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BY WM. H. BAYNE. FAYETTEVILLE, N. C., FEBRUARY 10. 1849. VOL. 9—NO. 520.

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PLANK ROADS.

Extracts from a Report on Plank Roads, made by Mr Philo White, Feb. 11, 1848, in the legislative council of Wisconsin.

Advantages of Plank Roads.

All who have given much attention to this subject, and made themselves even partially acquainted with it, acknowledge that plank is the best material for an improved road-way, in certain locations, and under peculiar circumstances. In the report of the New York Senate, it is remarked, that while Macadam roads "may be best for one section of country, the difficulty and expense attending their construction may render them impracticable for another;" while "plank roads can be built on any ground to the advantage of the public." And recent events, go far towards showing that plank are preferable to stone roads in nearly all localities, as will be seen from the following circumstances: A plank road is about to be constructed at a town in the State of New York, for a reach of 13 miles, the line of road runs along a ledge of rocks proper for Macadamizing, which only needs to be tumbled into the road-way ready for breaking. In another town of the same State, "movements are making to take up the cobble stone payment of a street for a distance of two miles, and lay down a plank road" in its stead. And we have seen letters from Cleveland, Ohio, saying that the city corporation there are about to substitute plank for the cobble stone pavements of some of their streets. This plan has already been adopted, to a limited extent, in the city of Chicago, to the universal satisfaction of teamsters and pedestrians.

It appears, from actual experiment, that a horse will travel, in any kind of wheeled vehicle, at an average rate of one-fifth faster, and draw at least one-fifth greater weight, on a plank than on a broken stone road. In fine, plank roads are preferable to those of Macadamized stone in cheapness, in case of draught, and in comfort to passengers; greater speed being attainable on them, with less resistance to draught, and stage owners say they are less fatiguing to horses than stone roads, at the same rate of speed.

It is most manifest that our farmers and agriculturists would partake more largely of the benefits flowing from the operation of these roads than any other portion of our population.

They will save him time and labor, which is the same as money; they will give him a choice of time in carrying his products to market, as they offer no such obstacle as "bad roads," but present to him as smooth and firm a surface over which to travel in the worst of seasons as in the best; they enable him to accomplish twice the distance in the same time, and haul double the load with less effort; let interest or inclination call him to town, and he can proceed thither with all desirable speed, in his own conveyance, and on any day of the year or hour of the day he may elect, without consulting horoscopes or watching the phases of the moon; and no accidents of weather need interpose bad travelling between him and his market, when an advance in wheat, or flour, or pork, or other products of his farm admonishes him of the appropriate moment for realizing the best reward for his toil.

The late Lord Sydenham having witnessed the great utility of plank roads during his residence in Russia, (which country led the way in their adoption some twenty or thirty years since,) was determined, on his accession to the Governor-Generalship of Canada, to test their adaptation to the wants of the Provinces over which he had been destined to rule: and the first plank road constructed there under the supervision of the Government, was commenced some nine years ago. Since when, the Canadians have become so fully satisfied of the very great advantages resulting to the farming and commercial interests of their Provinces, from the introduction of that species of road improvement among them, that they have gone more extensively into this system of road-making than any kingdom or republic on the globe.

1*st. Manner of laying down the Plank.*

At Quebec, the plank were in the first instance laid lengthwise of the road, under the impression that the timber would stand friction better in that position, that the plank could be more readily taken up in repairing the road, &c. But it was soon discovered that the horses could not, when heavily loaded, keep their feet on plank thus laid, and were constantly exposed to falling; moreover, the planks were liable to tilt up, and be jostled out of their places. The experiment having worked badly, we believe it has never been repeated.

On one of the Montreal and Chambly roads, the planks are twelve feet in length, but being laid diagonally with the line of the road, the track is only eight feet in width. This mode, too, is disapproved; for it is found that the coming suddenly of half the wheels and half the load upon one end of the plank, while there is nothing at the moment to keep the other down, constantly operates, to loosen the planks, causing them to spring from end to end, and very soon seriously disrupts the road.

On all, we believe, of the other plank roads in Canada, as well as those in the United States, the plank are laid crosswise, or transversely to the line of the road; which method is found to be free from the objections incident to the others, and liable to few or none peculiar to itself.

