

The steam fleet needed to handle the commerce of New Brunswick is being largely augmented. A new steamer will be added this year to the International Steamship Company's line between St. John and Halifax.

A steamer has been purchased for the Bay of Fundy route between St. John and the Charlotte Islands. A line of freight steamers between St. John and Miramichi has been provided for.

A new steamer for the St. John river trade is about to be launched.

Concerning railway communication, the St. John and Maine road will be laid with steel rails this spring, preparatory to an anticipated large amount of traffic.

The New Brunswick Railway will be extended to the St. Lawrence. A couple of millions of dollars have already been provided for this new enterprise.

Plans of connecting the Intercolonial Railway with the Western railway at St. John, and bridging the river, will, no doubt, be commenced this summer. This will involve an expenditure of the greater part of a million of dollars.

Authority is now asked of the legislature to build a railway from Woodstock to Harvey on the St. John and Maine Railway. As no provincial subsidy is asked, the legislature cannot well refuse the charter. The length of the road will greatly shorten the distance by which goods from St. John and the up-river country, and cause an expenditure in York and Carleton counties of nearly a million of dollars.

The Grand Southern rail, no doubt, be finished this summer, and it is altogether likely that the St. Martin's railway will be put in good order and operated as soon as the frost leaves the ground.

In addition to these important movements in connection with the general trade of the province, we note the fact that preparations are being made for the sawing of a quantity of large quantity of lumber; for doing a large business in the export of cattle; for extending agricultural operations; to say nothing of increased exports of dry goods, etc. The province is undoubtedly on the eve of a very prosperous season. From time to time we shall refer in detail to what is being accomplished in our Province, and point out industries which will be well for our people to take hold of. Meantime we quote from our exchanges the evidences of prosperity which are to be found in various parts of the Dominion. These are but some of the hundreds of similar items which might be supplied to our readers did our space permit.

NEW WELLAND CANAL.

Following that general statement of the work, contracts and improvements along the new canal would be appreciated by the public in general, our reporter has taken the trouble this week to make a tour of the whole line, examining the work and having interviews with contractors and canal men generally. Commencing at Port Dalhousie, the first work of importance is the building of all the lock gates required for the canal. This firm has the contract for building 14 lock gates, the average size of which is 14 feet 6 inches, and width 27 feet 6 inches. Mr. Townsend has the back bone of this contract, and at the present rate of work he will have the contract finished by the first day of June next. There are on this work constantly employed, day and night, gangs of 115 men each. Mr. Townsend has 14 gates to build and hang for the canal, and in addition to these, is building 10 extra gates as a precaution against accidents, etc. The timber for this contract is furnished by the Government, and is all of Dominion growth. These gates are remarkable for their strength, taking as it does no less than 40,000 feet of lumber for each gate. The iron work for the gates is supplied by the Hamilton Iron Works, and when once the quantity of castings required for each gate—being no less than seven tons, making the gross amount of iron required to complete the contract amount to 2,400 tons—it would seem almost impossible to break them. The peculiar distinction of these gates consists in the fact that Mr. Townsend, the contractor, has, after many years of practical experience, at last succeeded in perfecting a perfectly balanced valve, which is being placed on all the lock gates of the new canal. This valve works automatically; that is, there are three valves on each gate, it will easily be seen that should one or even two of the valves get clogged, the third one would suffice for the purpose of emptying a lock. This firm have had to trouble with their work, arising from the fact that they had to dispose of person or persons, in or near Port Dalhousie, did through much chop and nearly the bulk of the gates already completed, and in order to prevent themselves and avoid the recurrence of such a thing, the firm have been obliged to employ watchmen to guard their works wherever they happen to fix a gate. The bottom iron for each lock is complete and in position. The Government Inspector, Mr. Vanderburgh, is expected to complete survey of this work. Mr. Townsend has also in this firm, Messrs. Ross and Justus Miller, and to them to a large extent due the remarkable progress in doing the work. The Messrs. Miller being practical machinists, they thought their mechanical training to be of great use, and as a result they have succeeded in getting the very complete saw mill and machine shop in line of the work. Their plan is to run the mill on this continent, and with it, running as it is, they have been able to turn out a large quantity of finished planed timber. The mill is full of later saving machines, many of which are original with the firm of Townsend & Miller. So much credit cannot be given to them, but, notwithstanding all their difficulties, they will be able to get the last lock gate and complete their contract by the time. The wages paid to the men on this contract are, for common laborers \$1 37, for carpenters \$2 00, and for millwrights \$2 50 per day. These gates are being built in eight times as strong as the old ones. This firm's contractors have already located and placed in position the gates for the guard lock at Allanburgh, and have recently made these gates proved themselves to be the strongest and at the same time the most economical of any gates ever yet swung on the canal. We might mention that the largest gate on the canal is 14 feet high, which is for the lock at Port Dalhousie. This firm will complete their contract early in the next month. They are finishing 12 gates each week,

