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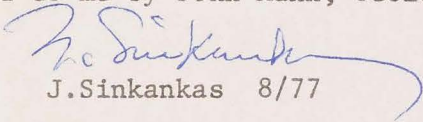
★ GEMSTONES · OF · NORTH · AMERICA · PROSPECTING · FOR · GEM ★

★ MINERALS AND STONES ★

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JOHN · SIN · KAN · KAS

According to the Preface, only 100 copies of this interesting work were prepared, the writing, by Jackson and J.D.Whitney, being specially composed for 100 copies of the plates which were struck off separately for Jackson from his Final Report on the Geology and Mineralogy of New Hampshire(1844). For remarks on the latter, see Merrill's First One Hundred Years(1924)p.204-5. Thus this independently published work is one of the rarest of all American geological publications.

This copy was rebound by me from a collection of reprints originally owned by Charles Lyell and sold to me by John Mann, Geological Bookseller of England in spring of 1977.


J.Sinkankas 8/77





VIEWS AND MAP,
ILLUSTRATIVE OF THE
SCENERY AND GEOLOGY
OF THE
STATE OF NEW HAMPSHIRE.

BY CHARLES T. JACKSON.

BOSTON:
THURSTON, TORRY, AND COMPANY.
1845.

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THE STATE OF NEW HAMPSHIRE

GEORGE W. WATSON

BY CHARLES W. WATSON

BOSTON:
THE STATE OF NEW HAMPSHIRE
1854

P R E F A C E .

IN printing my Final Report on the Geology and Mineralogy of New Hampshire, I had one hundred copies of the illustrative plates struck off for me on my own account, and I directed the State printer to supply me with the printed sheets of the Report to accompany them.

Through misunderstanding of my wishes, the latter were not furnished, and after subscribing for a hundred copies of the State Report, the above mentioned plates remained on hand.

In order to dispose of them, and to supply our friends and the public with views of the remarkable scenery of New Hampshire, Mr. Whitney and myself have prepared the following pages to accompany the plates, which we trust will not prove unacceptable to those who may travel in the "Granite State."

The accompanying map, illustrating the Geology of New Hampshire, will serve as a guide to the traveller who may wish to understand the structure of the country. In the colored lithographic drawings, representing the chemical nature of the different portions of grain and other seeds, the public are presented with the results of some new and interesting researches intimately connected with Agriculture and Physiology, and it is to be hoped, that it may prove both curious and useful.

Lest it might be supposed, that this volume is but an abstract of the Final Report on the Geology of New Hampshire, I would observe, that the descriptions of scenery are new, and were drawn up by my assistant, who was absent at the time the State Report was published. The reader is referred to the larger work for a full account of the Geology and Mineralogy of the State, and for details respecting the art and science of Agriculture.

The present volume is intended for the use of the traveller who may wish to preserve *souvenirs* of New Hampshire scenery; and its size being no greater than that of a port-folio, may allow its being placed in the carriage or in the knapsack, and perhaps it may be allowed to remain on the drawing-room table after having accompanied him on his journey.

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GENERAL VIEW
OF THE
GEOLOGICAL STRUCTURE OF THE STATE.

PLAN OF A MINERALOGICAL JOURNEY.

NEW HAMPSHIRE is the most mountainous State in the Union, and is based upon primary, metamorphic, and intrusive igneous rocks, the strata of the stratified deposits being not unfrequently much disturbed by the agency of dykes and veins, which have been injected from beneath.

Crystalline aggregates are the most common rocks, and among them occur many rare and beautiful minerals, and veins of valuable ores. Beds of limestone occur in the micaceous and metamorphic slates, and the limestone is granular or crystalline in the older rock, and preserves its stratiform structure in the more recent metamorphic slates.

On the eastern, northern, and western borders of the State, argillaceous slate rocks, destitute of fossils, but evidently of aqueous deposition, occur; while the central part of the State consists of granite, gneiss and mica slate, filled with veins of other rocks and minerals, and covered in the river valleys with a thick layer of diluvial or drift deposits, while the rocks may be seen on the borders of these trough-shaped excavations, or on the mountain sides.

Numerous erratic blocks of granite and other rocks, with smaller rounded and water-worn boulders, are observed on most of the hills, and were evidently drifted to their present resting places by the agency of ice and water, in ancient times. They all originated from rocks in a place north of their present localities, the current having transported them to the southward, or a little to the east of south.

Among the most remarkable of these erratic rocks, are, the porphyritic granite, distinguishable readily by its patches of crystalline feldspar, and trap rocks of a peculiar nature, containing basaltic hornblende. These rocks are so marked in their characters that they may be readily distinguished, and can be identified with the ledges and dykes which occur to the northward. Where the ledges have been recently uncovered of soil, it is not uncommon to find their surface strongly marked with drift striæ, and sometimes

the harder rocks are polished, as if from long continued action of running water, transporting sand and gravel.

Deep wells, or pot holes, are also found in the hard granite forming the dividing ridge between the Connecticut and Merrimack rivers, in the town of Orange, on the west side of the turnpike, at an elevation of from 900 to 1000 feet above those rivers, and 1229 feet above the sea level. One of these wells, which is more than four feet in diameter and eleven feet deep, has recently been cleared of the rounded stones which it originally contained, and is an object of curiosity worthy of examination. An ancient waterfall must have produced it, and from its greater depth it would appear, that a current of water formerly passed over these rocks for a longer period than it has flowed over those at Bellows Falls on the Connecticut, for the pot holes there are not half so deep, and are in the same kind of rock. No stream now flows anywhere near the above-mentioned ancient well, and the phenomena must be referred to a period when the configuration of the State was materially different from what it now is.

