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in the University of Hull.

AGRICULTURAL CHANGE IN THE EAST RIDING OF YORKSHIRE,

1850-1880 : AN ECONOMIC AND SOCIAL HISTORY

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SYNOPSIS

Emphasis in this study is primarily economic, examining the nature and scale of technical progress in the East Riding of Yorkshire in the years of high farming, and the ability and willingness of land-owners and farmers to invest in land improvement. A social dimension is added by considering fluctuations in the prosperity of those who owned, farmed and worked the land, but detailed discussion is reserved for labourers.

Most of the study's conclusions fall within current thinking though some indicate the need for re-interpretation and revision. It is undeniable that there was significant technical progress in the agricultural industry of the East Riding in the three decades after 1850. This is attested by improved trunk and field drainage in many parts of Holderness, the Vale of York and the Hull Valley; increases in the average size of farms in some of the least efficient areas of the lowlands; the widespread use of new types of machinery and implements, first on the Wolds and later in the lowlands; and the increasingly systematic use of artificial feedstuffs and fertilisers on medium-sized and large farms. However, equally undeniable is the considerable gap between the effort and cash expended in up-grading the agricultural system and practical achievements measured by heavier crop yields, higher productivity among farm workers and the greater efficiency of drainage systems.

The main conclusions reached in this study are as follows. First, the farming technology of the 'Railway Age' was applied most extensively on the Wolds. Its application on the clays, which predominated in the lowland areas, was partially successful but was frustrated in many instances by lack of knowledge, conservatism in the handling of new techniques and methods, and the enormity of the physical and legal

difficulties in modifying the traditional farming landscapes of the Vale of York and the plains of Holderness. The progress of the middle decades of the nineteenth century narrowed the gap between farming standards on the Wolds and lowlands but Wold farmers still commanded outright superiority by the 1870s. Farming developments in the East Riding give no support to the notion of a technological breakthrough in clayland farming; on the contrary they strengthen the notion of a slow evolutionary development in which more farmers over successive generations became acquainted with, and more inclined to use, improved methods.

Second, the absence of an 'agricultural revolution' in the 1850s and 1860s in connection with the introduction of cheap drainage, can be traced to several factors, among the most important being high costs and lack of co-operation between estate managements in drainage enterprises. Drainage was not cheap. East Riding evidence indicates that savings were significantly less than those calculated previously. Local landowners also showed little inclination to co-operate in drainage schemes, an essential prerequisite if the problems of entire watersheds were to be resolved satisfactorily. Field drainage was certainly better in 1880 than a generation earlier but the improvement had been piecemeal and was certainly not large enough to underpin any radical change in the quality of lowland farming.

Third, despite important drawbacks, estate managements showed sound business qualities which equipped them to play a determining role in agrarian improvement. The large majority of East Riding landowners involved themselves in improving their estates and were dedicated to the business of farming. This also applies to farmers. Tenants invested in improved seeds, artificial fertilisers and feedstuffs, and occasionally in items of fixed investment like buildings and drainage systems. Most investments were unprotected by farming covenants in the early part of

the period and some historians have concluded from this that farmers were either foolish in laying out their capital, or were inclined to caution and lacked the spirit of those farming under long leases. The East Riding study finds no support for this view. Farmers' investments were underpinned not so much by contractual arrangements between tenant and landlord as by informal understandings. A large part of the county's progress in agriculture can be traced to the firmness of landlord-tenant relations.

Fourth, there was no smooth shift to grass farming or a mixed farming system more heavily committed to grass and livestock. Corn was less important in the overall composition of East Riding agricultural output in 1880 than at the time of Repeal, but this hides the fact that the acreage under the plough increased in the 1850s and early 1860s, and that the total cereal acreage was fairly stable down to 1880. Farmers were not deliberately unresponsive to price movements which were generally more favourable to livestock producers. For example, there was a high correlation between movements in wheat supply and price in the years between 1867 and 1890. The movement against grass in the early part of the period reflects the absence of a strong price trend in corn, loyalty to wheat, and a determination to see reasonable returns from investments in the drainage of arable land.

Finally, and at a social level, the standard of living of agricultural labourers rose between 1850 and 1880 but rural families remained perilously close to the poverty line. The 'Revolt of the Field', which had distinct echoes in the East Riding, is a useful symbol here because at one level the articulateness of its leaders and the movement's efficient organisation attest to the progress achieved by labourers since the days of Swing. However, at another level, and judging from evidence collected from strike meetings held in villages throughout the East Riding,

the 'revolt' still remained basically a protest against elemental poverty. Wages and conditions had improved but a hard winter or a brief period when prices rose faster than wages, still overwhelmed household budgets leaving labourers, even on the Wolds where wages were highest, beholden to farmers and parish officials for basic necessities.

ACKNOWLEDGEMENTS

Many people have given advice and help at various stages in the development of this thesis, but I would like to thank, above all, Professor John Saville for his interest, encouragement and criticism over the last few years, and for launching me on an academic career. I would also like to thank Mr. Mike Brown for reading an early draft of the chapters on agricultural labourers and drawing attention to some of the obscurities and weaknesses there. Dr. Alan Harris of the Geography Department informed me about the Emmanuel Hospital MSS and gave information on the Yorkshire tithe surveys. And Mr. Norman Higson, formerly archivist at the East Riding Records Office, Beverley, and now of Hull University, guided me through a maze of manuscripts.

Professor John McCarty of Monash read through the penultimate draft, advised where weaknesses lay, and offered suggestions on the arrangement of chapters. I owe him a considerable debt. Finally I would like to extend a hearty thank you to Mrs. Bev Goodall, who has done all the typing, Miss Katherine Bell, who drew the maps and graphs, and to my wife Pauline for putting up with me during the last few months.

M.G.A.

Abbreviations

<u>Agric. Hist.</u>	Agricultural History
<u>Agric. Hist. Rev.</u>	Agricultural History Review
<u>B.O.T.</u>	Board of Trade
<u>Econ. Geog.</u>	Economic Geography
<u>Econ. Hist. Rev.</u>	Economic History Review
<u>Econ. Journ.</u>	Economic Journal
<u>E.R.R.O.</u>	East Riding Record Office
<u>E.Y.L.H.S.</u>	East Yorkshire Local History Society
<u>Journ. of Agric. Econ.</u>	Journal of Agricultural Economics
<u>J.R.A.S.E.</u>	Journal of the Royal Agricultural Society of England
<u>J.R.S.S.</u>	Journal of the Royal Statistical Society
<u>L.C.R.O.</u>	London County Records Office
<u>M.A.F.F.</u>	Ministry of Agriculture, Fisheries Food
<u>P.R.O.</u>	Public Record Office
<u>Quart. Journ. Econ.</u>	Quarterly Journal of Economics
<u>S.R.O.</u>	Sheepscar Records Office (Leeds)
<u>Trans. Y.A.S.</u>	Transactions of the Yorkshire Agricultural Society

Erratum

The Emmanuel Hospital estate at Brandesburton has been spelt Emanuel throughout the text.

**The Principal Towns and Villages
of the East Riding.**



PART 1 : An over view of
Agriculture in the East Riding
of Yorkshire, 1700-1880.

CHAPTER ONE

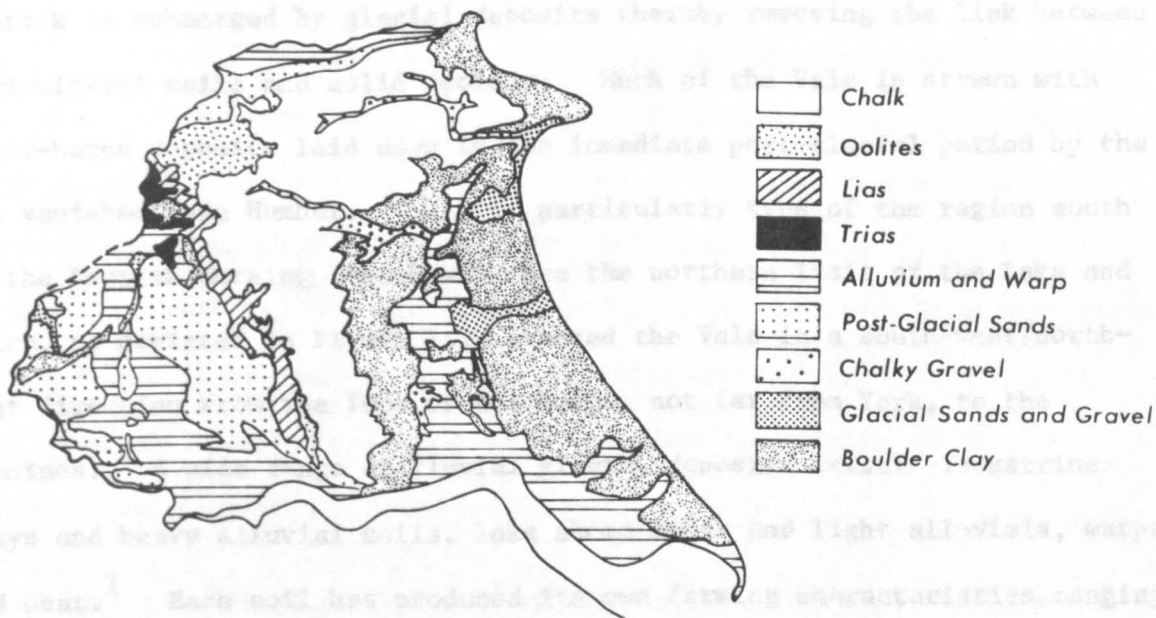
A SURVEY OF AGRICULTURE IN THE EAST RIDING OF YORKSHIRE, 1700-1850.

1. The geology and physiography of the East Riding : their relationship to current and past farming.

The farming characteristics of a region are influenced, among other things, by the distribution of lowlands and uplands, the diversity of soils, and the impact of glaciation. The physical variety of the East Riding has produced wide ranging contrasts in its agricultural economy and three distinct farming regions, each of about the same size, can be recognised. They are the Wolds, Holderness and the Vale of York which includes Howdenshire.

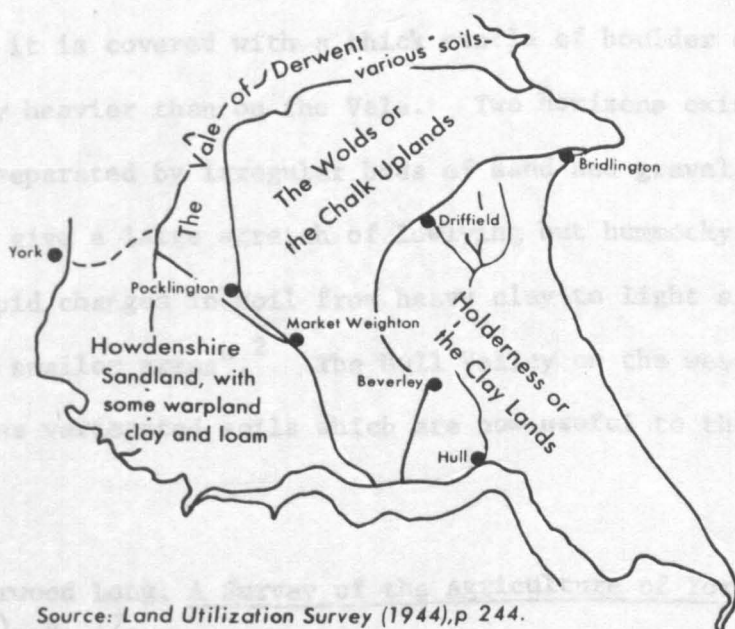
The uplands of the East Riding, the Wolds, are formed by an extensive outcropping of chalk. The outcrop has produced a line of hills, rarely exceeding 800 feet, which stretch from Hessle in the south to Flamborough Head on the north east coast, and divide the lowlands of the Vale of York in the west from the plains of Holderness in the east. The transition from plain to upland is sharp on the western flank of the Wolds, but the transition is less distinct to the east, the rough dividing line with Holderness being traced by the Hull Valley. Soils on the Wolds have weathered from chalk and vary from free draining loams to heavy calcareous boulder clays. The former predominate in the central districts and the latter on the eastern slopes, where a thick covering of drift deposits has produced heavier soils mixed in among glacial sands and gravels.

Figure 1.1 The Solid Geology of the East Riding.



Source: The Report of The Land Utilization Survey Of Great Britain, Pt. 48, The East Riding of Yorkshire (1944) (hereafter the Land Utilization Survey), p 236.

Figure 1.2 The Physical Regions of the East Riding, according to H.E. Strickland.



Source: Land Utilization Survey (1944),p 244.

The Vale of York has a more complex soil structure. The underlying bedrock is submerged by glacial deposits thereby removing the link between agricultural soils and solid geology. Much of the Vale is strewn with water-borne deposits laid down in the immediate post-glacial period by the now vanished Lake Humber. This is particularly true of the region south of the Escrick Moraine which was once the northern limit of the Lake and which, as depicted in Figure 1.1, crossed the Vale in a south-west/north-east direction from the foot of the Wolds, not far from York, to the Pennines. A wide range of fluvial glacial deposits exist: lacustrine clays and heavy alluvial soils, lake shore sands and light alluvials, warps and peat.¹ Each soil has produced its own farming characteristics ranging from rich arable farming on alluvial soils down to shifting and uncertain farming on the lighter wind-borne deposits. Glacial sands give way to alluvial silts and clays around Goole and Howden and heavy glacial soils predominate north of the Escrick Moraine.

