# FIRST REPORT

#### ON THE GEOLOGICAL SURVEY OF THE PROVINCE OF NEW BRUNSWICK. By Abraham Gesner, Provincial Geologist, &c. [Continued.]

That the volcanic rocks situated along the coast of the Bay of Fundy, have been produced at different periods, there can be no doubt. The same rock that has been forced through the superincumbent strata, has itself been injected with veins of matter of a similar origin : but frequently different in appearance and mineral composition.

It does not, however, appear that these intrusive masses have in every instance been forced upwards into the rocks above. Sometimes they have been injected into veins, and fissures pre-existing in the older rocks, and probably in some instances produced during the time of its cooling.

I have observed in a few instances two and even three dikes, or veins of hornblende rocks. intersecting each other in a manner that proves as many volcanic efforts made at different times. Again, it is evident that since these rocks have been produced, they have been broken up, and rent assunder by earthquakes, and thus the deep chasms, fissures, and fractured condition even of the trap itself may be explained.

I next proceeded to examine the country extending from St. John to St. Andrews, and situated more remotely from the shore. After leaving the argillaceous and greywacke slates at Carleton, and following the course of the main road, granite appears at the surface as far westward as Lancaster. The limestone formation was seen at a number of places in the forest, where it is sometimes exposed on the sides of ravines and brooks. Its course varies from west south west to south east, and it is met on both sides by the slates and greywacke already referred to.

LANCASTER .- A large hill on the east side of the Musquash, and about a mile from the village of Ivanhoe, is composed of conglomerate, which has been intensely heated by its proximity to an overlaying mass of trap. Numerous veins of quartz run through the rocks in all directions, and contain beautiful crystals of limped quartz. The limestone appears on the roots. opposite side of the river, and near Mr. MAR-SHALL's farm .- A tract of land was purchased by some Americans for the purpose of quarrying marble from it. Like many other speculations of the kind, it proceeded no further, notwithstanding a good marble might be procured at the spot.

Eastward and westward of the Mills of the Lancaster Mill Company, a course syenite forms a chain of hills of considerable elevation. This rock often changes in its character so as to become a greenstone, and by having mica these rocks contain injected masses of trapean matter. On the side of a hill half a mile northward of the church, some indications of limestone had been observed during the past sumbourhood, we were successful in discovering a at the surface. Into these dangerous openings able manner. Occasionally, detached portions sufficient quantity of that rock to supply the many wild animals have fallen and perished. demands of this flourishing settlement, and

each other in regular order. But all these ormations have been broken up, and overlaid by extensive masses of trap rock. The whole of the strata between the granitic chain, and the present sea, have been fractured, changed, and in many instances, buried by ancient lava, and the appearance of the hills indicates how

But few minerals were found of any value to its east side. luring the exploration of this wide and almost uninhabited tract of country, where the settle .

nents do not extend far from the road reaching from Carleton to St. Andrews. I was inormed that lead ore had been found at Clear Lake, near the head of New River, and I endeavoured to obtain such information as would lead to its developement; but the only the eminences where the tower and blockhouse ore, would not reveal the secret for less that

ive hundred pounds a sum I was rather unprepared to supply, especially as he would not of a good quality for making bricks : but few become my guide through the forest until the of the shells belonging to the tertiary deposits ittle better than an idle story.

Along the broken and desolated district exinaccessible cliffs, and the sublime appearance of this chain of mountains admirably displays the igneous character of its rocks. The renains of ancient craters, that have outlived the

issable, and fill the mind with the highest veneration. This mountain scenery is rendered still nore wild by the depth and silence of its valeys, and the succession of pyramid after paramid, risng as far in the distance as the eye can behold. Their bright tops seen glittering in the midravines, and winding hollows, mantled with the bear and bounding deer.

Wherever there is any collection of diluvial detritus, or alluvial matter brought from the nountains by descending torrents, derived of the falls, is composed of a white and variagatfrom rains and the melting snow, there is a fine ed limestone. The river here passes through growth of timber, and the beach and birch, and an opening not more than one hundred and maple, may be seen in those places where a fifty yards wide The cliffs on each side are sufficient foothold has been supplied for their about one hundred feet high, and perpendicular.

