

that has been done, the six inches that were taken away from the top of the foundation. From three to four inches of small stone put carefully on top of this will make a good road, but it will carry heavy weights and wear well. It is useless to put a quantity of small stones on a road without a foundation. For example, there was double the quantity of stone put on Kent Street last summer that was required for a good road, but it was properly applied. I am of opinion that our island towns would make a good foundation for a road, with about four inches of imported stone on top. There is another way of road making that I should like to see tried, which is to lay a layer of large, about nine feet long, and from six to eight inches thick, and split them down the middle, and lay them on the road, and put a layer of small stones on top, and grade the road the right depth, and put them down with the bark uppermost, then lay on a layer of small stones, and grade to five inches thick, or coarse mudd. I have seen splendid roads made with oyster shells. I would suggest that Poplar Island, North River Bridge, would be a very good place to try this plan.

As regards bushing the ice, it should be attended to as soon as it is fit to carry a horse. The Commissioners should appoint those that are acquainted with the ice to this duty, so that the ice is not in a state that would be in danger of driving into spring holes, or on land.

JOHN NELSON.

ME HANLAN'S  
To Richard Weeks, Esq., Superintendent of Public Works, Queen's County.

Sir, I received a postal card from you, some time since, requesting me to give you my views on our road service, and how to improve it. In the first place there should be a Superintendent of Roads for each County, whose duty it would be to take charge of all the roads in the district, and report to the Board of Works twice a year, the state of the roads, and make estimates for the ensuing year, to let all contracts on the leading roads and bye-roads as far as he would be able. He should keep on the move continually during the season that the roads would be clear of snow. This would give him a chance to see when and where prompt action is necessary. As for instance, if a hill was being cut away with water he might appoint a competent workman to save money. Another benefit it would be, he would have a knowledge of all places which would be necessary to put in repair early in the spring—a very desirable object. In a word, he should be a person of good judgment, and should have full power to do as he thought proper, subject of course, to the Board of Works. This would give a uniform system which would soon be understood by all road makers. All bridges should be built under the special care of the Superintendent, as that will be after this the most difficult thing on account of the scarcity of good lumber, where stone cannot be obtained. And where stone can be obtained watchfulness is even more necessary. Following out this plan the Board of Works should be made a *de facto* for the whole County instead of the districts as at present. Statutes that should be done away, and a road tax instituted. This might prove rather a knotty point, as taxes are always unpopular at first. But a road tax at first, equal to our consumption cannot be far from fair. This, taking the census of 1871 would give, by this time, \$12,000, and for tax on houses, say \$5,000, making \$17,000. This would more than cover the statute road expenditure, but I think something more than this is wanted. A road tax should reach men of means as well as the industrious poor. I would not advise a tax in the first instance to reach more than \$25,000, as a higher rate would be more needed at first, supplemented, of course, by a grant from the general revenue.

With regard to the construction of roads in general, much more care is required than is now used. The width of a road should depend on the amount of traffic that passes over it. On a leading thoroughfare it should be eighteen or twenty feet, well rounded to the centre, not flat on top as we so often see, capable of taking large quantities of water, but forming a complete segment of a circle from the bottom of the ditch, which should in a twenty foot road be raised at least two feet, or say fifteen inches, above the level of the surface of the ditch, drawing to the centre at the rate of eighteen inches on the level for one foot deep. This would concentrate the water in a narrow slope and cause it to discharge more freely where there is a descent. It would be also advantageous if a person had had to cross the ditch with a wheeled vehicle as is often the case. Other and minor details might be added, but may have to omit them for want of space. For overseers would have to be appointed whose duty it would be to see to the breaking of the winter roads, also to the filling of the ditches—the breaking to be done as at present. The filling of the ditches might be paid for from the road funds. And here the Superintendent should see that all winter nuisances, be removed as in many cases trees and bushes are growing on the ditches, and in the precincts of the road, which causes large snowdrifts to accumulate, and in many cases causes a complete blockade year after year. Another reason why this is very important should be, that the public money was paid for breaking the roads, in many places farmers would not allow parties to enter their fields, and to let public officers do so would be very unpopular. Should a person have hints be useful in forming to report, they are at your service.

I remain,  
Your obedient servant,  
WILLIAM HANLAN.