Many localities of interesting minerals will also attract the traveller's attention as he journeys through New Hampshire, and I would point out those, where handsome and otherwise interesting specimens may be obtained from rocks in place. Erratic rocks also supply many specimens that may interest collectors, though we attach but little importance to them, unless we know the parent ledge from which they were derived.

PLAN OF A MINERALOGICAL JOURNEY.

If the traveller sets out on his journey from Boston, I would advise him to go first to Nashua, and there take a wagon or other light carriage and go to Amherst, where he will find a very interesting locality of minerals on the estate of Widow Betsy Stevens, near the north-western corner of the town, and six miles N. N. E. of the village where it joins Bedford. By calling at the store of Mr. Stevens, near the spot, he may obtain the requisite information, and procure packing paper and boxes for his specimens.

The minerals referred to are found in a bed of granular limestone included in mica slate in a deep ravine. Both the limestone and the wall rock are filled with crystallized minerals, which are readily obtained by blasting the rock. The most interesting are, cinnamon stone garnet, of a light-yellow color, crystallized in the form of the rhombic dodecahedron, with the edges occasionally replaced by tangent facets. Some of the crystals are of gigantic size, measuring four inches across the planes, but they are not so perfect and smooth as those of smaller dimensions. The most brilliant crystals are found in the quartz which forms the walls of the bed of limestone, and they are readily detached from the rock.

Egeran, in very large and brilliant crystals, is found in the same place associated with the garnets. Some of the crystals are two inches in diameter and four inches in length, beautifully terminated with replacements on the terminal edges and solid angles. The smaller crystals, especially those in the quartz, are the most perfect and brilliant, and are often splendidly iridescent on the surface. This mineral is comparatively rare in other places, and very abundant at this locality.

Small green crystalline grains of pargasite are intermixed with the granular limestone, and a few crystals of scapolite are occasionally found in the wall rock, but are not good specimens.

It is interesting to the chemist and geologist to see at this spot the above-mentioned minerals, which resulted from the fusion of carbonate of lime with the including primary rocks, the siliceous combinations of alumina, lime, magnesia and the metallic oxides, producing those minerals which only can be formed by the agency of heat.

In the village of Amherst, crystals of magnetic iron ore, in octahedral forms passing into dodecahedra, occur on the farm of Dr. Spaulding, and may be picked up in the decaying granite. A few large crystals of amethystine quartz have also been found in the soil by Mr. J. Hartshorn.

From AMHERST the traveller will pass by a good road to Peterboro, Dublin, or Jaffrey, and can make an ascent to the summit of Monadnock Mountain from the last mentioned place. He may then go to Keene, and from thence to Westmoreland, where some interesting minerals are found. They are fluorspar, of colorless, transparent, purple, blue, and green varieties.

On Lincoln's Hill, fine specimens of sulphuret and yellow oxide of molybdena are found, associated with large crystals of yellow phosphate of lime.

In ALSTEAD large plates of mica are quarried, and good specimens of it may be obtained. Black tourmaline, and largely crystallized albite, occur in the coarse granite veins with the mica.

From Alstead a very hilly road leads to Acworth, where beryls of gigantic dimensions (some of the crystals being more than a foot in diameter and two feet long) are found on Williams's Hill. Mr. James Bowers, of Acworth, will give all the information desired, and furnish specimens of the minerals.

UNITY. In this town several very interesting minerals are found on the estate of the late Mr. James Neal. They are chlorophyllite, iolite, titanium ore, copper and iron pyrites. Mr. Neal's sons will give information and render aid if required.

From Unity to Claremont is a short ride of eight miles, and the traveller will find it a pleasant town, from whence he may make excursions to the Ascutney Mountain and to the neighboring hills. From thence he may go to Grafton, Orange and Danbury,

where the most beautiful beryls are found in the quartz veins traversing the granite, and in the soil where the rocks have decayed. Abraham Caswell, of Grafton, is the best guide to the localities, many of which he discovered. In this town an extensive quarry of mica is wrought on Glass Hill, and fine specimens of that mineral with its associated albite may be obtained. A few crystals of bluish-green phosphate of lime also occur in the granite. In Orange the well or pot hole on the Grafton turnpike should not be forgotten.

HANOVER. In this town there are found very pretty crystals of almandine, or precious garnet, in the hornblende slate rocks in the rear of the medical college.

LYME furnishes beautiful specimens of black tourmaline, thickly implanted in white quartz and finely crystallized. A few specimens of sulphuret of antimony, and of quartz containing rutile, have been found in detached boulders near Holt's tavern. Iron pyrites also occurs on the hill near by.

OXFORD. In this town fine specimens of clove-brown tourmaline are found at the soapstone quarry in talcose slate rock, and in the wall rock of the limestone beds there are crystals of rutile and quartz containing it. On Cuba Mountain, hæmatite iron ore and kyanite, occur in bunches and veins. A little carbonate and sulphuret, and native copper, have also been found near the hill.

PIERMONT contains an important bed of micaceous specular iron ore on Cross's Hill, and occasional bunches and veins of sulphate of barytes are found in it. Also a few crystals of apatite or phosphate of lime.

WARREN. In this town there is an important bed of copper pyrites, mixed with crystallized tremolite, brilliant black blende, and iron pyrites. Also a large quantity of black blende, mixed with argentiferous galena. A large vein of crystallized epidote, yielding gigantic crystals and hemitropic forms, also exists near Little's copper mine above mentioned.

HVERHILL. Dodecahedral crystals of garnet in chlorite, argentiferous galena, copper pyrites, and native arsenic, are found near the former residence of Roswell Wilmot. A large bed of excellent limestone occurs near Black Mountain.