The connection between agricultural soils and the underlying bedrock is again missing in Holderness. Although chalk in all probability forms the bedrock, it is covered with a thick mantle of boulder clay and soils are generally heavier than on the Vale. Two horizons exist within the drift cover separated by irregular beds of sand and gravel, and "the net effect is to give a large stretch of lowlying but hummocky country where there are rapid changes in soil from heavy clay to light sand - the latter covering the smaller areas".² The Hull Valley on the western fringe of Holderness has variegated soils which are now useful to the farmer after

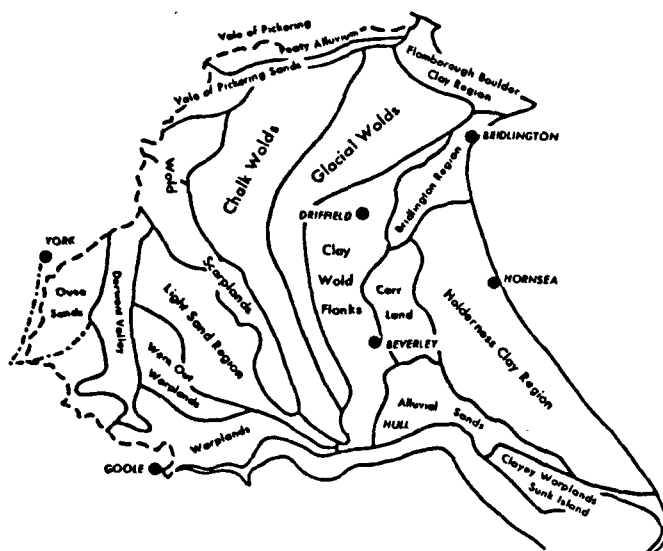
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1. W. Harwood Long, A Survey of the Agriculture of Yorkshire (1969), p. 17.
 2. A. Harris, The Rural Landscape of the East Riding, 1700-1850 (1961), p. 3.

two centuries of drainage activity. The alluvial soils of the Valley are mainly of a peaty nature though they give way to drift deposits between Drifffield and Bridlington, and marine clays predominate between Beverley and Hull. The 'carr lands' of the Hull Valley are formations produced by peat accumulations and are not continuous features of the area.

Warping,¹ both natural and artificial, has produced rich alluvial soils in south Holderness, especially around Sunk Island. This area was joined to the mainland by natural silting, assisted by warping, over the late eighteenth and early nineteenth centuries, and has become one of the finest farming districts in the county.²

The variety of soils, even within a single region, has produced a diverse pattern of farming with subtle changes occurring over relatively short distances. Some of the more important soil divisions in the county are shown below.

Figure 1.3 Soil Divisions of the East Riding.

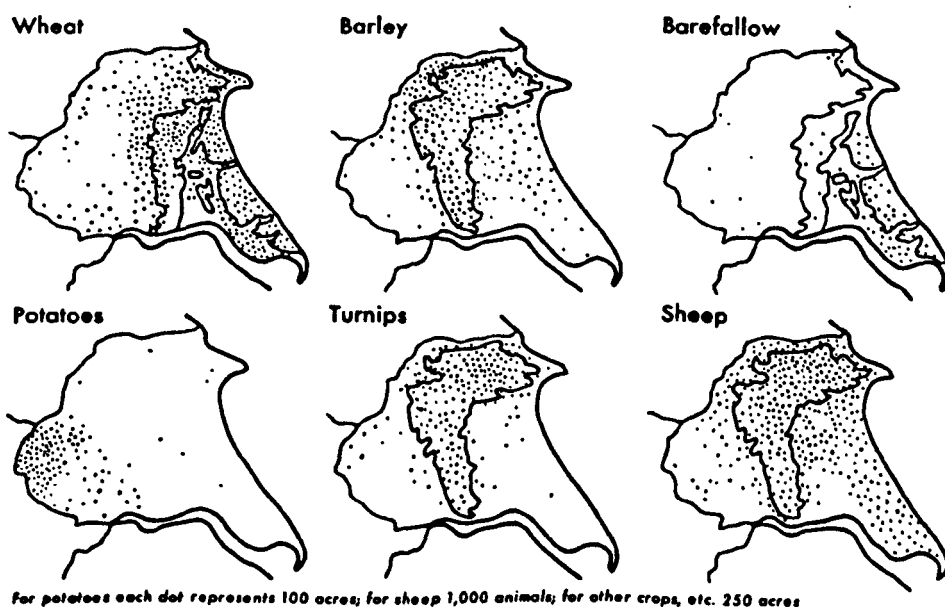


Source: Land Utilization Survey (1944), p 254.

1. Artificial warping involves letting silt laden tidal water on to land at high tide and then draining it after the silt deposit has settled. This process continues until the warp reaches a thickness of between 18 inches and 3 feet.
2. The term county is used in the text to define the East Riding rather than Yorkshire as a whole.

Wheat growing is concentrated on land mainly below 300 feet above sea-level and little is grown above 500 feet. Wheat is the leading crop in Holderness, the heavy soils being especially well suited to the crop, and relatively little is grown on the Vale of York or on the light chalk soils of the central Wolds. Barley production is concentrated on the Wolds and declines in importance in districts where soils are heavier. Oats are grown widely over the county as an alternative white crop to barley and wheat. The distribution of clover, turnips and swedes is almost identical to that of barley, again being associated with lighter soils. Sheep are also part of the light soil system and are one of the foundations of Wolds agriculture. However, their importance, unlike barley, is not restricted to the uplands, though their economic significance is greatest there. Figure 1.4 shows the distribution of cereals, root crops and sheep in the East Riding in 1938: the basic outline has not changed over the last century.

Figure 1.4 Crops and Sheep in the East Riding in 1938.



Source: Land Utilization Survey (1944), p 248.

2. The potential for agricultural development in the regions.

The physical geography of the East Riding has influenced the type of crops grown in the different districts and has helped to determine their agricultural potential. Only more systematic use of agricultural science and technology in the nineteenth and twentieth centuries has released farmers from much of their dependence on the physical environment. Defective drainage was the biggest natural obstacle holding back development in many areas of the Vale of York and Holderness. Little could be done to raise farming standards, except on a piecemeal basis, with drainage in an unimproved state. Its improvement therefore became a major pre-occupation of landowners and farmers in heavy land districts at least from the third quarter of the nineteenth century. Farmers on the Wolds were much luckier in tilling soils which were free-draining.

Farming is an activity in which land is modified to suit the needs of man, and the form it takes is heavily dependent on the state of his technology. Much of the land in the lowland districts of the East Riding has been tilled for centuries and the farming system which evolved by the eighteenth and nineteenth centuries was often constrained by an organisational framework left over from medieval times. Farms and enclosures, for example, were much smaller than on the Wolds which had developed into a major agricultural region only from the late eighteenth century. The problems farmers faced in applying the farming technology of the nineteenth century to the essentially outmoded farming environment of the lowlands retarded their progress compared to farmers on the Wolds who operated under modern, or near modern, farming conditions.

This does not imply that farming was primitive in the lowland districts. Attempts to raise farming standards were made frequently and

standards were generally above those for the country as a whole. But in spite of some success, the Wolds remained the most progressively farmed region in the East Riding throughout the nineteenth century. This was reflected in the modern layout of its farms, high crop yields, the rapid innovation of machines like the portable steam engine and reaper in the mid-nineteenth century, the early use of oil and linseed cake, and the revision of farm covenants to include tenant compensation for investments in drainage, farm buildings, artificial manures, and feedstuffs.

The faster rate of progress achieved by Wolds farmers over the nineteenth century, compared to farmers on the lowland vales, has been dealt with briefly here, but the forms that it took, and the reasons for it, are major themes of this study.

3. The marketing of agricultural produce in the East Riding.

District and regional specialization within the framework of the corn economy was underpinned by a highly developed system of market towns and by generally buoyant market conditions for agricultural produce. The main market towns of the county are shown in Figure 1.5.

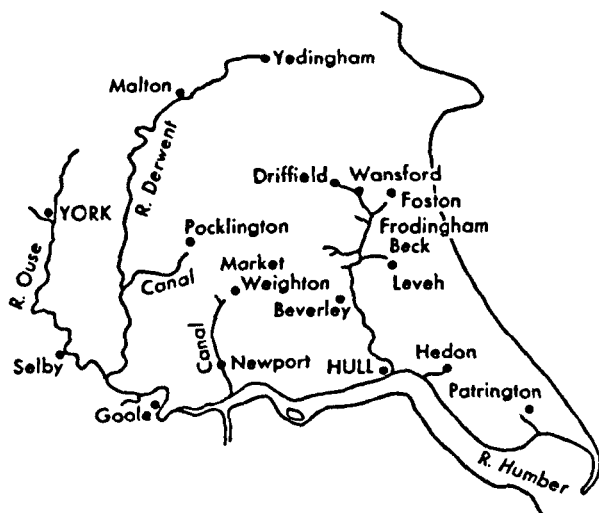
Figure 1.5 The Principal Market Towns of the East Riding.



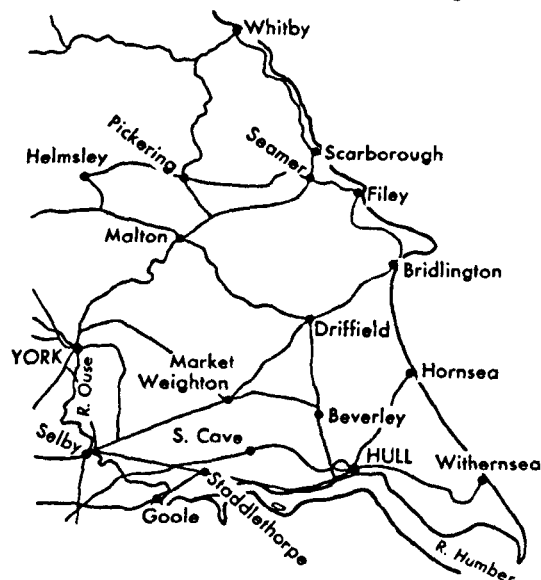
These were the centres to which surrounding villages and hamlets consigned their surplus foodstuffs and in certain cases, rudimentary manufactures. Each market town in turn was connected to a larger distributive system. Communications by navigable water were easy in the East Riding. The Ouse was navigable up to, and beyond York, and with the Derwent was the "common denominator of all East Yorkshire's inland waterways. [They knitted together] what would otherwise have been unco-ordinated limbs into one body",¹ nearly every farm in the East Riding being within 15 miles of a navigable waterway by 1790.²

Figure 1.6 Water and Rail Transport in the East Riding.

(i) East Yorkshire Waterways



(ii) East Yorkshire Railways



Sources: B.F. Duckham, *The Inland Waterways of East Yorkshire 1700-1900* (E.Y.L.H.S., No 29, 1972), p4; K.A. MacMahon, *The Beginnings of the East Yorkshire Railways* (E.Y.L.H.S., No 3, revised edition, 1974), p2.

1. B.K. Duckham, *The Inland Waterways of East Yorkshire 1700-1900* (East Yorkshire Local History Society, No. 29, 1972), p.3.
2. H.J. Dyos and D.H. Aldcroft, *British Transport* (1969), p.89.

Waterways in the Riding served the needs of the farming community.

"The men who built or improved them thought chiefly in terms of wider markets for the produce of their own lands, or cheaper sources of those materials calculated to increase agrarian efficiency ...".¹ Hull, which expanded rapidly in the nineteenth century, was one of the focal points of the river and canal system,² and its markets for cereals and dairy produce were vitally important to Holderness farmers in the eighteenth century, and to farmers further afield in the 'Railway Age'. The industrial West Riding was the East Riding farmers' principal market and the growth of a steady trade between the Ridings was noted as early as 1794 by Isaac Leatham.³ The London market was less important although it took bacon, butter and potatoes.

The significance of the West Riding market was reinforced by the railway. The first line built in East Yorkshire connected Hull and Selby and opened in 1840, its eventual purpose being to link Hull with Leeds and the manufacturing districts of the West Riding. A whole series of lines opened in the following few years. Hull and Bridlington were linked by rail in 1845, York and Market Weighton in 1847, Selby and Market Weighton in 1848, Malton and Driffield in 1853, Hull and Withernsea in 1854, Hull and Hornsea in 1864, Market Weighton and Beverley in 1865.⁴ These inevitably served the surrounding rural districts and some lines, such as the Hull to Withernsea line, were projected deliberately with this in mind.

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1. B.F. Duckham, op. cit. p.69.
 2. J.M. Bellamy, The Trade and Shipping of Nineteenth Century Hull (E.Y.L.H.S. No.27, 1971), p.6.
 3. B.F. Duckham, op. cit. p.69.
 4. K.A. MacMahon, The Beginning of East Yorkshire Railways. (E.Y.L.H.S. No. 3, 1953), p.38.

The railway helped to mobilise the agricultural surplus of the county and move it more cheaply, and with greater speed, to the great consuming areas in the west. In 1865, for instance, the East Riding produced a wheat surplus of over 930 thousand bushels which was transported almost entirely to the West Riding, where the deficit that year was 8 million bushels.¹ The railway also directly expanded dairying by making local markets like Hull and York, and more distant markets like those of the West Riding, more accessible. These markets grew quickly both in population and in the effective demand they generated for better quality cereals, meat and dairy produce. The population aspect of this is shown below for four Yorkshire cities between 1831 and 1871.

Table 1.1. Population of four Yorkshire cities, 1831-71.

	<u>1831</u>	<u>1851</u>	<u>1871</u>
Bradford	43,527	103,778	145,830
Hull	51,911	84,690	121,892
Leeds	123,393	173,270	259,213
York	26,260	36,303	43,796

Source: Census of Great Britain, 1851, I, Population Tables, p. cxxvii; Census of England and Wales, 1871, I, Population Tables pp. xviii, xxxiii.

4. East Riding agriculture in the early eighteenth century.

The agricultural system of the East Riding was in a process of change in the early eighteenth century. Much of the medieval structure persisted and about one-half of the county remained under open fields.²

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1. G.R. Hawke, Railways and Economic Growth in England and Wales 1840-1870 (1970), pp. 104-5, 107, 125, 127.
 2. A. Harris, op. cit. p.8.