2d. Width of Planking.

Much diversity of opinion seems to have prevailed with regard to the most suitable gauge for the width, as well of plank as of railroad tracks. On most of the latter, the rails are laid four feet eight and a half inches, on others, four feet six inches apart; in New Jersey, Ohio, and Mississippi, four feet six inches; South Carolina, Georgia, and Florida, five feet; in Louisiana, and on the Holland and Montreal road, five feet six inches; New York and Erie road, six feet; while on the "Great Western" railway, in England, from London to Bristol, the width is seven feet.

But while the superiority of the wider track for railroad is generally admitted, the reverse holds good as applicable to plank roads; for all experience has shown most conclusively, that for a single track eight feet is preferable to any greater width. At the commencement of the system in Canada, a plank road track was made from 16 to 24 feet for a double, and from nine to twelve feet for a single track. But the engineers of that country are discarding the greater width, and adopting sixteen feet for a double and eight feet for a single track, as the standard breadth. In Canada, through and in the vicinity of the principal towns, the sixteen feet double track is still used; but in New York it is being abandoned in almost all cases, and two eight feet single tracks substituted. Mr Alvord is so strongly impressed with the belief that eight feet is abundantly sufficient for the width of a plank track, that were he called upon to build a road fifty feet wide, he would construct it in separate eight feet tracks. "It would certainly be a little more pleasant for an unsteady driver to have a wider-track; but economy in building prevents it, while the real usefulness of the road is not impaired." In Canada, the ends of the plank are mostly pinned or spiked to the sills; but this is now deemed useless by the New York engineers; and a Detroit writer says the only use of pins or spikes is to keep the planks from being floated off, where the track should chance to be submerged in water.

3. *Sills—or Stringers—or Sleepers.*

A diversity of opinion has prevailed in regard to this part of the structure. "The sleepers," says the New York Senate report, "both in size and in number, have varied and changed since the first introduction of plank roads. At first, five or six were placed under a sixteen foot road, and were six inches square. But they have been gradually reduced both in size and number, so that now, under an 8 feet track, two sleepers 4 inches square, are considered abundantly sufficient; as the roads laid upon the light sleepers at present used, are as solid, and endure as well as any roads ever built." On the Salina road, 4 by 4 scantling is used for stringers; sills of this size will, more readily than larger ones, settle with the rest of the superstructure, leaving the plank to rest closely on the earth, thus excluding air and decreasing the liability to rot. Indeed, some think that the chief use of sills is to grade by, and keep the foundation in shape until it acquires solidity by settling, &c. On a short road near Toronto, no sills at all are used, the planks resting immediately on the bed of earth, and the grade and form of the road is preserved nearly as exact as on other roads where sills are used. The sills should be well bedded in the earth, their top surface barely in sight, and the earth in which they are imbedded should be broken and pulverized, so as to leave no stones or other hard substrances to obstruct their settling evenly, and thus permitting the plank to sink down firmly on the earth as its main support. Two stringers only are used on the Salina road, 4 by 4 inches in size, and none less than 13 feet in length; they should be so laid as to break joints, as in laying brick, or putting on siding—that is, the ends of the stringers on one side should not be laid opposite the ends of those on the other side. About 6 feet 8 inches is the proper width between the two lines of stringers, for an eight feet single track road, which will bring them under the wheels of most road vehicles, and thus give a continuous bearing on them. One set of sleepers of good timber and well bedded, will last as long as two or three plankings.

4th. Bed or Foundation.

