SURVEYOR'S REPORT

ON THE

THAMES

AND

GRAND RIVER CANAL.

REPORT

ON THE PRACTICABILITY OF CONNECTING

THE GRAND RIVER WITH THE RIVER THAMES,

BY MEANS OF A CANAL.

BY ROBERT A. MAINGY,

MINING AND CIVIL ENGINEER.

BRANTFORD:

DAVID M. KEELER, PLAIN AND FANCY JOB PRINTER, SENTINEL PRESS

1835.

REPORT.

To the Committee of Subscribers to the proposed Canal between the River Thames and the Grand River :—

GENTLEMEN—In pursuance of my instructions received from W. H. Merritt, Esq. and the arrangements entered into with your agent, G. W. Whitehead, Esq. I proceeded to examine and survey the several routes therein named, and I now beg leave to lay before you my Report, Estimate, and Plans.

It being indispensably necessary, that I should in some measure be acquainted with the general features of the country, I first turned my attention to, and devoted some time to the examination of, not only the several creeks pointed out in my instructions, but also of the surrounding country as far as I deemed it desirable; and finally, on the second day of June last, (accompanied by a competent surveyor and necessary assistants) commenced levelling, in which operation I was much retarded by the unfavorableness of the weather for such a work.

The first section of the route surveyed, (and which is delineated upon the ground plan by the broad red line,) comprising the three first miles, commences near the junction of Cedar Creek with the river Thames, on the property of Col. Light, through which it passes in an easterly direction until it crosses the Beachfield and Woodstock road, where taking a south easterly direction crosses into the first concession of East Oxford, thence into the second, and terminating at lock No. 3, in the nineteenth lot of the latter concession.

In this section there is unavoidably some extra excavation, as also some embanking, but by no means of any consequence, also three locks of ten feet lift each, the soil consists chiefly of black loam and mud upon a clay bottom, and as per annexed estimate, this section will cost £3403. 7. 0. The next section passing into the third concession continues in the same direction as the last, crosses the west quarter town line near the junction of Mud Creek, a sluggish stream with an average depth of eighteen inches of water. In this section, which runs for some distance through a cedar swamp, there occurs but a very trifling excavation or embanking—the soil is chiefly black mud lying on a clay and gravel bottom, and varying from two to three feet in thickness. The cost of completing this section as per detailed estimate, is £1950. 16. 8.

The third section, being a continuation of the third concession, crosses the middle town line, where the land rises rapidly, until it arrives at the highest summit of land in the course of the canal, having an elevation of 60f. 3 1,000i. above the level of summer water in the River Thames, and requiring a cutting of (23) say twenty-three feet for the length of six chains, where the fall is equally rapid until at the termination of this section, where the route is again at the requisite level. The expense of completing this mile is somewhat high in consequence of the deep cutting, which is requisite, in keeping the same level, and thereby turning the water of Cedar and Mud Creeks to the east. As per annexed estimate, it will amount to £6195. 14. 8.

The next section, in which is located three locks of ten feet lift each, crosses the fourth concession in a south east direction, then passes over the stage road in front of Mr. Sage's dwelling. (where it will be necessary to construct a bridge) into his clearing. This section repeatedly crosses a small branch of Kinney Creek, which is, however, so insignificant, that no culverts will be required, as it is proposed to take it into the canal. The expence of this section, in which occurs some little excavation and embanking, as per estimate, will be £3149 7 3.

The fifth section, which principally runs through a black ash swail, crossing into the fifth concession and seventh lot, takes a gradual bend back into the fourth concession, then again into the fifth, and finally terminates at lock No. 6.

Kinney Creek, which in this section receives an augmentation of water from a stream rising near the Governor's road, is frequently crossed : should it hereafter be deemed requisite a dam might here be constructed, (as the banks on either side are steep, and very close to each other,) for the purpose of collecting the waters arising from innumerable springs, as also the fall and spring floods. Three locks of ten feet lift each, are in this section located. The extra excavations, which consist of black soil on a clay bottom are not great—some embanking in preserving the level will be necessary. Estimated expense, £2359 12 10.

The next section, continuing in nearly the same direction as the last, crosses the town line between Oxford and Burford, thence to Mr. Wier's mill pond, which it is intended to make use of, as being a canal already formed, merely requiring to be cleared of the dead timber, and the formation of a tow path upon its southern bank. In leaving the pond the land is found to be somewhat lower than our level, and which it is intended to preserve by embanking,

thereby saving the expense of a lock and considerable excavation in crossing a small rising, which was found necessary to pass over to save following the valley, which here takes a considerable bend to the north. Under the excavation it will be necessary to place pipes for giving the water (which part of the year covers these flats) a free passage. The cost of this section as per annexed estimate, including one lock of ten feet lift, will cost £2495 12 10.