To those who have not become acquainted with the effects produced upon rocks by igneous causes, and have not studied the history of the water above. The whole length of the volcanoes, some of the facts laid down may s not alone in bearing the most faithful re-

cords of ancient terrestial disturbances." within a recent period, been disturbed and conken rocks, shew that from this, or similar ope-Brunswick, Nova-Scotia, and Lower Canada, and shipped after it is calcined. these phenomena are common. Sometimes there are deep fissures in the granite several

## ENTRANCE OF THE SAINT JOHN. CARLETON.

Having given some account of the Falls at the entrance of the Saint John River, in letters previously addressed to Your Excellency, and published in the Provence, I defer giving a more particular description of this remarkaextensively volcanic forces have been applied. a more particular description of the sector descr

At Sand Point, the greenstone may be seen, having forced its way through the greywacke slate, and in immediate contact with its broken strata, which frequently contain veins of quartz, and carbonate of lime. A small vein of jasper was also observed, where the sea had worn away the rock. The trap rock composes individual who declared that he had seen the are built, and the naked conical hills stretching proper kilns, to supply a much greater quanaway to the west.

At Negrotown Point there is a bed of clay money was placed in his hands. Probably, were observed in it, and it is free from the he report circulated concerning this ore, is carbonate of lime. This point suffers much from the action of the waves, and rapid currents; many old persons can remember when tending from the mountains of the Nerepis to it extended outwards much farther, and was the American boundary, the feldspathic and seperated from Partridge Island by a very narhornblende trap forms lofty, abrupt, and often row channel. Large blocks of calcareous breccia are occasionally seen in this part of the country: they have evidently been drifted from the mouth of the Kennebeckasis, situated to the north, where the rock is in situ. From the lestructive operations of the elements, are still tower, their is a beautiful view of the city, har bour, and falls of Saint John. The slate and trap formations, extending along the coast, are undulated on the surface, while the limestone formation, following a north east course, has a peculiar uneven and very picturesque appearance. Farther north, the more lofty mountains lay sun, seem like beacons hung over the dark of the Nerepis are seen rising in successive steps, and in more lofty grandeur. From the hickest spruce, inhabited only by the sulky site of the bridge, the greywacke slate is uncovered on both banks of the river, to the lower

opening of the falls, a distance of half a mile. The narrow gorge forming the lower outlet On the east side, a large block of impure limestone stands in advance, offering a great impediment to the flood tide, and the descent of " narrows" is perhaps, three quarters of a mile. appear fanciful and extravagant; but if they Two small islands are situated on the east side, at the surface, and extends along the sides of effects resulting from them in other parts of whirlpools: but, from being exposed to such cliffs. At the entrance and some distance up the world, they will find that New Branswick | rapid currents, they are wearing away, and in the Nerepis, (a small river emtpying into the

