

The Agricultural Revolution on the English Clays: a Rejoinder

By R. W. STURGESS

MR COLLINS'S and Dr Jones's rejoinder to my article is a useful addition to the history of a period in which, as they note, the quantitative material is thin and every piece of descriptive evidence must be examined closely. The rejoinder is seriously marred, however, by three mistaken points. Firstly, it is surely a conceptual misunderstanding to view technical and output changes in isolation from the results of these changes, that is to say, the greater ability of producers to exploit changes in the market for their goods. Mr Collins and Dr Jones have stigmatized the changes on the clays as merely an "adaptation to market trends" over the third quarter of the nineteenth century. But that farmers were able to adjust their systems only indicates how large were the changes in kind and degree over the third quarter of the nineteenth century, in contrast to farmers' painful inability to adapt in the first half. An agricultural revolution consists of technical and structural changes in farming systems which make it possible for farmers, with a new-found ability to reduce costs and a new elasticity of supply, to exploit the moving structure of prices which faces them. This moving price structure was a long-run rise of stock prices compared with corn, and the revolution resulted from the farmers' awareness that corn would not pay on the clays, and that in the wet north and west of the country, where a thick sward could be obtained in two years, a radically more intensive form of dairying and stock fattening was the answer. Land was converted from corn to grass, and meadowland, which previously had been tied up to provide winter fodder, was released as corn was purchased for feed, and meadowland was fully exploited for grazing during the period of optimum use, the summer season. The acreage of meadow on clay farms, kept merely to feed farm plough-horses before the middle of the nineteenth century, could rise as high as a quarter of total land on the farm.

This leads to the second point, which is that Mr Collins and Dr Jones appear to have overlooked the main distinction within the clays, which I strongly emphasized in my article, between those in the wet north and west and those in the dry east and south. At the risk of repetition, this distinction needs to be stated again because the failure of Mr Collins and Dr Jones to see its relevance and their discussion in aggregate terms mean that the many

descriptions of distressed conditions on the southern clays have been translated by them to the clays as a whole. In fact, of their examples of inadequate drainage and techniques and low yields, in which the locality is specified, seven out of the nine are southern or eastern counties. Because of the difficulty of obtaining a good sward, farming on the Essex and Wealden clays, and in particular the much criticized fallow, altered little, and farmers remained dependent on their precarious corn crop. This did not change appreciably until the flood of Scottish and north country farmers descended on Essex and other southern clay counties in the 1880's and 1890's and introduced intensive dairy husbandry.¹ This belated switch to intensive dairying was made possible by the adoption of the "soiling" system whereby most of the land was laid down to corn and meadow, the corn and hay being carted to the cows in the stalls and manure being carried back to the fields. In this attempt to get over the poor quality of grazing grass in these dry areas cattle were kept in the stalls for most of the year. In contrast, as I have tried to show in my article, production of livestock increased in the north, west, and Midland counties from the middle of the century. But even in the Weald attempts to diversify were made by introducing more stock on to farms. The problems of clayland farming today, referred to by Mr Collins and Dr Jones, are problems of the dry east and south where inadequate grass exists in the summer for cheap stock feeding.²

Lastly, Mr Collins and Dr Jones have argued in an inverted way that because drainage and manuring on the clays as a whole appears to them to have been inadequate, production did not increase. The evidence of increased dairy and beef production is overwhelming, however, and cannot be escaped, and the criticism of inadequate drainage and manuring is open to straightforward explanation. In Somerset cow numbers rose by a half over the 'fifties, whilst in Cheshire they almost doubled in the thirty years after 1830. In Cumberland and on the Wheatlands of Shropshire, stock farming expanded where previously many farmers had confined their production solely to corn, whilst on the fattening pastures of Leicestershire the consumption of all the grain produced on the farm permitted a larger head of stock to be carried over winter.³ Also, milk yields per cow increased because

¹ P. McConnell, 'The Experiences of a Scotsman on the Essex clays', *J.R.A.S.*, 3rd ser., II, 1891, pp. 311-24.

² I. G. Reid, *The Small Farm on Heavy Land*, Department of Agricultural Economics, Wye College, London University Publications, 1958, pp. 11-16.

³ J. Harding, 'Recent Improvements in Dairy Practice', *J.R.A.S.*, XXI, 1860, p. 83; 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; H. Tanner, 'The Agriculture of Shropshire', *J.R.A.S.*, XIX, 1858, p. 17; W. S. Moscrop, 'A Report on the Farming of Leicestershire',

of high feeding and the development of the milking properties of the Dairy Shorthorn breed. Although no figures are available, two of the leading authorities agreed that average milk yields per cow per year rose over the 1870's and 1880's.¹ It is impossible to estimate earlier yields because of the concentration of milking into the summer season and because of great differences between the milking properties of the different regional breeds.

