

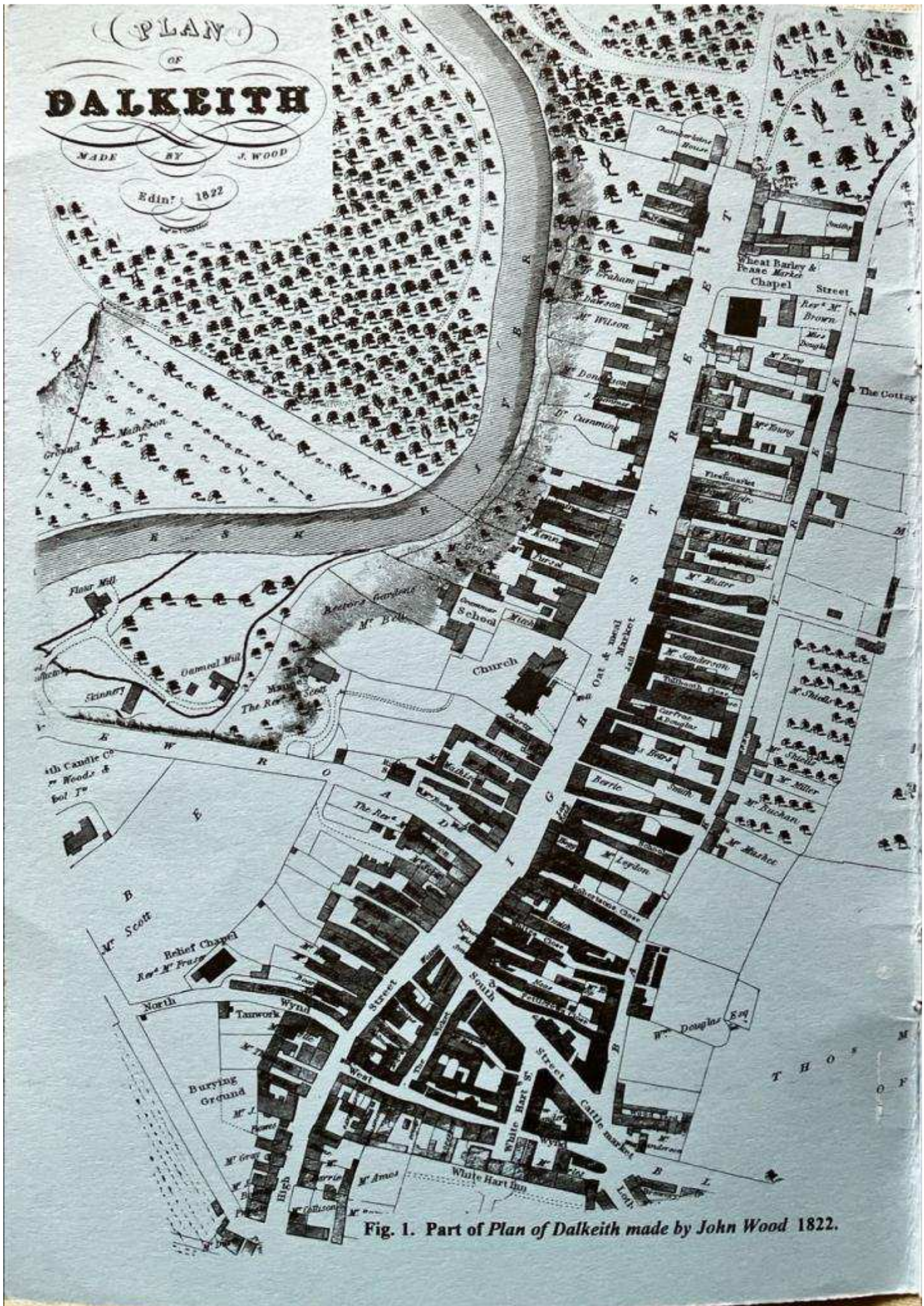


# Road and bridge making on main routes in and around Dalkeith 1750-1850

by  
Professor Roland Paxton MBE CEng FICE FRSE  
Civil and Offshore Engineering, Heriot-Watt University

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(PLAN)  
OF  
**DALKEITH**

MADE BY J. WOOD

Edin<sup>r</sup> 1822

Fig. 1. Part of Plan of Dalkeith made by John Wood 1822.



## Road and bridge making on main routes in and around Dalkeith 1750-1850. [DRAFT]

In this paper, to be presented to a meeting of the Dalkeith History Society and members of the East of Scotland Association of the Institution of Civil Engineers on 9 March 1998, the practice of making and preserving roads and bridges at and near Dalkeith from 1750-1850 is identified from contemporary records and assessed. The principal context is the strategically important *Dalkeith Great Turnpike* or toll road (1751-1883, now A 68) which extended from Edinburgh to the foot of Soutra and formed a link of the shortest and eventually quickest Edinburgh-Morpeth-London main route in the coaching era. Against an outline of turnpike travel, reference is also made to vehicle weighing engine practice and contributions by road surveyors Francis Oliphant, Charles Abercrombie, John Loudon McAdam, and parliamentary road engineer, Thomas Telford.

The most fundamental early development of the road resulted from the supersedence of fords or old brigs by more commodious bridges. For these the trustees employed leading designers and builders including architects William Mylne, John Baxter, John Adam, and Alexander Stevens, and engineers Robert Stevenson, James Jardine and Telford. It is evident that their contributions were unremarkable in terms of technical innovation and scale except for Telford's, which was obtained for the Trust by its active chairman Sir John Dalrymple. On the road from Fordell to Soutra Telford eliminated sharp bends and, by means of extensive cuttings and embankments, all steep gradients. He engineered at least five bridges, including tunnels through new embankments at Fala and Dean Burn with his able assistant Henry Welch. His elegant 90ft. high, state of the art, Pathhead bridge, served as the prototype for the nationally outstanding Dean Bridge, Edinburgh. Reference is also made to parish *statute labour* road repair.

### 1 Parish highways

The description of Dalkeith in 1827 accompanying [Fig. 1], records that its principal street . . . *the High Street, is handsome and spacious, and contains a great number of elegant buildings, the cross streets of communication from the north and south of the town, are wide and handsome, and the whole of the town is neat, clean, well-paved, and airy. . . The town [a Burgh of Barony since 1747] as to its police revenue, is under the management of 15 trustees, (including the Baron baillie, who is considered preses) appointed by Act of Parliament. This act gives two pennies Scots on every Scots pint of ale or beer, brewed for sale, or vended within the town and parish, the monies arising from this; the sweepings of the streets, and some small property; is the only revenue of the town, which is small, yet by judicious management, much public good has been done. The inhabitants are not burdened with any town's assessments . . . the town is about to be lighted with gas*[1].