LYMAN. In this town and in Bath, copper pyrites, argentiferous galena, blende, and iron pyrites, are found in small veins.

LISBON. Magnetic iron ores, both granular and in octahedral crystals, are abundant at the iron mine associated with epidote, hornblende, and brilliant manganesian garnets. Very fine specimens are easily obtained from the rubbish of the mine. Staurotide crystals abound in the mica slate, and the loose stones on the shores of Mink Pond are nearly all detached crystals of that mineral. Beds of limestone also occur in this town, and are wrought for lime.

FRANCONIA. This town is the site of an iron furnace, where the Lisbon ore is wrought into iron. The most interesting minerals in the town are the Danaite or mispickel, a cobaltiferous arsenical pyrites, and copper pyrites, which occur near the residence of Mr. Horace Brooks in the bed of a small stream. After visiting the localities of minerals, and ascending Mount Lafayette, and visiting the Flume, Profile Mountain and the Pool, the traveller may go to Littleton, and from thence to Lancaster and Colebrook, which are pleasant villages. From the last-mentioned town he may visit Columbia Lime Pond, the bottom of which contains a remarkable deposit of fine white marl, formed from the shells of myriads of *cyclas*, *planorbis*, *lymnea* and other small fresh water shells. It is a curious spot, interesting to the student of Natural History. Returning to Colebrook, an excursion should be made through the Dixville Notch, one of the most Alpine districts in the State, seldom visited, though one of the most picturesque regions. (See Mr. Whitney's sketch and description.)

Those who may be desirous of a backwood's tramp, and of fine hunting and trout fishing, are advised to continue their journey farther northward to Connecticut Lake, and to the Magalloway River; or a more comfortable journey may be made to Shelburn, where the mines of argentiferous galena, and dark black blende and iron pyrites in brilliant crystals will attract attention.

From Shelburn it is practicable to return southward on the eastern side of the White Mountains by the Pinkham road, a route too rough for a heavy carriage, but sufficiently good for a light wagon. A succession of magnificent views of the high mountains above the road affords occupation for the mind while traversing this wilderness. The road comes out in the town of

JACKSON, where the first discovered and only known veins of tin ore in the United States were found during the geological survey of the State. The oxide of tin occurs on Eastman's Hill, in five small veins traversing mica slate and granite rocks, accompanied by porphyritic trap, containing glassy feldspar and basaltic hornblende. Fluor spar and arsenic ore are the usual accompanying minerals of the tin. Large masses of the arsenic ore are found in veins and upon the surface of the soil, or where the tin veins have been opened.

A large number of veins of iron ore occur near the south line of Jackson on Baldface Mountain in Bartlett, and will furnish an inexhaustible supply for blast furnaces. It is an excellent iron ore, suitable for making fine steel.

From Jackson an excursion may be made to the White Mountain Notch, and a bridle path allows the traveller to ascend Mt. Washington on horseback from T. J. Crawford's, or from Fabyan's, where guides and horses may be obtained. Large crystals of black tourmaline are found in quartz veins on the mountain.

Returning from this picturesque tour, and retracing the road to Bartlett, a locality of green octahedral fluor spar may be visited near Abel Crawford's house on the way, and pretty good specimens may be obtained.

From Bartlett a journey should be made to Pequaket Mountain, where a very fine view of mountain scenery is seen from its summit, and some very curious geological phenomena on its sides, the granite having there been protruded through the argillaceous slates, the fragments of the latter being mixed with the granite while it was in a state of semifluidity.

Proceeding southward, the next locality of interest is the Eaton Lead Mine, where yellow blende, calamine, galena, and purple fluor spar are found in abundance at the mouth of the mine. Those who wish for a laborious mountain excursion, can ascend Chocorua Mountain from Albany.

On leaving this region, and travelling through Moultonborough, the Ossipee mountains may be ascended, and a picturesque view of the country obtained, and several large trap dykes may be examined on the mountains.

Centre Harbor is the usual resting place for travellers who visit Winnipiseogee Lake, and from thence an excursion may be made to Red Hill, and a fine view of the lake is obtained from its summit. A voyage in a boat among the islands in the lake may interest lovers of picturesque scenery, and prove instructive to those who have a taste for good farming. Long Island and Cow Island are celebrated for their heavy crops of Indian corn.

If an excursion is made to Guilford, the Gunstock Mountain, or Mt. Belknap, as it has recently been named, may prove an interesting point for a view of the lake, and among the attractive things found there, is a vein of native magnetic iron ore possessing strong polarity.

After performing the tour here proposed, the Shaker Settlement at Canterbury may be visited, and from thence the journey may be finished by returning to Concord, where by Railroad in a few hours the tourist may return to Boston.

In the above described route the traveller will see much of the picturesque scenery of New Hampshire, and will have an opportunity of collecting the most remarkable minerals. He must not suppose, however, that he has seen all that has been found, but on some future season he may vary his route, and visit other places which are fully described in the Geological Report.





J.D. Whitney del.

Cooks Lith. Merch. Exch. Boston.

VIEW ON LAKE WINNEPISSEEGEE.

VIEW ON LAKE WINNIPISIOGEE.

FROM the geological character of New Hampshire, one would hardly be led to expect great beauty or variety of scenery. The rocks, which are entirely of the oldest geological formation, are for the most part so rounded and worn by the action of the elements for countless ages, that they rarely retain that sharpness and boldness of outline, which is necessary to a grandly picturesque landscape. Deluge after deluge has swept over the surface of the State, rounding the outline of the mountain masses, smoothing and polishing the rocky strata, and heaping up huge piles of diluvial matter, which generally cover to a great depth and effectually conceal the rocks in place. The mountains do not rise to a height which would enable them to rival even the lower snow-capped summits of the Alps or the Pyrenees. No peak shoots up into the region of eternal snow, and sends down its frozen torrents into the green vallies at its base. Beautiful as is our scenery, it can rarely or never be said to rise to sublimity.

