

SECOND REPORT
ON THE
GEOLOGICAL SURVEY
OF THE PROVINCE OF NEW BRUNSWICK.

By Abraham Gesner, Provincial Geologist, &c.
[Continued.]

During the last year the coal and iron of Queen's County have been applied for; also, leases for coal and other minerals in the County of Westmorland. Petitions have also been laid before the Provincial Government for coal and other minerals discovered during the past season. Independent of the survey, the Gloucester Mining Association, from the exertions of WILLIAM STEPHENS, Esquire, has been successful in exploring for copper ore in the County of Gloucester, and a bed of manganese is worked at Quaco, where it had been discovered many years ago.

The discovery of the Westmorland Coal Field and the explorations of its boundaries, and the out-cropping of the coal itself along an extensive tract of country, as detailed in this Report, scarcely require a remark. It may, nevertheless, be affirmed, that few examinations in any part of the world have produced more important results under similar circumstances.

A more general spirit of enquiry has become manifest throughout the Province; and we have devoted much time, patience, and labour in examining a variety of specimens from different quarters. Only a few of these have been found to be worthy of notice. Many individuals have suffered much disappointment when informed that the objects of their search were of no practical value, and made acquainted with the fact "that all is not gold that glitters." Even in this case it is hoped some good has been performed by correcting erroneous opinions, and by directing the attention of individuals to objects of real value.

The "mineral or divining rod," invented by the Druids to awe their superstitious followers, has been introduced into the British Provinces from the Eastern American States, and has found its votaries even among persons otherwise intelligent. The power of divination contained in two small phials and fixed on pieces of whalebone, and borne along by the seventh son of the seventh son, has been considered infallible in the discovery of concealed money and all kinds of minerals. Indeed there are instances of ruinous sacrifices of time and money having been made by persons who have bowed down to this shrine of superstition and folly.

A number of communications have been received from scientific societies and distinguished individuals in Great Britain and America. In almost all these a degree of interest in the Geological exploration of New Brunswick is expressed in terms highly commendatory of the Provincial Government, and gratifying to the person to whom the charge of the Geological survey has been committed.

Specimens of the different rocks, minerals, and fossils have been carefully preserved: a collection of the minerals will be laid before Your Excellency with this Report.

The Geological Map of the Province has been commenced, and is advancing towards completion.

It was intended to devote a part of the present Report to Economic and Agricultural Geology; but, upon consideration, it was deemed most proper to treat of those parts of the subject at the close of the survey.

The discovery, by Captain RUEL,* of bones of a large fossil Elephant, which had been mistaken for wood, and sold in the market for fuel, gives a new and most interesting feature to the Geology of New Brunswick. These bones are now in my possession, and such information has been obtained as will probably lead to the discovery of the skeletons of these gigantic animals, which have long since ceased to exist upon the earth.

The following details will exhibit more fully the discoveries of the past season, and the vast importance of the Geological exploration, as one of those wise and judicious acts which have ever characterised Your Excellency's administration.

SAINT JOHN.

The belts of limestone described in the first Report, cross the river and extend along the broken and hilly tract situated between the city, and the entrance of the Kennebecasis. The first of these belts has been broken through by the river at its narrow outlet, directly opposite the Mills of Messrs. EVKITT, and those of the St. John Mills and Canal Company, and forms the overhanging cliffs above the Falls. It is about a furlong wide, and reaches to Marble Cove, a place of security for large rafts of timber, floated down the river, and secured here until a favourable opportunity offers to give them a passage through the Falls to the numerous lumber-yards at the extremity of the Harbour.

Proceeding in a north-east by north direction, it then passes beneath the new Church at Portland, and may be seen in the uneven land northward of the estate of HENRY GILBERT, Esquire, and along the road leading to Hammond River. Another remarkable ridge of this rock rises abruptly at Portland, and forms the site of Fort Howe, occupied by a small part of the garrison.

The limestone of this hill contains several veins of graphite, or plumbago, one of which is on the north side of the main street, and is upwards of four feet in thickness. This graphite is too impure for the manufacture of lead pencils. It is occasionally used for varnishing stoves, and lessening friction, and may at some future period afford an article of limited export.