The next section after crossing the west quarter town line, passes into the sixth concession, then in an easterly direction very near the stage road, through a black ash swail, which being below level, except where the line unavoidably crosses ridges in preserving the same direction, some embanking will be necessary which will save the navigation from interruptions, which it would otherwise unavoidably be liable to, from the land here being inundated during part of the year. The creek is frequently crossed in this section, the waters of which can be advantageously taken into the canal; pipes under the embankment, such as are in use in Great Britain for similar purposes, will be here required. The cost of the section as per estimate is £3564 16 0.

The eighth section, in which are located two locks, continues in the same direction as the last to the middle of the town line, where taking a northerly direction, strikes the junction of Horner's Creek, which is here fifty links broad, and somewhat above the level of the bottom of the canal, into which it is purported to admit the water, by raising a bank across the river in a line with the heelpath of the canal, and therein constructing a waste weir for carrying off the waste water. The embanking and extra excavation in this section is trifling. The whole three miles, as per estimate, including one bridge over the Oxford stage road, and another over a side road leading to the Governor's road, will cost but £3512 17 2.

The next section, including the nineteenth and twentieth miles, takes rather a sudden bend to the south, which can, however be obviated when locating the canal, by continuing on the north side of the creek, from where the rout crosses the side-road mentioned in the last section, until it strikes the dam thrown across the stream by N. Ives, Esq. and then continuing along the mill race, which merely requires to be widened from thirty links to the general dimensions of the canal and deepened. This section in which three locks are located, two of ten feet lift and one of [illegible] feet, will, as per estimate, cost £3026 5 0.

From the point of termination of last section, the tenth, consisting of the twenty-first and [illegible]rd miles, enters Mr. Ma-

thews' mill pond by a lock of ten feet lift. This pond is large and deep, but the present dam (composed of clay and gravel) is not of sufficient strength or size to resist the pressure of so large a body of water, consequently it will be necessary to give this dam increased dimensions sufficient to answer the double purpose of a toepath and resisting the pressure of the water.

Leaving the mill pond on the south side of the mill, the route crosses the road between Burford and Brantford, and enters the fourth concession in a south east direction, then taking a gradual bend to the north, terminates near lock 22. In this section, which after crossing the township line, runs through a narrow valley, confined on both sides by high precipitous banks, some extra excavation and some embankment occurs, as also six locks of ten feet lift each The route of canal in the eleventh section, continuing to follow the same valley as the last, occasionally passes through corners of cedar swamps, and unavoidably crosses the creek very frequently, to its termination at the junction of the Grand River. This section, in which are located six locks of ten feet lift each, there is some excavation and embankment; the expense of which, as per estimate, will be £4912 13 9.

The whole distance from the junction of Cedar Creek with the River Thames, to the junction of Horner's Creek with the Grand River, where the survey terminated, is twenty-five miles and thirty chains—the difference of level between the two rivers is two hundred and twenty-nine feet, seven inches, and two tenths; and as per estimate, the amount required for completing the communication, will be £45071 12 9.

Having completed the description of the route, I shall now proceed to mention the size of the boats for the canal, and give some description of the size of the locks, the quantity of water they receive and discharge—also, what quantity can be furnished by the several streams, and how many boats that quantity will admit through each lock in the twenty-four hours.

The canal is proposed to be twenty-one feet broad at the bottom, with a slope of one foot and a half horizontal to a foot perpendicular, and three feet deep, with wooden locks, eighty feet long by ten feet broad, and in general ten feet lift—the boats to be of commensurate dimensions.

Having had an opportunity of viewing (previous to my arrival in the province) the iron boats now in use on the Paisley and Glasgow canals, I feel no hesitation in strongly recommending, not only their adoption on this particular line, but generally throughout the

province, where it may be requisite to construct small canals, their cost is not great, (£50,) while from their lightness and peculiar construction, they are enabled to travel at the rate of eight and ten miles per hour, a speed never before witnessed on a canal, and that without the banks receiving any material damage.

It is intended to supply the summit level by means of Cedar Creek and Mud Creek. To effect this it will be necessary to throw a dam across the Cedar Swamp mentioned in the second section, and which, being bounded on either side by high ridges is very favorable for our purpose, the waters thus dammed up, will furnish a ready reservoir which will amply supply the locks at the western level, and also flow back through the deep cutting and supply that end also.