But if our mountains cannot challenge comparison with the Swiss and Tyrolese Alps, if we have not the glaciers with their wonderful variety and grandeur of form, we have lake and forest scenery, which, for peculiar and bewitching beauty, may be pronounced unrivalled. An immense sheet of pure and sparkling water, enclosed in an amphitheatre of mountains, from whose summits the dark foliage of a northern forest sweeps in one unbroken mass, down to the very edge of the water, whose surface is dotted with innumerable islands, crested with the towering pines, whose dark mass is repeated in a crystal mirror; such is our lake scenery, and first among our lakes is Winnipisiogee. The hand of man has done nothing to add to its charms; it cannot boast either the marble villas of Como, or the terraced islands of Lago Maggiore covered with tropical foliage. Were it not for the smoke which here and there curls up from among the pines, the eye would hardly trace the presence of man, from many points of its shores and islands. From the shore, the range of vision is soon stopped by the islands, which can hardly be separated from each other in the dim distance, but from the summit of any one of the numerous mountains which surround the lake, the whole extent of its surface is spread out like a map, and glitters in the sunlight, like a sheet of crystal sprinkled with emeralds. For this purpose Red Hill near Centre Harbor should be ascended. The view from its summit is the most beautiful panorama which this country

affords. On one side is Winnipisiogee and its still more picturesque rival Squam, on the other Ossipee and others of less note, the whole surrounded by the lofty peaks of Kearsarge, Chocorua, Pequaket, and innumerable chains of hills which recede behind each other till lost in the horizon. The islands, which almost conceal the surface of the lakes, seem to have every possible variety of form and shape, now rising to the height of several hundred feet above the water, and now seeming to float upon it, a mere tuft of evergreens, from the centre of which often projects some half-decayed, gigantic pine, whose knotty branches extend beyond the bounds of the patch of soil which gave it birth.

Some of the islands in this lake are inhabited, and one, which rejoices in the somewhat unpoetical name of Cow Island, is famed for the large crops which have been raised upon it. To one tired of the bustle of city life, who wishes to retire from the world and be quite sure of uninterrupted communion with nature, one of the numerous islands of this lake offers unbounded advantages. The sportsman would be tempted by the abundance of game, and by the delicious trout caught in the lake, and in the mountain streams which empty into it.

The Indian name of the lake is said to signify "the smile of the Great Spirit," a name characteristic of the deep feeling of the Indian for the beautiful in nature. The remark will be permitted here, since, though often repeated, it cannot be too strongly insisted on, that it is to be regretted that the aboriginal names of the most striking features of natural scenery have not been in all cases preserved, and that it is to be hoped that they may be hereafter restored, especially if characteristic and euphonious, and that the endless number of Long Ponds and Big Ponds and Little Ponds may receive more appropriate names. An attempt was once made to convert Winnipisiogee into Lake Wentworth, and Squam into Sullivan's Lake, but the original names had become too familiar, and the others were never adopted.

The accompanying view was taken from Red Hill about one third of the distance from the base to the summit, and represents but a small portion of the Lake, as the whole could hardly be included in the limits of anything less than a panoramic drawing.

To fully enjoy the scenery of the lake, a sail-boat should be taken at Centre Harbor, and a couple of days spent in exploring the islands. If one wishes to have a taste of wild woods life, he can camp upon any one of the rocky islands, and cooking his supper of any game or fish which chance or skill may have thrown into his hands, he can sleep, lulled by the music of the wind sighing through the pines, or, if the mosquitoes intrude upon his slumbers, he can sit by his camp-fire and look out upon a scene, which, when illumined by the full moon rising from the bosom of the water, is magically beautiful.





J. B. Hildrey del.

C. Cooke Lith. Meadell. Publ. Boston.

PROFILE MOUNTAIN. FRANCONIA NOTCH.

PROFILE MOUNTAIN.—FRANCONIA NOTCH.

THIS is the wildest freak of nature's fancy which the world can show, and it is really wonderful that it is so little known, and that it has never been accurately delineated. Imagine a perpendicular precipice rising from 1500 to 2000 feet, in the midst of the primeval forests, from the upper angle of which, sharply relieved against the sky, projects, not a shapeless mass of rock, which by an immense stretch of the imagination can be tortured into something like a resemblance to the human face, but a perfect profile of an old man, who seems to be gazing with an expression of solemn awe into the valley below. Not a feature is wanting; eye, eyebrow, nose, mouth and chin, all are there, and in excellent proportion, so that the hand of a gigantic sculptor could hardly have better shaped the mass, so as to produce a more striking effect, when seen from the point indicated by a guide-board, which directs the traveller where the best view is to be obtained. A few rods either way from this spot the features become scarcely recognizable, and soon all trace of the likeness disappears.

No one can look, for the first time, upon the face of the "Old Man of the Mountain," without a feeling of awe and astonishment. The first impression is, that it is the work of human hands, but a little examination soon convinces that all access to it is impossible. The telescope reveals the structure and arrangement of the huge blocks of granite, which, lying upon and overlapping each other, produce so astonishing a resemblance.

It would be interesting to know what were the notions of the Indians with regard to the Profile Mountain. Fond as they were of giving characteristic names to striking objects of natural scenery, no legend or name connected with this has been handed down by tradition. It is possible, and it seems almost probable, that by some change in the position of the blocks, produced by an earthquake, or by the action of frost, the likeness has been developed or rendered more striking within a few years, or since the settlement of America by white men. If so, some fall of a mass of rock might destroy the resemblance, and it is to be wished that some accurate Daguerreotype copy of so remarkable a physiognomy should be preserved for future comparison.