THE VOYAGE OF THE 'CHALLENGER.'—From Valparaiso, where H. M. S. 'Challenger' has arrived, an interesting account has been received of the doings of the ship during the previous three months. The scientific party explored a series of active volcanoes in an unfrequented island of the North Pacific, and were rewarded by the magnificent spectacle of the eruption of Mount Iwa and spray of brilliant fire. A run of 2,500 miles to Tahiti followed, where the members of the expedition passed an agreeable fortnight, examining everything of interest there. The Challenger then made a voyage, at the depth of 2,000 fathoms, very fertile of marine curiosities. After leaving Tahiti, forty days were spent in voyaging 5,000 miles. The sounding and dredging proceeded with a most satisfactory result, the average depth being 2,000 fathoms. The island of Juan Fernandez which was first reached, was unanimously declared to be the most beautiful scenery of any throughout the world. On this island is a monument commemorative of Alexander Selkirk's four years' solitary residence, which has been immortalized in the story of Robinson Crusoe. Several new varieties of birds and other species of ferns were here obtained. The island swarms with cattle and goats, and the bay abounds with fish and seals. A stormy voyage was made to Valparaiso whence the Challenger will sail for the Falkland Islands, via the straits of Magellan. Letters from the Challenger will be posted so as to reach Montevideo early next month. The Challenger will then make a straight course for home deeply laden with the spoils of the longest continuous series of voyages on record.

Gen. Sir Fenwick Williams, C. B., of Kars garrison, has retired from the Governorship of Gibraltar. The gallant general sent in his resignation to the Duke of Cambridge on the ground of ill health. Sir Fenwick, who is in his seventy-fourth year, was British Commissioner in Turkey, in 1840, at the conference preceding the signing of the treaty at Ezeroun, 1847; British Commissioner in the settlement of the Russo-Persian boundary, 1858; British Commissioner with the Turkish forces, 1855; General-Commandant at Woolwich 1856-9; Governor of the British forces in Canada, 1859-65; and Lieutenant-Governor of Nova Scotia, 1865-70. He was appointed to his last post in 1870.

The *Esper* is the name of a new and powerful iron-clad turret vessel, lately completed in the first division of steam vessels at Chatham, and ready for commission. She has a displacement of 5,414 tons, and her engines work up to 4,538 horse-power. She has a draught of 18 feet 10 inches deep, throwing 494 pounds shot, and on her upper deck two smaller guns. Her complement when commissioned will be 250 officers and men.

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The various conditions of the problem—the Maccan river as it is, and as it is believed to have formerly been, the result of cleaning out its old bed, falls and levels, and speed of currents, probable diurnal changes of currents in the gut, when made, comparison with known navigable rivers, the tides and the changes that the creation or restoration of a channel across the isthmus would give rise to—are considered at some length; and the conclusion is arrived at that the project of an open gut is practicable, and that the expense would not be great. The physical aspects of the subject under review Professor Hind to the following conclusions:

"1. An old channel excavated in the rock has been found to exist between Cumberland Basin and Baie Verte, which if cleaned would allow the waters to pass from the Bay of Fundy to the Gulf of St. Lawrence through the Baie Verte isthmus.

"2. If further deepened, and properly conducted, should prove that the old channel has not the required depth, an artificial sloping channel, eighteen feet below the level of the bay, and the family bay of Cumberland Basin would be a navigable gut through which the current would never be so strong as in the estuary rivers of the Gulf of Fundy, which are frequented by steamers and sailing vessels.

"3. That such a gut would greatly improve the navigation of the Cumberland Basin, and with them be accessible at all hours of the day and night during the season of navigation, and independently of the tides.

"4. That it would be self-maintained and self-protected, and that it would give great relief to the traffic of country now entirely worthless.

The subject of the second letter, viz: the commercial advantages of the proposed work and the comparative merits of various transportation routes between the Far West and the Atlantic seaboard, has been so voluminously discussed by many authorities that we need not here repeat what is several times a year set forth in Canadian and American papers.—*Toronto Mail.*

When a stranger asked a Detroit girl, when he went to a party, if she was married, she replied, 'No, but I have had three or four chaps for breach of promise!'

Wolves, half-starved and gaunt looking, with the result of starvation depicted in their very gait, have been bold enough to enter the city of London, and commit depredations. Recently a couple of these unfortunate swamp lotterers visited the farm of Mr. Peter Graham and killed four fine sheep, one of which was a prize ram. The shepherd, who had the strait to which they are driven for food.