The open field system was most prominent on the Wolds, only one-third of the district being enclosed in 1730. Three-quarters of the cultivated acreage was enclosed on the Vale of York and two-thirds in Holderness,¹ and "Townships in all stages of transformation ... lay scattered among the open field communities". Open field farming was outside the experience of many lowland farmers but its basis had been destroyed only on the Vale of York.²

Some of the progressive forces at work in the agrarian economy had antecedents stretching back into the Middle Ages. Convertible husbandry was of this type. Where it developed, and it did so only in a few areas, the traditional division within the farming economy between permanent pasture and permanent arable was being replaced by a system based on farming for fodder crops. This required that part of the arable was laid down in temporary grass leys thereby ensuring that more fodder became available over the winter months. This enabled farmers to keep more livestock which increased the supply of farmyard manure, which in turn helped to raise heavier crops and improve pastures.

It is difficult to estimate when roots and rotated grasses were first introduced into the open fields of the East Riding. It certainly occurred later than in several eastern and south-eastern counties. Clover, sainfoin and lucerne were features of the arable economy of one or two counties (or parts of counties) from the early 1600s and turnips were sown from the second half of the century.³ However turnips and clover were not grown in the open fields of the East Riding during the seventeenth century

1. Ibid. p. 3.

2. Ibid.

3. J.D. Chambers and G.E. Mingay, The Agricultural Revolution 1750-1880 (1966), p. 8.

though turnips were introduced as a field crop for the feeding of livestock in the first half of the eighteenth.¹

The open field system during the eighteenth century, and to a lesser extent the seventeenth, accommodated the above mentioned changes where soils were not too heavy to exclude them, and the gradual consolidation of farm strips must have assisted farmers in crop experimentation.² Large areas of open fields were therefore not necessarily backward compared with areas enclosed more recently, but limits were imposed on their farming potential by the fragmentation of land holdings, rigidities in crop rotations and the annual fallowing of up to one-third, and in some cases one-half, of the arable.

Farming systems varied between regions. Agriculture on the Wolds had become adapted to the requirements of a sparsely populated district. There were frequently fewer than ten families to 1,000 acres of farm land, particularly in the north, and few demands could be made on the land. An area would be cleared for cultivation around each settlement and the open fields would be divided into arable, common pasture and sheep walk, the two latter never being ploughed. In addition, there would be an out-field from which oats would be cropped at intervals of from three to seven years. This was shifting cultivation in which marginal land was cleared, ploughed, exhausted, allowed to revert to its natural state, and then re-used.³ A simple system of two white crops and fallow was in use on land lying close to areas of settlement, but arable occupied only a relatively

1. A. Harris, op. cit. p. 10.

2. O. Wilkinson, The Agricultural Revolution in the East Riding of Yorkshire (E.Y.L.H.S., No. 5, 1956), p. 4.

3. G. Legard, 'Farming in the East Riding of Yorkshire', Journal of the Royal Agricultural Society of England, IX (1848), 92-3.

small amount of the total croppable land. Sheep were the mainstay of the economy, Wold farmers investing more of their capital in them than other farmers in Yorkshire, apart from those on the North Yorkshire Moors and the Pennines.¹ Cattle were unimportant, particularly in the more remote districts. Agricultural land petered out beyond Wold villages and the countryside was empty except for rabbit warrens and occasional stones set up as boundary markers. There were about 20 commercially operated warrens covering 10,000 acres by the early nineteenth century.²

The population of Holderness was denser and settlements were more nucleated than on the Wolds. Bad drainage was the most serious problem farmers faced in this district. It had been a place of swamp in the Middle Ages and William Marshall described it as fen country as late as the eighteenth century. The carrs of the Hull Valley were an "undrained morass" and plough land never formed more than one-third of the agricultural land in this period owing to the inadequacy of field drainage.³ A good indication of the district's cold and ill-drained soils is that the open fields of Holderness were mainly of the two field variety. One field was sown with spring crops while the other lay fallow. Had drainage been better the temptation to grow a winter crop and extend the system (i.e. to the three-field system) would have been hard to resist.⁴ There were some

1. W. Harwood Long, op. cit. p.29.

2. The breeding of rabbits on the Wolds was felt to be a better alternative than letting the land run down to waste.

3. The Land Utilisation Survey of Great Britain, Pt. 48, The East Riding of Yorkshire (1944), p.241.

4. The trend towards the three-field system began in the temperate areas of Europe in the twelfth and thirteenth centuries partly as a response to population pressure on the cultivated acreage. It was a way of raising agricultural production. That Holderness should have escaped this movement testifies to the marginal condition of its soils throughout most of history.—
B.H. Slicher Van Bath, The Agricultural History of Western Europe AD.500-1850 (1963), pp. 59-62; 132-137.

three-field villages but they were a small minority.¹ The most common systems of cropping were wheat followed by fallow, or wheat followed by beans and bare fallow. A more advanced system was adopted sometimes in enclosed districts or where drainage was naturally good and soils were fertile; a root break was impractical on heavy undrained clays and had not been introduced even by the mid-nineteenth century.

The Vale of York had a level of old enclosed land in the early eighteenth century which exceeded that of Holderness and reflected its traditional importance in the farming economy of the county. It had a varied farming structure: some districts specialised in growing cereals, one or two specialised in raising cattle, while others combined both activities with varying levels of emphasis. Arable cultivation predominated on the lighter sands and clays which covered the greater part of the Vale. Drainage was adequate in a minority of parishes and this, together with enclosure, encouraged the introduction of several new crops. A rotation based on wheat and beans followed by fallow, or with the slight variation of oats substituted for beans, continued well into the nineteenth century in the clay districts, which included most of Howdenshire. The land produced little above inferior grass where drainage was totally inadequate. The principal cattle fattening districts were the lush meadow pastures bordering the Humber and Derwent rivers.

The agricultural industry of the East Riding had not been static in the seventeenth and early eighteenth centuries. New crops, ideas and techniques were introduced which could be built on and developed by future generations of farmers and landowners, but there was still much to be

1. A. Harris, op. cit. p. 41.

completed before a more efficient agricultural system could be established. The Wolds had yet to be enclosed and the drainage of Holderness and the Vale remained bad. Cropping systems needed to be revised, new rotations needed to be used more widely and tested under local conditions, and the knowledge of the engineer and chemist had still to be applied to the emerging 'science' of agriculture. However, more progressive husbandry had taken root and had begun to show vigorous signs of growth in 'sheltered' areas.

5. East Riding agriculture, 1700-1850.

The pace of agricultural development accelerated during the eighteenth and nineteenth centuries and was associated closely, both for speed and direction, with the Parliamentary Enclosure movement. Enclosure was concentrated into two periods, the 1760s and 1770s, and the French Revolutionary and Napoleonic Wars, and helped to transform about one-quarter of the cultivated land area of England and Wales. The movement aimed at more efficient and profitable farming and was a factor in raising productivity levels. Agricultural output in England expanded by an estimated 43 per cent over the eighteenth century. Much of this came from extending the margin of cultivation, the sown acreage increasing by one-quarter, but part resulted from better farming. Crop yields increased by about 10 per cent, wool and mutton production outstripped the percentage growth in grain output, beef and dairy production increased more slowly but kept pace with the overall growth in population.¹

Parliamentary Enclosure revealed a conscious effort on the part of market oriented landlords to improve their estates through a policy of

1. J.D. Chambers and G.E. Mingay, op. cit. pp. 34-5.

heavy investment. This, and the tendency towards larger estates, refinements in the landlord-tenant system, and the enlargement of farms (developments not without their counterparts prior to 1700), took more solid shape after 1700 and provided a framework for improved commercial farming, though the geography of progressive agriculture remained a function of the heaviness of the soil. Mixed farming continued to make progress on the lighter soils: livestock densities were raised, green crops, especially the turnip, were introduced more widely into arable rotations, and more manure was put on to the land. Progress was more limited on the heavier clays because of defective drainage. Underdrainage was improved in some cases but there was no real improvement until the 1840s and 1850s, and even then it was far from satisfactory. There was probably some advance in farming standards on the clays in periods of high prices and substantial profits but it was slowed down or even halted when prices were low and uncertain. Clayland farmers were high cost producers and were often submerged under a rising tide of debt during years of falling prices.¹ The differences in the rate of development between the light soil and heavy soil regions, already noticeable by 1700, continued throughout the eighteenth and nineteenth centuries.

The chronology of Parliamentary Enclosure in the East Riding was the same as for England as a whole, so that the slight preponderance of open fields in the 1770s was reversed by 1815. Few enclosure acts had been passed prior to 1760. Six acts were on the Statute Book in the 1750s; there were 78 in the following two decades, and 18 in the last twenty years of the century. Enclosure was virtually complete by 1815 after hectic activity

1. Considerable caution is required in drawing out the implications of high and low prices on the efficiency of agricultural production. For a discussion of these implications see below, pp. 276-92.

in the early years of the nineteenth century.¹ Almost all the cultivated acreage in Holderness and the Vale of York was enclosed by 1810; but Parliamentary Enclosure had affected only 70 per cent of the land area of the Wolds,² though this conceals the high proportion of natural waste there. Enclosure was complete on cultivated land.

Enclosure encouraged a more spirited approach to agriculture. Mixed farming became more important and four course alternate husbandry became general on light soils from the Napoleonic Wars.³ The area under arable cultivation, which was already growing in the eighteenth century, was increased in the first half of the nineteenth. The transformation was most rapid on the Wolds and from being mainly under permanent pasture immediately before the French wars, two-thirds were under the plough by Waterloo. The movement to tillage did not stop with the collapse of grain prices after 1814. It continued so that the Wolds were almost purely tillage by the 1840s and permanent grass was a rarity "except on the sides of dry valleys and close to farmsteads where it was customary to keep a sheltered paddock under grass for the use of dairy cattle and for convenience at lambing time".⁴ The trend to arable in Holderness was slower but still powerful. One-third of the cultivated area lay under crops in 1812 and this rose to two-thirds thirty years later, and to as much as four-fifths in areas like south Holderness.⁵ By the 1840s the proportion of arable

1. O. Wilkinson, op. cit. p.7.

2. M.B. Gleave, 'Dispersed and Nucleated Settlements in the Yorkshire Wolds, 1770-1850', Institute of British Geographers, Transactions and Papers (1962), p. 106.

3. T. Baines, Yorkshire, Past and Present: A History and Description of the Three Ridings of the Great County of York (1871), p. 109.

4. A. Harris, op. cit. p. 100.

5. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.102.

land in the Vale of York was roughly the same as in Holderness; pasture was widespread only in those parishes which contained large tracts of very heavy undrained clays.

The growing emphasis on arable cultivation after 1815 was not limited to the East Riding.¹ It was encouraged, despite the uncertainty of grain prices, by the advantages of closer integration of livestock and cereal production in the so-called 'virtuous cycle' of production. Falling grain prices encouraged small and even medium-sized farmers to expand cereal output as a means of preserving living standards. This was noticed by Charles Howard in some parts of Howdenshire in the depressed years of 1829-31.² And the Corn Laws, though they did not raise the price of grain, as was intended, promised a return to higher prices and helped perpetuate the attachment to corn.

The major agrarian developments of the eighteenth and early nineteenth centuries owed little to science; they depended more on practical farmers becoming familiar with improved techniques, many of which had been used by a minority of progressive farmers for several generations. Local agricultural societies discussed theoretical and practical aspects of better farming,³ and various local landowners used their home farms for experimentation and fostered innovation at a parish or estate level by personal leadership. In addition, the effect of uncertain prices after 1815 may have induced a greater willingness to reduce production costs and raise standards of farm efficiency.

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1. South Lincolnshire was considered to be a grazing county in 1815. By 1850 grass land was less common and less than one-quarter of agricultural land was under pasture by 1875. — D. Grigg, The Agricultural Revolution in South Lincolnshire (1966) p.117.
 2. Select Committee of the House of Lords on the State of Agriculture in England and Wales (Parliamentary Papers, 1837, V), Q. 2100.
 3. See below, pp. 45-7.

The use of more productive methods in East Riding agriculture varied from region to region. An extensive type of agriculture dominated by the large capitalist farmer, developed on the Wolds from the 1780s and 1790s. Output increased rapidly. M. de Lavergne estimated a three fold increase in wheat production¹ and George Legard a doubling in wheat and a quadrupling in barley production (which was more important than wheat), between 1820 and 1848.² Farms became less nucleated. Farms were concentrated in the villages and hamlets at the end of the eighteenth century and the outlying farm was the exception,³ but over the following half century, the geographical and economic centre of Wolds' farming shifted from the villages to the surrounding countryside.⁴ Farms became scattered and more isolated, and grew larger.

Improvement was more modest on the lowlands. This owed something to the depression of the late 1820s and 1830s which damaged the interests of many wheat farmers and forced much good wheat and bean land out of cultivation. Wold farmers were less affected. Their cost structure was more flexible than the clayland farmers and they accommodated themselves more easily and quickly to the falling price of grain. They also escaped the epidemics of sheep rot which decimated many lowland flocks in the early 1830s. In Charles Howard's words the condition of Wold farmers was "not bad" while lowland farmers, having "lost the most money", went through a period of severe distress.⁵ The disruption of the lowland economy had effects reaching down to 1850 and in some cases beyond. Particularly in

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1. G.E. Fussell, Farming Systems from Elizabethan to Victorian Days in the North and East Ridings of Yorkshire (1946), p. 18.
 2. G. Legard, 'Farming in the East Riding of Yorkshire', loc.cit. p.107.
 3. M.B. Gleave, op. cit. p. 105.
 4. Ibid. p. 106.
 5. S.C. on the State of Agriculture (P.P. 1837, V), QQ. 2201-33.

Howdenshire the 1820s and 1830s saw an exodus of "men of education and capital" who had come into farming during the Napoleonic Wars. Many of the large farms they occupied were broken up into smaller units¹ and were taken over by tenants who invariably had insufficient capital to farm efficiently.