Town, are syenite and trap, which have broassistance of several gentlemen from the neigh- miles in length, and not more than two feet wide ken up and replaced the limestone in a remark- the country. A few crystols of amethyst, of the slate and greywacke formations, hold near MATHER's excellent Inn. It has been said that Jacques Cartier, in his positions uncomfortable to the crystalline mas ses beneath them. The limestone crosses the direction, and to the distance of twelve miles river in separate belts, or what might be called passes through a belt of intervale of a superio slate meets the limestone on both of its sides. side of the river, but on his return in 1540, he large veins. The first of these is at the quality, and affording a fine growth of ash some places a sufficient quantity of brown and ring his absence, so that for a time he could the river on a line with the lime-kilns on each of underbrush, appears like a planted grove. side; and forms a part of the upper island. A large portion of this excellent land was The third is seen a short distance above In- owned by the late General COFFIN. The area The river communicates with a chain of Quebec, describes a number of tremendous dian Town; another appears at Robertson's occupied by the intervale is called COFFIN's lakes, extending to the head waters of the earthquakes that took place in 1663. These kiln, and also on the west side of the river. Valley, which passes through a deep gorge in Oromocto, so that every facility is offered for opened new channe's for rivers, and lakes This seems to be the most important belt, the Nerepis mountains, and affords the only Several more may be seen on each side of the passing over hills almost insurmountable. On "Narrows." These belts or veins will average each side of the valley the mountains rise in from a hundred to four hundred yards in thick- sublime grandeur, and afford some of the most New England, Acadia, or Nova Scotia, and ness. Detached masses of the calcareous rock picturesque scenery in the country .- These New France. Since that time, shocks of may also be seen included in the greenstone mountains are composed of varieties of granite, that is mingled with it in a singular manner. syenite, and greenstone. Several of these isolated portions of the transision limestone formation, were observed run- preccia, being composed of different kinds of to considerable depth by beds of sand, and Bay, but a few years since. The shock that ning in a north-east and south-west direction, granite cemented together. In other instanclay, containing large blocks or boulders that alarmed many of the inhabitants of Nova Scotia, Kennebeckasis. Directly opposite Indian poses this peculiar conglomorate, whose pro-Town, there is a rock composed of hornblende, bable origin is like that of trap tuff. feldspar, and quartz. It resembles granite, and I visited several places on Douglas mounis common on this part of the river, where it is tain, and ound the rocks to cousist of crystaoften injected with dikes of greenstone. The linestone is generally of a light blue bedded. The top of the mountain is naked of colour, and, so far as it has been examined, plants. The decomposition of feldspar leaves contains no organic remains. When calcined, the grains of quartz unattached, and they cover it is white, and the lime is well adapted for ma- the surface of the rock frequently to the depth sonry and agriculture. A short distance from the shore, and not far like walking over coarse salt. About two from Carleton, a beautiful marble was dis- miles northward of Mr. DIBBLEE's farm on covered. The rock is highly crystalized : the the main road, the crystalline rocks are met by marble is of a light pink colour, clouded and slate and greywacke slate, having the positions shaded with veins of bright green chlorite and so common to the strata wherever they have serpentine, resembling, very nearly the "verde been exposed to subterranean disturbance. antico" of the Italians. At the surface, the The mountain is about one thousand feet above rocks have been fractured by the frost; blocks the level of the sea. From its summit were of large size may be procured by opening the seen in a southerly direction the narrows and quarry to the depth of a few feet. Arrange- lands in the neighbourhood of the City of Saint ments will certainly be made in the spring, to John; and in the distance the north mountains in general trap of the red feldspar variety, the River St. Lawrence, have, from time to work this marble, as it is superior in beauty to of Nova-Scotia are distinctly visible. From will please say that they are advertised. which also extends to Chamcook, where it is time, since the year 1550, been submitted to that imported from the United States, and sold this site the primary chain of mountains will be At the "Narrows," there is also a fine white the country. This Alpine range is strongly marble, but it appears to be too much broken contrasted with the lower grounds situated to afford any large slabs. The greenstone and upon the slate, and the coal district placed limestone continue to within three fourths of a farther to the north. Eagle Cliffs and other mile of the " Boar's Head," where they are high lands were also visited, but they present met by a course calcareous breccia, or pud. but little of interest beyond what has been al dingstone, forming the Head and shore, to a ready noticed. considerable distance on the Kennebeckasis. The slate becomes more argillaceous and The breccia is composed of angular fragments | continues to the distance of about five miles of limestone of different colours, firmly cemen- northward of HARDING's Inn, on the main torical facts, or referring to tradition, it is only ted together. The whole formation resembles road leading thence to Fredericton. The width the conglomerate of England, sometimes found of this formation will not be however more than connected with the old red sandstone; and four and a half miles, if measured directly probably it is of the same relative age. Its across its surface, and at a right angle with the probably it is of the same relative age. Its across its surface, and at a right angle angle and a surface and at a right angle angle and a surface and a surface and a surface angle angle angle angle and a surface and a surface angle a vest side of the river. The limestone occurs them a number were found capable of affording \* See Lyell's Principles of Geologo, vol. ii. chap. ix. at South Bay, whence, westerly, the greenstone excellent roofing slate, but as this valuable Nerepis, there are deep beds of clay, sand, and river, and where it can be readily shipped, it is of a hundred feet. There are sixteen limekilns on this part of the river, and within a trict. 

