

Wide or Narrow

Following on from my research into the origin of the dimensions of the narrow boat, as published in my recent book¹, I have been looking at why and how subscribers to a canal chose a canal's dimensions. Very little seems to have been written about the subject in contemporary literature, and even opinionated John Sutcliffe² hardly mentions canal dimensions, apart from suggesting the L&LC should have been narrow. The matter does seem to have been left to discussion between the subscribers and the canal engineer, balancing cost against perceived benefit; what was expected to be carried, how far, and would other canals or navigations be involved. By the 1790s, the subject becomes further complicated by the proposals for tub-boat canals, as proposed by Fulton³ and Chapman⁴.

To understand better how these decisions were made, we need to look at contemporary correspondence. George Savile (1727-1784), 8th Baronet of Thornhill, near Wakefield, was heavily involved with northern waterways in Parliament, where he was one of the members for Yorkshire. This rather rambling letter, probably to Lord Irwin at Temple Newsham, near Leeds. The letter⁵ was written when the Leeds & Selby Canal was being promoted, something which was opposed by those involved with the A&CN, dividing the town of Leeds. Rufford, in Nottinghamshire, was Savile's main house at the time.

Rufford Jany 21st, 1772

Sir

I am glad that the weather and some other circumstances concurring have occasion'd my being still here at the time of your letter's arrival as it enables me to give thee sooner an answer on a subject on which you wish for my sentiments and which indeed seems hardly now to admit conveniently of delay.

I could find in my heart to quarrel with you a little for your introducing the business with anything like ban apology, even had it been relative to your personal interest, it would have required none, it is my duty to hear attentively and to wish for information as well as to act uprightly, more particularly where the interest of any of my constituents is concern'd, and it is a pleasure to me to converse and correspond when the subject is treated with fairness and good temper, even altho my sentiments should not perfectly correspond with those of the persons with whom I enter into the subject.

I propose to take this opportunity, and very gladly, of entering somewhat largely into the subject, which it is more than probable may prevent any getting thro it this post. It is a matter of some delicacy in itself; there has long been some reason to surmize that the business was in contemplation and I have naturally turn'd it so far in my thoughts as to form a general idea of the matter so far as the general principles of right and wrong are involv'd in it, as for the detail, that must be left to unfold itself as the business proceeds.

I have not been without opportunity of conversing with persons naturally interested on both sides the question, you would smile if I was to ascribe it to mere luck that I have found a clearness and conviction on each side respectively as their interests were concern'd, but tho I won't say this was merely owing to chance (being much too uniform and regular for that) yet I am far from accusing either side of wilful unfairness or sophistry. I know too well how far a very excusable prejudice will operate in questions which, to speak fairly, do not admit of mathematical certainty.

All this preface relates chiefly to the second and greater proposition treated in your letter, which takes its present rise, as it were, incidentally from the other of the proprietors own scheme of amendment to their navigation, they seem now connected into one argument, yet I think we ought to

¹ Technology, Economics, and Canal Technology, Sebastian Maillard, trans. Mike Clarke, RCHS, 2021, ISBN 09780901461711.

² John Sutcliffe, A Treatise on Canals and Reservoirs..., 1816

³ R. Fulton, A Treatise on the Improvement of Canal Navigation..., 1796

⁴ William Chapman, Observations on the various Systems of Canal Navigation..., 1797

⁵ WYL100/LA/5/1 Leeds Archive, 1772-1-21 Geo Savile's thoughts on the propriety of the schemes (to Lord Irwin?)

separate them as much as may be, for without this it seems hard to class the several separate interests and points of discussion, or to account for the order in which the different players have cut in.

The Trade has one cause of complaint against the Navigation, for delays, embezzlements, damage, etc, to remedy which (as well as to repair, strengthen and improve their own estate) the Proprietors propose to set apart a round share of the increas'd rent for the making the Navigation more speedy, more certain and of consequence less liable to those abuses, to which long delays on shallows etc naturally lead the Boatmen, they send their Engineer to form a Judgement and make his report of proper and practicable improvements, thus far the Navigation and trade play on one side, and the Land-holders on the other: for the latter seeing the Engineers come peeping and prying about their lands very naturally conceive an early jealousy, I chuse the word early rather than premature for I know not yet how far they will prove in the right, certainly, however, early.

The next news I hear is that the trading Towns join in their Opposition to what's certainly not to be an unknown scheme professing to expedite and secure the commerce of ye River, that it is unknown may be a reason of jealousy to the land owners who may be hurt by it, but both because it is a fair promising scheme and even because it is an unknown scheme cannot be even an Object of Jealousy, much less of opposition to the trade, for they are sure of one thing, that the Navigators will not intentionally set about at £20,000 expence to make their River tedious and insecure, so in this point the trade and the Navigators are natural Allies, and perhaps indeed against the Land holders whose Lands, Mills etc may be hurt, the solution of this is, doubtless, as you state it, that the trade think it a good opportunity to defeat the Monopoly of which they Complain, and which is a deep and old sore never yet either heal'd or probed to the bottom.

Regarding the original question, viz between the Land holders and the Navigators, as I have heard somewhat from both sides, and yet in the present Critical situation of their differences, am not sure how far I am at liberty to state what I have pick'd up of their pleas, I will only generally say, that I think the scheme of the Navigators ought, or ought not, to be allowed (so far as relates to their original opposers the Land owners) according as it can or cannot be executed without injury to the Lands, Mills etc, or the damage made good, and secondly that the behaviour of the Navigators will appear fair or otherwise according as it shall appear they have or have not been open and candid in their proceeding, by letting the Land owners know as soon as they could, what it was they intended, their proposed improvement will stand precisely upon the footing of any other or new work (Canal, Road etc) undertaken by proprietors for their own Emolument and publick benefit, and not injuring or else making Compensation to private property.

I shall be very happy if I have explained myself so far to your satisfaction.

I am less sanguine in my expectation of being able to draw out my next argument with the clearness I could wish. It is a question on which far wiser heads than mine have not only differ'd, but differ'd with much positiveness, and I don't only mean interested parties as I mention'd before, but bystanders likewise, merely by seeing the thing in different lights. The very hard struggle there was in the Duke of Bridgewater's business between the old Navigators and the new, shews that the line of distinction between damnum & injuria is not exceeding well defin'd, nor the cases ascertain'd in which you have a right to destroy or diminish a property held for many years, inherited from Ancestors or attain'd by purchase, by a small majority it was, I believe, that the Duke of Bridgewater carried his questions, and that in consequence great Communities were serv'd at cheaper rates, and persons who had great proportions of the properties in the old Works, Young Ladies their whole fortunes were brought (as it is said) to poverty and distress. I speak this from hearsay, for I was prevented being present at the debates. Maxims fight against Maxims, and one moral feeling against another, we are forced to distinctions without differences as sometimes we overlook differences without distinction, hence we contend that a thing is strictly just, yet allow that it is very hard, not meaning hard only on account of some particular distress or poverty of the party suffering (for that would be no paradox) but hard in its own nature that is, just, yet what gives a just man pain to think of, and offends his moral sense.

The great point seems to be, by what tenure, for what term, and on what condition the party threatened holds his property. If a man own a ferryboat, the term for which he holds his property seems to be only until the publick can build a bridge, and determines (to speak in law phrase) on that contingency or event, but not so if he hold by any kind of bargain with the publick (and for a consideration) implying he shall not be hurt, and that it is to be construed literally on the part of the Publick who is a great Gentleman and should do handsomely, this handsomeness or byass of the scale to the liberal side I mean to show is likewise true policy.

