PLATES

ACCOMPANYING

MR. MORGAN'S REPORT.

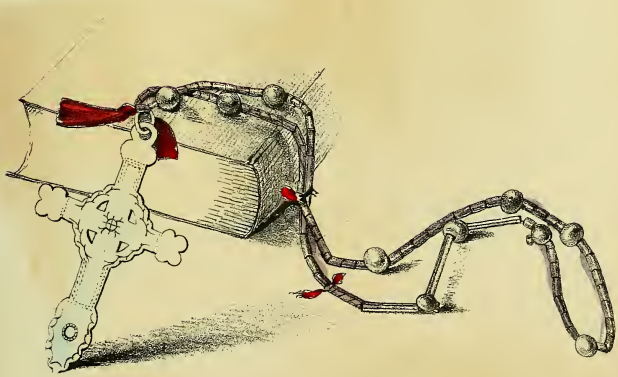
AH-TÄ-QUÄ-O-WEH, OR MOCCASON.

FOR MALE

AH-TA-QUA-O-WEH, OR MOCCASON.

FOR FEMALE.

GOS-TO-WEH OR HEAD DRESS.



GA-DE-US-HA OR NECK LACE

Gise-hă, or Female Leggin.

GÄ-KÄ-AH OR SKIRT.

GA-KA-AH OR SKIRT.

AH-DE-A-DÄ-ME-SÄ OR OVER-DRESS
FRONT

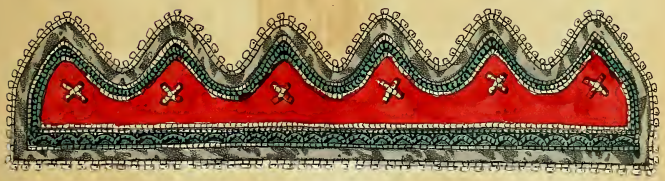
GA-KA-AH OR KILT.

GISE-HĂ, OR MALE LEGGIN.

GA-GEH-TA, OR BELT.

GÄ-GEH-TÄ. YEN-CHE-NO-HOS-TA-TÄ.
OR KNEE BAND

YEN-NIS-HO-QUÄ-HOS-TÄ.
OR WRIST BAND



GA-GEH-TA. YEU-NIS-HÄ-HOS-TA.
OR ARM BAND

GÄ-YÄ-AH OR WORK BAG.

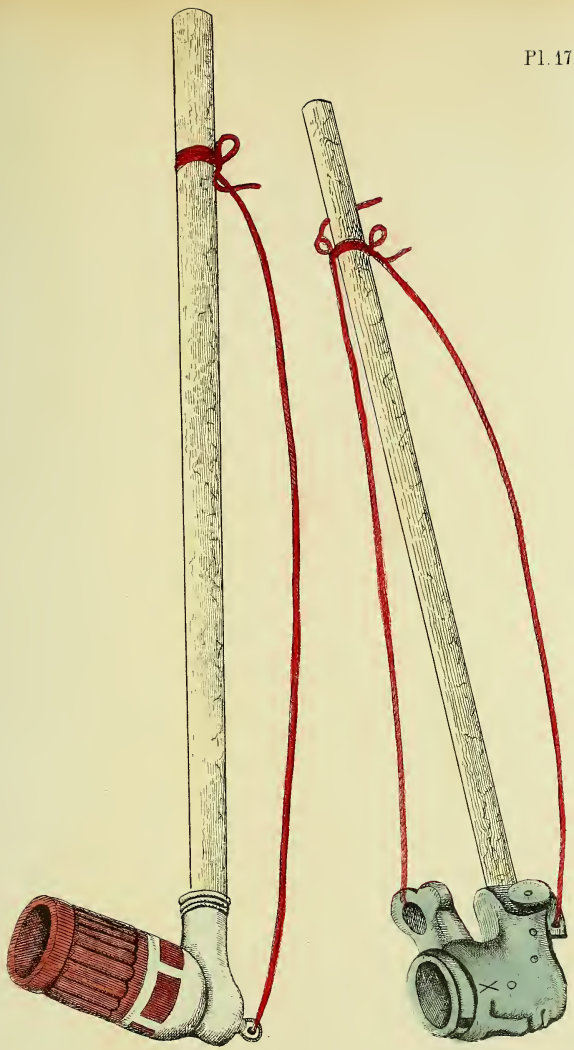
YA-WA-O-DÄ-QUÀ OR NEEDLE BOOK.

YA-WA-O-DA-QUÄ or PIN CUSHION.

GOT-GWEN-DA OR POCKET BOOK.

GA-KA OR BREECH CLOTH.

GA-ON-SEH, OR BABY FRAME.



AH-SO-QUÄ-TÄ.
PIPES

(F.)

DR. HOUGH'S PAPER

ON

INDIAN ANTIQUITIES.

NOTICE

OF

SEVERAL ANCIENT REMAINS OF ART,

IN JEFFERSON AND ST. LAWRENCE COUNTIES,

BY FRANKLIN B. HOUGH, M. D.

In the town of Leray, Jefferson county, there have been found two ancient trench enclosures. One of these is situated near the bank of Black River, a short distance below the little village of "Lockport," (Black River) and is now nearly obliterated by the plough; except the section that crosses the road, and that which lays in a pasture between the road and the river. For the relative situation of this enclosure with surrounding objects, reference is made to the accompanying plan, No. 1.

n the cultivated field north of the road, are found in many places traces of fireplaces, both within and without the trench; and in a circular area to the northeast, several skeletons have been exhumed. From the state of preservation in which these bones are found, it is inferred that they belonged to the recent tribes of Indians that inhabited the region. No aboriginal settlements were known to exist here at the time of the first settlement by the whites, about fifty years since. The same remark applies to all the other remains of ancient enclosures in Jefferson and St. Lawrence counties.

The other trench enclosure is about one mile north of this, is larger, and like the first, contains in and around it numerous traces of hearths, fragments of pottery, shells of edible fresh water shell-fish, and the bones of men and animals. Its outline is in many places very obscure, and the plough will in a few years efface the last vestige of mound or trench. The adjoining flat was once flowed by a beaver dam, making a shallow pond of several acres in extent. The remains of this dam are still distinct. It is built in a curve, the convex side being up the stream. For the dimensions and topography of this enclosure, see plan No. 2.

In the town of Rutland are vestiges of several ancient works. One of these is on land owned by the heirs of the late James Wilson, and near the residence of Abner Tomlin. The space is still covered with a forest, and trees of several centuries growth are standing upon and within the enclosure. Decayed and fallen trunks of others, of which but slight traces remain, indicate that the present growth of timber has been preceded by another quite as ancient, and carry back the origin of these works to a period exceedingly remote.

The little hillocks formed by fallen trees, have in some places so confused and obliterated the original work, that it is difficult to determine its precise extent. The annexed plan (No. 3) conveys a good idea of the extent and form of this trench enclosure. Great numbers of human skeletons have been found buried in the trench which surrounds the slight mound yet remaining. Within the area have been found graves, and fireplaces; while in the fields around, which have been cultivated, great numbers of flint arrowheads, stone chisels, pipes, and fragments of coarse earthen ware, have been found. Among the charcoal found within the enclosure, charred corn has been found in considerable quantities. The skeletons appeared to have been deposited in something like a regular manner, with their heads to the west, and the knees drawn up to the body. This place is about one mile from the western line of the town of Rutland, and two miles from Black River. There is said to have been found in this locality several years since, a *copper* arrowhead. Whether of ancient or recent workmanship, is not known. If the former, it would indicate an acquaintance with distant localities of that metal, as none has been found, in the metallic state, nearer than the great mineral regions of Lake Superior.

In the year 1842, a collection of human bones, evidently of ancient date, was discovered in Rutland, about three miles east from the village of Watertown, on a commanding height, and in a field owned by Mr. E. Huntingdon.

On removing a circular pile of stones, about three feet high and ten feet in diameter, there was discovered a flat stone, which covered a hole four feet square and two feet deep, filled with bones, thrown promiscuously together. They were evidently nothing but bones at the time of their burial, as the space was too small to have contained so many bodies. Some bones exhibited the marks of teeth, as if they had been gnawed by wild animals.

The surrounding fields contain traces of fireplaces, with much charcoal and charred corn; and the whole appears to bear evidence of an-

cient massacre and pillage, in which an Indian village was destoyed, and the bones of the slain afterwards collected and buried by their friends. The bones were in a tolerable state of preservation, but soon decayed on exposure. It was estimated that there were between thirty and forty skeletons buried here, besides detached bones of animals.

Among fragments of broken pottery found in this vicinity, was an entire pot, having a capacity of about three pints, and the form represented in the sketch.

A fragment of a pipe, containing the representation of a human face on each side, only a part of which remained, was also found; a figure of which is here inserted.

In the town of Macomb, St. Lawrence county, are found three trench enclosures, and numerous places where broken fragments of rude pottery, ornaments of steatite, and beds of charcol and ashes, indicate the sites of Indian villages. It may be proper to state, that this region was not inhabited at the time of its first settlement by the whites.

One of these ruins is on the farm of William P. Houghton, near the bank of Birch creek, and is the one which has furnished the greatest

quantity of relics. Beads of steatite, pipes and broken utensils of earthen, the bones of fish and wild animals, shells, &c., occur, mixed with ashes and bits of charcoal, throughout the soil, within and without the limits of the trench, and have been collected and carried off in large quantities. Cultivation has nearly obliterated every trace of the enclosure, but by the aid of several persons who were acquainted with the locality when first discovered, the accompanying plan (No. 4,) has been drawn, which is believed to represent the situation and extent of this work, before the land was tilled.

The ground formerly occupied by the trench, is at present the site of an orchard, and used as a mill yard.

Reference to this work is made in several gazetteers and "Historical Collections," as occurring on the farm of Capt. Washburn, in Gouverneur, (the former owner of the land, before the erection of the township of Macomb,) and in these it is erroneously stated that rude remains of sculpture occur within the enclosure. No traces of sculpture (except the beads, pipes and other articles,) have ever been found here.

About half a mile northeast of this place, is the trace of another enclosure, but so obliterated by cultivation, that it could not be surveyed with any degree of certainty. It occurs on the farms of Josiah Sweet and William Houghton, the greater portion being upon the farm of the latter.

It is situated on a small stream, the outlet of a tamarack swamp, formerly a beaver meadow; is of an irregular oval figure, and can be traced with tolerable accuracy about 160 paces, which is nearly half of the original circumference, Its longest direction was NNE. and SSW. Numerous fire-beds occur within the enclosure, and in one instance, a quantity of ashes and charcoal was found five feet below the surface. In a field a few rods distant, large quantities of broken pottery, and traces of an Indian village, are found. About three-fourths of a mile from the enclosure first described, (plan No. 4,) there occurs another trench of semi-circular form, and in a far more perfect state of preservation than either of the others. This is on the farm of Robert Wilson, and about 25 rods south of "Wilson's Lead Mine."

For the topography and extent of this trench, reference is made to the accompanying plan, No. 5.

As the land around this has never been ploughed, it has not furnished any relics of interest.

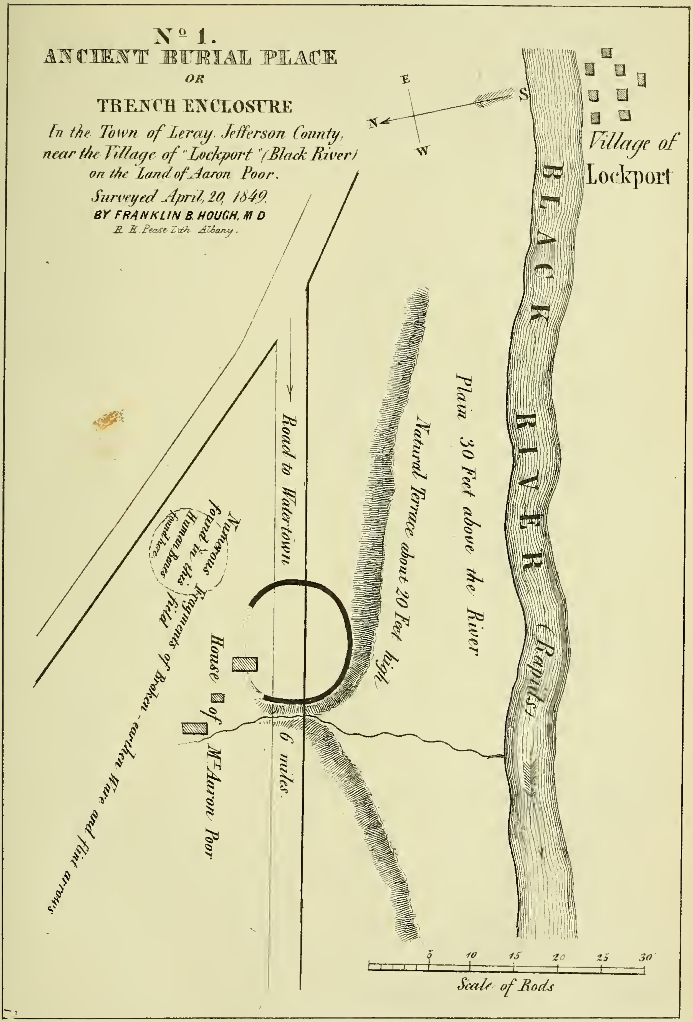
In the town of Massena, St. Lawrence county, is an ancient trench enclosure, on the farm of Josiah C. Bridges, about half a mile south-

west of the bridge over the Racket river, at a place called Racket River P. O. It is on a considerable eminence, about half way between the Racket and Grasse rivers, and three miles from the mouth of the latter. The hill may be fifty feet higher than either river; the ancient work is on the southern declivity of the hill, near the top, and the outer ditch may enclose perhaps an acre. It is nearly square, with the corners projecting beyond the line of the sides; from which it may perhaps be inferred that it was a defensive work, and belonging to a different period from the circular works above described. The bank when first discovered, was surrounded by a ditch about three feet wide, and between one and two feet deep. In the ditch were the remains of old pine trees, some of which must have been at least five hundred years old. Within the enclosure were two elevations, about fifteen feet square, and two feet above the level of the surrounding ground. The location commands a prospect of the country around, in every direction, to a considerable distance.

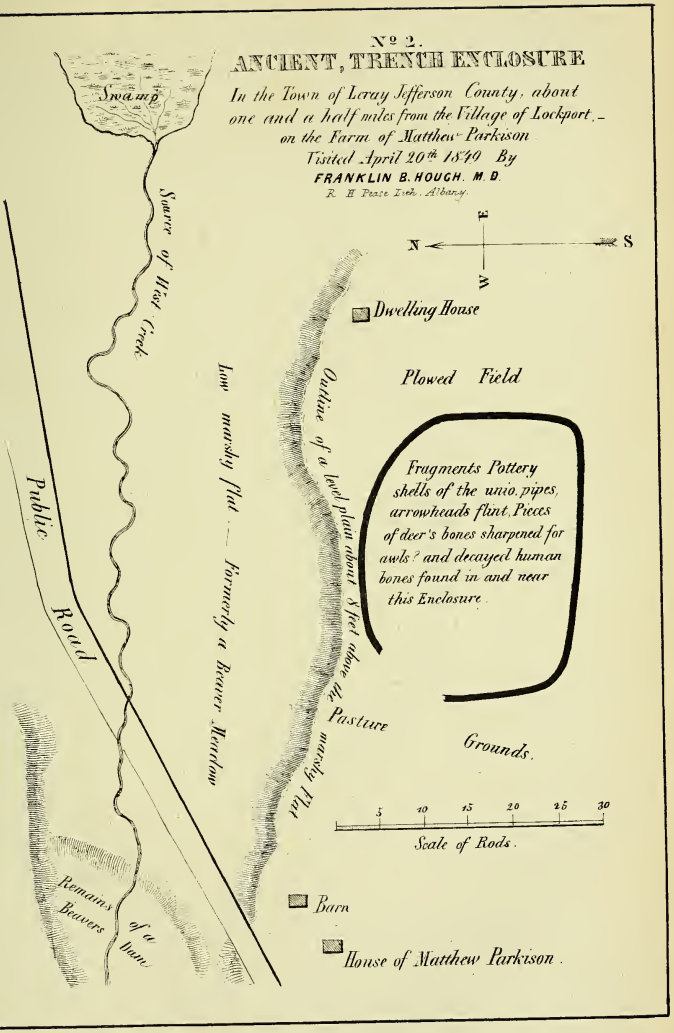
In Potsdam, St. Lawrence county, there existed, on the first settlement of the country, a work similar to the one last described, but which is now nearly obliterated by the plough. It was on the west side of Racket river, about half way from Potsdam village to Norfolk. Like the other, it was situated near the top of an elevation, conspicuous from all the surrounding country. Like it, also, it was quadrilateral; its size was nearly the same, and the vicinity of both furnishes numerous remains of rude pottery, stone axes, flint arrows, and various ornaments wrought in steatite.

