

The Diffusion of Knowledge among Northumberland Farmers, 1780-1815

By STUART MACDONALD

HOW was it that the late eighteenth- and early nineteenth-century farmer came to hear of new agricultural techniques that might have made his life easier or his farming more remunerative? How was it that, in an occupation in which experience taught the wisdom of tradition and the folly of change, the farmer became sufficiently convinced of the utility of a new technique to want to try it? These are not the same things. It is a far cry from knowing about something to being sufficiently impressed to want to use it.

I

Farmers did not generally farm for the glorification and improvement of agriculture, but for profit. Any change in the system by which they earned their living involved a potential threat to their standard of living. Farmers did not buy better breeds of stock or new implements because they felt their agriculture would benefit from the change, but because they thought they would. It is likely that one of the greatest obstacles to agricultural improvement during this period was the sheer inability of many farmers to calculate just what their profits were and where they had come from. A comment of 1852 was that "the leathern purse or canvass bag being full or otherwise [was] . . . the only indication of money gaining or losing with many."¹ The diffusion of knowledge had very basic, fundamental obstacles to overcome.

It has become almost traditional to regard the landlord as a source of agricultural information which farmers tapped to their benefit. Certainly the landlord was generally better educated and more travelled than his tenants, and had both a social responsibility and an economic incentive to enlighten them. It is easy

to overestimate the degree to which he did this because so much of our information is, of necessity, derived from estate records rather than farm records. It is very likely that landlords knew things their tenants did not, and that they made this information available, but what they could not so easily do was convince the tenant that change was to his own advantage. While the landlord certainly could help create those conditions conducive to agricultural improvement, he was poorly equipped to instigate that change in any other way, even by personal example. As an account of 1820 stated, "The example of one who is a good farmer, must have a much more beneficial effect in his neighbourhood, than that of a great landholder, however successful his practice may be . . . To such a man occasional failures are of little importance, though they might be serious to ordinary farmers, who, on this account, are seldom very forward in venturing out of their usual routine."² The example of one whose profit produced his agricultural techniques was hardly guaranteed to inspire those whose agricultural techniques were expected to produce their profit.

The ordinary farmer could hardly be blamed for lack of confidence in the agricultural enthusiasm of his landlord. Progressive experiments on the home farm were all very well, but the home farm was not usually expected to show a profit and when it did, as Professor F. M. L. Thompson has commented, it was worth writing a book about it.³ An important communications gap often matched the social divide between tenant and landlord. Evidence from working farmers is scant, but the follow-

² *Farmer's Magazine*, xxi, 1820, p. 480.

³ F. M. L. Thompson, 'English Great Estates in the Nineteenth Century', in *Communications of the First International Conference of Economic History*, Stockholm, 1960, p. 392.

¹ William Dickinson, 'On the Farming of Cumberland', *J.R.A.S.E.*, xiii, 1852, p. 224.

ing letter from George Boswell, a Dorset farmer and expert on the art of irrigating meadows, to another working farmer in Northumberland, is perhaps typical of the attitude of the practical man to his social superiors:

I've just had a letter from Sir John Sinclair acquainting me with the establishment of a Board of Agriculture, and with Desiring me to attend it in London as they wished to try an experiment of watering Hyde Park & Saint James Park. I have not yet answered it—He is quite ignorant of my situation in Life—it will not suit my inclinations nor pocket to go two hundred miles as my expense to gratify the idle curiosity of every person that chuse to ask it—I have had one or two of these excursions already—*pro bono publico*, won't always do. I very much doubt of the utility of these things in the hands of Lords and Dukes. Plain Country Farmers are not *at home* when they are with such sort of Folks. My hand, heart & Table such as it is are allways at the command of my Friends and nothing give me greater pleasure than to exchange mutual knowledge; but to dance attendance upon great Folk, & to answer such Questions as they may deign to ask you & then with an ungracious Nod be told you are done with—will not suit the stomach of your sincere Friend.⁴

It is suspected that many plain country farmers were equally resentful of schemes to encourage agricultural improvement by means of prizes. A farmer would consider changing his methods if he were reasonably certain the new would bring in more money than the old had done, but he would hardly change to win a medal. Advice from self-professed experts offered in books and periodicals—assuming these were read—was unlikely to encounter a sympathetic audience. In desperation, the Editor of the *Farmer's Magazine* wrote to a leading Northumberland farmer in 1803:

It is precisely such correspondents as you that I want; men who have learned wisdom in the school of experience and who do not attempt to pass base coin for sterling Money. I am under the Necessity sometimes of inserting Communications that are not altogether to my Mind, merely because that better cannot be got and also from a desire to keep well with people, who though imperfectly qualified to write are yet good friends to the Magazine.⁵

It is from Northumberland that this paper draws evidence concerning the means by which farmers found out about new ideas and became interested in making use of them. As very little innovation in agriculture could have occurred without the active interest and support of farmers, an examination of how this happened seems worthwhile. Obviously, such a study is best conducted at the local level, and Northumberland, a county which experienced marked and rapid agricultural change during the late eighteenth and early nineteenth centuries, provides a suitable basis. No attempt is made to examine the overall influence on farmers of landlords, or of agricultural publications. Presumably the impact of both varied greatly, and can be satisfactorily studied only at the national level.

II

Local newspapers may have been an effective source of information for the average Northumberland farmer. Such a paper, containing information about market prices and farm letting, as well as local news, was the sort of material he would have wanted to read. The *Newcastle Courant* was the major newspaper in the north-east throughout this period with a weekly circulation of about 4,000 copies in 1840.⁶ Map 1 traces the distribution of the paper's sales agents at this time, and gives an idea of the spatial extent of such a local newspaper's influence. An interesting piece of market analysis in 1841 revealed that farmers

⁴ Northumberland County Record Office (N.C.R.O.): ZCU/18. George Boswell to George Culley, 1793.

⁵ N.C.R.O./ZCU/25: editor of *Farmer's Magazine* to George Culley, 17 March 1803.

⁶ *Newcastle Courant* (N.C.), 1 Jan. 1841.



MAP 1. Distribution of *Newcastle Courant* sales agents

Source: *Newcastle Courant*, 1 Jan. 1841

accounted for a quarter of the circulation, and that each farmer's newspaper was read by an average of six people. Hence, 36,950 people in the agricultural community of the north-east were being contacted weekly by the *Newcastle Courant* in 1841.⁷ In fact, little use was made of this medium for the diffusion of agricultural information. A few snippets were taken from London papers, but the only agricultural topics dealt with at any length were those that appealed to the imagination. Caterpillars could be eradicated from turnip fields if ducks were sent in to devour them,⁸ mice from haystacks with the aid of a few sprigs of mint,⁹ and great things were expected of a plough designed to work by wind power.¹⁰ Once a £200 subscription had been filled, it was revealed that the problem of turnip fly could be overcome by planting radishes with the turnips, the fly apparently preferring the taste of radish to that of turnip.¹¹ Another subscription, this time of 2,000 guineas, was raised by one Henry Vagg, who promised a better remedy for the same problem. The subscription filled, Mr Vagg revealed that the real enemy was not the fly at all

but slugs, and these could best be destroyed by flattening them with a roller at night.¹²

While nearly all the agricultural advice offered by the *Newcastle Courant* was absolutely worthless, the newspaper must have encouraged farmers to keep abreast of the latest practices by means of the large number of advertisements it carried for new implements, draining tiles, seeds, manures, and all manner of agricultural services. A copy letter survives from one Northumberland steward to William Winlaw, requesting "a good wheel plough Such as are used in and about Norwich or yarmouth."¹³ Winlaw, the earliest London implement maker to advertise in the *Courant*, had offered "all kinds of Ploughs made use of in the different counties." Winlaw's first advertisement appeared on 30 August 1783, and the steward's order is dated 9 September, just ten days later.

The period was one in which many local agricultural societies were formed. These held meetings at which the members heard papers delivered, and discussed new ideas. Some societies had a library and some even a museum. All of them held agricultural shows, and existed, at least ostensibly, to encourage the diffusion of agricultural knowledge. If they did this, they may have been most effective through the very full accounts of their meetings published in local newspapers, although, to be fair, though there were some thirty agricultural societies founded in the north-east before 1850,¹⁴ none received anything like the press coverage given to the more aristocratic Society for the Improvement of the English Marigold. Not that the early agricultural societies were not socially respectable. Of the 101 members of the Tweedside Agricultural Society in 1812, only twenty-two were no more than farmers.¹⁵ Membership of the Durham Agricultural

¹² *N.C.*, 26 April, 14 June, 5 July 1788, 8 Aug. 1789.