I will endeavour to lay down a second rule, if A bargain with B and the bargain is the best that B can make at the time, moreover if A, for a long time, is thought to have a bad bargain and he suffers from it, but afterwards, by his skill or his luck, he becomes a great gainer, B shall not complain. The true measure of his bargain is the price his stock or lottery ticket bore before drawing. He has a right to the £10,000 prize when it turns up. It is by no means shocking that he should get £10,000 for the subscription would not fill if the publick were to declare that tickets should be £13 and there should be such and such prizes, nevertheless if any man get the £10,000 he must return it, or £5,000 for as much as would be an enormous profit, and besides private interest must give way to the Publick.

I will proceed still on the side of the proprietors on whose side I am free to confess I yet incline to think the balance of Argument lies. The bargain was made with the publick in K William's time, the Engineers' art in its infancy (in that branch), the Enterprize new in some measure and hazardous, and the Chances not very subject to Calculation. Certain Undertakers offer to do the Work, they were not outbid, they incurr'd a Certain expence for an uncertain profit. The publick both thought the bargain good, and the presumption is, could get no better, but over and above this, the publick took care not to be hurt, for it granted them no exclusive right against any mode of carriage then in use. The undertakers might lose as well as get, the publick could not but get, for to this day, the roads are open (I mean get in comparasion of their situation then). Nay, the roads are likewise better. Now if it fell out that the undertakers bought a lame horse, by their skill they cur's him, or they had the luck, shall the first owner grumble, having sold him for 3 shillings (being worth then but half a crown) because he became an excellent hunter and the buyer get 100 guineas for him? The question is what could the jockey have sold him for a week, a month, a year after he bought him?

Now whether it be true or not I can't tell, but I have understood that the Aire & Calder Stock was for a long time unsaleable, or sold for 40 per cent (or for 40 per cent discount, I don't know which). Did the publick then offer to make good their loss?, and this question I take to be the true test of the fairness of a gaming bargain. Or would the publick at this moment make up their loss, if a Gulph or an Earthquake were to carry the River to the Center of the Earth? But there is yet worse, suppose that the very large profits of the Undertakers are very principally owing to the increase of trade, and little more than in proportion to that increase, and that increase very principally owing to their Navigation, are they not entitled to a profit growing with the publick benefit of which they are one visible cause, and growing on it not by a greater tax on the same trade, but by the same tax on a greater trade?

Arguments of this kind have, after a good deal of consideration, impress'd my mind with a full conviction of the injustice the publick would be guilty of in making or annulling Bargains which turn out at the last more beneficial than there was any reason to expect. Wherever, indeed, the publick is deceiv'd in its grant, where, by some palpable blunder in the drawing of the Bargain, or by other means, the very end is defeated for which either side would be supposed to treat, and indeed perhaps in all, or most cases (to speak generally) where a Court of Equity would set aside a bargain which was good in Law, there, it should seem there is a right of revision and even revocation, but I can see none of these Circumstances in the Case I have been describing. The Ens, and more than the end, expressly implied in the Act is obtain'd, for the Carriage is Cheaper than the rates allowed in that Act, which rates are the Measure and declaration of the expectations of Legislature, and they have been fulfill'd, and more than fulfill'd.

I cannot myself conceive that a shadow of doubt hangs on this argument so far as it relates to annulling directly the bargain, or taking from the Proprietors any the least thing which they hold by virtue of it.

But there is a great field of difficult argument in applying this reasoning to indirect ways of affecting this property, for, (as much as it may sound like a quibble) there is no doubt but it may be strictly just to affect a property in one way, and yet not so in another, the one shall be injurious and the other damnum sine injuria. One instance will in a few words explain what I mean, and indeed, I think ?? it likewise, I set up a shop, I deal fairly, I serve the publick reasonably and I am getting an Estate, to take out of my shop, only so much silk as will make a pin cushion or a pair of pretty little french shoes, is a theft, perhaps felony.

But you having a larger Capital, a better Correspondence, more skill, or being content with gains even below a Modicum, and setting up a shop over the way, undersell me, get my business, and I lose thereby thousands of pounds, or I even break. I am a thousand times more hurt by you than by the Thief. But I am not at all injur'd, nor do those injure me who go to your shop, but you must not take a broken brick out of my wall to help build your shop, for every thing that is mine it is my right to keep to your hindrance, Yea because it is so. I know one is too apt to seem visionary and to run into metaphysical refinements, when one affects to bring the proceeding of business and the World back to the original Elements of strict theoretical truth, yet I am persuaded that this method, when us'd with discretion, would prevent that, pleasant indeed, but lazy and loose way of judging many Questions, so liable to be shaken (for want of fix'd principles) by every well sounding declamation; and still more by the very excusable interposition of interested prejudice, which often blinds very honest men. I dare say the instance I slightly touch'd upon above of the ferry boat, here occurs to your mind, the cases are so like that if we had been arguing about the ferry. I should have advanced the instance of a new Canal, as I now bring in the ferry to illustrate the present question. And I do allow that I know of no bargain whereby the Proprietors were assured, that for and in consideration of their risk, their expences, industry and skill, they should, to the end of time, have and enjoy the sole shop at which the Publick would accommodate itself. No, there is a reasonable medium in this, and as justice and true policy commonly coincide, so perhaps, in cases where the strict line of justice cannot be mathematically be made out, we may make a good guess by searching out what is true sound policy, and will prove so, not in the sense of the narrow minded farmer, just for a crop and away, but at the long run, the Landlord the Publick.

There seems a Maxim by which the Publick should always proceed in Bargains, viz to get it as cheap as they can, and another I join to it, viz by no means any cheaper. My meaning is plain, I will so deal in one instance as not to fright my trades people, I will not leave the family tradesmen for every opportunity of buying cheaper at a new set up shop, for I shall soon be very ill serv'd. The Publick has in a series of Experiments try'd every variety of terms in these bargains. Shock'd with the enormous gains, as they are pleas'd to term them of Wakefield and Leeds Adventurers, they tried the Halifaxians, to the terms of a turnpike 5 per cent, others struck a medium (which I think clearly the right doctrine, if practised in a right degree, especially now that Navigation is better executed and understood) and limit to double interest or the like, because if 5 per cent be reasonable, therefore, if you may get but four, you should have as good a chance of getting 6; if 3 - then 7; if 2 - 8, if 1 - 9, and lastly as an equivalent for your greatest possible loss (viz all) you shall possibly get 10. In some added to this you have a little bonus added, that you shall divide, 11, 12 13, etc etc, provided for every 1 above the 10 you lower the tolls 1/8 part. (Forth & Clyde and 2nd Halifax Act)

But it should seem that the Legislature was not got right to their satisfaction yet, for some argue 'what right have you to limit, not only the tolls, but likewise the profits? It is an unheard of condition, and as it were, merely envious, when you have agreed for a very advantageous low price of carriage, to cry out - Oh! But you shall at all events get but so much by one.' And so truly it has happen'd, I think, that the very last large work (if not others) is agreed upon without such 2nd limitation. I am not sure of this from my own recollection of the Act, but asking some Persons the other day about it, they smil'd and said Navigations were found by experience too precarious

schemes, the Expences too often exceeding the Estimates, and the trade and custom, to and fro, on the proposed Canal too uncertain to allow people to venture upon them without the tempting prospect of a grand reward at least in profitability, but it would frighten them to the purpose to be bold, look ye, you must expect that after you have risk'd and laid out your money agreeable to bargain we will lend an ear to the first man who will make a good offer of a canal along side yours, and carry cheaper than you. For as the world improves, better and better schemes are hit off and a reasonable security must be suppos'd to be given to every honest undertaker that you will not set up another shop, the moment you can be served still cheaper. All confidence would thereby be lost. I think an instance is now pending of a 3rd scheme which interferes with the profits of a canal which destroy'd an old property. Now that the judgement is falling on their own heads, they argue on other principles than those by which they attack'd the old River proprietors.

I think I need not add, that I look on all this 2nd part of the question, viz the proposal not of destroying or injuring directly, but of setting up a rival to old Proprietors, as a mixt question of Justice and policy to which, I may add, of that kind of Generosity likewise which in the end will be found true policy in publick as well as private transactions, for the publick is a great Gentleman and should do handsomely.