The location in Potsdam is about eighteen miles distant to the southwest, from that in Massena, and there is little doubt but that one might be seen from the other, if the intervening timber was cut away.

The foregoing are the only remains of ancient art which the writer has been able to learn of in St. Lawrence county, after making the most diligent inquiries. In Jefferson county there are many others, in the towns of Adams, Ellisburgh, &c., of which it is hoped a satisfactory account will hereafter be given.



N° 1.
ANCIENT BURIAL PLACE
OR
TRENCH ENCLOSURE
In the Town of Leray, Jefferson County,
near the Village of "Lockport" (Black River)
on the Land of Aaron Poor.
Surveyed April, 20, 1849.
BY FRANKLIN B. HOUGH, M D
R. H. Pease Lith Albany.
E
S
N
W
Village of
Lockport
BLACK RIVER
(Rapids)
Plain 30 Feet above the River
Natural Terrace about 20 Feet high
Road to Watertown
6 miles
House of Mr Aaron Poor
Numerous Fragments of Broken-earthen Ware and flint arrows found in this field
Human Bones found here
5
10
15
20
25
30
Scale of Rods


Nº 2.
ANCIENT, TRENCH ENCLOSURE
In the Town of Leray Jefferson County, about one and a half miles from the Village of Lockport, on the Farm of Matthew Parkison
Visited April 20th 1849 By
FRANKLIN B. HOUGH. M. D.
R. H. Pease Del. Albany
N
E
S
W
Swamp
Source of Wad Creek
Dwelling House
Plowed Field
Low marshy Flat — Formerly a Beaver Meadow
Outline of a level plain about 8 feet above the marshy Flat
Fragments Pottery shells of the unio, pipes, arrowheads flint. Pieces of deer's bones sharpened for awls? and decayed human bones found in and near this Enclosure
Public Road
Pasture Grounds.
5 10 15 20 25 30
Scale of Rods.
Remains of a Beavers Dam
Barn
House of Matthew Parkison.

Nº 3

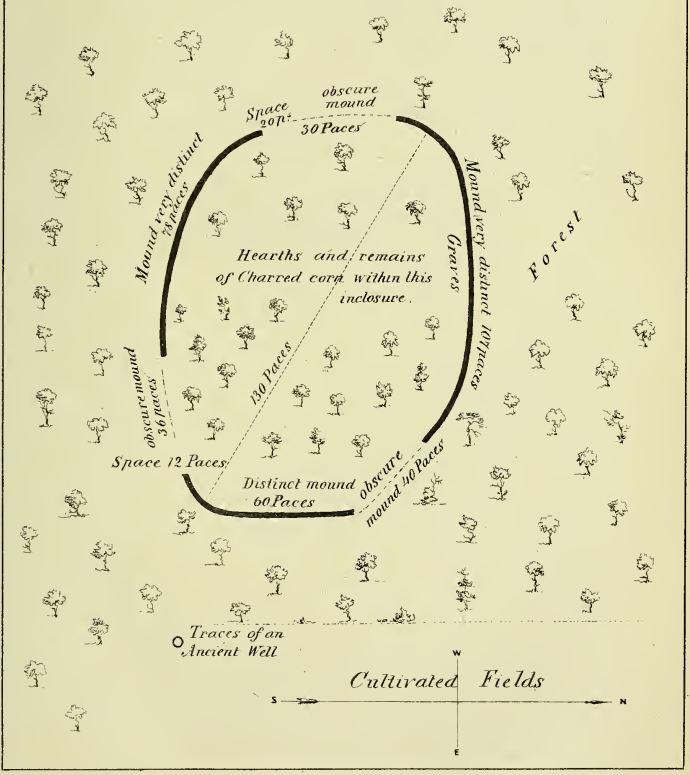
ANCIENT TRENCH ENCLOSURE

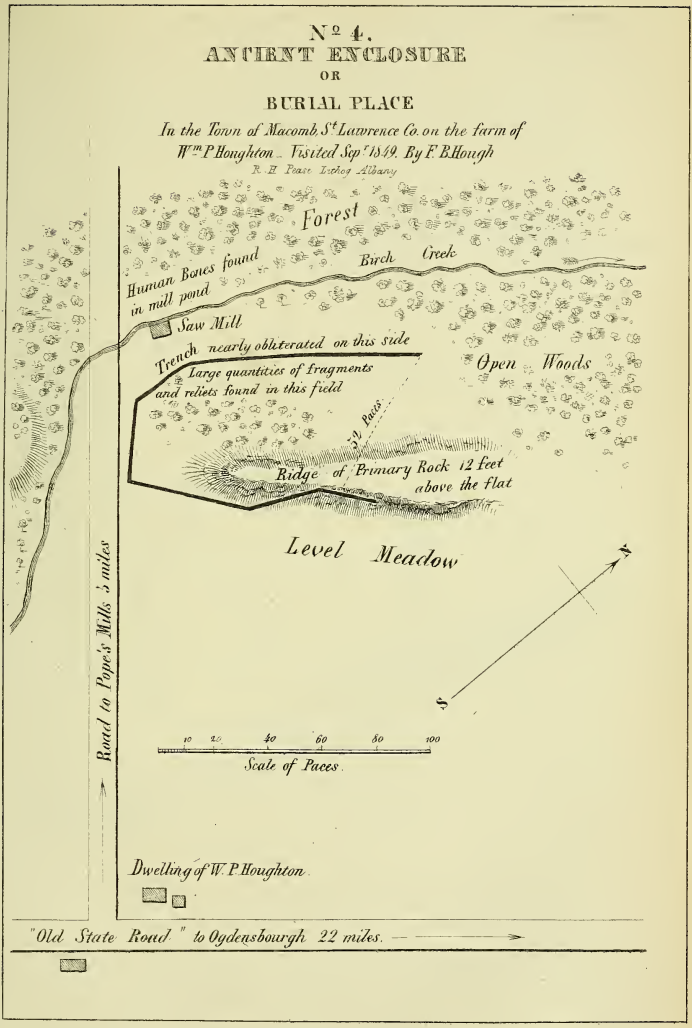
IN THE TOWN OF RUTLAND JEFFERSON COUNTY

near the Residence of Abner Tomlin.

Visited and surveyed June 1849 by F.B.Hough

E.H. Pease Lith. Albany. 1850



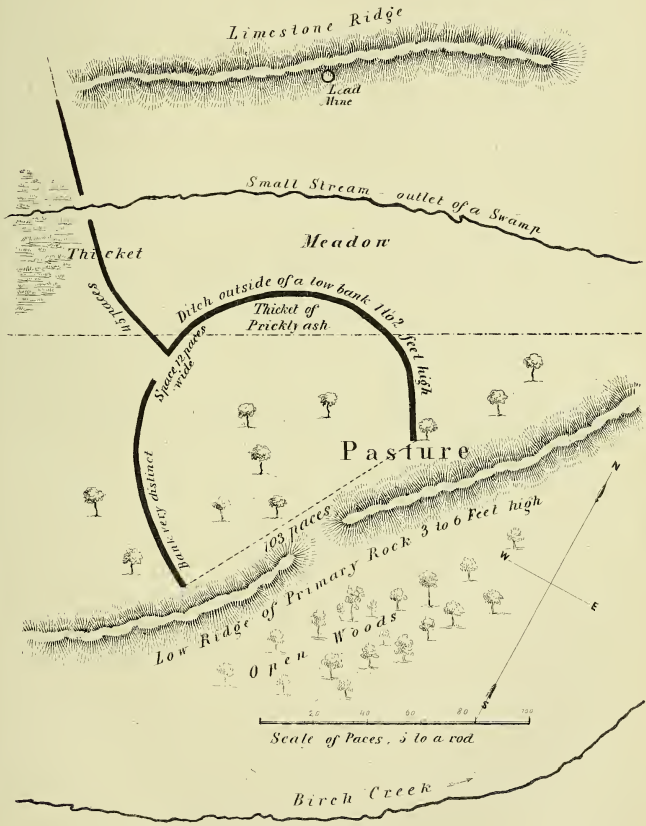

№ 4.
ANCIENT ENCLOSURE
OR
BURIAL PLACE
In the Town of Macomb, St Lawrence Co. on the farm of
Wm P Houghton. Visited Sep.r 1849. By F B Hough
R. H. Pease, Lithog. Albany
Forest
Birch Creek
Human Bones found in mill pond
Saw Mill
Trench nearly obliterated on this side
Large quantities of fragments and reliets found in this field
Open Woods
30 Paces
Ridge of Primary Rock 12 feet above the Flat
Level Meadow
N
S
Road to Pope's Mills 3 miles
10 20 40 60 80 100
Scale of Paces.
Dwelling of W. P. Houghton
"Old State Road" to Ogdensbourgh 22 miles.

No 5

ANCIENT TRENCH ENCLOSURE
or
BURIAL PLACE

In the town of Macomb St Lawrence Co. on the farm of Robt Wilson
Visited and Surveyed Sept 1st 1849 by Franklin B. Hough

R H Pease Lith Albany 1849



DRAWINGS

ACCOMPANYING

DR. HOUGH'S PAPER.

(G.)

REPORT

ON THE

MINERALOGY OF NEW-YORK;

Comprising Notices of the Additions which have been made since 1842:

BY LEWIS C. BECK, M. D.,

LATE MINERALOGIST TO THE SURVEY OF NEW-YORK.

REPORT.

TO THE HONORABLE THE REGENTS OF THE UNIVERSITY.

GENTLEMEN:

On the 2d of June, 1836, I was appointed by Governor MARCY, Mineralogist of the Geological Survey of the State, and was entrusted with that part of the work "which relates to an examination, a scientific description, and a chemical analysis of its soils and minerals."

In the discharge of the duty thus assigned to me, I from year to year visited the most important mineral localities in the State, collected many suites of specimens for the General Cabinet and for distribution to the several colleges, and devoted the rest of my time to arranging the materials collected, and to the analysis of such rare and useful products as seemed worthy of particular examination. At the close of the year 1842, the final report of the results of my investigations, under the title of the Mineralogy of New-York, was made to Governor SEWARD, five annual reports having been previously presented to the Legislature.

Although since the publication of the Mineralogy in 1842, my connection with the survey of the State has ceased, I have still endeavored to keep pace with the progress of this department of science. The additions which I have thus been able to make to the former report are so considerable, that I am induced to offer them to the Regents as a supplement to that work. I consider it as a most fortunate circumstance that the preservation and increase of the invaluable State Cabinet are placed in charge of a Board who duly appreciate the importance of Science, in all its multifarious departments.

I have only further to say, that the arrangement of the following notices is the same as that followed in the Mineralogy of New-York.

Your obedient servant,

LEWIS C. BECK.

RUTGERS COLLEGE, December, 1849.

CLASS I.

ORDER I. COMBUSTIBLE GASES.

SULPHURETTED HYDROGEN.

(Mineralogy of New-York, page 173.)

Since the publication of my account of the Sulphur springs of New-York, several new ones have been discovered; and of those previously known, some have been analyzed. Among these are to be noticed:

The *Bellevue Mineral Spring*, situated two miles below Niagara Falls, a few rods from the Niagara river, where the bank rises perpendicularly from the edge of the stream more than two hundred feet. The water of this spring has been analyzed by Prof. J. Torrey, with the following results in one pint, viz:

Sulphate of lime, - - - - -	3·68 grains.
Sulphate of magnesia. - - - -	1·92 "
Carbonate of magnesia, - - - -	0·76 "
Carbonate of lime, - - - -	0·32 "
Chloride of sodium, - - - -	1·31 "
Traces of iron,	
	7·99 grains.
Sulphuretted hydrogen, - - - -	9·33 cub. inches.
Carbonic acid gas, - - - - -	0·48 "

(*From a pamphlet published by the proprietor of the spring, in* 1842.)

Sylvan, or Iodine Spring, Avon. Livingston county. We have an analysis of the water of this spring, by Dr. James R. Chilton, with the following results in a wine put, viz:

Sulphate of magnesia, - - - -	1·62 grains.
Sulphate of lime, - - - - -	10·05 "
Chloride of sodium, - - - -	12·18 "
Chloride of magnesium, - - -	7·80 "
Carbonate of lime, - - - - -	3·35 "
Carbonate of magnesia, - - - -	2·00 "
Vegetable matter, - - - - -	0·03 "
Iodide of sodium,	
	37·03 grains.
Sulphuretted hydrogen, - - -	2·58 cub. inches.
Carbonic acid gas, - - - - -	0·62 "

(*From an Avon paper, containing an account of the springs at that place.*)

Upon this analysis I have to remark, that if the results are correctly stated, it is one of the most notable that has heretofore been published; at least, in so far as the New-York Sulphur Springs are concerned. The amount of solid matter is unusually large, and it must serve to keep up the high reputation of this favorite watering place.

Sulphur Springs, Sharon, Schoharie county. Three springs at Sharon were analyzed by Prof. Lawrence Reid, of New-York, in 1844, and the results published in the Proceedings of the Academy of Natural Sciences of Philadelphia, vol. 2, p. 120, (for October, 1844.) The following are the contents in a wine pint, the original being in reference to a gallon:

White Sulphur Spring, Sharon:

Bicarbonate of magnesia,	3·00 grains.
Sulphate of magnesia,	4·25 "
Sulphate of lime,	10·67 "
Hydrosulphates of magnesia and lime,	0·37 "
Chlorides of sodium and magnesium,	0·34 "
	18·63 grains.
Sulphuretted hydrogen,	2·56 cub. inches.

Blue Sulphur Spring, Sharon:

Bicarbonate of magnesia,	4·00 grains.
Sulphate of magnesia,	0·94 "
Sulphate of lime,	9·69 "
Chlorides of sodium and magnesium,	0·31 "
Solid contents,	14·94

Magnesia Spring, Sharon:

Bicarbonate of magnesia,	3·81 grains.
Sulphate of magnesia,	2·84 "
Sulphate of lime,	9·50 "
Hydrosulphates of magnesia and lime,	0·06 "
Chlorides of sodium and magnesium,	0·38 "
Solid contents,	16·59
Sulphuretted hydrogen,	0·8 cub. inches.

Prof. Reid states that the temperature of each of the above springs, taken at various times during a four days residence, was invariably 48° Fahr., and was not influenced by changes in the temperature of the atmosphere.

Richland Springs, Otsego county. The analysis of two springs by Prof. Reid, is published in the Proceedings of the Philadelphia Academy of Natural Sciences, for October, 1844. The contents in one wine pint are as follows:

	No. 1, A.	No. 3, C.
Bicarbonate of lime, - - -	2·50 grains.	2·50 grains.
Sulphate of magnesia, - - -	1·25 "	1·25 "
Hydrosulphates of magnesia and lime,	3·75 "	3·38 "
Chlorides of magnesium and sodium,	0·25 "	0·31 "
Sulphate of lime, - - - -	11·25 "	11·62 "
	19·00 grains.	19·06 grains.
Sulphuretted hydrogen, - -	2·57 cub. inch.	2·38 cub. inch.

Sulphuretted springs occur at Rosendale, in Ulster county. One of these has acquired some celebrity. It is on the verge of the south shore of the Rondout creek. It is principally remarkable for the large proportion of chloride of sodium which it contains. The following is the result of the analysis of Dr. James R. Chilton, in one pint of the water:

Chloride of sodium, - - - -	6·69 grains.
Chloride of magnesium, - - - -	0·31 "
Carbonate of magnesia, - - - -	0·32 "
Carbonate of lime, - - - - -	1·18 "
Sulphate of magnesia, - - - -	0·67 "
Sulphate of soda, - - - - -	0·96 "
Sulphate of lime, - - - - -	0·17 "
Hydrosulphurets of sodium and calcium, -	0·26 "
	10·56 grains.
Sulphuretted hydrogen, - - - -	1·51 cub. inches.
Carbonic acid gas, - - - - -	1·75 "

Massena Sulphur Springs. These springs are situated on the banks of the Racket river, in St. Lawrence county. They are somewhat remarkable, and their waters are said to have been very serviceable in cutaneous diseases and in rheumatisms.