Interstratified with these two belts of limestone, there are strata of greywacke, and very frequently masses of trap rock, containing the sulphure of iron in very small grains. This mineral, wherever it is exposed to the weather, is decomposed. The oxygen of the atmosphere unites with the iron, and forms the peroxide (common rust) of the metal, which is sometimes several inches in thickness. It has been said by some persons that these ferruginous masses would afford good iron ore, but both the iron pyrites and the peroxide are unfit for

*The writer begs to express his thanks to this Gentleman for the relics referred to; and also to Dr. LAWRENCE VAN BUSKIRK, for his aid in exploring the coast.

the manufacture of iron. Other strata (layers) extend from the main river nearly parallel to the Kennebecasis, and frequently contain thick beds of calcareous breccia. Of this breccia, large masses may be seen along the shores, and over the country southward, where they have been transported by causes to be noticed hereafter. Very frequently strata of this calcareous formation have a peculiar curled or wavy appearance, and the lamina forming even the most compact parts of the rock, are folded over each other in such a manner, that when the rock is polished it has the appearance of curled maple, and a beautiful clouded marble might be quarried in situations where the frost and other meteoric agents have not destroyed the solidity of the rock. The breccia is also very beautiful, and after it has received a polish resembles mosaic pavement.

The limestone is met on its south-east side by slate, and greywacke; these rocks are exposed on the side of the river, at the lumber and ship-yards, and at the powerful steam mills of MACKAY, BROTHERS & Co. The whole shore here is lined with the productions of the forest, which are seen either in the framework of some lofty ship, the squared trunk of the pine, or in tottering piles of deals prepared for the English market.

Between Portland and the City there is a narrow and deep fosse, extending from the harbour to the creek, and separating on the surface, the limestone from the rocks situated farther south. In the bottom of this fosse, there are beds of clay, containing the remains of the *Mya*, *Pecten*, *Mytilus*, and other marine shells, like those still inhabiting the coast. These shells are now elevated about eighteen feet above the level of the sea, which at some former period surrounded the site of the town and rendered its present rocky peninsula an Island. At the same period when the sea had a free access between the present sites of the Iron Foundries, it probably flowed into the low ground now occupied by the pond connected with the powerful Saw Mills of MACKAY, BROTHERS & Co., at Spar Cove, similar shells having been found in the clay at the bottom of the pond, previous to its being overflowed with water.

Saint John is built upon greywacke, and greywacke slate; the strata run north-east, and south-west nearly, and dip towards the south-east, at an angle varying from 70° to 80°. In some instances they nearly approach the vertical line. These rocks contain veins of white quartz, iron pyrites, and sometimes small quantities of the protoxide of iron.

A shallow estuary eastward of the City is terminated by a creek and a tract of marsh, four miles long, and upon an average half a mile in breadth. This marsh is composed of alluvium brought in by the sea; and the trunks of trees of the present growth, buried deeply beneath the soil, show that its formation is comparatively recent. This alluvium is of an inferior quality, and the growth of peat upon many parts of its surface renders it almost barren in a natural state. It is only by the skill and industry of its proprietors that it has been rescued from the sea, and rendered fertile.

The broken land between the Marsh and the Kennebecasis is composed of limestone, trap and syenite of several varieties. The peculiar features of this tract have evidently arisen from the eruption of the intrusive trappan rocks from beneath, and thus the broken and elevated position of the limestone and the slate sometimes associated with it, will admit of a satisfactory explanation.

On the north side of the ravine not far from the pottery, and directly opposite Jeffrey's Hill, there is a bed of chert extending some distance in an east and west direction; a few strata of slate meet the chert, and in them we found the remains of shells. They are all *Alterebratula*, and being among the oldest relics preserved in the rocks, are not to be seen without a close examination. These shells were afterwards found in the limestone, and therefore the relative age of these rocks is fully determined.