From the quantity of water afforded by the two abovementioned creeks, amounting after making the accustomed allowance for evaporation, &c. to 2155500 cubic feet during the twenty-four hours, and which I carefully gauged in the presence of Messrs. G.W.Whitehead and Martin, I do not apprehend that any scarcity in the supply will occur, allowing one lock full to each boat descending, and half that quantity to one ascending, the quantity consumed by each boat up and down, will be 12600 cubic feet at each end of the level, and consequently admit of 85 boats passing through the canal within the twenty-four hours; should it however be necessary to seek an additional supply, it can be readily procured either from Big Creek and Green Creek, two considerable streams running on the borders of Norwich, or from the various streams north of the Governor's road.

From the summit to the termination of the ronte, various streams are met with; some may readily be admitted into the canal, others at some future period it may be advisable to collect by damming (for which the whole route is favorable) into reservoirs, and admit into to the canal as required. Cooly Pond is so favorably situated, being about the middle of the route and not more than a mile distant, that it will be of essential use as a reservoir for supplying any deficiency that may occur in this and the next section. Horner's Creek as mentioned in the eighth section, is a stream quite as large as Cedar-Creek, but is not as durable, it will, however, with the aid of innumerable small spring creeks amply supply the eastern route.

I will now proceed to state generally the results of the examination made by me of the several routes mentioned in my instructions and my reasons for adopting this line in preference to the others, merely mentioning "*en passant*" that being a total stranger to all, parties interested in the several routes, my examination was con-

ducted with a total disregard to all prejudices in favor of one route or another, my only view being to study the intersts of the subscribers and the public in general.

Smith Creek, the first examined by me, is a considerable, but winding stream; from the point where it first enters Blenheim, which is in the 18th lot of the 14th concession, it passes south thro' the third concession and part of a fourth, in a very circuitous manner, then turns to the east entering into the eighth and ninth concessions of Dumfries, then re-entering the eighth concession of Blenheim, and traversing seven lots, once more takes a southern direction through three concessions, changing its direction for a short distance to the east, and continuing in a south east and very crooked direction to the town of Paris, where it empties into the Grand River.

I did not examine this river much above the seventh concession, as from an inspection of the map I felt convinced that it would not be for the interest of the subscribers to follow this creek any higher than was absolutely necessary in securing the most advantageous point for leaving it at. This being obtained at Trout Creek, distant from Paris about seven miles, I turned my attention to selecting the best line for forming a junction with Horner's Creek, and finally with the River Thames. The route delineated on the ground plan, by dotted lines, is the one I here selected; but Ithink it probable, that upon a more extensive examination being made, and which I regret time would not admit of my undertaking, a more favorable point nearer to the Town Plot may be found for its termination.

The summit of this line will be between Cranberry Lake and Pine Pond, and will not, I am convinced, exceed that of the route already surveyed, either in height or length. With regard to the supply of water, an inspection of the accompanying plan is only requisite to satisfy the most sceptic person that want of water can never be urged as one of the objections to this route being completed. Having fully satisfied myself upon the practicability of this route, I next commenced an inspection of Cedar Creek and Horner's Creek, from the junction of the former with the River Thames, to the junction of the latter with the Grand River; but having already given a description of it in a former part of my report, a repetition of it would be superfluous.

To attempt to particularize the immense advantages that will accrue to this province in a variety of instances from an extension of its inland navigation, or even to this section of country, from the proposed canal, when viewed as a link of the vast chain of inland navigation which it will possess when the improvement of the Grand

River, now rapidly advancing to a state of completion, and those of the River Thames now under survey to its mouth, are completed, would prove an endless task, and require a much abler pen than mine. It may not, however, be amiss to mention some few, which, before doing, I would beg leave to quote the words of a late celebrated author upon Inland Navigation: he remarks, "There are, perhaps, few objects of internal policy that so much call forth the powers of a country as canals. They not only are the means of enlarging foreign commerce, but they give birth to an internal trade, which with all the advantages attendant on foreign commerce, far exceeds it in extent, value, and importance."