Heavy land required underdrainage and farms had to be consolidated if the claylands were to be worked profitably in poor, as well as in good years. This required large injections of capital which neither the 'middling' tenant nor his landlord, in some cases, could provide.² The smaller tenant was not adjusted to the discipline of trial, criticism, adaptation, and innovation which lay at the heart of progressive farming. Old prejudices were not overcome easily as he seldom travelled beyond the local market area and was unable to see at first hand farming techniques used in neighbouring counties and counties further afield. It is not without importance that many labourers and presumably many of the smaller tenantry, who were similarly educated, could equate Yorkshire men with Englishmen but "Linkisher" men were set apart as "foreigners".³ The limited horizons of the small farmer were unlikely to have been broadened at second hand by the agricultural press which aimed at the capitalist farmer and improver. Districts dominated by small farms and with capital spread too thinly and unevenly over the land were at a grave disadvantage in the process of agricultural transformation compared with the Wolds and the more efficient parts of the Vale of York and Holderness.

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1. C. Howard, Agriculture in the East Riding (1835), pp.19-20.
 2. Rents fell on some estates in Howdenshire by 30-50 per cent in the late 1820s and 1830s which made it difficult for landlords to remodel their estates. On the other hand, it will be shown later that falling profits were often the incentive for landlord improvements to estates.
 3. F.D. Legard, ed. Ploughing and Sowing: or Annals of an Evening School (1861), p.19.

In spite of the obstacles, the first half of the nineteenth century witnessed some improvement in lowland farms. Drainage remained difficult in Holderness and on the Vale of York, but more careful attention to water courses and drainage ditches made it possible to grow root crops in one or two areas which had produced little above low grade pasture a century earlier. Drainage was defective in Howdenshire and a bare fallow remained the usual preparation for wheat on heavy land, though the use of drainage tiles brought some benefit. Drainage tiles had been scarcely tried on the Vale of York at the end of the Napoleonic Wars but they became popular over the following two or three decades and it was claimed by the 1830s that "extensive improvements [had] been affected by them".¹ However, their high price (they were hand made) limited their market to those parishes and estates where there was strong aristocratic leadership in farming. Tiles were not used by the average farmer and it is therefore unlikely that they led to any extensive improvement, though they were useful in the few areas where they were tried. For example, large sums were spent on underdraining using tiles at Scoreby, near York, with the result that land, previously kept clean of weeds only by regular fallowing, was brought into a high state of cultivation.²

The Norfolk four course rotation, or a variation of it, became firmly established on light soils. The acreage under turnips increased as did that under potatoes grown for the London market.³ Marling, first tried on the Vale of York at Melbourne in the eighteenth century, was taken up by a large number of farmers after 1815, as was the practice of applying crushed bones to the land.

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1. C. Howard, *op. cit.* p. 24.
 2. The use of drainage tiles did not necessarily improve drainage unless they were laid in an approved manner. — *Ibid.*
 3. A. Harris, 'Studies in the Historical Geography of the East Riding of Yorkshire' (Hull University Ph.D. thesis, 1962), p. 117.

A great deal of creative energy went into modernising East Yorkshire farming over the period from 1700-1850 but with varying results. Some districts which had been backward in the eighteenth century remained so in the nineteenth, while others showed signs of coming to terms with inadequate drainage and heavy unyielding soils. The dominant division in the county's agriculture was between light and heavy soil districts. Flexible crop rotations based on a root break gave the initiative to landlords and farmers on light soils, and the Wolds, which were underused and primitive in 1700, emerged as the focus of progressive farming from the early 1800s. This applied not only to crop rotations but to such practical matters as the phasing out of obsolete equipment and its replacement with newer, and more effective, implements and machines. Heavy soil areas, though showing signs of progress, suffered a relative decline.

6. Farming on the Wolds in 1850.

Green pasture fields are occasionally intermixed with corn, and more frequently surround the spacious and comfortable homestead. Large and numerous corn ricks give an air of warmth and plenty, whilst the turnip fields, crowded with sheep, make up a cheerful and animated picture. The large corn fields, 30 to 70 acres in extent, attest by the evenness of the stubble to the correct manner in which the drill man does his part, and the neatly trimmed hedges and well built ricks show that the labourer is expert, and that the farmer likes to have his work well done.¹

The Wolds were the largest area in the East Riding in a high state of cultivation, two-thirds of the district being under crops and the remainder under rough pasture. The turnip supplied winter fodder for

1. J. Caird, English Agriculture in 1850-51 (2nd edn, 1968), p. 310.

sheep and underpinned the rapid increase in stocking levels in the first half of the nineteenth century,¹ sizeable profits coming from the sale of mutton and wool in local and West Riding markets. Cattle were relatively unimportant except on the lower Wolds where an industry of some size was being established. Herds were mostly small and badly managed, but some farmers had begun to sense that the full value of store cattle exceeded their live or dead-weight price by the value of solid and liquid manure they produced. This was a much richer organic input than sheep fold and gave heavier following crops, especially if beasts were fed on artificial concentrates for part of the year. The increased stocking of cattle, particularly beef herds, was in its infancy over much of the Wolds in 1850. Dairy herds were even smaller and usually supplied only the needs of farm households and labourers' cottages; the principal exception was on the boulder clay flanks of the lower Wolds where a sizeable industry had developed. A reliable indicator of the poor standards of cattle farming over the region generally was the dismal state of most fold yards, a fact conceded even by the region's admirers.²

The principles of light soil farming were common both to the lower, and to the more exposed higher Wolds, though the style of farming varied considerably. Farming was more flexible on the lower slopes owing to easier access to spring water, milder weather and an adequate road and

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1. Stocking densities were kept low traditionally by shortages of winter fodder.
 2. Charles Howard described a progressive farm belonging to Robert Raikes of Brough, and even there farm buildings were old and ill-adapted to improved farming systems. Fold yards were constructed on the side of a hill allowing liquid manure to flow down to a large pond from which cattle drank.— Agriculture in the East Riding of Yorkshire (1835), p.102; Select Committee Report on Agriculture Customs 1847-8. (Parliamentary Papers, 1848, VII).

river system.¹ Farming communities on the more remote high Wolds were less fortunate in these respects though the Malton to Driffield railway, which opened in 1853, did much to make the district more accessible. Predictably, farms close to the surrounding vales used more fertilisers and artificial feedstuffs, supported more livestock per 1,000 acres, and grew heavier crops than farms on the high Wolds.² Farms tended to be larger in the latter to compensate for this.

Crop rotations on the lower Wolds were based on the four course rotation but were extended frequently to five or six courses with (i) seeds, (ii) wheat, (iii) white turnips or rape, (iv) wheat, (v) swedes and turnips, and (vi) oats. Clover (ie. seeds) and turnips failed if repeated too often in the rotation. This was an acute problem on the higher Wolds because of lack of manure and more severe weather. Rotations on good farms there combined (i) oats, (ii) turnips and rape, (iii) wheat, (iv) swedes and hybrids, (v) barley and (vi) seeds, though this was modified frequently as a good crop of clover was certain only once in 12 years. Tares, rape and peas were substituted for clover and the turnips course was

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1. Driffield was connected by river to markets like Beverley and Hull. The Driffield Navigation (see Figure 1.6 above) was extremely valuable to farmers. The Old Navigation was used, for example, to carry more than 11,000 quarters of wheat, 6,000 quarters of oats, 2,000 of flour and 21,000 of barley in 1830, and the New Navigation carried 15,000 quarters of wheat, 8,000 of oats, 4,000 of flour and 23,000 of barley, again in 1830.- B.F. Duckham, op. cit. p. 30.

2.	Yield per acre on a good farm on the lower Wolds (in bushels)	Yield per acre on a good farm on the higher Wolds (in bushels)
Wheat	28 - 32	24
Oats	48 - 64	48
Barley	32 - 40	36

Source: Hull Advertiser, January 17, 1850.

staggered,¹ but this was at the expense of lower yields in the following corn crop.

Wold farms were among the largest in Yorkshire ranging from 300-1,300 acres.² A sample of 69 farms in the northern parishes of Bishop Wilton, Fimber, Sledmere, Thixendale, Garton, Weaverthorpe, and Wetwang, which were owned in part or in total by the Sykes family, revealed that 40 per cent of farms were 300 acres or over, and 30 per cent were 500 acres or over.³ Field size paralleled farm size. Fields were large and rectangular, many were 20-40 acres in size and some reached 100 acres. This conformed to the most efficient size range for corn growing, roughly 20-50 acres, suggested by J.C. Morton and other contemporary farming authorities.⁴ Hedges were kept to a minimum.

The extensive scale of farming was linked closely with a class of large capitalist farmers. James Caird, obviously impressed by what he saw, added the corollary that farmers were educated and showed a liberal attitude to farm improvement.⁵ This conforms to the economic evidence for Wold soils were weak in their natural state⁶ and the farmers cultivating them in the late eighteenth and early nineteenth centuries had a choice

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1. Several factors explain the failure of clover if repeated too frequently in rotations: (i) Seeds might be covered too deeply by soil so preventing germination, (ii) a long summer drought could damage them, (iii) they could rot in a wet summer. The most common cause of failure was (iv) a too luxuriant growth of straw in the corn crop which drew up the clover plants prematurely and weakened them.
 2. Farms over 1,300 acres were not unknown on the Wolds.
 3. Sledmere Estate MSS Farm rent acc. 1850-60, E.R.R.O. DDSY/107/4.
 4. La Vern Hoelscher, 'Improvements in Fencing and Drainage in mid-nineteenth century England', Agricultural History, 37 (1963), 75.
 5. J. Caird, English Agriculture in 1850-51 (2nd edn, 1968), p.311.
 6. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. pp.99-100.

between investing in large farms, using large quantities of manure to improve soils, pasturing extensive flocks and using machinery when and where possible, or leaving farming, or satisfying themselves with a shifting and uncertain kind of farming. This choice was no longer necessary after two or three generations of farming improvement, but the historical legacies of that time probably still encouraged high standards of farming. Many farmers and landowners who had begun their working lives towards the close of the eighteenth century were still active in the 1840s and 1850s. Memories of the first plantations (the wretched management of large tracts of the Wolds and the arduous labours necessary to force some amelioration in the soil), must have remained vivid for many. The strong oral tradition of rural communities, their isolation and the binding power of the family group, almost certainly ensured that these early impressions were passed onto the rising generation of agriculturalists who had no personal experience of these times; these early experiences probably still influenced farming standards in the mid-nineteenth century even though the district was then settled and prosperous.

7. Farming on the lowlands in 1850.

Agricultural standards on the Vale of York and in Holderness were relatively low in 1850 compared to the Wolds, though they compared well with standards nationally. The traditional three course system of two corn crops and a fallow was used by the majority of farmers in the clay soil districts though clover was added where soils were less heavy.¹ Fallowing every third year was the standard method for controlling weeds and maintaining soil fertility. A system of cropping which combined root

1. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. pp.99-100.

crops, corn and clover was virtually impossible except where drainage was effective. Turnips rotted on undrained clays which helps to explain the secondary importance of livestock on many clayland farms¹ and the piecemeal integration of cereal and livestock production. The advantages of mixed farming were generally denied to heavy land farmers.

The effects of poor drainage had secondary repercussions. Farmers were more vulnerable to the vagaries of weather; fields could be waterlogged after heavy rain and the working season was shorter compared with light soil districts. Clays were stiff to work and required more horses per farm to plough, harrow and haul if they were to be worked effectively. Traction costs were therefore higher than on the average light soil farm and income was more uncertain. Sheep were more vulnerable to footrot; crops were more prone to storm damage; wheat ripened later, autumn ploughing was often delayed and crops were thinner because of the 'coldness' of the soil. Adequate drainage held the key to better farming but it was expensive, even with government assistance, and not all landlords were willing to raise farming costs substantially in the short term to secure possible economic rewards over the longer period. Inadequate drainage held back structural and technical transformation on the lowlands into the twentieth century.

Many farming commentators, especially those with a background in light soil farming, were critical of the agricultural system they saw on Vale and Holderness farms. George Legard, a leading agricultural authority in the county and himself an extensive farmer on the northern Wolds, argued that lowland farming was mostly bad and lacked the spirit of improvement he found in his own district.² This view was shared by others.³

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1. A. Harris, The Rural Landscape of the East Riding (1961), p.113.
 2. S.C. Report on Agricultural Customs (P.P. 1848, VII), QQ.7569-70.
 3. Ibid.

Advanced techniques were sometimes slow to be incorporated even on large, well managed farms. Charles Howard described a 1,300 acre estate belonging to Ottiwell Wood which he thought corresponded "in all the leading principles with the best cultivated farms of the district". Turnips, wheat and beans were still sown broadcast even though the estate agent conceded that the seed drill and ribbling plough produced better results.¹ This was in the mid-1830s and had probably improved by 1850, but it had not changed on many estates and certainly on the mass of small family-run farms in the Vale of York, the older methods of husbandry surviving there into the second half of the century.

In contrast, several lowland districts acquired a considerable reputation for the quality of their farming. Southern Holderness was the most prosperous and advanced farming district in the lowland vales. Farming was extensive and was based on cereal growing; farms varied from 200-800 acres and most farmers had substantial capital means and were willing to invest in long term capital improvements alongside their landlords. "... on all sides the evidence of improvement [was] very remarkable."² Several farms stood out and were models for the others. One was Enholmes, a 1,000 acre strong land farm belonging to William Marshall of Patrington. Another was the Ridgemont farm belonging to the Stickney family.