burnt in them last season, according to the by a coarse conglomerate, and finally by the wards of two thousand pounds. There is also at present. a considerable quantity of the rock transported to Nova Scotia.

Many of the strata have a peculiar waved appearance, and are finely marked with coloured lines, like those of curled maple ; these lines, no doubt, were laid during their original accamulation, and probably the wavings were effected while they were in a soft state. The above quarries are of much importance to the country, and might be made, by the use of Adams.

### INTERSECTING LINES.

I next proceeded to explore intersecting zabeth Banks. ines across this part of the Province, in order to cross the several series of strata between the sea and the great coal formation, and, if Carman, (4) J. Cashman, E. Curren, Dan. possible, to discover how far the coal district extends southward. It will be seen, presently, what success attended this plan of exploration, ri.r, John Carter, Wm. Chalemars, Denison and the important discoveries that resulted | Cox, Mary Crawseway. from it. The granite range of mountains, and the successive formations running paralel to its base, where observed to follow a north-east and south-west direction, and therefore, by exploring a north-west line of country, each | Dunphy, Wm. Duffus, John E. Dow. stratum was crossed at right angles. The section that was made for this purpose, extends from Carleton to the month of the Oromocto. following the direction of the Nerepis Road. Another was made along the south and west side of the river, as far as Fredericton ; and the Feemy, Mr. Fross. third reaches from the mouth of the Magaguadavic to the Oromocto, and crosses the strata obliquely.

#### NEREPIS ROAD.

The limestone extends northward on the river and the Nerepis Road, to the farm of Mr. JOHN STEVENS. From this place, and the kilns at South Bay, Fredericton and the villages along the river receive their supplies of lime. Near Mr. HATFIELD's mills, the greywacke may be seen in contact with a large dike, where its fissures are filled with the solphuret of iron, and beautifully spread upon each broken mass.

From HAMM's Inn to MATHER's, the green stone, interrupted by numerous dides appears, will look into those causes, and observe the and create powerful eddies and dangerous the Long Reach and river, often rising in bold time will disappear. Were the cliffs on each Saint John) there are large collections of sand side of the Falls brought together, they would and gravel, and as the trap rocks gradually It is evident that this part of America, has, correspond, and the protuberances on the one disintegrate, a fertile soil is produced, and a side would occupy cavities in the other : this is fine growth of beach, birch, and maple flour. vulsed by earthquakes. The numerous dislo- the best evidence of their having been separated ishes upon all the high grounds. The river sometimes becomes a perfect granite. Each of cations, chasms, and caverns, filled with bro- by the causes already mentioned. There are runs through an extensive tract of marsh and lime kilns on each side of the narrows, and the intervale, from which the farms along its banks rations, they have been produced. In New rock is conveniently situated for being quarried, are well supplied with hay. COFFIN'S Manor and other places in this neighbourhood are The rocks on each side of the river at Indian delightfully situated, and there is a neatness bout the farms not always to be observed in

The Nerepis River runs in a north-westerly At many places the rock is a perfect granitic lized feldspar, with large grains of quartz imof a foot; hence travelling over them seems seen elevated far above the common level of

most accurate computation that could be made, mill-tone grit and sandstones of the coal meais about five thousand hogsheads, and the price sures, which continue to the mouth of the Orois from eight to ten shillings per hogshead. mocto. The old red sandstone and mountain The amount of lime consumed in the Province, limestone, were also discovered above the slate, and shipped from these kilns, is therefore up- but an account of those formatious is deferred

(To be continued.)