It is interesting to know that, according to the latest census, the subjects of Queen Victoria, scattered over the five divisions of the British Empire, numbered 32,000,000 in the United Kingdom, nearly 20,000,000. Of these 5,000,000 are in America, 2,500,000 in Australia, about 2,000,000 in India, 176,000 in Europe, and 1,000,000 in the remainder of the world. At the end of 1874 was in England 11,622 in Scotland, 2,700; and in Ireland, 212,700.

CENTENNIAL RACE MATRICES.—LONDON Jan. 17.—The English National Rifle Association has just published the preliminary programme for the time match for small bore between the National Rifle Association of Great Britain and the American Association. This match will take place some time during the Centennial Exposition.

New York, Jan. 17.—Sir Henry Hallford, the noted English rifleman, has been for some time past earnestly engaged in organizing an English team of twelve, the team to be entered in the Centennial Exposition, expected to compete in the United States during the Centennial, against an American team of equal numbers. That an Irish team would appear on the scene had been predicted by the Scotch press, and is expected, while there are good reasons to believe that rifle teams will be here from France, Belgium, Germany, and probably from Italy. A cable despatch received to-day from Judge Hildreth, secretary of the Association of America to compete in a match for the championship of the world during the Centennial Exposition. The time match for small bore between the National Rifle Association of Great Britain and the American Association. This match will take place some time during the Centennial Exposition.

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ACKNOWLEDGMENT.—We are indebted to Messrs. Wise & Russell, of Boston, for a copy of the 'Twenty-second Annual Report of the Boston Board of Trade.' It contains much valuable information on Commercial Affairs.—H. A. Harvie, Esq., has our thanks for a copy of Mr. Jenkins' latest work, 'The Devil's Chain.' We have not yet had time to read it through. The opening sentences are sufficiently horrifying.

### THE BAIE VERTE CANAL.

Some time in December last two letters from Professor Hind appeared in the *St. John Daily Telegraph* on the subject of the proposed Baie Verte Canal. In the first letter the engineering and scientific problem was dealt with, while the second set forth the commercial results that might be expected to follow from the opening up of a short cut between the St. Lawrence Gulf and the Bay of Fundy. These letters have since been put in the form of a pamphlet, a copy of which we have received. Professor Hind holds that an open gut—not a canal locked at both ends—is perfectly practicable at moderate cost. His object, he says, is to show that a natural, but now closed, communication exists between Baie Verte and Cumberland Basin, through which, in former times the waters of the Gulf of St. Lawrence and those of the Bay of Fundy, passed and repassed, with a current less than that which now exists in many parts of the Bay of Fundy, and in the reaches of very many great navigable rivers through which steamers of large size daily pursue their way. Also, that if this natural channel or channels be cleared out and in part deepened, we shall obtain at a comparatively small cost, and largely contributing towards the expenses of construction, an open gut, establishing easy and uninterrupted communication for steamers and sailing craft between the Gulf of St. Lawrence and the Bay of Fundy, at all hours of the day and night. He endeavored to sustain the following propositions:

"1. The Maccan river formerly flowed directly towards and into the Gulf of St. Lawrence at Baie Verte, instead of, as now, into Cumberland Basin.

"2. One old channel of the Maccan has been struck off by the boring operations carried on by different engineers engaged in locating a canal.

"3. By cleaning out the old bed or beds of the Maccan (or it may have enclosed an island) now filled with moss and clay or silt, and the bed of the channel, a great river now navigated by steamers, and less than now prevails in Cumberland Basin.

"4. The current will be considerably less at Baie Verte than in a large river like the Ohio, with the same fall and similar vertical section as the gut, because at the Baie Verte the water will be held back by the tidal waves, whose progress is slower than that of the natural current of the river, and at the obb, because the fall will be less.

"5. A large number of shoals, which greatly improve the navigation of Cumberland Basin, and diminish the height of the tides.

"6. The current in an open gut will be uniform to the marsh lands, but it is probable that the gut will create out of worthless bogs, lakes and swampy lowlands sufficient reclaimed land, of first quality, as so large a proportion of the expenses of construction.

The various conditions of the problem—the Maccan river as it is, and as it is believed to have formerly been, the result of cleaning out its old bed, falls and levels, and speed of currents, probable diurnal changes of currents in the gut, when made, comparison with known navigable rivers, the tides and the changes that the creation or restoration of a channel across the isthmus would give rise to—are considered at some length; and the conclusion is arrived at that the project of an open gut is practicable, and that the expense would not be great. The physical aspects of the subject under review Professor Hind to the following conclusions:

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