Their temperatures are 52° in what is called the warm spring, and 46° in the cold spring.

The following is the composition of these waters in one pint, according to the analyses of Prof. Emmons:

	Warm Spring.	Cold Spring.
Chloride of sodium, - - - -	6·99 grains.	6·20 grains.
Chloride of magnesium, - - -	0·64 "	0·84 "
Chloride of calcium, - - - -	1·03 "	0·47 "
Carbonate of lime, - - - -	2·79 "	1·96 "
Carbonate of ——,* - - - -	1·63 "	1·10 "
Hydrosulphuret of sodium, - - -	——	——
Magnesium and organic matter, -	0·00 "	1·87 "
	13·08 grains.	12·44 grains.

There are three springs within thirty feet of each other, and they possess nearly the same properties. The quantity of sulphuretted hydrogen which they contain, is considerable. *Emmons' American Journal of Agriculture and Science, February*, 1847.

Sour Springs. In the Mineralogy of New York, there are notices of the occurrence of springs charged with sulphuric acid, in various parts of Genesee, Ontario and Niagara counties. Perhaps the most remarkable of these springs, is that which exists in the southwest corner of the town of Byron, where it occurs in a hillock composed of vegetable matter, which has been charred by the action of the acid. It was for a long time supposed that this might be an acid sulphate of some basis, but an analysis which I made of the water proved it to be nearly pure, although very dilute, sulphuric acid. This has recently been published as a new discovery, and seems at this late day to have excited fresh interest. There is now very little doubt in regard to the origin of the acid in this and similar localities. Dumas has shown that sulphuretted hydrogen, mixed with air by the assistance of a porous body, and especially of tannin, and under the influence of a slightly elevated temperature, is slowly converted into sulphuric acid. It is stated that this oxidation of sulphur is observed in the rooms where they take sulphur baths, at Aix, in Savoy; the linen curtains which in the pools serve to isolate the patients, are very rapidly impregnated with free sulphuric acid, and the fabric is strongly acted on if it is kept without being washed. *Millon and Reiset's Annuaire, for* 1847.

*In the published analysis, "Carbonate of lime" is twice repeated, which is undoubtedly an error of the press. Carbonate of magnesia may have been intended.

CARBURETTED HYDROGEN.

(Mineralogy of New-York, pages 128 and 172.)

The work as above quoted, contains a full account of the occurrence of this gas in various parts of the State. Subsequent researches have shed very little further light upon the question of its origin. We have indeed the negative evidence that in the western part of the State, where its evolution is most abundant, it does not arise from the decomposition of coal; and Mr. Hall asserts that "the amount of organic matter, both animal and vegetable, known in this rock, (Medina sandstone,) is so exceedingly small, that it could scarcely be supposed to give rise to the constant emission of this gas. The impervious nature of the lower part of the mass, and the absence of fossils in the next rock below, would preclude the idea of its origin in that direction, as there are no disturbances know in the district." *Report of the Geology of the Fourth Geological District, p.* 44.

One of these gas springs is noticed by Prof. Mather, as occurring at Haverstraw, in Rockland county. *Report on the Geology of the First District, p.* 107.

ORDER II. NON-COMBUSTIBLE GASES.

NITROGEN.

(Mineralogy of New-York, pages 133 and 174.)

Mr. Hall remarks, "that there is scarcely a doubt but the Canoga springs have their origin along a line of fault or fracture in the strata. Those Chateaugay, in Franklin county, are near the junction of the granite and Potsdam sandstone, and in the calciferous sandrock." *Report on the Geology of the Fourth District, p.* 309.

CARBONIC ACID.

(Mineralogy of New-York, page 175.)

ACIDULOUS, OR CARBONATED SPRINGS.

Congress Spring, Saratoga. In the appendix to Fownes' Chemistry, 1845, Phila. edition, I find a table of the anhydrous ingredients in one pound Troy of the water of this spring, by Dr. Schweitzer. The number of substances there given is much larger than that heretofore detected in these waters by other chemists. Among these are, carbonate of strontia, protocarbonate of manganese, sulphate of potassa, nitrate

of magnesia and chloride of ammonium; which are rarely met with under these circumstances. It is to be regretted that the fluid quantity of water analyzed by Dr. Schweitzer is not stated. The whole analysis differs greatly from those previously published.

Empire Spring, Saratoga. This is another of those, so called, new discoveries which are every few years made at Saratoga. That the proprietors of these new springs should find it to their interest to laud their waters as possessing remarkable properties, is not perhaps surprising. But a little reflection must satisfy us that there can be no great difference in the composition of springs which undoubtedly have a common origin.

The spring which has received the above name, was, it is said, partially made known in 1846, under that of *New Congress Spring*. According to the analysis of Dr. Emmons, the saline matters contained in one pint of this water, are as follows:

Chloride of sodium, - - - -	33·71 grains.
Bicarbonate of soda, - - - -	3·85 "
Bicarbonate of lime, - - - -	17·73 "
Bicarbonate of magnesia, - - -	5·25 "
Hydriodate of soda, - - - -	1·50 "
	62·04 grains.

The peculiarities of this water are said to be the remarkably large proportion of hydriodate of soda, and its freedom from any salt of iron. I am apprehensive, however that the proportion of iodine may be overstated in the above table, as I have been unable to detect its presence by the most delicate tests, either in the *raw* water, or in a portion partially reduced by evaporation.

CLASS II.

LIQUID MINERALS, NOT COMBUSTIBLE.

HYDROUS SULPHURIC ACID.

Under the head Sulphuretted Hydrogen, I have already introdueed some remarks in regard to the occurrence of this acid in a dilute form, in Western New-York.

CLASS III.

COMBUSTIBLE MINERALS, NOT GASEOUS.

SULPHUR.

(Mineralogy of New-York, page 181.)

Native sulphur is of common occurrence in the small cavities in the encrinital limestone at the Cold Spring quarries, two miles east of Lockport, Niagara county. *Report on the Geol. 4th Dist., p.* 99.

BITUMEN.

(Mineralogy of New-York, page 182.)

Mr. Hall informs us that fluid bitumen is of common occurrence in the Genesee slate, and with it a bright blue fluid and a substance like spermaceti, but softer. These are volatile, and it has been impossible to preserve any of them. The fluid bitumen and the blue fluid have likewise been noticed in septaria, in the Marcellus slate. *Rep. on the Geol. 4th Dist. p.* 221.

Mr. Hall has a cut of the Oil Spring in Freedom, Cattaragus county. He remarks that the origin of the spring is doubtless from the bituminous matter which is carried down by the water as it percolates through the interstices of the sandstone. *Rep. on the Geol. 4th Dist. p.* 310.

GRAPHITE.

(Mineralogy of New-York, page 186.)

Several localities of this useful mineral occur in Northern New-York, which it is probable will yield an abundant supply. The Ticonderoga deposits are already turned to considerable profit. In the village of Keeseville, at a short distance from these deposits, there are three manufactories of pencil points, which send out several millions annually. Large quantities of the mineral in powder are also consumed for stove blacking, for which purpose it is considered by many equal to the celebrated "British Lustre."

A new method has been recently proposed by Profs. R. E. and W. B. Rogers, for determining the carbon in native and artificial Graphites. For the details, the reader is referred to *Silliman's Journal, May*, 1848; *vol. 5, N. S., p.* 352.

ANTHRACITE.

(Mineralogy of New-York, page 188.)

It is believed that nothing has occurred since the publication of the Mineralogy of New-York, to change the views which were then expressed concerning the very unimportant character of the strata of anthracite which have been found in this State. The anthracite in Herkimer and Montgomery counties, is found in the calciferous sandstone, and it appears in the form of drops or buttons; from which Mr. Vanuxem inferred that its previous nature was bituminous, and that the greater part of the rock had been subjected to heat, not dry, but humid, and which accounts for the numerous siliceous and other products which are common to it. Analysis of this anthracite gave carbon, 86·50; water, 11·50; cream-colored ash, consisting of silica, 2·00. The proportion of water is greater than that obtained from the anthracite of the coal series. *Rep. on the Geol. 3d Dist. p.* 34.

CLASS IV.

ALKALINE MINERALS.

COMMON SALT.

(Mineralogy of New-York, pages 119 and 198.)

This is a product of great importance to the State, and I shall therefore occupy some space in presenting a summary of the information which has accumulated since the publication of the Mineralogy of New-York.

Crystalline form. Common salt sometimes occurs in hopper-form crystals, produced by the symmetrical agglomeration of a multitude of little cubes. The largest surface of these crystals is first formed near the top of the solution. The upper part rises, the solution is thus weakened in the immediate vicinity, and the next row of particles retreats from the margin. The same explanation applies to the succeeding rows.

The manufacture of salt at Syracuse, and the surrounding villages in Onondaga county, has been steadily increasing in importance. The annual produce of the works might still be greatly extended, although it has already reached the considerable amount of nearly 4,000,000

bushels annually. The quality of the salt, has, also, I have reason to believe, been generally improved. Complaints, however, are yet sometimes made on this score, and the prejudice which was formerly entertained against the "Onondaga salt," has not been entirely removed.

More than twenty years since, my attention was directed to the salines of Onondaga county, when I made an analysis of the water, and carefully examined the various modes of manufacturing salt which were adopted. I have at various times subsequently visited these salines, and have devoted much time to the study of all the facts which I supposed would have an influence in improving the manufacture of salt and of increasing the value of the springs. All the information which I collected up to 1842, was embodied in my work. The following additional facts are conceived to be of sufficient interest to be here introduced.

In June, 1844, I analyzed two specimens of salt, the one from the "Hope Factory," in Onondaga county, and the other the "Liverpool, or Ashton." The composition in 1,000 grains was as follows:

Liverpool, or Ashton:

Insoluble matters,	0·25
Sulphate of lime,	11·65
Sulphate of magnesia,	1·56
Chloride of magnesium,	trace.
Chloride of sodium, (*pure salt*)	986·54
	1,000·00

Hope Factory:

Insoluble matters,	0·15
Sulphate of lime,	11·06
Chloride of calcium,	0·38
Chloride of sodium, (*pure salt*)	988·41
	1,000·00

These results, together with those previously given, sufficiently show the superior purity of the samples of Onondaga salt. Their correctness is generally confirmed by the analyses executed by Dr. Emmons. and of which the results are published in the Transactions of the New-York State Agricultural Society, for 1847, p. 281. The complaints which have been made in regard to this salt, can only have arisen from

carelessness in the manufacture. The presence of an undue quantity of moisture, and of certain deliquescent salts, probably constitute the principal grounds of objection. No pains should be spared by the manufacturers to ensure the perfect dryness of the salt, before it is put up into barrels. It should be recollected that sometimes the character of the salt is judged of by the use of a single barrel, which may have been carelessly prepared. Perhaps it is the fact that the Onondaga salt is manufactured by so many different individuals, and is wanting in uniformity, that has operated injuriously and caused much of the difficulty. That many of the samples, and especially those obtained by solar evaporation, are among the purest found in market, there can be little doubt. And the statement which has been made that "the *Salina salt*, after repeated trials, has been entirely thrown aside by the best western butter makers," must have arisen from the fact that there is still a want of due attention on the part of some of the manufacturers, and that the system of inspection is not so perfect as it should be.

The Transactions of the American Institute for 1847-8, contain a valuable communication from Mr. E. Meriam, who has devoted much time to the study of this important article. His paper embodies much information in regard to the quantity of salt imported into the United States, and manufactured at the most considerable Salines, viz: those of New-York and of Virginia.

In adverting to the prejudice which has been entertained against American salt, Mr. Meriam exhibits the subject, to which I have repeatedly directed the attention of the manufacturers, in a striking point of view. The quality of any sample of salt does not so much depend upon the greater proportion of chloride of sodium, (pure salt,) as upon the nature of the other saline matters which are mixed with it. He illustrates this fact by the following statement: "If two parcels of sugar are to be estimated as to their value for family use, one containing 85 per cent pure sugar, and 15 per cent pure silica, (sand;) the other containing 99 per cent pure sugar, and 1 per cent *sulphate of iron*, (common copperas;) the injury done in the latter case would be far greater than in the former. The 1 per cent of sulphate of iron would render the sugar unfit for use, while the 15 per cent of silica would merely reduce its value in that proportion. So it is in regard to the samples of salt. A small proportion of the deliquescing chlorides, (chlorides of calcium and magnesium,) by constantly rendering the salt moist, is a most injurious impurity; while sulphate of lime or gypsum,

although in considerable quantity, detracts very little from the real value of the salt."* The suggestion, therefore, which I have from time to time made in in regard to the removal of these deliquescing chlorides is, of all others, worthy of attention, and I am satisfied that if this was in all cases carefully attended to, no complaint would be heard in regard to the western salt.

Brine Spring, Galen, Wayne county. Some time during the year 1843, a salt spring was opened at a place called Lockpit, within thirty rods of the Erie canal, about eight miles west of Montezuma, and on the westerly border of the great Montezuma marsh. A boring was executed here which attained the depth of about 400 feet. The water obtained from this well is more highly charged with saline matter than any which has heretofore fallen under my notice. The following are the results of an analysis which I made in November, 1843:

1000 grains of the brine contain 247·50 grains of perfectly dry saline matter. Of these 247·50 grains, 59·66 grains consist of chloride of calcium, mixed with very small proportions of chloride of magnesium, sulphate of lime, and oxide of iron. The remaining 187·84 grains are chloride of sodium, or pure common salt.

The proportions in 100 grains of the Lockpit brine, therefore, are as follows, viz:

Chloride of calcium and other impurities, as above,	5·97
Chloride of sodium (pure salt), - - -	18·78
Water, - - - - - - - -	75·25
	100·00

The richest Onondaga brine that I have examined, contains in 100 grains:

* Mr. Meriam seems to take rather too much credit to himself for this very plain proposition, which he thinks many "excellent chemists" have overlooked. But this is a matter concerning which no chemist can be mistaken. All agree that the great objection to the Onondaga salt, arises from the presence of the deliquescing chlorides. But this is entirely owing to the neglect of the manufacturer. With care they can all be removed, and hence if the proportion of chloride of sodium is large as in the case of the Lockpit brine, even if it is mixed with a large proportion of these chlorides, salt may still be manufactured from it, by a close attention to the proper drainage of the salt, and washing it with saturated brine. No better evidence of the correctness of this statement need be given, than the fact that sea water, and the brines from which the best foreign varieties of salt are manufactured, contain considerable proportions of these earthy chlorides. Indeed the Onondaga brines are, perhaps, as free from them as any that are elsewhere used.

Sulphate of lime, &c., - - - - -	0·85
Common salt, - - - - - - -	17·35
Water, - - - - - - - - -	81·80
	100·00

The Lockpit sample, therefore contains a larger proportion of common salt, also of earthy chlorides, usually denominated impurities. Twenty-eight to thirty gallons of brine of this strength, would yield a bushel of merchantable salt.

If this brine should be abundant and the location favorable, salt might be advantageously manufactured from it by the solar evaporation process. Should the mode by boiling be pursued, great care will be required in removing the deliquescent chlorides, by long drainage of the salt, or by washing it with strong brine before it is put up for use.

With this brine is associated small, but very beautiful and transparent crystals of selenite. They seem as if deposited by a water strongly charged with the sulphate of lime. This will account for the small quantity of this salt which is found in the brine. A particular description of these crystals will be given under the appropiate head.

Brine Spring, of York, Livingston county. Prof. Dewey states that this brine gives evidence of a large proportion of iodine, on the application of the usual tests. (*Hall's Report on the Geol. 4th Dist., p.* 315.) I have had no opportunity of repeating these experiments. It is very desirable to ascertain the proportion in which this substance is found.

CLASS I.

ALKALINE EARTHY MINERALS.

CELESTINE.

(Mineralogy of New-York, page 210.)

To the localities of this somewhat rare mineral, I may add its occurrence in projecting points on black marble, at Watertown, Jefferson county. (*Emmons' Rep. on the Geol. 2d Dist., p.* 111.) The fibrous variety described as occurring in the town of Stark, Herkimer county, exactly resembles that from Tornberg, in Saxony.

STRONTIANITE.

(Mineralogy of New-York, page 212.)

This interesting mineral, of which we have heretofore had only one or two localities in this State, occurs, according to F. B. Hough, in considerable quantities in the town of Theresa, Jefferson county. (*Sil-*

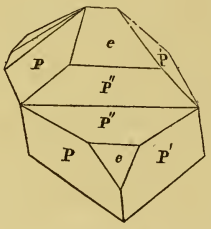
liman's Journal, January, 1848.) Massive strontianite is also said to have been found by Mr. James Heron, at Warwick, in Orange county. *Dana's Mineralogy, 2d ed., p.* 254.

