

Adjustments in Arable Farming after the Napoleonic Wars

By A R WILKES

IN 1968 E L Jones remarked that the writing of nineteenth-century agricultural history was at an awkward in-between stage.¹ His assertion is still true especially of the years between the end of the Napoleonic Wars and the repeal of the corn laws. While the traditional wisdom of Lord Ernle is doubted, no complete alternative hypothesis has been advanced. The critique of Ernle, however, has focused on his unquestioning acceptance of the evidence on agricultural distress presented to parliamentary Select Committees in the twenty years after Waterloo, which encouraged him to depict the period as one of pervasive depression. Monographs on the more advanced areas have emphasized the differences between the more dynamic light-land farmers and the hard-pressed clayland arable farmers.² It is this strand of research which, above all, appears to colour modern interpretation, even though the local studies have not yet been properly integrated to produce a national picture. The aim of this paper is to put forward an alternative hypothesis for the post-Napoleonic War period by reinterpreting certain evidence used in other works, but also by putting forward hitherto unused sources.³ It is not intended to re-examine the case for considering the period as one of depression but to consider in detail those patterns of response to the post-war price fall which can be observed in English arable farming. Initially

this will require some comment on what caused agricultural prices to fall and an examination of contemporary analysis. An adjustment is nearly always a reaction, and if contemporary judgement can be shown to have been false this is clearly of significance. Secondly, an attempt will be made to show that the new orthodoxy of English agricultural history, which puts down most increased production to the dynamic light-land sector and emphasizes the role of increased yield per acre in raising agricultural production, fails to take into account important developments in early nineteenth-century farming, namely a large increase in the national wheat acreage, some of which occurred on the claylands, which while they remained England's traditional granary soils have come to be regarded as a laggard sector. Above all, an attempt will be made to consider agricultural adjustment from the point of view of the English farmer, that comparatively neglected figure of agricultural history.

I

The fall in the price of cereals after 1813 was both sudden and dramatic. The price of wheat (perennial yardstick of agricultural prosperity) more than halved between January 1813 and December 1815; similar falls occurred in the prices of barley and oats. In the short term the price fall must be attributed to a reversal of those factors which had served to raise the prices during the war. Hence the bumper harvest of 1813 revealed the productive potential of the extended wartime acreage which had previously been masked by deficient harvests. At the same time imports became more readily available, while the

¹ E L Jones, *The Development of English Agriculture*, 1968, p 9.

² D B Grigg, *The Agricultural Revolution in South Lincolnshire*, 1966; A Harris, *The Rural Landscape of the East Riding of Yorkshire*, 1961.

³ A fuller discussion of the post-Napoleonic War period is available in my 'Depression and Recovery in English Agriculture after the Napoleonic Wars', unpublished PhD thesis, Univ Reading, 1975.

reduction in freight and insurance charges lowered their costs. The inflationary elements of extensive government purchases, and bulk-buying by corn merchants anxious to secure a speculative price increase above the market rate, were withdrawn.

However, the combination of circumstances which had reduced prices in 1813 and 1814 were not long-lasting. After 1815 imports were forbidden except when wheat prices reached 80s per quarter; and as the 1822 Corn Law amendment was never operated this prohibition remained in force until 1828. Indeed, after 1815 high imports coincided with high prices, as they had done during the war. Contemporaries attributed some influence to Irish imports, which were at their largest in years when prices were low. However, over the period 1801–50 Irish imports at their peak amounted to only 0.47 bushels per head of the population of England and Wales. Their influence may have been considerable in certain localities such as South Wales, Cheshire and Lancashire but nationally such figures are insignificant.

When in addition to the fact that imports were generally lower than in 1813 and 1814 it is considered few harvests (at least in the years here under consideration) were as prolific as that of 1813, it is clear that we are observing a long-term decline in agricultural prices for which long-term causes must be discovered. In part this price reduction could be attributed to general deflationary trends in the economy. The price of most manufactured goods fell sharply over the first half of the nineteenth century, largely as a result of technical developments in manufacturing which reduced unit output costs.⁴ However, the price of farm produce is conditioned more by supply and demand than by production costs. The fact that so many farmers complained so readily of distress would appear to undermine any assertion that the price reduction was part of a general deflation. Farmers were not

selling cheaply because cost reductions enabled them to do so.

It is therefore necessary to examine long-term production and consumption patterns. Unless there was a shift towards consumption of cheaper cereals, population growth in the years after 1813 would naturally have created an expanding market of wheat consumers. In the short term the disturbed social conditions of the immediate post-war years may have reduced consumption. However, in view of the tenacity with which wheat consumers during the wartime shortage when prices were high clung to a diet containing that cereal as a major component, it seems unlikely that they would abandon it when prices were low. This low-price argument is further reinforced by the fact that a bushel of wheat produces more flour than a bushel of barley or oats, thus reducing the differential between them in terms of food costs. It seems improbable therefore that wheat-eaters gave up the consumption of that cereal in the early nineteenth century.

The persistence of the price fall in the face of a continuously expanding home market, and the fact that except in years of high prices imports were negligible, pose an interesting question.⁵ Was supply outrunning even this enlarged demand? A complete solution to this problem is hampered by the absence of accurate long-term production statistics. The figures produced by Dr Fairlie present certain problems.⁶ The most obvious is the fact that the series begins only in 1828, thus the immediate post-war trends cannot be enumerated. Secondly, it is impossible to ascertain the degree to which the market returns for wheat represent the sum total available for human consumption. Part of it was undoubtedly used as seed or fed to

⁴ J Burnett, *A History of the Cost of Living*, 1969, pp 199, 214–15; W W Rostow, *The British Economy of the Nineteenth Century*, 1948, p 17.

