

The Agricultural Revolution on the English Clays

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THE term 'Agricultural Revolution' has usually been associated with the turnip husbandry of the late eighteenth century which permitted the intensive arable cultivation of light soils on enclosed farms.¹ The term has sometimes been extended to cover the heavy lands of the country, and improvements in drainage in the mid-nineteenth century have been seen as the clayland counterpart to the turnip on the light soils.² But no attempt has so far been made to show in what this latter Revolution consisted in terms of changes in the structure and output of farming. In concentrating attention on eighteenth-century changes on the light soils, moreover, no account is taken of the fact that as late as the eighteen-thirties contemporaries generally agreed that half of all cultivated land in England was heavy land, and possibly a quarter was cold clay.³

The turnip or Norfolk husbandry was essentially an arable system. Manure from the folded sheep flock and the beasts stalled in the winter was returned to the arable in preparation for the wheat or barley crop, and the corn harvest was considered the fulcrum. But the traditional corn lands of the country were the clays, and after the Napoleonic wars observers were deeply conscious of the failure of farmers on the enclosed clays to increase production and reduce costs to overcome the severe fall in corn prices. The dependence of most heavy-land farmers on the corn crop as their main form of revenue was unquestioned, and in the eighteen-twenties and -thirties committees viewed with resignation the plight of the clayland corn farmer. After the widespread adoption of improved drainage techniques and the increased use of oilcake and artificial manures in the 'fifties and 'sixties, however, agricultural reporters acknowledged a significant increase in produc-

¹ Lord Ernle, *English Farming Past & Present*, 6th edn, 1961, chaps. VIII-XIII; R. A. C. Parker, 'Coke of Norfolk and the Agricultural Revolution', *Econ. Hist. Rev.*, VIII, 1955, pp. 156-66; G. E. Mingay, 'The Agricultural Revolution in English History: a reconsideration', *Agricultural History*, xxxvii, 1963, pp. 123-33; J. D. Chambers & G. E. Mingay, *The Agricultural Revolution, 1750-1880*, 1966, introduction and chaps. II and III.

² C. S. Orwin & E. H. Whetham, *History of British Agriculture, 1846-1914*, 1965, pp. 4-5; Chambers & Mingay, *op. cit.*, pp. 57, 174-6.

³ *House of Lords Select Committee on Agricultural Distress*, V of 1837, Q.3125 (G. Trumper); Q.3564-5 (E. S. Cayley).

tion from clayland farms. But the balance of this expansion was in livestock, in dairy produce, pigs, and beef stock. This paper is concerned to show the problems of increasing production on the clays before the introduction of pipe drainage, oilcake, and bones, and the controversy which raged over the objectives of clayland farming in the first half of the nineteenth century.

I

The revolutionary effects of the introduction of the turnip husbandry into general culture during the eighteenth century were restricted to the light soils. On the clays, the problem of increasing production remained as intractable after enclosure as before. The fallow persisted on enclosed farms as an indispensable means of cleaning and resting the soil after grain crops. Heavy land is a term covering a wide range of soils from the retentive Gault and Kimmeridge clays to the more friable Lias of Leicestershire and Northamptonshire. The feature which distinguishes it from sand, chalk, and limestone soils is the difficulty of obtaining a fine seedbed necessary for roots on clays that are wet or frozen in the spring and of carting the crop off the field in the autumn without damage to the soil structure caused by the treading of horses' hooves. This effectively precluded the introduction of the turnip husbandry.

Farming the clays is fraught with uncertainty because of the lateness of the seasons, the likelihood of the complete loss of a crop in a wet harvest time, and the high costs of production which persistently press up against fluctuating revenues. The Select Committees of the eighteen-twenties and -thirties are replete with accounts of the high cost of growing a corn crop on soils where ploughing could not be done with less than three horses. Probably the most eloquent account of the vicious circle of fluctuating yields and high costs and the oppressive dominance of the weather over all farm operations in the first half of the century is contained in Wren Hoskyns' *Chronicle of a Clay Farm*. An old farmer in the eighteen-forties ruminated about farming the clays, "We know nothing about them, almost *absolutely* nothing! We know that they are stiff to the plough and sticky to the flock; positive to the Bean, and negative to the Barley; costly to drain, and, without it, profitless to farm. We blunder on with just these two or three negative dogmas on our tongues, and are satisfied to think them knowledge enough. The truth is we have everything to learn about them. I say again we haven't *begun* with 'em."¹

¹ C. Wren Hoskyns, *Talpa or the Chronicle of a Clay Farm*, 1852, p. 189.

II

After the Napoleonic wars a deterioration was observed in the physical condition of the heavy lands as a result of the pernicious system of wartime cropping. Clayland cultivation during the wars was of two types. On the fertile clays of south Leicestershire and the Vale of Aylesbury, the fattening of cattle on summer grass was acclaimed. But on the second class clays, which predominated in the country, the prevailing husbandry was one in which a wheat crop and then oats or beans were obtained before the tired soil was either left to tumble down to grass for two or more years or was immediately fallowed in preparation for the next wheat crop.¹ The permanent pasture and meadow were strictly demarcated and were not subject to the plough. Because of the poorer sward these soils produced compared with the fertile clays and their wartime conversion to corn land in response to high corn prices, wheat was accepted as the main cash crop and the system on the farm geared to its production. Because no arable land could be spared for other than the exhausting wheat crop, winter fodder for livestock was obtained from the meadow. All farmyard manure was transferred to the arable in preparation for wheat sowing. But as the manure produced on the farm was inadequate to replace the soil nutrients carried away in the grain and hay,² and as the range of purchased manures locally available to most farmers was small, both corn and hay yields were low. The exhausted grassland could carry only a small head of stock which produced little manure for the arable, whilst the need to rest the arable and remove the weeds which flourished on the undrained corn land and tumbledown leys meant that a fallow year was indispensable before wheat could be sown. In the Vale of Thame the wheat fallow received all the manure from the stalls, and beef and dairy stock were wintered on hay and straw alone.³ In the Kentish Weald, hops replaced wheat as the main cash crop and monopolized the supply of dung,⁴ but, in the Sussex Weald, the practice "familiar to the

¹ H. E. Strickland, *A General View of the Agriculture of the East Riding of Yorkshire*, 1812, p. 118; A. Young, *A General View of the Agriculture of the County of Sussex*, 1808, p. 70; C. Vancouver, *A General View of the Agriculture of Essex*, 1795, p. 107; W. Pitt, *A General View of the Agriculture of the County of Leicester*, 1809, p. 506; A. Young, *A General View of the County of Oxford*, 1809, p. 408; J. White, *A General View of the Agriculture of the County of Lincoln*, 1794, p. 85.