The trap rock will be seen in the naked hills northward and in the excavations made in opening the road to Indian Town. At the latter place it contains veins of quartz, and is composed chiefly of hornblende.

At several situations along the high ground, running parallel to the mouth of the Kennebecasis, and at an average distance of two and a half miles from the City, marble, of a good quality, and equal in beauty to any imported varieties may be quarried, and a part of the machinery employed in sawing deals, might be usefully and profitably devoted to sawing and polishing the native rock, now remaining valueless in the bosom of the hills. At Lily Lake the marble is highly crystalline and of a pure white, and although it is much broken wherever it is exposed to the frost, it is evident large slabs might be procured by opening the rock to the depth of a few feet. White and green talc appear in the limestone near the Lake. They are only found within the limits of the influence of the heat, that accompanied the elevation of the trap dikes. This part of the limestone formation supplies the City, and large quantities are annually exported for agricultural and other purposes. The extensive beds of clay belonging to the tertiary deposit already mentioned, also afford bricks, of which there were seven hundred and twenty thousand manufactured during the past season. It also supplies a small pottery, at the foot of Jeffrey's Hill.

It is only in the valleys, and on a few of the slopes that the soil is sufficiently deep for cultivation, and even in those places the covering of the rock is frequently composed of peat and other decayed vegetables instead of earthly soil.

On the north side of the hill at Coburg street, where the sand and gravel have been removed, diluvial grooves and scratches, produced by the moving of loose stones over the rocks subsequent to the fixed position of the strata, and prior to the collections of loose matter above them, are still to be seen. Some of these are dotted by the vibrations of heavy masses as they passed along; an effect common to heavy bodies when they are propelled over solids by the force of water. Similar grooves are often seen in these rocks, affording another proof of the former submersion of the Country and the powerful currents that have passed over its surface.

The River Saint John having taken its rise about three hundred miles in the interior of the country, and collected the waters of numerous lakes, and streams, opening into its channel, has all its forces collected at Indian Town, and is poured into the sea, at the extremity of the harbour two miles and a half from the city, with an irresistible fury.

The entrance of this majestic stream is only about two hundred yards wide, and is situated between perpendicular and overhanging walls of limestone. The river, having passed through this narrow gorge, turns immediately to the eastward and mingles with the waters of the sea.

The ordinary tide of the harbour rises twenty six feet, while above the Falls it only rises about eighteen inches; therefore the height of the Falls might be estimated at twenty four feet and a half. But this estimate will not be received as correct, when it is considered that the entrance of the river at the Falls is too narrow to allow the sea to flow in freely; and therefore there is a fall inwards at high water, and a fall outwards at low water, and the time of passing for vessels is fixed at three quarters of an hour each tide, and when the sea and river have assumed the same level. The fall outwards we have estimated at twenty feet, and at high tides the fall inwards at high water is fifteen feet, making the whole height of this double fall thirty five feet.

The accumulated water of this extensive and deep river, with all its lakes and tributary branches, is here dashed through a narrow gorge and over a rudely inclined plane into the sea. Interrupted by small islands above, and compelled to pass over huge masses of rocks obstructing the narrow passage, the river foaming and spouting with tremendous fury, assumes, at making its exit, a most tragical character, threatening with instant death any who may venture upon its troubled bosom. But on the flood tide the scene is changed: the ocean spreads its mantle over the thundering cataract, and flowing inwards through the narrow channel, stills the noisy rapid—the tide lock of the Falls is shut, and apparently to oblige the inhabitants, allows them to pass in safety with large ships.