¹³ *N.C.R.O./2DE/4/15/48*: Joseph Oxley to William Winlaw, 9 Sept. 1783.

¹⁴ Stuart Macdonald, "The Development of Agriculture and the Diffusion of Agricultural Innovation in Northumberland, 1750-1850", unpub. Ph.D. thesis, Newcastle, 1974, p. 488.

¹⁵ *N.C.*, 25 April 1812.

⁷ *N.C.*, 1 Jan. 1841.

⁸ *N.C.*, 5 Aug. 1780, 26 July 1783, 30 July 1836.

⁹ *N.C.*, 26 Oct. 1793. ¹⁰ *N.C.*, 13 April 1811.

¹¹ *N.C.*, 3 July 1802.

Society in 1803 was restricted to twenty-one, and no other local persons were to be admitted, even to visit.¹⁶ Even the agricultural shows arranged by these societies were really hardly likely to encourage that spirit of healthy competition it was said was their function. Prizes were generally won by the same few individuals year after year, and Table I suggests that only in the turnip section did a newcomer stand much chance of winning a prize from the Tyneside Agricultural Society. The Tweedside Agricultural Society was the only one to sponsor competition in agricultural implements before 1830, but with predictable results. How eager these winners were to improve the agriculture of the district may be gauged by the general refusal to accept prize money for champion male animals. That would have involved a commitment to make the animals available to serve in the district at rates set by the society.¹⁷ It is necessary, however, to distinguish between these agricultural societies and the more local and less formal farmers' clubs which began to displace them from the 1830's.¹⁸ The latter

abandoned prizes for the servant who had been with his master longest or who had raised most children without resorting to the parish; their meetings debated strictly practical subjects, and their membership was one of social and occupational equals. The farmers' clubs may well have had an important part to play in the diffusion of agricultural knowledge.

There were other forces at work much more effective in diffusing agricultural information, and more certain to convince farmers of the merits of a good idea. Personal contact among farmers and among farm labourers was of paramount importance in the diffusion of new techniques. Of course, the great obstacle to this thesis is the argument that neither travelled far, that they would be most conversant with the practices of their own area, and able to diffuse only what was already well diffused. Sir Robert Peel determined the greatest obstacle to the diffusion of agricultural information to be the "general unwillingness on the part of ordinary farmers to travel beyond the bounds of their own parish,"¹⁹ but some farmers certainly did travel. It was quite common for estate agents in backward areas to entice farmers from more advanced regions in the hope that their skills would rub off on the local farming population. More cosmopolitan farmers sometimes acted as agents for the supply of skilled tenants, and advertisements in northern papers for farmers able to introduce the Scotch or Northumberland mode of agriculture were not uncommon. Similar procedures were used to find men from progressive districts to act as stewards of estates in less advanced areas. But these were hardly average farmers. The average farmer was a much more static animal.

George Hughes was rather wealthier than the average farmer: he was a tenant of about 2,000 acres at Middleton Hall in Glendale in north-west Northumberland, and between July 1789 and October 1800 he kept a diary, which has survived, listing every journey he made during these years. As Map 2 shows, journeys beyond the nearest markets, particu-

¹⁹ In James Caird, *English Agriculture in 1850-51*, 1852, p. viii.

TABLE I
DISTRIBUTION OF AGRICULTURAL SOCIETY
PRIZES

Tyneside Agricultural Society

	Section	Prizes	Winners
1805-19	Turnips	23	15
1805-21	Sheep	47*	21
1805-21	Cattle	109†	29

Tweedside Agricultural Society

	Section	Prizes	Winners
1812-19	Implements	16‡	—

* 1 Winner took 12 prizes (26%); 4 winners took 25 prizes (53%); 5 winners called Bates.

† 7 winners took 65 prizes (60%).

‡ 2 winners took 8 prizes (50%).

Source: *Newcastle Courant*, 1805-21

¹⁶ *Farmer's Magazine*, IV, 1803, pp. 283-6.