² One chemist considered that on most clay farms in the 'forties the wheat crop annually took away the equivalent of $\frac{1}{2}$ cwt. of bones per acre.—J. E. W. Johnstone, *Lectures on Agricultural Chemistry and Geology*, 2nd edn, 1847, p. 408.

³ C. S. Read, 'On the Farming of Oxfordshire', *Journal of the Royal Agricultural Society*, xv, 1855, p. 244 (hereafter *J.R.A.S.*).

⁴ Viscount Torrington, *On Farm Buildings with a few observations on the State of Agriculture in the County of Kent*, 1845, p. 69.

Roman husbandmen and practised in Virgil's time" of taking two corn crops after a fallow was followed, and the few cattle were fed mainly on straw with hay as a supplement.¹ In Essex, beans were grown after wheat, but were mainly consumed by horses.²

On improving estates where attempts were made to reduce the corn acreage and expand stock farming, the inability to grow fodder on the arable imposed a limitation on the clayland farmer. Because the grassland was forced to provide both winter provender and summer grazing for stock, a constant clash arose over the use to which the grassland should be put. If the same head of stock was to be carried throughout the year, a large part of the grass acreage was locked up as meadowland during the summer, which was the period of greatest activity in grassland livestock farming, with spring calving, summer milk from the dairy herd, and summer fattening off grass. The Leicestershire graziers had long accepted the low profit per animal involved in buying in the spring and selling in the autumn as the price of carrying large numbers of stock on the summer pastures.³ But Gloucestershire farmers were forced to keep small dairy herds throughout the year because of their small hay supplies and the low yield of their pastures.⁴

The older grasslands experienced a decline of yields. In the Trent valley and on the Cheshire clays, years of depasturing the grasslands with cows in summer on farms where milk and calves were sold each year, although little manure was returned, had resulted in phosphate-deficiency of the soils. Authors of Prize Essays of the Royal Agricultural Society were impressed by the exhausted state of the cow pastures in Nottinghamshire and Derbyshire in the 'forties and 'fifties, as was Palin by the Cheshire pastures in the 'forties.⁵

III

Various attempts were made on improving estates to overcome the lack of fodder either by growing beans on the fallows or by controlling the management of grassland in an attempt to maintain yields. In 1813 James Loch entered the agency of the estates of the Marquess of Stafford, later Duke of Sutherland. He found that most of the estates in Staffordshire and Shropshire were on heavy land and the property was in a deteriorated condition. Although Loch's ideas were founded in Lothian and Northumberland sheep and corn husbandry, his energies were directed to the improvement of English clayland farming. He knew his mission: in 1818 his sub-

¹ Young, *Sussex*, p. 70.

² R. Baker, 'On the Farming of Essex', *J.R.A.S.*, v, 1845, p. 34.

³ Pitt, *op. cit.*, pp. 153-4.

⁴ J. Caird, *English Agriculture in 1850-1*, 1852, pp. 42-4.

⁵ W. Palin, 'The Agriculture of Cheshire', *J.R.A.S.*, v, 1845, p. 63.

agent informed a tenant, "Mr. Loch's duty requires him by all the means in his power to introduce as good a system of farming upon the stiff lands of the country as exists upon the light and turnip soils."¹ He considered that the arable acreage on the clays was excessive, and that the dominance of corn had caused exhaustion of the soil.² No cropping covenants existed in leases before 1813, but, as leases fell in, covenants were inserted restricting the acreage under corn on each farm. Change was also obtained by a more selective choice of tenants and exhortations to adopt a recuperative rotation. Loch's main criticism was the failure to obtain a fodder crop in the fallow year, and he believed that beans could fill the rôle. But he believed that the bad husbandry of local farmers thwarted his efforts. The risk attending the growing of beans, because of the loss of value as fodder unless harvested at exactly the right time, deterred the tenants from adopting them.³ The acreage under beans on the Trentham estate rose only from 1 per cent of total acreage in 1820-1 to 2 per cent in 1850-1.⁴ The failure of farmers to grow beans as a fallow crop on the heavy lands because of the risk of mildew in a moist climate was also observed in Shropshire and Durham,⁵ and in the 'fifties bean growing was believed to have declined because of the risk of disease.⁶ In contrast, beans were a common break in Essex because of careful and expensive management and a drier climate.⁷

Because of the growing awareness by agents of the strain imposed on the meadows, protection was given in leases. Although restriction on the mowing of unmanured meadows more than once a year was mentioned as important in Cornwall, Lancashire, Westmorland, and Sussex in the late 'twenties,⁸ it was also mentioned in Gloucestershire, Essex, and Northumberland by the 'sixties.⁹ Conservation of meadow was carried to its height in Cheshire where leases generally stipulated that all the dung was to be applied to the meadow and manure required for the arable was to be pur-

¹ C. Lewis, Memorandum on New Lodge Farm, Lilleshall, 1818. Staffordshire Record Office, D.593. Documents not catalogued individually at time of use.

² J. Loch, *A Survey of the Improvements on the Estates of the Marquess of Stafford*, 1820, pp. 173-9.