An important part of the whole structure, is the preparation of the bed of earth, or foundation. This should be graded about twenty-one feet wide, measuring from the inside top lines of the ditches on each side; the earth on the surface of the bed should be broken and made fine and firm as practicable, and graded smooth; good ditches should be dug in the beginning, say two feet deep, and two and a half feet wide at the bottom, sloping on the sides according to the nature of the soil; a sufficient number of sluices or culverts should be made under and across the bed, to pass all water that strikes the bed, rapidly off, and effect a thorough drainage. "I cannot impress too strongly upon you," says Mr Alvord, "the necessity of building your road-way high, and draining it well by side ditches and cross culverts. In grading crosswise of the road, particularly on an old road-way, care should be taken not to break up and pulverize any greater depth of the surface than is necessary for imbedding the sills, for it is important to preserve as solid a foundation as practicable. The plank tracks should be laid as far on one side of the road bed as can be, and leave a sufficient shoulder to keep the earth on that side up to and even with the top surface of the plank; one stringer should be laid by the eye, from four to six inches inside of the intended outline of the plank; then lay the other stringer on a parallell line with the first, and about six feet eight inches from it, which can be leveled by means of a common mason's level, having two legs the requisite distance apart to reach and rest in the two stringers, the leg on the ditch side being two inches longer than the other, so as to give the proper inclination to the plank track; the earth should then be packed close around the stringers, and brought up to a level with the top surface of them, great care being taken to have the surface of the bed even and smooth under the plank, so that they will rest at all points firmly on the dirt, otherwise the plank are apt to spring and wear; the plank should then be laid as close and tight together as practicable. In making the side earth track, or turnout path, which is twelve feet wide on the Salina road, the earth should come up even with the top surface of the plank track, and slightly fall off towards the ditch at a depression of about four inches in the twelve feet. A planked way thus thoroughly and carefully built, says Mr Alvord, "is the *ne plus ultra* of road-making." Mr Geddes saw a road in Canada which "had been worn out, and was being replanked: the sills were still good, and the plank sound on the underside, save where air had supplied the place of earth, and there they were destroyed by rot."

5th. Grading.

The Port Stanly and London plank road foundation is graded thirty feet wide between the ditches, and the bed raised twelve inches above the natural surface of the earth. This road ascends from the lake to the level of the country by a grade of one foot elevation in thirty, altho' in one case it overcomes an escent of one foot in twenty; and it is Mr Talcott's opinion, that an inclination of one foot in twenty-one can be easily overcome on a plank road. But Mr Alvord, in a recent letter to us, says: "In building a plank road, there is no necessity of paying that strict attention to lengthwise grading which is supposed to be necessary by the speculative (not practical) road builder. I can hardly conceive of any elevation in your country which would require much cutting down. We pass over rises on our road, (short, it is true,) of one foot in ten. It is easier to go over the same elevation on a plank road than on a common dirt one; for on plank there is no cutting into the substance passed over, no encountering of stones by the wheels; and if, as it ought to be, the plank way is covered with a slight coating of earth, the only danger suggested, the slipping of the animal, is avoided. It would be a prettier sight to the eye, were we to grade our plank roads more level; but while their practical utility is not lessened in any perceptible degree by their unevenness, economy forbids the expense of leveling them for ornament!" The grading and grubbing on the Port Stanly road seems to have been more costly than any similar structure in Canada. Independent of embankments and deep cuts, the expenditure on account of grading, &c., of this road, average $320 per mile; while on the Salina plank road, (built on an old road-way, however,) the whole cost for bridges, sluices, and contingencies, was only $63 per mile. Where the entire foundation is to be made a new, it is difficult to make any calculation that can claim to be more than an approximation to accuracy, in regard to the expense of grading, &c. Should the line of the road pass over a plane surface, with only gentle undulations, or over an old road-way, with no hills to cut down nor valley to fill up, fifty cents a rod might cover the expense; while under other circumstances, one dollar per rod might not be too high an estimate. Seventy-five cents per rod was the cost on the Salina road. The grading, when once, well done, is done for all time.

6th. Timber for Plank and Sills.

In Canada, the kind of timber used for stringer's is pine, or hemlock, or tamarack; while pine or hemlock, or oak, are the materials used for planking. For the Salina road, and we believe for that at Oswego also, hemlock is invariably used, for the reason that it is more abundant and cheaper than any other timber, although it is acknowledged not to be as durable as pine. Oak is used to a considerable extent at and near London, (Canada West,) for planking; and Mr Gzowski, the engineer there, who has probably constructed more plank roads than any man in America, is of opinion that oak plank will wear at least as well as any other. Slipperiness is the main objection urged against oak and other hard wood; but this objection can, in a great measure, be obviated by a thin coating of sand or earth spread over the planking; although a slight additional expense for hauling and handling the hard wood might be incurred, because of its 1-5th greater specific gravity than pine or dry hemlock. A writer in the Detroit Free Press, however, thinks that oak, from "its superior capabilities to resist both wear and decay, would make the most permanent road;" and in support of this opinion, he refers to the fact, that the oak-plank cross-walks in that city, the plank being laid flat upon the ground, are found to last two or thee times longer than those laid with pine plank. Mr Alvord also has a preference for oak as planking; he says: "Your oak plank, three inches thick, well laid, I have no hesitation in saying, would last at least twelve if not fifteen years."

