished a number of handsome crystals of bluish white Corundum, attached to loose masses of grey Hornblende.

Locality No. 6, is one mile north of Amity church, upon land owned by Wm. Raynor, and situated in a wood. The Limestone merely crops out over an extent of a few rods, and is filled with Brucite of various colors, but mostly dull; black *Spinel* in hemitropes, and Magnetic Iron in large octahedral crystals, whose faces are rough; it also contains Hornblende and blackish Serpentine. The aggregate is in a decomposing state, apparently from the presence of the Octahedral Iron.

No. 13 is situated upon the land of Isaac Smith, two and a half miles north of Edenville. It affords handsome groups of *Spinel* crystals. To obtain them, it is necessary to dig into a side hill, and roll over large blocks of an aggregate consisting of Hornblende, Mica and Limestone, upon whose surfaces and in veins traversing them, we often find druses of large octahedral crystals, varying in size from a quarter to one inch in diameter. Their form is well defined, the edges of the octahedrons being sharp and their surfaces perfectly flat. They are of a dark green, almost black, color; and are often possessed of a good degree of lustre. This place produces, occasionally, handsome crystals of Zircon, straw colored Brucite, and green and black crystallized Hornblende.

No. 14 is a spot between Mt. Adam and Mt. Eve, upon the farm of Wm. Davis, which affords red and black *Spinel*, red *Brucite*, *Augite*, green *Hornblende*, *Idocrase* and *Scapolite*.

No. 15 situate upon the declivity of Bellvale Mt. affords handsome four-sided prisms of Rutile, terminated by four-sided pyramids. They are about half an inch in diameter, of a brownish black color, and free from those striæ common in the crystals of this substance. The gangue is a sienitic Granite, which also contains handsome crystals of brown *Zircon* and lengthened prisms of *White Iron Pyrites*, terminated at both of their extremities by dihedral summits.

The Magnetic Iron deposit, No. 16, is described as occurring in the blue Limestone; but it is more probable that it belongs to the primitive, which may approach the surface at this spot. A perpendicular excavation, twenty five or thirty feet in depth, was made here many years ago for the purpose of working the ore; but the limited quantity in which it occurred, caused the undertaking soon to be abandoned. The ore existed in isolated masses from the size of a

man's fist, to pieces weighing a hundred pounds. It possesses unusually strong magnetic power. The neighbors, about the mine, say that masses of it have been known to lift a pair of kitchen tongs. A great abundance of specimens may be obtained from the heaps of rubbish about the excavation.

It was my intention to have entered into a description of the Newton minerals, from the specimens of them in my possession, and the notices respecting their deposit sent to me from, time to time, by Dr. Young; but Dr. Fowler having just forwarded an article relating to them for insertion in this Journal, and which appears in the present number, I shall content myself with adding a few particulars not noticed by him, with a view to elucidate still farther the condition of this remarkable locality. What I have to add is wholly abstracted from the letters of Dr. Young. It is situated twenty miles south-west from Amity meeting house, two and a half miles south-west of Hamilton's inn, upon the Sparta and Milford Turnpike. It lies in a narrow trough formed by two ranges of Limestone, which are elevated about sixty feet above the general level of the country. This trough, or narrow valley contains soil, through which are disseminated blocks of Limestone containing occasionally the various minerals mentioned by Dr. Fowler. Several excavations were made in this trough, many years ago, by some ignorant persons with a hope of finding silver. The substance which encouraged these undertakings, probably was Iron pyrites, which is occasionally found here along with the Hornblende and Sapphire. It was among the loose masses thrown out by the authors of this enterprise, that the first pieces of Sapphire were found. In 1829, Dr. Young and Dr. Horton visited the spot and found few or no signs of much examination having been made for the Sapphire. They turned over a number of stones around the excavation which afforded the minerals, from which, as well as from the soil, they obtained the Sapphire in small quantity. In 1830, they visited it again, and found but one small block of Limestone, which contained the mineral, and which afforded them a great number of handsome crystals of this precious substance. In July, 1831, they spent two or three days there, assisted by five laborers, who were employed in digging, blasting, and breaking the blocks which were thought likely to afford the Sapphire. They found the mineral confined to a bason eighteen feet long and six feet wide, which they sunk to the depth of nine feet, taking out and examining every stone they met with. The bottom of this trench, they sounded with iron

bars to the depth of four or five feet, but were unable to perceive any thing but fine soil. The side walls consisted of solid Limestone, free from minerals, and gradually sloping on both sides towards the middle of the trough. They obtained on this occasion a very fine supply, not only of the Sapphire but of the other minerals found in connexion with it. Dr. Young mentions a single crystal of Sapphire in his possession, that weighs five ounces avoirdupois. He also alludes to crystals of the supposed Idocrase in six-sided prisms with trihedral terminations at both extremities,—a form which would seem to indicate that this substance is rather Garnet than Idocrase, as has been believed. It is possible, indeed, that both substances occur there; though all the specimens I have seen from the spot have uniformly consisted of large foliated masses, having three polished planes inclining to one another under angles of 120°, which goes to strengthen the opinion I have here ventured to suggest.

Concerning the minerals of Franklin and Stirling, scarcely any thing remains to be said after their full description in the various papers alluded to, at the commencement of this article. The mineral formerly called manganesian Feldspar, crystallized siliceous oxide of Manganese, and Ferro-silicate of Manganese, has very happily been endowed with the trivial name of Fowlerite; a change which will undoubtedly be readily acquiesced in by mineralogists, no less on account of the greater convenience of a short name, than the propriety of calling so interesting a substance after Dr. Fowler, of Franklin, to whose zeal in mineralogy the cultivators of this science are so much indebted. The crystallization, hardness and specific gravity of the Fowlerite bring it under Mohs' natural order *Baryte*, and probably within the genus *Parachrose-Baryte*.

The Stirling mineral, formerly known as a silicate of Zinc, and since ascertained by Dr. Thomson, to be a Ferruginous silicate of Manganese, has been found of late in distinct crystals. These are of a form which justifies the opinion originally entertained by Dr. Troost concerning their primary form, which he suggested to be that of a cube. Mr. Ingliss, of Hamburg, has an isolated crystal of this substance, upwards of an inch in length; its form is that of a rhombic dodecahedron with its acute solid angles replaced by tangent planes. Its hardness is a little below that of feldspar, and its specific gravity and form approximate it to the Genus Garnet, among whose species it will probably receive a place in the Natural History system. When freshly broken, it presents an asparagus green color: on a

short exposure to the weather, it changes to a dull yellow, and at length its surface passes to black.

Several doubtful substances have been found in the vicinity of Amity, of which I have taken no notice in the foregoing remarks, and whose character can only be completely elucidated by a better supply of specimens than their localities have as yet afforded.