

13. The long winters do not injure the soil, but benefit it, provided the ground is frozen and covered with snow.

CHAS. DIXON, Westmorland.

15. No injurious effect.

ALEXANDER MUNROE, Westmorland.

16. The frost has generally a good effect upon the soil.

JOSEPH AVARD, Westmorland.

18. The land is benefitted by being covered with snow all the winter. I have observed that the crops are not so good when the snow disappears early. The land that is ploughed in autumn is not again touched until the grain is put under the harrow in the Spring, the soil being completely pulverized.

A. C. EVANSON, King's.

20. On ploughed land the winter is a benefit, making the soil beautifully mellow when it thaws and dries. If the snow begins early, falls heavy, say from 5 to 7 feet deep, and remains till the latter part of March or beginning of April, the whole country benefits, and an early spring is the result.

THOS. BEER, King's.

20 1-2. If the land is constantly covered with snow, the heaving by frost causes a general pulverization.

ANDREW AITON, King's.

22. I cannot see how the winter here can be so injurious to the soil as some imagine, as the frost and snow may be said to keep possession from the time the winter sets in, till the Spring, without any alteration, such as frost and thaws; and in my humble opinion the winters of the old country (although not near so long or severe) have a tendency far more to sap and wash away the fertile portions of the soil, through a succession of rains, frosts and snows.

DANIEL McLAUCHLAN, King's.

25. The frost has a tendency to improve the soil by pulverizing it after fall ploughing.

ALLAN COSTER, Queen's.

32. When hard frozen or covered with snow, the soil is uninjured.

C. L. HATHEWAY, Sunbury.

33. When we have a good depth of snow, and to remain all winter, our meadow and pasture lands are much more productive; and as to the tillage land, we think it rather improves it than otherwise, particularly the clay soil that is ploughed in the autumn.

NATHL. HUBBARD, Sunbury.

34. I am not aware of the winter being an injury to the soil.

CHAS. H. CLOWES, Sunbury.

35. The winters I think have a beneficial effect upon the soil when covered with snow, and not too much exposed to frost.

CHAS. HARRISON, Sunbury.

36. Our common winters in which the snow continues on the ground from November till April, do not I think in the least degree injure the soil, but on the contrary are very beneficial to ploughed lands, the frost leaving them in the Spring much more light and mellow than they were in the autumn.

EDWARD SIMONS, York.

it friable. I do not think it hurts it in any way. Winters that the snow lies on the ground from the 15th November to the 10th of April, are best for meadows and pastures, as they do not much kill the grass.

JOHN H. REID, York.

39. The frost of winter leaves the land in a very friable state, and is better order for green crops than any number of ploughings in winter could make it. On this account, I believe a span of horses could work as much land here under a given rotation as they would in Scotland.

ROBERT GRAY, York.

41. The effects of the long winter on the soil are chiefly observable in the easy working of the land when the frost is out of it.

ROBERT D. JAMES, York.

43. The effects of the long winter on the soil vary with the character of the weather. When the frost continues almost uninterrupted from December to April, it is of course one cause producing its corresponding effect on the various sorts of soil and organized tissue. When interrupted by thaws, the effects are considerably diversified—sometimes destructive to roots and germs, but perhaps as often to weeds and insects.

EDWIN JACOB, D. D., York.

44. The hard frosts serve to pulverize and mellow the ploughed lands.

ISRAEL PARENT, York.

45. It is beneficial on all lands except the grass lands.

WILLIAM DOW, York.

50. The winters in this country act very favourably in pulverizing the soil and making it productive.

JOHN LEWIS, Albert.

51. The winters in this country act favourably on the soil.

WILLIAM WALLACE, Albert.

55. The effects of the long winter on the soil, particularly on clayey lands, we conceive to be beneficial.

JAMES CAIR, Northumberland.

53. Winters, however severe, when the snow falls deep upon the ground, rather serve the soil.

HENRY W. BALDWIN, Gloucester.

62. The effects of the long winter on the soil are not understood, but the effect of the hard frost is to lessen the labour of the husbandman, as it heaves up, opens and pulverizes the earth, consequently it requires less tillage.

REGALD STEWART, Restigouche.

The general purport of all these opinions is, that upon ploughed land its action is decidedly advantageous. So much so, that most persons, because of this effect, do not think it necessary to plough their land more than once. When ploughed in the fall, the seed is merely harrowed into it in the Spring. This must necessarily lessen the labour of the farmer, make the cultivation less expensive, and enable him to do more work with the same force in the same time. Only one of them, as I have already remarked, specifies the actual amount of saving of labour thus caused; but this one, (that of Mr. Gray) estimates it to be so great, that a pair of horses in this climate will be able to do as much ploughing in a year as they could in Scotland in the same time.

