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## SURVEYORS REPORT

ON THE

## THAMES

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 civit enginetr.


## BRANTFDRD:

DAVID M. KEELER, PLAIN AND FANCY JOB PRINTER, SENTINEL PRESS ${ }^{\circ}$
1885.

DEC15,1953

## REPORT.

## To the Commilite of Subscribers to the proposed Canal between the Kiver 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 mecessary, 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 botlom, and as per annexed estimate, this section will cost £3403. 7. O. 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. 31.000 i . 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 atj the requisite level. The expense of completing this mile is somewhat tigh 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 threis locks of ten feet lift each, crosses the fourth concession -in a south east direction, tien 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 occu. some little excavation and embanking, as per estimate, will be $£ 314973$.

The fith 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 excava, tions, whir:h consist of black soil on a clay bottom are not greatsome embanking in preserving the level will be necessary. Estimated expense, £2359 1210.

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 tov 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,
n feet lift tion, then pg. (where This ek, which quired, as this secing, as per
black ash t, takes a $n$ into the frequently ht here be y close to ising from hree locks a excavas ot greatry. Estim ion as the thence to f, as being the dead ern bank. ower than nbanking,
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 ne"row 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 $£ 4912139$.

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 $£ 45071129$.

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 twentysfour 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 woodenlocks, 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 boate 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
arge and is not of body of ncreased path and

1e route aters the gradual n, which ley, con cavation lift each llow the of cedar $y$, to its ction, in ne excalate, will with the Grand id thirty wo hun. and as dication, proceed ne desreceive several h each
bottom, dicular, ten feet nsurate
arrival d Glast only out the province, where it may be requisite to construct small canals, their cost is not great, ( $\mathbf{£ 5 0}$, ) while from their lightness and peculiar constructior, they are enabled to travel at the rate of eight and ten miles per hour, a speed never bofore 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 cutling and supply that end also.

From the quantity of water afforded hy the two abovementioned creeks, umounting after making the accuatomed allowance for evaporation, \&c. to 2155500 cubic feet during the twenlyofour hours, and which I carefully gauged in the presence of Mesers. G.W.Whitehead and Martin, I do not apprehend that any scarcit ' the supply will occur, allowing one lock full to each boat descesuact and half that quantity to on 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 Greek 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 atreams 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 whith 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 men tioned in the eighth section, is a stream quite as large as CedarCreek, but is not as durable, it will, however, with the aid of innuw merable small spring creeks amply suppiy 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 strarger 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 subscris bers 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 concesn sions of Dumfries, then resentering the eighth concession of Blenheim, and traversing seven lots, once more takes a southern direction through turee 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 tur:ed 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 fos its termination.

The summit of this line will be between Cranberry Lake and Pine Pond, and will not, I am coavinced, 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 oaly 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 attemp! 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

## (9)

one routé he subscris
erable, but Blenheim, south thro' tous man th concesm n of Blen lern direcfor a short ry crooked and River. concession, - would not any higher vantageous eek, distant lecting the and finally ound plan, obable,that ch I regret rable point

Lake and f the route ard to the an is only ter can necompleted. this route, er's Creek, les, to the Ig already repetition
that will extension ; from the of inland the Grand

River, now rapidly advarcing to a state of completion, and thone 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 amise to mention some feit, which; before doing, I would beg leave to quote the words of a late celobrated author upon Inland Navigation : he remarks, "There are, perhäps, 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 olive to these advantages, or ever reaped more from canals in an equal ratic 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, ard wealthy state.Great Eritain, possessing innumerable rivers made nävigable by art, possess at this day a greater number of canals than any other coun try 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, populour, and powerful republic. The British North American possessions, untit 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 pre. sented itself of bursting forth in a manner becoming the fontered 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 entimated 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 twent; tons of goods upon a canal such as is here contemplated, the boos 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 hila 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 secessity 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 catile, 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 ether 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 cat tle, be a considerablégainer.

The extension of mland 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 warlike 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 mo as likely to accrue to this province in general, from an extension of its Inland Navigation. To you who are so much better acquainted

## (11)

olists in the canal such on a rough require one to convey red, and at $\checkmark$ attendant e merchant quently the n hila still
over the der almost he should osing of a ften obliged and as freit at a loss, are unable he farm. ng through as usual he ho, it is to or, he may is personal the value of his cat
advantages if not its apness and sit of war:ountry by f convey e province ae, instead of the trag villages, ted farms. nselves to extension acquainted
with the immediate wants and trade of your section of country, I shall leave the task of summing up the lecal advantages, an undertaking that has hitherto been considered as endless as enumerating the sands on the sea shore.

In conclusion, 1 would take occasion to mention, that aithough fully persuaded in my own mind of the practicability of connecting the River Thames with the Grand River, by means of a canal, through eijher 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.

1 remain Gentlemen,

Your obedient Servant,

ROBERT A. MAINGY,

Mining \& Civil Engineer.

## (12)

Eatimate of the probable expense of completing a Canal three feet deer, twentynone feet at boltom with a slope of one and a half feet horizontal to one foot perpindicular.

## DESCRIPTION OF WORK.

FIRST SECTION.
Excavation, 49710 cubic yards Do extra 22992 do
Embanking 12496 do
Three Locks
Forming Towpath and back Drair Two Road Bridges
Grubbing and clearing ten acres
SECOND SECTION,
Excavation 32881 cubic yards
Do extra 17264 do
Embanking 6110 do
Constructing Dam
Forming Towpath and back drain
Grubbing and clearing four acres
THIRD SECTION,
Excavation 21120 cubic yards Do extra 162352 do
Forming Towpath and back drain
Grubibing and clearing four acres FOURTH SECTION.
Excavation 19737 cubic yards
Do extra 29171 do
One Road Bridge
Embanking 16577 cubic yards
Three Locks
Forming Towpath and back drain
Grubbing and clearimg eight acres
pipes uudes Embankment
FIF'LH SECTION.
Excavation 19798 cubic yards
Do extra 40019 do
Embanking 14777 do
Three Lctks
Grubbing and clearing seven acres
Forming Towpath and back drain
SIXTH SECTION.
Excavation 25344 cubic yards
Do extra 44757 do
Embanking and puddling 8887 do
One Lock
Forming Towpatli along the M:ll Pond
Grubbing and clearing six acres
Layiug pijes under Embankment
Forming Townath and $\cdot \cdot=$ drains



$\qquad$


## (18) <br> ESTIMATE-CONTINUED.



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

Burford, September 21, 1835.

ROBER'T A. MAINGY, Mining and Civil Engineer.

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DAVID M. KEELER, EDITOR AND PROPRIETOR.