³ Report on the State of the English Estates, 1817. Staffordshire Record Office, D.593.

⁴ Trentham cropping books, 1820-1851, *ibid.*

⁵ H. Tanner, 'The Agriculture of Shropshire', *J.R.A.S.*, xix, 1858, p. 17; Johnstone, *op. cit.*, p. 407.

⁶ R. Vallentine, 'On the Cultivation of Beans and Peas', *J.R.A.S.*, xv, 1855, p. 479.

⁷ Baker, *op. cit.*, p. 34.

⁸ L. Kennedy & T. B. Grainger, *The Present State of the Tenancy of Land in Great Britain* 1828, pp. 177, 256, 334, 346.

⁹ C. Cadle, 'Farm covenants in England & Wales'. *J.R.A.S.*, xv, 2nd ser., 1868, pp 50-86.

chased.¹ Manuring of the grassland was of limited extent and success before the 'forties. Liming was a long-established method of fining and restoring meadow, and it was particularly of value on badly drained sour soils. But it did nothing to restore phosphates in over-grazed or excessively mowed grasslands, and cost of transport restricted its use to within some eight miles of a quarry or a canal. The success of boning of turf and meadow in Cheshire was famous at this time, and was evident on many exhausted pastures from the eighteen-twenties.² Soil scientists considered that the acute phosphate-deficiency of Cheshire soils and high rainfall were the main factors in its physical effect.³

Grain feeding was of local importance before the middle of the century. The feeding of tail corn to calves and heifers from March until grass day was a common practice amongst the better farmers on Cheshire and Staffordshire farms.⁴ Within a radius of ten miles around Burton-on-Trent the feeding of cattle on brewers' grains in winter had greatly reduced the meadow acreage.⁵ But the brewing season was in summer and storage of the grains until winter was a problem even within the vicinity of Burton, many farmers being unwilling to experiment with grain feeding.

IV

Over the four decades after 1815 worn out arable was converted to grass in the north and west of the country, although land under the plough increased in the east. On two Staffordshire estates totalling 9,000 acres, where cropping can be calculated, the grass land increased from 52 per cent of the total acreage to 64 per cent,⁶ whilst after the enclosure of 20,000 acres of the Forest of Exmoor, land was quickly laid down to grass after a few years of corn production.⁷ In Warwickshire the proportion remained between one-third and a half.⁸ But during the French wars farms in the Vale of York were generally "two-thirds in grass;" over the following five decades they were converted piecemeal into tillage.⁹ The expansion of grass acreage possibly

¹ J. Caird, *English Agriculture in 1850 & 1851*, 1852, p. 253.

² C. Davis, *The Agricultural History of Cheshire, 1750-1850*, 1960, p. 60.

³ Johnstone, *op. cit.*, p. 791; C. W. Johnson, *On Fertilizers*, 1839, p. 58.

⁴ Caird, *op. cit.*, p. 258; Palin, *op. cit.*, p. 70.

⁵ J. J. Rowley, 'Farming of Derbyshire', *J.R.A.S.*, xiv, 1853, p. 60.

⁶ Leicester Borough Record Office, 26D53/1990, 1997; Ranton Estate Office, Chebsey surveys.

⁷ T. Bedford Franklin, *British Grasslands*, 1953, p. 102.

⁸ J. Wedge, *A General View of the Agriculture of the County of Warwick*, 1794, p. 11; H. Evershed, 'Farming of Warwickshire', *J.R.A.S.*, xv, 1856, pp. 481-2.

⁹ J. Tuke, *A General View of the Agriculture of the North Riding of Yorkshire*, 1794, p. 32; M. M. Milburn, 'Agriculture of the North Riding of Yorkshire', *J.R.A.S.*, ix, 1849, p. 512.

involved an increase of meadow because of falling meadow yields which were inadequate to provide for an extension of dairying. After James Loch's entry to the Sutherland agency, the number of farms called 'dairying' or 'mixed' on the Staffordshire and Shropshire estates rose from 14 to 19, and those called 'arable' fell from 45 to 40.¹

Thus the dilemma facing the clayland farmer on improving estates was that, whilst pursuing a system of farming in which the importance of corn was declining and livestock becoming financially more important, his inability to grow fodder crops on the arable forced him to observe a ceiling to the expansion of his more profitable enterprise. The release from this dilemma constituted the Agricultural Revolution on the clays.

V

By the middle of the century the failure of attempts to grow fodder crops on the arable and thus break the vicious circle of low productivity was accepted by observers. But during the 'fifties and 'sixties hay was widely supplemented by oilcake brought on to the farm and pipe drainage was introduced under the supervision of government inspectors. The increased yield of the grasslands and the growing of vetches and mangolds that this made possible permitted an extension of grazing land at the expense of meadow and the carrying of larger dairy herds and fattening stock on summer pastures.

In Somerset the consumption of oilcake and the increase of grazing land was estimated to have increased the average number of milk cows per 100 cultivated acres from some 20 to 33 over the 'fifties.² On the very high yielding grasslands of the county, farmers kept the whole of their farms in pasture and sold most of their cows in the autumn, the increased supply of summer milk being considered sufficient to compensate for the high price paid for in-calf heifers in the spring.³ In Cumberland before the 'forties, "many farmers depended exclusively upon the production of grain in order to meet their rent, rates, and taxes. Now [in 1874] they generally rely upon corn growing and meat making concurrently; sometimes upon the latter alone, the produce of meat having within a few years become a striking feature in the agriculture of the county."⁴ On the Wheatlands of Shropshire wheat was "almost the only produce sold in the market" in the 'twenties and 'thirties,⁵

¹ Loch, *op. cit.*, pp. 69-112.

² J. Harding, 'Recent Improvements in Dairy Practice', *J.R.A.S.*, xxi, 1860, p. 83.