⁵ Roughly the same proportion of the 15,731,000 inhabitants of England and Wales of 1840 were fed on home-produced wheat as the 10,650,000 of 1813. See J D Chambers, *The Workshop of the World*, 2nd edn, 1968, p 52; J D Chambers and G E Mingay, *The Agricultural Revolution 1750–1880*, 1966, p 208.

⁶ S Fairlie, 'The Corn Laws and British Wheat Production 1829–76', *Econ Hist Rev*, 2nd ser, XXII, 1969.

animals, and in addition we have no way of telling how many farmers ate the wheat grown on their own land. However, using Fairlie's production series as it exists, and dividing it by the population, points to an increase in wheat availability per head in the mid-1830s when wheat prices were low, and a probable decline thereafter.

TABLE 1
Wheat availability in bushels per head, 1828-50⁷

1828	6.4	1840	7.83
1829	6.05	1841	7.86
1830	7.3	1842	—
1831	6.41	1843	7.09
1832	7.44	1844	7.38
1833	7.98	1845	8.9
1834	8.3	1846	7.86
1835	8.53	1847	6.06
1836	9.41	1848	6.96
1837	8.23	1849	6.59
1838	8.51	1850	5.9
1839	6.54		

All of this ties in very well with the price figures which rise in the late 1830s, with qualitative evidence which points to a flooded home market in the mid-1830s, and with the higher import figures of the years 1829-32.⁸

Similar figures are not available for the immediate post-war years; however, the case for assuming that the wheat markets were flooded in 1813 and 1814 has already been discussed. Reliable evidence also points to over-production as the cause of very low prices in the years 1821-23. Thomas Tooke

was content to assign all the blame to over-supply, commenting:

In truth the depression of the average price of wheat at the close of 1822 is fully accounted for. First by the produce of that harvest coming early to market, and being ascertained to be average in point of quality, so that there was no relief nor immediate prospect of it from the pressure of the large surplus, which was then ascertained to be on hand from former years.⁹

In 1821 the Commons Select Committee on Agricultural Distress produced a report of similar persuasion, and ignoring the protestations of witnesses who appeared before it, declared that

So far as the present depression of the markets of agricultural produce is the effect of abundance from our own growth the circumstances arises from a cause which no legislative provision can alleviate.¹⁰

The failure of prices to rise dramatically between these troughs, other than in years of dearth, leads to the conclusion that while the extent to which production outran demand was greater in two distinct periods, ie 1821-23 and 1833-36, wheat production until the late 1830s remained ahead of population growth. This accounts for a great deal of the reduction in price.

Similar arguments relating to barley and oats are harder to substantiate. Figures similar to those calculated by Fairlie can be obtained from parliamentary papers but their reliability is suspect.¹¹ The most reliable barometer of demand for barley is supplied by examining returns relating to the amount of beer brewed. Beer production was fairly stable from 1815 to 1829, any increase being accounted for by population growth.¹² It appears likely, however, that human consumption of barley in bread declined, and these trends may have counteracted each other. Contemporary agricultural opinion favoured

⁷ Fairlie, *op cit*, pp 114-15; B R Mitchell and P Deane, *Abstract of British Historical Statistics*, 1971, p 8.

⁸ In the mid-1830s Simon Gray, a regular and not unperceptive contributor to the *British Farmer's Magazine* urged farmers to withhold their corn from market as an antidote to the prevailing glut: *op cit*, VIII, No 31, May 1834, p 165. In the following year he struck a familiar note: 'Let only those really compelled by distress, whether in Ireland or Britain, come into the market (and these should keep back every quarter they can) for a month or two, and the prices will rise to fair British rates.' *Ibid*, No 34, January 1835, p 165. Figures on imports are from Mitchell and Deane, *op cit*, pp 98-9.

⁹ T Tooke, *A History of Prices*, facsimile edn, 1925, II, p 85.

¹⁰ BPP 1821 (668) IX, p 26.

¹¹ Market returns for barley and oats are contained in *Miscellaneous Accounts and Papers* II, 1898, BPP 1898 (102). For a discussion of their accuracy see Wilkes, *op cit*, pp 21, 23, 50.

¹² Figures on beer production are contained in J Burnett, *Plenty and Want*, 1966, p 27. Arguments on the malt duties are discussed in Wilkes, *op cit*, pp 33-4, 183-5.

repeal of the malt duties to encourage the consumption of barley as animal feed and in home-brewed beer. However, following the passage of the Beer House Act of 1830, beer production rose, and so did the consumption of barley. This coincided with several years in the mid-1830s when the supply of barley was deficient and prices rose.

The price of oats correlated very closely with that of barley.¹³ It is impossible, however, to discover any accurate national consumption or production figures for that cereal. In all probability human consumption declined, but some of the decline may have been offset by the large amounts consumed by horses, the numbers of which may be assumed to have increased as a corollary of increased economic activity. The failure of the price to rise very much suggests that there was a healthy surplus of supply over demand. It is therefore apparent that for twenty years after the Napoleonic Wars the low price of cereals was the by-product of an oversubscribed home market. The factors which brought this about must now be examined.

II

The existence of rising agricultural production during the period of price deflation has long been recognized and has been commented upon as a factor operating against considering the post-Napoleonic War period as one of total depression.¹⁴ E L Jones has advanced the argument that English wheat yields rose by 16 per cent from 1815-19 to 1832-36.¹⁵ This, he claimed, was indicative of how increased production was secured by means of investment in improved techniques to offset low prices by higher production. However, even if we accept that this increase did take place, it could not by itself account for the increased production which must have taken place

during those years to feed the growing population and, as shown, maintain the surplus of supply over demand which depressed prices.