Mechanisation advanced rapidly at Enholmes and almost every operation was powered by steam with the exception of tillage. This extended to threshing, grinding, straw cutting, turnip cutting, and liquid

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1. C. Howard, Agriculture in the East Riding (1836), pp. 7, 10-11.
 2. Hull Advertiser, August 16, 1850.

manure distribution. A portable iron railway¹ manufactured by William Crosskill helped in the feeding of 40 horses, a large number of fat bullocks, cows, pigs, and poultry.² At Ridgemont the entire 840 acres had been consolidated into a single farming unit by the 1830s. The farm had machinery for threshing and straw cutting, a horse mill, and a complete carpenter's shop. Farm buildings were well adapted to the large scale housing of cattle and fold yards were of an advanced design with liquid manure being channelled into large covered tanks instead of running to waste in the farmyard. This was no small improvement as the chemist Liebig had shown in the 1840s that there was a potential loss to the farmer of 60 pounds weight of wheat for every pound of ammonia allowed to evaporate and one pound of wheat for every pound of urine.³

The standard of farming at Enholmes and Ridgemont was well above the norm for south Holderness but indicates the superior farming of the district. Similar standards existed elsewhere on the lowlands though the Vale of York and Holderness generally failed to keep up with the mainstream of agrarian improvement. It is not without significance, for example, that the less efficient sickle was used to cut most of the lowland corn harvest in the 1840s whilst the more efficient scythe was used on the Wolds. Numerous factors held back farming development on the lowlands and perpetuated the difference in standards so clear between the Wolds and the Vale of York and Holderness in 1850. The small capital means of

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1. This was a device for laying down a temporary track over which farm carts etc. would run. It was useful in wet weather to prevent equipment bogging down.
 2. Hull Advertiser, August 16, 1850.
 3. J. Hannam, 'The Economy of Waste Manures', Transactions of the Yorkshire Agricultural Society, VI (1843), 45-6.

many lowland farmers made the innovation of new techniques more difficult than on the Wolds where fixed and circulating capital was more abundant. Small and medium-sized farms, in which the lowlands abounded, were also less suited to the techniques of high farming than were the larger farms of the Wolds. The two basic factors retarding progress were the absence of effective drainage, at least 50 per cent of Holderness and the Vale of York were without effective drainage, and the over-commitment of farmers to earlier farming systems. Parliamentary Enclosure had been unable to reduce this commitment more than marginally as the area of old enclosed land, especially on the Vale of York, was so high.

CHAPTER TWO

BASIC DEVELOPMENTS IN THE AGRICULTURAL ECONOMY OF THE EAST RIDING, 1850-80.

1. The years of prosperity.

Landowners and farmers prospered in the three decades after 1850 and the condition of agricultural labourers was eased. The agriculturalist experienced, by and large, what one extensive cultivator on the Wolds described as an "uninterrupted run of prosperity".¹ Wheat prices fell throughout most of this period, barley and oat prices increased marginally, and livestock prices increased quite strongly. Mixed farmers, especially those who increased their emphasis on livestock, benefited from higher prices and the relatively lower cost of feed. Small losses from cereal cultivation were balanced by profits from livestock. The farmers' money income and the landowners' rent receipts increased by one-quarter between 1850 and 1880, though the latter often varied widely from estate to estate. The money income of farm labourers increased between one-quarter and one-third.

Rural recovery from the Post Repeal depression dated from the early months of 1853 and was later strengthened by a soaring demand for corn during the Crimean War. Tenant indebtedness shrank in the late 1850s and early 1860s almost disappearing in the late 1860s and early 1870s. The life style of many large farmers began to change and critics accused them of mimicking the gentry; the "fine ladyism" of their womenfolk was a favourite theme developed at this time.² The criticism was sometimes unfair but pianos and oil paintings did become features of many farm-house

1. Royal Commission on the Agricultural Depression 1894-97
(Parl. Papers, 1895, XVI), p. 919.

2. Hull Advertiser, April 12, 1850.

parlours and the well-turned-out 'dog carriage' became a popular means of travel as well as a symbol of gentility. Several authors have commented on the widening social gap between the households of the larger farmer and to a lesser extent of the medium sized farmer, and those of their workers, and have dated this from 1850. The reasons for sharpened class consciousness are complex but it seems undeniable that the financial advancement of the tenantry was prominent among them.

Landowners shared this prosperity. Rent receipts rose in the mid-1850s and early 1870s, and non-estate incomes from urban property, industry and government stock also increased, benefiting the larger landowner in particular. The third quarter of the nineteenth century marked the economic peak of landownership in Britain. Landowners, for the last time in the century, had the means, either from private or public sources, to extend mansion houses, make improvements to the home farm and stud, and more importantly, to undertake investments aimed at raising agricultural standards on their estates. Priorities varied but only a small minority of landowners failed to improve their estates.

Farm labourers benefited least from the progress of the mid-nineteenth century. Money wages rose and there is firm evidence that the opportunity to rise through the various earning divisions within the agricultural labour force was greater at the end, than at the beginning of the period. Day wages rose slightly in the 1850s and 1860s (assuming no upward movement within the labour hierarchy), and nearly the whole of the increase in money wages occurred in the early 1870s. Rates for task work, especially if it involved machinery, rose through the entire period, as did harvest wages. The former were tied to higher productivity while the latter, in addition to this, reflected the increasingly acute shortage of labour over the August-September period.

In spite of the increases, farm wages trailed behind urban wages. Agricultural labourers were handicapped by weak union organisation; they lacked the binding power of the factory floor and were over supplied in former Speenhamland counties,¹ though the agricultural labour market was tighter in the north of England and wages were higher. Labourers felt their living standards had deteriorated in the twenty years after 1850, and this almost certainly accounts for the bitterness of the "revolt of the field" - the strike of agricultural labourers which spread through many parts of England, including the East Riding, in the spring and summer of 1872. Living standards in fact had not fallen, taking the period as a whole, though they dipped periodically as in 1871 and the first month or so of 1872, as prices increased strongly and wages remained unchanged.

Agricultural labourers were generally subject to less intense market pressures than urban labourers. Cottage rentals, for example, were deliberately kept low and remained unchanged on several East Yorkshire estates between 1850 and 1880. Most labourers in the county had gardens or access to allotments and were able to supply a significant part of their food requirements. Gleaning² also helped rural families to be independent of the baker for part of the year. Labourers' living standards may have stagnated between the mid-1850s and the spring of 1872, but they rose

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1. Historians disagree on the tightness of the rural labour market. E.H. Hunt has argued that structural unemployment among farm labourers continued in former Speenhamland counties down to 1914.- 'Labour Productivity in English Agriculture', Econ. Hist. Rev. 2nd ser. X (1967). E.L. Jones has argued that the labour market tightened nationally after 1850.- The Development of English Agriculture 1815-1873 (1968). For a full discussion see Ch. 12, 'Income trends among Farm Labourers in the East Riding'.
 2. Gleaning involved removing grains of corn from the harvest field which the harvesters had missed. This was a job for women and children, and if successful, the gleaners would take home enough grain to feed a family over the winter.

considerably in the following few years and were not undermined to any great extent by the cereal depression of the late 1870s and 1880s.

2. The years of depression.

The crisis of the early 1850s was produced by a combination of low prices and wet seasons. Prices slumped in 1850. Grain prices fell on average by a little over 20 per cent between 1848 and 1850 and livestock prices fell by slightly less on the Saurbeck price index.¹ Flooding was serious on lowland clays, crops were spoilt and flocks were decimated by liver rot. These experiences taxed the resources of most farmers and forced tillage landlords to lower rents; reductions of 10-15 per cent were reported to be fairly common in the East Riding by 1851.²

The hardships faced at this time by good, as well as by bad farmers, are amply documented, manuscript sources referring both to individuals who suffered misfortune as well as to tenant indebtedness generally. The level of indebtedness on most tillage estates in the Riding was between 10 and 20 per cent of the total rental. Farm labourers were hit badly; wages fell and unemployment rose,³ but conditions were generally better than in several other eastern, and especially south-eastern counties, owing to greater tightness in the local labour market⁴ and the policy of keeping "labourers off the poor rates by paying wages out of capital".⁵

1. B.R. Mitchell, Abstract of British Historical Statistics (1962), pp.474,488.

2. Hull Advertiser, September 19, 1851.

3. Ibid. February 22, 1850.

4. Underemployment was never serious on East Riding farms because of the drawing power of northern industry. The labour market was tighter and wages were correspondingly higher than in the south, especially the south-west.

5. Hull Advertiser, February 15, 1850.

Recovery set in in 1853 and real income on the land increased at slightly less than one per cent per year over the following quarter century. The most serious interruption to agrarian prosperity in this 'Golden Age' was the outbreak of rinderpest in the mid-1860s. The East Riding was an infected area by the autumn of 1865 and the Vale of York was especially hard hit. A local landowner described the situation in the following terms:

... during the past seven weeks, my time has almost been exclusively occupied in one way or another by the Cattle Plague. Never before have I witnessed such distressing scenes.¹

The outbreak caused the loss of about 10 per cent of the East Riding's cattle population² and about 5 per cent of the cattle population nationally.³

This was a temporary set-back and herds were brought up to strength by 1869. Far more serious was the depression in cereal farming and later in livestock production in the last quarter of the century. The crisis was produced by an "immense increase in imports of cheap grain coming from North America and also to some extent from Russia".⁴ Greatly reduced transport costs together with the opening up of virgin lands were chiefly responsible for the crisis, though the failure of successive governments to protect farmers from foreign competition ultimately accounted for its magnitude.

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1. J. Dunnington-Jefferson MSS, Letter Book, 1865-6, E.R.R.O. DDJ/40/7.
 2. See below, pp. 199-200.
 3. A.B. Erickson, 'The Cattle Plague in England, 1865-67', Agricultural History, 35 (1961), 102.
 4. M. Tracy, Agriculture in Western Europe (1964), pp. 21-2.

Most contemporaries failed to recognise the relevance of developments in international trade and argued that a run of bad seasons had severely squeezed farmers' resources and was responsible for their difficulties. The evidence for this is quite strong. 1877 was a bad year and came as "no bright exception to the indifferent harvests of late years".¹ 1878 was little better, heavy rain flattening extensive areas of corn on the Wolds and in Howdenshire.² The following year, 1879, was recognised to be the worst for British agriculture in the nineteenth century. Excessive wetness damaged cereals and green crops in Holderness, and "a more gloomy outlook [was] not remembered" on the Wolds. Harvesting continued into November on the high Wolds around Garrowby and Thixendale. As late as the second Royal Commission on the Agricultural Depression, 1894-97, only a minority of commissioners were prepared to depart from stock arguments about the weather and other trivia and accept that the inflow of cheap wheat was the main cause of rural depression.³

The depression dragged on for two decades. Surprisingly, Holderness came through the crisis more easily than other districts in East Yorkshire for there were few vacant farms in 1880 and these soon found tenants.⁴ This was the assessment of Assistant Commissioner Coleman and was probably too optimistic as agricultural land was falling out of cultivation in central Holderness or was coming under the cultivation of landowners themselves.⁵ The Wolds were affected badly by the crisis and its economy reeled under

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1. Hull and Eastern Counties Herald, September 6, 1877.
 2. Ibid. August 15, 1878; November 14, 1878.
 3. T.W. Fletcher, 'The Great Depression of English Agriculture 1873-96', in P.J. Perry (ed), British Agriculture 1875-1914, 46-9.
 4. R.C. on the Depressed Conditions of Agricultural Interests (1880), p.133.
 5. Emanuel Hospital MSS, Report to Governors, November 14, 1879, L.C.R.O. EH 5.3.

the combined assault of falling grain and wool prices and deficient harvests. The Sledmere management received 39 notices to quit in 1880 and many farms were unoccupied as new tenants had not been found to replace them.¹ Conditions on this estate were strained by the decision to raise farm rents in the last years of the 1870s but hardship and loss of income were experiences common to most Wold farms.² Tenant indebtedness amounted to nearly 40 per cent of the Sledmere rental in 1880³ and was at least 10 per cent of the rental on the majority of estates in the county.⁴

3. Technical developments in agriculture, 1850-80.

The progress of the first half of the nineteenth century was continued and broadened in several important ways in the second half. Knowledge of sound farming principles and practice continued to spread through the farming community, and the agricultural industry developed on "the principle of obtaining the largest produce at the least cost".⁵ Drainage schemes were pressed forward vigorously, though not always with optimum results, and much badly drained and undrained land remained after a generation of improvement. Attempts to consolidate farms and enlarge fields were partially successful though the farming landscape of areas like the Vale of York and Holderness continued to bear the features of earlier farming systems. Artificial fertilisers came into fairly common

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1. R.C. on the Depressed Condition of Agricultural Interests (1880), p. 133.
 2. Ibid. p. 134.
 3. Sledmere Estate MSS, E.R.R.O. DDSY/107/8-9.
 4. Houghton Estate MSS, E.R.R.O. DDLA/34/5; Wenlock Estate MSS, E.R.R.O. DDFA/41/18-20.
 5. J. Caird, The Landed Interest and the Supply of Food (5th edn, 1967), p. 46.

use by the 1870s; mechanisation became a standard feature of the large farm and increasingly of the medium-sized farm; farm buildings were modernised.

Many of the technical achievements of this period have been associated with high farming. High farming symbolised the advent of modern farming both from the technical and management standpoints. It was the outcome of farming changes begun in the seventeenth century, tested in the eighteenth, and accepted and used by an increasing number of farmers in the years between Waterloo and Repeal. High farming combined the best of traditional farming (the empiricism of generations of practical farmers), with the scientific knowledge of the 'Railway Age'. Its methods were controlled livestock breeding, soil management, drainage, and mechanisation; its aim was expanded production; the most probable cause of its quickening was the effort of offsetting the effects of falling prices in the 1820s and 1830s, and later in the early 1850s. The threat of lower prices in the late 1840s can also be added to this.