THE FLUME, FRANCONIA NOTCH.

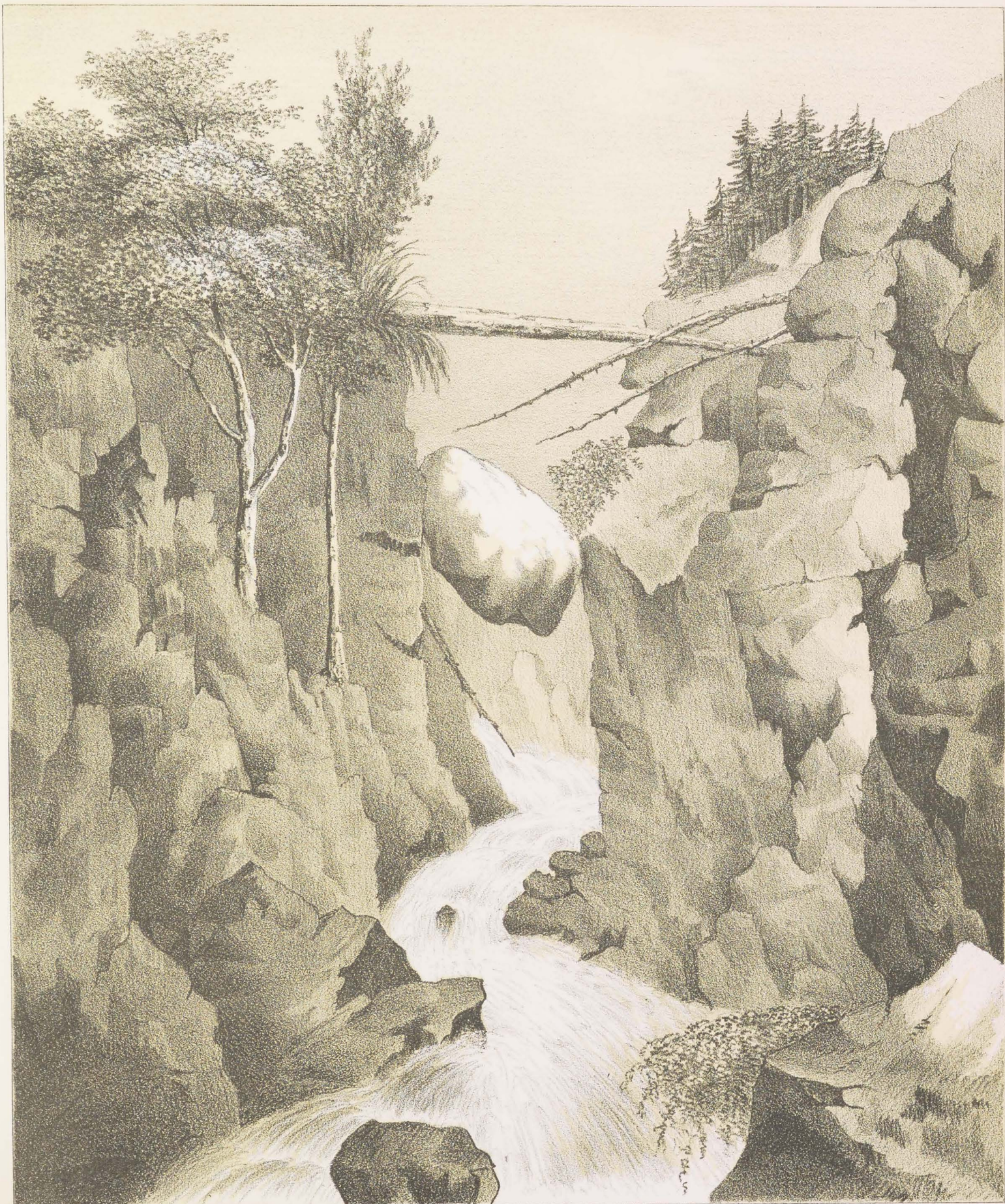
Nor far from the place where the best view, as indicated by a guide-board, is obtained of the "Old Man of the Mountain," a path turns sharply to the left, and following up the course of a mountain torrent, crossing and recrossing it on frail bridges, or passing directly over the polished rocks, which form the bed of the stream when swollen by the spring rains, leads to the "Flume." This is a deep chasm between perpendicular walls of granite, at the bottom of which rushes wildly down, in a series of picturesque waterfalls, a small stream, which, however, when increased to many times its accustomed volume, by the melting of the snow, or by some sudden and violent mountain storm, dashes wildly with tremendous fracas over its rocky bed. The walls are from 1 to 200 feet in height, vertical and bare, and they approach in some places so near as almost to touch each other.

At one point a huge boulder of granite has become wedged in between the sides of the chasm, high above the present level of the stream, and beyond any point to which it could at present attain, at its greatest height. Here it hangs, seemingly ready to fall on the head of the first person who should be rash enough to venture beneath it. Yet there it has remained suspended, in all probability, for thousands of years.

The Flume extends up the course of the torrent for two or three miles, and affords a variety of pleasing and romantic views of dashing waterfalls hemmed in by vertical precipices, and sometimes so closed at the top by the overhanging foliage, that the light of day can scarcely penetrate. It is no easy matter to scramble up the rocky ravine and follow the stream to its source, since, when it is confined to a narrow channel, the depth and strength of the current is so great, that he must be a practised wader who does not find himself obliged to retrace his steps.

This curious chasm is in all probability the result of an original fracture in the rocks, and not formed by the action of running water, since the walls are generally vertical, and not hollowed out and irregular in shape, as they would be if produced by the latter cause.

