

Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the Eighteenth Century

By ROBERT A. DODGSHON

TO the eighteenth-century Scottish farmer, land improvement, or any means by which the physical, chemical, or biological condition of the soil could be made more conducive to agricultural production, was as much an object for his attention as was the search for better farming systems. To date, however, few of the various aids to improvement which the farmer had at his disposal have been studied in any depth. This neglect is especially serious with regard to marl and lime.¹ Prior to the disappearance of infield-outfield and the subsequent adoption of new farming systems, many Scottish farms, even in the Lowlands, had their arable interspersed with poorly drained and invariably acidic patches of bog, moss, and muir, whilst even the land in cultivation suffered from a general deficiency of manure and of calcium in particular. It need occasion no surprise, therefore, to learn that the spread of the Improver's Movement through Lowland Scotland during the second half of the eighteenth century was presaged by extensive and costly programmes of land improvement in which marling and liming occupied a central place. As one writer remarked, they formed the "first and most important step in the new system of husbandry."² Some idea of the extent and economics of their use can be gained by looking at the experience of Roxburghshire and Berwickshire, two counties which re-

sponded willingly to the farming opportunities of the period.

I

First, some background notes on marling and liming may be useful. They were not, of course, innovations of the eighteenth century. In Britain as a whole, traces of their practice exist even for the prehistoric period. Altogether though, their use appears to have remained sporadic and localized right up until the end of the medieval period. According to E. Kerridge, they were adopted by English farmers, at least, on a much more widespread scale during the sixteenth and seventeenth centuries, forming one of the key improvements in the agricultural revolution which he postulates for the period.³ Even in Lowland Scotland, lime, if not marl, was used on a growing scale in areas like the south-west and the Lothians from the early seventeenth century onwards.⁴ Its later use along with marl as the basis of eighteenth-century land improvement, therefore, was not entirely without prior knowledge or experience.

As soil additives, lime and marl were valued by farmers for their positive effects on the chemical and biological activity of the soil and for their very marked effect on soil structure. As regards the former, they not only corrected any tendency towards calcium deficiency, and thereby acidity, but they also helped to make available for plant growth a wider range of nutrients like phosphate and trace elements like

¹ To date the only discussions of liming or marling in Scotland before 1800 are those provided by B. C. Skinner, *The Lime Industry in the Lothians*, Edinburgh, 1969; J. E. Handley, *The Agricultural Revolution in Scotland*, Glasgow, 1963, esp. ch. v; T. C. Smout and A. Fenton, 'Scottish Agriculture Before the Improvers—An Exploration', *Ag. Hist. Rev.*, XIII, 1965, pp. 82–4.

² D. Ure, *General View of the Agriculture of the County of Roxburgh*, 1794, p. 26.

³ E. Kerridge, *The Agricultural Revolution*, 1967, pp. 244–50. A slightly later chronology for their adoption on a widespread scale is preferred by J. D. Chambers and G. E. Mingay, *The Agricultural Revolution, 1750–1880*, 1966, pp. 62–4.

⁴ Smout and Fenton, *loc. cit.*, pp. 82–4.

molybdenum. As regards the latter, when applied to clays, they facilitated the formation of a more open and friable structure, so essential in a soil that could be naturally structureless; whilst when applied to light or gravelly soils, they had the effect of binding the various fractions together into a more compact and consolidated soil. Marl, in particular, has long been known to have an enhanced effect on light soil, since as a mixture of clay and calcium carbonate it countered the soil's physical, as well as its chemical, deficiencies. Its use on clays, though, was avoided if lime was available: this was not only because clay-soil farmers did not relish the labour of applying very large quantities of marl for the sake of the relatively small amounts of calcium carbonate which it might contain, but also because marl, to be effective, required a thorough mixing with the soil, an operation that could prove costly on clay. In an area like Roxburghshire and Berwickshire, with its well-defined clay and light soil sectors on the lower ground, these differences between lime and marl cannot be ignored.

Two types of lime were used: burnt lime and ground lime. The former represented limestone or shells which had been calcined by burning in a kiln. At first, only lime produced in this way was thought to yield the full effects on the soil. However, during the eighteenth century it was realized that ground lime, or lime produced by the simple crushing and grinding of limestone or shells, could have an equal effect. Significantly, Lord Kames, a local Berwickshire landowner, did more than most to publicize this fact. His efforts can hardly have gone unnoticed by a local farming community which possessed scattered deposits of limestone but lacked suitable fuel supplies. Whatever its meaning to present-day geologists, to the eighteenth-century farmer, marl was a generic term covering a range of deposits. Within the area covered by this article, three different types were recognized: clay, rock, and shell marl. The first two were, respectively, clay, and any soft rock such as a mud or silt stone with a high calcareous content. The pre-

cise composition of the third, or shell marl, is a little uncertain, but it appears to have been a clay-based marl with a high shell content: this would have given it a higher calcium-carbonate value and made it an attractive substitute for lime, especially on light soils.

II

Taking an overview of the problem, liming was first practised in Roxburghshire and Berwickshire as a supplement to outfield tathing (manuring) during the pre-Improvement period.⁵ However, in spite of this early use of lime, marl was the first of the two to be used on a large scale. Following its pioneer use on the lowland Berwickshire estates of Ninewells, Swinton, and Eccles in the early 1730's,⁶ marling quickly became established as the prime aid to what most Improvers saw as the necessary task of land improvement. The widespread use of marl, though, lasted only until the 1760's, when lime became much the more popular of the two. This pattern of change is borne out by a number of writers. A. Bruce, for instance, writing on Berwickshire farming in 1794, reported that "lime . . . is here entitled to the first place; though marl amongst the early improvers had the preference."⁷ Likewise, A. Lowe, after noting that "marl was deadstock after the general introduction of lime," went on to observe that "the period of the greatest avidity for lime in Berwickshire" was from 1760 up to about 1780 when the scale of its use began to decline.⁸ A similar shift from one to the other is documented for Roxburghshire, but here it was less sudden and sweeping in its character, with shell marl continuing in use until the early nineteenth century.⁹

⁵ A. Lowe, *General View of the Agriculture of the County of Berwick*, 1794, p. 93. Late surviving examples of outfield liming can be found in late eighteenth-century leases for the Scott of Harden estate; see Scottish Record Office (hereafter S.R.O.), GD 157/1172.

⁶ J. Home, *Rectified Report of Berwickshire Agriculture*, Berwick, 1797, pp. 24-5; A. Bruce, *Appendix to the General View of the Agriculture of the County of Berwick*, 1794, pp. 103-4.