Some developments in the farm economy after 1850 owed little, at least directly, to the historical development of high farming, though they added to its success. The government's decision to introduce cheap drainage loans as part of the Repeal 'package' can be numbered among these. Over £7 million was invested nationally in drainage improvements in the quarter century after 1847 under the Drainage and Improvement of Land Act, and government loans were also available for other improvement schemes. This was a sharp break with previous practice for successive governments had appointed select committees over the years to investigate rural problems, but they had not enacted any legislation aimed directly at assisting farmers except for the largely ineffective corn law of 1815. The Poor Law Amendment Act, 1834, and the Tithe Commutation Act, 1836, though they brought some relief, the first by reducing the poor rate and

the second by making all tithes payable in money, only marginally affected the economics of farming.¹ They did not, unlike the Act of 1847, make a positive contribution to agrarian efficiency and profitability.

The efficiency and profitability of field drainage is examined more closely in a later chapter but the discussion can be anticipated by raising two basic points. First, the amount of money spent on land drainage is an imprecise measure of drainage improvement. Second, a more precise measure combines the economic resources available to drainers with their technical sophistication and their willingness, in the case of landowners, to co-operate in drainage projects extending over several estates and possibly over entire watersheds.

The basic principles of field drainage were grasped by only a minority of those actively engaged at the task. Good drainage required modifying rigid rules to meet variations in local conditions. Shallow drainage was efficient in clays but inefficient in light soils while deep drainage was useful in light soils but of limited use in clays. Much of the drainage work undertaken in the 1850s and 1860s was too inflexible in its approach, ignored local conditions and gave little lasting benefit to the farmer.

The importance of co-operation between neighbouring landowners in drainage activities has been given scant attention by most historians. Two crucial problems were that improvements in one area, if not co-ordinated properly within the framework of a larger drainage project, could exacerbate existing problems in other areas by increasing the rate of run-off. A second difficulty was in securing general agreement on aims, methods and

1. L.P. Adams, Agricultural Depression and Farm Relief in England 1813-1852 (1965 edn), pp.170-2.

cost, considerable even when two or three landowners were involved, but often insurmountable in districts dominated by a welter of small landowners. Lack of co-operation helped to delay the introduction of efficient drainage in several districts of the Vale of York and Holderness. This does not deny that there was general improvement in land drainage over the third quarter of the nineteenth century; it merely suggests that these factors, among others, were responsible for an imbalance between practical achievement and the effort and cash expended.

The introduction of the reaper, the drainage plough and the clod crusher, to name but a few machines, also dated from mid-century. The mechanical reaper more than any other farming innovation at the time, symbolised for many the link between science and practical husbandry which was the essence of high farming. The broader acceptance of machinery and the up-grading of traditional implements¹ in the second half of the century, helped to raise productivity levels both on the clays and on the lighter soils. However, the trend was not strong enough in the former, even with better drainage, to eliminate the efficiency gap between heavy and light soil farming. The achievement of the third quarter of the nineteenth century was to narrow it.

This is also demonstrated by the increasing use of artificial fertilisers and manures. They had been unimportant before 1850, guano excepted,² but became indispensable 'ingredients' of progressive husbandry over the following two decades. Progress was most rapid on the Wolds, the high cost of oil cake and phosphates being beyond the means of most small and medium-sized farmers who were the dominant group in the traditional farming areas.

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1. See below, Ch. 5, 'Farm Mechanisation In The East Riding, 1850-80'.
 2. Guano was a new, rather than an 'artificial' manure.

Potash salts were available commercially to farmers by the 1860s¹ and were in common use on the better type of farm by the 1870s.² A crude indicator of the importance of artificial feedstuffs and fertilisers is the extent to which they entered international trade. Imports of crushed bones and oil cake into the United Kingdom increased at an annual rate of 3.83 and 3.97 per cent, respectively, between 1861 and 1880.³ The impression from this, and from manuscript evidence relating to individual East Riding estates, is that farming became considerably higher between 1850 and 1880 both in light and heavy soil districts, though the change was nominal on the heaviest soils. Accumulated disadvantages, not least a backward farm and field structure and a relative shortage of working capital, continued to impose limits on the extent to which new farm technology could be taken up by, or would benefit, the heavy soil farmer.

New technologies outside the immediate farming nexus also began to influence, and in some cases to shape, the course of agricultural development. The railway was the most important of these and was vital to much of English farming by the 1860s and 1870s. Unlike many internal developments in agriculture which stimulated the newer farming districts more than traditional areas, the railway made faster progress on the lowlands than on the chalk uplands and was a major factor in raising farming standards in regions like the Vale of York and Holderness. It exerted strong pressure on farm rents. Some contemporaries estimated that the letting value of land increased by 5-20 per cent according to proximity to a railway station, and

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1. G.R. Fussell, 'The Dawn of High Farming in England', Agric. Hist. 22 (1948), 87.
 2. J. Caird, The Landed Interest and the Supply of Food, (5th edn, 1967), p.18.
 3. Calculated from Agricultural Returns for Great Britain (P.P. 1881, xciii. 589), pp.64-5.

some even claimed that the railway influenced rents more powerfully than direct investment on the land.¹ This is speculative; more certain is that many of the changes and improvements in agriculture in the quarter century after 1850, together with much of the prosperity of that time, came as a consequence of better transport.²

How far then was the agricultural industry in the East Riding changed by these developments? This is difficult to estimate not least because the rate of improvement varied so widely from area to area, and because there is no obvious indicator of general improvement. Several indicators have been used in this study: some are technical such as the analysis of farm size, while others, such as attitudes to technical change, are more impressionistic. Both will be described briefly.

The attitudes of landowners and tenant farmers can be gauged from various sources. Manuscript evidence is quite detailed and often itemised the investments made by landowners and their strategies for future development. The farm covenant, one of the most useful pieces of evidence, specified the terms on which tenancies were offered. Covenants were modified substantially in the East Riding by the late 1850s and early 1860s, and came to include tenant compensation for investments in oil cake, artificial manures, lime, marl, and land drainage. There had been no compensation for these items previously and covenants had awarded only what the "custom of the county" allowed, usually an away-going crop taken from one-third or one-quarter of the arable. The wider concept of compensation built into the covenant was a reflection of technical progress in

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1. F.M.L. Thompson, English Landed Society in the Nineteenth Century (1963), p.256.
 2. This is in the sense of the railway underpinning a national market for agricultural output and cheapening the carriage costs of bulky goods such as machinery, oil cake and lime.

agriculture - new practices had gained acceptance and had to be legally acknowledged - and was also a factor in bringing about technical progress itself. Tenant farmers were more willing to improve drainage and use artificial manures if they were compensated, than if their capital was unsecured.¹ The revision of tenancy agreements varied from district to district. The initiative was taken by landowners on the Wolds and on this evidence it would appear that the Wolds were at least a decade ahead of most lowland districts in the application of modern techniques and practices.

Measures of technical change such as movements in the average size of farms have several advantages over those built up from the impressions and attitudes of landowners. In the first place they can be quantified as the data are sufficiently detailed for county-wide and district analysis. There is also a clear historical association between size, rural technology and the state of the market.² Economies of scale became progressively more important in the thinking of farmers and landowners as competition intensified and as the technology used by the average farmer increased in complexity. Small fragmented farms were recognised to be at a disadvantage in most areas of agricultural production except for horticulture and dairying.

The great upsurge in technical development in the mid-nineteenth century affected the average size of farms particularly in the older farming areas - areas like the Wolds were less affected. Major changes occurred on the Vale of York where the acreage held by farms of 300 acres and over increased by about 14 per cent between 1851 and 1871.³

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1. This is modified in more detailed discussion. See below, pp.322-331.
 2. See below, Ch. 3, 'Farm Size and Economic Progress in the East Riding'.
 3. Calculated from Census Enumerator's Abstracts, P.R.O. HO 107 2362-9; P.R.O. RG 10 4799-4808.

Movements in farm size point to real development in the lowland vales in the 1850s and 1860s and indicate that the forces of inertia were not strong enough to exclude permanently technical advances in agriculture. Much effort was certainly wasted on the lowlands absorbing technologies like the mass-produced drainage tile, and improvements such as the reaper were slow to gain acceptance. In many cases there was a simple unwillingness to depart from traditional practices which was reinforced by scepticism about the chemical sciences and the value of many classes of farm machinery. The task of combining science with the traditional art of husbandry proved particularly difficult in districts dominated by small farmers and 'middling' landowners, but this should not hide the fact that there was considerable progress there and that the efficiency gap between the Wolds and the vales narrowed between 1850 and 1880.

4. Themes in agricultural development, 1850-80.

The agricultural industry both nationally and in the East Riding was not in its modern form by 1850 though many districts were close to achieving it. East Riding farmers were generally advanced and compared favourably with farmers in other counties - this even applied to districts like the Vale of York and Holderness despite their half transformed state.¹ Farming standards were rising and a cautious spirit of scientific enquiry was taking root in the countryside. Local agricultural journals began criticising farmers who allowed only "wont or haphazard experience" to guide

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1. East Yorkshire was well ahead of most southern counties and was marginally in advance of districts like the Lincolnshire Wolds in harvest productivity. Harvest labour productivity was 70 per cent higher than the average for England as a whole in 1850.- P.A. David, 'Labour Productivity in English Agriculture, 1850-1914: Some Quantitative Evidence on Regional Differences', Econ. Hist. Rev. 2nd ser. XXIII (1970), 510.

cropping, liming, sowing, drainage, and construction.¹ The liberal press campaigned for controlled and skilful farming arguing that the "blessings" of free trade could be realised only if farmers employed "more science, /procured/ better implements of husbandry, and to the toil of the hands, /added/ the toil of the head".² Many did this; others did not and as late as the 1870s farming experts commented on the indifference and apathy among British farmers to the discoveries of science.³

The theme of progress was taken up by local agricultural societies. The stated object of the Yorkshire Agricultural Society was given at its foundation meeting on October 10, 1837, as the "General Promotion of Agriculture".⁴ This was later defined more closely as a concern for machine improvement and mechanisation, the quality of wool, the breeding of livestock, and in particular, a concern for raising agricultural standards on the smaller farm. Smaller local societies had similar aims⁵ and were established in large numbers in the decade after the Corn Laws were repealed. Their precise contribution to agricultural improvement is difficult to assess. The Holderness Agricultural Society addressed itself to just this issue and concluded that it had helped to spread "the most

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1. W. Throp, 'Report on the Agricultural Geology of the Wolds District and the Oolite District around North and South Cave', Trans. Yorks. Agric. Soc., IV (1841), 37.
 2. Hull Advertiser, March 26, 1847.
 3. J.R. Fisher, 'Public Opinion and Agriculture, 1875-1900', (unpublished Ph.D. thesis, Hull University, 1972), pp.75-6.
 4. Yorkshire Agricultural Society Minutes, October 10, 1837. (Documents lodged with Messrs. Mumby and Scott, solicitors, York).
 5. The Holderness Agricultural Society, for example, defined its aims on December 8, 1845, as "the promotion and improvement of the Science of Agriculture". Its members felt that its influence in the 50 years the Society has been established was "commensurate with that design".-
W. Bethell, Extracts from the Minutes of the Holderness Agricultural Society, 1795-1850 (1853), pp.24-5; 180-6.

approved principles and practices [of farming], and [had] inspired a spirit of improvement" throughout the surrounding district. It traced this to the discussion of general and scientific farming, the exchange of farming experiences and opinions, and the communication of "their collected knowledge to others".¹

Interest in agricultural societies and expanded press interest in agrarian reform turned on the widespread expectation of landowners and tenant farmers that Repeal would begin a period of permanently lower agricultural prices. New techniques of production and new attitudes to agrarian reform found growing acceptance among landowners seeking to lessen the effects of depression, which most of them anticipated, by reducing farming costs. The first five or six years after Repeal were among the most hectic in the nineteenth century for agricultural investment whose effects probably continued down through the 1850s and 1860s. This provided a broader basis, together with awakening interest in soil chemistry, better farm management, and greater professionalism among landowners and farmers, for the development of a more efficient farming system. Not surprisingly one of the themes developed in this study is the attitude of the landed interest to rural improvement. The evidence suggests that it supported attempts to raise agricultural standards in the East Riding, that laggards were few and the county was well served by its landed families.

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1. The Society credited itself with encouraging underdrainage. In the early nineteenth century this had amounted to nothing more than advising farmers to dig trenches in the clays and fill them with thorns, stones and earth. It had later extended to encouraging tile drainage. The Society pressed for the establishment of a wool market in Hull and one was eventually formed in June, 1841. The Society also purchased agricultural machinery and implements "which were experimentally used by the members of the Society and then sold at auction at its Quarterly meeting ..." - Ibid. pp.183-5.

One of the most important questions asked in this study relates to the extent of technical and organisational change in the East Riding's agricultural economy between 1850 and 1880. This has two dimensions: change in the technical sense of modifications to the farm landscape, mechanisation and drainage; and change in the marketing and production senses of shifts in the composition of agricultural output. Both aspects are debated at length and the impression which emerges is of significant technical advance and substantial progress towards grass and livestock farming.

Technical progress on the land continued at a rapid and accelerating rate. Steam-powered threshing machines were replacing horse-powered threshers by the 1850s,¹ especially on the Wolds;² the reaper was cutting one-half of the Yorkshire corn harvest by 1870³ and a little under that nationally by the mid-1870s;⁴ artificial manures and feedstuffs were being used widely on the Wolds and in those areas of the lowlands where farms were larger and tenants could afford the high costs involved. (The bill for cake could easily equal the annual rent bill.) Drainage on the lowlands continued to improve with the help of loans from government and from public companies specialising in drainage work.