³ *Ibid.*

⁴ T. Farrell, 'A Report on the Agriculture of Cumberland chiefly with regard to the Production of Meat', *J.R.A.S.*, x, 2nd ser., 1874, p. 402.

⁵ Tanner, *op. cit.*, p. 16.

but by the late 'fifties, "the spirit of enterprise has found its way here, and a better system of tillage has resulted whereby a considerable quantity of spring corn and meat finds its way to market as well as wheat."¹ Damage to the soil caused by the treading of horses' hooves caused many farmers to grow vetches or to fallow instead of attempting to grow turnips. Few farmers, however, were using purchased grain as feed and, because the grasslands had deteriorated, peas and, to a lesser extent, beans provided additional fodder.

In the dairying areas of north and south-west Leicestershire, allegations were made of a decline in cheese production in favour of fattening because of the difficulty of obtaining dairy maids,² but on grazing farms an increased head of stock was carried through the winter by the consumption on the farm of all the grain produced on the small arable acreages.³ The increased yield from Cheshire pastures following the application of bones both before and after the introduction of pipe drainage in the 'forties and 'fifties was believed almost to have doubled the number of dairy cows in the county in the thirty years after 1830.⁴ In the 'fifties the wheat crop was "the main object of the Wealden farmer."⁵ Because of the infertility of the soils and low rainfall in the Weald, seeding down to permanent pasture was a risky and expensive venture and in the 'seventies farmers were fattening additional stock in the winter on grain and larger acreages of vetches and mangolds.⁶ The general shift from corn to stock output within mixed farming systems over these years has been discussed by Dr E. L. Jones.⁷

The feeding of grains and increased hay yields from highly manured meadows permitted an increase in milk yields per cow in dairy areas. The wide-spread change from cheesemaking on farms to the sale of liquid milk into towns over the 'seventies and 'eighties required a year-round production from dairy herds. Although the sale of liquid milk by farmers on the fringe of towns was common in the first half of the century, the reduction by a third in the number of cows kept in London dairies during the cattle

¹ *Ibid.*

² 'The Production of English Cheese', *Farmers' Magazine*, xxviii, 3rd ser., 1865, p. 371; 'Leicestershire Farming', *ibid.*, xxxiv, 3rd ser., 1868, p. 198.

³ W. S. Moscrop, 'A Report on the Farming of Leicestershire', *J.R.A.S.*, II, 2nd ser., 1866, pp. 321, 328.

⁴ J. Dixon, 'Manuring Grasslands', *J.R.A.S.*, xix, 1858, p. 207.

⁵ J. Hawes, 'Notes on the Wealden Clay of Sussex and its Cultivation', *J.R.A.S.*, xv, 1858, p. 181.

⁶ H. Evershed, 'Early Fattening of Cattle in the Counties of Surrey and Sussex', *J.R.A.S.*, xiv, 1878, pp. 152-3.

⁷ E. L. Jones, 'The Changing Basis of English Agricultural Prosperity, 1853-73', *Agric. Hist. Rev.*, x, 1962, pp. 102-19.

plague in 1865-6 forced London dealers to range the traditional cheese producing areas of the country in search of supplies.¹ Dealers usually stipulated that supplies of milk be sent in winter at about a third of the summer level, and higher prices were given in winter as an inducement to produce outside the summer when cheap milk could be obtained off grass.² By 1888 cheese-making was considered important in the Trent valley only when the milk trade was temporarily oversupplied, whilst the Vale of Gloucester and north Wiltshire were milk-producing areas by the early 'eighties.³

In 1841 a farmers' club in the Trent valley debated "whether it is better to keep dairy cows on strong food and prolong the flow of milk or to give them a less expensive diet and let them dry earlier."⁴ This debate had point because it was a common practice to feed cows on straw alone in the winter and to cease milking them for three to five months. Increased hay supplies from boned meadows were claimed to have increased the average milk yield of cows in Cheshire by a half over the 'sixties and early 'seventies.⁵

Improvement in clayland farming was not uniform: on the most infertile clays in the dry east and south of the country permanent pasture was a precarious crop and arable farming continued. The length of time and risk involved in obtaining a good turf deterred most farmers from seeding down whilst the poorer soils were not considered worth the cost of draining. The ease and speed with which grass grew on the fertile clays in the wet north and west had long been observed, where a thick sward capable of feeding an ox was produced twelve months after harvesting the corn crop.⁶ In the 'sixties it was believed that Cheshire and Staffordshire farmers could obtain an acceptable grazing turf in one year at a cost of up to £3 per acre, although on the Weald and Essex clays up to ten years was required and £10 per acre was the average cost.⁷ In the 'seventies an Essex farmer questioned Joseph

¹ 'Country' supplies were initially obtained from the Home and eastern counties. A third of the average annual 6.4 million gallons going to London by rail in the three years after 1864 went along the Great Eastern and London & Brighton lines. By 1890 80 per cent of the 40 million gallons came along the Great Northern, Midland, Great Western, London and N. Western, and London and S. Western lines.—J. C. Morton, 'Town Milk', *J.R.A.S.*, IV, 2nd ser., 1868, p. 95; R. H. Rew, 'An Enquiry into the Statistics of Production and Consumption of Milk and Milk Products in Great Britain', *Journal of the Royal Statistical Society*, LV, 1892, pp. 264-5.

² E. A. Pratt, *Transition in Agriculture*, 1906, p. 13.

³ *Staffordshire Advertiser*, 15 August, 1888; Pratt, *op. cit.*

⁴ *Farmers' Magazine*, xv, 2nd ser., 1847, p. 10.

⁵ 'Dairy Farming in Cheshire', *Agricultural Gazette*, IV, N.S., 1876, p. 238.

⁶ W. Cobbett, *Rural Rides*, Everyman edn, 1957, II, pp. 279-81.