Jones's figures are based on the results of the Cropper Benson surveys. If the adjustment he and Healey suggested is applied to the series then the average yield per acre for 1815-19 was 21.68 bushels, and that for 1832-36 23.098 bushels. If the average demand for those years is estimated by assuming that a population of the arithmetic means of those years consumed at a rate of six bushels per head, the home wheat requirement was 8,528,280 quarters in 1815-19 and 10,914,750 quarters in 1832-36. Combining these figures with the yield (ie multiplying by eight and dividing by bushel yields), the acreage required to meet home demand in 1815-19 was 3,155,981, and in 1832-36 3,479,081. If the acreage had remained stable while the yield rose, production would have been 9,901,101.6 quarters and would have fallen short of demand by 1,013,648.4 quarters or 9.28 per cent. The existence of continuous low prices necessarily shows that demand did not exceed supply. Assuming therefore that an acreage increase was forthcoming to meet the demand, then 57.52 per cent of the increase would (based on these figures) have been obtained from the rise in yield per acre and 42.48 per cent from the increased acreage.

However, Jones's figures may be criticized for giving an upward bias to the yield per acre. Even allowing for the adjustments suggested, it is likely that the surveyors who compiled the series visited the more co-operative farmers whom we may venture to suggest, were likely to have been the more progressive. Secondly, comparison between the years 1815-19 and 1832-36 can be criticized for comparing a run of good harvests in the latter period with a series of indifferent ones in the former. While it remains unlikely that there was no increase in yield per acre over the period, it does seem unlikely that it was as high as that postulated

¹³ The actual figure is 0.9346.

¹⁴ Jones, *op cit*, p 13.

¹⁵ *Ibid*: the figure is based upon statistics in M J R Healey and E L Jones, 'Wheat Yields in England, 1815-1859', *Jour Royal Stat Soc*, Ser A, CXXV, 1962.

were given over to that crop. This applied particularly to areas which had been put under the plough during the Napoleonic Wars and by the gradual consolidating effect of the tread of folded sheep fed on either downland grass, clover or turnips had become fit to grow wheat where previously rye or barley had been cultivated. The most spectacular effects of this were seen on the Lincolnshire Heath and Wolds, on the Yorkshire Wolds, and on the fens where it was claimed, 'vast quantities of wheat have been grown . . . where wheat never grew before, and the crops have proved most abundant'.²²

Thirdly, there is evidence to suggest that wheat production was expanded on the clay soils, England's traditional granary, by means of an increase in the importance of wheat in the rotations and by ploughing up permanent pasture in order to procure a cash crop. Grey of Dilston complained that farmers in Northumberland 'have had recourse to repeating corn crops too frequently and exhausted the land'.²³ Further south, in Buckinghamshire, J Brickwell noted that

About the year 1827, when there was an enquiry here, they were running wheat on wheat; I recollect the time perfectly, but I do not recollect the precise year'.²⁴

In Essex W Downes, a land agent, commented that the breadth of land under wheat was increasing: 'the farmers will take a crop of wheat whenever they have the opportunity of doing so'.²⁵ A great change in the cereal cropping of land in Huntingdonshire was noted by T Bowyer in 1836: 'twenty years before the proportion of wheat to barley had been three acres to five; now it was three to one'.²⁶ Evidence relating to the breaking up of old grassland and its conversion to tillage is abundant. J B Turner, an owner-occupier from Hereford, informed the 1836 Agricultural Committee of the House of Lords that when allowed to break

up a pasture a tenant would usually do so. He claimed that such indulgence had often been granted of late years.²⁷ In Cumberland W Blamire, a witness before the same Committee, observed that the farmers had '... scourged their land more and cropped it harder and broken up more lea than they ought to have done'.²⁸ W Reed, an agent and valuer from Lancashire, noted the break up of pasture in that county and attributed it to the depressing effect on local markets of Irish cattle imports which had forced farmers to grow corn.²⁹ A similar trend was noted in Leicestershire: W Smith, a land agent from Derby, denied that grassland had been broken up on the estates under his control, but thought that other agents had allowed the tenants to plough up pastures. He confirmed that, in general, a great deal of grassland had been broken up in Leicestershire.³⁰

While these people do not refer specifically to clay soils when making these assertions, it is fair to assume that as most of the permanent pasture that would repay ploughing up in the short term lay on heavy soils they are indeed referring to an increase in the wheat acreage on the clays. This connection is definitely made in the evidence of S Wooley, a land and tithe agent from Newark:

Have you found in Rutland that there has been a tendency to break up the old pasture land?

I am not acquainted with Rutland. There has been a great quantity of grassland broken up in Lincolnshire in the last three or four years . . . It has been generally confined to the land most liable to rot sheep.³¹

He was obviously referring to clay soils, the occupiers of which had generally suffered most from the ravages of that disease.

Contemporary evidence is not abundant enough to enable any accurate assessment of which source of the extended wheat acreage was most important. However, it is clear that the previous concentration on cereal

²² *British Farmers' Magazine* (hereafter BFM) IX, No 35, April 1835, p 55.

²³ BPP 1837 (404) V, p 384.

²⁴ BPP 1836 (79) VIII, p 35.

²⁵ BPP 1833 (612) V, p 77.

²⁶ BPP 1836 (79) VIII, p 170.

²⁷ *Ibid.*, p 391.

²⁸ *Ibid.*, p 305.

²⁹ *Ibid.*, pp 179–80.

³⁰ *Ibid.*, p 595.

³¹ *Ibid.*, p 535.

switching on recently cultivated light soils as the source of higher wheat production underestimates or ignores the existence of other sources. In view of contemporary complaints and the claims of modern historians that wheat-growers on heavy soils were the most depressed group this development would appear to be totally illogical. It is therefore necessary to examine those economic pressures which forced farmers to grow more wheat, to examine the alternatives and to suggest why they were rejected.