¹⁷ E.g. *N.C.*, 30 April 1808.

¹⁸ See Nicholas Goddard, 'Kentish Farmers' Clubs in the Mid Nineteenth Century', *Cantium*, VI, 4, 1974, pp. 80-3.



MAP 2. Journeys of George Hughes of Middleton Hall, 1789-1800

Source: N.C.R.O./ZSI/46

larly the one at Wooler, were rare, and Hughes's main field of experience was obviously his native Glendale. Presumably less substantial men were even more circumscribed in their experience. But even George Hughes had made one long journey out of the area in those eleven years. He went to Scotland for some weeks on tour. As the nobility saw Europe on the Grand Tour, so the wealthier farmers of Britain toured in this country.²⁰ Oblivious of cathedrals, stately homes, and scenic wonders, they journeyed from farm to farm and scrutinized everything agricultural. The farmers travelled in groups of three or four, and had generally made contact with a few farmers along the proposed route before setting out. Further recommendations came along the way as the farmers found practices which particu-

²⁰ John Bailey, *General View of the Agriculture of Durham*, 1810, p. 67.

larly interested them. George Culley, probably the best known of Glendale farmers, listed those areas of the United Kingdom he had not toured as "Shropshire, Sussex, Devonshire, Cornwall, and a great part of Wales,"²¹ but many of his farming neighbours also journeyed widely and frequently. Culley's letters are full of references to these neighbours being away from home on tour.²² George Boswell's farm in Dorset became an important staging point for northern farmers. "Pray Sir," Boswell wrote to Culley in 1793,

What kind of Folks are left behind in the North? Are we to judge by the samples you've sent us? Upon my word and credit we make a very ridiculous appearance, accepting one or two of my acquaintance, . . . they all stand and look like stuck piggs, with their mouths open. I have only to request, you will continue me on your list of acquaintances and let me often hear from You, and let me see as many of your Country men as you can spare to travel this way. What I have seen charm me, Tho' they are not Bakewell's [*sic*] and crusty, They are *Ready enough* and friendly, which I much more value.²³

Another means of affording farmers practical experience of unfamiliar techniques was the system of agricultural apprenticeship. Farmers' sons in their late 'teens or early twenties would be sent from home to spend a year in a more progressive area.²⁴ Fees in the late eighteenth century could be as much as £60 for the year, during which time the young

²¹ George Culley, *Observations on Livestock*, 3rd edn, 1801, pp. vii-viii. There are now several articles on Culley, including D. J. Rowe's Introduction to John Bailey and George Culley, *General View of the Agriculture of Northumberland, Cumberland and Westmorland*, 1805 (reprinted 1972, Newcastle), pp. i-xxiv; D. J. Rowe, 'The Culleys, Northumberland Farmers, 1767-1813', *Agric. Hist. Rev.*, xix, 2, 1971, pp. 156-74; Stuart Macdonald, 'The Role of George Culley of Fenton in the Development of Northumberland Agriculture', *Archaeologia Aeliana*, 5th ser., iii, 1975, pp. 131-41.

²² E.g. N.C.R.O./ZCU/31: George Culley to Robert Bakewell, 1 Nov. 1791.

²³ N.C.R.O./ZCU/30: George Boswell to George Culley, 25 July 1793.

²⁴ *Farmer's Magazine*, vii, 1806, pp. 153-6.

man actually worked on his hosts' farm.²⁵ That farmers in some areas were willing to pay such considerable sums for the privilege of allowing their sons to work for another farmer speaks volumes for their faith in the effectiveness of this learning process. Culley frequently housed half a dozen students at a time, and his neighbours were most certainly engaged in exactly the same business.²⁶ By the end of the nineteenth century, Glendale had an established reputation as a centre of agricultural pilgrimage.²⁷

There was another way of establishing contact with areas using different agricultural techniques and that was by post. Four large boxes of Culley's papers survive, the bulk of them letters to and from other farmers throughout the country. The letters are crammed with detailed agricultural advice, all of it based on personal experience and addressed to the particular circumstances of an individual. Although there are several letters to and from editors and acknowledged agricultural experts, such as Arthur Young and Sir John Sinclair, in all the many hundreds of letters to and from farmers, there is scarcely a reference to a printed work. Little correspondence between farmers has survived, but it is likely that leading farmers made extensive use of the postal service. When in 1800 Culley abetted in the hiding of a Lincolnshire farmer from his creditors, he felt it necessary to send the poor man even further north, to Scotland, because his Glendale neighbours were such regular correspondents with Lincolnshire farmers that there was no hope of keeping his presence a secret from them.²⁸