You will say I am sending you a Pamphlet or a Sermon not a letter, and I ought to desire your excuse for holding you so long, and that, not inadvertently but of malice aforethought as you may conclude from my hint at setting out, but I trust you will excuse me in favour of the desire I have not to miss the opportunity of thus stating my mind unreservedly, and indeed the real satisfaction it gives me to do it to one, who will, I am persuaded, approve of my explicitness rather than of that narrower, or as some think it, more prudent, way of disguising or reserving always some part of ones argument for an upcast when one sees which side it will be more political to take. The same sentiment makes me not even wish that any parties concern'd should be ignorant of my present notions, assuring them and you that I am as ready to alter, revoke and change any error the moment I am convinced of it, as you can imagine or wish, for I am not quite so tenacious of my opinions as I have maintain'd the Publick ought to be of their Word and Bargains.

I incline to believe from a slight memory of the Act of K William, that are many questions of detail arising from particular parts of the Act, and especially from the joining in one the freight and lock dues. If any of these should be found to have weight, I guess it will come under the head of what I have call'd the public being deceived in its grant etc As these matters turn out, so must it fare with the contending parties and the Lord send them (and me) a good deliverance when we come to the field of action, a crowded committee of the House of Commons.

If there be any proceeding commenced in Parlia't of which there shall be reason to suppose the Country is ignorant, I shall make it my business to apprize those concern'd of it, I dare say it is a needless caution to the proposers of the new Bill on the part of trade, that the Navigators should likewise be timely acquainted with their proceedings or intentions. I wish I had time to make you a fairer copy of this illegible manuscript, but I have scribbled it in some haste and at different times as I had opportunity. However, if you, after you have perused it and shewn it as you may judge convenient, will please to return it me. I will send you a copy or rather another original, wishing indeed withall to have it to refer to as an index to what were my thoughts at the time of writing.

I am, Sir, G Savile

Additional sheet:

Allowing the ferry man to have made a bargain with the public and that he fulfils it according to the meaning and intent thereof, it certainly would be unjust to deprive him of the advantages arising therefrom, but suppose this ferry man keeps a leaky boat, and that in passing the water I am exceedingly wetted and my cloaths all spoil'd entirely owing to his negligence. Suppose this ferry man loiters in an alehouse and will carry me just when it suits his convenience only, saying to me that if I did not like it I might go some other way, and this because of his bargain with the public who is a great gentleman, is not that circumstance a sufficient reason for my applying for redress, and have I not the utmost reason to expect that the great gentleman should say, this behaviour is

absolutely contrary to my meaning. I gave you an advantageous privilege for the benefit of the public and your own private advantages. You have converted it into a nuisance and hindrance, therefore unless you ferry over my subjects with all reasonable speed and in a commodious good boat, the Bargain is void, my intent being defeated and a new ferry shall be established directly. Therefore Gentlemen the first interest is defeated and proper means must be taken for redress.

Savile was one of the most influential of northern MPs, and was involved with many of the Parliamentary committees on canals and navigations. It is interesting that he notes that many people considered the economics of inland waterways 'too precarious'. Even after seventy years of operation by the first 'industrial' navigation, the A&CN, people were still uncertain about the benefits. This uncertainty was not universal, with the A&CN being mentioned specifically in a pamphlet promoting the Trent & Mersey Canal.⁶

The navigations of the Aire and Calder, in Yorkshire, will elucidate the great utility of inland navigation, in the increase of established manufactures, and in the setting up of new ones. And it is well known, that the navigations to Manchester and the saltworks in Cheshire, have contributed to the present flourishing state of the port of Liverpool. That inland navigations benefit greatly the landed gentlemen cannot be denied, as in many instances their lands have been improved to tenfold value.

The pamphlet also mentions European and Chinese waterways, as well as the Duke of Bridgewater's, and although the Bridgewater was proposed as the example that others should follow when it came to canal building, the early northern navigations were suggested as providing the best economic example of the benefits of inland navigation. Being established 50 years before the Bridgewater, they provided more specific financial information. Little advice can be found regarding whether to build a wide or narrow canal, and this was left to the engineer and subscribers of individual canals.

Looking further into early canal dimensions, it is interesting that Wedgewood, one of the main men behind the narrow 'Staffordshire Canal', did recognise the benefits of wide canals. In a letter to a friend in Liverpool, he remarks,⁷

...I have many things to say to you from the good folks at Newcastle etc, and something of the enclos'd Nav'n l'r; but Sally says "give over Joss, and tell our fr'd. B. that I command it", so I have done, only I must just add that if Mr. Hustlet [probably John Hustler, who was the main promoter of the L&LC] is well assur'd of his Estimate, and a £200,000 Subscript'n. I sho'd. vote for the larger boats.

This was the time when the canal was being planned, and estimates drawn up, so there does seem to have been some discussion as to the size of the L&LC. In 1768, the following unsigned letter seems to have been sent to the committee...⁸

Navigation — Reasons

It seems to me of Consequence to dispose Whitworth, and after him Brindley, to adopt the plan of 6 feet water and 36 feet width at the Top for the following Reasons:

1st Because we have no difficulties to render it either difficult or much more expensive and it will make a Nobler as well as Cheaper Navigation as the abundant tonnage upon it will under Boats of 50 or 60 Tons the most useful, and the plenty of water at the Central part will allow of them, and the aboundings of Useful heavy articles in one part and the entire want of them in other distant parts of the country on the Line, will under the Loading of such Vessels expeditious and regular.

2nd Because upon a Copious Canal and deep water the Boats will move freer by carrying a less head of water, and in case of many Boats following each other Close will occasion less delay by furnishing a plentiful supply of water; the Canal betwixt each Lock amking a good Reservoir.

3rd Because Locks fitted to Boats of this Burthen would accommodate those of the Leeds Navigation

⁶ The History of Inland Navigations..., 1769, p.10.

⁷ In letter E18199-25, June 1768?, Letters of Josiah Wedgewood, 1973, ISBN 0901598895

⁸ Bradford RO, 10D76 Box 75/2

and also as well admit those of the Staffordshire Canal by taking two of them into a Lock abreast, and by their passing along upon it by pairs would occasion neither Loss of Water or time.

4th Because as this place seems the most eligible for making a Communication betwixt the 2 Seas of any in the Kingdom of England, as being attended with the least difficulties, and being the Shortest, We should neither be just to our Selves nor to Posterity, if we do not make it upon the Extensive plan proposed at least, as there can be no doubt of its paying good Interest for the Money, and being a growing Estate to the proprietors, and supposing the Canal cost £200,000 on these dimensions, it would be of bad consequence to reduce the expence 1/5th or £40,000, if the Freight was rendered but in a small degree dearer by it by less Business being done with the same Hands, and Haling for the Vessels rendered less fit for the Conveyance of Bulky light Articles, etc.

It will also be necessary with all expedition to make appointments to wait upon the Great Men who are interested in it, and particularly to engage some of them to appear at the Head of it, viz: Lord Strange, Lord Archibold, Hamilton in Lancashire, Lord Devonshire, Thanet, Montague, Dalton, Leeds, Rockingam, Irwin, Bingley, Sir George Savil, Edwin Lascells, Weddel Esq, the principal Landowners, Sir Lawrence Dundas, etc, etc.

The Branch up to Bradford whether joined with the principal Canal or separate however to be planned and estimated and made by a Clause in the Act upon the same footing.

Discussion continued into 1769, when the following was written,

*1769 Remarks on the dimensions of canals*⁹

To the Committee etc

I have frequently reflected upon the proposal of executing the grand Canal upon the lesser scale. I have viewed it in various lights & considered it under various probable connections.