III

The phenomenon of an increasing supply in the face of a falling price is known as a backward sloping supply curve. The theory of this in relation to wheat production was examined by G R Allen using the example of Saskatchewan in the 1920s and 1930s. He concluded that

... The supply price necessary to call forth new production will often be higher than the supply to maintain that production³² and furthermore that ... a change in the real price of wheat between one harvest and the next during the period 1914-1939 resulted in an opposite short-term movement in the wheat acreages. ... As far as Saskatchewan is concerned there undoubtedly exists a backward sloping supply curve in the short run. The evidence suggests that it was this fact which accounted for the increase in the wheat acreage in the first few years of the 1930s much more than does the impetus of long term expansion.³³

This development was noted by one of the more acute of contemporary observers, Joseph Sanders, who stated in his evidence before the 1836 Committee:

... when there has been a high price of corn and good crops and afterwards a descending scale of prices, that invariably, for one or two years, there is more wheat grown than ever; but that always cures itself in the course of one or two years more, and then they get into another extreme.³⁴

The increase in the wheat acreage was neither uniform nor continuous. Two distinct cycles

can be identified, one reaching a peak in the years 1822-23 and the other at the harvest of 1835. In both cases the original impetus can be ascribed to rising prices. The latter case fits this category more definitely. During the years 1828-31 English harvests were deficient and prices rose. In many cases this was reinforced by the loss of sheep through sheep-rot which forced farmers to increase their wheat acreage. The last development may indeed have prolonged the period of increase. Most of the evidence points to a peak acreage harvest in 1835 followed by a sharp decline.

The earlier cycle is more difficult to date accurately. It has been generally assumed that the cultivated acreage was reduced after the Napoleonic War.³⁵ The *Edinburgh Review* had no doubt about this, and asserted that a re-extension had been brought about by a combination of the 1815 Corn Law and also by the bad seasons of 1816 and 1817 which had raised prices above their natural level.

But this prosperity carried in its bosom the seeds of future mischief. The increased price necessarily occasioned a fresh extension of the tillage: capital was again applied to the soil; and the supply of corn thus being augmented, prices fell.³⁶

How far this represents total objectivity is difficult to decide. The *Edinburgh Review* was opposed to the Corn Laws and was unlikely to be sympathetic to the needs of the farmers if they in any way clashed with the interests of the consumer. However, the beginning of this cycle can be dated as 1816-17. Its continuance can be traced to 1822-23 but establishing when it ended has proved more difficult.³⁷ There does not appear to have been a large-scale movement away from wheat such as occurred in 1835. Economic alternatives in the form of spring grain or pasture did not present themselves as

³² G R Allen, 'Wheat Farmers and Falling Prices', *The Farm Economist*, VII, 8, 1954, p 336.

³³ *Ibid*, p 338.

³⁴ BPP 1836 (189) VIII, p 152.

³⁵ 'The edge of cultivation was pushed beyond even the obliterating limits of the second World War's reclamation campaign, so that abandoned Napoleonic ploughing rig survives far up on the chalk downs and Dartmoor and out on the New Forest heaths': Jones, *op cit*, p 10.

³⁶ J R McCulloch, 'Progress and Present State of Agriculture', *Edinburgh Review*, XXXVI, no 72, Feb 1836, pp 460-1.

³⁷ *Supra* p 92.

obviously as they did in 1835. Had a movement towards these occurred it would surely have received notice in the farming press. It is more likely that the expansion tailed off and that if there was any reduction it was not dramatic and attracted little attention. Comment upon extensions of the wheat acreage ended in 1822, but there is no indication of any reduction until 1825, and that referred only to parts of Scotland.³⁸ Just as the temporary halt to the increase in the wheat acreage was ended by the rising prices of the late 1820s, so the widespread falling off in 1835 was reversed in the autumn of 1837 when high prices encouraged re-extension.³⁹

The economic forces which operated to compel farmers to grow more wheat can be fairly easily analysed. Rising wheat prices necessarily encouraged its cultivation, falling prices may easily have made increased production imperative. A farmer facing a crisis of diminishing returns and stable overheads needed to accelerate his cash flows and to secure the largest possible monetary return per acre. On balance, despite the large fall in the price, the best way to achieve both of these in the short term was to grow more wheat. By taking a long-term view of price movements we can see that the prices of barley and oats fell by less than that of wheat. However, to a farmer who had to deal in absolute values and related prices rather than in long-term trends, this was likely to count for less than the return per acre supplied by each crop, assuming his land could support them. The price-correlation between the major bread grains was very close in the first half of the nineteenth century.⁴⁰ The degree to which prices fluctuated can be seen in

Table 2. While the gap between wheat and barley prices narrowed gradually, in only eleven years was it less than 40 per cent. The gap between wheat and oats also decreased marginally, but in only thirteen years was it less than 50 per cent. Thus in order to produce the same monetary return per acre barley had to yield 40 per cent more than wheat on the same soil, and oats 50 per cent more.⁴¹

Some of this difference in return would have been compensated by the costs involved in producing different cereals. Unfortunately these are almost impossible to estimate on a national scale. Contemporary calculations of production costs are at best tenuous, since cost accounting was in its infancy as far as farmers were concerned. Naturally the amount involved in producing a given crop depended to a large extent on the method employed; for example, should the cost of the fallow be totally laid on the wheat crop or divided over the rotation? Several of the witnesses who appeared before the 1821 Select Committee on Agriculture presented their ideas on production costs and returns per acre, but in many cases these require some adjustment to obtain a true picture. Their usefulness lies in allowing us to obtain some idea of the costs and returns involved, not only as we can see them but as they were estimated through the eyes of contemporaries who were making adjustments in their farming systems to counteract the price fall.