Culley wrote weekly to the manager of his family farm in south Durham. The correspon-

dence in both directions cost Culley about £5 a year, and was a bargain in his estimation if only for the news it brought him from Darlington market.²⁹ A letter posted at Darlington late on Monday afternoon travelled well over 100 miles via Berwick to Wooler, and was generally in Culley's hands by the Tuesday afternoon or the Wednesday morning at the very latest.³⁰ The contents of farmers' letters were rigorously agricultural. Pleasantries were cut to a minimum; there was little mention of family affairs or social matters, no religion, and no politics. Agricultural improvement was obviously a very serious business. Though it is unrealistic to assume that information contained in a letter was, in itself, full and accurate enough to initiate innovation, it is reasonable to see the letter as an important means of convincing a farmer, already aware of a new technique, that it was worth trying.

Much agricultural innovation seems to have foundered because the men closest to the innovation—the agricultural labourers—were not its keenest supporters. In 1783 Sir John Delaval was seized with a desire to improve the agriculture on his Northumberland estate, and sent several consignments of implements from London. The reception these received never varied:

The two ploughs was received some time ago and has been tried. Matthew [the ploughman] says they will nether [*sic*] of them answer well for this strong Land—they can't get the smaller one to answer at all, he imagines the Beam has been made of Green wood, or otherwise has been twisted since it was made and stands quite from the Land. The larger one goes much better and I do not hear of any fault only its not effectually turning the furrows.³¹

A double plough sent later that month similarly did "not meet with Matthew's appro-

²⁵ See Stuart Macdonald, 'An Agricultural Apprentice in Northumberland, 1842', *Local Historian*, xii, 1976, pp. 139-45.

²⁶ N.C.R.O./2DE/4/14/42: Joseph Oxley to Sir John Delaval, 14 Dec. 1782; N.C.R.O./ZCU/9: George Culley to Matthew Culley, Oct. 1784; N.C.R.O./ZCU/21: George Culley to Thomas Wakefield, 17 Aug. 1796; N.C.R.O./ZCU/32: George Culley to ?, 13 July 1806.

²⁷ Richard Welford, *Men of Mark 'Twixt Tyne and Tweed*, I, Newcastle, 1895, p. 673.

²⁸ N.C.R.O./ZCU/31: George Culley to Mr Foreman, 22 March 1800.

²⁹ N.C.R.O./ZCU/6: George Culley to John Welch, 13 May 1800.

³⁰ N.C.R.O./ZCU/6: George Culley to John Welch, 23 April 1802.

³¹ N.C.R.O./2DE/4/20/35: John Bryers to Sir John Delaval, 14 Feb. 1783.

bation."³² In April of that same year, something called a drill rake, an implement which Lady Delaval had ordered constructed from the directions in Harte's *Essays on Husbandry*, was given a fair trial. It was a ribbing implement, supposed to score friable soil so that broadcast seed—in this case peas—would fall into the troughs and so grow in rows. The trial took place on heavy clods of clay formed into huge curving ridges, the machine preceded by a specially selected untrained horse, and followed by no less than a dozen plodding women and children sowing peas. It was not a success.³³ In September the gardener's man was sent into the fields with his scythe to try the experiment of mowing the stubble. Smarting under the insult, he reported that stones and clods of earth made the whole business impossible.³⁴

Unless labourers were willing to show enthusiasm for new methods, that was likely to be the end of innovation.³⁵ A man whose position rests on skill acquired over years does not readily accept a change which renders his experience worthless. Faced with this difficulty, the farmer could make concessions to placate his men. Boswell persuaded his labourers to drill oats by letting them sow the enormous quantities they were convinced would be necessary.³⁶ Alternatively, the farmer himself could show how the work should be done. Tales of passing farmers leaping over hedges to demonstrate to ploughmen how ploughing could be managed with just one man and one horse are so common that the majority must be apocryphal.