The objection to the larger scale arising from the Leeds Navigation [the Aire & Calder Navigation] not carrying equal burthen appears to me to have no weight at all, as the Proprietors of that Navigation may (& if they find their advantage in it undoubtedly will) conform theirs to this. Or if the Leeds proprietors cannot, or will not, do this, the great Canal may easily, & to great advantage, be continued to some more favourable place.

The eligibility then of each plan seems to turn singly upon this question, Whether the advantage of larger burthen will compensate the greater expence?

This question is to be determined by considering, & as near as may be ascertaining, the quantity of business. And if we recollect the great variety of branches that may, & in time undoubtedly will, open into it, the vast extent, populousness, fertility, & riches of the country thro' which it runs; the want of coal in some parts, & of lime in others, and that it probably will ever afford the safest, easiest & most conveniently situated communication between the East & West Seas, there can, I think, remain no doubt of the Business the Canal being in time almost inconceivably great.

In order to obviate the force of argument in favour of the greater plan, drawn from the immense quantity of Business, it has been said that two vessels of 30 tons fastened together, are as easily towed as one of 60 tons. I am no judge of the truth of this; but if it is true there appears no doubt of the lesser plan being more eligible.

It is evident I think from the Laws of Hydraulics that the deeper the water a vessel draws, caeteris paribus, the greater the power will be required to tow it. But on the other hand the deeper the canal & less liable to be obstructed by frost. But to return.

If two vessels with 30 tons each are not as easily & as safely haled as one with 60 tons, it will be necessary to consider, in case this canal should be extended, whether it will not be eligible to execute such extension upon the larger scale, & if so whether it should not have the same dimensions thro' the whole length.

It may also be considered whether any branches that may ever here after open into it, may have such quantities of heavy articles to convey, as may make a larger Burthen more eligible; for none of

⁹ Bradford Record Office, Vint Hill Killick, 10D76/4/136/4

the Branches can with any propriety be made deeper than the trunk.

In case we shall in a future war, be hard pressed at sea by the enemy, which is very likely to be the consequence of the Bourbon family Compact, then the larger burthen of this Canal may probably become a national object.

I have sometimes observed, & it seems as if the observation will generally hold good, that where works of public utility have been contracted & cramped in their execution thro' economic parsimony, & thro' pusillanimous apprehensions that they would not pay, such contractions have generally been repented of when too late. And this will be the case here, if, by thus contracting it, we put it into the power of any other Canal to carry cheaper between the East & West parts; or to serve any considerable tract of intermediate country, which would otherwise be served by this.

Upon the whole it seems evident to me that the larger Plan promises the greater advantage to the Public, but whether the plan will be more advantageous to the Proprietors, is a problem which I freely confess I am altogether unable to solve. It is a matter however that merits the most serious attention of those who are more acquainted with such business, & are better able to judge there upon. My small knowledge tells me that any considerable contraction in the breadth would hoever be very improper. A.S.

A further letter was sent in 1770 by a merchant from Leeds. This is interesting as it gives the dimensions for the earliest Aire & Calder Navigation locks, which were for boats 54 feet long and 13½ broad, and the suggestion that the Duke of Bridgewater's first wide boats were of these dimensions.

To the Proprietors of the Intended Canal from Leeds to Liverpool¹⁰

Gentlemen,

Whereas there have been several meetings relative to, and accurate surveys taken of an Intended Canal from Leeds to Liverpool, and as a Petition hath been laid before the Honourable Houses of Parliament in order to obtain an Act, and as such Act is newly obtained for the Execution of such a most laudable work (for it is the longest and best that ever was performed in England beyond all Degrees of Comparison) it behoves every one concerned thereon to Consider which is the best Form or manner of Executing it, and for my part I cannot reconcile myself to the proposed Dimensions as they are far from being founded upon the most beneficial Principles either for the Public or Proprietors.

The Dimensions of the proposed Canal are 42 feet wide and 5 feet deep (Summary View page 4) and I am informed that the Vessels are to convey 60 tons a piece. Now suppose such Vessels were to be occupied upon this canal as are upon the River between Leeds and Rawcliffe (of which the noble Duke of Bridgewater hath lately built six, viz) 54 feet long and 13½ broad, Burthen 30 tons or more, and draws 3½ feet of water. Then wo'd not a Canal 32 feet broad and 4 feet deep be sufficient for such Vessels. If so, a vast sum wo'd be saved, for if a Canal 42 feet broad and 5 feet deep wo'd cost £259,777 (See the Estimate in the Summary view) by the Rule of Proportion one 32 feet broad and 4 feet deep wo'd only cost £166,257, the difference of which is £93,520, a prodigious saving! To say nothing of the Difference between the digging, casting etc of the last foot, for everybody knows that the last or fifth foot in depth will cost nearly as much as two foot from the surface. It is true the Bason or Reservoir and the fences on the Banks will cost neither more nor less, let the Dimensions of the Canal be what they will, nevertheless I presume that the difference between digging the last of fifth foot (which wo'd cost far more than any of the other four feet) will save as much as the Reservoir and fences will cost more than an equal Proportion with the whole, and not only so but in my opinion the Aqueducts and Banks will cost far less than an equal Proportion, for water being a fluid, it does not only gravitate upon its own Basis, but pro[ce]sses in a horizontal form also, and consequently he greater Body of water, the greater pressure upon the Banks. Therefore they must be stronger to resist its force or also they will give way, and the stronger the Banks etc are, the more Expensive. To reduce the Dimensions of the Canal will also be of great Utility to the Public, for

¹⁰ Bradford RO, 10D76/4/136/10

suppose a Vessel of 60 tons Burthen was to go up any of its Branches, we will say to Settle, Bradford etc, and clear off the Merchandise once a week, then one of ½ the Burthen will clear twice a week and consequently despatch Business more Expeditiously. This is an Advantage well understood by all Traders and Manufacturers. “Summary view page 11”

I am Gentlemen, your humble servant,

Pot Garforth

If the Vessels which ply upon the Intended Canal be so long as to convey 60 Tons a piece, how will such Vessels pass between Leeds and Castleford when the River is low? I fancy every commodity must change its Vessel at Leeds, and will not that be attended with much less of Time and Expençe? Doubtless it will, and if the Vessels are made small, fit for Leeds River, why sho’d £93,520 be thrown away?

A note from J Hollinshead, who was involved with the L&LC and a coal merchant in Liverpool, undated but around 1770, suggests that the width of the boats using the canal should be 8 feet.

Staffordshire Canal¹¹

Is 27 feet wide and carries boats 7 feet broad and 70 ft long which measure 18 tons each but carries 28 tons.

The canal is 27 feet wide.

3 boats at 7 ft is 21 feet; 6 feet spare room, w’ch is found rather too little.

Leeds Canal

Intended to be 42 feet wide, and the cost is estimated at £259,777

Suppose this canal to be reduced ¼, viz 10½ feet, makes Breadth 31½ feet, cost likewise ¼ less

£64944

£194,833

Suppose it to be navigated by Boats 8 feet wide and 70 feet long about 23¾ Tons each will carry 35 Tons.

3 Boats at 8 feet wide is

24 feet

W’ch deducted from the width of the canal

31 ft 6 in

Leaves

7 ft 6 in

To spare w’ch is 1½ feet more than the Staffordshire Canal.

Quare

Is not one fourth of the Water to be Considered in a Country where there are few Springs and Rivers, and shou’d not the Boats be calculated in the Staffordshire Canal, which is to be hoped will be joined to it by a Bridge over at Runkhorn, and may be a sufficient reason for not making the Leeds Canal so Wide.

These document raise the question as to what other dimensions could have been suggested. Early wide canals do seem to have been expected to serve ports, and to be used by coastal vessels, and this could account for their dimensions. Then there were the wide canals promoted and built during the Canal Mania. At the time John Rennie was engineer for the Lancaster and Rochdale canals, he was interested in the various sizes of the boats used on inland navigations, and he records in one of his notebooks,¹²

Sowerby Wharf, Aug 5th 1791

Boat on the Aire & Calder Navigation; Length: 53 feet; Width: 14 feet; Rudder: 4 feet

When loaded with 50 tuns neat weight they draw 4 feet of water.