From this account, it seems that the burgh roads, which were of small extent compared with those of Dalkeith parish and Dalkeith Turnpike Trust [Fig.2-cover][2], were then in good order. The Dalkeith Trust, a constituent part of the County of Edinburgh Turnpike Trust formed under a parliamentary Act of 1751[3], maintained



some of the town's *through* roads and had made an occasional contribution to the burgh towards the cost of provision of this category of road. For example, in 1779 they allowed twenty guineas towards the cost of making the *New Road* from Lugton Bridge to High St. (the present A68 route) [Fig. 1], but refused to take over the road for future maintenance[4]. It is probable that this was the road used by what is believed to have been the first local stage-coach from Edinburgh to Dalkeith, operated in 1783 by Dunn, a hotel keeper in Prince's [sic] Street[5]. In 1830 110 yards of this road was still a statute labour road [Fig. 3][6], but by 1850 it had been *turnpiked* [2].

The beer revenue was not applicable to the provision and maintenance of public roads in Dalkeith parish outwith the burgh limits. For road administration within the county before 1751 the reader is referred to Heddle's account[7]. Repair of parish roads was carried out by means of *statute labour* provisions levied on the parish's inhabitants under ancient Acts. All tenants, cottars and their servants were required to give six days labour a year on *parish road days*. In general, because of a lack of proper skill and an element of unwillingness on the part of the conscriptees, any work done was often ill-conceived, inadequate and even useless. Whether this situation applied in Dalkeith parish prior to 1827 is a matter for further research. It was the inadequacy of personal statute labour in maintaining highways which earlier had led to the creation nationwide, on a local basis, of *turnpikes*, for which the users of the road paid tolls rather than the inhabitants of the localities through which the road passed. This system brought about a great, although far from perfect, improvement in the state of roads and eventually had the effect of greatly diminishing the mileage of road maintained by statute labour.

Under the terms of the 1773 Highway Act[8], the practice of commutation, that is payment by individuals of composition money in lieu of their statute duty, was regularised. Any male parishioner, however inept as a road-maker, with an annual income of £100, could be chosen and appointed *surveyor* by a *Justice of the Peace*. Work on the road was performed under his direction by male parishioners aged 18 to 59 years having an income of less than £4 per annum. Unless exempted, they were required to work on the road for six days or pay 4d/day. If they failed to turn up for work they were fined 1s.6d. for *every such neglect*. Owners of vehicles, horses or oxen, were required to make an income-related statute duty contribution in kind towards *teams* [e.g. a horse and cart] or pay a composition not exceeding 6s./day.

The practical effect of personal statute labour, which continued in use for another six decades, was ably summed up by Paul Pry's poor stone-breaker in 1829, *we have not improved the High Ways a bit*[9] [Fig. 4]. Nevertheless, reform was on its way. Under the 1835 Highway Act personal statute labour was abolished and local authorities took on this role, financing the work by charging the inhabitants *rates*[10]. In 1830 the length of statute labour road in Dalkeith Parish totalled only 2,803 yards [Fig. 3 - the elements of 700 and 1056 yards almost certainly refer to the West Cowden road from old Cow Bridge toll bar to the main road - Fig. 10].

## 2 Dalkeith Turnpike Trust 1751-1883

Dalkeith [District] Turnpike Trust, administered by local members of the general County of Edinburgh Turnpike Trust, continued in existence until its functions,



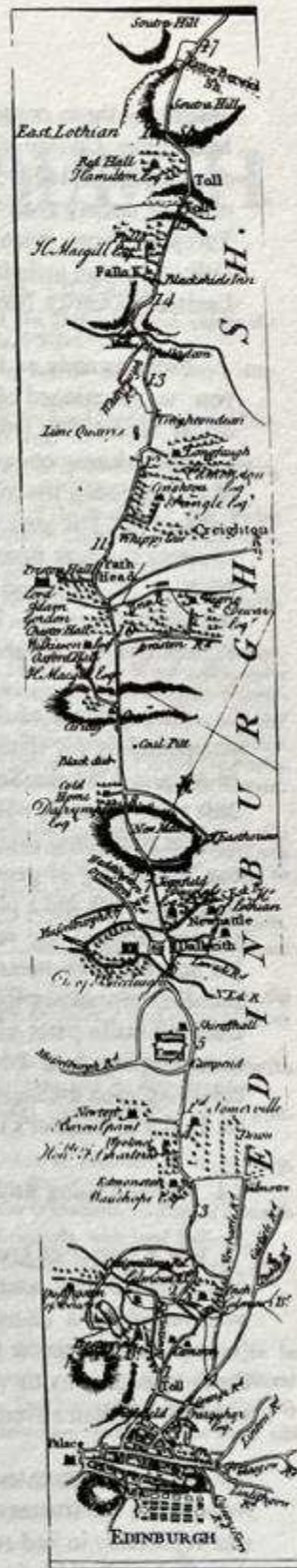
*List of Roads Kept by Statute  
Labour in the Parish of  
Dalkeith*

North New Road	110 yars
Road into the watering place	60 Do
Back of the Toll house	33 Do
foot of the north wynd	56 Do
Wheat Market	77 Do
from Cowbridge toll bar to the burn	700 Do
from the burn upwards	1056 Do
Ironmill Road	451 Do
Newbattle Road	260 Do

**Fig. 3. List of roads kept by statute labour in the parish of Dalkeith 1830.**



**Fig. 4. Stone breaking by statute labour in 1829.**



**Fig. 5. Dalkeith Great Road from Taylor & Skinner's Survey of the Roads of North Britain 1775.**



essentially those consolidated under the 1773 Turnpike Act [11], were taken over by Midlothian County Council in 1882-3 when it adopted the *Roads and Bridges (Scotland) Act 1878*. The maintenance, improvement and management of at least 273 miles of county road (in 1819), of which at least 35 miles came under the Dalkeith Turnpike Trust, were funded from tolls collected at numerous toll-bars. Those in Dalkeith parish included Newmills, Lugton, Cowbridge and Gallowshall (Eskbank - in Lasswade District Turnpike Trust's area).

From as early as 1757 the produce of some toll-bars for a given period, usually a year, was auctioned off at a public *roup*, the price paid being based on the amount the bidder expected to collect. Collecting the tolls was far from being a sinecure. In 1789 a Daniel Murray complained that he had got about £80 of bad halfpence in the course of his collecting the tolls and he desired the Trustees to take them off his hands. They refused[4]. The amounts obtained in respect of half tolls roused in March 1824 and covering the year from 25 May 1824 were in respect of the toll-bars at *Lugton & New Mills* . . . £1,180 and *Cowbridge* . . . £100[12], which gives an indication of their relative traffic usage. The tolls charged, with ticketing arrangements and the numerous exemptions in force are shown in Fig. 6.

The minutes of the Dalkeith Turnpike Trust in 1751, relate to such matters as compounding for statute labour, toll evasion, and the use of soldiers on road-making. In August 1751 the Trust accepted an offer from a Richard Bason for **making a road 30ft wide [overall] with an 18ft wide carriageway, the central 12ft of which was to consist of an 8in. thickness of stones not exceeding the size of a man's fist, with a top spreading of gravel, all at a cost of £225/mile.** The Trustees were to provide tools, six carts and a plough. Within a week Bason had started work at Bridgend [near Lugton Bridge], but his contract seems to have been short-lived as five months later his account was minuted *to be cleared*. The above description is important as it probably represents the Trust's specification for many years. A William Skirving of Dalkeith made parts of the road to this standard from 1752-56[13]. In 1761 soldiers were employed at 8d/day. Five shillings was allowed for erecting, figuring and colouring each milestone[4]. These are almost certainly the milestone positions shown on Taylor & Skinner's first comprehensive survey of Scottish roads [Fig. 5][14].