⁷ *Ibid.*, p. 121. ⁸ Lowe, *op. cit.*, p. 93.

⁹ R. Douglas, *General View of the Agriculture of the Counties of Roxburgh and Selkirk*, Edinburgh, 1798, pp. 138-9.

There can be little doubt that one of the reasons for the initial popularity of marl lay in the convenience of local deposits. An attempt to map those areas in which marl pits were concentrated can be seen in Figure 1. The most important were along the Rivers Dye and Whiteadder in north-central Berwickshire, where extensive beds of clay marl were to be found, and in the parishes of Bowden, Lilliesleaf, Ashkirk, Wilton, Minto Robertson, and Hawick in south-western Roxburghshire, where rich deposits of shell marl were to be found under the many mosses that dotted the area. Outside these two main areas, smaller concentrations of marl pits existed within reasonable distance of most parts of the lower ground.

Encouraged by the prospect of finding local deposits, many landowners did in fact search for marl beneath suitable parts of their property. For example, work and stock books for the Marchmont estate in central Berwickshire contain, on the one hand, regular instructions for marling particular fields, such as the entry in 1759 that the "whole of the Woodsidehill not marled, is to be plowed, as level as possible, the stones gathered off and to be made fit for Marling."¹⁰ On the other hand, they also contain directions for locating marl deposits, such as in 1756 when it was instructed that "all the stones be led off the Cothill Bank, and a ditch be drawn through the boggy part of it on the northside of the oats so as to see if there be any marle in it."¹¹ Similar activity took place on the Roxburgh estate once it became clear that beds of shell marl existed under its property in the parish of Bowden. To some extent, the estate's interest in surveying the location and extent of marl in this area was prompted by the fact that the mosses under which the main deposits lay, Blackpool and Murder Mosses, were used by the feuars (perpetual leaseholder) of Midlem for casting peat. As the value of marl became established in the area, the feuars seized the opportunity of exploiting it along with their peat. Naturally, the estate, mindful of the loss of

¹⁰ S.R.O., GD 158, Marchmont Stock Book, 1746-62, Directions for the year 1759.

¹¹ *Ibid.*, Directions for the year 1756.

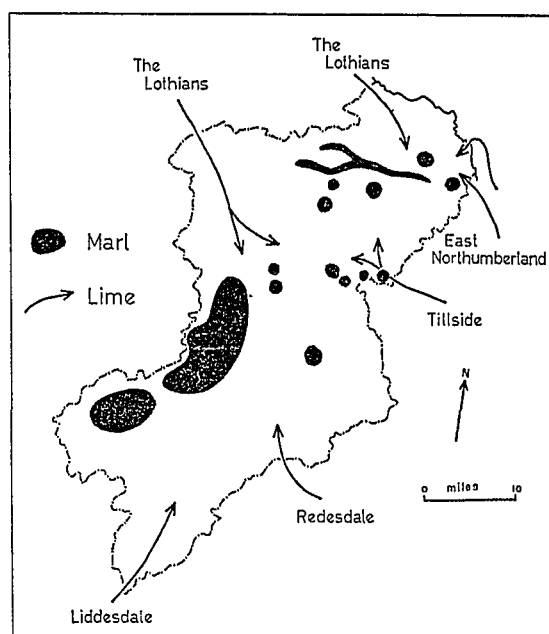


FIG. 1. Roxburghshire and Berwickshire: Sources of Marl and Lime.

potentially valuable estate resource, sought to resist this unfounded extension of rights.¹² However, once its interest had been awakened, the estate began to sanction the use of the marl by its own farms, particularly those which bordered the Mosses. Thus, within a few years, marl from Blackpool Moss was being used on the adjacent farms of Faughill and Hollydean.¹³ Similarly, amongst the plans for the creation of a farm out of part of Clarilaw Muir, on which Blackpool and Murder Mosses were situated, was a proposal for draining two small mosses within the bounds of the planned farm and extracting marl for its necessary improvement.¹⁴ However, a later report commissioned by the estate, did not consider these farms to be especially suited to marling. To use the report's own words, marl

¹² Roxburgh MSS., Floors Castle, Kelso, *Memorial for His Grace The Duke of Roxburgh concerning Clairilaw Mosses*, 1781, and *ibid.*, *Coppy Letter from WL to Mr Erskine anent Selkirk common—Claim of Marle Mosses*, Oct 31st 1777.

¹³ *Ibid.*, *Report of M.S. [Mathew Stobie] Blackpool Moss*, Oct 31st 1791, and *ibid.*, *Letter Andr. Blackie anent Blackpool moss & marle Drain*, 13th Nov 1771.

¹⁴ *Ibid.*, *Mr Stobie's observations for making a ffarm of Clarilaw Muir*, Octr. 1783.

is an excellent Manure, if it be properly Managed, and adapted to a Dry light Soil, I have seen better Crops produced by Marl, upon very poor Soils, than ever I have seen by Dung or Lime, its value is not known in this Country, by the very low price it is sold for which may be accounted for, as the Soils in the Neighbourhood of the Marle Pits, about Hollydean, Faughill xc. xc. are not proper Soils for Marle, no doubt it does a little good to the land, but if it were applied to proper soils, the produce would be more than double, it has bad effects in the adjacent Grounds about Blackpoolmoss, where it is got as it always makes the Crops later, and that being Generally a late Country whereas Lime has the Contrary effect, in making crops early. . . In my way to Faughill the other day, I did not see proper Soils for Marle till I came as far East, as Broomhouse, a Farm belonging to Sir Alexander Don, and about Rutherford, and the Barony of Roxburgh, Where the lands are of a light dry Soil Marle will have a good effect.¹⁵

A number of estates conserved their marl resources by restricting its sale or use to farms on the estate. This was certainly true of the Roxburgh estate pits on Clarilaw Muir, and was also true of pits opened on the Minto, Buccleuch, and Scott of Harden estates elsewhere in Roxburghshire.¹⁶ Indeed, in Roxburghshire generally, where marl had the greatest effect because of its fairly large light-soil sector, and where it was in fact used longest, the first public sale of marl was not until 1772 when the pits at Whitemoorhall in Bowden

parish were opened, followed shortly after by those at nearby Falkside.¹⁷ Inevitably, this restriction on the sale of marl must have contributed further to the active search for it by those farmers or estates who were otherwise excluded.