When loaded with 40 tuns they draw 3 feet 8 or 10 inches of water - But as the Sowerby Cut is a very bad one, very much silted up by the water from the Halifax River, they can only bring 30

¹¹ Bradford RO, 10D76/4/136/9

¹² Rennie’s Notebooks are held in Edinburgh at the National Library of Scotland

tuns to Sowerby Wharf and then draw about 3 feet 4 inches of water.

To keep the water deep there are drags as afterwards represented.

The locks are 61 1/2 feet long between the upper point of lower gates and under point of upper gates, and 14 feet 6 inches clear width.

Manchester Aug 1st 1791

Duke of Bridgewater's Canal Barges etc; Barge carrying timber and what is called a Lighter; Length: 70 feet; Width: 12 feet; When it draws 4 feet of water it carries 57½ tuns of 21 cwt each; Rudder: 6 feet.

The largest size is what is called a flat and carries 80 tuns.; Length: 67 feet; Rudder: 7 feet; Width: 14 feet 6 inches; Draws 4 feet 3 inches of water at head and 4 feet 9 inches aft.

This barge cannot sail on the Duke's Canal with this load, it can only go to Preston Brook and must afterwards lighten to 40 tuns.

Duke of Bridgewater Coal Barges are 69 feet long.; Rudder: 4 feet; Width: 7 feet

Grand Trunk Canal Barges 70 feet long; Rudder 2½ feet; Width: 7 feet; Carries about 20 tuns of Goods which sink her about 20 inches additional.

Rennie's original design for the Rochdale was for a wide canal, the subscribers then favouring a narrow one, before eventually building it wide. Did Canal Mania promoters have a better idea when it came to comparing construction costs against ease of movement of goods? There are a number of letters in Rennie's papers held in the Institution of Civil Engineers Archive., which give some insight into the discussions which were entered into on the subject. I have transcribed all those concerning the size of the canal and give them here in full. They do suggest how little the subscribers and engineer understood regarding the economic benefit the canal was expected to bring. At this time, limestone was still expected to be the major traffic, with a branch canal from Todmorden, firstly to the Leeds & Liverpool at Burnley, then Wanless Water, near Barrowford, then to Slaterforth, and finally down the Lothersdale valley. Discussions amongst the subscribers revolved around this branch and the effect of the canal's usage of water on mills along the route, with little about the traffics on which the canal eventually depended.

1791-11-10¹³

From Hassal

Dear Sir

The desirability of a narrow canal having been suggested from a respectable quarter, has drawn more attention to the subject than was otherwise likely to have been paid to it by the subscribers in this neighbourhood, many of whom being advocates for a broad canal without having considered or questioned the merits of their cause, wished the subject to drop in silence & die away without a public discussion. As however several of the arguments urged in favour of a narrow canal are calculated to strike the multitude, & certainly have great weight, it seems very proper & necessary to combat them with superior arguments, if such can be offered, in favour of a broad canal. The determination of this important question is referred to a general meeting of the proprietors to be called for that purpose. As I am persuaded that you are a real well wisher to our cause, & hope that ere long you will become more interested in its success, I take the liberty to request that you will point out to me the principal advantages arising from a broad canal & particularly that you will inform me if any narrow canal have been already, or are intended to be altered. The instance of the Staffordshire one urged at our last meeting by Mr Travis who had received his information from some boatmen employ'd on that canal was denied by the advocates for a narrow one.

The principal arguments urged in favour of a narrow canal are the following:

1st that we shall thereby save at least one third of the expence.

¹³ Rochdale Canal Book

2nd that it will require much less water to maintain it.

3rd that such a canal will answer every purpose of accommodating the public.

4th that it will be more beneficial to the proprietors.

& Lastly, that it will prevent opposition & in all probability secure us admission into the Duke's canal.

As I write merely for my own information I shall make no other use of your communications without your express permission.

I am, D^r Sir, with great esteem, your most ob^t servant

Mr. Hassal, Balderstone 10th Nov. 1791

London Nov'r 12th, 1791¹⁴

Dear Sir,

Your favour of the 10th came duly to hand. The respectable quarter from which the proposition for a narrow canal originates has no doubt been the reason why it has been listened to & since this has been the case the only thing left is to furnish the best arguments in favour of the wide canal that can be found. I shall therefore endeavour to combat your arguments against the wide canal in the order you have stated them.

1st You say 1/3 of the expence will be saved. Granted.

2nd That it will require much less water to maintain it. This I positively deny, for supposing 100,000 tons of goods be to pass along the canal annually & suppose for arguments sake the barges on the narrow canal were to be 20 tons, & those on the broad canal 40 tons. Then as twice the number of barges would be requisite to carry the same goods, consequently the number of locks, ie. The same quantity of water will be used. It is true the broad canal would have more surface to evaporate from, but as a greater quantity is wasted at the opening and shutting of the lock gates, and as the small gates would be opened twice for the large ones, I think the same quantity would be used.

3rd That such a canal would answer every argument of supplying the accommodating the public. If all the goods to be carried along this canal were to travel 12 or 14 miles, probably a part of the accommodation might be admitted, but as a shipping & re-shipping must take place, no produce would ever be carried to a short distance. Then, suppose a barge to come from Liverpool to Middleton (for Oldham which is only 6 miles distant from Manchester) with grain or other goods, then at Cornbrook they must be transshipped into the small barge & again at Scowcroft or at Hollin Road into the carts; would not this be more expensive, and would not the goods receive more injury than by putting them directly into the cart at Manchester. Would not the same thing happen at Sowerby for goods going to Hebden Bridge, Todmorden, etc, etc & finally to all short distances.

One very material object is the Craven lime which would always require to be reshipped at Ormerod yet the expence is so heavy an article is too evi^dent to require any explanation. It has been said that two of the narrow barges might pass the Leeds & L locks or those on the Calder, but if they are made of the size of those on the Staffordshire canal, this cannot be the case. The Staffordshire branches are 72½ feet long & 7 ft wide, whereas the Leeds locks are only 66 feet long & those on the Calder 61½ feet, thus the loading & unloading of the limestone would amount to an absolute prohibition of the trade, & the loss of this, with that of carrying to short distances, would pay the interest of 1/3 instead of 2/3 of the cost.

The monopolizing spirit of his Grace the Duke of B is here very evident, he sees by your adopting a narrow canal, the carrying trade to Liverpool must wholly rest with him, & it will also be an argument to induce others such as the Stockport & Lancaster Gentl'n to adopt narrow ones also. Although I am inclined to think even with the broad canal the carrying trade will principally rest with him, yet knowing that you can at any time send your own barges, he would be more ready to

¹⁴ Rochdale Canal Book

accommodate you, than he would do, were the narrow barges to be adopted.

I forgot to mention that small barges are more expensive to navigate than large ones, for the same no. Of men is necessary to manage one of 20 as one of 40 tons, a material consideration to the public.

His Grace's opposition is certainly of consequence to avoid, but I do not think the public interest should be sacrificed to the private convenience or humour of any man & I am of opinion Parliament will concur in opinion with me. If a small space is left between his Grace's canal as proposed, and a crane to load from one to the other, I doubt not but in time you will force your way into the Duke's canal in spite of his opposition.

As I have made free with the Duke in this letter, it may probably be as well to keep it to yourself, but if my opinion is wanted against a general meeting on this subject, I shall readily submit it to public inspection. My best compliments to Mr Hassal.

I remain dear sir, with real esteem

John Rennie

PS The Birmingham Canal, not the Staffordshire, is the one proposed to be altered. Mr. Royds was informed of this from me & I think the channel by which I had the information is indisputable. I forgot to mention that large stone, timber, millwork, steam engines, etc, will not be able to pass in narrow boats.