J Lake presented accounts on operating a seven-tillth system in Kent. He estimated the cost of growing one acre of barley as £6 10s 6d and one of oats as £6 15s 6d. Wheat appeared twice in the course, the cost being £7 5s 3d and £8 17s 3d; in the latter case a charge of £1 10s 0d for manure was included. In all these figures allowances were made for tithe

³⁸ *Farmers' Magazine*, XXVI, No 102, May 1825: 'The breadth of wheat in this quarter seems to decrease; but so it ought, as much of it was lately sown on land totally unfit to grow it to advantage.'

³⁹ BFM, NS, I, no 4, Jan 1838, p 497; *Farmers' Magazine*, VIII, i, Jan 1838, p 73; *Quar Jour Ag*, IX, 1838-39, p 138.

⁴⁰ The correlation coefficients are: between wheat and barley 0.8533; wheat and oats 0.8677; and barley and oats 0.9346 (calculations using the CDC 7600 version of Time Series Process. I am grateful to Paul Kelly a former postgraduate colleague for demonstrating the use of this programme).

⁴¹ According to Caird's estimates, barley yielded 28.9 per cent more than wheat, the yield of oats exceeded that of wheat by 39.7 per cent. *English Agriculture in 1850-51*, new edn, 1968, p 522. The differentials for the period 1800-16 were: between barley and wheat 34.3 per cent; and between oats and wheat 39.1 per cent. (I am grateful to Dr E J T Collins for the latter figures.)

TABLE 2
Percentage price differentials between
wheat, barley and oats, 1813-50

	A Price of wheat exceeded price of barley by per cent	B Price of wheat exceeded price of oats by per cent	C Price of barley exceeded price of oats by per cent
1813	45.7	64.8	35.3
1814	49.7	65.5	31.5
1815	53.9	64.0	21.8
1816	56.9	65.3	19.5
1817	48.9	66.5	34.4
1818	37.7	62.5	39.7
1819	38.8	62.1	38.1
1820	50.1	64.3	28.4
1821	53.7	68.3	25.0
1822	51.1	59.1	16.5
1823	41.0	57.3	27.6
1824	42.9	61.1	31.8
1825	41.6	62.6	36.0
1826	41.2	54.6	22.6
1827	35.7	51.7	25.0
1828	45.7	62.7	31.4
1829	51.0	65.6	29.8
1830	49.2	61.9	28.1
1831	42.7	61.7	33.1
1832	43.3	65.1	38.5
1833	47.9	65.1	33.0
1834	37.2	54.9	28.2
1835	32.6	44.1	26.1
1836	32.3	52.1	29.2
1837	45.5	58.4	23.6
1838	48.2	65.3	32.9
1839	44.0	63.4	14.6
1840	45.1	61.4	29.6
1841	49.0	64.9	31.7
1842	51.9	66.4	30.2
1843	41.2	63.3	37.6
1844	34.3	61.2	38.6
1845	37.7	65.7	28.7
1846	40.2	56.7	27.5
1847	31.4	58.9	35.2
1848	37.6	59.4	34.9
1849	37.5	60.4	36.5
1850	41.7	59.2	29.9

at 16s, interest on capital 12s, and rent and rates £2 10s 0d. The return per acre was also calculated: barley yielded 36 bushels, sold at 4s, total £7 4s 0d; wheat 32 bushels at 10s, total £16 0s 0d; oats 48 bushels at 3s, total £7 4s 0d.⁴² All the costings were based upon cereals selling at the importing prices of the 1815 Corn Law. His costs per acre have to be adjusted downwards, therefore, to allow for a lower seed price. Using the average corn prices for 1821 this would reduce the cost of growing one acre of wheat by 9s, barley by 3s 7d; and oats by 3s, producing costs of £6 16s 9d and £8 8s 3d for wheat, £6 6s 11d for barley, and £6 12s 6d for oats.

A second estimate was provided to the same committee by William Illott.⁴³ He calculated that the operations of a four-course shift produced one acre of barley at a cost of £6 16s 3d, and one acre of wheat at £8 2s 7d. The barley yielded four quarters per acre, which at 24s per quarter returned £5 according to his calculation (an error of 4s, the actual return being £4 16s 0d). Wheat yielded 20 bushels per acre, which sold for 7s, producing a net return of £7. While neither product showed a profit the loss was least on the wheat crop. His costings were very full, and the prices he used reflect those current.

William Stickney also presented a set of accounts in evidence before the same Committee.⁴⁴ He estimated that on turnip soil farmed on a nine-year course, barley cost (exclusive of rent and tax) £3 8s 5½d; and returned £5 0s 0d. Wheat cost £3 12s 0d per acre and yielded three quarters which sold at £2 14s 8d, producing a net return of £8 4s 0d. On strong soils wheat was less economic. By charging to it the cost of the fallow year, expenses were £7 1s 7d the first time it was grown, and £8 1s 8d the second, which charge included £2 11s 0d for the application of lime. The produce was again £8 4s 0d. Oats cost £3 12s 11d and were estimated (perhaps over-estimated would be a better term) to produce

⁴² BPP 1821 (608) IX, pp 69-71.

⁴³ Ibid, pp 140-4.

⁴⁴ Ibid, pp 152-9.

seven quarters at 18s 5d, ie £6 8s 11d; per acre. However, he had charged all the costs of two fallows and all the manures to the wheat crops, making an extra £9 8s 6d in all. As the benefits of these would be felt by all the crops in the course it seems an unfair burden. Conversely, it is impossible to distinguish the benefits each individual crop would receive, and obviously the benefit was not divided equally; simply dividing the total by nine would be inappropriate. Clearly, however, the production costs for oats would rise and those for wheat fall. Bearing in mind that the yields he used for oats appear high, the cost and produce differential are probably inaccurate. A fairer estimate would probably be five quarters of oats at 18s 5d, a total of £4 12s 1d per acre compared with the £8 4s 0d estimated for wheat, thus reversing the profit differential.