⁷ H. Evershed, 'Early Fattening of Cattle in the Counties of Surrey and Sussex', *J.R.A.S.*, x, 2nd ser., 1878, pp. 167-8.

Mechi's call for further draining in that county, believing that all the land worth draining had been drained. On the less fertile soils of the east and south the perennial cropping of farms in an attempt to maintain income, and the existence of the bare fallow on the stiffest soils, could be excused because of the difficulty of growing grass.¹

Because farmers could not afford to pay for the seeding down of their land and at the same time to have land out of production for a year, landlords frequently paid for seeding down of land to permanent pasture on their estates. Over the 'fifties and 'sixties Lord Ferrers seeded down 327 acres of his Chartley estate² whilst Ralph Sneyd spent £914 on seeds for his tenants.³ Cheshire landlords frequently contributed to the cost of grassing down arable and stipulated that no such grass should be broken up.⁴

The capital requirements of farmers entering heavily stocked dairy farms were greater than for those entering arable farms over the third quarter of the century, and landlords were particularly desirous of obtaining tenants with adequate capital. In Warwickshire the capital value of stock on clay farms was an average £5-£6 per acre and was the same as for highly farmed light land farms in the 'fifties.⁵ Caird believed that Northamptonshire stock farmers needed to have greater financial resources than arable farmers in the early 'fifties.⁶ With the increasing intensity of stocking and rise in value of stock, these requirements were increasing. By the late 'seventies a Nottinghamshire agent believed that most stock farms on the clays required double the working capital of sheep and corn farmers.⁷

The expansion of stock farming on the clays, in which the feeding of farm-produced grain and purchased oilcake played so large a part, enabled farmers more easily to expand production in response to changing prices in the second half of the century than in the first half when supply was inelastic. The buoyancy of stock farmers who benefited from falling prices of purchased grain feed in the Great Depression has been described by Mr T. W. Fletcher.⁸ T. Carrington Smith, a Trent valley dairy farmer and agricultural writer, wrote of the Midlands in the late 'eighties that, "taking the whole

¹ *Agricultural Gazette*, VI, N.S., 1877, p. 52.

² Leicester Borough Record Office, 26D53/1996-2003.

³ Sneyd Papers, O.S. 4 & 5, University of Keele Library.

⁴ Palin, *op. cit.*, p. 86.

⁵ C. Wratlaw, 'The Amount of Capital required for the Profitable Occupation of a Mixed Arable and Pasture Farm in a Midland County', *J.R.A.S.*, XXII, 2nd ser., 1861, pp. 177-8.

⁶ Caird, *op. cit.*, p. 414.

⁷ *Royal Commission on Agricultural Interests*, xv of 1881, Q.6176 (J. Coleman).

⁸ T. W. Fletcher, 'The Great Depression in English Agriculture, 1873-1896', *Econ. Hist. Rev.*, XIII, 2nd ser., 1961, pp. 417-31.

situation of dairying all round, and including the adjuncts of pigs and poultry it will be safe to conclude that the general output is greater than it was in the days when corn was dear."¹ In 1886 he could conjecture, "If it should turn out that the jubilee year of 1887 shall, like the Exhibition year of 1851, be coincidental with a revival of trade and agriculture, we shall find that we have less leeway to make up. The tide of disaster and ruin has not swept us so far out to sea as it had done before 1851."² The increased production of the clays over the 'fifties and 'sixties was acknowledged by observers. But why were earlier attempts unsuccessful?

VI

The failure of farmers on the clays to combat the falling price of wheat after the Napoleonic wars was viewed with mixed sympathy and scorn. Dependence on the corn crop was unquestioned by observers and farmers, and salvation was seen in a reduction in the cost of obtaining it. The Select Committee investigating petitions of distress in the wet harvest year of 1821 accepted that little prospect existed of a rise in the wheat price to the level of the war years and, recognizing the changing national outlook, could not recommend protection beyond the 1815 Corn Law.³ After singling out the corn farmer as the main victim of price changes, it recognized his helpless position and was only able to offer the advice of using more manure and fewer horses. The Select Committee of 1833 was appointed to investigate the distress of both corn and livestock farmers after the wet years of the late 'twenties and early 'thirties and it remarked upon the distress on the clays where output of corn and stock was greatly reduced although increased production from light land farms prevented a rise in corn prices.⁴ The commission of 1836 was appointed after a sharp fall in the corn price from 1833 to a trough in 1835. It singled out the small corn farmer on the clays as one of the greatest sufferers in these years because of his inability to increase production, but could offer no solution.⁵ The paradox of dependence on the wheat harvest as the chief source of revenue and continuing failure to move away from this in a time of falling prices seemed beyond legislative solution.

The wheat crop traditionally paid the rent on arable clayland farms and the dependence on corn for a livelihood was particularly a problem for the small farmer. Whilst observing the distress of farmers on the clays the 1833

¹ Farming Reports, *Agricultural Gazette*, N.S., XXVII, 1888, p. 494.

² *Ibid.*, XXVI, 1868, p. 577.

³ *Select Committee on Agricultural Distress*, x of 1821, pp. 13-23.

⁴ *Select Committee on Agriculture*, v of 1833, p. iv.

⁵ *Select Committee on Agricultural Distress*, VIII of 1836, Part II, Appendix.

