

have the advantage of an inhabited region, with cheap and easy access and abundance of wood and water. For these reasons the cost of mining and treating the ore is considerably reduced; and, besides, the development of a gold mine demands a comparatively small capital. One who goes prudently to work, usually opens only such veins as show themselves in the beginning valuable, and then goes down into the body of the veins. If the mine is opened by a shaft, a depth of 100 to 200 feet is usually sufficient to obtain a considerable quantity of ore, and to repay the first outlay upon the mine. Reduction works for gold are at the outset, and also in the management, much cheaper than for silver works. The extraction in a good work should never cost over \$4 per ton, and with water power in large operations it is often only 75 per cent. In a very important mine the entire cost in the mine and in the amalgam works amounts to no more than 80 cents per ton. Under some circumstances ores averaging \$5 per ton can be worked to a profit, while there are others, as for example, some of the richest mines in Grass Valley, the Allison Ranch, Massachusetts Hill, where, on account of the narrowness of the vein, the hardness of the rock and the quantity of water, the entire expenses amount to \$30 per ton. These are, indeed, exceptional cases. Another result of the combination of the favorable circumstances referred to, is that gold mining in numberless cases gives an unusually regular source of income to the owner. There is a considerable number of mines which for years have yielded a constant, never-failing net monthly profit, which in some small works amounts to \$2,000—in larger ones \$20,000, \$30,000 and more. The openings are in many cases sufficient to ensure this income for many years.

There are two ways of starting; either to buy newly discovered and promising veins at a low price, and undertake the cost and risk of developing them, or to buy mines already developed. For the first, great knowledge of the gold bearing country is requisite to proceed with safety, but a far less outlay of capital is demanded than in the second method. An outlay of \$20,000 to \$25,000 is usually sufficient to open for working, and to set up the necessary hoisting and pumping machinery for a moderate depth. The cost of reduction and crushing works usually amounts to \$1,000 for each head of stamps. With this amount one can with good sense and careful management succeed wonderfully, for one who is prudent, opens no vein which is not rich enough to pay a profit from the beginning. In such case the risk is inconsiderable. Numberless undertakings of this sort fail where slight indications lead to too extensive outlays, or the judgment is warped by the occurrence of very rich ore in limited quantities. The last mistake is made more frequently.

Railway News.

GREAT WESTERN RAILWAY.—Traffic for the week ending Jan. 3, 1867:—

Passengers.....	\$25,410 29
Freight and live stock.....	4,251 58
Mails and sundries.....	34,227 02
Total.....	63,888 89
Corresponding week, 1866,	58,571 60
Increase.....	\$5,317 29

ERIE AND NIAGARA RAILWAY.—The Act introduced into the Legislature of Ontario provides for the extension of the Erie and Niagara Railway line, from Fort Erie to Sandwich or Windsor, or the construction of a branch from the main line to Amherstburgh. For this purpose power is sought to increase the capital stock by \$500,000 in 50,000 shares of \$100, and to issue bonds which shall be free from prior claims. As soon as \$500,000 of additional capital shall be subscribed and paid the extension may be proceeded with.

WOODSTOCK, (N. B.) RAILWAY. This undertaking appears to be in difficulty owing to a scarcity of funds. The rails are laid on ten miles of the road, with six miles ballasted, leaving only one mile to be laid and five miles to be

ballasted, to make the road complete. The company want about \$30,000, which with a little Government subsidy to enable them to finish the work. It is intended to apply for municipal aid. The receipts of the company so far have been—

Receipts.....	\$126,417.46
Expenditures,	180,347.81

Showing a deficiency of \$53,957.35 which the Directors, or somebody else, must be liable for. The work is still proceeding on the road, however; and it certainly would be too bad if it should be suspended altogether after so much has been expended and which can be of no avail if the line be not completed.