B. Its effects on grass are often unfavourable.

3. Very injurious to the grass when bare or covered with ice.

DAVID MOWATT, Charlotte.

5. The effects upon the soil by the long winters are very injurious to farming, as the roots of the grasses are affected, and winter grains cannot be used in consequence.

JOHN MANN, Jr., Charlotte.

6. The soil being generally light the meadow land suffers materially by the frost heaving up the roots of the grasses, particularly when recently laid down, but the difficulty is obviated in a great measure by early rolling in the spring.

JOHN FARMER, Charlotte.

The soil gets extremely cold and damp, and where it stands it gets winter killed some times.

HOWARD D. CHARTERS, Westmorland.

10. What is called mild winters, with frequent rains, or if the snow covers the ground before it is sufficiently frozen, has a bad effect.

ROBT. B. CHAPMAN, Westmorland.

16. On lands where the surface water is allowed to remain, the action of the frost on the grass roots is injurious, and not unfrequently destroys the crop or materially weakens it.

JOSEPH AVARD, Westmorland.

19. The long winter is very injurious to the country. I am of opinion the hard freezing and the heavy rains reduce the strength from the soil.

HENRY HAYWARD, King's.

20. On the meadows it tends to kill the grass roots, and make the land too cold, causing them to run to moss. If we have frequent thaws taking away the snow in 48 hours, and then freezing hard before another fall, which is to often the case of late years, this proves very detrimental to the land, and all kinds of labour and travelling.

THOS. BEER, King's.

20 1-2. If the ground is but partially covered, in dry hard weather, the fine parts of the soil drifts off into hollows and ravines.

ANDREW AITON, King's.

24. One for night without snow on the land has an injurious effect.

DANIEL S. SMITH, Queen's.

28. The intense frost during the winter leaves the soil in the spring in a loose spongy state, so much so, that much of the nutritive substances contained are subject to be washed away by incessant rains and the water produced by melted snow; and frequently, if any rain falls during the winter, it is immediately frozen and becomes solid ice on the surface, which generally has a tendency to produce what is called "winter killing," viz. the grass is so much injured that it must be broken up before the land can again produce grass.

WILLIAM REED, Queen's.

29. It generally kills the roots of the grass and washes the ploughed land.

WM. PINDAR, Queen's.

31. On high hilly lands it affects the grass roots and injures the soil.

ROBERT SMYTH, Queen's.

32. With alternate freezing and thawing, particularly of clayey soils, it injures the grass land and winter grain.

C. L. HATHEWAY, Sunbury.

33. If we have frequent thaws, and frost immediately after, it injures our meadows and pasture lands.

NATHANIEL HUBBARD, Sunbury.

36. We sometimes have a very changeable winter, which is very injurious to our grass lands, by the heavy thaws and rain taking the snow off them and leaving them exposed to the action of the frost, which coming immediately after the thaw, when the land is very wet, exhausts the ground so much as to thaw the grass roots out of their places and leave great part of them exposed to the air, if we have another thaw it washes so much of the earth from the roots of the grass that they have nothing left to draw the frost out of them in the spring, and being exposed to the sun and air are generally killed.

EDWARD SIMONS, York.

40. Our long winters are the most serious drawback to the farmer, but they have no serious effect on the soil provided the snow falls in November and remains on till some time in April. The want of snow to protect the grass or winter crops of grain has often proved injurious. Heavy rain in the winter, followed by hard frosts, often kill the young clover, which is always followed by a lighter crop of hay on the higher ground.

WM. WILMOT, York.

44. The hard frost injures the grass on clay lands, as it heaves the grass up and exposes it to the atmosphere, and causes it to be weakly, but does not injure the dry land so much.

ISRAEL PARENT, York.

47. The effect of the long winter is very injurious to the grass.

JAMES L. PICKETT, Carleton.

51. The winter sometimes operates unfavourably on the meadow lands, killing the clover roots.

WM. WALLACE, Albert.

53. The effect which frost and snow may have organically on the soil I know not, nor what effect "the rest from its labours" may produce; but I think the water which penetrates it in the spring, when the great body of snow melts, chilling and retarding vegetation, is injurious.

JOSEPH C. WHETEN, Kent.

58. Without snow the frost is apt to kill the grass roots.

HENRY W. BALDWIN, Gloucester.

To be Continued.

REPORT ON THE NAVIGATION OF THE RIVER

ST. JOHN.—Continued.

KELLY'S ROCKS.

Below the Aqueduct River, one of the rocks called "Kelly's Rocks," might be removed in the course of the operations to improve the navigation.

POMFRAY'S ROCKS.

Some rocks pointed out as "Pointrey's Rocks," cause broken water, but do not appear to obstruct the channel.

COFFEMAN'S BAR.—Survey No. 6.