Committee noticed that these areas were largely old corn land which it believed had been under the plough since time immemorial.¹ The main demand for farms after 1815 was claimed to be for light land sheep and corn farms or dairy and stock farms on the more fertile clays.² Agents found a slack demand for heavy land farms which had been exhausted by the taking of successive corn harvests, and were forced to accept tenants whose small means obliged them to perpetuate the system. James Loch observed on the Sutherland estates, "Upon the heavy lands they are certainly deficient farmers and it will require some pains to make them better. This sort of land has hitherto been abandoned to the least skilful and the poorest of the tenantry and until men of capital and skill can be induced to take it and cultivate it as it ought to be little improvement can be expected. To accomplish this is ever uppermost in my mind."³ On the Durham clays a recommendation that a fallow be substituted for the second of two consecutive corn crops was unacceptable because "the farmers generally were so poor and obliged to sail so near to the wind that they would not afford to lose a crop."⁴ Wren Hoskyns, a discerning lawyer who had experienced the frustrations of farming the clays, expressed the disdain which improving farmers held for the large number of heavy-land farmers who ploughed their arable land to a standstill and carried both grain and straw to market.⁵ In 1847 an observer remarked upon the need for the small farmer on the clays to grow less wheat, but admitted "His corn pays his rent—his corn feeds his family—his corn pays his interest—his corn is his mainstay."⁶

The object of agents on progressive estates was to amalgamate farms and so permit a more balanced husbandry with a smaller dependence on corn. James Loch informed the Duke of Sutherland in 1820 that when the existing long leases fell in, farms were amalgamated, "the arrangement which was adopted for the improvement of this property was laying the land together in farms of considerable extent."⁷ A new agent for Earl Ferrers's estates in the Trent Valley remarked, "The exchanges with neighbouring owners have tended greatly to the advantages of the estate and whereas many of the smaller farms not exceeding 150 acres extended over a distance of three miles,

¹ *Ibid.*, v of 1833, p. iv.

² *Ibid.*, Q.8621 (J. Buckley), Q.12194 (S. Woolley); W. Donaldson, *Clay Lands and Loamy Soils*, 1852, *passim*.

³ Report on the State of the English Estates, 1817.

⁴ 'Newcastle Farmers' Club', *Farmers' Magazine*, xx, 2nd ser., 1850, p. 198.

⁵ Hoskyns, *op. cit.*, p. 154.

⁶ M. M. Milburn, 'On the Improvement of Cold Clays', *Farmers' Magazine*, xv, 1847, p. 119.

⁷ Loch, *op. cit.*, p. 178.

the farms have now been laid together and are tenanted by substantial working tenants."¹ The process of amalgamation seemed to have progressed by the middle of the century and the decline of holdings between 50 and 200 acres from 1851 to 1861 was attributed by one observer to a reduction in the number of small corn farmers.²

VII

The increasing attention given to the problems of the clayland farmer in the 'twenties and 'thirties was directed to the unprofitability of corn production in comparison with that on the light lands. This low profitability was considered to lie in the high and fixed level of costs involved in getting the crop from the ground, and the large number of horses required to plough the fallow was cited as the main cost. Witnesses before the Select Committees of the 'twenties and 'thirties accepted that the number to a plough was never less than three,³ whilst on the Essex, Oxford, and Leicestershire clays five healthy horses were necessary to pull a plough.⁴ Five ploughings of the fallow were common in Northumberland and Durham, and six were the minimum in Essex.⁵ Horses could be employed continuously in summer but the peak demand for ploughing occurred in the autumn before wheat sowing, and because of the uncertainty of the weather and the sodden or frozen state of the soil ploughing might have to be concentrated into less than a month. The employment of six horses on farms of two hundred acres, of which only a half was arable, was common in the Midlands.⁶ If these horses were kept throughout the year they could consume the produce of some fifteen acres of meadow and oats in addition to their summer grazing. Mechi could claim that a quarter of the land on clay farms was tied up in feeding horses before the eighteen-forties.⁷

Cultivation of the fallow was accepted as a cost of the wheat crop. The cost of purchased manure and ploughing was expected to be covered by receipts from wheat. Farmyard dung, the main form of manure, was not charged as a cost to the enterprise. In Holderness the income from wheat only just covered the cost of ploughing and purchased lime in the early 'twenties as it did in Durham in the late 'forties.⁸ Most farmers were probably like the

¹ Report on the Estates of the Rt Hon. Earl Ferrers, 1867 (Leicester Borough Record Office, 25D60/74).

² J. D. Dent, 'Agricultural Notes on the Census of 1861', *J.R.A.S.*, xxv, 1864, p. 324.

³ E.g., ix of 1821, p. 1545 (W. Stickney).

⁴ Caird, *op. cit.*, pp. 19, 215; Read, *op. cit.*, p. 238.

⁵ Baker, *op. cit.*, p. 34; Caird, *op. cit.*, p. 340.

⁶ Wratislaw, *op. cit.*, p. 170.

⁷ J. J. Mechi, *Agricultural Improvement*, 1845, p. 77.

⁸ *Select Committee*, ix of 1821, p. 1545; Caird, *op. cit.*, p. 340.

clayland farmers of Northumberland, and made no attempt to work out the actual costs of the fallow for the wheat crop.¹ In that county the estimated cost of an acre of fallow was £4 12s. excluding purchased manure, £1 15s. of which was for five ploughings.² In Essex six ploughings alone cost from £3 to £3 12s. an acre at a time when income per acre was about £3 10s.³ But accounts of farming which professed to show the unprofitability of corn growing on the clays in terms of the cost of ploughing and purchased manure only considered the cost to the arable side of the farm of growing the corn crop; they took no account of the cost to the farm as a whole. This cost included the supply of hay from the meadows to stalled cattle during the winter and the diversion of the resulting manure to the arable. The true cost of deference to the wheat crop showed itself in the large acreage of impoverished meadows and the small head of stock carried on the summer pastures.