CALCAREOUS SPAR.

(Mineralogy of New-York, page 215.)

Of the crystallized varieties of this mineral, the most interesting localities which have heretofore been found, perhaps, in any part of the world, exist in this State. The finest specimens have been obtained at the mines of Rossie, St. Lawrence county. One gigantic specimen in the cabinet of Prof. B. Silliman, Jr., weighs 165 pounds, and is nearly transparent. *Dana's Mineralogy, 2d ed.*

The accompanying cut is the figure of a twin from Rossie, in the collection of Mr. Alger, of more than a foot in length. *Alger's Phillips, page* 265.



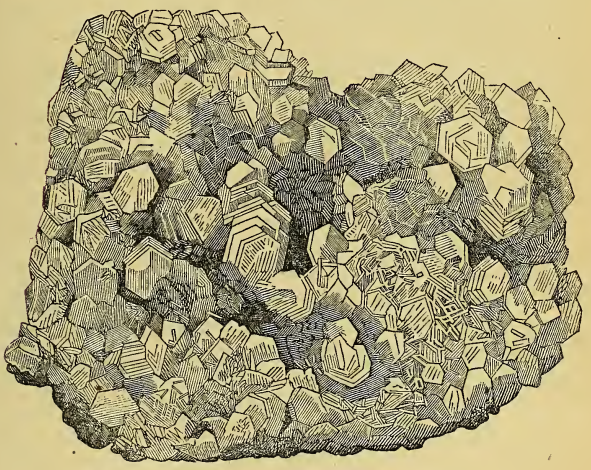
Mr. Dana has given a figure of a crystal differing from any of those contained in my report. *See Sill. Jour.*, xlvi, p. 33.

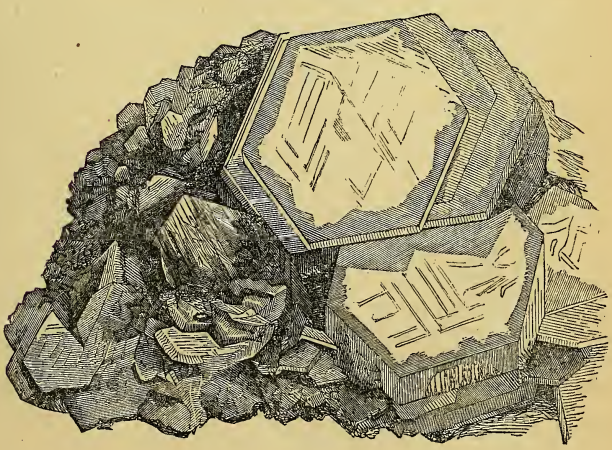
In regard to the form of the calcareous spar from Rossie, Mr. Ashmead has remarked, that in reducing specimens to convenient size for the cabinet, he observed that some of the fractured crystals were susceptible of mechanical division in different directions from those of the planes of a rhombohedron. He succeeded in obtaining as a nucleus, a solid, bounded by six isosceles triangular planes, of similar lustre, or two obtuse, three-sided pyramids, placed base to base; it has but one axis, passing through opposite solid angles; assuming the axis to be vertical, the base is an equilateral triangle. As the faces are not parallel, but inclined to each other, it is susceptible of perfect cleavage in six directions.

"The solid angle of the apex is similar to the obtuse solid angle of the rhombohedron, therefore, by truncating the alternate solid angles of the rhombohedron, this solid is produced." *Proceedings of the Academy of Nat. Scien. of Phila., Feb.* 8, 1848.

Some of the crystals from the Belmont mine, in St. Lawrence, weigh over a hundred pounds. The colors are purple, straw, yellow and limpid. *Emmons' Rep. on the Geol. 2d Dist., p.* 365.

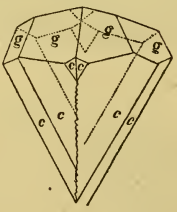
Specimens of Calcareous spar, presented by JOHN E. HENRY.





A novelty in the occurrence of calcareous spar, is the recent discovery of groups of crystals in the form of flat, six-sided tables, of various sizes, from half an inch to two inches in diameter. These crystals have been found in the coarse granite near St. Anthony's Nose, on the Hudson river, during the excavations for the railroad on the banks of that stream. The accompanying cuts are drawn from a specimen presented to the State Cabinet by John E. Henry, which is one of the best that I have seen from that locality. It is more than a foot in length and breadth. I have received several fine specimens from Mr. Cyrus Fountain, of Peekskill, who has been for several years actively engaged in collecting the minerals of Westchester and Putnam counties; and to whom I acknowledge myself indebted for many interesting facts, which he has from time to time communicated.

In addition to the numerous forms heretofore figured from Tompkins quarry, in Rockland county, several others may be added, as having been found at that locality. Among these are the *dodécaèdre*, of Haüy, (Fig. 71, of the Mineralogy of New-York,) and several of its modifications. Also a twin of the same form, represented in the annexed figure. In other crystals, the solid angle of a rhombohedrom passes through the terminal planes of a six-sided prism.



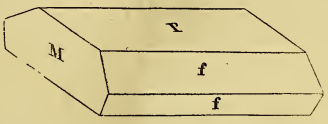
DOLOMITE.

The following mode of distinguishing between dolomite and carbonate of lime, is proposed by M. Zehmen: Pulverize a small quantity of the mineral, and subject it to the heat of a common alcohol lamp, in a platinum spoon. The carbonate of lime acquires, by this treatment, a certain degree of coherence; while the powder of dolomite, which loses carbonic acid, remains without coherence. *Berzelius' Report for* 1847.

GYPSUM.

(Mineralogy of New-York, page 237.)

Beautiful and very perfect crystals of selenite, have been obtained from the deep boring at Lockpit, in Wayne county. They are found imbedded in gypseous marl, which contains chlorides of sodium and magnesium; the whole probably formed by the evaporation of the brine. The crystals are six-sided prisms, from half a line to two lines in diameter, and from one-fourth to five-eights of an inch in length. They are extended in the direction of *f f*; *P* on *f*, 124° 41′ 43″; *f* on *f*, 110° 36′ 34″. They frequently exhibit the primary plane *M*.



A careful trial yielded 21·20 per cent of watar.

Several localities of this mineral occur, according to Prof. Mather. in the First Geological District, but uone of them are of special importance. *See Mather's Rep., p.* 84.

APATITE.

(Mineralogy of New-York, page 239.)

To the localities of this interesting mineral, I have to add its occurrence in Putnam Valley, Putnam county; for which discovery we are indebted to Mr. Cyrus Fountain, of Peekskill.

In the Mineralogy of New-York, I noticed the occurrence of apatite as an associate of magnetic iron ore, at several mines in Essex county. Prof. Emmons states that it is also found similarly at the Rutgers mine, in Clinton county. It is sometimes in large crystals upon the walls of the vein, but it is so extremely brittle that it will be very difficult to procure it in a good form for the cabinet. *Amer. Quart. Jour.*, i. *p.* 60.

Some difference of opinion still prevails, in regard to the modes in which apatite has been formed. Mr. J. D. Dana maintains (*Sill. Jour.* xlvii. 135,) that the apatite found in white limestones, although now in supurbly finished crystals, originated from organic structures, from corals, which, after being enclosed in their rocky prison, were exposed to intense heat, and hence were decomposed, &c. Dr. Emmons objects to this view, as a general theory of the formation, and in support of his

objections adduces the occurrence of apatite in iron ore, and in gneiss, mica-slate, and granite; in which we have, at least. no evidence that these organic structures have existed. Again, the limestones which are the richest in phosphate of lime, are always enclosed in granite or gneiss. *Amer. Quart. Jour.*, i. *p.* 63, 64.

These objections seem to me to be valid. I can see no reason why phosphate of lime, in the form of apatite, may not be an original product, as well as fluor spar, or the magnetic iron ore itself. It is an overstrained view, to refer the formation of every mineral to chemical action exerted upon some previously existing body. And after all, it only removes the difficulty in regard to the formation of these substances one step further, for it may be fairly asked, whence the phosphate of lime in the coral was derived?

FLOUR SPAR.

(Mineralogy of New-York, page 243.)

I have only to add the occurrence of this mineral in small quantities in Gouverneur, St. Lawrence county, reported by Dr. Emmons, and which had escaped my notice in the explorations which I made in that county. *See Rep. on the Geol. 2d Dist. p.* 366.

I may also state, as connected with the general history of this mineral, that it has been found in many of our common waters, and that its existence in recent and fossil bones, has been attributed to this source. See the papers of J. Middleton, Esq., and of Dr. Daubeny, (*Lon. Ed., and Dub. Phil. Mag.*, vol. xxv, p. 14 and 122.)

HYDRAULIC LIMESTONE.

(Mineralogy of New-York, page 256.)

Dr. C. T. Jackson's analysis of the Rosendale hydraulic limestone and cement, will be found in the *Trans. of the Amer. Ass. of Geologists, for* 1845, *p.* 48.

The following fact, noticed by Bezelius, throws some light upon the chemical nature of hydraulic limestones: "When muriatic acid is added to hydraulic mortar, which has been under water three months and reduced to powder, it gelatinizes at the end of a few minutes. Hence it is inferred that there is formed a double silicate of lime and alumina, a native zeolite, which gives solidity to the mortar." *Berzelius' Ann. Report for* 1844.

CLASS VI.

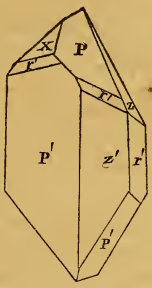
EARTHY MINERALS.

ORDER I. SILICA.

QUARTZ.

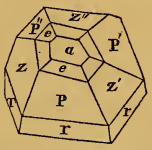
(Mineralogy of New-York, page 257.)

To the full account which is contained in the Mineralogy of New-York, of our remarkable localities of quartz, I have still to make several additions. Herkimer county has furnished such an almost countless number of specimens, which have been distributed among the various cabinets, that it is by no means strange that new and interesting crystalline forms are from time to time discovered. The figure annexed is



from Middleville, and is copied from Mr. Alger's edition of Phillips' Mineralogy, (page 6.) It is similar to the fig. 133, in the Mineralogy of New-York, which is from a crystal found in Greene county.

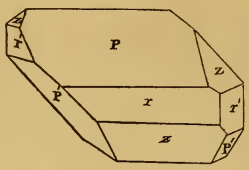
Subsequent examination of the crystalline forms from this county, has led me to doubt whether fig. 152, of the Mineralogy of New-York, and fig. 9 *a*, (page 409) of Dana's Mineralogy, 2d edition, are really true modifications of this mineral. The first was copied from Shepard's



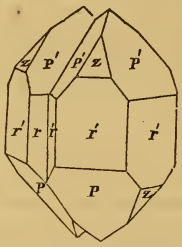
Mineralogy. The faces *o* and *a*, as represented in these figures, seem to be accidental, and to have been formed by the pressure of some por-

tion of the matrix of the crystal during the time of its formation. Individuals exhibiting this peculiarity, are not uncommon, and in some the number of these *so called* planes, is still further increased.

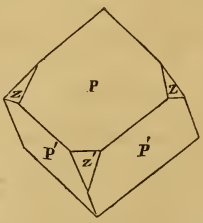
Since the publication of the Mineralogy of New-York, I have received sundry specimens of quartz crystals from St. Johnsville, in Montgomery county, collected by Mr. Israel Smith, Jr. One of these is similar to fig. 156, from Middleville, but with the planes, *z* and *z*



more extended. Also No. 161, of the Mineralogy, and several other more common forms, but the crystals are usually quite small.



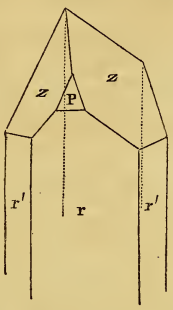
To the figures of crystals heretofore found in the town of Edwards, St. Lawrence county, I have to add the one now introduced, which occurs in a group of dodecahedrons, for which that locality is so remark-



able. It is the same form as that from Ulster county, fig. 172, of my Mineralogy. Some of these crystals have blades of specular iron

diffused through them, like the masses of anthracite found in those from Herkimer county. Occasionally they appear almost like crystals of specular iron itself, but with the form of quartz. It is probably to the disintegration of this ore that the ochery and cavernous appearance of these crystals is to be ascribed.

The Natural bridge, in Lewis county, has furnished opaque crystals of quartz of considerable size, and presenting some interesting modifications. To those already given, I can now add that which is here figured, and which is remarkable, as exhibiting only three terminal faces.



According to Vanuxem, *hyalite* is found in the Potsdam sandstone, half a mile below Canajoharie, in Montgomery county. *Report on the Geol. 4th Dist., p.* 29.

TABULAR SPAR.

(Mineralogy of New-York, page 270.)

Dr. Emmons states that fine specimens of this rather rare mineral are found in Keene, Essex county. *Geology of the 2d Dist., p.* 286.

NEMALITE.

(Mineralogy of New-York, page 272.)

Prof. Connell has recently analyzed this mineral. His results are very different from those of Dr. Thomson, but he operated upon a very small portion. They are as follows, viz: Magnesia, 57·86; protoxide of iron, 2·84; silica, 0·80; water, 27·96; carbonic acid, 10·00; = 99·46. He supposes the formula to be, 5 Mg O, H O + Mg O, $C O_2$ H O.

This gives: magnesia, 61·67; water, 27·24; carbonic acid, 11·09;= 100. It effervesces sensibly in acids, and contains only a minute quantity of silica. *Proceedings of the British Association, for* 1846.

I cannot but think that the specimen analyzed by Prof. Connell must have been impure. His formula is too complex.

A more recent analysis of this mineral by Mr. J. D. Whitney, shows it to be a fibrous variety of the hydrate of magnesia, or brucite. It afforded him magnesia, 62·89; protoxide of iron, 4·65; carbonic acid, 4·10; water, 28·36. A small portion of magnesia is replaced by protoxide of iron. The formula of brucite (Mg H) requires magnesia, 69·67; water, 30·33. *Jour. Bost. Soc. Nat. Hist.* 1849, *p.* 36.

SERPENTINE.

(Mineralogy of New-York, page 272.)

Subsequent examination has satisfied me of the protean forms of this mineral, and would lead me to receive with distrust the *dermatin* and *kypholite* proposed by Breithaupt, and the *hydrophite* and *picrophyll* of Svanberg. *Marmolite* should certainly be united with serpentine, and the same may be said of all the minerals included under the general name of *magnesite.*

The supposed crystalline forms of this mineral, are, probably, in most cases, pseudomorphs. Some of these have heretofore been noticed. Kersten has examined a specimen of serpentine from Schwarzenberg, which is remarkable, as being a pseudomorph in the crystalline form of garnet. The crystals are blackish green, and contain a mixture of 82·50 of serpentine, and 17·50 magnetic iron ore, which can be separated by the magnet. The serpentine was composed of silicic acid, 41·50; magnesia, 40·34; protoxide of iron, 4·10; oxide of manganese, 0·50; soda, 0·42; water, 12·87. *Berzelius' Annual Report,* 1847.

Upon a comparison of specimens, I find that some of the varieties of serpentine from Phillipstown, (Heustis' farm) in Putnam county, closely resemble those from Smithfield, Rhode Island, and which are usually labelled *nephrite.*

CHONDRODITE.

(Mineralogy of New-York, page 281.)

Two new localities of this mineral are to be added to those heretofore given. The one in Schroon, Essex county, and the other in Carmel, Putnam county.

I have also to add, that Dana (*Mineralogy*, 2*d ed.*, *p.* 388,) gives a figure of a crystal of chondrodite, drawn from a specimen in the collection of J. A. Clay, Esq., of Philadelphia, and obtained in Orange county, New-York.

PYROXENE.

(Mineralogy of New-York, page 286.)

A fine locality of this mineral has been found in the town of Fine, St. Lawrence county. The crystals, though not perfectly smooth, are still well formed, and more than a yard in length! *Emmons' Jour. of Agriculture*, iii., p. 158.