Perhaps there is not a river in America of the same extent, which has so narrow an outlet as the Saint John. From the Falls to Grand Bay, a distance of four miles, this majestic stream passes through a tortuous channel, at many places not more than two hundred and fifty feet wide, while in the interior of the country it will average from one to three miles in breadth. The rocky shores of its outlet have not been worn down and scooped out, as is common on the shores of all rivers giving exit to immense quantities of ice. On the other hand, they appear to have been separated from each other at a period comparatively recent, and the gorge through which the stream now passes appears like a deep fissure, opened by some sudden movement in the earth. It was at one time hoped that the ancient entrance of this river would be discovered, but we have been unsuccessful in the search. It is, however, most probable that the mouth of the Saint John formerly had two branches, one opening from the Kennebecasis down to the present site of the Marsh, and the other opening from Grand Bay through to Manawagonish. But the same causes that opened the new channel, have evidently obliterated the old one. That the whole line of coast westward has been elevated from eighteen to twenty six feet, and upwards, we have sufficient evidence in the marine shells found in the clay and marl. The conditions of the Magaguadavic are similar to those of the Saint John, whose bed has been raised, and a stream that was in all probability once very rapid, has become like a lake, from the narrowness of its outlet and the geological causes which have elevated its former bed. But we defer entering widely upon the interesting facts connected with this noble river until it has been explored throughout its whole extent.

The slates and greywacke on the east side of the creek, and extending along the shore to Cape Missee, on the east side of the Harbour of Saint John, are different in many particulars from those rocks as they appear on the peninsula of the City, and from the direction of the strata, they extend into the bay, and do not reach across this arm of the sea. The strata all dip towards the south-east, at a high angle, and from the anticlinal line formed northward by granitic and syenitic rocks. These slaty strata differ much in their external character and mineral composition. At some places they are argillaceous, (clayey,) and at others arenaceous, (sandy.) The clay slate frequently contains a considerable quantity of mica in a finely divided state, or mixed with a small quantity of lime. From a hard and brittle, it passes into a soft and finely laminated rock, containing carbon, and yielding readily to meteoric influence. Again it becomes chloritic, and often contains hornblende. A slaty conglomerate also appears interstratified with each of these varieties. From these circumstances and others which might be noticed, it is evident that these rocks were not produced by causes equal and uniform in their operations, and a great length of time must have elapsed, and many changes must have occurred in the physical geography of the country, during the accumulation of such a variety of sedimentary matter.

At Horse Race Point a dike of trap containing veins of quartz and chlorite is seen occupying a place between the strata; but instead of having its lines of separation well defined, it is mixed with the hornblende and chlorite slate, into which it passes insensibly. These facts were observed at many other places along the coast, and they can only be explained by admitting that these dikes were elevated by volcanic influence, while the schistose (slaty) rocks were in a soft state, and therefore became mingled with them before the one had cooled, and the other had passed from sand and mud into compact rock; or, the heat which accompanied these eruptions might have been such as melted the superimposed slate, and

*Some excellent remarks on the Harbour of Saint John, and the causes effecting changes in its channel, have been recently made by LAUCHLIN DONALDSON, Esquire, and published by order of the Commissioners of the Harbour.

changed, by combination, its mineral character altogether.

It is evident that these slaty rocks once existed in the form of mud, sand, and silt, and it is equally evident that the trap rock owes its origin to heat, and therefore it is necessary to refer to the conditions under which each rock is known to exist, to explain the phenomena.

At a small creek, near the new Penitentiary, there is a soft fine-grained clay slate, divided in layers from half an inch, to four inches in thickness. In these strata I discovered two small veins of anthracite coal, and it is probable that a workable quantity is not very far distant from this spot. If the coal exist here, it could not be expected to appear in the cliffs of the shore, as the strata associated with it, are readily decomposed, and when exposed to the air crumble down, and are either washed away by the brook passing along the site, or are covered with clay and debris. The existence of coal here is rendered more probable, from the occurrence of the remains of large vegetables embedded in the rock. Several of these vegetable relics were discovered in the slate and greywacke, which agree in their general character with the sandstone and shale of the upper coal series.