Franconia, a thriving little village supported by its iron furnace, is excellent headquarters for exploring the objects of interest in the neighborhood of the Franconia Notch, and for making the ascent of Mount Lafayette, which rises to the height of over 5000 feet, and affords a magnificent view of the whole range of the White Mountains.



J. D. Whitney del.

C. Cooks lith. Merril's Esch's Boston.

FLUME FRANCONIA.



J. D. Whitney del.

C. Cooks Lith. Boston.

WHITE MOUNTAIN NOTCH.

THE WHITE MOUNTAIN NOTCH.

THE accompanying plate represents the western entrance of the passage through the White Mountain range, and is taken from a point near Mr. Crawford's house, so well known to tourists and naturalists who visit the New Hampshire mountains. The name of Notch or Gap may be appropriately applied to this extremity of the defile, for here a narrow opening between the perpendicular walls of rock, just wide enough to give passage to the road, forms a natural doorway, which might be defended by a handful of men against the passage of a whole army of enemies. Near this spot the Saco takes its rise, tumbling down over its rocky bed in a series of cascades from the side of the mountain. The road which connects a large portion of the northern part of the State with the Atlantic coast, follows its course through the Notch, and obviates the necessity of a circuitous route around the mountains. The discoverers of this passage, Nash and Sawyer, were rewarded by large grants of land from the government. The height of the summit of the pass is not far from 1800 feet above the sea level, and it is not improbable that we may see a railroad connecting the Atlantic coast with Canada traversing the White Mountain Notch, and making the rocky solitude echo to the shrill whistle of the locomotive.

To the traveller who wishes to spend a few days in examining the mountains, the "Notch House" affords excellent head-quarters, since it is surrounded by picturesque scenery, and so near Mount Washington, that the excursion may easily be made in a day to its summit and back, either on foot, or, since the completion of a rude horse-path, on the tough mountain ponies, which scramble about among the loose rocks, seemingly as secure as if jogging along on the best road in England. In ascending Mount Washington from the Notch House, the traveller passes over the summits of Mount Clinton, Pleasant and Franklin, so that he is presented at every turn with a succession of grand and striking views.

Whoever determines to make the ascent of the mountain must be prepared beforehand for sudden changes in the weather, and he must not be disappointed, if midway in his course he is caught by a storm of snow or rain and enveloped in clouds, which compel him to return half frozen to his quarters, hoping for better luck next time.

WILLEY HOUSE, WHITE MOUNTAIN NOTCH.

As the traveller, following the course of the Saco, winds his way through the Notch, he sees here and there immense patches stripped of vegetation, and strewn with masses of rock, boulders of all sizes, and rocky detritus. Following up one of these "slides" to its origin, it will be found to narrow as it ascends the steep side of the mountain, till at length a point is found in some deep gulley of the almost perpendicular wall of granite, from which the avalanche commenced its headlong descent. The whole surface of the White Mountain range is scored and furrowed by these land slips. Their origin is this. The matter resulting from the slow and gradual decomposition of the granitic and slaty rocks is brought down by the action of the mountain torrents, and gradually accumulates in the deep gorges along the side of the mountain. Forest trees and shrubbery cover it, and it seems as secure in its place as the mountain itself. But as its mass gradually and slowly accumulates, its tendency to slide from its base becomes greater and greater, and finally some violent and long-continued mountain storm loosens it from its bed, and sends it thundering down into the valley below. As it descends, it sweeps everything before it, and its impetus gradually increases, till nothing can resist its progress, and rocks, trees and soil are mingled together in promiscuous ruin.

Such was the memorable catastrophe of the 28th of August, 1826, which has given so thrilling an interest to this portion of the Notch. On that fearful night the Willey family, nine in number, was buried under the descending avalanche, and not one spared to describe the scene of horror. On the morning of that day a most terrific storm of wind and rain burst upon the White Mountains, and continuing during the day and the following night, loosened rocks, earth and trees from their bed, and furrowed the vallies with a succession of slides, causing a scene of devastation and confusion, which no one could have realized who had not witnessed the effect of the action of water on a grand scale among the mountains.

At the point of the Notch where the Willey house stands, the mountains rise on either hand to the height of from 1500 to 2000 feet, bare and precipitous, leaving between them a small meadow, towards which the house fronted. The family had been alarmed by a descent of earth and rocks from the mountain behind them about two months before, and had constructed a temporary shelter, which they deemed more secure, and to



J. D. Whitney del.

C. Cook & Lath. Boston.

SLIDE, AT THE WILLEY HOUSE - WHITE MTS.



J. D. Whitney del.

C. Cooke Lith. Boston.

DIXVILLE NOTCH.
(From the Western Entrance)

which they intended to fly in case of danger. On the night of the above-mentioned storm they had retired to rest, not dreaming of danger, but roused by the crash of the descending avalanche they rushed from their beds and fled, but fled only to meet instant destruction; for the moving mass which bore directly down upon the house, halted just before reaching it, divided into two branches, and passed on both sides, uniting again in front, and leaving it entirely unscathed, but sweeping away the unfortunate inhabitants, who had thus unconsciously rushed into the midst of death. The descending mass seems to have been checked in its course by the falling of some huge rock on its flat surface, and had the family remained within the house, it would no doubt have seemed to them an almost miraculous interposition of Providence, which had diverted the avalanche and left them uninjured in the midst of the wreck of mountains.

DIXVILLE NOTCH.