I do not disagree about the change, in the country as a whole, to a more intensive mixed system of farming with greater emphasis on stock over the third quarter of the century. But on the clays change was more pronounced in kind and degree. Mr Collins and Dr Jones have talked about a "gap" between clayland and lightland farmers, and have compared corn yields, as if they were in open competition. But clay farmers were more concerned with their present condition compared with what it was a few years before than in any notional competition with other farmers. Equally, to compare wheat yields on the clays with those on the light soils over the 'fifties and 'sixties is irrelevant, because the measure of change was the ability of heavyland farmers to turn away from wheat to stock. More important to farmers in the west and north was the cheapening of their main cost, purchased feed, during the price fluctuations of the last third of the century. Because they were now in the more buoyant business of dairy and beef production, and were able to adjust production more easily to suit market conditions by fully utilizing their grassland and buying cheap corn as feed, they were in a position to accept a reduced level of prices during the "Great Depression." In fact, it may be stated that the general fall in prices from the 'seventies, distressing as it was for corn farmers, obscured a reduced level of real costs on all the clays of the country, except in East Anglia and the Weald. These lowered costs stemmed from the technical and structural changes of the 'fifties and 'sixties.

Mr Collins and Dr Jones have suggested that there remained "a huge gap of untreated clayland" requiring drainage by the 'seventies and that generally there was "so little done." This was patently not so on all of the clays outside of East Anglia, the east Midlands, and the Weald. In fact, of the first £2½ million borrowed from the government and improvement companies be-

J.R.A.S., II, 2nd ser., 1866, pp. 321, 328; J. Dixon, 'Manuring Grasslands', *J.R.A.S.*, XIX, 1858, p. 207.

¹ 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. 258-9; J. P. Sheldon, *The Farm and the Dairy*, 1889, p. 57. In fact, one authority could criticize country shows for being behind the times and giving prizes for the looks of an animal rather than for its milking properties: "The time has now arrived when milk is of the primest importance, and a well kept cow, if not yielding in the 12 months 550 to 600 imperial gallons is not worth keeping."—Gilbert Murray, 'The Dairy Cow', *Livestock Journal*, XXIII, 1886, p. 100.

tween 1846 and 1855, 83 per cent was spent on estates in counties to the north and west of Leicestershire.¹ Although drainage was not being carried out in eleven of the forty-two counties in the country in 1870, as quoted by Mr Collins and Dr Jones, it was still "extending" in twenty-five. The area drained in the west and north was large. If Caird's and Denton's view that the sum spent by landowners from their own resources on drainage by the late 'seventies was double that borrowed from the government or improvement companies, the amount spent in the north and west, as earlier defined, would be some £16 million. Reckoning the cost of drainage at the generally accepted figure of £6 per acre before 1872 and £6 10s. after, this represents just over 2 million acres, or the cultivated acreage of the counties of Leicestershire, Staffordshire, Warwickshire, and Cheshire. Since a considerable part of the western and northern counties was light land not requiring drainage, the proportion of the land in these areas which benefited from drainage must, therefore, have been great. Part of the reason for the apparently low percentage of land drained in the country as a whole during the 'fifties and 'sixties is that Bailey Denton, the leading writer on the subject, calculated the land actually drained as a proportion of land cultivated or *capable of cultivation*.² This area capable of cultivation included woodland. The difference between this latter area and the area *actually in cultivation* is not known. But if the total land in the country actually in cultivation in the year of the calculation, 1883, be compared with Denton's acreage actually in cultivation, and capable of cultivation, there is a difference of some 7½ million acres. This optimistic view of land which could technically be drained as opposed to what was economically desirable would therefore considerably depress any percentages worked out by Denton.

Also, the generally low rate of artificial manuring on the clays, pointed out by Mr Collins and Dr Jones, was compensated for by the fact that the increased herds carried on dairy farms in the 'fifties and 'sixties and the increased use of purchased grains for winter feeding returned more and better dung to the land. By the mid-'eighties brewers' grains were used by the majority of farmers in the Cheddar district of Somerset, and their use was "universal" in the west of England.³ In the Trent valley brewers' grains or imported meal and oilcake were the main items in costs on most farms. Lord Lichfield, a Trent valley landowner, strongly opposed the change from cheese-making to milk-selling in the 'fifties because no milk-whey was left to be fed to pigs and so converted into manure. But he changed his views during

¹ Applications to Enclosure Commissioners for Drainage Loans, *London Gazette*, 1846-55, *passim*.

² J. Bailey Denton, *Agricultural Drainage: Reminiscences of Forty Years' Experience*, 1883.