and when the canal opens they will only have to float gates to their places and hang them. Captain Laikin, of St. Catharines, has the contract for building the floating tow path between locks 1 and 2. The piling is already completed, and the contractor expects to finish this work by the 15th of April. There are about 25 men employed here, and the wages are good. The new waste water recently flushed proved itself all that the contractor desired. This is an important piece of work, as it controls the water supply on the level between locks 1 and 2. Just here we might state that the guard lock at Macdill's pond are finished, and the gates are hung and in complete working order. The Messrs. Hart, Dawson and Morrison, who have the contract for all the tow-path bridges, have the material for building on the ground and will complete their agreement on time. They have twenty-four bridges to build, and from a conversation had with these gentlemen, who are noted for their push, we are certainly not in saying that they will complete their work before the 15th day of April next. Messrs. O'Brien, Gordon & Beigin have the contract for building all the swing bridges on the line of the new canal. There are 19 bridges to be built, 7 of which are 14 feet in length, and 12 are 120 feet in length. The short bridges are 13 and the long ones 16 feet wide, and besides these there are 21 stationary bridges to build. They are all made on the Howe Truss principle. The timber used is all white oak, and the iron work is being built by the Hamilton Bridge Co. The turn-table tracks for the 19 swing bridges are solid steel, imported from England forged in one piece, 4 feet in diameter. The inconvenience and delay caused from importation have hindered this firm a little. The wood work for the bridges is all made at Moncton, and when once a bridge is shipped it can be put together in a few days. The Port Robin and Quaker Road bridges are already in place and complete while the Junction bridge will be finished next week. The Welland bridge is one of the largest on the line of canal, being 120 feet long and 16 feet in width. There are two approach spans of 38 feet in length. This bridge is built and ready for shipment and will be on the ground by the 22nd inst. This bridge is certainly, judging from the plan shown, a handsome structure, and though we may murmur at the narrowness of the way we must still admire the architecture of the work. The bridge at Port Colborne will be the last one placed in position on the line of canal. This bridge will be 120 feet long by 15 feet in width. The firm anticipates finishing up their contract by June 1st. They employ about 90 men, and are well pleased with the extraordinary success they have met with during the progress of their contract. Messrs. Richardson and Talbot will complete their contract at Port Robinson by the 10th of April. The work is nearly completed from Allanburgh to James's Bend, a distance of about 12 miles, and the first section one arrives at on the way up from Welland is number 33, under the control and management of the Messrs. Baunerman & Co. This section is about one mile long and the contractors have to excavate about 90,000 cubic yards of solid rock. On this work are employed about 600 men and nearly 100 horses. The raising of the rock from the bottom of the canal is done by the means of powerful steam derricks, there being 12 constantly working day and night. This firm have all the newest improvements in the way of machinery, etc. The steam drills, of which there are about 10 working at the time, are capable of drilling a hole about two inches in diameter through a solid limestone rock of 7 1/2 feet each hour. This firm can easily make their average of 80 feet of rock work excavated the whole width of the canal each week. They use for their explosive duiline, manufactured by the Hamilton Powder Co., of Montreal, and though this explosive is a combination of nitro-glycerine still it is conceded by all scientists to be at once the most powerful and least dangerous of the many explosives used. Section 34 the Messrs. McNamee & Co. have under contract. They have about 150,000 cubic yards of rock to move, and are at present working 700 men and 40 teams. The plant in use on this section consists of 9 steam derricks, 10 steam drills, capable of drilling a hole 2 inches in diameter 8 feet in solid rock, 5 powerful steam pumps, one of which is the largest on the line of the canal, being 18 inches in diameter. The extraordinary cold winter has hindered the work a little, requiring vast quantities of snow and ice to be moved. The first day of May will, however, find the excavation work of this section so far finished as to allow vessels drawing 12 feet of water to pass through. The Hamilton Powder Co. furnish the explosives for this section, and when one thinks of the enormous quantity required on a work of this kind, there having been used some 30,000 pounds already this winter, this firm pushing their contract energetically, working day and night, it certainly is a matter for sincere congratulation that among so many men and in work so dangerous they have not had a serious accident. The dry wall of this section is a splendid piece of work, and should be seen before the water is let into the canal, and we can recommend anyone in search of a grand sight and a busy scene to go and visit section 34. The firm having the contract for the snubbing posts already have their material on the spot, and on the opening of the spring can quickly finish their contract. The posts are ten feet long and 16 inches in diameter, and are capped with iron. They are sunk eight feet in the ground. The dam on the Hill and road at Allanburgh will be removed as soon as the frost is out of the ground, and the water let down to the guard lock at Macdill's Pond, sec. 17. The gates and waste weir are complete and ready to be let the water on the summit level. The tumble gate being built at Port Colborne under the management of Mr. Stanton are progressing rapidly. There are about 50 sailing crabs of all kinds waiting in the canal.—H. P. H. P. H.