THIS romantic pass is almost wholly unknown to tourists, though one of the most striking scenes in the State. It is a defile or passage through the chain of mountains which extends through the town of Dixville, opening by means of a recently constructed road, a communication between Colebrook and the adjacent towns with the Atlantic coast. The walls of the defile are mica slate, which rises, in some places, in bare and almost vertical precipices, to the height of nearly a thousand feet. The angular and precipitous appearance of this rock is strikingly different from the rounded and water-worn appearance of the primitive rocks generally in New England. The defile is two or three miles in length, and presents at various points a great number of grand and striking scenes.

The scenery of the northern part of the State should be seen at the time when the magic touch of the first frost has tinged the deep green foliage with all the colors of the rainbow. The long, gently swelling mountain ranges are thickly wooded to their summits with the maple, the beech, the ash and other trees, whose leaves acquire the most brilliant hues, from the deepest blood-red to the most golden orange, presenting a combination of color which the painter would endeavor in vain to copy. The whole country is one unbroken forest, and the eye may sweep over an immense extent of surface, across range on range of hills, without one sign of the presence of man to break the spell, as if one vast sheet of many-colored tapestry had fallen from heaven, concealing

the face of the earth and its inhabitants. The autumnal scenery of American forests has been often enough described, but he who has not seen it displayed in the primeval woods of the northern part of New England has but a faint conception of what its effect may be. As travellers and tourists begin to learn the beauties of the scenery of this part of the State, and as the facilities for communication are improved, the tide of travel will begin to set this way, and not a few will gaze with astonishment at the grandeur of a mountain defile, which surpasses even the famed notch of the White Mountains.

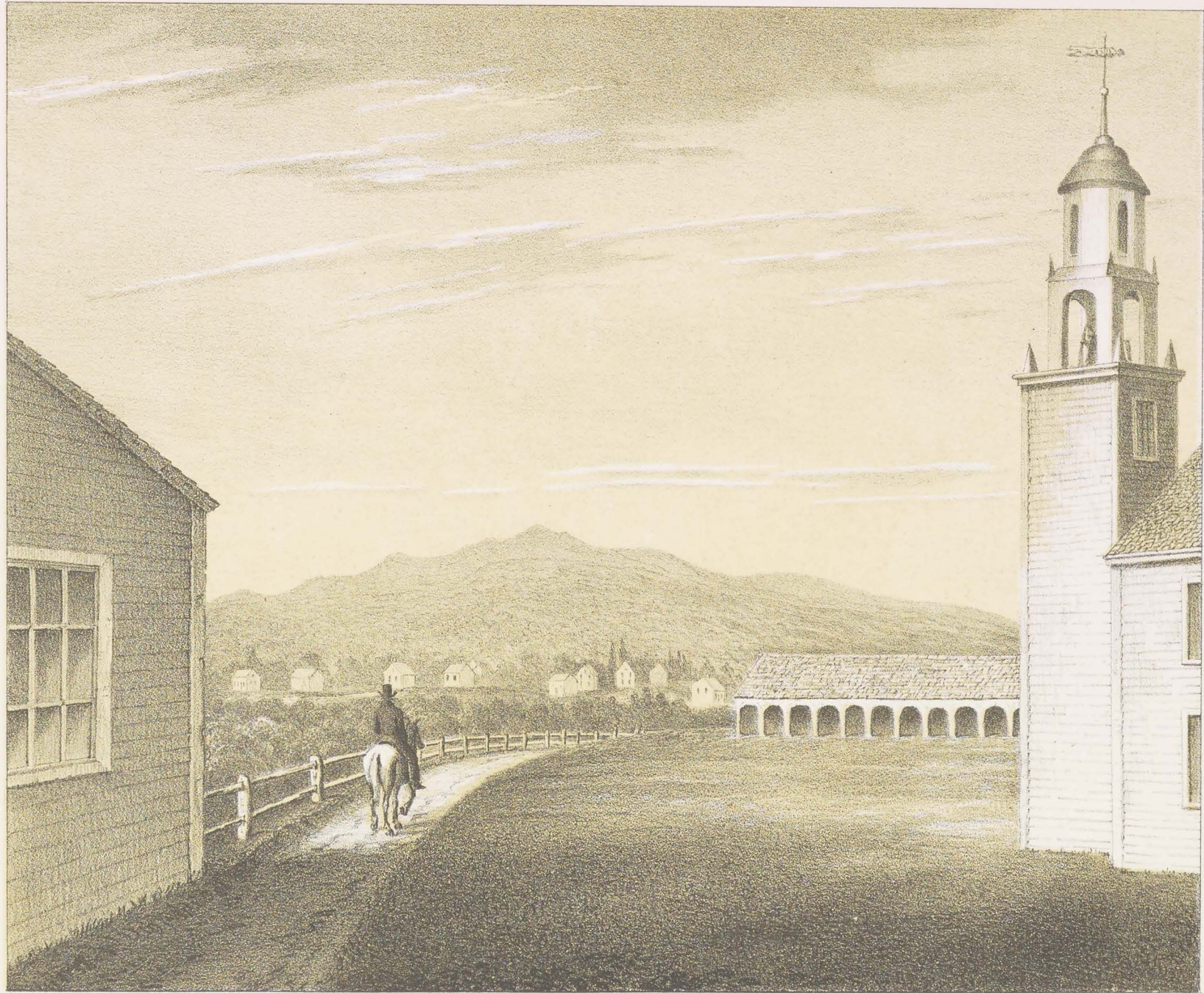
MONADNOCK MOUNTAIN.

THE Grand Monadnock, situated in the towns of Jaffrey and Dublin, is one of the most elevated peaks of the ridge of land dividing the Connecticut from the Merrimack rivers. It rises abruptly from a base which is 1209 feet above the sea level, and its summit reaches the height of 3096 feet above the sea. The rocks composing the mountain are gneiss, mica slate, and porphyritic granite, the latter, appearing to constitute its base, may be seen protruding from its sides in several places. The compact mica slate is filled with fibrolite or fibrous kyanite, and the gneiss contains veins of quartz with garnets and black tourmaline, and some thin layers of graphite or black lead. Few specimens of mineralogical interest can be obtained, and the traveller must look to the magnificent view from the summit of the mountain as a reward for his labors in climbing up its rugged sides.