³ 'Brewers' Grains in Feeding', *Livestock Journal*, xxiv, 1886, p. 520.

the 'sixties because his tenants were feeding their cows so highly with grains, and thus returning large supplies of manure to the soil.¹

Mr Collins and Dr Jones have said that rent on the poorer clays failed to rise over the 'sixties and 'seventies. Yet rents on the Earl of Lichfield's 16,000-acre estate on the claylands of the Trent valley increased by 18 per cent from 1855-7 to a peak in 1875-9; on Earl Ferrers's 6,500-acre Chartley estate they rose by 9 per cent from the 'fifties to their peak in 1878; on the Duke of Sutherland's 10,000 acres of the Trentham estate they rose 25 per cent in the same period. It is premature to generalize about rents on the bulk of the clays.²

To answer all Mr Collins's and Dr Jones's points would be to descend to petty dispute, but some examples must be given to show a looseness of argument. The reason why the original debt on the drainage of the North Devon estate cited by them was not paid after twenty years was that no improvement company asked for its loans to be fully repaid in less than twenty-five years. Who were the advanced agriculturists who had given up drainage by the 'sixties and gone in for steam ploughing? In what did their advancement consist if they were "sinking men . . . making desperate ventures upon a costly machine" during the propitious 'sixties? Also, to compare sheep numbers on the clays of Wiltshire with those on the light soils and to discover that in sheep equivalents the clays were less densely stocked than the chalk soils is misleading as sheep are not clayland livestock; dairying and beef fattening are the predominant enterprises.

A more serious criticism lies in the misuse of the term "opportunity costs." To state blandly that the change from cheese and butter sales to liquid milk selling, which occurred in the north-western and south-western grass counties after the London cattle plague of the mid-'sixties, meant that "a net gain in physical production on the clays (was) at best equivocal" is just not adequate. This, it is argued, was because no whey was now available as a by-product to be used to fatten pigs and thereby gain extra income. But in attempting to calculate opportunity costs Mr Collins and Dr Jones have omitted to include costs of the respective enterprises. This can be settled by a simple calculation using figures typical of the north-western or south-western grassland counties. In the 'sixties, good quality Cheshire, Derbyshire, Gloucestershire, or Wensleydale cheese was selling at 6d.-7d. a pound whilst farmers were receiving 9d. a gallon for "country" milk sold in London. A gallon of milk will yield 1 lb. of cheese. On a 100-acre farm with

¹ H. Evershed, 'The Farming of Staffordshire', *J.R.A.S.*, 2nd ser., v, 1869, pp. 80-1; 'The Farming of Nottinghamshire', *ibid.*, pp. 442-51; *Livestock Journal*, xxi, 1885, p. 396.

² Ranton Estate Office, Eccleshall; Leicester Borough Record Office, 26D53/2424-2436; Staffs. Rec. Office, D593.

access to London, the milk from twenty cows would yield £225-£262 as cheese, or £337 as milk, or at least £70 more as milk. At the same time, by turning from cheese to milk selling, larger farms would be able to forgo paying a dairymaid some £70 a year. Thus the gain from turning to liquid milk selling would be roughly £70-£140 and this would be much more than the value of milk whey as pig feed. In Leicestershire and Staffordshire the value of whey to be consumed by pigs was considered to be 30s. to 50s. per cow.¹ Because of the long-term cheapening of corn purchases these in fact could take over from whey and a considerable expansion of pig and poultry-keeping seems to have taken place on small farms over the 'seventies and 'eighties, using grain as feed.²

My contention is that over the 'fifties and 'sixties there occurred a technical revolution on the clays of the north and west of the country which consisted in the conversion of cornland to an intensive grassland husbandry on newly drained farms. This new intensity was gained by the feeding of cows with grains and oilcake which released much of the meadowland for summer grazing and permitted expanding herds of dairy and beef cattle to be carried on summer pasture. Because more livestock were carried in the summer a propitious circle appeared. The increased dung available gave higher yields of hay and corn for feed, which permitted a reduction in the meadow and arable acreage and the keeping of fewer hay-consuming plough horses, thereby releasing more land to be laid down as summer pastures. A large increase of dairy produce followed these changes where previously, on these traditional clay cornlands of the country, corn had been the mainstay. Mr Collins and Dr Jones have argued that the balance of production, of grain and of livestock, in the country as a whole came from the mixed farming of the light soils over the third quarter of the century. I think that this point is open to argument because of the difficulty of equating the production from different farming systems at a time when the statistical evidence is so thin. But that dairy production on the clays increased is beyond doubt. Also, this was a *continuing* increase. Because of the increasing supplies of cheap corn over the last quarter of the century and the buoyant demand for dairy produce, farming on the clays was in a position to exploit price changes at the time when the rigid classical turnip husbandry of the light soils was in decline. As such, the agricultural revolution on the clays in terms of increasing production may be said to have spanned the second half of the century. Clayland farmers were thus in a better position to face the price fluctuations in the last quarter of the century than their fathers had been in the thirty years after the Napoleonic Wars.

¹ Moscrop, *op. cit.*, p. 327; Evershed, *op. cit.*, p. 271.

² Farming Reports, *Agricultural Gazette*, N.S. xxvii, 1888, p. 494.