GEOLOGICAL SURVEYS AND EXPLORATIONS.

The following extracts from the reports of the Minister of the Interior contain information of the progress of the geological surveys last year.—  
GEOLOGICAL SURVEY.  
The purchases in Ottawa purchased for the accommodation of the geological party have been placed in a state of thorough repair, and are ready for the reception of the staff and effects of the survey and museum. The work of removal is now in progress, and is expected to be completed about the beginning of May. The annual report of the director of the survey will be usual reported in a separate volume. In the meantime, I have the honor to submit to your Excellency the following summary of the operations of the geological corps in the field during the year. These operations were presented in—  
1. The North-West Territories. 2. Manitoba—(Hudson Bay Basin); 3. Quebec, on both sides of the St. Lawrence; 4. New Brunswick; 5. Nova Scotia—(Cape Breton Island). A reconnaissance was also made of the Magellan Islands by Mr. Richardson.

THE NORTH-WEST TERRITORIES.

In March it was decided to make an investigation by boring to obtain more precise information respecting the tertiary lignite coal seams of the Souris River Valley, more especially as regards their eastern extension from the known outcrops in the vicinity of the Roche Perce. With this object in view, a contract was entered into with Messrs. McQuay & Highman, of Port Hope, Ontario, to make two or more borings in the valley of the Souris river, the aggregate depth not to exceed 500 feet for the sum of \$5,000, the sites, not more than 25 miles apart, to be selected after careful examination by the director, and occupied from the 14th May to the 30th August. Expenses, \$1,200.30. The borings commenced about seven miles east of the Roche Perce on the 12th July, and finished on Turtle Mountain on the 6th October. Four borings were made as under: Souris River, 257 feet; Moose Mountain Creek, 175 feet; South Anlier Creek, 157 feet; Turtle Mountain, 200 feet.  
In No. 1, there is a bed of lignite coal, six feet thick, of good quality, was struck at 275 feet. None was found in the other borings, though it is quite possible it may exist at greater depths.

BRITISH COLUMBIA.

No field work was done during the past season in British Columbia, Dr. M. Dawson being occupied during the early part of the year in working up the results of his Peace river expedition of 1879, and during the director's absence in the North-West in May, June and July, in attending to correspondence and to the printing of the annual report. In August he received leave of absence to attend the meeting of the British Association and to visit the continent. Returning early in November, he has since been occupied with the printing of his report on the Peace river explorations, and the preparation of the map to accompany it. This map will embrace all the available information regarding a region of about 130,000 square miles in extent, from the Pacific Ocean to the 112th meridian, and from the 51st to the 67th degree of north latitude. Considerable time has also been devoted to arranging specimens from British Columbia previous to packing them for removal to Ottawa.

HUDSON'S BAY.

Dr. Robert Bell, with Mr. Cochrane as assistant, and Messrs. Molson and Langford, volunteers, left Montreal early in June, with instructions to continue his exploration of previous seasons in the Hudson's Bay Company's ship from Churchill or York factory to London, with a view of making observations on the navigation of the Hudson Bay and Straits. This, through the kind assistance and facilities afforded by the officers of the company, Dr. Bell has accomplished. The passage, owing to calms in the straits and head winds on the Atlantic, occupied from the 10th September to the 17th November, or nearly three times the average duration. The three weeks during which the vessel was passing through the straits afforded good opportunities for observing both shores in many places, as well as the islands. Dr. Bell returned to Montreal on the 14th February, and his report now being prepared will contain full particulars of the season's explorations.

QUEBEC.