No country on the face of the globe is more alive to these advantages, or ever reaped more from canals in an equal ratio than China. The country, as we are informed by travellers, is in every direction intersected by canals from the smallest to the largest dimensions, and to such an extent have they carried inland navigation, that a traveller is enabled to traverse this vast empire entirely by canals. The industrious Hollander, as we are told, from mere necessity, and hatred to their oppressors, the Spaniards, were first led to turn their attention to the construction of canals, and have, from a diligent perseverance raised, comparatively speaking, a small tract of marshy land into a populous, powerful, and wealthy state.—Great Britain, possessing innumerable rivers made navigable by art, possess at this day a greater number of canals than any other country in the world, and has derived, and is still deriving incalculable benefits therefrom. The United States, following the steps of the mother country, is every day designing new projects of Inland Navigation, which, possessing the patronage of the government, must at no very distant period raise it to a rich, populous, and powerful republic. The British North American possessions, until of late years, appear to have been laboring under very powerful disadvantages, but will, I trust, e'er long be enabled to prove to their more enterprising neighbors, that the spirit of improvement has never been entirely wanting, but merely lying dormant until an opportunity presented itself of bursting forth in a manner becoming the fostered child of so great and powerful a nation as Great Britain.

Even in the short time that I have known this province, several projected canals have been commenced and are far advancing to completion, and several others are now in contemplation. The immense saving in the expence of carriage (which may be estimated at one third) may be classed at the head of the many advantages attendant on the adoption of canals in lieu of the dilatory, uncertain,

and expensive mode of transit afforded by the monopolists in the carrying trade. To convey twenty tons of goods upon a canal such as is here contemplated, the boat and horse would, upon a rough calculation, cost from eighty to one hundred pounds and require one man to manage the boat, with a boy to drive, whereas, to convey the same weight by land, twenty horses would be required, and at least ten men, and the goods so carried, besides the delay attendant upon such a precarious mode of transit, would cost the merchant one third more in the item of carriage, and, as is most frequently the case, reach him in a damaged state, and thereby occasion him still greater loss.

To the farmer, canals present very great advantages over the present system of the country. At present he labors under almost insurmountable disadvantages; probably at a time when he should be occupied on his farm, he is under the necessity of disposing of a certain portion of his produce; to realize its value,he is often obliged to travel with his load from eight to ten and twenty miles, and as frequently to return home with the same load, or dispose of it at a loss, and his horses or cattle, from the fatigues of the journey are unable the following day to perform their accustomed work on the farm.—How very different would it not be, had he a canal running through or near his property, in lieu of losing his valuable time, as usual he would be enabled either to dispose of it to speculators, who, it is to be inferred, would be met with along the line of canal; or, he may at a much less expense get his produce conveyed without his personal attendance, to a sure market, and in the end, considering the value of time, the ware and tare of his waggon, and the fatigue of his cattle, be a considerable gainer.

The extension of Inland Navigation holds out so many advantages to the government as should secure at least, its patronage, if not its co-operation, for setting aside the facilities in point of cheapness and exepedition afforded in time of war by canals, in the transit of war-like stores—they will greatly facilitate the settling of the country by affording the emigrant an easy, cheap, and certain mode of convey ance for themselves and baggage to the different parts of the province they may select for settling in, and in a short space of time, instead of the immense forest that every where attracts the eye of the traveller, we may hope to see rise, as if by magic, flourishing villages, an industrious and prosperous population with well cultivated farms. These are some few of the advantages that present themselves to me as likely to accrue to this province in general, from an extension of its Inland Navigation. To you who are so much better acquainted

with the immediate wants and trade of your section of country, I shall leave the task of summing up the local advantages, an undertaking that has hitherto been considered as endless as enumerating the sands on the sea shore.

In conclusion, I would take occasion to mention, that although fully persuaded in my own mind of the practicability of connecting the River Thames with the Grand River, by means of a canal, through either Smith Creek route or Cedar Creek, still it is my decided opinion that the former does not afford the same advantages as the latter, either in point of directness or cheapness of execution, neither possess the same favorabla site for the termination of such a work, and can never secure a sufficient trade to promise the stockholders the most distant hope of ever realizing that remuneration which such an undertaking would warrant them in expecting.

I remain Gentlemen,

Your obedient Servant,

ROBERT A. MAINGY,

Mining & Civil Engineer.

Estimate of the probable expense of completing a Canal three feet deep, twenty-one feet at bottom with a slope of one and a half feet horizontal to one foot perpindicular.