Todmorden 3 Dec 1791¹⁵

First part of the letter is about the L&LC branch and limestone.

...And now before my paper be exhausted let me inform you that a great revolution has happen'd lately in the minds of the majority of our select committee. When you left us we were unanimous for a broad canal. I know not that any one of us now adheres to that opinion except Mr Lloyd & Mr Jackson. I feel myself wavering & unsettled. The account as urged by their advocates seems to stand thus:

A Narrow Canal

- 1. will cost less.*
- 2. be soon finished.*
- 3. please our rivals.*
- 4. take less water.*
- 5. be sufficient for the business to be done.*
- 6. open to ye Staffordshire canal & the Duke's*
- 7. boats will go full at stated times, which larger boats cannot do.*

A Broad Canal

- 1. will do business cheaper if boats filled.*
- 2. will carry passengers*
- 3. better please friends than rivals.*
- 4. will enable us to go from Liv'l to Leeds without unloading if the Duke of B can be conciliated.*
- 5. if large boats cannot go full at stated times now, the increase of popularity & trade will soon fill them.*
- 6. will carry us if the Duke will permit us to Preston Brook where he meets the Staffordshire boats.*
- 7. will carry the Baltic & German goods to Manchester & the Manchester goods to Hull without unloading.*

Many other arguments are used on both sides, which I have not time to mention.

¹⁵ Rochdale Canal Book

It is presumed that the last circumstance (No.7) in favour of a broad canal, will give us the profits of the whole traffic between Manchester & Germany, Russia, etc, in time of war, by the difference of insurance at Hull & Liverpool, which advantage it is argued will be lost if we have a narrow canal because we must then unload at Sowerby at the expence of 6d a ton at cart (wharfage included) exclusive of damage & delay.

A meeting of the subscribers in general is called to determine at Manchester on the 16th inst, this great question, & that of an increased sunscription, & the lime trade. But the decision on the first of these questions will materially influence the fate of the other two. For if we are to have a narrow canal (which I think will be the case) there will not be occasion for a much larger subscription. And with a narrow canal below, it will be a folly to make a broad one above, viz. From Warthorn to Wanless. If you are soon to go to Lancaster, pray contrive to give us your company at Manchester in your way, & if you could spend a day or two with Mr Crosley at Colne on this Lodderdale scheme of mine, before the meeting at Manchester, it would be a very happy circumstance. Life and breath permitting, I mean certainly to be at Manchester on the 15th.

I will make no apology for the length of this letter, because its importance will plead its excuse & that of, D'r Sir, your very truly Geo Travis

PS I beg as speedy an answer as the other advocates will permit, & your opinion as to a broad canal. In opposition to Nos. 4 & 7 (in favour of a broad canal) it must be consider'd that if we take in goods at Liverpool for Leeds or Hull, & vice versa, we must submit to the expence of Clerks, Wharfs & Warehouses at all those three places. If we resolve on a narrow canal will there be any necessity for us to increase our present subscription at all, & if yes, how much.

Brigghouse 9th Dec'r 1791¹⁶

From Crosley

Dear Sir,

first section re water and the branch canal.

...I expect very florid debates respecting wide & narrow canals, I could be glad to have your opinion. I shall be glad of any instructions from you to Burnley per return of post, & beg you will say what stake is level with the head level that lies nearest the Red Lees....

New Surry Street Dec'r 10th 1791¹⁷

Rennie to Travis

First section re the branch canal.

...I am sorry to learn the change in minds of the select committee. I flatter myself on a further investigation they will be induced to change their opinions although I do not expect it will arise from any arguments of mine. I shall however throw together a few hasty observations which if they produce they effect I wish will give me much pleasure.

1st a narrow canal will cost less money.

2nd be somewhat sooner finished.

3rd please our rivals because you thereby serve to them a profitable trade which you yourselves relinquish.

4th take less water, only the difference of evaporation, for the lockage will be the same, perhaps more, as the great loss of water arises from frequent opening & shutting the gates. This argument therefore falls to the ground.

5th be sufficient for the business to be done. This is doubtful as the trade on this canal will be principally in minerals. I do not think the small barges so well adapted for that purpose as large

¹⁶ Rochdale Canal Book

¹⁷ Rochdale Canal Book

ones.

The argument of barges with merchandize will not stand examination because goods will be so small a part of the general carriage that one or two barges to Sowerby & Manchester a week merits little consideration. It would be long before such a trade would pay the initial interest if £200,000 & I think the increase of population will soon create trade to fill them.

All barges that should go a short distance on the canal will unload at Sowerby or Manchester, the expence of shifting the cargo for a 5 of 6 mile distance with the damage sustained thereon will be more than land carriage. This will be a material matter, especially in corn & I think the loss of this trade will be adequate to the difference of cost.

Your locks to admit the Staffordshire barges must be longer than those of the Leeds & l & Sowerby canal, therefore the boats cannot pass their locks. If you have a shorter kind they will be of less burthen than the Staffordshire & of consequence waste water. The Staffordshire boat is 70 feet long, rudder 2½ ft, in all 72½ feet, L&L 66 ft, Sowerby 61½ ft. I need not add that the D of Bridgewater will wholly monopolize the carrying trade & you must submit to his terms. These with the judicious remarks you have stated is all that occurs to me at present, indeed my time is so much engaged that I have not an opportunity of saying more.

I hope however no hasty decision on this momentous question will take place, indeed when I consider the respectability of the parties I cannot have any other fear. I shall probably write you to the Star Inn, Manchester, by the 15th.

I remain yours with real esteem,

John Rennie, 1791-12-10

Letter A87¹⁸

Mr Travis

Dear Sir,

I was duly favoured with yours of the 3rd from Todmorden. It gives me pleasure to have the L&L Gentlemen now aprised to the junction at Wanless Water & I think the terms are as well as could have been expected. But if your Loddersdale scheme should prove practicable (which I sincerely hope it will) their opposition would be of little consequence. There appears to me several difficulties to encounter in this business & althoiugh I don't mean to say they are unsurmountable yet they merit a serious consideration.

1st in respect top the ground I expect you will find much of a ?Nothy? Rock to pass through which you know is expensive to make watertight especially when the canal is carried along the sides of steep hills as it must be here.

2nd an expensive set of tunnels & much heavy embanking for although you may avoid the one at Holme Chapel you will have 100 feet of additional lockage & the two tunnels you mention. The saving in lockage will therefore be only 70 feet.

3rd The water gained by this line can only be from reservoirs or from the tunnels for every brook you pass must run into some river & although there be no mills on itself as there must be some on the rivers. This water is ultimately their property. I have taken some pains since my return to obtain information relative mill property & I think I am warranted in saying there is not one drop in all this branch that they will not claim & therefore must have compensation. The only advantage therefore is the long head level which is certainly a very great one.

4th There are many difficulties in pursuing the line from Holme Chapel to Travis Mill where is proposed the head level of the main line. The passing along the face of the ?Noth? Is impracticable otherwise than by tunnelling & then in several other very difficult places. As however the object is great so should the consideration be serious. I wish I were with you that I might have the pleasure

¹⁸ Rochdale Canal Letter Book

of surveying the line in company, but I as cannot have that pleasure it means I must content myself with requesting you will do me the favour to advise the success Mr Crossley meets.

I am sorry to learn the change in the minds of the select committee. I flatter myself on a further investigation they will be induced to change their opinions although I do not expect it will arise from any experiments of mine. I shall however throw together a few hasty observations which if they produce the effect I wish will give me much pleasure.

1st a narrow canal will cost less

2nd do be somewhat sooner finished

3rd phase our ?ponents? - because yold thereby ... them a profitable trade which you yourselves retaining.

4th take less water - only the difference of evaporation, for the lockage will be the same, perhaps more as the great loss of water ?appears? from frequent opening & shutting the gates - this argument falls to the ground.