In the Province of Quebec, on the north side of the St. Lawrence, explorations were continued by Mr. Vennor in the counties of Argenteuil, Terrebonne, Montcalm and Joliette, embracing about 900 square miles. A number of details of interest and importance in connection with the distribution of the beds of crystalline limestone and the labradorite rocks were ascertained, and in association with the latter promising deposits of iron ore were discovered at a number of new points, at one of which, near St. Jerome village, a considerable amount of work has since been done by an American company with a view to its development. Mr. Vennor's exploration occupied from the 2nd June to 27th November; expenses, \$900.43.  
To the east, in the counties of Berthier, Maskinonge and St. Maurice a large area, 1,600 to 1,700 square miles, was examined by Mr. Ord and Mr. McConnell; 350 miles of road, not shown on any existing plans, were measured by pacing. The Matawan river was examined in canoe from the township of Hrasward to the St. Maurice, also its tributaries from the north and north-east, Rivers des Millen, au Lac Claire la Chienne, as well as some of the lakes forming the head waters of Riviere du Loup. The greater portion of this area is occupied by almost flat lying Laurentian gneiss, forming a summit of an anticlinal axis. One band of limestone, supposed to represent the lowest on the west side of the anticlinal, was found on the St. Maurice with an easterly dip, and it seems probable that the higher bands which occur to the westward may yet be discovered east of the St. Maurice river, together with some of the valuable mineral deposits with which they are usually associated. The explorations of Messrs. Ord and McConnell occupied from the 6th June to the 26th September; expenses, \$728.35.

On the south side of the St. Lawrence, Mr. Webster has made explorations over a large area, about 3,000 square miles, extending from Lake Memphremagog northward and north-eastward along the New Hampshire and Maine boundaries. The whole of this region is auriferous, and no examination had hitherto been made of a large part of it. It seemed very desirable to ascertain more definitely the probable economic value of these auriferous deposits, also to determine the extent of the granitic areas, their relation to the adjacent strata, and the influence of the granitic intrusions on the auriferous character of the surrounding formations, which correspond in all respects with those of some of the richest of the Australian gold fields.

NOVA SCOTIA.

The work in New Brunswick was continued in the north-east, in the counties of Nothumbland, Gloucester and Westmorland, by Mr. Ellis, and south of the river St. John, in the counties of York and Carleton, by Mr. Broad, who also connected his work with that of Mr. Ellis by a survey of the road, about 100 miles from Fredericton, to Newcastle. Altogether more than 400 miles of roads were surveyed during the season by aneroid and chain, about 950 miles of the courses of the south-west Miramichi, the Nipisiquit, the Upsalquitch and the Restigouche rivers and their tributaries, by canoe, and numerous traverses made through the woods to examine and define the limits of the several geological formations. Mr. Ellis' exploration occupied from the 3rd May to the 14th November, including journey to New Brunswick and return, expenses, \$2,675. Mr. Broad's exploration occupied from the 2nd May to the 23rd November, expenses, \$2,173.41.

NOVA SCOTIA.

In Nova Scotia Cape Breton Island, the work of the survey under Mr. H. Fletcher comprised further explorations and measurements in the Richmond and Port Hood coal fields, also surveys of roads and brooks between Whyocomaah and Mabou river, and between Cheticamp and St. Ann's harbor. The courses of the

Magalloway, Middle and St. Ann's rivers were also surveyed. The gold mines of Middle river occur in a series of shallow rocks, which extend far to the northward, and is probably the source of the gold previously discovered by Mr. Campbell in the sands of the Cheticamp river, Jumping Brook and other streams. This formation should therefore be carefully examined and its limits accurately defined, and of even greater importance is the accurate determination of the lines of contact of the carboniferous and pre-carboniferous formations as along these lines all the valuable deposits of iron manganese occur, such as those recently discovered at Forks Lake, on the flank of the Codrington hills and at the head of Loch Comond. The season's exploration in Cape Breton occupied from the 4th of May to the 25th December, expenses, \$1,250.31.

PALAEONTOLOGY AND NATURAL HISTORY.