A tightening of the agricultural labour market as more labour was attracted into higher paying urban industry or into coal mining,⁵ explains

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1. W. Harwood Long, 'The Development of Mechanisation in English Farming', Agric. Hist. Rev. XI (1963), 19.
 2. Hull Advertiser, October 31, 1851.
 3. Hull and Eastern Counties Herald, September 1, 1870.
 4. P.A. David, 'The landscape and the machine: technical inter-relatedness, land tenure and the mechanisation of the corn harvest in Victorian Britain', in D.N. McCloskey, ed. Essays on a Mature Economy: Britain After 1840 (1971), p.148.
 5. For a discussion of labour scarcity see Ch. 12 'Income Trends Among Farm Labourers In The East Riding'.

some of these developments. Equally important, however, were the carry over effects of increasing cost consciousness in the late 1840s and 1850s, and the impact of rising scientific interest in agriculture. The labour supply hypothesis has received considerable attention but although it is useful in explaining the innovation of the reaper, it cannot be applied in any exclusive way to technical progress generally. Farm wages were fairly stable between the Crimean War and the spring of 1872, and the majority of East Riding farmers did not complain about labour shortages apart from at harvest time.

High farming did not break down the pattern of farming established earlier in the century either in the technical or output senses. The light soil districts which were in the vanguard of agricultural development in the eighteenth century continued to develop rapidly in the nineteenth. Cheap drainage did not produce major changes on the clays except where soils were less heavy;¹ the argument that oil cake and the modern drainage pipe led to higher yields on pasture land, the more widespread growing of root crops and heavier stocking - the so called agricultural revolution on the English clays² - is refuted by East Riding evidence. This study points to progress on the lowland vales but suggests that they still lagged behind the Wolds by a large margin by the 1870s and 1880s.

The composition of agricultural output in England moved in favour of livestock between the 1850s and 1870s.³ The acreage under grass increased and livestock numbers rose, though the rate of increase was kept

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1. E.H. Whetham, 'Sectoral Advance in English Agriculture, 1850-1880: a Summary', Agric. Hist. Rev. XVI (1968), 47.
 2. R.W. Sturgess, 'The Agricultural Revolution on the English Clays', Agric. Hist. Rev. XIV (1966), 10.
 3. E.L. Jones, The Development of English Agriculture 1815-1873 (1968), p.22.

low by the effects of rinderpest and periodic outbreaks of liver rot among sheep. However, large gains in the killing-out weight of stock together with higher turnovers,¹ meant that the economic significance of livestock rose more than proportionally to the numerical increase. E.L. Jones has pointed to a gradual "but fundamental, shift in the pattern of agricultural production from the 1850s",² and has indicated that beef, milk and mutton prices rose by well over 25 per cent between 1851-5 and 1876-80, while barley and oat prices increased by less than 10 per cent and wheat prices fell by 7 per cent.³ The economic advantage clearly lay in strengthening the role of livestock in the mixed farming system.

It can be suggested strongly that although the role of cereals diminished nationally while that of livestock increased, the movement to livestock and grass was neither continuous, gradual or particularly fundamental in the East Riding. This is also the impression from one or two other districts in the Eastern Counties.⁴ The corn acreage in the East Riding increased up to the late 1850s and early 1860s,⁵ and even into the 1870s on some estates.⁶ The most likely reasons for this centre on the effects of the Crimean War, drainage investment in improving arable land, and the substitution of barley and oats for wheat.

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1. E.L. Jones, 'The Changing Basis of English Agricultural Prosperity, 1853-73', Agric. Hist. Rev. X (1962), 115.
 2. Ibid. p.110.
 3. E.L. Jones, The Development of English Agriculture 1815-73 (1968) p.21.
 4. D. Grigg, The Agricultural Revolution in South Lincolnshire (1966), p.117; R. Perren, 'The Landlord and Agricultural Transformation', Agric. Hist. Rev. XVIII (1970).
 5. See below, pp.
 6. Emanuel Estate MSS, L.C.R.O. EH 5.19.

The Crimean War was a prosperous period for grain farmers. The high price of corn led to an expansion in its acreage and was a factor in perpetuating the attachment to corn, and to wheat in particular, which was a feature of farmers throughout eastern England. Inability to distinguish between long term price shifts and cyclical fluctuations, except where the former were very pronounced, as in the last quarter of the nineteenth century, probably reinforced the stable pattern of agricultural production. A determination to see a reasonable return on the drainage work undertaken on arable farms in the late 1840s and 1850s might also have had a similar effect. This does not mean that farmers ignored price changes. The movement to grass was quite noticeable in the East Riding by the 1870s and 1880s but this still did not lead to a collapse in the cereal acreage. The cereal acreage held fairly well until the early 1880s as farmers strengthened the role of barley and oats in cereal rotations. In this way they benefited from more stable prices and, because barley and oats were fodder crops, made headway towards increasing the role of livestock in the mixed farming system. The trend should not be exaggerated. Many districts in Yorkshire still bore the features of corn specialisation even by the 1890s when the depression had more or less run its course.¹

The relationship between agricultural prices and farm production is crucial to this study and occupies a central place in the analysis. It is important because it throws light on the stability of the corn economy and because it shows the farmer to be a keen and perceptive entrepreneur within the marketing and information limitations he operated. The impression of bungling inefficiency and ineptitude handed down by the

1. R.C. on the Agricultural Depression (1895), p.916.

Anti-Corn Law League must be discarded.¹ Work on the revision of this view is already underway. In one of the most recent contributions Cormac O'Grada, looking into the supply responsiveness in Irish agriculture in the nineteenth century, concluded that "The main result of all this work is to raise the status of the peasant in the development literature to one of 'economic man' ...".² The East Riding study confirms this; it shows that farmers were sensitive to price movements and understood the economics of farming.

Some of the findings of this investigation into East Riding agriculture are as follows. First, farming standards rose in the lowland districts between 1850 and 1880, and Wolds farmers lost some of their earlier lead. Drainage was improved, the use of machinery increased, and farms were consolidated and enlarged in the Vale of York and the central parishes of Holderness. These developments helped many lowland farmers to meet superior competition from the Wolds and from districts outside the county - the railway had intensified the level of competition in local markets. To a very large extent the improvements made in lowland farming after 1850 were a continuation of improvements begun much earlier and did not constitute a technological break through in clay and heavy soil farming. Drainage improvements were frequently disappointing and the use of machinery, though widespread on the Wolds from the 1850s, was slow to take hold in other districts.

Second, labour was scarce on the Wolds throughout this period in contrast to many of the lowland districts where serious labour shortages over the summer months were reported only after 1870. The traditional

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1. J.T. Ward and R.G. Wilson, Land and Industry: The Landed Estate and the Industrial Revolution (1971), p.10.
 2. C. O'Grada, 'Supply Responsiveness in Irish Agriculture during the Nineteenth Century', Econ. Hist. Rev. 2nd ser. XXVIII (1975), 312.

shortage of labour on the Wolds, together with its higher price, were important reasons behind early mechanisation and the general acceptance of more productive and cost saving methods of farming. This also applied to the lowland districts towards the end of the period, though other factors like the impact of agricultural societies, individually progressive landlords, and the threat of lower prices after Repeal, were important in stimulating technical and organisational changes in farming.

Third, the corn economy was stable down to the early 1880s. Farmers were sensitive to agricultural price movements if trends were defined clearly as in the last quarter of the nineteenth century but were more hesitant, and rightly so, about responding to the less clear price trends of the 1850s and 1860s. The cereal acreage was maintained even in the 1870s and 1880s, when the trend in favour of livestock production was much clearer, by cereal farmers abandoning wheat and increasing production of oats and barley whose prices were reasonably maintained, and whose market - feed merchants and mixed farmers - was buoyant.

Fourth, the majority of farmers and landowners in the East Riding were business orientated and efficient both in the manner in which supply was regulated and in the innovation of new techniques. The analysis underlying this ultimately becomes an exercise in decision making. How old attitudes were abandoned or gradually phased out, and how new ones replaced them, is the central theme of this study.

The study falls into four parts. The first two chapters have been intended as an introduction to farming developments during the age of high farming and as far as possible have attempted to relate progress at a county level to progress nationally. The second part investigates some of the technical aspects of farming improvement between 1850 and 1880 - farm size, drainage and mechanisation. The study is largely impressionistic

and is built up from estate records and newspaper reports which were often incomplete. The data were much fuller on farm size, and changes in the average size of lowland farms is probably the most accurate measure of progress in lowland farming developed in this study. The third part is entirely quantitative and is concerned with supply and demand problems in agriculture. It breaks down the structure of agricultural prices and arable and livestock production into their cyclical, non-cyclical and linear components. The production data were also disaggregated on a district basis to get a clearer impression of the factors influencing them. This part of the study concludes with an econometric investigation into how farmers adjusted cereal supply to suit changing prices between 1868 and 1890.¹

The final section considers several economic and social themes. It deals with the condition and attitudes to improvement of landowners and farmers and examines themes like the professionalism of the landed interest, the development of tenant right, the level of investment in farming, the average length of tenancy, and the adequacy of one-year tenancy agreements for long term tenant investment. The economic well-being of landlords, farmers and labourers is also dealt with at some length, although the analysis of landowners and farmers is drawn mainly from rent movements, farm profits and tenant indebtedness and ignores some of the broader social dimensions of their life styles. This is not the case with labourers and two chapters are devoted to describing their wages, and relating these in the first instance to productivity and technical criteria, and then subsequently using wage material, prices, cottage rentals, and broad qualitative evidence to make some estimate of changes in the labourers' standard of living.

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1. Much of the analysis in Part 3 is extended down to 1890 to overcome the problems of inadequate output data prior to 1866-8. It was felt that many of the general principles underlying production responses to changing prices could be exposed over a longer, rather than a shorter period.

PART 2: Technical changes in

Agriculture in the East Riding

of Yorkshire, 1850-1880.

CHAPTER THREE

FARM SIZE AND ECONOMIC PROGRESS IN THE EAST RIDING, 1850-80.

1. A model and definition of farm size.

Secular changes in the size of farms were a product of the separate and combined effects of technical and economic progress on the land, and are a significant indicator of the technical efficiency of farm production and of the progressiveness of farmers and landowners. The association between farm size, farming technology and the market rests on three relationships. First, large consolidated farm units were more efficient than farms which were small and/or scattered. Second, economies of scale became more important in the financial calculations of landowners and farmers as agriculture improved technically and the market became more refined. Third, changes in farm structure were generally slow in coming about and upward adjustments were beset by powerful opposing forces.

Farmers who kept up with changing technology had a cost advantage in extensive production which the others did not have, and the advantage this gave them was proportional to the pace of agrarian change. Farmers who resisted modernising their farms became slowly weaker in the market as competition increased, the railway in particular being a powerful leveller of local and regional market barriers. Unprogressive farmers became less efficient producers of corn and beef, which were capital intensive operations and suited to large scale production. Some farmers dropped out of the market or concentrated on the intensive production of vegetables, milk or pig meat which were suited to small scale farming, and the land they released was absorbed by more efficient farmers and used to build up

farms nearer to their technical and economic optimum as defined by local criteria.¹

Factors such as lack of capital, the heaviness of the soil, conservatism, and in some cases ignorance, slowed down the pace of change in farming. If they had not operated as powerfully, farms would have been nearer to their technical and economic optima by 1850 and the principles of high farming would have been applied more thoroughly. Farm structures were difficult to modify in established farming districts. They were much easier to modify on the Wolds, at least up to the late eighteenth century, though some flexibility was lost in the following century as the agricultural system matured.

Historians who have considered the adaptability of the farming landscape to changing economic and technical circumstances can be divided into those, mainly of an older generation, who see parliamentary enclosure as the most decisive influence on modern farm structure, and those who see farm structure evolving slowly over time and not subject to any one determining influence. The model of farm size adjustment outlined above leans towards gradualism. It does not exclude the possibility that adjustments could be made rapidly at times, and developments on the Vale of York between 1851 and 1871 confirm this. However, it rejects the notion that farm structure was fixed as a result of earlier developments (such as in the second half of the eighteenth century), though these would lessen the scope for further adjustments to farm structure.

This view of farm development agrees with the findings of David Grigg. He found only a weak correlation between the proportion of large

1. Technical optima are extremely difficult to define outside theory but some of the factors influencing the most efficient size of farms within a given district will be discussed presently.

farms and the level of Parliamentary Enclosure in 11 English counties, including the East Riding.¹ It seems probable that regional differences in farm size in the Riding pre-dated enclosure. William Marshall who visited Yorkshire in the last quarter of the eighteenth century, before Parliamentary Enclosure had run its full course, noted the size differential between farms on the Wolds and in the lowland districts in the following terms:

On the Wolds, they are principally large; in the Vale and the Morelands (sic), extremely small ... more than half its lands (ie. on the Vale) are laid out in farms, under twenty pounds a year. Perhaps, three fourths of the Vale, and the lands belonging to it, lie in lands of less than fifty pounds a year ... In the west marshes, and in the richer parts of the Vale, low moist situations, inhabitants are thinner, and farms larger.²

Few farms on the Wolds "were in the hands of the yeomanry; as they were on the Vale". Farms were extensive.

... Mowthorp and Coldham are near two thousand acres each, Crome thirteen or fourteen hundred acres; all of them charming arable farms; such as would (if properly sheltered) let in Norfolk, for fourteen or fifteen shillings an acre.³

A size differential pre-dating enclosure has been commented upon more recently by Alan Harris. He has shown that the average Wold farm contained about 60 acres of arable by the late seventeenth century, while the average was nearer 30-35 acres in Holderness and the Vale of York.⁴

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1. D. Grigg, 'Large and Small Farms in England and Wales: Their distribution and size', Geography, 48 (1963), 274-5.
 2. W. Marshall, The Rural Economy of England. (2nd edn, 1796), I, p.239. (The underlined words are Marshall's).
 3. Ibid. II, pp.239, 243.
 4. A. Harris, The Open Fields of the East Riding of Yorkshire (E.Y.L.H.S., No.9, 1966), p.9. This evolutionary approach to farms and their size has been taken up, or is implicit, in B.A. Holderness, 'The English Land Market in the Eighteenth Century: The Case of Lincolnshire', Econ. Hist. Rev. 2nd Ser. XXV (1974); G.E. Mingay, 'The Size of Farms in the Eighteenth Century', Econ. Hist. Rev. 2nd Ser. XIV (1962); - 'The Agricultural Depression, 1730-50', Econ. Hist. Rev. 2nd Ser. VII (1956).