## 2.1 Road-making under Francis Oliphant 1788-90

It is a matter of great interest to engineering historians to know how the surveyor of a turnpike trust conducted the day-to-day management of his work. This can now be revealed for a 12-mile length of the *Dalkeith Great Road* from the 3rd milestone [near Edinburgh to the foot of Soutra Hill - Fig. 5] because of the fortunate survival of the notebook of its surveyor Francis Oliphant[15]. The entries in his notebook contain a wealth of detail covering the period from July 1788 to January 1790.

With the increased national prosperity and traffic generated by the *Industrial Revolution*, the trustees were concerned to improve the condition of their road which was reportedly in bad repair in 1786. At their meeting on 28 June 1788 it was stated that *Robert Bell* [their other surveyor] *has so much to do on the Lasswade Road that he cannot undertake the repairs on any part of the Dalkeith Road, but that Francis Oliphant is a fit person to be employed as he has been accustomed with repairing*



# COUNTY OF EDINBURGH.

## 1st, TOLLS.

	L.	s.	d.
I. COACH, CHAISE, &c. with 6 Horses, &c.	0	2	0
— 4	0	1	3
— 3	0	1	3
— 2	0	0	6
— 1 Horse, &c.	0	0	3

## II. WAGGON, CART, &c.

1st, For 26 Cwt. and under,	1st, with 6 Horses, &c.	0	6	0
	— 5	0	5	0
	— 4	0	2	0
	— 3	0	1	6
	— 2	0	0	4
	— 1 Horse, &c.	0	0	3
	2d, Manure, excepting N <sup>o</sup> 15, until 15th August 1815,	<i>One Third.</i>		
	Afterwards,	<i>Full Toll.</i>		
	3d, Flour from Water of Leith Mills,	<i>One Half.</i>		
	2d, Above 26 Cwt. and under 34 Cwt.	<i>One Half more.</i>		
	3d, For 34 Cwt. and upwards,	<i>Double Toll.</i>		
	4th, On Broad Wheels,	<i>No Addition.</i>		

III. HORSE not Drawing,	0	0	0	4
IV. SADDLED HORSE,	0	0	0	1
V. ASS,	0	0	0	1
VI. OXEN or NEAT CATTLE, per Score,	0	0	0	7
VII. CALVES, HOGS, SHEEP, LAMBS, GOATS, per Score,	0	0	0	3

Any greater or lesser Number than a Score pays in Proportion.

VIII. *Note.* The Trustees may diminish all or any of these Rates, and for any Period. Wherever that Power is exercised, it will be intimated by rectified Tables at the Bars where it is to operate.

## 2d, PASS TICKETS.

- IX. One Pass Ticket, on the Day it is issued, carries the Traveller Six measured Miles.
  - X. Two Pass Tickets answer for a whole Day's Travelling; but
  - XI. A new Loading, and, for hired Carriages, a new Fare, are subject to a fresh Toll.
  - XII. Nor do Pass Tickets avail at the Bridges of Arncliffe, Elginhaugh, Kirkettle, or Cramond.
- Note.*—By a Regulation of the Trustees, a Pass Ticket from Arncliffe exempts at Elginhaugh, and *vice versa*.

## 3d, EXEMPTIONS.

- XIII. Materials for the High Roads or Bridges, or Works carried on by the Trustees.
- XIV. Hay, Grain, or Pulse in the Straw, Potatoes, Turnips, or other Vegetables, Flax, Hemp, or Wool, passing to be laid up in the Houses or Yards of the Raifer thereof.
- XV. Dung, or other Manure, not bought, sold, or disposed of, or carried for the Purpose of being sold or disposed of, but passing to be laid up or placed in the Outhouses or Onsteads, or on the Lands of the Owner thereof, who shall not have bought the same.
- XVI. Implements of Husbandry passing from one Part of a Farm to another Part of the same Farm, or from Yards and Offices of Towns or Villages in the County, to Burgh Roads, or Fields adjoining.
- XVII. Work Horses and Cattle, in the like Predicament.
- XVIII. All Horses and Cattle going to or returning from Pasture, Watering Places, or Smithy.
- XIX. Funerals of Persons dying and buried within the County, except those Attendants who travel in Four-wheeled Carriages.
- XX. Attendants on Divine Worship at the Parish Church, or other customary Place, with the same Exception.
- XXI. Mails and Expresses under Authority of the Postmaster General.
- XXII. Officers and Soldiers on their March, or on Duty, with their Baggage, &c.
- XXIII. Volunteer Cavalry in Uniform, on Days of Exercise.
- XXIV. Vagrants and Criminals, with legal Passes.
- XXV. Empty Carts, and other Carriages of Trade, Commerce, and Husbandry.

*Edinburgh, 15th August 1803.*—The above is the Table by which the Tolls of the County of Edinburgh are to be levied from and after this Date. To avoid prolixity, the Substance, rather than the very Words of the different Clauses, has generally been adopted; but every Toll Gatherer is bound, under a Penalty, to have in his Custody an authentic Set of the whole Road Acts of the County, to which the Traveller may have recourse. The Index will readily lead him to any Article he may desire to examine.

THOM. CRANSTOUN,  
*Clerk to the Trustees.*

Fig. 6. Notice of Tolls for the County of Edinburgh 1803.



roads, understands accompts and is a man of good character . . . they authorise Robert Bell and Francis Oliphant to examine what parts of the Great Road require an immediate repair and authorise the said Francis Oliphant to employ men to put in repair such part of the said road as shall be fixed by them. Oliphant was to be paid £21 per annum salary for the term of his employment, which seems to have ended in 1790. On 20 January 1790 a Thomas Baillie was given a contract to keep the road in repair for 10 years. By Martinmas 1799 he had received £2,751. In 1790 John Laurie, a farmer at Wallyford, was appointed surveyor and overseer at £40 [per annum] plus £10 if satisfactory to the Trustees. Evidently he was as he died in post in 1804[4].