Further encouragement to the exploitation of local deposits was provided by the fact that marl, especially clay and rock marl, had to be applied in large quantities if it was to have a discernible effect. Exactly how much is difficult to say with any certainty, for most estimates involve figures based on "cart loads." Since cart loads could be one- or two-horse carts, with capacities ranging from as low as two up to six or seven bolls, it follows that estimates based on such figures do not lend themselves easily to comparison with each other. If a farmer reported using 25-50 cart loads of shell marl per acre,¹⁸ and another 150-200,¹⁹ or if a farmer recommended spreading as much as 450-600 cart loads of clay or rock marl per acre,²⁰ one has to allow for part of these variations as arising from differences in cart load size. What is clear, though, is that the considerable quantities of marl usually involved must have placed a high premium on the farmer's proximity to available deposits.

An important feature of marl was that its effect on soils was slow when compared with that of lime. As Bruce put it, "its process in fertilising the soil, for the first two years, is little more than discernible, whereas lime operates instantaneously."²¹ Part of the difficulty was that before it had any effect, marl needed to be thoroughly mixed with the soil. At Ninewells and East Mains in the Berwickshire parish of Chirnside, for example, both of which were extensively marled in the 1730's

¹⁵ Roxburgh MSS., Floors Castle, Kelso, *Report about Marle from Clarilaw Muir And where it might be used to advantage*, 1791 M.S. [Mathew Stobie].

¹⁶ The Minto estate opened a marl pit in a small moss called Crows Moss on the farm of Wellridge. See National Library of Scotland (hereafter N.L.S.), Minto Plan no. 5, Barony of Minto 1766. According to Douglas, *op. cit.*, pp. 134-5, Sir Gilbert Eliot of Minto was the first landowner to use shell marl in Roxburghshire. His Crows Moss pit was opened in 1755, and was used to marl 200 acres. For the Buccleuch estate, see *Old Statistical Account of Scotland* (hereafter O.S.A.), VIII, Edinburgh, 1791-8, p. 23. For Scott of Harden estate, see S.R.O., GD 157/1172.

¹⁷ Douglas, *op. cit.*, p. 134; Roxburgh MSS., *Letter from Andr Blackie—State of Mosses Clarilaw and proposal for settling marle affair*, 30th May 1782.

¹⁸ A. Wight, *Present State of Husbandry in Scotland. Extracts from the Report Made to the Commissioners of the Annexed Estates*. Edinburgh, 1778-84, II, p. 391, IV, p. 603.

¹⁹ O.S.A., VIII, Eckford parish, p. 23.

²⁰ Wight, *op. cit.*, II, pp. 295-300, and IV, p. 535; Home, *op. cit.*, p. 94; Bruce, *op. cit.*, p. 121.

²¹ *Ibid.*, p. 121.

and 1740's, it was estimated that it took three to five years to mix the marl adequately with the soil.²² This was a problem even with shell marl. Writing of the tenant of Burnfoot and Branxholmbræ near Hawick, A. Wight commented that "shell marl is his plight anchor. He gives 160 bolls to an acre; but he does not find from it the increase expected. The reason may be, either the quantity is too great, or that sufficient care is not taken to mix it intimately with the soil. The last appears to be the case; because the marl has no sensible effect till the land be frequently ploughed."²³ However, although slower to act, marl had a more lasting effect than lime, continuing "longer to aid the crop than either lime or dung; and shows itself again when the field is broken up from grass."²⁴ To farmers on a fixed-term lease, the slower action of marl must have been a dissuasive factor. Even those on fifteen- or twenty-one-year leases must have debated whether their interests were better served by adopting a quick-acting manure. The point is well made by a writer on the parish of Bunckle and Preston in Berwickshire, who stated in the 1790's that clay marl "was formerly used as a manure to great advantage... but its operations are very slow, though lasting. The obligation in tenant's leases, in regard to the rotation of crops, and the obligation of having so great a quantity in grass, at least for the last 10 years of a 21 year lease, have induced farmers to prefer lime as a quick manure, though they are obliged to drive it 15 miles."²⁵

Although liming had become the more favoured of the two by the 1760's, marling did not cease entirely. The easily worked beds of clay marl along the Rivers Dye and Whiteadder, for instance, were quarried until at least the 1780's.²⁶ By the 1790's, however, commentators living within the vicinity of the pits were able to report that local farmers mostly used lime carted from Midlothian.²⁷ Without

doubt the most important area for the late-continued use of marl was central and northern Roxburghshire. This was an area of light soils on which marl offered an advantage that lime did not possess. As one local farmer observed when writing about marl in 1782, "people are not so fond of it of late unless the lands are naturally of a light dry soil."²⁸ Strong encouragement to its continued use in this area was also provided by the fairly late discovery of large amounts of shell marl in parts of central and south-western Roxburghshire. Most of the marl pits opened in this broad area after 1770, such as those at Whitemoorhall (Bowden parish) or Wester Moss Side (Eckford parish), were designed to tap local shell marl deposits. A fine illustration of how late marling continued in this area is provided by extracts from the diary of James Grieve, a farmer who occupied the farm of Branxholm Park in Teviotdale, a few miles south of Hawick. Grieve drew his marl from a small loch called Easter Loch, which stood a measured "3840 paces, or two miles, and about 1/5th" to the west of Branxholm Park. The entry he made in his diary for 14 November 1796 provides some glimpse of the routine associated with marling:

Began to lead out marle with three carts to the Crossflat 3 men and one women helping to fill and 2 women for spreading, went down to Ormiston [five miles to the north-west] today to see the shaft Mr Curor is driving to his marle pit. The common method is to lay it down in small nols [mounds] and spread it from them, or spread it direct from the carts when it is tolerably dry and not meant to be very thick laid on. Which is the best and less labour attending it, and where the land is rough or uneven it is better to spread it off the carts, 30 carts to the acre, or only 20 or under if done lightly.²⁹

Grieve obviously maintained a scheme of marling for a number of years, for some months

²² O.S.A., XIV, Chirnside parish, p. 11.

²³ Wight, *op. cit.*, II, p. 398. ²⁴ *Ibid.*, p. 380.

²⁵ O.S.A., III, Bunckle and Preston parish, p. 156.

²⁶ Lowe, *op. cit.*, p. 94.

²⁷ O.S.A., III, Bunckle and Preston parish, p. 156; *ibid.*, I, Longformacus parish, p. 69.

²⁸ Roxburgh MSS, *Letter from Andr Blackie—State of Mosses Clarilaw and proposal for settling marle affair*, 30th May 1782.