Durability of Plank Roads.

This is a question of no small magnitude, determining the value of this class of road improvements, and the expediency of adopting it. Of course the durability of plank roads is dependant, in a very considerable degree, upon the amount of travel upon them, and other contingent circumstances. One efficient means of protecting the plank against wear by abrasion, is the covering them with an inch or two of sand or earth—the grit of which, combined with the excrement of the animals and the fibres of the wood, protects the plank from the corks of the horses' shoes and the bruises of the wheels, and forms a hard coating of grit, fibre, &c., of three-fourths of an inch to one inch in thickness, which it is difficult for either cork or wheel to disturb. Mr Gzowski calculates the wear by abrasion at the rate of one-fourth of an inch in two years; and as planking will not break through until one and a half to two inches of the surface is worn away, it follows from this that the duration of the plank will be eight years. But this calculation is based upon the supposition that the planking is of pine or other soft wood; oak will of course last from 20 to 50 per cent longer. According to the experience of the Salina company, plank from three to four inches in thickness will wear from 7 to 12 years; The wear and tear of the first year is said to be equal to that of the 7 succeeding years; and Mr Gzowski says the repairs of the first year are double those of any succeeding year, until the road comes to need replanking.

Cost of Plank Roads.

This, too, is a consideration of no small moment, in deciding upon the adoption of this species of road improvement. Their cost will necessarily depend much on the physical characteristics of the country, and the facilities of obtaining suitable timber. And much also depends upon economical management. All the expenditures on the Salina road seem to have been husbanded to the best advantage. As Mr Alvord remarks, they built it themselves—that is they superintended it themselves, hired, their workmen by the day, bought their teams, tools, &c; and he feels "satisfied that this is the true way," not only to save expense, but to secure a more substantial structure than could be expected through the agency of contractors. The average cost of all the Canadian roads, however, is stated by Mr Gzowski at about $3,500 per mile. But when it is recollected that these Canadian roads are one-third larger than the modern structures in western New York, and at least one-sixth more expensive than those constructed in accordance with American improvements and economy, (as exemplified by Messrs Geddes and Alvord's management of the Salina road,) it is evident that the average might be reduced to less than $2,000 per mile.

Although it is doubtless to be attributed to favoring circumstances that the Salina road was constructed so cheaply—the actual expenditure being on an average only $1,487 per mile—yet we perceive that the estimate of the cost of the Rome and Oswego road is even less—only $1,250 per mile; the difference in their favor, however, consists in the low price of their hemlock plank, which seems to have cost them only $3 50 to $4 per mile; and, moreover, they built upon an old road way, with very little expense for grading, &c. What was the actual expenditure on this road, we have not been advised.

Mr Geddes, the engineer, made the following estimate of the average:

Cost per mile of the Salina road.

Sills, 4 by 4 inch scantling,	14,080ft.
Plank, 8 ft. long, 4 inches thick	168,920ft.
	183,000ft.
Which, at $5 per M, amounts to	$915
Laying and grading, $1 per rod	320
Engineering, superintendence, &c, 10 per cent	102
Gates and gate houses	100
Sluices, bridges, and contingencies	63
Aggregate cost per mile	$1,500

This was the estimate; the actual cost of the road, as we learn from the superintendent, was only $1,487 per mile.

Having now furnished the data on which to base an estimate, any ready reckoner can calculate for himself, and judge of the reasonableness of the estimate we present below, of a single track plank road, 8 feet wide, built in accordance with modern improvements.

If of Hemlock, at $6 per M:

Sills, 4 by 4 scantling, 14,080ft.
Plank, 4 inches thick, 168,960ft.