From Oliphant's note-book four main road-making operations can be identified. Firstly, **quarrying** at sites fairly close to the road for which payment was made at 2d/cart-load (larger and double carts more or less *pro rata* by volume. Sometimes a lump sum was paid e.g. £2.5s.). Secondly, **supplying carts and driving loads of stone** to the section of road to be repaired at 4d-9d each cart-load dependent on cart size and the distance travelled (for driving only, a typical rate was 3/- per man-day. **Carts or horses only** were supplied at 2/6d-3/6d each per day). Thirdly, **breaking the stones** to the size to be used at 3d/cart-load. Finally, **the stone was placed in the road and blinded with gravel** at daily rates of 10d-1/4d (1/6d for the foreman) using **gangs of up to 10 men**. Up to 6 women received 5d per day, for *filling stones* [Fig. 7] and *gathering stones*. Other operations referred to at day rates were: *filling and seeing carts well loaded, filling ruts and spreading, laying on wi' shovels, gravelling, laying on small stones and clearing earth, rib[b]ing* [removing ridges? at 1/8d/day]. Gunpowder for quarrying cost 1/- per pound. Robert Brunton was paid various sums for smith work on tools, &c. An interesting tailpiece is *To Robt Bell & F. Oliphant for a dinner in Mrs Johnstone's as allowed by the Trustees 5s.0d.*

From the above information it can be calculated that the total cost of repairing the 12-mile length of road over an 18 month period was £540. There is little mention of that pre-requisite of good road-making, side drainage. The expenditure on particular lengths varied. Between Edinburgh and Dalkeith the cost was about £80/mile, from Dalkeith to Pathhead £40/mile and southwards to Soutra £20/mile. These rates are probably broadly proportional to traffic usage. Subsequently the amount of traffic increased greatly. In general, inadequately made roads sustained serious and continual damage from an assortment of iron-shod wheels which, although wide overall to benefit from lower tolls, because the narrowness of the part of their *tires* actually bearing on the road surface, combined with heavy loads, greatly increased the pressure applied. Wide conical waggon wheels actually ground up the surface. By 1819 the problems of keeping Midlothian's roads in good repair were such that John L. McAdam, author of *Remarks on the present system of road-making*[16], whose services were then much in demand by Turnpike Trusts nationwide, was consulted.

## 2.2 McAdam's report on the state of the County of Edinburgh turnpikes 1819

McAdam found the roads of the county . . . *in a very rough and uneven state, from the unskilful application of the most valuable road materials that I have seen . . . From the appearance of the Roads, and the manner in which they are constructed, it is more than probable, that they break up every winter. This defective state of the*



roads proceeds from mistaken principles in the original formation, as well as from want of skill in the direction of the repair. From what I have seen practised in making a new Road in this County, it appears that a trench of considerable depth is dug for the purpose of depositing the Road; and to counteract the bad effect of this trench, which would be necessarily full of water, it is refilled with large stones collected at an enormous expense, and over this very faulty foundation, a road is made of ill-prepared and unskillfully laid materials. It is difficult to say whether this system be most injurious to the public, by entirely precluding the possibility of good Roads or by the wasteful expenditure it occasions in procuring and burying a quantity of materials sufficient, if properly applied to form a great extent of Road.

The materials for making Roads in the County are not only of the very best quality, but are so happily distributed, and of so easy purchase, that the expense of repairing the roads ought to be very moderate; and when reformed under skilful management, so as to be smooth and solid, the annual expense required for their maintenance will be very much diminished. He recommended that protection of the funds from wasteful mismanagement can only be attained by . . . a suitable executive department. This should consist of of a General Surveyor, with not less than ten Sub-Surveyors under his orders. [He] should be acquainted with the principles of road-making in all its various details . . . a gentleman of education and station in society . . . [with] authority to suspend any Sub-Surveyor [he found the existing surveyors] . . . lamentably deficient[17].

In the report McAdam, as was his usual custom, confined himself to management matters and improving the state of the carriageway to existing lines and levels. He did not propose more expensive engineered improvements such as new lines with slacker gradients as was the practice of Abercromby and Telford. He estimated that his proposed new management structure would cost an extra £600 or £700 a year, but that this would be more than offset by a saving of more than half on the 1818 repair expenditure of £19,522. He maintained that the roads could be put in order under his system within two years. McAdam's report was agreed on 17 Sept. 1819, but two years later the Trustees of the Dalkeith District were not very pleased with his scheme as it applied to their roads. Generally there were too many small stones added and ruts were forming. Only a small part of their roads had been completely repaired upon his plan, but these were considered satisfactory[4]. In 1819 he had recommended that of the trust's 35 miles of road, 25 miles should be lifted and remade at £176/mile and the remaining 10 miles smoothed and levelled at £12/mile. Although McAdam's advice was not followed to the letter his influence was very beneficial. In July 1826 he supported the external appointment of Robert Reid as its surveyor.

### 2.3 Steelyards and weighing machines on the county turnpikes 1819-28

Attempts were made under various acts to make tolls proportionate to the road wear caused by vehicles, which required the accurate determination of their weight on occasion. For example, in 1803 waggons and carts of 34 Cwt. or over paid double toll. By 1818 weighing machines had been set up at over half the county's toll-bars. In 1827 the County High Road Trustees appointed Peter Sime, *lately Staff Sergeant to the Recruiting Department of North Britain at Edinburgh* . . . to be General Superintendent of all the Steelyards erected at the Toll Bars . . . salary of £20[18]. In



②1 Train the 9 Mule Stone 37 9 6	
to the end	
	Days
To William Dickson	29 1/2 d/ 0:19:6
Robert Cleland	36 1/2 d/ 1:10:5
James Gilbert	33 d/ 1:13:0
James Watson	41 d/ 1:14:2
John Morrison	44 d/ 1:18:8
William Shilby	7 d/ 0:7:0
Alastair Steel	9 d/ 0:7:6
Weomen filling stones at	0:9:19 1/2
Soutra farm	-
To clear steel sent to	3:9:9
cars &c	-
James Glendon single	9 d/ 1:12:6
James Procter Madon	9 d/ 1:2:6
James McParren	7 d/ 0:18:9
To single	6 d/ 0:15:0
James Procter Farmer	5 d/ 0:12:6
To good steel	32 d/ 4:0:0
To do for Draining 32 carts from	-
Jacobsen side to the road	5 d/ 0:13:4
Robert Douglas Quarrying	2:18:6
321 carts d 2 of chert	-
To do for 1 1/2 hrs powder	0:1:6
To Fall paid at Soutra	1:0:0
<hr/>	
	26:7:4 1/2
	<hr/>
	63:16:10 1/2

Fig. 7. Page from Oliphant's note-book 1789  
Note Weomen filling stones at Soutra farm.

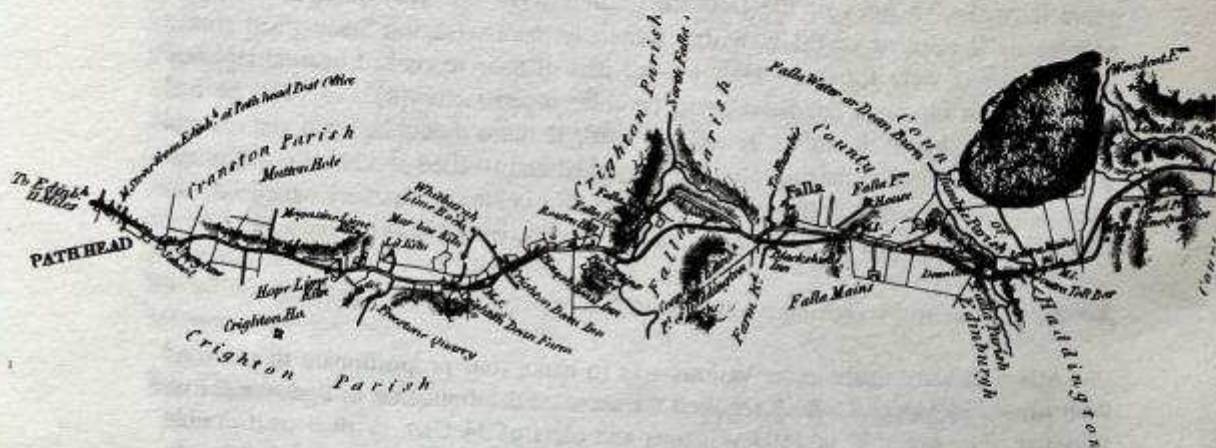


Fig. 8. Telford's proposed mail coach route from Pathhead to Soutra 1820.