On the north side of Little River, on land owned by JOHN R. PARTELOW, Esquire, and near the Bridge, a quarry had been opened in a compact greywacke to supply stone for the new Penitentiary. The workmen had removed the rock the distance of a few yards, and exposed the trunks of two large fossil trees, and several of small dimensions. These trees were embedded between the strata, and lay inclined to the south-west. The largest was two and a half feet in diameter, and ten feet of its trunk was exposed. The other was sixteen inches in diameter, and nine feet long; both were nearly cylindrical. These original trunks of trees are now composed of sandstone, anthracite, and sulphure of iron. The vegetable fibre of the plants still remains distinct, and is now represented by these minerals. The trees belong to the *conifera* (fir tribe.) Other smaller plants and the impressions of leaves, were also found. Among them is a species of *phylloides*, and a calamite. How long these fossils will remain in their present situation is doubtful, as they are exposed to the violence of numerous visitors from the City. According to the latest geological discoveries, these plants belong to the first classes of vegetables that ever flourished on the earth. They are different from any now growing upon its surface, and are evidently far more ancient than those which now afford bituminous coal. They are relics whose history cannot be traced, and remind the geologist of the changes each kingdom of organic nature has sustained, since they were first established upon this planet. The remains of a *cactus* have since been found, near the residence of His Worship the Mayor, in the City, where the rocks had been opened to level a street.

We do not stop here to discuss the question, whether anthracite and bituminous coal are contemporaneous deposits, but briefly remark that the rocks containing these fossils, are different in many particulars, and evidently much older in their formation, than those containing the bituminous coal of the County of Westmorland to be noticed hereafter. The indications of anthracite coal were not observed until the season of exploration had passed, and the inclemency of the weather urged a retreat from the field of labour. The task will be again resumed early in the ensuing spring. The greywacke and slate had been examined several miles in the direction of Little River, where their general characters appear unchanged. About three miles eastward of the harbour this stream passes three falls, or successive steps; each fall will average thirty feet, so that the river in the distance of four hundred yards, falls perpendicularly ninety feet, and rushes through a narrow gorge overhanging with the bending birch, and a wild growth of spruce, and fir.

The power afforded by these falls has been profitably employed by Messrs. OWENS & DUNCAN, who have erected an excellent set of flour and saw mills, directly at their base, to which the river from below is navigable for large boats.

This group of rocks extends as far eastward as Loch Lomond, and northward to the Kennebecasis. They are here met by the syenite already mentioned. It also occurs as far eastward on the coast as Emerson's Creek, where the new red sandstone covers the strata, forming a curve to the north east. The tertiary deposits on this tract consists of collections of loose boulders, beds of clay, sand and gravel. The soil is at many places extremely scanty; this is more especially the condition of the insulated patches, occupied by dikes of trap. The surface is covered with groves of spruce, except such tracts as are depressed, where peat forms almost the only vegetable production.

(To be continued.)

NOTICE.

ALL persons who have any demands against the estate of the late FREDERICK PHILLIPS, of Rushagoan in the County of Sunbury, deceased, will render their accounts within six months from the date hereof, and those who are indebted to said Estate will make immediate payment to
THOMAS O. MILES, } Executors.
THOMAS PHILLIPS, }
Dated at Margerville, 2d October, 1839.

CONSIGNMENT.

THE Subscriber has received by the last Steamers and has on hand a variety of articles consisting of Gunpowder, Souchoing Congo, and Bohea TEAS; an excellent assortment for family use or Retailers. Also, Very superior WINES, Bottled in Cases, Golden Sherry, Best L. P. Madeira, old Claret, old Port, Lisbon, and Sicily WINES, fine flavored high proof Jamaica SPIRITS, BRANDY, WHISKEY, Double Brown Stout and Porter, Best London Sperm Candles, No. 1 Gibbed HERRINGS, Rose Blankets, Kegs Fig Tobacco, with a great variety of other articles.
MARK NEEDHAM.
Fredericton, 2d Dec., 1839.

POST OFFICE.
Fredericton, Dec. 5, 1839.