While these estimates are by no means conclusive, they illustrate that in terms of pure monetary returns based upon average prices wheat was an advantageous crop. Such reasoning would carry great weight on newly-reclaimed land, or land put under the plough during the Napoleonic Wars, often at great expense. In addition it the demand for barley and oats was depressed more than the demand for wheat after the war. Thus in his evidence to the 1821 Committee G Brown George noted:

... a great avidity to bring land into a course of cultivation for wheat; and a corresponding indifference respecting the cultivation of barley.⁴⁵

The logic of this was well expressed by a correspondent of the *Farmer's Magazine*, who wrote in 1822:

... low as that grain [wheat] sells, it is out of all comparison easier to get quit of than barley. And, throughout the greater part of this district [East Lothian] at least as many bolls of wheat, in ordinary years, can be raised as barley; that is to say when wheat can be got sown by this time of year; and ten shillings per boll the difference at present between the price of those grains is a point of greatest consideration, but especially in seasons like this.⁴⁶

Some farmers, however, had no choice in the matter. On clayland arable farms the decision to grow wheat was often based not so much upon the desire to grow a higher-priced cereal as on the fact there was no alternative to meet overheads. In addition, on some farms the increased acreage of the 1830s may have been partly accidental. Three consecutive autumns when the weather was good for sowing wheat coincided with the periods of low prices, and thus farmers took the easiest and most obvious way out of their difficulties.⁴⁷ Indeed this proved most convenient to farmers who had seen their flocks reduced by the ravages of sheep-rot, the numbers of which could only be increased by purchases on the highly inflated stores market. This probably forced many of them to cultivate extra cereal crops, a trend facilitated by the fortuitous seasons.

In part the instigators of this increase in the area under wheat were the landlords, who either turned a blind eye to the abrogation of cropping covenants or encouraged it in order to maintain rentals. A good example of the dilemma this posed is provided by an incident on the Bothal Barony, a clayland Northumberland estate owned by the Duke of Portland. During 1832 and early 1833 the agent, William Sample, recommended to Portland that a 20 per cent rental reduction should be allowed.⁴⁸ Portland was not convinced of this but agreed to allow three of the tenants who had applied for reductions to have their farms valued by a third party.⁴⁹ The valuer, a local land agent called William Nelson, rejected Sample's ideas for lowering the pivot price on the corn rent system used on the estate, which would have the effect of lowering the rentals. But he stressed that in order to maintain the rental levels the farmers would have to grow more corn.⁵⁰ Had

⁴⁷ BFM, IX, no 35, April 1835, p 54.

⁴⁸ Northumberland Record Office (hereafter NRO) Bothal Sample MS ZSA 1/2. Letter Books. Sample to Portland 25.1.33.

⁴⁹ Ibid, 15.3.33.

⁵⁰ NRO, ZSA 1/1 Portland to Sample 15.3.33.

⁴⁵ BPP 1821 (608) IX, p 92.

⁴⁶ Op cit, XXII, no 89, Feb 1822, p 114.

Portland been solely concerned with maintaining his rent roll he must surely have allowed his tenants a certain latitude in observing their cropping agreements.

However, the farmers were also to blame, especially if they indulged in cross-cropping and lowered the standard of their farming. But in the face of stable overheads and diminishing returns they could do little other than seek sanctuary in extra production. The technical disabilities inherent in clayland arable farms at this time, and the high capital cost involved in overcoming them, in most cases precluded increased production via new techniques and forced the farmer to plough up grassland and neglect his fallows. Adam Murray told the 1833 Select Committee that 'there is a good deal of old grassland broken up to raise money to meet the exigencies of the times'.⁵¹ W Smith described the breaking up of grasslands, and on being asked why replied, 'From the poverty of the occupier; he gets a crop of corn to enable him to pay his rent, and he sells his breeding cattle'.⁵² Similar reasons were advanced to explain the breaking up of pastures in Lancashire and in Leicestershire, where it was stressed that the landlords had given permission for this development.⁵³

From such a system produced as it was by lack of capital, it proved difficult to depart. The farmer was producing a commodity which was gradually falling in price, and it is probable that with over-cropping the yield per acre was reduced. Alternative grain crops were out of the question as they produced a lower return per acre. The other alternative rested in a shift of productive capacity into livestock.

IV

Modern work on the post-Napoleonic War period has focused attention on the fact that livestock farmers suffered less in most years than those who put their faith in arable crops.

⁵¹ BPP 1833 V, p 17.

⁵² Ibid, p 594.

⁵³ Ibid, pp 138, 180.

By implication, therefore, it should follow that had those farmers who complained so loudly of agricultural distress invested more time and money in expanding the livestock side of their business they would have suffered less. It is evident, however, that the advantages envisaged by historians in making such a change were not so obvious to contemporary farmers. Comments to the Select Committees focused on the difficulties of creating good quality pastures, especially from exhausted land. While detailed descriptions of the techniques involved in grassing down land were available, they were very much in the vanguard of agricultural progress and beyond the capacity of most farmers. Even the most optimistic commentators wished to allow a sward development of two years before the pasture was stocked.⁵⁴ To a hard-pressed farmer such a suspension of income, combined with the capital requirements of stocking the land, was a very powerful constraint. Problems of adjusting field layout and building use also arose. Finally, the farmer would be basing his adjustments on short-term rather than long-term prices. Over the years 1813–50 the price correlation between meat and cereals was high.⁵⁵ Thus returns to livestock farmers were at their lowest at the same time as returns to arable farmers. Why then spend time, money and effort reducing output of the traditional rent-payer in order to embark on a new operation?