1818 there had been many complaints about the accuracy of weighing machines after which clauses empowering an inspector to superintend and inspect such machines were inserted in the articles of roup for toll-gates. The first inspector under these arrangements was a George Young, appointed in November 1819. From 1821 monthly inspections were confined to machines within 8 measured miles of The Tron Church of Edinburgh. Defective machines could be disallowed, corrected, or repaired at the expense of the Tacksmen[collectors]. Many disputes continued to take place.

Sime's monthly report of Sept. 1828[19] on 35 machines, found:

**Gallowshall** [Eskbank, in Lasswade District] *An excellent machine, clean and well attended to.*

**Lugton Bridge.** *This is one of the worst machines in the County, it cannot be depended upon;- it is absolutely worth no more than old iron.*

**New-mills.** *A good machine and kept in respectable condition; it would be greatly benefited by having the scale permanently fixed; at present it is only attached by a thumb-screw; and which can be altered at pleasure.*

**Cow-Bridge.** *An excellent machine, clean, substantial and well looked after; it is the only one in this District that does not belong to the Trustees.*

**General Remarks.** *The [35] machines [at 55 toll-gates] in general appear in good condition, and are clean; Yet the discordance of their weights causes much altercation; An adjustment of them is really necessary to prevent loss to the public.*

[A month later]

**Lugton Bridge.** *One of the lever knobs is broken off; the frame is loose, and it is altogether in a bad state, and of a bad construction; Upon trying it with the Imperial Standard, the smaller weights seem to be accurate, but with 10 or 20cwt, it often becomes stationary;- it is also too narrow by 4 inches being only 5ft. 6in, in width & the cover is in a ruinous state; its leverage is 11b.14oz per 112lb and it has these weights 3 of 10cwt, 1 of 5cwt, 1 of 3cwt, 1 of 2cwt, 1 of 1cwt, 1 of 28lb and 1 of 14lbs.*

**General Remarks.** *The whole of the machines were taken to pieces; cleaned thoroughly, and charcoaled, previous to being tried by the Imperial Standard;- Could the keepers be persuaded to abolish the use of oil, and use charcoal . . . they would work better, and be far easier cleaned[20].*

#### 2.4 Dean Burn, Fala Water, Lothian, Cranston and Cotyburn bridges 1820-31

As has been seen in the case of McAdam the trustees believed in getting the best advice in order to improve their roads. They also consulted the eminent parliamentary road engineer, Thomas Telford. In 1820, he had carried out a survey for the government and proposed an improvement of the Edinburgh to Morpeth road 19 miles shorter and 3 hours quicker in use than the main coast route via Berwick. He had commenced his survey at Pathhead [Fig. 8 - the dark line is the proposed one][21], considering that the local inhabitants could well afford to make the 11-mile section of road into Edinburgh. In the event there were *clashing interests* locally in agreeing this line, and in 1827 Telford was invited to determine the matter and make proposals.

In 1827 authorisation was also given for the implementation of Telford's proposals south of Pathhead. A contract was entered into for the improvements at Fala and Deanburn with Archibald Logan for £6,800. [The estimated price for the work was £8,074]. Logan's firm went into liquidation in Dec. 1828 and Messrs Fox & Lowrie



completed the work. The new Fala road was opened on 23 December 1829. The Dean Burn was accommodated under the newly formed embankment [completed October 1830] in a 20ft. wide arched masonry tunnel 133ft. long. A similar tunnel was built at Fala but, fortunately for posterity not at Pathhead [Fig. 9][22]. The sandstone for these tunnels came from Longfaugh[4]. It is evident from the drawings that before the great direct line and level improvements by Telford, in the best tradition of his celebrated London to Holyhead road, many parts of the Dalkeith road had gradients steeper than 1 in 13[21]. Afterwards not only was its alignment much improved but the gradients were slackened to between 1 in 22 and 1 in 30 on the steepest sections.

Of the line south of Pathhead, Telford recounted later, *I . . . furnished designs for improving the road through Path-head [via Fordel, on the present A68 line] to Dalkeith. The most expensive portion of the improvement being the first mile north of Path-head, it was fortunate that the residence of one, the most zealous and active of the road trustees, Sir J[ohn] H. Dalrymple, Bart., was there situate. [His father had built a new road with bridges at Fordel from 1804-07[13] (Fig. 10) as an alternative to the steep road over Edge hill and up to Pathhead from the old bridge at Ford (widened 1771)]. [Sir John] lost no time in making arrangements for commencing practical operations and I immediately prepared working drawings and specifications for the first mile from Path-head, in which were included the ravines of Tyne-Water, Cranston-Dean [bridge completed October 1830] and Cotty-Burn. The first [Lothian or Pathhead Bridge built by James Lees of squared sandstone and opened in 1831] is much the largest . . . [with] five arches, each 50 feet in span and 25 feet rise from their springing, which is 49 feet above the bed of the river, the shaft of each pier is 8 feet in thickness, and it is not solid masonry, the side and cross-walls being 2 feet in thickness . . . [23] Telford had designed this bridge to be 86ft. high and 22ft. wide, and Cranston Burn Bridge to be nearly 40ft. high and 22ft. wide, but as he had stated *the higher and wider the better*, Sir John added 4ft. to the width and height of both. Lees' contract at the outset was, for Lothian Bridge £6,500 and Cranston Burn £800[4].*

Problems were encountered in founding Lothian Bridge where . . . *An iron rod was driven 56ft without impediment so piling became out of the question. Telford, Jardine [an associate of Telford and engineer for the Edinburgh & Dalkeith Railway] & other persons of skill & science were consulted & in conformity with their directions, the piers were founded upon platforms composed of double tiers of memel logs and of three tiers of stones from Craigleith quarry. This has occasioned an extra expense of about £2,000; and it was unexpected as the ground had been bored, and a report made that rock was found . . . the boring irons must have been impeded by large round stones which are found 13 feet below the surface. The platforms were laid upon this hard channel, and as the piers were raised thirty feet a year ago [October 1829] and had stood the winter . . . the foundations may be said to be amply tried[4].*

In elevation the outer arches advancing 2ft. from the main structure and supported on slim pier pilasters create an appearance of slenderness. This innovative use of masonry in a bridge combined with skilful workmanship by Lees resulted in an elegant structure which, additionally, served as the prototype for the truly outstanding Dean Bridge, Edinburgh 1829-32, in the author's opinion Telford's and one of the nation's finest masonry bridges[24]. By advancing the supplemental arches 5ft. at Dean Bridge the appearance of slenderness is much enhanced [Fig. 11].