The geologist will observe the myriads of erratic rocks strewn over the surface of the mountain, and will notice the deep drift scratches and furrows which are seen on the ledges, indicating the long-continued passage of water with floating ice and frozen gravel over its rocky sides.

Most of the plants on the mountain top are of an Alpine character, and the few trees are dwarfish, and grow in the crevices of the rocks. In their season blueberries are very abundantly collected from the sides of the Monadnock by the neighboring inhabitants, parties of ladies and gentlemen often ascending it to feast on them.

The view from the summit of the mountain is very extensive, and the ordinary hills appear to be reduced to a plane surface when seen from this height. Among the numerous villages seen from the top of the mountain are Keene, which bears N. 30° W., Jaffrey on the S. E., Fitzwilliam S. 30° W., and Wachuset Mountain in Massachusetts is seen to the S. 15° E.



C.T. Jackson del.

C. Cook's Lith. Merch. & Exc. Boston.

MONADNOCK MT. FROM JAFFREY.



C. T. Jackson del.

C. Cook's Lith. 32 Merch' Exchange, Boston.

SECTIONS OF SEEDS.

Exhibiting the Situation of the Oil, Starch, Gluten, Phosphates and Oxide of Iron.

Descending the mountain, the mineral spring, a chalybeate water of some celebrity, may be visited. A fine view of the Monadnock may be taken from the road which passes by the pond at its base in Dublin, that beautiful lake giving a picturesque effect to the scene.

COLORED PLATE OF SEEDS.

THIS colored lithograph has attracted much attention among men of science and practical farmers, and is an object of interest to all who may be curious respecting the composition of the food of men and animals, or concerning the saline matters extracted from soils by growing plants. I have thought it might prove interesting to the naturalist, and have therefore inserted it in this work.

It explains the chemical nature of the different parts of seeds, and shows the manner in which the phosphates of lime, magnesia and ammonia are distributed in them. The drawings are exact copies of the seeds as they appear after having been immersed in the liquid test for a few hours.

Thus the horse bean, common white and kidney beans, and the pea, when thrown into a solution of sulphate of copper are dyed throughout of a green color, owing to the action of the phosphates on the sulphate of copper, the sulphuric acid leaving the oxide of copper to combine with the bases of the phosphates, while the oxide of copper unites with the phosphoric acid and forms a green pigment. (See the plate.) Beside each of the colored specimens is a drawing of the seed of its original color, or before it had been exposed to the test. The epidermis or skin of the seeds will not take any color, indicating the absence of the phosphates. When the above-mentioned seeds are exposed to a solution of sulphhydrate of ammonia they become colored dark olive-brown, indicating the presence of salts of the oxide of iron throughout their tissues, the sulphuret of iron being black, while the ammonia alters the vegetable coloring matter to yellow, and the mixed colors give this result. I have not inserted a figure of the bean treated in that manner, but there are some of grains of maize.

When Indian corn or any cereal grain is slit in two, and is immersed in a solution of sulphate of copper, the "chit" only becomes colored green, as represented in the drawings, and on analysis, the phosphates are found to exist only in that portion of the grain.

The plate represents a number of varieties of Indian corn, tested as above described. If we dip the corn into a weak tincture of iodine, and then into water, the limits of the starch and dextrine will be indicated by a rich violet blue color, which is produced by a combination of the iodine with the starch and dextrine, the iodide of starch being blue, and that of dextrine being Port-wine red, the combined colors form a violet.

The yellow color indicates the limits and extent of the oily glutinous portion of the grain, which is very curiously arranged in the different varieties. When corn is thrown into a solution of sulphhydrate of ammonia, the presence of a salt of oxide of iron is indicated only in the "chit," where a chemical analysis also detects its presence. Barley, wheat, oats and buck-wheat are constituted in a similar manner, as represented in the plate.

This method of testing grains is very similar to the operations of mordants and dyes in calico printing. It will serve the physiologist in testing various plants during their development.

Thus I have proved the exact points, where starch changes into dextrine, when absorbed through the umbilical cord of the embryo, and in the plumules or buds which spring from tubers. It is easy also to detect unripe seed by the action of the above-mentioned tests.

Those who wish to study this subject more in detail, are referred to my Final Report on the Geology and Mineralogy of New Hampshire, p. 256.

GEOLOGICAL MAP. NEW-HAMPSHIRE.

CHARLES T. JACKSON.

1874.

Scale by Cassin, 22 Mar. 1874, New-Hampshire, U.S.A.

1	Granite, Sienite and Gneiss.	v	Copper.	M	Manganese.	+	Dip and Direction of Strata.
2	Mica Slate.	S	Eyrites.	A	Arsenic.	+	Anticlinal Axis.
3	Quartz Rock.)	Silver.	B	Molybdena.		
4	Trip.	o	Gold.		Mine.		
5	Horriblende Rock.	^	Titanium.				
6	Argillaceous Slate.	+	Trit. Iron.				
7	Limestone.	o	Plumbago.				
8	Talc. & Soapstone.	o	Beryl.				
9	Drift.	7	Mica.				
10	Alteration.						
11	Peat.						
12	Iron.						
13	Lead.						
14	Zinc.						
15	Tin.						



Note.
 State Line
 County Line
 Town Line
 Road
 Rail Road

Scale 6 Miles to the Inch.

M A S S A C H U S E T T S