The last of the natural dams at which an obstruction to

the navigation occurs, is about 1 mile below Hardwood Creek, and called "Coffeman's Bar," it consists of ledges of rocks running partially across the bed of the River, together with a shoal of stones and gravel deposited against and below it.

The water in its passage spreads once nearly the whole width of the River from bank to bank, but its discharge is deepest—First, in a narrow channel past the extremity of the main ledge of rocks extending from the right bank; Second, through the same ledge close to the right bank; Third, by a channel down the middle of the River, passing over the head of the bar into the deep water below the main ledge of rocks; Fourth, by another channel crossing from the left bank obliquely across the bar into the deep water below the main ledge of rocks.

The set and force of the current is towards the right bank, against which the ice packs in the Spring.

The water in the first channel is deep, with soundings from 5 to 10 feet, passing again into 5 and 6 feet. A skilful and well practised pilot could run a small boat down this channel at any time, but during seasons of low water it is an extremely dangerous one, being in the vicinity of sharp projecting rocks, against which boats, after passing round the end of the extreme ledge, are liable to be drifted by the eddies, as well as by the set of the current.

The second channel could be rendered of sufficient width and depth, by blasting off the top of some of the projecting ledges; but from the nature of the formation of these rocks, it would be difficult to blow them without the danger of jagged projecting points being left, and of boats striking against them should they swerve at all from the direct channel in this rapid water.

The third or centre channel is the most direct and straight, it crosses the head of the shoal in 2 ft. 9 inches water, and where the bed is comparatively smooth.

Where the 4th or left channel crosses the shoal, the depth of water varies from 2 ft. 3 in. to 3 ft.

Both these two last could be deepened, but from the wide expanse of the water, and the quantity of gravel brought down by the floods in the Spring, any excavation would be extremely liable to be quickly filled up; under these circumstances, we have selected the third or centre channel for improvement, and which we propose to effect by means of a wing dam, projecting from the left bank, to bend obliquely 160 yards down with the stream, in order, by contracting the width of the water-way of the river, to turn a greater volume into the channel in question.

After the execution of this work any alteration in the extent and position of the shoal must be carefully watched, in order that an addition or reduction be made in the length of the dam, according to the form assumed by the accumulating gravel and debris. The probable cost will be £180.

MONQUART RIVER.

There is a small rock in the channel, at the mouth of the Monquart River, which should be removed. Probable cost, £5.

About 1 1/2 miles below the Monquart River a shoal caused by the ice jamming against the left bank, composed of rounded stones and coarse gravel, extends across the River; the depth of water in the centre channel is rarely less than 3 feet; this shoal, known as "Squire's Bar," is not considered a sufficient impediment to the navigation to require immediate attention.

CHICKTEBAW STREAM.

There are two rocks standing in the channel, about 250 yards above the mouth of the Chicktebaw Stream, which should be removed. Probable cost, £10.

GREEN ISLAND.—Survey No. 7.

Green Island divides the River into two branches: that on the left is interrupted by numerous shoals, whilst a good boat channel is found down the right one, with deep water to where it cuts through a bar extending across the River. Its depth then varies from 2 feet to 2 ft. 6 in. only. This bar appears to be an accumulation of the stones and gravel deposited above, and against the ice, which in the Spring of the year, after jamming below at a sudden and narrow bend of the River, packs back in a solid mass to the foot of the Island.

The current in the Summer sets from the Island to the right bank, and is again deflected towards the middle of the River, to where the deepest water is found over the bar. In order to throw a greater volume of water into the same passage, we propose the construction of a wing dam, AB, to project from the right bank 180 yards obliquely down with the stream, and which, from its position and inclination, will not be liable to be injured by the floating ice; and further recommend the construction of the embankment CD, 270 yards long, bending down with the stream, to stop the spread of the water over the sunken portion of the foot of the Island. The probable cost will be £510.

CHARACTERISTIC OF THE RIVER.

The characteristic of the River exhibits entirely new features throughout the section we have now to describe: the banks in many places rising in successive steps or terraces, from one level surface to another, evinces that the bed of the River stood formerly at a much higher level than it does at present; appearances denote elsewhere that the wide basins through which the River flows contained a chain of lakes which spread through the valley of the Saint John, during the period the water stood at a higher level. There is in many localities seen the trace of channels the stream has of late years cut for itself through the alluvial deposit which then took place, (now called "Intervals"); in some places forming islands, and at others, where the current sets against it, washing it down, until the snaken remains assumes the appearance of shoals in the course of accumulation. Several bars and shoals are thus formed between Green Island and the Beekagumic River; the principal of which are—

Wakefield Bar;
Palmer's Island Shoal; and
Presquille Island Shoal; but which are not at present serious impediments to the navigation, and have not therefore been made the subject of special notice.