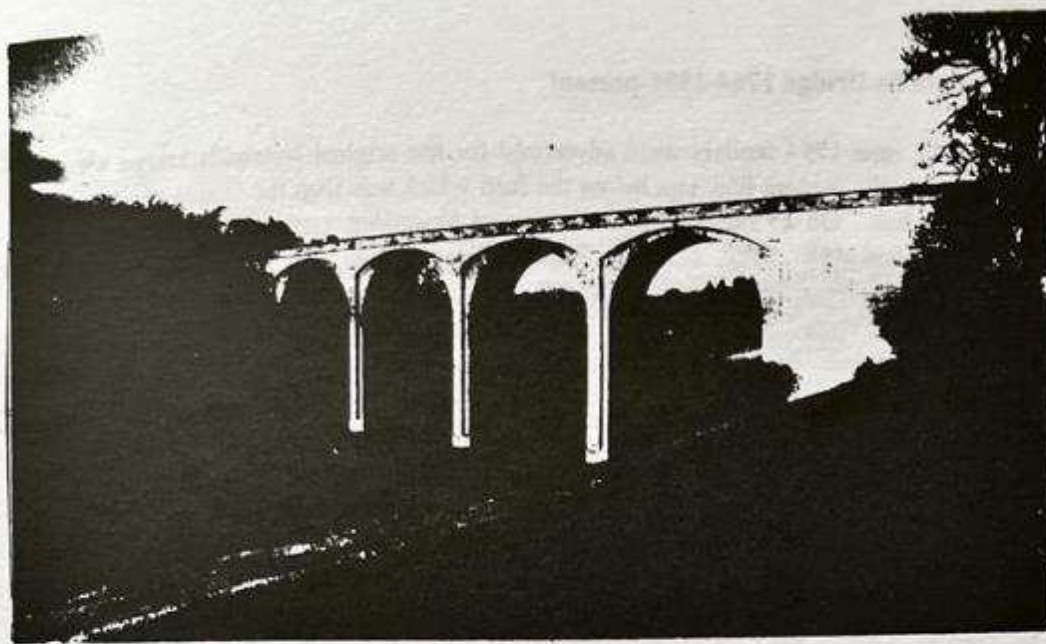


Fig. 9. Pathhead or Lothian Bridge 1831.

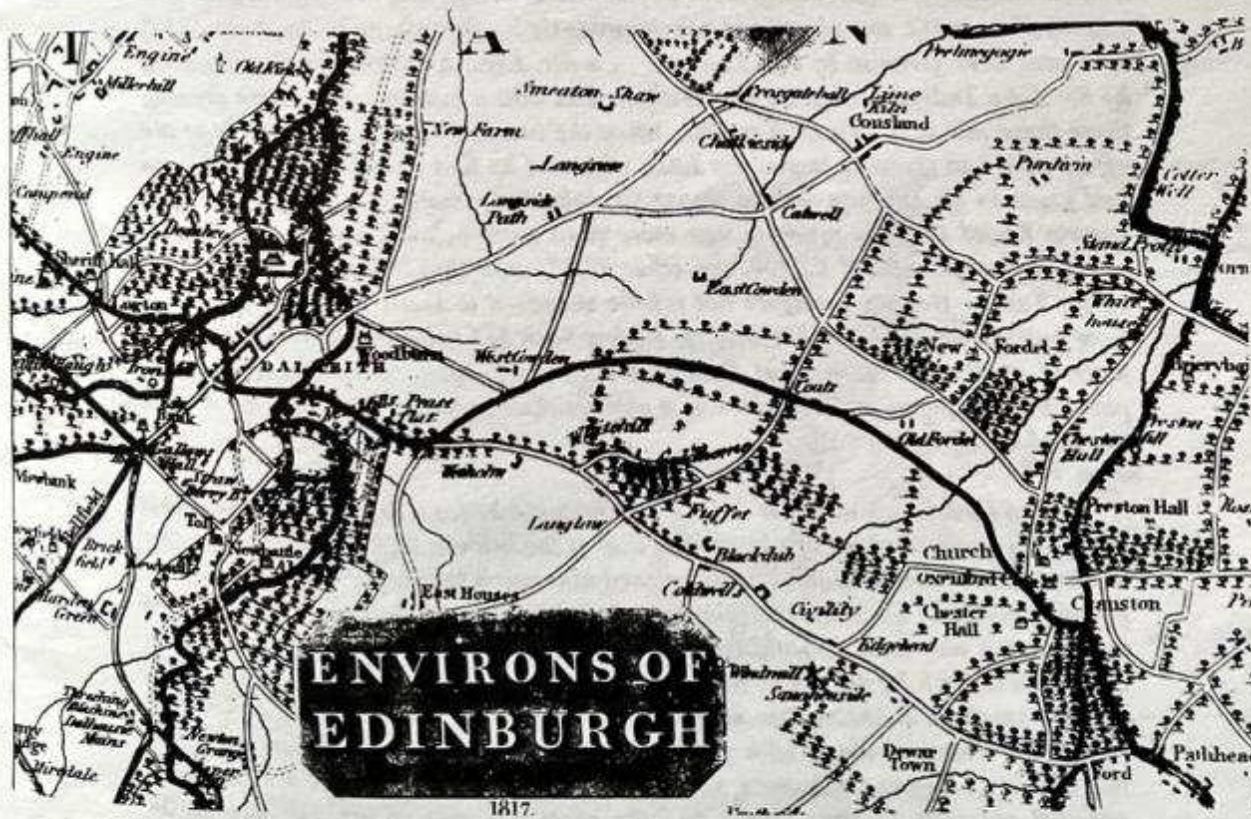


Fig. 10. Roads in 1817 from Kirkwood's map.



## 2.5 Newmills Bridge 1754-1838-present

On 13 June 1754 tenders were advertised for the original Newmills bridge which was built on the present line, just below the ford which was then the means of crossing the South Esk. On 25 November the bridge at *Newmilns*, consisting of one arch of 55ft. span and 18ft. wide, built by Thomas Brown, was finished [Fig. 12]. The structure was evidently not well-built as in 1769 Alexander Stevens reported that its retaining walls were *out of plum and dangerous*. In 1770 a contract was let for new retaining walls. In 1814, following the collapse of a wall at the bridge which blocked a mill-lade, Charles Abercrombie was consulted and proposed raising the roadway 6ft. This was probably the work *in hand* in 1817. The bridge was widened in 1835-36 under the direction of James Jardine who received £150 for his services[4]. Within two years, the old or downstream part gave way and in April 1838 it was rebuilt to conform with the new work, at a width of 40ft[4]. The bridge is still in everyday use as part of the A 68 route. The manner in which its contract seems to have been awarded by the trust serves as a fascinating example of unacceptable practice.