²⁹ Wilton Lodge Museum, Hawick, Grieve Diary, 14 Nov. 1796.

later he can be found meeting a small party of other farmers at Easter Loch to arrange the setting aside of a 9-acre plot for "accomodating the man who is to take charge of the marle."³⁰

It will be apparent from what has already been said that the cost of marling varied in accordance with a number of factors. Needless to say, this makes it difficult to fix an exact cost per acre. All one can do is cite the two most detailed estimates available, and then underline ways in which its cost might vary from these estimates. The first estimate, compiled by A. Low, refers to his own experience in applying rock marl to his farm at Woodend on the Langton Estate in Berwickshire during the 1760's. His costs worked out at £35 per 10 acres, the marl being spread at a rate of 600 carts per acre.³¹ Although he does not make it

absolutely clear, Low's figures probably relate only to the labour of digging, carting, spreading, and mixing the marl. It is difficult otherwise to see how so much marl, even at the assumed low price of say 2d. a cart, could possibly have been applied for so little. In all probability, Low was using marl available to him without cost, perhaps from deposits on the farm at Woodend itself or from another part of the Langton Estate.³² The second detailed estimate is one published by R. Douglas in 1798.³³ Unlike Low's, it incorporates no allowance for the labour of spreading and mixing the marl. Instead, it costs only the marl itself and its carriage (see Table I). Regrettably, Douglas omits to mention what kind of marl he used as the basis for his estimate. Its fairly high price of 10d. per cart suggests it was shell marl, for near-contemporary figures provided by other

³⁰ *Ibid.*, 26 April 1797.

³¹ Wight, *op. cit.*, II, p. 315. Low's estimate can be compared with Bruce's estimate of "31. 10s. to 41. per acre": Bruce, *op. cit.*, p. 121.

³² *O.S.A.*, xiv, Langton parish, p. 579.

³³ Douglas, *op. cit.*, pp. 134-8.

TABLE I
COST OF MARL AND ITS CARRIAGE IN ROXBURGHSHIRE

Example A.	£ s. d.
Cost of 30 carts of marl from the pit at 10d. each	1 5 0
Carriage of 24 carts of dried marl 3 miles at 8d. each	16 0
Total	2 1 0
Example B.	
Cost of 60 carts of marl from the pit at 10d. each	2 10 0
Carriage of 48 carts of dried marl 3 miles at 8d. each	1 12 0
Total	4 2 0
Example C.	
Cost of 30 carts of marl from the pit at 10d. each	1 5 0
Carriage of 24 carts of dried marl 8 miles at 1s. 8d. each	2 0 0
Total	3 5 0
Example D.	
Cost of 60 carts of marl from the pit at 10d. each	2 10 0
Carriage of 48 carts of dried marl 8 miles at 1s. 8d. each	4 0 0
Total	6 10 0

Source: Douglas, *op. cit.*, pp. 136-7

sources fix the cost of shell marl when sold publicly at about 6d.-9d. per cart. As noted earlier, however, comparisons based on cart-load units need caution unless they are accompanied by the number of bolls which each cart load contained. Possibly the most valuable aspect of Douglas's figures is the importance which they clearly attach to transport costs. Thus, at three miles, the cost of carriage was only slightly less than the cost of the marl itself. If the distance involved rose to eight miles, transport costs per cart could be as much as twice the value of the marl. Given that clay and shell marl might be applied in quantities of 450-600 carts per acre, it scarcely needs stating that such manures must have been subject to very stringent cost restraints imposed by distance. Perhaps the utility of shell marl lay not simply in its higher calcareous content but in the fact that, by requiring smaller amounts per acre, it proved to be much more capable of withstanding the costs of transport. An important source of variation not mentioned by Douglas lay in the cost of the ploughings necessary to mix the marl with the soil. Compared with their light-soil counterparts, clay-soil farmers who marled faced the prospect of having to give more ploughings at a higher cost per ploughing, yet they were in no position to expect their returns to be proportionately greater.³⁴

³⁴ Comparison between these costs for marling in Roxburghshire and Berwickshire and its cost in other parts of Britain are complicated by variations in the amount applied per acre, and by such factors as whether farmers had to buy the marl or whether it was available to them free of charge. Thus, A. Young, *A Six Months' Tour Through the North of England*, III, 1770, pp. 214, 221, 314, and W. Marshall, *Review and Abstract of the County Reports to the Board of Agriculture*, II, York, 1809, p. 140, cite costs which are comparable with those for Roxburghshire and Berwickshire. However, A. Young, *General View of the Agriculture of the County of Norfolk*, 1804, pp. 402-12, and W. Marshall, *The Rural Economy of Norfolk*, I, 2nd edn, 1795, p. 157, cite figures which are noticeably lower. The latter, though, appear to make no allowance for the purchase of marl. In Roxburghshire and Berwickshire tenant farmers frequently paid for the marl quarried from their own farm. See, for instance, S.R.O., GD 157/1172, especially the lease for Oakwood and Huntly (1793) which allowed the tenant to use the marl on the farm at a rate of 3d. per single cart and 6d. per double cart.

III

The problem of liming differed in a number of ways. Although a few lime kilns were operated using local limestone, such as those around Hawick³⁵ or the solitary example reported in use on the Marchmont estate,³⁶ the region's main sources of lime were the kilns in the adjacent counties of Midlothian, Dumfriesshire, and Northumberland (see Fig. 1). In northern Berwickshire, the pattern of supply reflected proximity with lime being brought from Midlothian via Lauderdale or from East Lothian via the east coast. In the Merse, lime was drawn from Tillside and other centres in east Northumberland, the lime being transported across the Tweed at Berwick or Coldstream. The pattern in Roxburghshire was similar, with the northern part of the county drawing lime from the Midlothian kilns, and the eastern parts drawing lime from Tillside via Coldstream. Further south, as the distance from both these sources increased, farmers depended on the poor-quality lime produced by the handful of kilns around Hawick, or on lime drawn from the kilns along Redeswater in Northumberland or from Liddesdale. Whichever source was used, the distances involved were usually substantial. Small wonder then that some writers should attribute the swing to lime to the greater ease of cartage brought about by road improvements.³⁷

Lime of course did have the compensating advantage of needing smaller amounts per acre than marl. Writing in 1794, D. Ure reported it as being "used in various quantities, from twenty to fifty bolls English, per acre,"³⁸ or to put this another way, "six, eight or nine . . . cart loads, according to the nature of the ground."³⁹ Detailed evidence for the Paxton estate in Berwickshire suggest that the amount applied per acre on its farms certainly fell within these

³⁵ Douglas, *op. cit.*, p. 11.

³⁶ S.R.O., GD 158, *Report relative to the Lordship and Estate of Marchmont, The Barony of Hume, etc.* Compiled by D. Low, 1819, p. 3.

³⁷ O.S.A., VII, Westruther parish, p. 114; Bruce, *op. cit.*, p. 97; Douglas, *op. cit.*, p. 139.