List of Letters remaining in Office at this date

- A
Jacob Allen, James Adams, Arch. Anderson, John Alean, William Allan.
B
William Beyeton, Samuel Brown, Thom Blair, Margt. Burke, Isaac Blether, Mrs. as Block, Thomas Briggs, William Brown, G. J. Barnes, William Braithwaite, James B., John Barter, Dr. Bridges, Mrs. L. Breen, Amos Barker, John Bell, Agnes Boyd, John Burnett.
C
D. C. Consins, Mrs. Carson, Capt. Clarke, Wm. Carrick, Mrs. M. Cook, Pat. Cassidy James Cannon, J. S. Cousins, James R. Currey, (2), E. Cresby, Ben. Close, G. Carone, Mary Camber, John Carter, James Craigs, John C. Oibett, John Crawford, Frances Campbell, Charles Colepher, Francis Cluff.
D
Barney Drew, M. Doran, Ann Dillon, Justis Dunham, (2), Oliver Dow, Robert Davis, George Davidson, J. W. Dow, Thos. Doyle, H. Dougherty, Walter Dixon.
E
Wm. Estey, Wm. Erslev, Saml. Estey, Hugh Ervine, Jr. Mrs. Earls.
F
L. A. Farlan, Margt. Fletcher, Margaret Fitzgerald, William Fimal.
G
D. Godfrey, Thos. Grady, James Groves, John Pardon, Ichabod Grant, Marg. Gallagher, William Goodwin, George Gibbs.
H
Andrew Hammond, M. Halland, Alex. Hay, A. Hartt, William Horner, C. Howley, J. S. Hill, A. Hooper, Wm. Harper, James Harper, John Hurley, A. V. Hammond, James Hay, Jane Henderson.
I & J
Xenophon Joutet, John C. Ingraham, John Joce, Mary Ann Jones.
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M. Kilbourn, S. Kidder, Anne Kelly, Thos. Kelly.
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Mr. Lewis, James Largey, M. Loneygan, Jane Longhley, Capt. G. Long.
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W. P. McAddam, D. McDonald, J. McManimen, Margt. McGrath, Thos. Millian, S. McKirley, Rev. J. Mann, George Morrel, John McConnel, J. Merrithew, Jr. Charles McCre, J. A. Miles, J. L. Marsh, (2), Margt. Hanson, George Morrel, Alexander Mitchell, James Moore, Robert Miller, Isabella Maddigan, Rebecca McCre, Mary McDermot, James McCann, John McGuire, James Mackinnon, John McKay, Francis Miller, Pat. McGinn, Alex. A. McDonald, Andrew McLaughlan.
N
Mr. Nixon, E. S. Nutton, Geo. Nevers, S. Nevers, A. C. Nelson.
O
Margt. Orr, Henry Ochterley.
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R. Porter, George Price.
R
Daniel Reed, Darico Ramsay, Jonathan Revelle, Miss Reed.
S
R. Sullivan, Wm. Smith, J. W. Smith, (2) E. Slack, (2), S. B. Smith, Wm. Sloat, Saml. Smith, S. Scott, Esq. C. Symonds, James Shannan, (2), John Stilson, (2), David Saunders, Susan Shay, E. Sheppard, (2), Thomas Smith, Seur.
T
John Town, (2), James Telford, James Taylor, M. Thompson, Jacob Thompson.
V
Mary Vohn.
W
John Whited, W. P. White, B. Wheeler David White, E. J. Watson, T. Whitehead, George Walker, Miss L. A. West, (2), Thos. White, N. Wheeler.
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W. B. PHAIR, Post Master.
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Manufactured and sold by
W. H. SCOVIL.
North Market Wharf, St. John, N.B.
CUT Lath, Shingle, Board and Finishing NAILS of all sizes.
Cut Flooring Brads, 3, 3 1/2, 4 inch.
"Finishing" do. 1, 1 1/2, 1 3/4, 2 inch.
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Copper Boat Nails assorted sizes.
A supply of the above description of nails always on hand, and for sale at very low prices, whole sale or retail.
Purchasers of nails will find it much to their advantage to call and inspect for themselves.
June, 1839.
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These apartments will be found suitable for a Dry Good Store or offices.
J. & A. SMITH.
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TERMS.—Sixteen Shillings per annum, exclusive of postage.
Advertisements not exceeding twelve lines will be inserted for four shillings and sixpence the first, and one shilling and sixpence for each succeeding insertion.
Blanks, Handbills, &c. &c. can be struck off at the shortest notice.
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