Sir John Dalrymple was undoubtedly zealous and efficient in pursuing the trust's interests, but seemingly not a man to be crossed, if the content of the following extract from a letter by R. Scott Moncrieff, Baron Baillie and Chamberlain of Dalkeith, to the Duke of Buccleugh dated 17 May 1837 is true. Moncrieff wrote to his Grace, *It has become necessary to [undertake work on] Newmills Bridge and . . . Mr. Jardine was employed to make out plans and specifications . . . [on Thursday 26 April 1837] estimates were given in by Mr. Lowrie, . . . a Mr. Lees, a builder much patronised by Sir John Dalrymple, and a Mr. William Tait also a builder. The same evening these three met at the Cross Keys Inn, when the two latter spoke quite freely of the offers they had given in, especially Lees, who said he had no wish for the job, and had given in an estimate only to please Sir John Dalrymple. On comparing notes Lowrie found that his estimate was more than £300 below Lees'; the one being within a few pounds of £2,700, the other £2,375 and that it was also about £200 below Tait's. He was therefore not a little surprised to learn the week after, that Lees had got the contract, his estimate having been £15 below his [Lowrie's], but he learned at the same time that Lees [two days later, after re-consulting Jardine's plans and specifications] had given in a new estimate to Sir John which was the one that had been preferred.*

*I asked Lowrie . . . what Sir John's motive could be for using him so. He said it could only be on account of his politics, that at the last election [Sir John] came up to him in the streets of Dalkeith and pressed him much to vote for Gibson Craig . . . Lowrie declined. Sir John told him that the new bridge at Lugton was soon to be built, that it was entirely within his power to give the the contract to anyone he liked, and though he did not in so many terms promise it to him for his vote, he left not the smallest doubt on his mind that such was his meaning. The two most influential Trustees along with yourself [are] the Marquis of Lothian and Lord Melville . . . Those tradesmen who like Lowrie happen to entertain the same political opinions as your Grace and the great majority of the Trustees of the District, are surely entitled to look to that majority for protection from injustice[25]. Whether his Grace took any action is not known, but Lees's contract stood. By summer 1839 the widening of the bridge on its downstream side was nearly complete.*



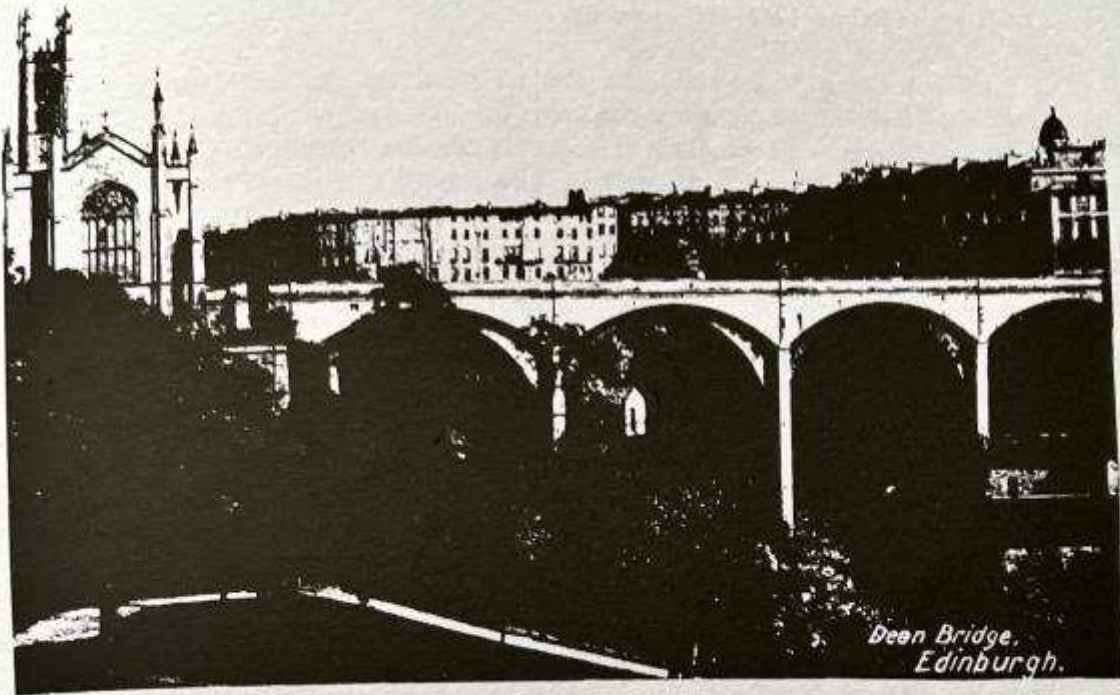


Fig. 11. Dean Bridge, Edinburgh.

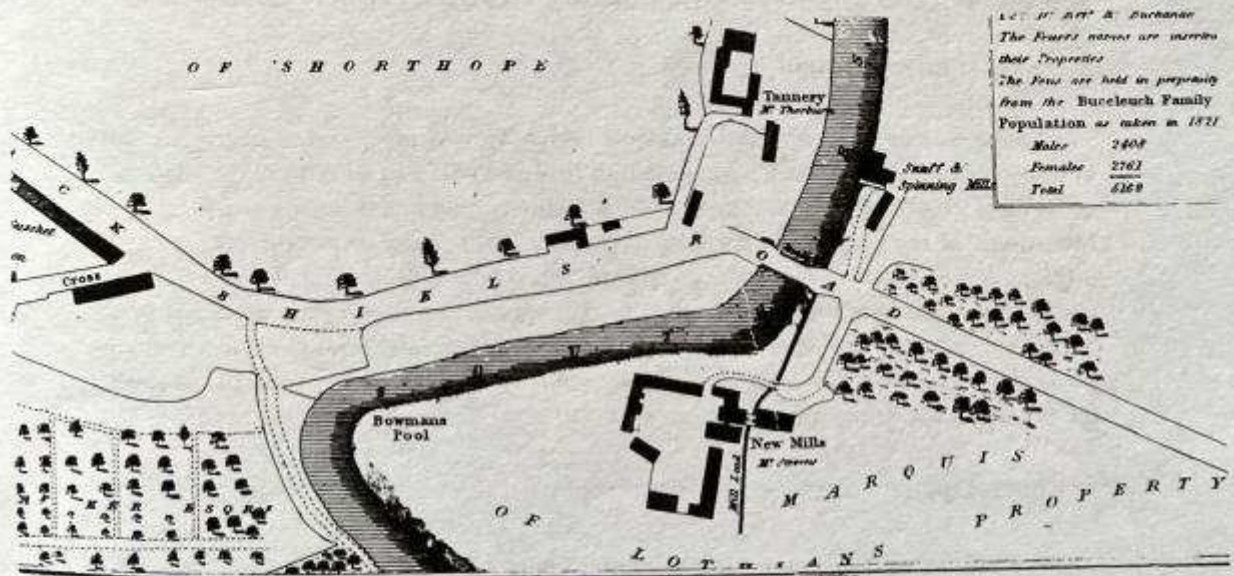


Fig. 12. Newmills bridge and Dalkeith population figures. Wood's survey 1822.