³⁸ Ure, *op. cit.*, pp. 25-6.

³⁹ O.S.A., X, St Boswells parish, p. 205.

limits.⁴⁰ Elsewhere, however, the nature of the ground could demand much more. Thus, on the farms of Northside and Southside Upsetlington in the Berwickshire parish of Ladykirk, most fields were limed at a rate of 8 carts or 50 English bolls per acre, but some received amounts as high as 40 or even 82 carts per acre.⁴¹

As noted earlier, farmers in the Merse used lime as a supplement to outfield tathing during the pre-Improvement period. It is hardly surprising, therefore, that when the more progressive landowners in the region began to seek out ways of improving their estates during the 1740's and 1750's, lime was sometimes used, albeit on a lesser scale than marl. It was used on the farms of the Scott of Harden estate in Berwickshire, for instance, during the late 1740's, whilst on the nearby Marchmont estate small amounts were used alongside marl in the mid-1750's.⁴² A good illustration of the early use of lime nearer the Tweed is provided by the tenant of the farm of Paxton, who like other tenants on the Paxton estate was required by a lease of 1745 "to carry five pund Sterlings worth of lime each year dureing the last seven years of the present tack of the distance of five miles and no further and be laid on the sd. lands in the manner the sd. John Home and his forsd Shall direct"—though, at the same time, he was allowed "to dig for Marle anywhere on the grounds."⁴³

Late eighteenth-century writers give the impression that lime supplanted marl as the

preferred artificial manure round about the 1760's. Certainly, references to liming are much easier to find over the next two or three decades. Numerous examples, for instance, can be found in the relevant sections of A. Wight's *Present State of Husbandry in Scotland*,⁴⁴ and in the parish reports of the *Old Statistical Account of Scotland*.⁴⁵ Manuscript sources, likewise, are much more forthcoming. The Ladykirk estate, for example, appears to have followed a systematic liming programme on its farms of Northside, Southside, and Eastside of Upsetlington during the 1760's and 1770's, with frequent reference in the estate's work-books to fields being cleared of stones, their ridges levelled or straightened, and lime spread.⁴⁶ Farms or fields not limed by the estate were limed by their tenants.⁴⁷ On the Dunglass estate in northern Berwickshire, accounts and receipts show that during the 1770's a number of tenants, such as those on the farms of Carnside, Swinton Quarter, and Berryhaugh, were given discounts on their rent for liming.⁴⁸ A similar arrangement prevailed on the Billie estate nearby. Thus, in 1775, the tenant of Ashfield, Billie Hill, and Billie Mains was allowed "out of his rent the sum of Two hundred pounds Sterling for purchasing Shell lime at Berwick or Northumberland Kilns."⁴⁹ The Marchmont estate in central Berwickshire appears to have followed a similar policy, for an early nineteenth-century estate survey not only notes that a number of farms had been limed during the latter part of the eighteenth century, but

⁴⁰ S.R.O., GD 267/29/21. See, in particular, those manuscripts which, under the old Home-Robertson MSS scheme of classification, were numbered 225/6, 225/9, 237/5, and 232. The last mentioned manuscript, no. 232, contains a set of proposals by P. France for cropping a farm in Paxton (1783), and is especially forthcoming on the number of bolls or cart loads of lime to be applied per acre.

⁴¹ N.L.S., Robertson of Ladykirk MSS., no. 998, pp. 168, 175.

⁴² S.R.O., GD 157, Box 134 *Accompt Charge and Discharge for Croft*, 1749; *ibid.*, Box 135 *Accompt of Money Delivered for several things* 1753; S.R.O., GD 158, Marchmont Stock Books, 1746-62, *Account of Arable Ground*, 1755. The latter details the treatment of 14 fields, 1 of which was limed, 1 was part limed and part fallowed, 6 were fallowed, and 6 were marled.

⁴³ S.R.O., GD 267/29/21 (old classification no. 225/9).

⁴⁴ Wight, *op. cit.*, II, pp. 280, 319-20, 326-7, 332, 340, 344, 352, 361, 372, 378, 380; IV, pp. 535, 540, 544, 551, 555, 567, 581, 592, 600.

⁴⁵ O.S.A., XII, Abbey St Bathans parish, p. 61; I, Ayton parish, p. 80; II, Crailing parish, p. 326; III, Linton parish, p. 120; X, St Boswells parish, p. 205; X, Kelso parish, p. 577; XI, Foulden parish, p. 117; XI, Eccles parish, p. 231; XI, Ednam parish, p. 304; XI, Oxnam parish, p. 326; XII, Coldingham parish, p. 51; XIV, Langton parish, p. 579; XVII, Lilliesleaf parish, p. 174.

⁴⁶ N.L.S., Robertson of Ladykirk MSS., no. 998, pp. 118, 136, 148, 162-3, 168, 175.

⁴⁷ *Ibid.*, no. 999, Lease to Thos. Richardson, 1774.

⁴⁸ Reading University Library, Hall of Dunglass MSS., *Rental of Lands in the Shire of Berwick belonging to William Hall of Whitehall for Crop* 1775.

⁴⁹ S.R.O., GD 267/29/21 (old classification no. 237/5).

also states that in 1772 a tenant of Kingsrig farm had gone bankrupt despite receiving lime discounts.⁵⁰ To the south, the Scott of Harden estate, with farms in both southern Berwickshire and northern Roxburghshire, provides still more evidence for lime discounts. The estate's rental of 1785, for instance, records that the tenants of Magdalenhall "are allowed out of their rent £5 yearly, for lyme upon producing the lyme Grieves [overseer's] receipts for the same." Other tenants, meanwhile, on the farms of Bellfield and Crossrig are noted down as allowed discounts of £10 for lime.⁵¹ However, one must not overlook the fact that the Scott of Harden estate possessed extensive reserves of shell marl, and during the closing decades of the eighteenth century quite a number of its tenants, especially those in northern Roxburghshire, were encouraged to use these reserves rather than buy lime.⁵² On some estates, tenants were even compelled to lime by the management clauses inserted in their leases. The earlier-cited Paxton lease provides a good illustration of this. Another example amongst the Home-Robertson Papers is provided by a lease granted to the tenant who entered Blackspotts farm, near Coldingham, in 1766. Its management clauses included one which bound the tenant "to lime and Improve the whole arable Lands in a regular and sufficient manner."⁵³ So-called "improving leases" stipulating the use of limes were also issued by the Roxburgh and Minto estates in Roxburghshire.⁵⁴