VIII

By the late 'thirties exhaustion of the grass lands on the clays provoked widespread criticism of the dependence on hay as the main form of stock feed. The expense of a system in which a large part of the grassland was tied up as meadow to provide manure for the arable was openly questioned. A Gloucestershire observer considered that at least three acres were needed to keep a cow in that county,⁴ whilst a Staffordshire farmer considered that the hay crops did not produce a third of what they should.⁵ Despite the wide use of bones, a large proportion of Cheshire meadows was still in a deteriorated condition in the early 'forties.⁶ Because of the supremacy of corn and the dependence of the arable on the meadow for manure, authorities disagreed over the practice of ploughing old pastures in an attempt to restore fertility.⁷ In the late 'thirties an attack was made on the restrictions in leases upon the ploughing of pasture in the belief that this was the only way to regain its yields.⁸

The high cost of hay in relation to other forms of feed was criticized. In 1839, a commentator remarked that "if we believe that produce or crops of any kind require encouragement for their growth, our practice is very contrary in respect of grasses, for lands are purposely exhausted by corn crops, filled with weeds, and then grasses are expected to grow, and we are very

¹ 'Newcastle Farmers' Club', *Farmers' Magazine*, xx, 2nd ser., 1850, p. 198.

² *Ibid.*

³ Baker, *op. cit.*, p. 34.

⁴ Caird, *op. cit.*, p. 44.

⁵ 'Burton on Trent Farmers' Club', *Farmers' Magazine*, xv, 1847, p. 248.

⁶ Palin, *op. cit.*, p. 67.

⁷ J. Dickson, *Principles of Agriculture*, 1845; J. C. Loudon, *An Encyclopaedia of Agriculture*, 1825; *British Husbandry*, 3 vols., 1833-40.

⁸ J.D., 'On the Unprofitability of Old Pastures', *Farmers' Magazine*, III, 1839, p. 15.

gravely told the system pays best.”¹ In 1847, Staffordshire farmers were exhorted “instead of providing a large supply of hay which, except in the case of water meadow, is the most expensive of all kinds of winter provision for stock, [to] lay in a quantity of linseed cake . . .,”² and in 1851 the agent for a Trent Valley estate stated, “All strongland farmers will be driven to adopt the green crop system or the pulse system or part of each as a substitute for an unproductive year. The old system has been protected by prices but it must now fall.”³

As the feeding of grain and oilcake became more general, farmers were assiduous in finding substitutes for hay. The movement for repeal of the malt tax, which before the mid-’forties was concerned primarily with the reduced supply of beer for farm labourers, took a new direction. In 1848 a national association stressed the value to farmers of malt for stock fattening.⁴ In 1853 a Derbyshire farmer remarked upon the increasing practice of grain feeding in that county. “Those farmers who have been in the habit of using grains are anxious for malt tax repeal. They agree, if the malt tax was repealed, they could increase their dairy cows and reduce the growth of hay.”⁵

Evidence of a changing pasture acreage, as tired arable was converted to grass and meadow land was released by grain feeding, is not substantial but suggests an increase. In Staffordshire in the late ’sixties “the increasing profit of dairy farming as compared with arable cultivation on strong land has occasioned a great portion of such land to be laid down as permanent pasture during the last few years.”⁶ On the Leicestershire lias conversion occurred in both directions. In the dairying areas the poorest turf was ploughed and sown with oats or beans to provide straw and feed as a supplement to meal in a grassland area where these had previously been lacking.⁷ On the more fertile clays an increase in grass acreage for grazing occurred. Whichever change was made, “speaking of the county as a whole, more furrows are turned up every year, but more with a view to the meat market than to Mark Lane.”⁸ Rising wages for the large labour force necessary to work the arable clays and the rising price of stock were claimed to be the reasons for the

¹ J.D., ‘On the Unprofitability of Old Pastures’, *Farmers’ Magazine*, III, 1839, p. 15.

² Anon., *How is the Farmer to Live?*, 1846, p. 5.

³ H. Wyatt, ‘The Management of a Heavy Land Farm’, *Catalogue of the North Staffordshire Agricultural Society Show*, 1851, p. 25.

⁴ ‘Repeal of the Malt Tax’, *Farmers’ Magazine*, xvii, 2nd ser., 1848, p. 308.

⁵ Adding “The practice had much reduced the growth of hay. More cows are kept and more land is under pasture.”—J. J. Rowley, ‘Farming of Derbyshire’, *J.R.A.S.*, xiv, 1853, p. 60 and n. 1.

⁶ H. Evershed, ‘Agriculture of Staffordshire’, *J.R.A.S.*, v, 3rd ser., 1869, p. 268.

⁷ ‘Leicestershire Farming’, *Farmers’ Magazine*, *op. cit.*, p. 106.

⁸ *Ibid.*

extension of permanent pasture in Warwickshire and Worcestershire over the 'sixties and early 'seventies.¹ In contrast, the low rainfall of the Weald made the seeding down of tired arable a risky and expensive venture, and the acreage of grass extended little.² Even to an enterprising farmer the trouble involved in conversion to grassland was a deterrent. Carrington Smith seeded down some of his farm in the 'sixties, but admitted, "It was even under the hard discipline of the wet season of 1861 a rare thing for anyone to suggest that the royal road leading to the recovery of fertility was to be found in rest from the plough."³

IX

Whilst farmers were experimenting with grain feeding and on the improving estates extending their dairy enterprises and moving away from corn, the belief that the clays were the natural home of wheat farming still held sway in the national debate. The debate over the prospects of farming on the clays in the 'fifties and 'sixties resolved itself into a clash over the function of livestock, whether merely as providers of manure for the arable or as earners of revenue in their own right. The critics of the hay-feeding system hoped that drainage would permit the adoption of turnip husbandry on the clays and that the increased winter feed and manure would permit an extension of corn farming. After criticizing the state of meadows on heavy land in 1840, M. Milburn, a Holderness farmer, conjectured hopefully whether drainage would extend the cultivation of turnips.⁴ Even Philip Pusey could remark in the same year, "To whatever extent the Deanston system might be found applicable to the claylands of England, a revolution will at the same time be effected by the introduction of the turnip upon them."⁵ The revival of the orthodoxy of corn farming on the clays found its priest in Joseph Mechi. His advocacy of corn and root farming on the clays left no room for grass and assumed that the large cost involved in growing roots would be offset by the increased return of dung from a doubling of

¹ 'Report on Laying Down Land to Permanent Pasture', *J.R.A.S.*, xi, 2nd ser., 1875, pp. 490, 493.