5th be sufficient for the business to be done - this is doubtful for as the trade on this canal will be principally in minerals I do not think the small barges so well adapted to that purpose as large ones. The argument of barges with merchandize will not stand examination because goods will be so small amount of the general trade that 1 or 2 barges per week to Sowerby & Manchester merits little consideration, it would be long before such a trade would pay the interest of £200,000 & I think the increase of population will soon create trade to fill them - all barges that should go a short distance on the canal will unload at Sowerby or Manchester, the expence of shifting the cargo for a 5 or 6 mile distance with the damage sustained thereon will be more than land carriage. This will be a material matter especially in corn & I think the loss of this trade will be adequate to the difference of cost - your locks to admit the Staffordshire barges must be longer than those of the L&L and Sowerby canal, therefore the boats cannot pass their locks - if you have a shorter kind they will be of less burthen than the Staffordshire & of consequence waste water - the Staffs boat is 70 ft long, rudder 2½ ft, in all 72½ ft; L&L 66 ft; Sowerby 61½ ft. I need not add that the Duke of B will wholly monopolize the corn...trade & you must submit to his terms mentioning the Judicious remarks you have stated but it occurs to me at present indeed my time ... much enjoyed that I have not an opportunity ... more. I hope however no hasty decision on this momentous question will take place, indeed when I consider the respectability of the parties I cannot have any fear - I shall probably write you to the Star Inn at Manchester by the 19th,

I remain dear Sir, your

John Rennie, New Surrey Street, London , Dcr 10-1791

Letter A93¹⁹

From Wm Crosley

Dear Sir,

Agreeable to your request, I sent over to Mr. Hartley desiring his advice respecting the business in question, but he had so many engagements that he could not possibly attend. I the recollected a Mr Luke Holt who made the New Dock at Hull and who has for a long time been engaged in executing canals under the direction of Mr Smeaton and others; but he was so indisposed that he could not attend.

Mr Heap who is very much employ'd by Mr Rawden in building, & who knows the ground in the propos'd line to Lothersdale very well is of opinion that no material difficulty can occur in making a canal that way, and when I consider the expence of making a canal the same dimensions as the Leeds and Liverpool Canal from near Worsthorn to Wandles Water, together with the extra expence of 60 feet of lockage and difference in the quantities of lands, I'm inclin'd to think the line to Lothersdale may be made in one level from the summit at Crossdean at nearly the same expence as the junction line, considering the difference of 6 miles in length

¹⁹ Rochdale Canal Letter Book

upon the Leeds and Liverpool Canal which will be to navigate at rather an advanced charge, for I am now satisfied that a tunnel to begin about three quarters of a mile north of Emmot Hall and to come out in the valley below Cowling Hill is all that will be necessary in that line. But as both the lines have their peculiar advantages and disadvantages respectively, I will take the liberty of mentioning such as occur to me for your consideration.

First, the line to Lothersdale would go within a small and nnearly an equal distance from the Gin Quarry, the Worsthorn, Munks Hall and Marsden Height Quarries which would perhaps cause a little opposition in the different proprietors of stone there, and keep down the prices. This together with the difference of cartage betwixt and the junction line would I presume bring the stone upon this line or canal at 2d per yard or 1/8d per ton lower than they could be brought upon the other line, and would of course be laid down at Todmorden, Hebden Bridge, Colne, Lanshaw Bridge, Lothersdale, Wycoller, Trawden and places adjacent at 2d per yard lower.

And as the prices of coals at the last mentioned places are from 10d to 14d per horse load, the tonnage of coal no doubt would be very considerable as they are supplied from Burnley, Extwistle and Marsden. As coal could be laid down at Lothersdale at much less expence by the canal, the lime would be burnt for less, and would increase the sale of it very much in that quarter and by thsi means the tunnage of coal & lime would be very great for it is obvious an abundance quantity of lime would be fetched from the canal at Wycoller to Haworth and its vicinity as well as have a very extensive spread on each side of the canal, for this canal being upon high ground woukld perhaps induce the inhabitants toi fetch both coal and lime from the canal at a greater distance, but the country through which it would go is not very populous.

2. In the Junction line, though the flags and slate would cost 2d per yard and more when put upon the canal at Worsthorn, yet they would be taken to supply Colne and its vicinity and along the Leeds and Liverpool Canal and to Salterford, Barnoldswick, Gargrave and likewise to Burnley, Padiham and perhaps might be fetched from the canal to Whalley etc, and very probably so far as Blackburn. I have some doubts whether they might not be laid down at Burnley at as little expence by land carriage on account of the great length of canal by Foulridge to that place.

With respect to coal, if none near the Leeds and Liverpool Canal can be brought to the lime in Craven so cheap as those from Extwistle and Marsden, perhaps the very great quantity of coal wanted to burn lime there to supply both canals would balance that extensive spread of the coal trade mentioned respecting the lime to Lothersdale and coal probably might be brought from Burnley round by Foulridge to Colne etc, being of a superior quality for home use.

Could say much more respecting water and many other thikngs but the post is just going off.

I am your humble servant

Wm Crosley

Halifax, 15th Dec'r 1791

Letter A193²⁰

Dear Sir,

As the want of water is the great difficulty, I should be glad to ask Mr. Rennie the following questions, but submit them to your previous consideration.

Four four locks I have always understood require little more than half the quantity of water than eight foot locks require.

2. What objection is there (except a small additional expence) to the locks between Rochdale and Manchester being only a descent of four feet each?

Somewhere in Flanders there is a canal whose locks have two reservoirs, one on each side of each lock; as soon

²⁰ Rochdale Canal Letter Book

as a boat enters a lock, its bulk forces two thirds of the water into these little reservoirs, so that when the other gates are opened, only one third of a lockful of water is let into the lower reach of the canal, and as soon as the gates are shut again, the water is again let out of the two reservoirs into the lock again, and serves in part for the next boat, so that three times the number of boats are navigated by the same quantity of water as in the common way.

2. Could not this be done between Rochdale and Manchester

I am yours sincerely, etc,

G?

January 1792? From a Subscriber²¹

No apologies necessary for addressing the proprietors on a subject so interesting to them as the present intended canal from Manchester to Sowerby. On the contrary, I think it the duty of every individual who has considered the comparative utility of such canal, compleated on a broad or narrow scale, to lay his opinions and reasons before them for their consideration, it being probable that many facts may be added and hints thrown out which may better enable us to form a decisive opinion on the subject.

I apprehend the idea of a narrow canal has not long been entertained by any subscriber, or indeed by any other person, at least that I have heard of, and I confess that till lately, I had no other idea of a canal, but such a one as goods might be loaded on in boats at Hull & conveyed to Liverpool without interruption.

But when I consider the utility of a broad canal in this point of view, the idea vanish'd at once, for I believe that whoever is best acquainted with the trade of this country, will admit that the quantity of transit goods from Hull to Liverpool or vice versa is not sufficient to load a vessel of 50 tons in the cours of 12 months.

I consider the ports of Hull & Liverpool therefore, not as having any considerable intercourse with each other, but as rivals in trade. They are, however, the two principal inlets by which are introduced material, for the employment of the manufacturers, and corn and other necessaries for the support of the inhabitants of the interior part of the country, of which I consider the town of Rochdale as nearly the central point between them. If we add to these two ports the influx of corn & materials by the River Trent & the Staffordshire Canal, I think the most considerable means of supply to this country are taken into account.

I consider the goods brought into this country, by the forementioned channels, as continually lessening & diminishing in quantity as you approach the centre, not that I mean to insinuate that a narrow canal is sufficient for our use, if not for that of the canals at its extremities; on the contrary I apprehend a narrow one with a proper number of vessels will be deemed sufficient for all trade either of Liverpool or Hull, & I think it no improbable inference to suppose that was the original cause why a broad canal at each extremity was adopted in preference to a narrow one, in order to introduce those vessels into their locks which were of such size & burthen as could with tolerable safety be navigated below the point to which the tide flows.