Although the distinction is not necessarily a clear one, lime was used in two ways, either as a vital part of the process of land improvement, or as a general-purpose manure for use in the

routine of husbandry. In the former role it was naturally more important on land which had previously been outfield rather than infield,⁵⁵ and upon lowland moss and muir ground which was suitable for reclamation. Its effect on former outfields was particularly significant. On many lowland farms, outfield represented up to two-thirds of the entire farm, yet in consequence of past treatment it generally showed signs of too much cropping and too little manure. For many Improvers, then, putting heart back into their outfield was their most immediate task.⁵⁶ As outfield formed the only source of grass on the farm, some farmers approached its improvement by reversing the roles of infield and outfield, laying the former down to grass and subjecting the latter to a course of liming and fallowing. This was obviously the procedure followed on the farms of Woodheads and Harden on the Marchmont estate, for amongst the estate's 'Instructions for 1763' was a note to the effect that the "infield of Woodheads and Hardens till the Outfield be limed must be left in grass for working cattle."⁵⁷

Writing about Berwickshire in 1784, Wight made the point: "Forty years ago, the good land was checkered with moors and other barren ground. These have all disappeared in the Merse, a district comprehending the lower

⁵⁵ See, for instance, the comment by the reporter for Coldstream parish, *O.S.A.*, XII, pp. 50-1, that "lime seems only useful on the outfield not on infield where its effect was less dramatic."

⁵⁶ A good illustration of this is provided by the 1761 lease for Easter Muirdean, since it required the tenant "as soon as may be to improve the whole of the outfield thereof—(excepting the muir) by fallowing & liming or dunging." Roxburgh MSS., *Tack to J. Penman for Easter Muirdean, 1761*. According to Wight, *op. cit.*, II, p. 372, the tenant of Stodrig, also on the Roxburgh estate, began his scheme of improvement by liming the outfield.

⁵⁷ S.R.O., GD 158, Marchmont Stock Books 1746-62, *Directions for 1763*. See also Wight, *op. cit.*, II, pp. 319, 342-4, 397. A very detailed example is cited by *O.S.A.*, XII, Coldstream parish, p. 51. The origin of this approach to improvement can be traced back to Lord Belhaven, *The Countrey-Man's Rudiments: or, an Advice, to the Farmers in East Lothian how to Labour and Improve their Ground*, Edinburgh, 1699, p. 22, with his suggestion that one of the most urgent tasks facing farmers was the improvement of the grazing capacity of farms: the method recommended involved the laying down of infield to grass and the systematic liming of outfield.

⁵⁰ S.R.O., GD 158, *Report . . . Lordship and Estate of Marchmont, 1819*, pp. 17, 100, 116, 129.

⁵¹ S.R.O., GD 157, *Rental of Mr Scott of Harden's Mertoun, Berwickshire . . . and Harden Estate, 1785*.

⁵² Numerous references to the exploitation of these marl resources can be found in the late eighteenth-century lease transcripts provided by *ibid.*, 1172.

⁵³ S.R.O., GD 267/29/21 (old classification no. 237/10).

⁵⁴ Roxburgh MSS., *Tack to J. Penman for Easter Muirdean 1761*; N.L.S., Minto MSS., *Tacks and Inventories, 1786-93—Minutes of Agreement between Sir Gilbert Eliot and George Mitchelson for the farm of Minto, 1792*.

parts of the shire; and, at present, every field in it looks rich and fertile."⁵⁸ The prime aid to this transformation was almost certainly lime. Indeed, H. Home, when making roughly the same sort of point, ascribed the change directly to lime:

the "Berwickshire farmer, tho' desirous to dispense with the dear-bought manure of lime, . . . must at the same time gratefully acknowledge the present flourishing state of cultivation to be founded on the basis of that manure. Its predecessor, clay marl, too laborious for the means or patience of the farmer, . . . and too tardy in its returns . . . had not in the year 1750 made much visible impression on the great wastes of the country. Lime, portable to all distances, quick and instant in its action, unlocked at once on all soils the dormant powers of reproduction. Among its many wonderful effects, experience tells us, that laid upon barren moor, where, for centuries past, heath only had been known to grow, the sward covers with white clover; spread upon moss the moss vanishes away."⁵⁹

Other writers were just as inclined as Home to link reclamation with lime. A leading surveyor in Roxburghshire, for example, observing a stretch of waste ground on the farm of Sprouston Hill which had previously been common grazing land, commented that "it is a shame to see the Lands in Haddenrigg, upon each side of the Turnpike Road lying in a state of nature, when they are very Capable of Improvement being so near Lime."⁶⁰

Apart from small patches of waste which, like Haddenrigg, were present in most parishes, the region could boast of a number of large, lowland waste areas. Some, like those which fringed the southern edge of the Lammermuirs, were partially or wholly reclaimed during the late eighteenth century.⁶¹ Others, however,

like Coldingham Muir, proved more resistant to change, with only a small proportion of the Muir's 6,000 acres being reclaimed or improved. Commenting on the scene which he found during his second visit to it in 1784, twelve years after it had been divided out of common, Wight declared the Muir to be "the subject of much industry; parts are enclosed, trees planted, corn growing, and cattle pasturing on pretty good grass."⁶² However, the optimism present in this description is tempered by his further comment that it would "require so much labour and expence to make it productive of good crops that it would be beyond the ordinary endurance of a lease to attempt improvement"; any improvement must be carried out by the proprietor, and "even he must consider it a purchase."⁶³ Admittedly, one or two proprietors did attempt or plan to improve their shares of the Muir. Sir John Home, for instance, improved 280 acres, using ground shell lime; but out of his share in the division over 1,000 acres still remained unimproved.⁶⁴ The largest landowner on the Muir was Sir Patrick Home of Billie, with 1,375 acres, but none of the schemes which he planned for his portion ever came to fruition. Considering the prospect soon after the Muir's division, he did at least decide that the "most proper way for improving the Common seems to be, to Break the Turf Sufficiently by plowing burning & harrowing, to Lay on 40 bolls of Shell lime to the acre, and to sow up oats & grass seeds."⁶⁵ In another set of proposals, this time involving the creation of a number of small farms, the "tenants were to be allowed the prime cost of all lime . . . from kilns beyond the Tweed or in East Lothian."⁶⁶ A covering note to his various unrealized schemes ruefully reflected that "they

⁶² Wight, *op. cit.*, IV, pp. 532-3. Information regarding the division of Coldingham Common can be found in S.R.O., GD 267/621, *Decreet of Division of Commony of Coldingham, 1772*, and *ibid.*, *Copy Extrs. from the Surveyors Report of the Division of Coldingham Common, 1772*.