Pyroxene, as is well known, presents a great variety of forms; distinct names have been applied to many of these varieties, and some have even been described as distinct species. The researches of mineralogical chemists have resulted in the reduction of many of these supposed distinct minerals to one species. Dana has, I think, carried this further than any author; for he not only places under *pyroxene*, diopside, pyrgom, sahlite, coccolite, jeffersonite, and hedenbergite, in which I concur, but he also ranges with it diallage and hypersthene; concerning the propriety of which I still have much doubt. If this wide scope is given to the mineral in question, there seems to be no reason why its limits should not be still further extended, and made to embrace many other species.

Hudsonite, proposed in the Mineralogy of New-York as a new species, (p. 405) is thought by Dana to belong to the pyroxene family, and to be very near to hedenbergite. It is certainly more closely allied to the latter mineral than to any other, although it is remarkable for the large per centage of oxide of iron which it contains. The circumstances of its being found in a gangue of quartz, from which it is easily seperable, induced me to believe that this was not an accidental ingredient. I regret that I have not yet obtained any specimens which admit the determination of its crystalline form, as this would conclusively settle the point in dispute. Its cleavages, as far as they can be determined, certainly resemble those of pyroxene. But chemical composition ought also to have some weight in the determination of specific distinctions. No one, however, who has a just appreciation of the true interests of science, should hesitate to abandon an opinion which he has advanced, when it is found to be inconsistent with facts subsequently made known. The useless multiplication of species, and the introduction of arbitrary names in natural history, is especially to be avoided.

From an article in the Newburgh Telegraph, it appears that the Rev. R. G. Armstrong has obtained from a locality in the town of Monroe, Orange county, a crystal of pyroxene nearly eight inches in length, and fifteen and a half in circumference. This is one of the largest crystals of this mineral heretofore noticed. It may be remarked, however, that these specimens from Orange county, although remarkable for their size, want the finish which give such beauty to the crystals from some other localities.

In regard to the steatitic-pyroxene, the Rensselaerite of Dr. Emmons, I have nothing further to add, except a reference to the localities cited in the *Report of the Geol. 2d Dist., pages* 350 *and* 365. I believe it is now generally admitted that the views presented in my Mineralogy (p. 297) are correct. It is undoubtedly a mixed mineral, containing steatite or serpentine in variable proportions, but usually presenting the cleavages of pyroxene. It is in fact a pseudomorph on a large scale, as it sometimes occurs in mountain masses.

HORNBLENDE.

(Mineralogy of New-York, page 298.)

This species is so abundant, that with the increasing attention paid to our mineral resources, new localities must from time to time be discovered. No remarkable crystalline forms, however, have come to my knowledge, since the publication of the Mineralogy of New-York. Some researches have been made by Dr. Blum, on the pseudomorphs of hornblende and other minerals, which are worthy of being carefully studied by the mineralogist. A fact mentioned by him, which particularly interests us, is that of a greenish white augite, (pyroxene,) in the Leonard collection, which he supposes to have undergone a change from hornblende. This he says is indicated, both by its structure and analysis. *See Sill. Jour.*, xlviii., p. 78.

The analysis of a variety of asbestus, (rockwood) from Staten Island, gave the following results, viz: Silica, 55·20; magnesia, 30·73; oxide of iron, 11·82; water, 2·25. The specimen is of the compact kind, and had a greenish color, with a kind of cleavage resembling that of crystalline hornblende. The above composition is very near that of a specimen of rockwood from the Tyrol, analyzed by Dr. T. Thompson.

Mountain cork and mountain leather, usually placed under hornblende, probably belong to some other species, if not themselves distinct.

HYPERSTHENE.

(Mineralogy of New-York, page 309.)

Damour has published an analysis of a specimen of this mineral, from Labrador; the following are the results: Silica, 51·36; protoxide of iron, 21·27; magnesia, 21·31; lime, 3·09; protoxide of manganese, 1·30; alumina, 0·37. *Phil. Mag., April*, 1845.

A specimen from Orange county, known by the name of hypersthene, is foliated, has a brownish color, and is not unlike feldspar in its appearance. Upon analysis it was found to contain the following ingredients, vic: Silica, 59·50; oxide of iron, 12·00; magnesia, 27·75; (not a trace of lime.) In composition this mineral is almost identical with Klaproth's bronzite, the hemiprismatic schiller spar of Jameson, (*Man. of Mineralogy, p.* 166,) and with the anthophyllite of Thompson, (*Outlines of Mineralogy, &c.*, ii., p. 206.) Some obscurity, therefore, still rests upon this species. As before stated, Dana unites hypersthene with pyroxene; but this, it seems to me, is scarcely allowable in the present state of our knowledge.

ORDER II. ALUMINA.

SPINELLE.

(Mineralogy of New-York, page 315.)

To the localities of this interesting mineral heretofore given, may be added its occurrence in Schroon, Essex county, in pink-colored crystals. (*Emmons' Rep. on the Geol. 2d Dist., p.* 227.) I have also received regular octahedrons of spinelle, having a black color, from Carmel, in Putnam county.

I must again refer to the paper of Dr. Blum, on pseudomorphous minerals, (*Sill. Jour.*, xlviii., p. 73,) for a notice of the soft spinelles described in my report, (p. 318.)

AUTOMALITE.

(Mineralogy of New-York, page 319.)

In regard to this mineral, whose existence as a New-York species is very doubtful, I have to state that recent examinations have rendered it probable that it is identical with dysluite. The two minerals pass into each other, and the difference in hardness, color, specific gravity, &c., can thus be accounted for by the well known fact of the isomorphous

replacement of the constituents of certain minerals, the crystalline forms of which remain the same. *See Memoirs Bost. Nat. Hist. Soc.*,ii., p. 88

GIBBSITE.

(Mineralogy of New-York, page 320.)

Hermann, of St. Petersburgh, has announced that the constitution of gibbsite was that of a hydrous phosphate of alumina, and that the composition assigned to gibbsite by Torrey, belonged only to the hydrargillite of Rose. Prof. B. Silliman, Jr., has repeated the analysis of this mineral, from Richmond, Mass., and finds it to correspond to the formula first given, which requires:

Alumina, - - - - - - - -	65·800
Water, - - - - - - - -	34·200
	100·000

And the mean results of his analysis correspond very closely to the calculated per centages. The phosphoric acid is like the magnesia, iron and silica, contained in gibbsite, only as a contingent impurity. The gibbsite, he says, is sometimes mixed with allophane, which will account for the presence of silica; and he thinks the silica mentioned by Dr. T. Thompson, in his analysis, was derived from the same intermixture of the two species. There is now little doubt that the hydrargillite of Rose, and gibbsite, are identical; the former is the crystalline, the latter the amorphous variety of the same species. *Sill. Jour., July*, 1849, *page* 411.

IDOCRASE.

(Mineralogy of New-York, page 321.)

Subsequent examination has satisfied me that the mineral called idocrase, from Hall's, on Muscolunge lake, in Jefferson county, is pyroxene. The measurement of the primary is, as nearly as can be determined, 87° and 93°; the replacing planes, 134°. Its color, although peculiar, is not unlike that of the pyroxene found on the Rossie turnpike, two miles from the village of Oxbow, in Jefferson county.

GARNET.

(Mineralogy of New-York, page 323.)

The variety colophonite, is reported by Dr. Emmons as being abundant at Johnsburg, Warren county. *Rep. on the Geol. 2d Dist., p.* 192

SCAPOLITE.

(Mineralogy of New-York, page 329.)

Imperfect crystals of scapolite have been found in Putnam Valley, Putnam county, by Mr. Cyrus Fountain.

In regard to the specimens heretofore described, I have to remark, that some of those from Brush's, in Monroe, Orange county, resemble the wernerite, from Franklin, N. J. They are in the form of small, irregularly crystallized masses, and are imbeded in a reddish carbonate of lime. I formerly supposed the mineral to be apatite. The following notices may, also, be here itroduced:

The specimens from Fall Hill, in Orange county, melt into a darker colored globule than any others which I have tried. They are associated with a dark colored pyroxene, which will account for their larger proportion of oxide of iron.

Analysis has proved that the specimens of scapolite from Ticonderoga, in Essex county, are similar in composition to some of the foreign ones, although the proportion of alkaline matter is larger.

Nicol, in his Manual of Mineralogy, published during the present year, describes nuttallite as a distinct species. A recent analysis made in the laboratory of Prof. B. Silliman, Jr., confirms the statement made in my report, of its identity with scapolite. The composition of a specimen from Bolton, Mass., as thus determined, is as follows:

Silica,	45·79
Alumina,	30·11
Peroxide of iron,	1·86
Lime,	17·40
Potash,	3·49
Soda, Manganese;	trace.
Water,	1·63
	100·28

(*Silliman's Journal, Nov.*, 1849, *p.* 394.)

FELDSPAR.

(Mineralogy of New-York, page 334.)

The recent researches of Erdmann, in regard to this mineral, deserve to be noticed. The following abstract is given by Berzelius, in his Annual Report for 1847. He makes four different species of feldspar, which are easily distinguished from each other:

1. *Orthoclase.* (feldspar, with a base of potash.) Sp. gr. from 2·50 to 2·60. Before the blowpipe it melts with more or less difficulty, and yields a bubbly or tuberculous pearl.

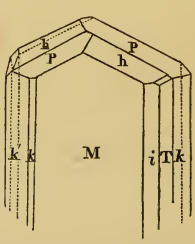
2. *Albite*, (feldspar, with a base of soda,) Sp. gr. 2·59 to 2·65. Before the blowpipe it melts more easily than the preceding, and gives a bubbly, semitransparent pearl.

3. *Oligoclase*, (natron spodumen.) Sp. gr. 2·61 to 2·69, and rarely 2·70. One of the faces of cleavage presents very fine striæ. It melts easily, and gives a pearl free from bubbles, sometimes transparent, sometimes opaline, and sometimes like enamel. These differences seem to be due to the proportions of lime which they contain.

None of the three above described, are sensibly acted on by muriatic acid.

4. *Labradorite.* This sometimes presents a striated surface, like the preceding. Sp. gr. from 2·67 to 2·73. It melts more easily than oligoclase, and gives rise to a transparent or opaline pearl; but its most distinctive character is its solubility, when pulverized, in muriatic acid.

Mr. Alger, in the supplement to his edition of Phillips' Mineralogy, (page 420) gives a figure of a twin crystal of feldspar from Hammond, St. Lawrence county. It has smooth planes, is very perfect, and is one of the simplest of the twin forms.



To the locality of crystallized albite, noticed in my Mineralogy, I must now add the hemitropic form found by Dr. Emmons in the Coal Hill mine, St. Lawrence county. *Rep. on the Geol. 2d Dist., p.* 366.

STELLITE.

(Mineralogy of New-York, page 342.)

The mineral from the trap region of Bergen, in New-Jersey, and Piermont, in Rockland county, New-York; which I supposed to be the stellite of Dr. Thomson, has been the subject of some discussion.

It is stated by Dana, (Mineralogy, 2d ed.,) that Mr. A. A. Hayes has analyzed the same mineral with quite a different result, as follows: Silica, 55·96; lime, 35·12; soda, 6·75; potash, 0·60; alumina and magnesia, 0·08; protoxide of manganese, 0.64; water, (hygrometric) 0·16;=99·31. Dana adds that the large per centage of soda, and the proportion of silica and lime, would seem to ally the species to *pectolite*; from which, however, it appears to be removed, by containing no water. He has compared specimens of the stellite from Bergen with the foreign pectolite, and finds them closely similar in external characters; moreover, Frankenheim makes pectolite an anhydrous mineral, stating that the water varies, and is not an essential ingredient.

Mr. Alger, in the supplement to his edition of Phillips' Mineralogy, (p. 624) quotes the same analysis of Hayes, and adverts to the very close resemblance in composition and general physical characters, between this mineral and three others: the wollastonite and stellite of Thomson, and the pectolite of Von Kobell, excepting in its entire freedom from water, and its more perfect crystallization. "They undoubtedly all constitute but one species, and while they may be most appropriately designated under the name of stellite, the chemical title of *anhydrous lime* (*mesolite*) is naturally suggested by their crystallographical identity with mesolite, as established by Mr. Teschemacher."

In the number of Silliman's Journal for July, 1849, is a short notice of pectolite and stellite, by Mr. J. D. Whitney. "Pectolite occurs in Isle Royale, Lake Superior, in spheroidal masses, consisting of delicate silky fibres radiating from a centre resembling foreign specimens from Monte Balco. The stellite of Bergen Hill, New-Jersey, analyzed by Beck, has the external characters of pectolite; and also, as Whitney shows, its composition. The following are the results of four analyses:"

	Isle Royale.		Stellite from Bergen Hill.	
	I.	II.	III.	IV.
Silica, - -	53·45	55·66	54·00	55·00
Lime, - -	31·21	32·86	32·10	32·53
Soda, - -	7·37	7·31	8·89	9·72
Potash, - -	trace.	.....	trace.	.....
Alumina, - -	4·94	1·45	1·90	1·10
Water, - -	2·72	2·72	2·96	2·75
	99·69	100·00	99·85	101·10

The stellite of Thomson, Mr. Whitney observes, was probably impure pectolite, and he refers Thomson's wollastonite to the same species.

The above analyses do not differ much from mine, of the Bergen Hill mineral, except in the presence of soda, which I still think may, in some specimens, be replaced by magnesia. They confirm the results of Von Kobell, and of my own analysis, in regard to the presence of water.

PHAKOLITE.

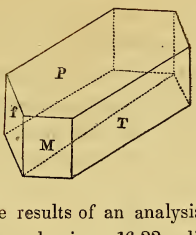
This mineral, which has been usually considered as a variety of chabazite has been found by Mr. Alger, among specimens of minerals from New-York Island. The crystals are very perfect double six-sided pyramids, implanted on carbonate of lime. They have a wax yellow color, a waxy lustre, and are transparent. They show the incipient modifications, from the primary rhombohedron, to the six-sided pyramid. *Memoirs of the Boston Nat. Hist. Soc.*, ii., p. 86.

It may be remarked that phakolite, although it has a primary form differing only a few minutes in its angles, compared with that of chabazite, is somewhat unlike in its chemical composition. Breithaupt supposes it to be a distinct species; while Rammelsberg, from his own analysis, is disposed to regard it as a mixture of acadiolite and scolesite, with an additional atom of water.

HEULANDITE.

(Mineralogy of New-York, page 346.)

Well defined crystals of heulandite, with a form similar to fig. 335, of the Mineralogy of New-York, have been found with stilbite, in the fissures of gneiss, in 23d street, New-York.



The following are the results of an analysis of this mineral by M. Damour: Silica, 59·64; alumina, 16.33; lime, 7·44; soda, 1·16: potash, 0·74; water, 14·33. This composition indicates that heulandite should be ranked with the zeolites. *Philosophical Mag. and Ann.*, xxix., p. 556.

It seems to be now settled, that the *Lincolnite* of Prof. Hitchcock, (*Final Report on the Geological Survey of Massachusetts, p.* 662,) is identical with heulandite. Crystals, exactly like those described by Hitchcock, have been found in gneiss on New-York Island. *Alger, in Sill. Jour.*, xlvi., p. 235.

PREHNITE.

(Mineralogy of New-York, page 349.)

Since the publication of the Mineralogy, this mineral has been found in the fissures of gneiss in 23d street, New-York. Dr. Emmons also reports localities near Adirondack, and in Keene, Essex county. *Rep. on the Geol. 2d Dist., p.* 31.

LAUMONITE.

(Mineralogy of New-York, page 351.)

It is well known that this mineral when exposed to the atmosphere, soon loses its transparency, and becomes so soft as to yield to the finger nail. According to M. M. Malaguti and Durocher, this efflorescence is owing to the loss of a small quantity of water. Specimens of it did not suffer the least alteration when kept for several months in a moist amosphere. Crystals of laumonite altered, recovered their original transparency and appearance by being immersed in water, and these same crystals, after drying and exposure to dry air, behaved like crystals recently taken from their locality. *Phil. Mag. and Ann.* xxix, p. 555.

Dana states that the rapid decomposition to which this mineral is liable may be prevented by dipping the specimen in a thin solution of gum arabic, by means of which it is preserved from contact with the air. *Mineralogy, 2d ed.. p.* 326.

CHABAZITE.

(Mineralogy of New-York, page 353.)

This mineral has been found associated with mezotype, in fissures in the gneiss, 23d street, N. Y. At Haerlem it also occurs in yellow or brownish crystals with stilbite and heulandite.

EPIDOTE.

(Mineralogy of New-York, page 354.)

To the particular localities heretofore given, I have to add the occurrence of fine, though small crystals, in the gneiss near the old penitentiary, in 23d street, New-York.