WELLINGTON, GREY & BRUCE RAILWAY.—The report of Mr. G. L. Reid, the Engineer of this company, has been presented to the Directors. He says:—

Starting from the Guelph station of the Great Western railway, the proposed line of railway runs in a very straight course to the village of Elora, keeping on the west side of it, and nearly parallel to the Gravel Road between Guelph and Elora. It enters the village of Elora at the S. W. corner, at a distance of 12½ miles from Guelph; then proceeding in an easterly direction, it crosses the Grand River at a point about one mile west of Fergus, and touches the westerly limit of that village at a distance of 15½ miles from Guelph.

So far there can hardly be any difference of opinion as to the route from Guelph northwards; but at the village of Fergus a choice of courses to the north and west is presented, both of which offer great advantages for the construction of a line of railway. One of these tends to the north-west, passing in its course the thriving villages of Alma, Dayton, and Rothsay, reaching the village of Harriston, on the Maitland river, at a distance of 31½ miles from Fergus, or 47 miles from Guelph. At this point I terminated the survey for the present. The other route lies more nearly due north and runs very nearly parallel with and west of the Garafraxa Gravel Road, passing the important village of Arthur, and terminating, for the present, at Mount Forest, on the south branch of the Sauguen River. The extreme distance by this line from Guelph to Mount Forest is 42 miles.

Were the railway to be constructed, in the first instance, the whole way to Walkerton, (from which point there is a choice of routes to Lake Huron,) the distance from Guelph via Drayton and Harriston would be 68 miles, and via Mount Forest and Newstadt, 67 miles. But as occasional lateral deviations might be found advantageous in determining the final location of either route, the distance between Guelph and Walkerton may be assumed to be practically the same by both lines.

The district of country traversed by both of the lines above described presents no obstacles whatever to the construction of a cheap and easily worked line of railway. In fact I know of no part of western Canada, north of the line of the Grand Trunk railway and west of Toronto, which presents so many favorable features for the building of a line of railway at once durable and inexpensive.

Starting from Guelph at an elevation of 833 feet above Lake Ontario, the summit level on the Harriston line is found at a point nine miles north-west of Fergus, where the elevation is 1,286 feet above the same level. On the Mount Forest route the summit level is 1,334 feet above the water of Lake Ontario, being at a point eight miles north of Fergus. In both cases the steepest gradients do not exceed a rise of 60 feet per mile (and that in short lengths at a time) which is somewhat more favorable than the ruling grade of the Galt and Guelph Railway; and there are no curves of less radius than 600 yards. After computing accurately the quantities of materials on both lines, I find that they are so nearly similar in amount that, for all practical purposes, the two routes may be regarded, in a mere engineering point of view, as offering equal facilities for railway construction.

In calculating the cost of the lines above described, I have based my estimates upon a railway of the existing gauge of the Canadian lines—viz., 5 feet 6 inches—and I have kept in view

the various requirements of a line capable of carrying with safety and certainty such an amount of traffic as at present daily passes over the Great Western Railway, from Guelph and Galt to Harrisburg, and at the same rate of speed as these trains. Instead of rails weighing 66 lbs. per yard, as used on the Great Western and the Grand Trunk railways, I propose to adopt a rail of 50 lbs. per yard, secured at the joints by means of an improved steel scabbard. The track will be ballasted in a very thorough manner; and although the majority of the bridges and open culverts and cattle guards will be of timber, they will be constructed in a very strong and substantial manner. The line will be fenced throughout, and well drained. The stations will be provided with good and commodious passenger and freight buildings, and an adequate number of water tanks, wood sheds, and engine-houses will be erected.

As the country consists, in a large measure, of a series of gravel ridges, the cuttings and embankments will be easily formed, and the ballasting of the track will be of a superior description. These important features in the first construction of the line not only indicate a comparatively small expenditure in the building of the road, but they as surely point to an inexpensive maintenance of the track in future years.

I made out my estimates of cost in three distinct divisions, namely: 1st. From Guelph to Fergus; 2nd. Fergus to Harriston; and 3rd. Fergus to Mount Forest. But I have now taken an average of all these and reduced the same to the cost per mile of railway, which, after making an ample allowance for right of way, general management, engineering and all contingencies, gives a result of \$15,000 per mile, exclusive of rolling stock and cars.

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