DESCRIPTION OF WORK.	RATE	£	s.	d.	AMOUNT.		
FIRST SECTION.	D.						
Excavation, 49710 cubic yards	6	1242	15				
Do extra 22992 do	4	383	4				
Embanking 12496 do	6	312	8				
Three Locks		1200					
Forming Towpath and back Drain		45					
Two Road Bridges		70					
Grubbing and clearing ten acres		150			3403	7	0
SECOND SECTION,							
Excavation 32881 cubic yards	6	822					
Do extra 17264 do	6	432					
Embanking 6110 do	4	101	16	8			
Constructing Dam		500					
Forming Towpath and back drain		30					
Grubbing and clearing four acres		65			1950	16	8
THIRD SECTION,							
Excavation 21120 cubic yards	8	704					
Do extra 162352 do	8	5411	14	8			
Forming Towpath and back drain		20					
Grubbing and clearing four acres		60			6195	14	8
FOURTH SECTION.							
Excavation 19737 cubic yards	7	575	13	3			
Do extra 29171 do	6	729	5	6			
One Road Bridge		50					
Embanking 16577 cubic yards	6	414	8	6			
Three Locks		1200					
Forming Towpath and back drain		50					
Grubbing and clearing eight acres		80					
pipes uudes Embankment		50			3149	7	3
FIFTH SECTION.							
Excavation 19798 cubic yards	7	577	8	10			
Do extra 40019 do	6	1000	9	6			
Embanking 14777 do	6	369	8	6			
Three Locks		1200					
Grubbing and clearing seven acres		70					
Forming Towpath and back drain		50			3267	6	10
SIXTH SECTION.							
Excavation 25344 cubic yards	6	633	12				
Do extra 44757 do	6	1118	18	6			
Embanking and puddling 8887 do	4	148	2	4			
One Lock		400					
Forming Towpath along the Mill Pond		50					
Grubbing and clearing six acres		60					
Laying pipes under Embankment		70					
Forming Towpath and [illegible] drains		15			2495	12	10

ESTIMATE—CONTINUED.

SEVENTH SECTION.									
Excavation 32423 cubic yards	....	....	6	810	11	6			
Do extra 17071 do	....	....	6	426	15	6			
Embanking 49898 do	....	....	6	1247	9				
Pipes under Embankment	....	....		85					
Two Locks	....	....		800					
Forming Towpath and back drains	....	....		45					
Grubbing and clearing eight acres	....	....		150			3564	16	0
EIGHTH SECTION.									
Excavation 40268 cubic yards	....	....	7	1174	9	8			
Do extra 25750 do	....	....	6	643	15				
Embanking 25745 do	....	....	6	643	12	6			
Two Locks	....	....		800					
One Waste Weir	....	....		6					
Two Road Bridges	....	....		80					
Forming Towpath and back drains	....	....		45					
Grubbing and clearing eight acres	....	....		120			3512	17	2
NINTH SECTION.									
Excavation 30819 cubic yards	....	....	6	770	9	6			
Embanking 27231 do	....	....	6	680	15	6			
One Road Bridge	....	....		40					
Grubbing and clearing six acres	....	....		60					
Forming Towpath and back drains	....	....		30					
Pipes under embankment	....	....		45					
Three Locks	....	....		1200					
Enlarging present Mill Race	....	....		200			3026	5	0
TENTH SECTION.									
Excavation 57811 cubic yards	....	....	7	1636	2	5			
Do extra 23073 do	....	....	7	672	19	3			
Embanking 18451 do	....	....	6	461	5	6			
Six Locks	....	....		2400					
Raising Mr. Mathews' Embankment along Mill Pond				50					
Grubbing and clearing twelve acres	....	....		180					
Forming Towpath and back drains	....	....		45			5495	7	2
ELEVENTH SECTION.									
Excavation 38773 cubic yards	....	....	7	1130	17	7			
Do extra 29108 do	....	....	7	848	19	3			
Embanking 15433 do	....	....	6	385	16	6			
Six Locks	....	....		2400					
Forming Towpath and back drains	....	....		35					
Grubbing and clearing seven acres	....	....		112			4912	13	9
							40974	4	4
To which add for unforeseen Contingencies 10 per cent.							4097	8	5
E. E.							45071	12	9

Say Forty-five Thousand and Seventysone Pounds Twelve Shillings and Nine Pence.

Burford, September 21, 1835.

ROBERT A. MAINGY,
Mining and Civil Engineer.

DAVID M. KEELER,

Plain and Fancy Book and Job Printer,

SENTINEL PRESS,

COLBORNE-STREET....BRANTFORD.

The Brantford Sentinel:

AND GRAND RIVER GENERAL ADVERTISER,

ONE OF THE LARGEST NEWSPAPERS IN U. CANADA,

——DEVOTED TO——

Internal Improvement, the Arts, Sciences, Foreign & Domestic News

Published Weekly at Brantford,

BY DAVID M. KEELER,

EDITOR AND PROPRIETOR.