TOURMALINE.

(Mineralogy of New-York, page 356.)

Crystals with very short prisms, generally resembling fig. 360 of the Mineralogy of New-York, but variously modified, have been found in the white limestone, near Amity, in Orange county.

Green and brown crystals of tourmaline are credited to Chester, in Warren county. *Rep. on the Geol. 2d Dist., p.* 64.

BUCHOLZITE.

(Mineralogy of New-York, page 364.)

In my remarks upon this mineral I stated, that its identity with sillimanite, wihich was urged by some mineralogists was inconsistent with the difference in chemical composition. This arose chiefly from the fact that Muir, under the direction of Dr. T. Thomson, found sillimanite to contain a large per centage of zirconia. But the early analysis of Bowen and the more recent ones of Prof. Connell, Prof. Norton and Erdmann, failed to detect the presence of this earth. The composition of a specimen of sillimanite from Chester, Penn., as given by Erdman, is, silica, 40·08; alumina, 58·88; protoxide of manganese, 0·74, which approaches to that of andalusite and gives the same formula.

According to a more recent notice of Dr. T. Thomson, sillimanite and fibrolite are identical with bucholzite. The species should be distinguished by the name of *silicate of alumina.* (*Phil. Mag. and Ann.*, xxvi, p. 536.) Rammelsberg has also shown the identity of bucholzite with xenolite of Nordenskiöld.

Finally, to complete the catalogue of identical minerals, M. Staff states that his analysis of a specimen of sillimanite from Chester, Conn., gives the formula of kyanite, which again is supposed to be identical with the disthene of Haüy. The recent analyses of Prof. B. Silliman, Jun., also show the identity of sillimanite, bucholzite and fibrolite, with kyanite. *Sill. Jour., Nov.*, 1849.

If these views are correct, the following minerals should be reduced to one species, viz:

Bucholzite,	Andalusite,
Sillimanite,	Kyanite,
Xenolite,	Disthene.
Fibrolite,	

Sillimanite has been found in the town of Yorktown, Westchester county, about ten miles north-east of Sing-Sing, near the road leading from Pine's brige to Yorktown post office, associated, with monazite, tremolite and magnetic iron. The crystals are distinct and run through the iron ore; they are often 6 or more inches in length, much bent and fractured, as they are at Norwich and Chester, Con. (*Sill. Jour.* xlvi, p. 207.) I have received specimens from my friend, Mr. Cyrus P. Fountain, of Peekskill.

According to the analysis of Prof. Norton, of Yale College, the Yorktown sillimanite contains,

Silica, - - - - - - - -	37·70
Alumina, - - - - - - - -	62·75
Oxide of iron, - - - - - - -	2·29
	102·74

(*Dana's Mineralogy*, 2*d ed.*, *p.* 378.)

PITCHSTONE.

(Mineralogy of New-York, page 367.)

This is perhaps the most appropriate place for the introduction of a notice of a mineral found by Dr. Emmons at Johnsburg, in Warren county. It is called *obsidian*, and is described as occurring in a trap dyke at the line of contract of the gneiss, in which it is embraced. The mineral has a bluish black color, a vitreous lustre and a conchoidal fracture. It is only about an inch wide on both sides of the dyke. Dr. Emmons says, "it is to be considered as a part of the dyke, which for some cause was more perfectly pure, and in consequence of more sud-

den cooling from contact with the rock, assumed the more vitreous form of obsidian." *Report on the Geol. 2d Dist., p.* 184.

An analysis of a specimen of this substance gave, silica, 55.50; oxide of iron, 32.00; lime, with a minute portion of alumina, 6.90; magnesia, 4.62. If this is a correct view of its composition, it differs considerably from the varieties of obsidian heretofore examined. But I apprehend that its chemical character will be found liable to great variations.

PYROPHYLLITE.

(Mineralogy of New-York, page 368.)

Well characterized specimens of this beautiful mineral have been found in Phillipstown, Putnam county. It is supposed to be a mechanical mixture, consisting of greyish green foliated scales, looking like talc or mica in a greyish white, mealy base. It is, however, very distinct in composition. Mr. J. E. Teschemacher thinks it identical with vermiculite. *Proceed. Bost. Nat. Hist. Soc'y*, 1843.

MICA.

(Mineralogy of New-York, page 369.)

This mineral is exceedingly abundant, and fine specimens have been found in various parts of New-York, many of them of great beauty. Attempts have been made to arrange the multiplied varieties under classes or groups, but these have not been entirely successful. They differ principally in their optical characters; but the difficulty which attends their division founded on these is, that the chemical composition does not always accord with them.

Since the publication of my Mineralogy, I have examined several of the New-York specimens and introduce the following notices, which, although incomplete, may be of some use to those who shall hereafter be induced to take up the investigation.

MARGARITE.

Some of the specimens from Orange county, often ticketed talc, belong to this species. The mineral has a vitreous lustre, a pale, pearly gray color, rather brittle, translucent to subtranslucent. It is associated with chondrodite and pseudomorphs of hornblende. It exhibits only one axis of double refraction and fuses *per se* into a white enamel. Similar specimens occur in the town of Rossie, St. Lawrence county. I have not analyzed these specimens.

The micas with a single axis, so far as I have examined them, are usually more easily fusible than those with a double axis, In thin fragments they curl up under the blowpipe and fuse into a vermicular enamel, varying in color with the specimen. The following belong to,

HEXAGONAL OR MONOAXIAL MICA.

Forshee's mine, Orange county. Optic axis single; rather difficultly fusible.

Copper colored mica, from Edenville, Orange county. Optic axis single; fuses into a dark enamel.

Silvery mica, from Rossie, St. Lawrence. Optic axis single; fuses into a white string.

Mica, from Vrooman lake, Jefferson county. Optic axis single.

Mica, from Gouverneur, St. Lawrence county. Optic axis single. In thin plates it fuses into a string of a white color and high lustre.

Copper colored mica, from Edwards, St. Lawrence county. Crystalized in six-sided tables, sometimes 5 or 6 inches in diameter; optic axis single; fuses with difficulty into a white mass; angles of the crystals about 120°; lustre metallic; plates sometimes curved.

Silvery mica, from Edwards. Crystallized in six-sided tables; optic axis single; fuses rather more easily than the preceding.

The brown mica, from Jefferson county, New-York, has been analyzed by Meitzendorff, whose average results are thus stated by Berzelius, (*Arsb.* 1843, *p.* 211,) silica, 41·30; alumina, 15·25; peroxide of iron, 1·77; magnesia, 28·79; potash, 9·70; soda, 0·65; fluoric acid, 3.30; loss by ignition, 0.28. It thus agrees very nearly with Prof. H. Rose's analysis of magnesian mica from Siberia. *Alger's Phillips*, 619.

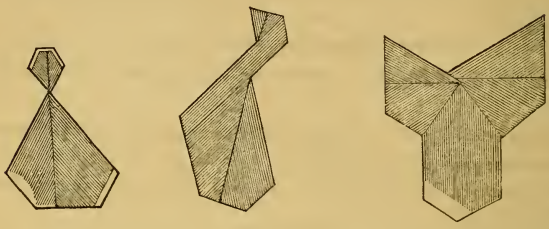
ORDER III. GLUCINA.

CHRYSOBERYL.

(Mineralogy of New-York, page 375.)

To the extensive series of compound crystals figured in the Mineralogy of New-York, I have to add a few others. For the ability to do this, I am indebted to Dr. Leonard, of Lansingburgh, N. Y., who has been uncommonly successful in his exploration of the Greenfield locality. He has obtained from thence specimens of extraordinary size and beauty. Many of them exhibit the forms which I have heretofore

figured; but those which are here introduced are worthy of notice. They are of the actual size, and from one-third to one-half an inch in thickness.



Dr. Leonard informs me that next to the six hemitropes, the most common combination is that of two united by their apexes.

Specimens of columbite have been found by Dr. Leonard, associated with chrysoberyl, at the Greenfield locality.

Descloizeaux has published under the crystaline forms of cymophane, a detailed description, with plates, and M. Biot has made some experiments upon the structure of this mineral in regard to polarized light. *Ann. de Chim, et de Phys.* xiii, 329, 335.

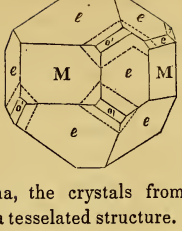
ORDER IV. ZIRCONIA.

ZIRCONITE.

(Mineralogy of New-York, page 378.)

This mineral has been found in New Sweden, Essex county, (*Emmons' Rep. Geol., 2d Dist., p.* 286;) Putnam Valley, Putnam county, (*Fountain;*) and on the farm of Mr. Cleaveland in Diana, Lewis county. At the latter locality it occurs rarely, but the crystals, although small, are very brilliant. *F. B. Hough, who quotes Mr. Wilder, Sill. Jour., Jan.*, 1848.

I have also received specimens from Mr. Charles Thomas, which were obtained from a mine of magnetic iron ore, near Port Henry, Essex county. In form and color the crystals resemble those from the Hall mine in the same county.



According to Mr. Dana, the crystals from Johnsburg, in Warren county, sometimes have a tesselated structure. The accompanying figure represents the appearance of one of the crystals. *Sill. Jour.*, xlvi., p. 36.

CLASS VII.

METALLIC MINERALS.

NATIVE IRON.

(Mineralogy of New-York, page 382.)

Since the publication of my Mineralogy, several interesting facts in regard to the occurrence of native iron in this State have been made known.

Dr. Emmons has described a specimen which he calls native iron, said to have been obtained from the vicinity of Catskill, in Greene county. It is in the form of laminæ, which are about one-thirtieth of an inch in thickness. Sp. gr. 6·58. It dissolves completely in warm sulphuric or muriatic acid, and when nitric acid is added, ammonia precipitates the peroxide of iron. It is strongly attracted by the magnet. The laminæ are only slightly flexible, but are entirely destitute of malleability. *Amer. Quart. Jour. of Science*, ii., p. 367.

B. Silliman, Jr., describes a mass of meteoric iron found a short distance below the surface of the earth in Cambria, near Lockport, Niagara county. On analysis it was found to contain iron 94·22; nickel 6·35. *Sill. Jour.*, xlviii., p. 388.

For a notice and analysis of a mass of meteoric iron found in the town of Burlington, Otsego county, see *Sill. Jour.*, xlvi., p. 401.

MAGNETIC IRON ORE.

(Mineralogy of New-York, page 383.)

Crystals of this mineral have been found in a mine near Port Henry, in Essex county. They are regular octahedrons from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in diameter, and are strongly magnetic. For these interesting specimens I am indebted to Mr. Charles Thomas.

Prof. Adams, in his report on the Geology of Vermont, (1846,) describes crystals of magnetic iron as occurring in granular specular iron. In some cases they are partly, and in others wholly, converted into peroxide of iron. They are found in Chittenden, adjoining Lake Champlain.

Several new localities of common magnetic iron have been discovered since the publication of my Mineralogy, especially in the northern parts of the State. I will only particularize its occurrence in beds in the gneiss rock of Greig, Lewis county. It is supposed to exist in some quantity, but it is associated with iron pyrites, and requires to be purified by the magnet. This is said to be the only known locality of magnetic iron ore on the western side of the great northern forest of New-York. *F. B. Hough, Sill. Jour., Jan.*, 1848.

The sanguine anticipations which were at one time entertained in regard to the conversion of the magnetic iron ore into steel by a direct process, have not been realized. This is no matter of surprise to those who had carefully studied the nature of steel and the peculiarities of structure to which it owes its value. None but the most visionary persons would have sanctioned expenditures based upon such erroneous views.

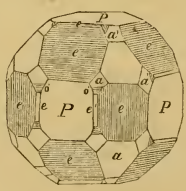
I may add here the composition of the cast and forged iron from the ore of the Long mine, in Orange county. The cast iron contains carbon 2·390; silicium 1·904; phosphorus 0·027; sulphur 0·004; iron 95·603.

The forged iron contains, silicic acid 0·532; phosphorus 0·023; sulphur 0·001; iron, carbon and loss 94·443. The cast iron contains traces of cobalt and nickel. *Berzelius' Annual Report*, 1847.

IRON PYRITES.

(Mineralogy of New-York, page 287.)

To the interesting crystalline forms of this mineral, figured in my Mineralogy, I may add that here introduced, which has been figured by



Mr. Dana from a crystal from Rossie, St. Lawrence county, in the possession of Dr. Emmons. *Sill. Jour.*, xlvi., p. 36.

CACOXENITE.

(Mineralogy of New-York, page 402.)

This mineral is liable to decomposition, even in the closed drawers of a cabinet. My specimens from the Sterling iron mine in Jefferson county, at the end of 2 or 3 years entirely lost their silky lustre, and were converted into a dull yellowish powder.

BABINGTONITE.

(Mineralogy of New-York, page 407.)

The composition of this mineral as determined by Dr. R. D. Thomson is as follows: silica 47·46; protoxide of iron 16·81; protoxide of manganese 10·16; alumina 6·48; lime 14·74; magnesia 2·21; water 1·24. This analysis approaches one by Bonsdorff of a black hornblende from Nordmark and Pargas, the magnesia being replaced by manganese in Babingtonite. *Phil. Mag. & Ann.*, xxvii., 123.

ZINC BLENDE.

(Mineralogy of New-York, page 408.)

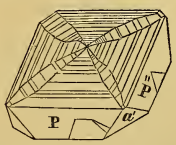
The occurrence of this species in the calciferous sandrock, one or two miles N. E. of Glen's Falls, in Warren county, is mentioned by Dr. Emmons. *Rep. on Geol., 2d Dist., p.* 180.

GALENA.

(Mineralogy of New-York, page 412.)

Various crystalline forms of galena occurring at the Nash vein in St. Lawrence county, are noticed by Dr. Emmons. *Rep., on Geol., 2d Dist., p.* 356.

For some remarks on the singular crystals of this mineral found at Rossie, St. Lawrence county, by Mr. J. E. Teschemacher, see *Phil Mag. & Ann.*, xxv., p. 232.



The crystals of galena from Rossie are sometimes very singularly constituted. Alger introduces a figure representing a crystal of the

natural size in his possession. It is a flattened cube. The lateral planes P P″, as well as the replacements of the lower solid angles *á*, are extremely brilliant and regular; but the upper solid angles and the terminal edges, are replaced by planes, which successively rise, in a step-like manner to the apex, forming a low pyramid. See his explanation of the mode of formation, *Phillips' Mineralogy, Suppl., p.* 623.

WHITE LEAD ORE.

(Mineralogy of New-York, page 414.)

Small crystals of carbonate of lead, an eighth of an inch or less in length, are occasionally found sprinkled thickly over the surface of the galena of Rossie, which when this is the case is deeply roughened or corroded. The crystals are striated prisms, terminating in four brilliant planes, two of which meet at an angle of 117° nearly, and the other two at an angle of 88°. The crystalline form, as well as the blowpipe characters prove that the mineral is carbonate of lead. *Dr. G. Hadley, in Sill. Jour., Jan.*, 1847.

NATIVE COPPER.

(Mineralogy of New-York, page 420.)

Prof. Dewey states that he has found some speculæ of native copper in the pentamerus limestone, (probably near Rochester, Monroe county.) Pyritous copper and green carbonate of copper occur in the same mass. *Hall's Rep. on Geol., 4th Dist., p.* 67.

This mineral is also occasionally found in the Taconic slate. *Emmons' Rep. on Geol., 2d Dist., p.* 158.

RUTILE.

(Mineralogy of New-York, page 428.)

According to Damour, this mineral is identical in composition with anatase. *Phil. Mag. & Ann.*, xxiv., p. 477.

SPHENE.

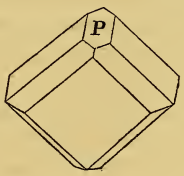
(Mineralogy of New-York, page 433.)

A brown mineral resembling sphene, but supposed to be different, is said to have been found in Rossie, St. Lawrence county. *Emmons' Rep. on Geol., 2d Dist., p.* 366.

Sphene has been found in Putnam Valley, Putnam county, by Mr. Cyrus P. Fountain.

Rose's analysis of the sphene of Zillerthal gave the following results: silica 32·29; titanic acid 41·58; oxide of iron 1·07; lime 29·60. The analysis was effected by sulphuric acid, and the details are given in the *Phil. Mag. & Ann.* xxvii. p. 560.

A new process for the analysis of this mineral, invented by Fuchs, is described in *Berzelius' Annual Rep. for* 1845, *p.* 178.