By the mid-1830s however, attitudes had begun to change. As wheat prices reached their nadir in 1835 a trend towards livestock

⁵⁴ F Blaikie, *On the Conversion of Arable Land into Pasture*, 1817; G Sinclair 'On Converting Clay Land into Permanent Pasture'; *Quar Jour Ag*, III, 1831–32; and 'On Converting Strong Loam into Permanent Pasture'. Ibid, IV, 1832–34; R H Gregg, *Scotch Farming in the Lothians* — a letter to the editor of the *Manchester Guardian*, 1842. A less sanguine attitude was assumed by J F Burke, *British Husbandry*, I, pp 476–8. For a full discussion of this problem see Wilkes, op cit, pp 219–40.

⁵⁵ The correlation coefficients between cereals and meat over the period 1813–50 were: wheat and mutton 0.7457; wheat and beef 0.7502; barley and mutton 0.6601; barley and beef 0.6419; oats and mutton 0.6741; oats and beef 0.7011.

production became more apparent. There is evidence to suggest that in addition to a movement towards greater livestock production, many farmers adjusted their arable farming systems in the mid-1830s to grow less wheat. This alteration in the opinion of contemporaries, was very dramatic. It represented a complete reversal of the trend since the war and a marked change from the pattern of the immediately preceding years. In the autumn of 1835 the wheat acreage showed a marked decline. The extent of the decline was variously estimated as one-fifth in the *Quarterly Journal of Agriculture*, between one-fifth and one-quarter by Thomas Tooke, and one-eighth in *Bell's Weekly Messenger*.⁵⁶ This was largely brought about by the very low wheat price of that year. Joseph Sanders expressed this very well:

There is a point of poverty to which they fall which makes them reason, and shows them the folly of running out the land.⁵⁷

In view of the fact that prior to 1835 low prices had generally encouraged the cultivation of wheat it is necessary to discover what alternatives were adopted and what, other than the low price of wheat, made them appear attractive.

V

Part of the reduction in the wheat acreage can be accounted for by the fodder shortage of 1835. The *British Farmer's Magazine* reported that land normally sown with what had been given over to winter tares, the low price of wheat and shortage of fodder having encouraged such a course.⁵⁸ But there is evidence to suggest that many farmers also made a positive decision to cultivate other cereals. In December 1835 *Bell's Weekly Messenger* described

many hundreds of acres of grass in which ought to have been sown wheat, but which owing to the price, and want of manure are left to be sown with oats.⁵⁹

⁵⁶ QJA, VIII, p 103; Tooke, op cit, II, p 257; *Bell's Weekly Messenger*, 5 Dec 1836.

⁵⁷ BPP 1836 (189) VIII, p 152.

⁵⁸ BFM, IX, no 38, Jan 1836, p 508.

⁵⁹ BWM, 7 Dec 1835.

Certainly in 1836 the price differential between wheat and oats was at its lowest for the period 1813–50, and that between oats and barley was also low. However, it seems likely that more farmers would have chosen, where possible, to substitute barley for wheat than oats. As early as July 1834 a correspondent of the *British Farmer's Magazine* commented that

The price of malting barley, for instance, is weight for weight approaching that of wheat; and when the malting season commences, may be even higher: this has rarely happened in corn market history.⁶⁰

In 1835 and 1836 the prices of barley and oats were even closer together and the returns per acre similar. It is possible that barley was easier to sell in those years than was wheat. Hence the *Quarterly Journal of Agriculture* noted somewhat soberly:

The depressed currency of wheat, and more than relative value of barley in 1835, induced farmers to sow a larger breadth of land with the latter article.⁶¹

Confirmation of the fact that barley had occupied the majority of the space was provided by a report in *Bell's Weekly Messenger* in 1836. The growth of barley had been adopted because the English market for oats was liable to competition from cheaper Irish produce.⁶²

Obviously not all farmers reacted in the same manner. Samuel Goodman reported to the 1836 Select Committee that he differed amazingly from most farmers: he was growing more wheat than ever.⁶³ W Umbers reported that the general alteration had been 'very extensive, but he had not deviated much from my normal rule'.⁶⁴ In complete contrast J Brickwell had completely abandoned wheat growing.⁶⁵ Other witnesses detailed reductions of the wheat acreage in Kent, Sussex, Buckinghamshire, Glamorgan, Gloucestershire, Somerset, Essex, and

⁶⁰ BFM, VIII, no 32, July 1834, p 316.

⁶¹ QJA, VII, p 422.

⁶² BWM, 5 Dec 1836. For confirmation of this competition with Irish-grown oats see *Farmers' Magazine*, VIII, no 8, 1838, and QJA, IX, 1838, p 141.

⁶³ BPP 1836 (465) VIII, p 88.

⁶⁴ BPP 1836 (189) VIII, p 225.

⁶⁵ BPP 1836 (79) VIII, p 225.

Norfolk.⁶⁶ While these are indicative of the over-all decline they can only represent the sum total of the experiences of the individual witnesses. They cannot be used to discover the amounts by which the wheat acreage decreased in different areas. Some comment on this is contained in a report in *Bell's Weekly Messenger* which pointed out that in the

... great wheat growing counties in the South East and South of England, the average decrease may be safely estimated at not under one eighth. Where wheat is less extensively cultivated, the transition to other descriptions of grain was more easy and a greater proportional reduction of wheat sowing has been the consequence.⁶⁷

This was confirmed in the *Quarterly Journal of Agriculture* where it was asserted that the reduction was least in those counties supplying London, which we may venture to assert were in the south-east and south, and much greater elsewhere.⁶⁸

VI

Thus it is apparent that in the autumn of 1835 there occurred a change in the pattern of agricultural response to falling wheat prices which had existed since the war. Even in the 1820s there had been no large-scale movement away from wheat growing, simply a tailing-off of expansion. This change in response coincides with signs that prosperity was returning to English agriculture. Petitioning Parliament on the subject of agricultural distress abruptly ceased, and the political movement aimed at obtaining legislative relief

for agriculture came to an end.⁶⁹ Indeed, in the autumn of 1836 a correspondent of the *British Farmer's Magazine* concluded from his conversations that the farmers were 'less repining than usual'.⁷⁰ Such evidence indicating a return of prosperity coincidental with a change of cropping patterns suggests that profits were being secured by cultivating those crops most suitable to the farms on which they were grown.