The examination, commenced in 1877 of the fossil plants of the carboniferous formation of Canada in the collection of the survey, has been completed. The species not hitherto determined have been kindly identified by Professor Dawson, and the whole series is now properly named and labelled. Collections as follows have been examined during the year—1. Small series of durian mollusca from the lignite quarry of the Souris River, collected by the director, 2. 70 specimens of Cambro-Silurian and Devonian fossils from Red River, Manitoba, and the valleys of the Nelson and Churchill rivers, collected by Dr. R. Bell in 1879; a report on these has been prepared and published as a supplement to Dr. Bell's account of his explorations. (See Progress Report, Geological Survey of Canada, 1879-80.) 3. 50 specimens of fossil fishes, collected by Messrs. R. W. Ellis and F. C. Weston, from the Devonian rocks of Scammon Bay, on the north shore of Baie des Chaleurs. A paper describing the specimens in this collection has been published in number 116 of the "American Journal of Science," August, 1880. During the months of July, August and part of September, Mr. A. N. Ford made a careful examination of the fish-bearing beds and secured a further collection of 282 specimens. A preliminary examination has been made of these, and some notes on the specimens were read at a meeting of the Natural History Society of Montreal, on the 25th October. Though the actual number of species in the collection is not very large, most of the specimens are of great interest. Since the commencement of October, a great portion of Mr. Whiteave's and Mr. Ford's time has been occupied in sorting and labelling specimens and superintending the packing of the collection, preparatory to their removal to Ottawa. One hundred and fifty-five fossils from the Silurian rocks, Clifton and Arsga groups, in the vicinity of Hamilton, Ontario, have been presented by Col. Grant. Besides those already mentioned, large collections have been made by the exploring parties in the North-West Territories, in Manitoba, in New Brunswick, and in the Province of Quebec. The whole of these, about 1,500 specimens, have been carefully labelled, and most of them have received a preliminary examination.

NORTH-WEST MOUNTED POLICE.

The following extracts respecting the condition of the North-West Mounted Police are from the report of the Minister of the Interior:—

Lieut.-Col. J. F. Macleod, C.M.G., formerly Commissioner of this force, has been re-appointed a stipendiary magistrate for the North-West, and on the 1st November last resumed the duties connected with that position, the district assigned to him being the southern and south-western section of the Territories, with residence at Fort Macleod. Lieut.-Col. A. G. Irvine, an officer of ability and experience, who has been for several years Assistant Commissioner, has been promoted to the command of the force. Complaints continue to be made regarding the condition of the police buildings, and the character of the accommodation they afford in their present state of repair. It is most desirable that the barracks should be as comfortable as possible, but it is not deemed expedient to incur any considerable expenditure upon them at present, nor until the line of the Pacific Railway has been finally determined, as upon that determination will depend the situation of the permanent headquarters; and it may then be found convenient to abandon a number of the existing posts and construct others elsewhere. The measures contemplated last year with a view to reduce the cost of maintaining the force have been gradually brought into operation, and a large saving in expenditure will be effected during the present season. The pay of the men has been reduced from 50 cents per diem, for the first year of service, and 75 cents for each of the subsequent four years, to 40 cents and 50 cents respectively; and a corresponding reduction has been made in the pay of the non-commissioned officers. In accordance with the provisions of the Act 42 Vic. chap. 45, the system of granting bounty land warrants at the close of the term of service has been discontinued in so far as concerns all enlistments subsequent to the 20th June, 1879. It is proposed, however, to establish a scale of long service and good conduct remuneration in addition to the ordinary pay, which will constitute an incentive to desirable men to remain in the force. There were obvious disadvantages attaching to the custom of permitting detachments to remain throughout the entire length of service at one post, and during last spring the system was inaugurated of moving them to new stations at least once in two years. It is, of course, understood that the headquarters do not remain in the operation of this rule. The most noticeable relations continue to exist between the police and the Indian and manifestly increasing of growing numbers and good feeling on the part of the latter. Although partially relieved of the responsibility of making heavy payments since the appointment of agents to take charge of the whole of the force, the force still rank imperant services to the Indian Department in the way of furnishing escorts to persons charged with the conveyance of the treaty money, and in assisting the agents during their disbursement. Every effort is being made to render the life of members of the force, separated a thousand miles from their families, as enjoyable as may be. Quite a large sum of money has accumulated to the credit of the lines fund, which it is proposed to expend in purchasing books for the men, and furnishing them with the means of recreation and amusement. The buildings at Fort Macleod are constructed upon an island, which is gradually being washed away, in consequence of which it has been decided to remove the post to the police farm, some thirty miles distant. By this change it is reported a considerable economy will also be effected, particularly in the supply of fuel. The discovery in the neighborhood of Wood Mountain of a considerable quantity of hard timber, suitable for the manufacture of wagon wheels and other useful purposes, reported last year by Superintendent Walsh, has been fully confirmed. The sanitary condition of the force continues to be satisfactory.