The *Lederite* of Shepard, it now appears, is identical with common sphene in its crystallographic and other characters. The accompanying figure illustrates its crystallization.

ADDITIONS

Of Mineral Species found in this State since the date of the publication of the Mineralogy of New-York.

COLUMBITE.

This mineral has been found by Dr. Leonard, associated with chrysoberyl at the remarkable locality in the town of Greenfield, Saratoga county.

LOXOCLASE.

This name has been applied by Breithaupt to a mineral received from Prof. Shepard. It was found in Hammond, St. Lawrence county, with pyroxene, graphite and calcareous spar. In many respects it resembles oligoclase (soda spodumene;) color yellowish-gray, yellowish-white, pea yellow and blueish gray. Lustre between vitreous and greasy; pearly on the most perfect cleavage surface. Primary form an oblique rhombic prism. P. on M. 93° 45′, P. on T. 115° 30′.

Cleavage perfect, very distinct in the direction of the short diagonal; indistinct approaching distinctness in the direction of the long diagonal; hemiprismatic in fragments. Fracture uneven to conchoidal and hackly. Hardness 6. Specific gravity=2·609 to 2·620. Translucent in thin laminæ to transparent.

The oblique cleavage in the direction of the long diagonal is characteristic of loxoclase, although not always very distinct; hence its name. The sp. gr. is also higher than any other of the orthoclastic feldspars. It appears subject to decay by exposure to the atmosphere.

Composition. (Mean of two analyses,) silica 63·50; alumina 20·29; oxide of iron 0·67; potash 3·03; soda 8·76; lime 3·22; water and fluoride of silicon 1·23. Fuses before the blowpipe with difficulty. Heated in a glass bulb it gives out a little water and fluoride of silicon, and is very imperfectly decomposed by hot muriatic acid. *Poggendorff's Annalen; Phil. Mag. & Ann.*, xxix., *p.* 150, *Aug.*, 1846.

MONAZITE.

This mineral, associated with sillimanite, as at Chester, Norwich and Saybrook, Conn., has been found in a quarry in Yorktown, Westchester county, by Mr. J. Mekeel. The monazite is in very perfect, transparent prisms, with a simple pyramidal termination; the crystals are small, rarely exceeding one-eighth of an inch in length, and are scattered like small garnets through the brown quartz adjoining the magnetic iron ore which is an associate of this mineral. *Sill. Jour.* xlvi, p. 207.

NITRATE OF LIME.

This is said to be found in Marbletown, Ulster county, and near West Point, Orange county. *Mather's Rep. on the Geol. 1st Dist.*, *p.* 85.

PHYLLITE.

This is a mineral which was first found by Vanuxem, in the town of Newport, Rhode Island. It is in the form of black shining scales, in slate. I have found the same near the Clove iron mine, in Dutchess county.

Composition. According to Dr. T. Thomson, the constituents of phyllite are as follows: silica, 38·40; alumina, 23·68; peroxide of iron, 17·52; magnesia, 8·96; potash, 6·80; water, 4·80.

It is thought to be identical with the ottrelite of Desclozeaux and Damour; but Thomson's name has the priority.

YTTRO-CERITE.

The occurence of this very rare mineral in the limestone of Orange county, N. Y., was first noticed by Mr. Alger.

It presents all the characters of the mineral from Finbo, in Sweden, and cannot be distinguished from it in hand specimens. (*Memoirs of the Boston Nat. Hist. Soc.* ii, p. 88.) It occurs in grains of a beautiful purple color, resembling fluor spar for which it has heretofore passed among the New-York mineralogists. I have specimens from Amity, in Orange county, associated with talc and other minerals in white limestone.

(H.)

REFERENCES

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ON THE

NATURAL HISTORY OF NEW-YORK,

MOSTLY PUBLISHED SUBSEQUENT TO ISSUING THE RESPECTIVE VOLUMES ON THAT SUBJECT.

REFERENCES.

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Annals of the New-York Lyceum of Natural History, vol. 4, *p.* 53. Description of five species of Vespertilio, that inhabit the environs of New-York, by William Cooper:

1. Vespertilio pruinosus.
2. Vespertilio noveboracensis.
3. Vespertilio noctivagans.
4. Vespertilio carolinensis.
5. Vespertilio subulatus.

All of these are recognized by Dr. DeKay.

BIRDS.

Annals of New-York Lyceum, vol. 4, *p.* 51. Notice of the appearance of the Pine Groesbeak, (*Pyrrhula enucleator,*) in the vicinity of New-York. By James F. Ward.

Annals of New-York Lyceum, vol. 4, *p.* 171. Description of a new species of Anser, by George N. Lawrence. Read March 18, 1846. Anser nigricans, (*Black-bellied Goose.*)

Sir Charles Lyell's Second Visit to the United States, vol. 2, *p.* 247, *American edition.* "In Wilson's Ornithology it is stated that the Hummingbird migrates from the south to Pennsylvania, the latter part of April and builds its nest there about the middle of May. For the last thirty years Mr. McIlvaine has never been disappointed in seeing it reach Burlington, in New Jersey, on the banks of Delaware, the first

week of that month, generally about the middle of the week; its northward progress being apparently hastened or retarded by the mildness of the season. They seem always to wait for the flowering of a species of horse-chesnut, called here, the Buckeye, from the fancied likeness of its fruit to the eyes of a deer. The bright red blossoms of this tree supply the nourishment most attractive to these birds, whose arrival had been looked for, the very day after I came. Strange to say, one of them, the avant-courier of the feathered host, actually appeared and next morning, (May 7, 1846,) hundreds were seen and heard, flitting and humming over our heads."

INSECTS.

Annals of the Lyceum, &c., vol. 4, *p.* 141. Monograph of the species of Psamichus, inhabiting the United States, with descriptions of two new genera belonging to the family Carabica. By John L. LeConte. Read November 9, 1845.

Annals of the Lyceum, &c., vol. 4, *p.* 173. Descriptive catalogue of the Geodephagous coleoptera, inhabiting the United States, east of the Rocky Mountains. By John L. LeConte. Read May 25, 1846.

BOTANY.

Silliman's Journal, new series, vol. 7, *p.* 167. Notes on some Chenopodiacæ, growing spontaneously about the city of New-York. By John Carey.

Silliman's Journal, new series, vol. 8, *p.* 347. Observations on American species of the genus Potamogeton, by Edward Tuckerman, A. M.

MINERALOGY.

Annals of the New-York Lyceum, vol. 4, *p.* 76. Description of the Vauquelinite, a rare ore of Chromium, in the United States. By John Torrey, M. D. Read April 27, 1835.

(Noticed by Dr. L. C. Beck, in his Mineralogy of New-York.)

Proceedings of the Academy of Natural Sciences of Philadelphia, vol 4, *p.* 6. Mr. Ashmead on Calcareous Spar from the Rossie lead mines, in New York.

Boston Medical and Surgical Journal, vol. 40, *p.* 283. Dr. Samuel P. White, on the Acid springs, at Alabama, Genesee county.

Silliman's Journal, new series, vol. 8, *p.* 385. Professor Benj. Silliman, Jr., analysis of Munrolite, occurring at Munroe, Orange county.

GEOLOGY AND PALÆONTOLOGY.

Silliman's Journal, new series, vol. 7, *pages* 45, 218. Parallelism of the Palæozoic formations of North America with those of Europe. By Ed. DeVerneuil, and translated by James Hall.

Silliman's Journal, N. S., vol. 7, p. 175. On the Acid Springs and gypsum deposits of the Onondaga salt group. By T. S. Hunt, of the Geological Survey of Canada.

Proceedings of the American Association for the Advancement of Science, 1st meeting, September, 1848, *p.* 135. Account of a remarkable geological development in Elizabethtown, Essex county.

Quarterly Journal of the Geological Society of London, vol. 2, *p.* 20. Observations on the Caryocrinites of Mr. James Hall.

Quarterly Journal of the Geological Society of London, vol. 4, *p.* 66. On Trematis, a new genus, belonging to the family of the Brachiopodous mollusca. By Daniel Sharpe, F. G. S. (The Orbicula terminalis of Emmons and Hall is here called Trematis terminalis.)

Quarterly Journal of the Geological Society of London, vol. 4, *p.* 146. Remarks on the Palæozoic formations of the United States, contained in the collection of Charles Lyell, Esq., with remarks on the comparison of the North American formations with those of Europe. By Daniel Sharpe, F. G. S.

Quarterly Journal of the Geological Society of London, vol. 5, *p.* 107. On the supposed impressions in shale of the soft parts of an Orthoceras. By James Hall, foreign member of the Geological Society, State Geologist of New-York.

Emmons' American Journal of Agriculture and Science, May and June, 1847. Observations on the Geology of Lewis county. By Franklin B. Hough, M. D.

The first discovery (probably) of fossil bones and teeth in the State of New-York.

(From Weld's history of the Royal Society, vol. 1, p. 421.)

In 1713, in answer to "instructions to Ministers and Governors proceeding abroad," and which had been directed by the Queen to be prepared, Lord Cornbury made the following communication. It is dated from New-York and addressed to the secretary.

"I did by the Virginia fleet, send you a tooth, which on the outside of the box, was called the tooth of a giant, and I desired it might be given to Gresham College. I now send you some of his bones, and I am able to give you this account. The tooth I sent was found near the side of Hudson's river, rolled down from a high bank, by a Dutch country fellow, about twenty miles on the side of Albany, and sold to one Van Bruggen for a gill of rum. Van Bruggen, being a member of the Assembly, and coming down to New-York to the Assembly, brought the tooth with him and shewed it to several persons here. I was told of it, and sent for it to see, and asked if he would dispose of it; he said it was worth nothing, but if I had a mind to it, 'twas at my service. Thus I came by it. Some said 'twas the tooth of a human creature; others, of some beast or fish, but nobody could tell what beast or fish had such a tooth. I was of opinion that it was the tooth of a giant, which gave me the curiosity to enquire farther. One Mr. Abeel, Recorder of Albany, was then in town, so I directed him to send some person to dig near the place where the tooth was found; which he did, and that you may see the account he gives me of it, I send you the original letter he sent me; you must allow for the bad English. I desire these bones may be sent to the tooth, if you think fit. When I go up to Albany next, I intend to go to the place myself, to see if I can discover any thing more concerning the monstrous creature, for so I think I may call it."

Mr. Abeel's letter runs thus:

"According to your Excellency's order, I sent to Klaverak to make further discovery about the bones of that creature, where the great tooth of it was found. They have dug on the top of the bank, where the tooth was rolled down from, and they found, fifteen feet under ground, the bones of a corpse that was thirty feet long, but was almost all decayed; so soon as they handled them, they broke in pieces; they took up some of the firm pieces and sent them to me, and I have ordered them to be delivered to your Excellency."

(I.)

INDEX TO THE VOLUMES

IN THE

State Cabinet of Natural History,

CONTAINING THE

PLANTS OF THE STATE OF NEW-YORK.

☞ A reference to Prof. TORREY's Catalogue of the Plants, of which specimens are preserved in the State Cabinet at Albany, (published in the Annual Report of the Regents of the University, on the condition of the State Cabinet, for the year 1849,) will indicate the individual species of the genera contained in each volume. The Orders and Genera are numbered according to Prof. TORREY's Flora of the State of New-York.

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Order 107.	TYPHACEÆ.	*The Cattail tribe.*
Order 108.	NAIADACEÆ.	*The Pondweed tribe.*
Order 109.	ALISMACEÆ.	*The Water Plantain tribe.*
Order 110.	JUNCAGINACEÆ.	*The Arrowgrass tribe.*
Order 111.	HYDROCHARIDACEÆ.	*The Frogsbit tribe.*

VOLUME XXXVII.

CONTAINS

Order 112.	ORCHIDACEÆ.	*The Orchis tribe.*

VOLUME XXXVIII.

CONTAINS

Order 113.	HYPOXIDACEÆ.	*The Stargrass tribe.*
Order 114.	IRIDACEÆ.	*The Iris tribe.*
Order 115.	DIOSCORACEÆ.	*The Yam tribe.*
Order 116.	SMILACEÆ.	*The Smilax tribe.*
Order 117.	LILIACEÆ.	*The Lily tribe.*

VOLUME XXXIX.

CONTAINS

ORDER 118.	PONTEDERIACEÆ.	*The Pickerelweed tribe.*
ORDER 119.	MELANTHACEÆ.	*The Colchicum tribe.*
ORDER 120.	JUNCACEÆ.	*The Rush tribe.*
ORDER 121.	COMMELYNACEÆ.	*The Spiderwort tribe.*
ORDER 122.	XYRIDACEÆ.	*The Yellow-eyed Grass tribe.*
ORDER 123.	ERIOCAULONACEÆ.	*The Pipewort tribe.*

VOLUME XL.

CONTAINS THE GENERA, (from 1 to 13 inclusive,) OF

ORDER 124. CYPERACEÆ. *The Sedge tribe.*

VOLUME XLI.

CONTAINS THE SPECIES OF THE GENUS *Carex*, DOWN TO AND INCLUDING *Carex aurea*, OF

ORDER 124. CYPERACEÆ. *The Sedge tribe.*

VOLUME XLII.

CONTAINS THE RESIDUE OF THE SPECIES OF THE GENUS *Carex*, (commencing with *Carex livida*,) OF

ORDER 124. CYPERACEÆ. *The Sedge tribe.*

VOLUME XLIII.

CONTAINS THE GENERA, (from 1 to 13 inclusive,) OF

ORDER 125. GRAMINEÆ. *The Grass tribe.*

VOLUME XLIV.

CONTAINS THE GENERA, (from 14 to 32 inclusive,) OF

ORDER 125. GRAMINEÆ. *The Grass tribe.*

VOLUME XLV.

CONTAINS THE RESIDUE OF THE GENERA, (commencing with *Poa*,) OF

ORDER 125. GRAMINEÆ. *The Grass tribe.*

VOLUME XLVI.

CONTAINS

ORDER 126.	EQUISETACEÆ.	*The Horsetail tribe.*
ORDER 127.	FILICES.	*The Fern tribe.*
ORDER 128.	LYCOPODIACÆ.	*The Clubmoss tribe.*
ORDER 129.	SALVINACEÆ.	*The Salvina tribe.*
ORDER 130.	ISOETACEÆ.	*The Quillwort tribe.*

(K.)

DESCRIPTION

OF

NEW SPECIES OF FOSSILS,

AND

OBSERVATIONS UPON SOME OTHER SPECIES

PREVIOUSLY NOT WELL KNOWN,

FROM THE TRENTON LIMESTONE.

BY JAMES HALL.

DESCRIPTION.

The following described fossils have been obtained from the Trenton limestone since the publication of the first volume on the Palæontology of New-York. Several of these are entirely new, and interesting, as adding to our knowledge of several genera, of which few species have yet been described. These fossils were collected during a short excursion in a few localities not thoroughly examined, and from these we may infer that a large number yet remain undescribed in the lower silurian rocks. In these descriptions I have not included several, the characters of which are somewhat equivocal, or of which we may expect to procure more perfect specimens. Several specimens, illustrating in a more perfect and satisfactory manner species already described in the volume referred to, have been added to this list, in order to give those pursuing the study of this subject the best information we possess up to this time.

In commencing a work like the Palæontology of New-York, in a country where comparatively so little had been done in collecting or investigating fossils of the older rocks, it was impossible in all cases to procure perfect specimens of the fossils described. It is expected moreover that the fossils from the older strata are less perfect and more dilapidated than those of newer formations; and the solid and sometimes altered condition of the strata often prevents the procuring of perfect specimens, which may readily be done in the more modern formations. It would not be satisfactory to the student, nor even to the cursory examiner, to leave unfigured and undescribed, fragments or imperfect specimens of fossils, since the collection of every one, and particularly of beginners, must necessarily consist in part of such, from the difficulty and time required to obtain perfect ones. It is therefore desirable from time to time to present the additional knowledge acquired by the fortu-

nate discovery of a fossil in natural exposures, or their constant development from the increased number of quarries and excavations from public improvements. In this way those species originally figured in an imperfect condition may be represented in their perfect state; and the difficulty and annoyance avoided that may arise, and has often arisen, from describing as two species parts of the same animal.

Moreover, undescribed species can be of little use to the collection of an amateur; and however many he may have thus circumstanced, he cannot use them to advantage in the ordinary mode of exchange for others, since they are not designated by name. A fossil to be valuable in the eyes of a geologist or palæontologist, must have a name and the true geological position given, or it sinks in his estimation at once to a mere object of curiosity; while otherwise, it has a place not only in its zoological relations, but also in the order of its succession, or time, doubly important to the naturalist.