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The slate passes into greywacke, containing at fell in with a shore which had been formed dured oxides of iron to be manufactured for pig- not proceed on his voyage. ments.

transporting the logs from the forest to the vil- were formed in the depressions left in the earth. lage, where there are mills of superior construc- New islands arose, hills were levelled, and tion to saw them into lumber fit for the English showers of volcauic ashes fell upon the surface market."

The granity and syenite penetrated by numerous dikes of trap, continue in a westerly direction to near the Le Proe river, where earthquakes have been felt at separate interthey are met by the sandstones already men- vals, and volcanoes are said to have been in a have been swept from the mountains and hills but a few years ago, is well remembered. The situated to the north.

with occasional tracts of new red sandstone, burst its barriers at the falls during an earthcontinue about three miles northward, and a quake, and emptied its contents into the sea. mile westward of Le Proe Bridge; from Whether it was from these earthquakes that thence to New River the talcose, argillaceous, the lakes in Canada had their origin, is not and greywacke slates are found in place; but certainly know; but it is certain that the the same interruption they have suffered on waters flowing into them, formerly escaped the coast, is also manifest throughout their se. down the Mississippi into the ocean; and the veral formations, wherever they are found in original bed of the river has been disthis part of the country. The hornblende tinctly traced to a great distance in that dirocks forming the dikes contain veins of quarts, rection. Hence it cannot appear improbable carbonate of lime, and feldspar.

distance of fifteen miles, the trap predominates had a common cause with those just mentioned, and the surface is frequently occupied with when the whole cost of British America was boulders of granite, and heds of gravel. The shook to its deepest foundations. mountains in the neighbourhood of Lake Utopia, and westward to the Digdeguash, are FIELD, the shores of the Gulph and mouth of met by the new red sandstone.

Extending in a north east and south west direction, and on a line parallel with the coast At St. Paul's Bay, fifty miles north-east from and the granite range of mountains, the transition slates and limestone, followed by the coal measures appearing at Le Proe river, and the years, and the shocks continue forty days. It conglomerate and red sandstones, &c. lieing is also stated in the history of Canada, that, in above them, appear once to have succeeded 1663, these convulsive upheavings of the earth

\* The village of Ivanhoe belongs to the Lancaster | tance of a hundred and thirty miles.+ Mill Company, who have here a very superior and powerful set of mills for the manufacture or all kinds of lumber, and an incalculable amount of unemployed water power. The mills are 200 feet in length, by 60 in breadth; the moving power is an oversho water-wheel 25 feet in diameter, which carries four gangs of sawe besides other machinery. The Company own a tract of country containing upwards o 50,000 acres, in connection with these mills, and from which they procure supplies of excellant timber The establishment appears in a very thriving condition, and every thing about it at the time of my visit had the appearance of busy industry. It is well worthy an attentive examination, especially by those who have not been accustomed to the lest kind o machinery .- It is fitted up in a manner so perfec that it reflects a high credit on both the mechanic and architect, and must make the capital advanced a profitable stock.

means have already been employed to bring it first voyage up the St. Lawrence in 1939, met

Indians, also, have a tradition that the Saint The gray sandstones of the coal measures, John river was formerly a great lake, which

that the submersion of Grand Manan, and From New River to the Magaguadavic, a other phenomena observed in New Brunswick,

According to the memoirs of Captain BAYupheavings of the earth. Sometimes their force at a high price. has been sufficient to throw down chimnies.

Quebec, the inhabitants say that the country is visited with an earthquake every twenty-five continued six months, and extended to a dis-

But without calling in the aid of these hisnecessary to appeal to the rocks themselves, which bear the most indubitable evidence of having been broken up and moved by the earth's internal energies, but at what period of time cannot be exactly known.;

+ See M'Gregor's Travels in America.

! Since the above went to press, accounts have een received from King's County and other parts o this district, that an earthquake has within a few day past greatly alarmed the inhabitants; and a church, in consequence of the injury received during the shocks, was consumed by fire.

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