³² N.C.R.O./2DE/4/15/3: Joseph Oxley to Sir John Delaval, 22 Feb. 1783.

³³ N.C.R.O./2DE/4/20/39, 42: John Bryers to Sir John Delaval, 14 March, 4 April 1783.

³⁴ N.C.R.O./2DE/4/20/66. John Bryers to Sir John Delaval, 28 Sept. 1783.

³⁵ Contemporary support for this point was widespread: e.g. William Marshall, *The Rural Economy of Norfolk*, 1, 1787, p. 270; Andrew Grey, *The Plough-Wright's Assistant*, 1808, p. xi; William Lester, *A History of British Implements and Machinery Applicable to Agriculture*, 1811, pp. 205–6; R. M. Weeks, 'On Grubbers, Cultivators and Autumn Cleaning', paper read to Newcastle Farmers' Club, 1 July 1854, Newcastle Literary and Philosophical Society Library/Bolbec/N630.6/3.

³⁶ N.C.R.O./ZCU/14: George Boswell to George Culley, 6 April 1789.

Of more importance was the transfer from one area to another of labour skilled in new techniques. Not only did this overcome the problem of giving the innovation fair trial, but it was also probably the best means of instructing native agricultural labourers in the use of new techniques. Reapers in Berwickshire in 1790 would not accept the scythe hook as a replacement for their customary sickle when given them by farmers, but eagerly made the change when outpaced by imported labourers wielding scythe hooks.³⁷ When Culley was arranging for the transfer of one of many Glendale labourers to his Durham farm, he wrote to the manager there, "... you will want someone who understands, *drilling* or *ridging* for Turnips. Now I don't know that this Hills can ridge, but I think it is very probable he can as he belonged this Country. . . It will save us sending a young fellow. . ."³⁸

The newspapers frequently carried advertisements from distant farmers seeking northern labourers. Often they sought men simply familiar with northern agriculture, but there were also many more specific requests; for example, for a man acquainted with the drill management to go into the south, or for a man accustomed to mowing with the Aberdeen Corn Scythe.³⁹ Culley was constantly pestered by correspondents asking to borrow labourers for a year or so until their techniques had become familiar to local workers. Culley himself had used a variation of this method in 1787, when curious about the artificial watering of meadows. Various friends had suggested—by letter⁴⁰—that George Boswell in Dorset was an expert in the matter, and so Culley wrote, asking to borrow one of his men for a few years. Boswell was critical of this suggestion, and replied that such a man "by his self consequence, and *acquired* importance . . . might withhold much useful instruction. The method I shall submit to you is; to fix upon an healthy,

³⁷ *Farmer's Magazine*, xxiii, 1822, pp. 235–6.

³⁸ N.C.R.O./ZCU/6: George Culley to John Welch, Nov. 1789.

³⁹ N.C., 5 March 1808, 5 Sept. 1845.

⁴⁰ Newcastle University Library/Basement/Misc. MSS./7: Robert Bakewell to George Culley, 8 Feb. 1787.

robust Man, who has been *used to labour* . . . it is absolutely necessary for him *to be a Labourer* and to be both willing and able to go through the manual part of the work in all weather, as the Watermen do here."⁴¹ The man went to Dorset, learned the art, and returned to build Culley the first water meadows in Northumberland.

In the north, mobility in agricultural labourers was common. They were generally hired by the year, and frequently moved considerable distances to work on farms where wages might be better, and conditions, if not improved, at least different. The extent of this annual flitting of agricultural labourers can be measured from contemporary figures for 1841. In the parish of Norham in Northumberland there were then 174 families of agricultural labourers, of which fifty-one had flitted the previous year, eighty-three during the preceding two years, and 156 or 90 per cent within ten years.⁴² Such a highly mobile agricultural population meant that, in the north at least, agricultural information was always readily available at the level at which it had to be applied, and from a source by which adoption was likely to proceed.

III

There were then several ways in which at least a few farmers in an area were likely to find out about and effect new methods. The mass of farmers did not import labourers from any distance, probably did not write much, and read even less, did not go on tours or place their sons in agricultural apprenticeships. Rather they learned from their neighbours, and particularly from those of their neighbours whose prosperity could be reasonably linked with the introduction of a new process. In Scotland it was said that such men stood out like colonists in a wilderness.⁴³ Culley, for example, was well aware of his position not only as an innovator

but also as an agricultural leader in the neighbourhood.