Since it is quite impossible, with the limited means possessed by the palæontologist, to collect and describe every species, and since it must be expected that new species will be obtained for the next half century, from the rocks already examined, it is evident that every year will produce something to be done, to bring the subject up to the best knowledge we possess. It is equally true that whatever means are adopted, much must still remain to be discovered. Excavations for railroads, canals, and the improvement of highways, as well as the increased number of quarries opened to supply the wants of an increasing population, will constantly bring to light new fossils, as well as other objects of natural science. If every student or collector finding fossils undescribed in the State work on Palæontology, would forward them to the curator of the Geological Rooms at Albany, the annual reports of the Regents offer an opportunity for having them properly described and figured; thus permanently preserving in the State collection, the originals of these fossils, while it is adding to his own knowledge of the subject, and enhancing the interest and value of his collection. Many collectors, residing upon the ground, have it in their power to furnish better specimens to the State collection, than it has been in the power of the Palæontologist to do, from his limited time for examining individual localities. Such specimens greatly enhance the value of this part of the collection, and furnish facilities for further elucidation of the subject. It may be necessary for me to make the same appeal for all the departments.

For Palæontology, however, I will make another observation. Species have heretofore been described chiefly from exterior characters,

and very few collections are made with a view to the examination of the interior or more vital parts. To the palæontologist the interior of the shell is often of more real importance in his investigations than a perfect specimen; since this part may reveal to him characters more reliable and more constant than the exterior. The same is true of other fossils; whatever exhibits the internal characters and arrangement of parts is very desirable in an extensive and permanent collection, for these furnish at once points of comparison very conclusive, regarding the identity or difference of similar fossils. Every collector, therefore, should understand that those fragments showing internal structure in fossil bodies, are worthy of preservation, and even when these characters are apparently unallied to any other, they are nevertheless important in extensive comparisons. I might instance the columns of crinoidea, which occur in fragments in all our strata. These, when studied, furnish illustrations of the highest interest, and we are often able to connect with certainty the veriest fragment with the perfect form by a minute internal characteristic. Lest there be not observed in this, some important result besides the scientific value and interest, I may mention what every collector knows, that the locations of perfect specimens are few, while those of fragments and detached parts are numerous. Now it is important, upon economical considerations, to be able to recognize fossils by fragments, or from some zoological character, that in seeking for valuable beds we may know our proximity thereto, not only from the occurrence of perfect fossils, but from the fragments which are preserved in the more numerous localities.

Since New-York must always remain the classic ground for the study of the geology and palæontology of the older rocks, no other country having so perfect a development of the systems, it is important that the State collection should contain the most perfect and authentic collection of these as of the other productions of her territory. I would appeal, therefore, to the patriotism of our citizens to consider the interests and wants of this collection before they dispose of their beautiful specimens to private collections which can never be permanent. As an encouragement to those who have already spoken to me on this subject, expressing hopes of the permanent care and preservation of this part of the collection and who have been only waiting such an arrangement to contribute specimens, I may say that the collection has recently been placed by the Regents of the University, in the charge of Mr. John Gebhard, Jr., of Schoharie, whose quiet zeal and untiring

industry have almost solely contributed to bring out the rare and beautiful exhibition of fossils from the rocks surrounding his native valley. Those, therefore, who desire to contribute specimens may feel assured that in the hands of Mr. Gebhard, every fossil will be fully appreciated and carefully preserved.

BUTHOTREPHIS? CÆSPETOSA, (*n. species.*)

Plate 1, fig. 1, *a*, *b*, *c*.

Plant at base composed of numerous coalescing stems which in ascending are frequently bifurcated; branches tapering to acute points.

The mode of growth is very peculiar in this species; in all the individuals seen the base appears like a coalescing or twisted bundle of stems, which separate and expand above, frequently bifurcating in their extension. Several specimens of this species have been found in the lower part of the Trenton limestone. It is extremely different from all the other species of the genus and may perhaps be referred with almost equal propriety to the genus *Palæophycus*, though when better known it will probably be separated from both these genera.

This species has been found in the vicinity of Watertown, Jefferson county, and occurs in thin layers, exposed by the action of the water of the river, near the lower part of the formation.

RETEPORA FENESTRATA, (*n. species.*)

Plate 2, fig. 1, *a*, *b*, *c*, *d*, *e*.

Frond much expanded, loosely reticulate; branches rounded, frequently bifurcating, united laterally by transverse bars; non-poriferous surface striated; poriferous side of branches covered with numerous small angular pores, sometimes with poriferous nodes upon the poriferous side of the branches; fenestrules irregular in size and form.

This species is very peculiar in its character, appearing at first view like a reticulated coral without transverse bars. The growth and bifurcation of the branches appear to have been quite irregular and they approach each other so closely as often to appear as if coalescing. In the presence of transverse bars, which are apparently non-poriferous, uniting the branches, it differs from Retepora, to which it is closely allied in other respects. In the rounded branches and transverse non-celluliferous dissepiments it resembles Polypora, but the cells are angular as in Retepora, and the coral has the general aspect of that genus.

Fig. 1, *a*, a specimen of this coral upon the surface of a fragment of limestone. In some parts the coral appears to be distinctly reticulated, while in others the branches are united by transverse bars.

Fig. 1, *b*, a portion of the poriferous surface enlarged.

Fig. 1, *c*, another fragment, having elevated nodes upon the surface of the branches.

Fig. 1, *d*, an enlarged portion of the non-poriferous face.

Fig. 1, *e*, a similar fragment of the non-poriferous face, partially covered by an incrusting coral which has the character of Chætetes.

This species occurs in the lower part of the Trenton limestone, near Lowville, Lewis county. (*State Collection.*)

ÆGILOPS, (*new genus.*)

Inequilateral, valves, somewhat trigonal, rounded on the base, sloping abruptly from the beaks, which are incurved at the extremity.

ÆGILOPS SUBCARINATA,

Plate 4, fig. 1, *a*, *b*.

Trigonal, with the beaks much elevated and incurved; anterior slope short, ending in a slightly rounded extremity, which continues into the curve of the rounded base; posterior slope long and straight; surface marked by a rounded ridge or carina extending from the beak nearly to the base, and margined on each side by a corresponding depression.

The form of this shell is peculiar and characteristic, the inequality of the valves is only apparent or due to pressure. It is clearly the type of a genus which has not hitherto been noticed in the lower silurian rocks of this country, if in Europe.

This species was found in the Trenton limestone, near, Lowville, Lewis county. (*State Collection.*)

MURCHISONIA SUBFUSIFORMIS.

Plate 4, fig. 2.

Reference.—Palæontology of New-York, vol. 1, page 234, plate 39 fig. 2.

The two figures of this fossil referred to, give but a very imperfect idea of the species. Nearly all the specimens procured are so mutilated that the true form is scarcely to be determined. The specimen now figured is the most perfect one that has fallen under my observation, and will serve to give a better idea of the form and proportions of the species, than those heretofore given. It preserves five volutions, two volutions of the apex are broken off The specimen is scarcely at

all compressed, and it shows the peculiar form which clearly distinguishes it from *M. bellacincta.*

In the shaly portion of the Trenton limestone, near Lowville, Lewis county. (*State Collection.*)

SUBULITES ABBREVIATA, (*n. species.*)

Plate 3, fig. 2, *a, b, c.*

Short, subfusiform, last volution making nearly the whole bulk of the shell; spire rapidly diminishing; composed of about three volutions; aperture long, very narrow above; outer lip straight and parallel to the axis of the shell; margin of the shell opposite the outer lip, and with the spire above forming a regular curve from apex to base.

This species possesses the character of the genus as expressed in the *S. elongata*, but it is extremely different from that one in the short spire and curved outline of the back of the shell. The specimens are interesting as presenting a second species of a peculiar genus, and one not recognized above the lower silurian period.

The specimens figured were obtained from the semicrystalline limestone in the higher part of the Trenton limestone, near Watertown, Jefferson county. The position and associated fossils are the same as in the other species of the genus. (*State Collection.*)

ONCOCERAS CONSTRICTUM.

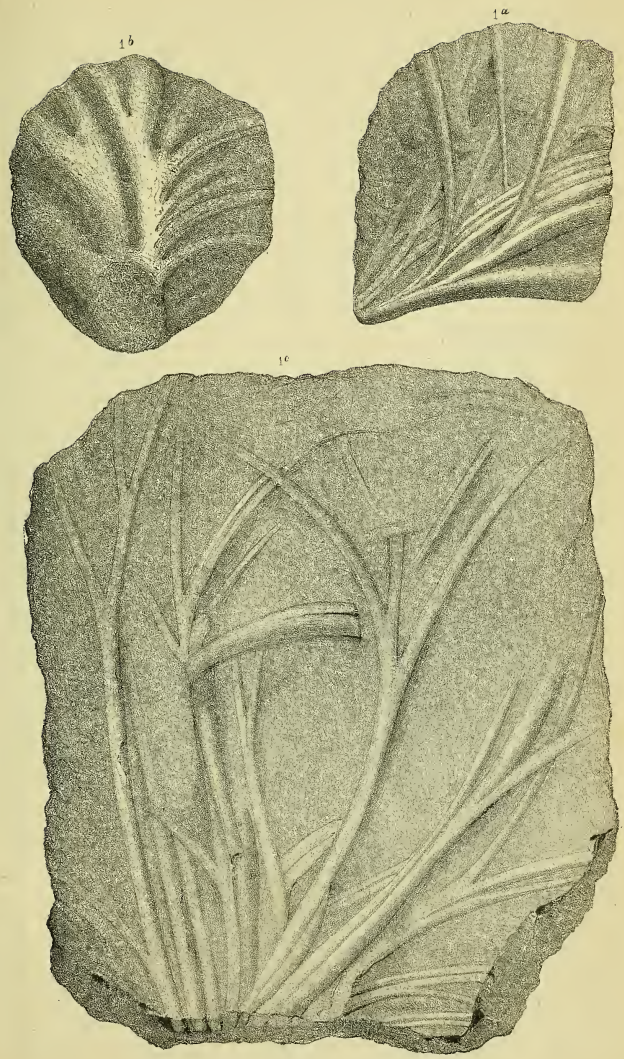
Plate 3, fig. 3.

Reference.—Page, 197, plate 41, figs. 6 and 7, Palæontology of New-York, vol. 1.

This species was described from fragments and the characters were not completely defined. The specimen figured is almost entirely perfect, showing the contracted, nearly circular aperture, and the swelling above, which presents a transversely oval section, suddenly tapering from thence towards the apex, which is curved from the commencement of the contraction; surface finely striated, with the striæ arching upward along the dorsal line.

This specimen is almost entire, a small portion of the apex having been broken off only. It is one of the most remarkable forms of cephalopoda in the lower strata. The specimens figured in the first volume of the Palæontology of New-York, are such as are usually found, the one now described being the only perfect one known to me.

From the limestone in the neighborhood of Trenton Falls.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1a

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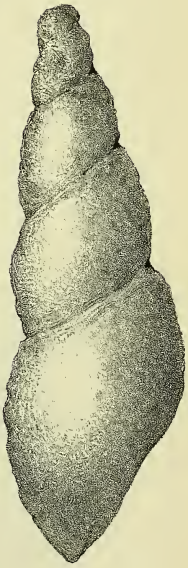
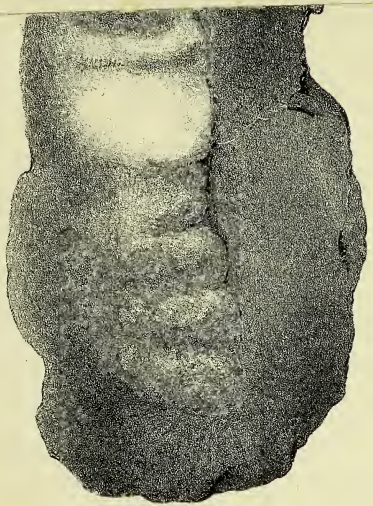
3

2





1 a

1 b

2

ORMOCERAS REMOTISEPTUM, (*n. species.*)

Plate 4, fig. 3.

Cylindrical, gradually tapering; septa moderately convex, distant half the diameter of the tube; siphuncle excentric, large, swelling moderately between the septa, and but slightly contracted at the junction of the septa; character of the external surface unknown.

The specimen described is a fragment which is worn down through the centre of the siphuncle. The proportions of this part of the fossil and the great distance of the septa contrast very strongly with the *Ormoceras tenuifilum* and with the other known species of the genus.

This species occurs in the higher part of the Trenton limestone, near Watertown, Jefferson county. (*State Collection.*)

ENDOCERAS LATIVENTRUM, (*n. species.*)

Plate 5, fig. 1, *a*, *b*.

Cylindric or conical, somewhat rapidly tapering, septa very slightly convex, distant from each other about one-sixth of the diameter of the tube; siphuncle large, entirely lateral, diameter towards the smaller extremity greater than one-third the diameter of the entire tube; embryo tube smooth, slender towards the smaller extremity.

This species is easily distinguished from the *E. proteiforme* in any of its stages by the more rapid diminution of the tube, by the entirely lateral position of the siphuncle, and the closer arrangement of the septa. The fragment described is something more than a foot in length, and is from the central part of the individual, neither the apex or outer chamber being preserved. The embryo tube, which is visible near the apex, is slender and gradually tapering.

Fig. 1 *a*. The specimen natural size, showing the embryo tube above the middle.

Fig. 1 *b*. A section showing the position and size of the siphuncle.

This species occurs in the lower part of the Trenton limestone, near Lowville, in Lewis county. The only specimen known is the one here described, which is placed in the State collection.

COLPOCERAS, (*new genus.*)

Gr. κολπος, *sinus*, and κερας, *cornu*, in allusion to the deep sinus in the septa.

Cylindrical or sub-cylindrical, septa oblique to the axis of the shell, regularly arched on the dorsal side, and bending downwards in a deep sinus towards the mouth on the ventral side.

COLPOCERAS VIRGATUM.

Plate 5, fig. 2.

Tube virgate, scarcely diminishing towards the apex; surface strongly annulated; annulations arching towards the apex on the back of the shell and bending downwards in an abrupt sinus on the ventral side, and becoming almost entirely lost on the ventral line; septa following the direction of the annulations and arranged between them, except on the ventral side where they encroach a little upon the annulation, being more abruptly bent downwards; septa in the longitudinal section, cutting each side, regularly arched; section when not compressed cylindrical; siphuncle unknown; character of the surface, except the annulations, unknown.

This species occurs near the junction of the Birdseye and Black river limestones in Lewis county.

ASAPHUS EXTANS.

Plate 3, fig. 1.

Reference.—Asaphus extans. Palæontology of New-York, vol. i., page 228, plate 60, fig. 2, *a*, *b*, *c*.

This species, which was described as an asaphus, with some doubt, has again fallen under my observation, and though the specimens yet procured are fragments, they throw some farther light upon the character of the fossil. These specimens are mostly in a bad state of preservation, from a dark shaly layer near the base of the Trenton limestone in Lowville. The character of the caudal shield which is preserved in several specimens is well marked, though the rings of the thorax attached are so much obliterated as to afford very little satisfactory evidence of their number or character. Still there appears to be nine or ten articulations of the thorax, though the junction with the caudal shield is obscure.

In connexion with a mutilated specimen, we have the convex middle lobe of the cephalic shield, with two large and prominent eyes. This specimen does not preserve the margin of the shield, but in another one we find the two lateral portions of the shield preserved in their natural relations to each other, the central lobe being wanting. This fragment proves that the facial suture terminated on the base of the shield as in asaphus, though it is difficult to reconcile the number of articulations of the thorax with that genus. The prominent eyes are also like asaphus, the form of the head is rather more prominent in the middle lobe than

known species of the genus, and the posterior projection into a spine is also unlike, while the caudal extremity and character of surface sculpture are all closely like the asaphus.

We shall probably soon be able to have perfect specimens, and as it will prove an interesting species, perhaps this notice may attract attention and excite examination among those living in the neighborhood of the localities where this species has been found.

It is not improbable but the middle lobe of a buckler described (Pal. N. Y., vol. i., page 248, pl. 61, fig. 1, *a*, *b*,) as *Asaphus nodostriatus*, may prove to belong to this species, but the same part of the fossil here figgured does not preserve the surface markings to enable us to make the comparison. (*State Collection.*)