⁶³ Wight, *op. cit.*, IV, p. 533. ⁶⁴ *Ibid.*, p. 535.

⁶⁵ S.R.O., GD 267/2622, *Memorandas about Mr Homes Allotment in Coldingham Common*.

⁶⁶ *Ibid.*, *Proposed Conditions for sett of small farms in Coldingham Common*.

⁵⁸ Wight, *op. cit.*, IV, p. 587.

⁵⁹ Home, *op. cit.*, pp. 92-3.

⁶⁰ Roxburgh MSS., *Mathew Stobie's Report of Sprouston-hill Farm, May 31 1792*.

⁶¹ O.S.A., III, Bunckle and Preston, p. 153; XII, Abbey St Bathans parish, p. 61; XIV, Greenlaw parish, p. 512.

were found either imprudent or impracticable, I think the great error has been in not planting. They say it is never too late to mend—but the objection has been, I am apprehensive must continue to be, the Inconvenience of the immediate expence and the distant profite.”⁶⁷

Unlike marling, which was regarded as something of a once and for all treatment, liming established itself as a practice that could be repeated. Obviously, though, once any basic calcium deficiency had been made good, further applications of lime were unlikely to have the same effect as the initial application. This led to a certain amount of controversy over whether recurrent liming repaid the investment. D. Low of Woodend declared himself in favour of continuing applications: his policy was, he stated, “to lay lime upon the fallowed field; so that some of my land has been three times limed. I cannot agree, that lime laid on ground the second or third time, does no good though I have often heard the fact asserted.”⁶⁸ Although some farmers seemed bemused by its potentially dramatic effects when first applied to impoverished outfield and muir ground, and felt disappointed with anything less, farmers generally were inclined increasingly to Low’s view, and limed on a regular basis both their former infield and outfield.⁶⁹ Perhaps the best illustration of the acceptance of lime as a general-purpose manure is the management clause inserted into leases for farms in the Barony of Coldstream after 1788. It stipulated that each tenant was “to lead one Cart load of lime for every three cart loads of straw he sells.”⁷⁰ Older tenants, in particular, might have appreciated the precise significance of this clause, for a complete embargo on the off-farm sale of straw was one of the few restrictions which pre-Improvement leases contained.

Cost-wise, lime was not vastly different

from marl, its higher cost per cart and higher transport costs being offset by the smaller quantities needed per acre. An opportunity to see its cost in full is provided by material relating to the Ladykirk estate. As part of his comprehensive liming programme, R. Robertson, the owner, made two detailed calculations of how much liming cost him on two particular fields, one of which had previously been outfield, and the other an enclosure which presumably had formerly been infield (see Tables II and III). In both cases the lime used cost around 5s. per cart. Given that Robertson was using carts capable of holding seven to eight English bolls, this seems a reasonable price for lime when compared with the range of prices quoted elsewhere. In terms of lime alone, it represents a cost per acre of about £2 10s., though when Robertson applied lime at the rate of 40 or even 82 carts per acre his costs must have been of the order of £10 and £21 respectively. This, however, represents simply the cost of lime. Robertson’s calculations suggest that the cost of preparing the soil, spreading the lime, and then mixing it in with the soil could add anything up to a further pound per acre. Thus, his total costs worked out at about £3 to £3 10s. per acre. This can be compared with Low’s estimate of £3 17s. 6d. per acre for liming on his farm in Langton parish,⁷¹ with Douglas’s figure of £4 4s. per acre for liming an unspecified farm in Roxburghshire,⁷² or with the figure of £4 to £5 8s. per acre for the cost of lime and its carriage in St Boswells parish.⁷³ The higher value of these three estimates relative to that of Robertson is possibly explained by the fact that they were compiled twenty to thirty years later, and also that, being so close to Coldstream Bridge, and therefore the lime kilns of Tillside, Robertson probably had substantially lower carriage costs than most other farmers in the region. However, a total cost of between £3 17s. 6d. and £5 8s. per acre is still within the range of cost cited by writers like Arthur Young and William Marshall for

⁶⁷ *Ibid.*, untitled note accompanying *Memorandas about Mr Homes Allotment in Coldingham Common*.

⁶⁸ Wight, *op. cit.*, II, p. 315.

⁶⁹ *Ibid.*, II, pp. 372, 375, 378, 380, 381; IV, pp. 540, 551, 556, 578. Generally speaking, liming was followed by turnips on light soils, and wheat or barley on clays.

⁷⁰ S.R.O., GD 158, *Rental of the Barony of Coldstream, 1788*.

⁷¹ Wight, *op. cit.*, II, p. 315.

⁷² Douglas, *op. cit.*, p. 140.

⁷³ O.S.A., x, St Boswells parish, p. 205.

TABLE II
ACCOUNT OF EXPENCE OF IMPROVING . . . 16 ACRES NEVER HAD BEEN TOUCHED FOR 8 YEARS
WAS OUTFIELD ANNO 1763

(Abstracted from N.L.S., Ladykirk MSS., no. 998.)

Days Work	£	s.	d.
One winter ploughing, lay till 6 Aug	3	00	0
23 Several ploughing some parts more some parts less cross ploughing, cleavings, gathering &c in order to lay the Ridges all one way and Streight from 6 August to 21 Sept 23 days of a Three Horse plough Horses at Grass & Driver & Ploughmen tear & wear 2/6	3	00	0
2 Brake with three horses & driver 2 sh.		4	0
3 Harrows wt. two horses & driver 1/6		4	6
Price of 116 Carts of Lime Shells	28	00	0
9 Laying on lime from 21 Sept to 9 Oct two Carts one horse each & Driver 1 sh. Horse at grass - Men 1 sh. . . 2 sh.		18	0
9 Ploughing in said lime to ly all Winter from 27 Sept to 13 Oct 8 days whereof three horse plough at 2/6 £2 0 0			
Item a two Horse light Plough with feathered Sock Driver and greeve holding 6 days 2/6 . . . 15 0. Stopped with wett.		2	15 0
6 Days of 3 Horse plough in December to finish same Horses on Hay at 1/6 Men 1 sh 2/6			15 0
	£38	16	6

the closing decades of the eighteenth century.⁷⁴ If one sees the matter in terms of the total acreage limed by particular farmers, then it soon becomes apparent that it formed a significant use of farm capital. Not a few farmers it seems, were prepared to invest anything up to £1,000 on a liming programme designed to improve their farms, in addition to the amount they subsequently spent in purchasing lime as a general-purpose manure.⁷⁵ One local commentator, writing about Berwickshire farming in 1798, suggested that "lime had at least in one dressing overspread the whole cultivated area

of the county."⁷⁶ No doubt the same boast could be made in Roxburghshire. Even if it were only half true, it would make the regional investment in liming considerable.