There is evidence that Culley was concerned with the introduction to Glendale of new varieties of oats, of one-horse carts, of turnip drilling, of spring-sown wheat, of water meadows, of ploughing by oxen, of the New Leicester sheep, of the drilling of barley, peas, and beans.⁴⁴ Some of these innovations became general and important to the region's farming: others did not. In 1794 Culley wrote that "the working of oxen is becoming more general every day, as many of our neighbours are following this example."⁴⁵ Of water meadows he commented, "so slow is knowledge in making its way, that it was near 20 years before any other person ventured to pursue the practice, and profit by the example. It is now beginning to spread in the neighbourhood."⁴⁶ In fact, neither made any real impression on the neighbourhood at all. Farmers were not wont to follow blindly the example of even the most successful of their neighbours, but the point is that Culley thought of diffusion from the few to the many in neighbourhood terms. The neighbourhood was the core of agricultural life and popular agricultural experience. Map 3 is compiled from information, given in question 11 of the Tithe Files,⁴⁷ about which markets were visited most regularly by farmers in the early 1840's. The importance of the market town in the life of George Hughes has already been illustrated, and, though market towns are few in Northumberland, it is not unreasonable to see the market-town hinterland as being typical of the extent of a neighbourhood. The size of such areas varied and they overlapped, but even as late as the 1840's a market such as Morpeth, one of the largest stock markets in the country, was visited regularly only by those in close proximity.

It is possible, though a weary task, to show the influence of a few innovation leaders in the rapid diffusion of the New Leicester sheep in

⁴¹ N.C.R.O./ZCU/12: George Boswell to George Culley, 25 March 1787.

⁴² N.C., 8 Oct. 1841: Rev. W. S. Gilly's Address to Highland and Agricultural Show at Berwick.

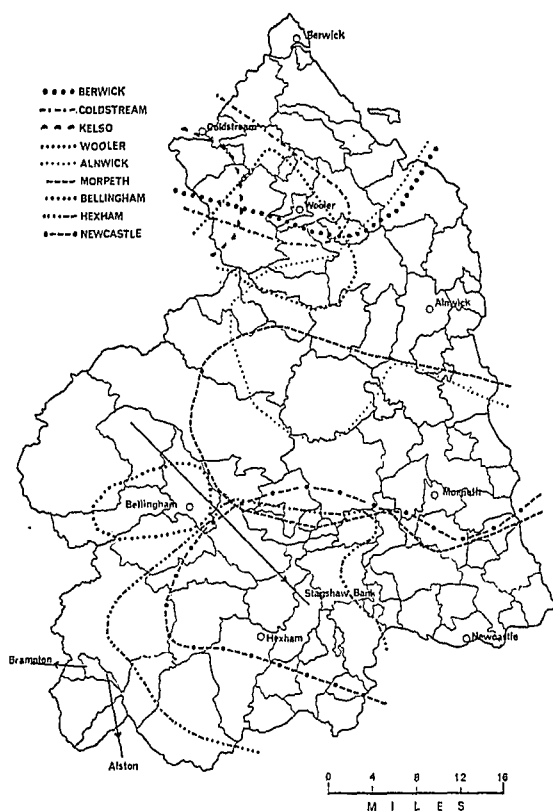
⁴³ T. Pennant, *A Tour of Scotland*, 1774, p. 42.

⁴⁴ See Macdonald, thesis, *passim*.

⁴⁵ Culley, *op. cit.*, 2nd edn, 1794, p. 85.

⁴⁶ Bailey and Culley, *op. cit.*, 1805, pp. 136-7.

⁴⁷ P.R.O. (Ashridge)/IR/18.



MAP 3. Market hinterlands in Northumberland,
c. 1840

Source: P.R.O. (Ashridge)/IR/18

the Glendale neighbourhood. They had been introduced at an earlier date to other parts of the county, but really as little more than experiments. In Glendale, they were brought in by innovation leaders to make money and it was their success in doing just this that assured their rapid diffusion throughout the neighbourhood.⁴⁸ As Culley was fond of saying, profit would always overcome prejudice.⁴⁹ But the example of turnip drilling is more concise and appropriate.