At $6 per M	183,040ft.	$1,098 20
Grading road and laying plank and sills		320 00
Sluices, bridges, and contingencies		100 40
Engineering, superintendence, &c,		100 00
Gates and gate houses, say		100 00
		$1,718 60

Or if white or burr oak timber be used, at $8 per M, then we would state the maximum cost of such a road at about $1,9[illegible] per mile.

Your committee understand that Gov. Cass is at this time constructing an 8 feet wide single track plank road on his individual account, to extend from his farm in to the city of Detroit, a distance of about one mile and a half. It is laid upon a travelled road-way; the lumber costs $8 per M, and the whole expenditure will not exceed an average of $1,500 per mile.

Tolls.

It is suggested by those most experienced in the management of plank roads that the tolls be so regulated as to blend the interests of the owners and of the public. By the charter of the Salina road, the directors are authorized to levy a toll of *two cents* a mile for a two horse vehicle; but as it is for their interest to encourage such an amount of travel as will insure the *wearing* out rather than the rotting of the plank, as a light tariff will bring a heavy revenue, they have thus far never availed themselves of the maximum rates of toll allowed, but have only charged one and a half cents per mile in summer, and one cent in the winter.

Profits of plank Roads.

From careful estimates of the quantity of travel on the market roads and principal thoroughfares of Wisconsin, your committee are of the opinion that the stock of plank roads on the routes of nearly all of that kind of highways, would be a good investment, yielding a profit of seven to fifteen per cent. per annum. The stock of the Salina Company cannot now be purchased at par; and we learn from the superintendent, that, since the completion of that road, they have made semi-annual dividends at the rate of 12½ per cent. per annum; besides having accumulated a reserve fund of surplus profits, within somewhat more than one year, of about $3,500! So that considerations of private revenue are super-added to those of public utility, in urging the adoption of plank road improvements among us. And this profit accruing to the company, is not the only pecuniary advantage immediately emanating from the construction of plank roads, for they impart increased value to all contiguous property. We are advised from Salina, that it is a "universally admitted and proved fact that since that road has been in existence, a period of about eighteen months, "it has benefitted the three towns through which it passes, more than $100,000."

Speed, Draught, Etc.

Over the Port Stanley and London road, in Canada West, two-horse light wagons, with five to six passengers, travel at the rate of eight miles per hour with perfect ease; and two horses in a lumber wagon usually haul two tons (forty hundred) at a load. And on the London and Brantford road, two-horse teams invariably carry sixteen barrels of flour each, at a load, from Woodstock mills, 52 miles. The motion of a carriage over these roads is said to be similar to that on a solidly beaten snow track.

Plank Roads preferred by Farmers.

Half a dozen railroads leading into a market town, would not obviate the necessity of a good road for wagons in all seasons, to a distance of thirty miles at least from the place. Railroads can never be made to "take the place of teams for the transportation of grain," &c., within one day's drive of a market, "because the farmer can carry the cheapest for that distance." There are seasons when work is slack with almost every farmer; yet his teams are daily consuming as much food at such times, as when fully employed. Availing himself of these seasons, he can haul his produce to market with a very few shillings' expense in addition to what would have been incurred had his teams remained idle in their stalls.

PHILO WHITE, *Chairman.*

To Young Ladies.—I have found that the men who are really the most fond of the society of the ladies, who cherish for them a high respect, are seldom the most popular with the sex. Men of great assurance, whose tongues are highly hung, who make words supply the place of ideas; and place compliment in the room of sentiment, are the favorites. A due respect for women leads to respectful action towards them—and respectful is usually distant action, and this great distance is mistaken by them for neglect or want of interest.

Complaining of adverse fortune, keeps fortune adverse. A happy disposition to improve opportunities, sooner or later, I believe, never fails of success.

Advice to Young Men.—Have it fairly understood before you wed, whether you intend to marry an individual or a whole family.—*Boston Post.*

This precaution reminds us of an anecdote which looks to the other side of the house. A blunt wealthy farmer had six daughters; a young man of equal frankness came to him and asked his permission to address one of them. The farmer replied, do you wish to marry *in* or *out*, sir, for I have about as many now as my hearth will hold. I wish to marry out, sir, was the reply. Then take one, said the farmer, —but mind you, no picking and choosing; take them as they came into the word.—*Phila, North American.*