It will be clear from the foregoing discussion that the shift from marl to lime can be ascribed to a number of factors. However, without discounting the idea entirely, the suggestion of some writers that lime became noticeably the cheaper of the two as roads were improved and transport costs lowered is not borne out by a comparison between the costs of liming and those of marling. More convincing reasons are the greater convenience of lime, its more rapid effect on the soil, its greater suitability for use as a regular manure, and its common availability on a commercial basis by the last quarter of the eighteenth century. Once the changeover had taken place, marl continued to be used only on light soils and where local supplies were available. Even taking the lowest possible estimate for liming, it is clear that these farmers must have spent over £1,000 on it. See *ibid.*, II, pp. 280-1, 318, 326, 371.

⁷⁶ Home, *op. cit.*, p. 93.

⁷⁴ See, for instance, Young, *Northern Tour*, III, pp. 62, 77, 127, 191, 205; Marshall, *Review and Abstract of the County Reports*, II, pp. 146, 243; *ibid.*, IV, pp. 38, 382-3, 532; Marshall, *Rural Economy of Yorkshire*, 1796, pp. 325-30.

⁷⁵ Douglas, *op. cit.*, p. 140, cites one farmer as paying out £545 14s. 7d. on an improving course of liming. Another farmer, in Ednam parish, reported spending £150 on lime "several" years running: see Wight, *op. cit.*, II, p. 340. Wight also provides a number of examples (Mordington, Kimmerghame, Fishwick, Stodrig, and Windywalls) in which farmers reported liming over 700 acres of land at rates of 50/60 bolls (or 7-8 carts) per acre.

TABLE III
ACCOUNT OF EXPENCE OF IMPROVING A SMALL INCLOSURE CONSISTING OF 10 ACRES
ENGLISH MEASURE

(Abstracted from N.L.S., Ladykirk MSS., no. 998.)

Imf. Sown by outgoing Tennant Anno 1754 remained in Grass 1755, 56, 57, 58, 59, 60. Sown with Oats 1761. Anno 1762 brought in thus:		
Days Work		£ s. d.
10 1 Ploughing before Marts. a Three Horse plough Ploughman & Driver at 3 sh pr day		1 10 0
10 2 ^d Ploughing same plough in April		1 10 0
12 3 ^d Plough ⁿ . from 16 May to 5 June being a Cross ploughing Horses on cutt grass at 2/6		1 10 0
7 4 Plough ⁿ . from 5 to 17 June at 2/6		17 6
2 A Brake with three Horses one Driver 2 sh Dung Cartfull of the Dung of 8 Horses 16 Cattle ledd out at different times		4 0
82 Cart full of Lime Shells price & carriage		20 00 0
7 Days spent in leading said Lime from several hutts with two carts each a Horse & a Driver at 2 sh pr Day—One Labourer to fill at 8 ^d —Ind 2/8 From 17 June to 24 June		18 8
9 Leading & spreading said Dung D ^o . Carts & D ^o . Horses from 17 June to 26 June 2 sh Labourer D ^o .		18 0 6 0
10 5 th Plough ⁿ . from 1st to 28 July 3 Horse Plough 2/6		1 5 0
		<u>£28 19 2</u>

able. Even where these two conditions were satisfied, the continued use of marl was not necessarily assured, for on light soils the special effects of marling on soil structure could be achieved just as easily by the folding of sheep on turnips, whilst the advantage of local supplies was ultimately a persuasive factor only if they were formed of calcium-rich shell marl.

IV

Any assessment of the impact of eighteenth-century marling and liming must begin with their effect on farm output. By exactly how much the latter rose it is difficult to say, for much depended on the particular circumstances and condition of each field. Those estimates available put the increase when marl or lime were applied for the first time at anything from

25 per cent to 100 per cent.⁷⁷ Inevitably, any increase in farm output was bound also to raise rent and land values. With other capital-intensive improvements taking place at the same time, it is almost impossible to isolate the precise contribution made by marling and liming to the recorded increases in rent and land values. However, writers who mention the matter leave no doubt the two were connected.⁷⁸ To the contemporary observer, a major contribution of marling and liming was their vital role in the transformation of the pre-

⁷⁷ Roxburgh MS., *Report about Marle from Clarilaw Muir And where it might be used to advantage*, 1791 MS.; O.S.A., x, St Boswells parish, p. 205; *ibid.*, 1, Longformacus parish, pp. 69-70; Wight, *op. cit.*, II, pp. 300, 310; J. S. L. Waldie, 'William Dawson, 1734-1815', *Agricultural Progress*, xxvi, 1951, pp. 97-8.

⁷⁸ Wight, *op. cit.*, pp. 341-4, gives the example of William Dawson at Frogden in Roxburghshire. Dawson took the farm of Frogden at a rent of £83 13s. After liming

Improvement landscape from its veritable patchwork of arable, moss, and muir into the regular and uniform pattern which we associate with the Improvers. Many a marginal soil must have owed its value to the stimulus pro-

and marling heavily, and then enclosing the farm, he sublet it for a rent of £331 6s. 8d. For further examples of increased rent and land values linked to liming and marling, see *ibid.*, IV, p. 544; *O.S.A.*, XIV, Langton parish, p. 579; *ibid.*, III, Ashkirk parish, p. 214; J. Thomson, 'Sketch of the Present State of Agriculture in Berwickshire', *Annals of Philosophy*, I, 1813, p. 262. Also worth mentioning is a reference by Mathew Stobie to "a Gentleman in Perthshire, who Doubled the Value of his Estate, by Marling, which he got at very great expence, he fished it with a Boat from a Loch, and afterwards carried it a considerable distance in Carts to his Estate, he took several of his farms into his own hand, at different times, and Marled them and then let them at double rent."—Roxburgh MSS., *Report about Marle . . . 1791*.

vided by marl and lime. Nor must one overlook the simple contribution to the farming scene made by the very routine of marling and liming. No better reminder of this can be cited than a local farmer's reminiscence about the mid-nineteenth century, a time when marling had virtually died out, and when lime was used on a reduced scale compared with the eighteenth century. Looking back across fifty years of farming life, he picked out the "scores" of carts which set out for the lime kilns at dusk and returned the following afternoon as one of his more enduring memories of the farming calendar.⁷⁹

⁷⁹ J. Wilson, 'Half a century as a border farmer', *Trans. High. and Agric. Soc.*, XIV, 1902, p. 41.