² H. Evershed, 'Early Fattening of Cattle in the Counties of Surrey and Sussex', *J.R.A.S.*, xiv, 2nd ser., 1878, p. 167.

³ T. Carrington Smith, *The Story of a Staffordshire Farm*, 1906, p. 9.

⁴ M. Milburn, *op. cit.*, p. 119.

⁵ P. Pusey, 'Some Introductory Remarks on the Present State of Agriculture as a Science in England', *J.R.A.S.*, I, 1840, p. 6. As late as 1860 it could be remarked, "Drainage had been the great improvement of modern days, and had worked the most striking alterations in the strong lands, rendering turnip culture and sheep farming possible where bare fallows before were the rule."—J. D. Dent, 'The Present State of Agriculture in England', *Farmers' Magazine*, xvii, 3rd ser., 1860, p. 22.

stock carried per acre.¹ He believed that roots could be grown on any land, and objected "*in toto* to permanent pasture as a positive individual and national loss."² Cattle were to be considered "our manufacturers of manure, as the Lincolnshire farmers call them, and if they occasionally pay for their feed or a profit so much the better."³ Even Wren Hoskyns believed the clays were the source of future corn supply because wheat occurred more frequently in the old clayland three-course of two crops and a fallow than on the light lands. "It seems obvious that the improvement of the clay soils to their utmost extent is the special, I should almost say the only, means left to us for operating in any degree to maintain the produce of wheat in proportion to our increasing numbers."⁴ In the middle years of the century Caird and John Morton were solitary voices suggesting that the future of the heavy soils lay in stock farming.⁵ In 1850 Caird recommended an extension of grass as the salvation of the clay farmer. But by the 'eighties stock farming on the clays was accepted as a main form of livelihood and corn farming was considered exceptional.⁶

X

The revolutionary effects of the introduction of the turnip husbandry in the late eighteenth century were not felt on the heavy lands. Clayland farmers on all but the most fertile soils depended on the wheat crop for the payment of rent, and suffered after the Napoleonic wars because of their inability to increase production. The deterioration of both grassland and arable caused by a system in which the meagre supply of manure was monopolized by the cornland and the unmanured meadows were the main source of winter fodder, made a shift from the system impossible for most farmers. Attempts by improving landlords and farmers to increase the supply of provender from the arable and to expand the livestock sides of their farms failed because of the difficulty of growing fodder crops on undrained clays, although the successful application of bones to exhausted grassland in Cheshire permitted an early intensification of dairying. The increased supply of oilcake and widespread use of bones and chemical fertilizers from the late 'forties released meadowland for summer grazing, and an expansion of stock farming occurred on clayland farms, differing from the direction anticipated by agricultural authorities. These changes occurred at a time when agents and farmers were increasingly aware of a divergence in the profitability of stock

¹ Mechi, *op. cit.*, p. 15.

² *Ibid.*

³ *Ibid.*

⁴ C. Wren Hoskyns, 'The Progress of English Agriculture in the last fifteen years', *Farmers' Magazine*, ix, 3rd ser., 1856, p. 349.

⁵ Caird, *op. cit.*, pp. 485-6; J. Morton, *On Soils*, 1853, pp. 147-8.

⁶ *Royal Commission on Agricultural Interests*, xv of 1881, Q.8841, Q.9361.

and corn farming, and improvement was directed to an expansion of dairying and grazing on land where grass was a natural crop. The later Revolution on the clays and change to stock farming using grain as feed thus meant that clayland farmers were in a better position to face the price fluctuations of the last third of the century than their predecessors had been fifty years before.

Letter to the Editor

MADAM,—Dr Everitt's remarks on the distribution of nonconformity in his review of Mr Chalklin's *Seventeenth Century Kent*, and the latter's suggestion that clothiers coming from London may have helped to spread nonconformity in the county, receive some support from a manuscript (Add. 3117) in Cambridge University Library. This opens as the account book of John and Robert Saxby as executors of John Scotchford of Brenchley, a substantial husbandman (his stock included 9 horses, 38 head of cattle, 25 sheep, and 7 swine) who died in 1600. The executors' accounts occupy a few pages only, and later Robert Saxby appropriated the book to his own use, copying out pious discourses, chapters of scripture, etc.

After coming (as he tells us) to London in the summer of 1629, Saxby proceeded over the next five years to fill up the remaining pages with abstracts of nearly 200 sermons heard in City churches or at Paul's Cross. Many are by Thomas Westfield, later Bishop of Bristol, in whose parish of St Bartholomew, Smithfield, Saxby perhaps resided. Among other preachers who can be identified, Saxby displays a clear liking for such puritans as Dr William Gouge and his son Thomas ("young

Mr. Gudge"), William Bray (later chaplain to Laud, but then a puritan), and John Downham, from whose *Christian Warfare* he made long extracts. Three sermons in Kent are included; and the preacher of one at Brenchley, "Mr. Edwards . . . he lectures without Allgat upon the Tusdayes," is certainly Thomas Edwards, author of *Gangraena*, a noted puritan controversialist who preached frequently outside London.

The only hint that Robert Saxby was himself a clothier is his note of "The first clothes that I mad at Brenchly in the yere 1622." But a family connection with the trade is certain: the debts of his kinsman Scotchford, paid by the executors, included £16, £14, and £10 for purchases of wool in Kent and Surrey, £20 16s. to a London grocer for "dinge stoffe" (dyestuff), 7s. to "Cunstabell of Horsmanden" for grinding "brasell" (brazilwood for dye), and 17s. 10d. to Richard Styther for "canslinge" and dressing cloth. Certainly as a link between London and the Weald of Kent Saxby deserves further study.

Yours faithfully,

A. E. B. OWEN

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