It has already been shown that the wheat acreage began to expand again in the autumn of 1837. However, this re-expansion can be seen to represent a very different response from the previous increases. In all of the abundant evidence relating to English agriculture it has been possible to discover only one isolated reference to a backward sloping supply curve.⁷¹ This suggests that throughout the 1840s the margin of profit on wheat was sufficient to enable farmers to make normal adjustments to price changes. Had the increased acreage been secured on marginal land this is unlikely to have been the case.

Secondly, yield per acre continued to rise at the same time as acreage expanded. Thus it is highly unlikely that the expansion was taking place on marginal land. Indeed, much of the increased yield per acre must have been brought about by the application of new fertilizers and feeds, which in the latter case increased the level of animal manurial residues which contemporary improvers were so enthusiastic to use efficiently.⁷² As these represented the vanguard of agricultural progress it appears logical to assume that they

⁶⁶ BPP 1837 (404) V, pp 10, 252; BPP 1836 (79) VIII, pp 20, 203; BPP 1836 (189) VIII, pp 165, 218, 225-30, 237; BPP 1836 (465) VIII, pp 71, 101, 154, 172.

⁶⁷ BWM, 5 Dec 1836.

⁶⁸ 'Retrospect of the British and Foreign Corn Trade for the half year preceding November 1836', *Quar Jour Ag*, VII, p 418.

⁶⁹ For a fuller discussion of agricultural politics see Wilkes, *op cit*, ch IV, pp 169-203. Evidence of the return of prosperity is abundantly supplied by the rise in prices and the end of political agitation. It is also worthy of note that several witnesses who appeared before the 1846 Select Committee of the House of Lords on the burdens affecting real property mentioned that after 1835 prosperity returned to English agriculture: BPP 1846 (411) VI, pp 53, 489.

⁷⁰ BFM, X, no 41, Oct 1836, p 490.

⁷¹ Caird, *op cit*, p 56.

⁷² F M L Thompson 'The Second Agricultural Revolution' *Econ Hist Rev*, 2nd ser, XXI, 1968.

were in the hands of the large-scale arable farmers of southern and eastern England who were most likely to be able to afford these improvements and also to apply them properly. Having raised their yield per acre they would be alive to the idea of extending their acreage.

It is probable therefore that the dramatic reductions of the wheat acreage which took place in the autumn of 1835 was least in the south-eastern counties where conditions were best suited to its cultivation and greatest in those areas where wheat was less economic. The very low prices of the mid-1830s had finally forced the least efficient farmers to abandon wheat while permitting others to continue its cultivation. When the price of wheat increased again those farmers who had either abandoned or made a great reduction in its cultivation were less inclined to extend its growth.⁷³ Support for this theory is supplied, indirectly, by the series of British wheat production figures calculated by Dr Fairlie. She concluded that the decline in net output of British wheat after 1846 was 'caused by the withdrawal of precisely those low efficiency farmers on marginal lands (perhaps mostly small farmers)',⁷⁴ she noted that the increased production of the 1840s occurred in counties such as Lincolnshire, Cambridgeshire, Hampshire, Dorset, Nottinghamshire, Yorkshire, Cumberland, Norfolk, and Suffolk. In other areas a decline in sales set in, caused by the competition posed by imports. However, in view of the fact that before 1846 imports were, in Dr Fairlie's own word, 'insignificant', this could be seen as part of the rationalization of the national cereal acreage which concentrated production in those areas best suited for growing wheat. Those areas of north and west England which

moved away from the cultivation of wheat turned increasingly to livestock as their staple produce.

VII

For twenty years after the Napoleonic Wars the response of England's farmers to low wheat prices was to produce more. While some of this increase was obtained from higher yields, the major part came from a vastly expanded acreage. This development appears to have taken place throughout the country. Although on some farms it was a positive economic response, ie a turning to the cultivation of a higher-priced cereal, on many it represented the only possible response by farmers already growing wheat as their main crop. Such people were unable or unwilling to adjust to other types of farming, and they were forced increasingly to pin their hopes on the traditional rent-payer, often at the expense of good farming. This pattern did not change until the mid-1830s. In those years wheat prices reached totally uneconomic levels, but at the same time alternatives, which had previously been lacking, presented themselves. Many farmers then moved away from the cultivation of wheat to concentrate on other cereals or on livestock. When the wheat acreage expanded again in the 1840s it represented a more logical response to price movements. Initially the impetus was provided by high prices, but when prices fell there are signs to suggest that farmers were better able to combat the fall, either by raising yield per acre or by reducing the growth of wheat. Over all these adjustments suggest that English farming was more troubled after the Napoleonic Wars than recent writers have allowed. However, of even more importance is the significance imparted to the 1830s in English agricultural history. Those years represent a decisive turning point when the trends of the previous twenty years were reversed and English agriculture emerged from the post-Napoleonic War period ready to enter its 'golden age'.

⁷³ This would suggest that the late 1830s and early 1840s witnessed a decisive step towards regional specialization in English agriculture. However, the full examination of such an hypothesis would require greater space than can be devoted to it here.

⁷⁴ Fairlie, *op cit*, p 109.