## 2.6 Lugton Bridge 1765-1817- present

The previous bridge at Lugton over the North Esk, for which the Duke of Buccleuch received tolls, was in a dangerous condition by June 1761 and Mylne and Baxter, architects, were brought in to report. In February 1762 there is reference to a contract to be drawn up with Mr. Adams, [John Adam?] architect and Messrs. Young & Shields investigating for foundations. On 4 June 1765 a contract was made with Alexander Stevens for building the arch [55ft span?] of the present bridge. By 1794 the bridge was in a dangerous condition and repairs were carried out by Stevens[4].

In 1815 it was proposed to raise the roadway and widen and improve access to the bridge to a specification by Robert Stevenson. He paid particular attention to obtaining a secure foundation. The abutments were *to be excavated not less than 6ft. below the bed of the river in firm ground . . . [if the ground was insufficient to support them] a platform of beech or elm timber must be laid of planks 4in. in thickness and not less than 15in. in breadth. If the ground should still turn out too soft and porous this platform should be supported on piles of the same timber of at least 8in. in dia. and not less than 6ft. into the ground nor more than 4ft. apart*[26]. The width was to be increased on the east side from 21ft-33ft. The date on the bridge is 1816, but in July 1817 some work was still in hand on the bridge widening, a new tollhouse, filling at each end of the bridge and cutting through Lugton Bank for the new road (on the present south line bypassing Lugton). In 1823 the old Leith road from Lugton [Figs. 5&10] was closed at the request of the Duke of Buccleuch. The proposed *new bridge* referred to earlier by Moncrieff was designed by Jardine in 1840 but never built. His account (submitted 15 years later!) amounted to £445. The Trustees offered £210 in settlement[4]. The 1765-1817 bridge is still in everyday use as part of the A 68 route.

## 3 Other Dalkeith bridges

To the east of Dalkeith another ancient bridge, Cow Bridge, said to have been old in 1594, existed on the Trust's Musselburgh road in 1751. In June 1839 the Marquis of Lothian proposed an improvement of the tortuous road line including a new bridge, reporting that *the road had 7 turns in about half a mile some of them nearly at right angles. It would be a favourable time to do this as the Duke of Buccleugh's railway could be used for materials.* Plans for three different lines of road were produced by a Mr. Connel, one of which was approved [the present line and bridge] by the trustees on 14 January 1840, and a decision made to borrow £4,000[4,13]. West of the town the present stone bridge at Elginhaugh [Fig. 10] was built in place of a ford in 1798.

## 4 Postscript

In 1844, towards the close of the period under consideration, the *New Statistical Account* entry for Dalkeith provides testimony that *every bridge in the parish is at present in excellent condition*[5]. This was also true for Telford's fine bridges further south. This seems a fitting tribute with which to end, but an even more appropriate one to the creators of the network of roads and bridges referred to above, is the useful and immense contribution their work has made and continues to make to present day road travel in the locality since the dawn of the motor age nearly a century ago.



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## 6 Acknowledgements

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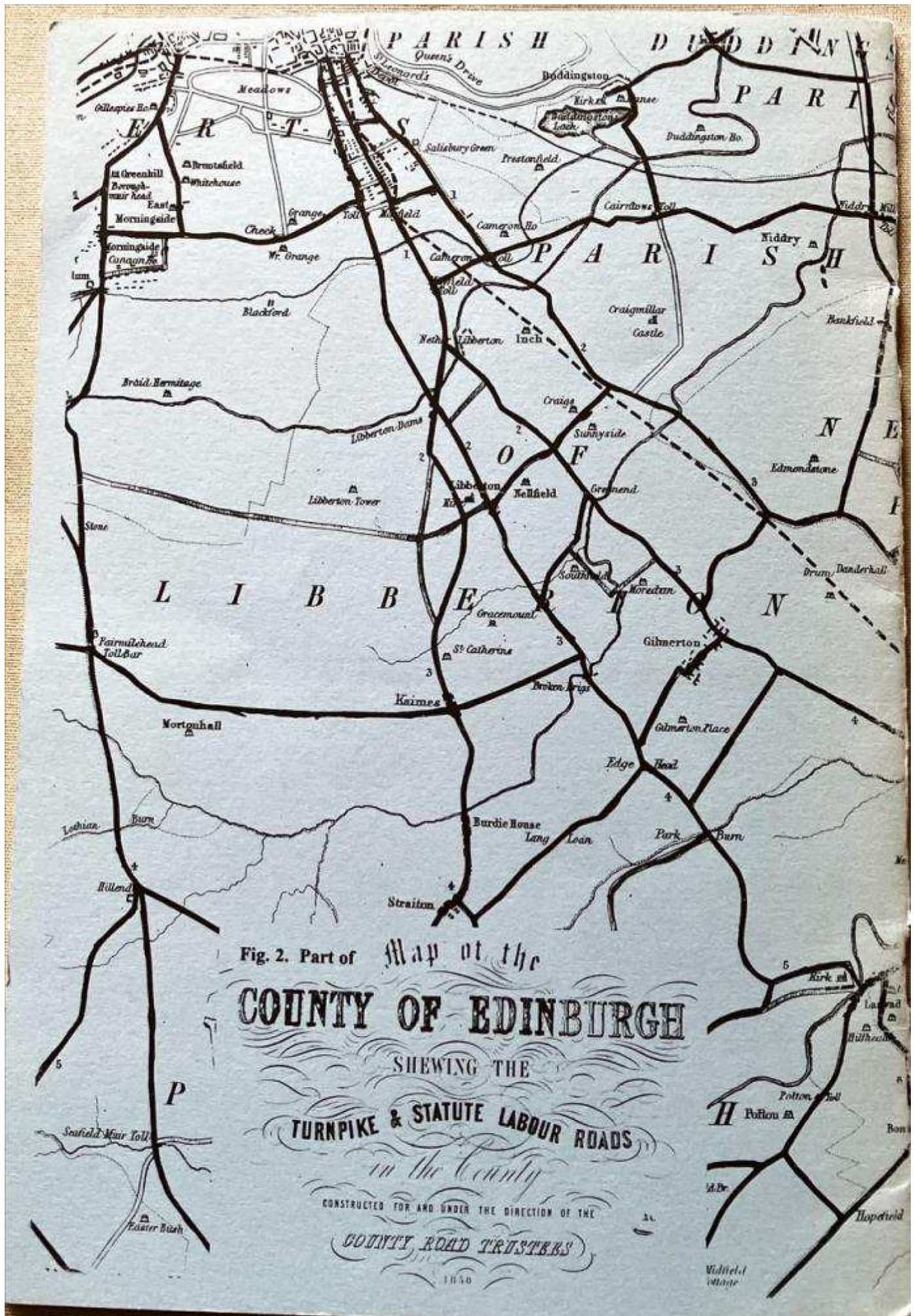


Fig. 2. Part of Map of the  
**COUNTY OF EDINBURGH**

SHEWING THE  
**TURNPIKE & STATUTE LABOUR ROADS**  
*in the County*

CONSTRUCTED FOR AND UNDER THE DIRECTION OF THE  
**COUNTY ROAD TRUSTEES**