Culley first came to Glendale in 1766, and in that year saw his first field of drilled, as opposed to broadcast, turnips: not in Glendale, but across the Scottish border, at Mr Pringle's farm

⁴⁸ Stuart Macdonald, 'The Role of the Individual in Agricultural Change: the Example of George Culley of Fenton', in *Change in the Countryside* (eds. R. A. Butlin and H. S. A. Fox). *Inst. Brit. Geog.* (forthcoming).

⁴⁹ E.g. Culley, *op. cit.*, 1801, p. 124.

near Coldstream. At this date Culley had heard of Tull's system, but had not been impressed until he actually saw drilling in practice—not that Pringle's drilling of turnips on ridges as a highly fertilized fallow crop was much like the system recommended by Tull.⁵⁰ Only two other men in the region were drilling turnips at this time, one Philip Howard of Corby in Cumberland, and a William Dawson from near Kelso. There were then three centres from which the extremely important practice of drilling turnips might have spread, but Howard at Corby was a squire, Pringle at Coldstream an army surgeon, and only Dawson at Kelso a working farmer. Howard and Pringle had no imitators, but, to quote Culley, "no sooner did Mr Dawson (an actual farmer) adopt the same system, than it was immediately followed, not only by several farmers in his vicinity, but by those very farmers adjoining Mr. Pringle, whose crops they had seen for ten or twelve years so much superior to their own."⁵¹ Even Culley, though he had experimented from Pringle's example, had actually learned from Dawson by visiting him personally and by sending a man to learn the art.⁵² Dawson himself had learned the value of drilling turnips and how to do it when he spent six years farming in the south of England as a young man.⁵³ Upon his return to Scotland he had difficulty finding a ploughman who could form the ridges for turnip drilling. Dawson chose a young man—James MacDougal—and taught him personally.⁵⁴ MacDougal worked for Dawson from 1765 as ploughman, overseer, and instructor of visiting students until 1778, when he took his own farm in Peebles "where his example"—and the quotation is from his obituary—"as a farmer paying rent, and acting at his own risk, had immediate influence,

⁵⁰ N.C.R.O./ZCU/3/1: George Culley to Arthur Young, c. 1791.

⁵¹ Bailey and Culley, *op. cit.*, 1805, p. 102; R. M. Garnier, *History of the English Landed Interest (Modern Period)*, 1893, p. 242.

⁵² N.C., 14 Jan. 1848: John Grey to Hexham Farmers' Club.

⁵³ *Annals of Agriculture*, xx, 1793, p. 164.

⁵⁴ Robert Douglas, *General View of the Agriculture of Roxburgh and Selkirk*, 1798, p. 69.

as to the ready introduction and rapid diffusion of the turnip . . . husbandry among practical farmers."⁵⁵ In Glendale Culley introduced turnip drilling about 1780, admitting freely that he had "learned from our neighbours on the Scotch side."⁵⁶ By 1790 the innovation had become general throughout the Glendale neighbourhood.⁵⁷

In the late eighteenth century one farmer summed up the degree to which his colleagues were receptive to new ideas. "I never converse with farmers without a fever; I would as soon argue with a methodist, and deem a horse in a mill a superior character."⁵⁸ So much attention

in studies of the diffusion of agricultural innovation is directed towards finding what went where, when it went, and why it did so. Comparatively little attention is given to the practical, rather than the theoretical, problem of just how the process worked. Not all farmers were methodists. George Culley's rebuke to an over-confident correspondent may be much more typical of the attitude of a very important minority of farmers. "I often say that we have a deal to learn yet. And every wise humble man will learn every yr and every day. But a conceited selfwise *animal*, I will not call him a man, will not nor ever can learn."⁵⁹

⁵⁵ *Farmer's Magazine*, XXIII, 1822, p. 512.

⁵⁶ *Annals of Agriculture*, xv, 1791, p. 628.

⁵⁷ *Ibid.*, xiv, 1790, pp. 183, 473.

⁵⁸ *Ibid.*, iv, 1785, p. 37.

⁵⁹ N.C.R.O./ZCU/6: George Culley to John Welch, 1 Dec. 1801.