With respect to the intermediate carriage of goods, from the little knowledge I have of the country, I believe that few goods brought from the eastwards by the River Calder, are carried to the westward, beyond the town of Rochdale, & still fewer of those, which are brought from the westwards, pass beyond it to the eastward. I admit that some exceptions may be made to this observation taken as a general assertion, but none of sufficient consequence to effect a general plan.

It remains to be considered how the trade of Rochdale and its neighbourhood would be affected by a broad or narrow canal, for I consider that as the greatest public object, at present, tho' I have no doubt that every place on its course will be more or less benefited by either.

If we suppose a broad canal, we must first consider all opposition as effectively done away, a broad canal would then be open to Liverpool, and it the becomes necessary to consider the intercourse

²¹ Rochdale Canal Letter Book

between Rochdale and Liverpool. Whether it is sufficient to employ large vessels, to sail at certain fixed times, with the same regularity that it is now done from Manchester. If the trade is deem'd sufficient, it will then be necessary to provide either docks or accommodations at Liverpool for those vessels, & also a clock, warehouse and other conveniences for the reception and delivery of goods there.

In the present state of this intercourse, goods are dispatch'd from Manchester three days every week with such regularity that the time of the vessels sailing is publicly known to an hour. I have heard several merchants (who I think are sufficiently inform'd) compute that the manufactures of Rochdale & its neighbourhood sent to Liverpool, would not be sufficient to load a vessel of 50 tons in less than a fortnight. If, however, it will be admitted that with the addition of those goods which may be expected from Yorkshire, a vessel may be loaded every week, I conceive that every trader will prefer the present expeditious method, and if it be proposed to dispatch two vessels weekly with such goods as may be ready, I apprehend it will not be sufficient inducement to any person to undertake the business, which cannot be done so cheap as by the present practice, after paying tonnage, expence of warehouse clerk and other incidental expences.

The same reasons hold good with little variation respecting the dispatch of goods from Rochdale to Hull, and if you consider that vessels are laid on for foreign ports at Hull and Liverpool to sail on an appointed day, every person concerned in foreign trade will certainly prefer the present regular dispatch of goods from Manchester on one hand, and Sowerby wharf on the other, to any uncertain contingency or eventual arrival of their goods, in order to serve the respective ships for which they are intended. But this is not all, a broad canal cannot with any propriety be adopted (on account of its increased expence) except where it is necessary to employ vessels large enough furnish'd with mast, sails and rigging to navigate the tideway, and a mast and rigging are absolutely useless to those vessels when passing above the tideway notwithstanding the great expence of fitting them up in this manner & likewise of constant wear and tear, & also rotting and decaying, nearly in the same proportion, when they are not necessary as when they are used.

This expence has induced the Aire & Calder Comp'y Proprietors on one hand & the Duke of Bridgewater on the other; to erect warehouses at the extremity of the tideway in order to employ boats with sails & rigging on the tideway only, & other vessels above it. And will the Rochdale Canal Navigation Company attempt to carry into execution a plan which has been fully tryed and abandoned at each end of their canal, & likewise to become competitors in the carrying trade with those on whose hands the business has been long established. For this I assent must be the case (except for bye boats) if they extend their views beyond Manchester on one hand, and Sowerby Wharf on the other.

I believe there are now some boats which may carry some goods (but chiefly coals from Huddersfield) to Hull without stopping, but as the scheme seems to be only founded on a plan which has been already tried, and abandoned, I look on it only as a project which will probably die away in a short time.

A narrow canal has been objected to by some on account of the expence which will attend the removing of the loading of one vessel into another, but I have the authority of experience in this case to assent that the expence of wear & tear on sails and rigging is considerably more than that of shifting cargoes.

The regular & constant manufacturers of this country ought to have on every account and on every occasion a regular & constant conveyance to their respective ports, and I hope the future practice on this canal will be the regular dispatch of goods of all kinds from one station or warehouse to another; not depending at all on accidental or bye boats, & to effect this the stations must not be too far distant from each other. But if the quantity of goods sent from Rochdale to Hull & from Rochdale to Liverpool is not sufficient to employ vessels to sail to those places (& I apprehend it is not) with the same regularity & certainty as it is now done. I know of no regulation that can be proposed sufficient to compensate the defect.

The amount of tonnage arising from the export of manufactures may not be comparable to that of

some other articles, yet that export is of the utmost importance to the country at large, & particularly so to those who are subscribers & engaged in this business.

With regard to lime, coals, stone, slate and flaggs, they may be carried the whole length of the canal without unloading, and I apprehend no one will extend its views beyond its limits on those articles, for the limestone may be brought on the Leeds & Liverpool Canal, through their own locks to the most convenient place for burning it, on this side Colne, without the necessity of any of our boats entering any of their locks, or theirs entering or passing through any of ours, and all the other articles lie within the limits of our own canal to be carried thereon and distributed where necessary.

These are my sentiments on this subject, if any better suggestions can be offer'd in favour of a broad canal founded on past experience, present facts, or future probabilities, I am entirely open to conviction, until then I remain of opinion that a narrow canal is sufficient for every purpose of public utility, and that the employment of small vessels, in this interior part of the navigation, will not only facilitate but expediate business, and render more regular the dispatch of goods thereon & prevent every disagreeable interference with the other adjoining canals where the carrying trade has been long establish'd, that by the opinion of our engineer the compleating of a narrow canal will cost less by £100,000 and upwards than a broad one and will consequently tend greatly to the interest of the proprietors.

If you adopt a narrow canal it will have these advantages and conveniences:

1st a saving of one third of the expences already estimated at more than £230,000, and may probably cost £400,00.

2nd it will be compleated in much less time.

3rd goods are equally safe from damage on a small boat on a narrow canal as on a large boat on a broad one.

4th goods on a small boat are equally safe from pilfering etc.

5th passage boats may be apply'd on a narrow canal than a broad one where such a number of locks is necessary.

6th goods may be carried thereon at a lower rate of tonnage than on a broad one.

7th it will pay more per cent upon our subscription.

8th it will be attended with much less loss of water by evaporation and by constant leakage at the locks.

9th business will be dispatch'd upon it with more regularity and expedition which is a circumstance of great consequence.

10th it will require less expensive repairs.

11th a narrow canal of 9 or 10 yards broad will be sufficient too every purpose and effectually serve every branch of the business of the country public or private.

A Subscriber

Two things strike me from these archive extracts. Firstly, how little investors understood about how their canal was likely to influence the local economy. In the north, there was an expectation that limestone would be the mainstay of trade. They certainly did not realise that canals would open the floodgates to development, and the economic effect their construction would create by encouraging new industries and markets. Further south, coal supplies to London dominated canal economics, and though this trade was of major local and regional importance, it never became national, with the north east and south wales dominating the various markets.²² With so few detailed figures surviving of trade on canals, it is difficult to interpret their actual benefit to the economy at all levels, despite their being one of the more influential factors in the economic growth of the country in the late 18th

²² Unfortunately, coal tends to be considered as a single item, rather than a collection of different products serving different markets.

and early 19th centuries.

The other aspect is financial, with subscribers suggesting narrow canals to keep down costs. In making such decisions, they were not helped by the wildly optimistic estimates of canal engineers, though they were, in their turn, not helped by the wartime inflation during the canal-building era. As a result, canals were almost all built on the cheap, and their survival is perhaps testimony to the skill of those who built them.

These two factors does make assessing the effect of narrow canal promotion and building difficult. That they continued being built into the 1820s, does suggest that they continued to be considered economically viable up until that time, and the lack of the establishment of a single gauge for railways reflects that a lack of a good understanding of the role of transport in the national economy continued into the 19th century, and still does.