This makes no mention of grassland but as rough pasture and sheep production went together and were one of the mainstays of the Wolds' economy, there was probably a similar ratio in favour of grassland on the Wolds.

The decisive influence of enclosure on farm size, which has been argued by Levy, Gonner and Clapham, needs to be revised.¹ The historical record shows that the average size of farms in settled districts could change significantly even after enclosure, especially in inefficient districts.² It also suggests that farm consolidation and improvement, although essentially a gradual process, varied in intensity to suit technical and economic pressures over time.

Changes in farm size will be examined in the Vale of York, mid-Holderness, south Holderness and the Wolds. There was a quite strong movement towards farm consolidation in the two former between 1851 and 1871, especially on the Vale, but it was more modest elsewhere. Before qualifying regional trends in farm size it should be made clear how farms can be classified according to size. The popular impression of a large farm has not changed from the mid-nineteenth century, as most writers considered it to be over 300 acres³ and a sub-group was sometimes suggested for extensive farms over 500 acres.⁴ The classification of small farms has been revised over the past century. Most contemporaries

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1. H. Levy, *Large and Small Holdings* (1911); E.C.K. Gonner, *Common Land and Enclosure* (1912); J.H. Clapham, *An Economic History of Modern Britain*, II (1932).
 2. Some of the main arguments to arise out of the historical discussions on enclosure and the size of farms are summarised in Appendix I, pp. 419-25. 'Inefficient' is used here, and elsewhere in the text, to indicate a backward farm structure and a low level of performance.
 3. J.C. Morton, ed. *Morton's Cyclopaedia of Agriculture*. (1855), II, pp. 377-85; D. Grigg, 'Large and Small Farms in England and Wales: Their size and distribution', *Geography*, 48 (1963), 268.
 4. J.H. Clapham, *An Economic History of Modern Britain*. (2nd edn, 1950), II, p. 110.

talked in terms of 50 acres or less¹ though John Morton, one of the keenest farming observers of his day, considered 100 acres to be more appropriate,² which is close to the modern interpretation of 100-150 acres.

Despite several limitations, acreage is used extensively in this study as a measure of farm size. Its most important limitation is its weak connection with the amount of capital invested per acre and the efficiency of farm production. A more useful measure of size is the value of gross output disaggregated on a farm basis, but it was not computed owing to deficiencies in the data used. An alternative procedure which retained some of the advantages of the gross output method was to calculate farm size according to the regular day wage employment farms provided.³ This was calculated easily from the Census Enumerator's books and was useful because employment is an accurate measure of size and provides an interesting comparison with the acreage analysis. Employment data were arranged as follows:-

- (i) Farms employing 3 labourers or less were classified as small.
- (ii) Farms employing 4-5 labourers were medium-sized.
- (iii) Farms employing 6-9 labourers were large.
- (iv) Farms employing 10 labourers and over were extensive.

1. D.G. Grigg, 'Large and Small Farms in England and Wales: Their size and distribution', loc. cit., p.268.

2. J.C. Morton, ed. Morton's Cyclopaedia of Agriculture (1855) p.382.

3. This classification excludes labour hired from within the farmer's own family.

2. The advantages of farm enlargement and its difficulties.

The model of farm enlargement rests on the assumption that there were advantages in largeness, especially in technical efficiency, the threshold level for innovation being usually lower on large farms than on smaller farms. Expensive modifications such as the installation of tanks to collect the liquid and solid deposits of fold yard and bier could be justified more easily on well stocked farms than on farms where buildings were under used. Steam threshing, to take another example, was a more efficient operation than the horse drawn thresher but small cereal producers were cautious about taking up the superior technique. The quantities of corn they reaped, and which needed threshing, were considerably less than on large Wold farms, and the time machinery lay idle was correspondingly greater. Generally speaking the expected gain in productivity from the installation of new equipment had to be larger on the smaller, than on the larger farm.

Large producers enjoyed an advantage in rent which the small producer did not. Tenant farmers who could successfully combine technical ability and capital to manage a large farm had a scarcity value which the skilful among them could exploit to their advantage. Rents could be kept down, or at least the rate of increase could be kept within acceptable limits, which was no small consideration in a period when rents rose on average by one-quarter. The small and medium-sized farmer rarely had comparable bargaining power.

The large producer also had an advantage in periods of low prices and depression. He had the resources to continue farming at a reasonable level of efficiency and was not forced to sell crops or stock when the market was dull, unless conditions were particularly difficult. The small producer and the large producer also, if his working capital was

inadequate, was sometimes forced to do this in order to meet current expenses.

It should be stressed that small scale production did not necessarily mean inefficiency, nor large scale production high productivity and agrarian progress. The following criteria helped to determine local norms for size efficiency. The farming advantage favoured the substantial producer and the optimum level of output was towards the upper end of the size scale where small producers had difficulty marketing their produce at rates secured by larger competitors, and where technical considerations were crucial to a farming operation. This latter applied to corn production and the optimum unit was the extensive farm. Farms of 50-100 acres were most vulnerable, judging by East Riding evidence, to the erosive power of superior competition. Farms below 50 acres were less vulnerable as their commitment to corn was generally minimal and their use of family labour was virtually complete. On the Vale of York, for example, 63 per cent of all farms in the 5-49 acre range used family labour exclusively in 1851, and 27.5 per cent used it on farms between 50-99 acres.¹ Family labour gave an important advantage to small farmers in the 1870s as the cost of hired workers climbed steeply. However, as a general principle, large farmers who kept a lively interest in technical improvement and were flexible in their cropping policies, were in a much stronger position to face growing competition than those who farmed small units (intensive producers apart), and held back from technical innovation.

In spite of its advantages "an increase in the most economical size of a farm would not necessarily justify more than a very slow

1. The parishes sampled on the Vale of York were Deighton, Elvington, Escrick, Stillingfleet, Thornganby and Wheldrake.- P.R.O. HO 107 2356.

expansion in the scale of farming in a fully settled country".¹ Farms grew by drawing on cultivated land which was endowed with buildings, fences and transport systems adapted to the requirements of smaller, separate farm units. Estate managements were committed to a heavy programme of investment if they re-designed the layout of established farms to meet the requirements of the newly enlarged farm. Managements had several alternatives open to them if they wished to avoid this expense. The buildings of an enlarged farm could be used in the same manner as when the various farms, or parts of farms, were managed separately. This would mean sacrificing economies of scale from concentrating livestock, the storage of grain and other supplies in the new economic centre of the farm. If managements were prepared to do this they could use buildings on the parent holding to accommodate the increased livestock and grain of the larger farm, though this would be inefficient unless these buildings had been previously under used. An alternative often adopted in the East Riding, and elsewhere, was to operate two or more holdings under one tenancy. No attempt was made at physically integrating them as this was usually a short term measure until landowners found suitable incoming tenants for the separate holdings. It was continued occasionally for several years either because a farmer intended to establish his sons in business, or because it offered purchasing and marketing advantages.

The costs of modifying a traditional farming system, particularly with respect to buildings, were high. The economic advantages of integrating two or more formerly separate farms, or parts of farms, were substantial if the technical aspects of the transition were dealt with efficiently, and if the strain on estate resources was kept within

1. R.L. Cohen, The Economics of Agriculture (1940) p. 59.

reasonable limits. If this was not the case the economic advantages were more modest and justified lack of action except where the competitive disadvantages of retaining an obsolete farm structure were so large that they forced landowners to take action.

The scarcity and indivisibility of capital and skill exerted a second round of restrictions on farm size and its adjustment over time. Most authorities agreed that tenant farmers required a minimum working capital of £10 per acre if they were to farm efficiently and to fulfil their contractual obligations outlined in the tenancy agreement.¹ Tenants with limited working capital were urged to take smaller holdings rather than stretch their capital over a large acreage. The advantage of large scale farming could be "thrown away ... in large measure, if put under the care of men who had not sufficient means to manage them [*i.e.* large farms] properly".² They faced difficulty in meeting their rent and tax bills and had to skimp on wages, which meant either not using enough labour or using cheap, inferior labour. It was also difficult to finance new equipment and make improvements to bloodstock, and if efforts were made to do this, capital had to be borrowed and the interest repayments became an added burden on the farm's resources. It is not surprising that the average size of farms in the East Riding fell in the 1880s as the working capital of tenants dwindled.³

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1. L. Morton, The Resources of Estates (1858), p.117. A complete break down of the working capital required by tenant farmers on small, medium and large farms is shown in Appendix III, pp.428-30.
 2. Ibid. p.115.
 3. R.C. on the Depressed Condition of Agricultural Interests (1880), pp.157, 176; R.C. on Agricultural Depression (1895), p.918. This was also the case for England and Wales.— H. Levy, Large and Small Holdings (1911), pp.1-2.

The standards of entry on to progressive estates were high, estate managements probing very carefully into the capital, experience and character of applicants for tenancies, and those who possessed the qualities to manage large farms had to prove themselves worthy. Dunnington-Jefferson, for example, wanted to "be informed as to the character, the ability and skill ..." of William England, a prospective tenant.¹ He wanted to know whether another prospective tenant, "young Hornsey", was a "well conducted person with sufficient capital" to farm a medium-sized farm.² This vetting inevitably limited those who were fit to farm large holdings and influenced the degree to which farms could grow.

3. A quantitative survey of farm size in the East Riding, 1850-80.

This survey is based on the unpublished data contained in the Census Enumerator's books. Parishes were sampled in four districts, three on the lowlands and one on the Wolds, with the object of quantifying regional differences in farm size and estimating the amount of movement in average size over the middle decades of the nineteenth century. The analysis was restricted largely to the period 1851-71 because of the "one hundred years' rule" applied to census data of this type. It has been supplemented by published census data to assist comparison with the development at national level. An analysis of the patterns of farm amalgamation and fragmentation on several East Riding estates has also been included and this extends the study down to 1880.

Farms in the East Riding were of above average size and the county was among the upper quartile of English counties ranked according to farm

1. Dunnington-Jefferson MSS, Letter book of Dunnington-Jefferson, 1859-63, E.R.R.O. DDJ/40/5.

2. Ibid.

size.¹ Over half of all farms in the East Riding were over 100 acres in 1851, while in England and Wales it was one-third. The precise concentration of farms in each size interval between 5 acres and 600+ acres is given for the East Riding and for England and Wales in Table 3.1.

Table 3.1. A comparison of the farm structure of England and Wales with that of the East Riding in 1851.

Size Interval (in acres)	<u>England and Wales</u>		<u>East Riding</u>	
	Number of Farms	Proportion of Total	Number of Farms	Proportion of Total
5 - 49	90144	41.8	1203	30.3
50 - 99	44558	20.7	711	17.9
100 - 99	45752	21.2	1055	26.5
200 - 99	18401	8.5	513	12.9
300 - 99	8061	3.7	236	5.9
400 - 99	3585	1.7	110	2.8
500 - 99	1971	0.9	69	1.7
600 +	3143	1.5	80	2.0
		<u>100.0</u>		<u>100.0</u>

Source: Census of Great Britain, 1851, Population Tables, II, Vol. I (1854); Population Tables, II, Vol. II (1854), p.729.

The parishes chosen for detailed study were as follows: in the Vale of York, Deighton, Elvington, Escrick, Stillingfleet, Thornganby and Wheldrake; in mid-Holderness, Atwick, Catwick, Nunkeeling with Bewsholme, Rise, Swine and Witherwick; in south Holderness, Burstwick, Easington, Keyingham, Ottringham, Paull, Skeffling, Sunk Island, Thorngumbald and Welwick; on the Wolds, Cottam, Cowlam, Garton, Helperthorpe, Langtoft, North Dalton, Sledmere and Wetwang.² The acreages sampled in each district were between 14,000 and 30,000 acres and were large enough to give useful information about the regional farm structure.

1. Calculated from Agricultural Returns for Great Britain (P.P. 1870, LXVIII.363), p.20.

2. These parishes are mapped on a district basis in Figure 8.2 , p.190.

Table 3.2. The farm structure of selected districts in the East Riding in 1851.

<u>Size Interval (in acres)</u>	<u>Vale of York</u>		<u>Mid Holderness</u>		<u>South Holderness</u>		<u>Wolds</u>	
	<u>No.of Farms</u>	<u>% of Total</u>	<u>No.of Farms</u>	<u>% of Total</u>	<u>No.of Farms</u>	<u>% of Total</u>	<u>No.of Farms</u>	<u>% of Total</u>
5 - 49	32	23.9	24	18.6	22	17.2	9	9.4
50 - 99	33	24.6	17	13.2	12	9.4	6	6.3
100 - 99	51	38.1	47	36.4	37	28.8	24	25.0
200 - 99	18	13.4	30	23.2	21	16.4	10	10.4
300 - 99	-	-	7	5.4	11	8.6	18	18.7
400 - 99	-	-	2	1.6	12	9.4	8	8.3
500 - 99	-	-	-	-	8	6.3	4	4.2
600 +	-	-	2	1.6	5	3.9	17	17.7
<u>Total</u>	<u>134</u>	<u>100.0</u>	<u>129</u>	<u>100.0</u>	<u>128</u>	<u>100.0</u>	<u>96</u>	<u>100.0</u>

Source: Census Enumerator's Books, 1851, P.R.O. HO 107/2366;
P.R.O. HO 107/2356; P.R.O. HO 107/2365; P.R.O. HO 107/2364.

Inter-regional differences in farm size were well established by mid-century as contemporaries noted.¹ There were no farms larger than 300 acres in the parishes sampled on the Vale of York though 8.6 per cent of farms in mid-Holderness, 28.2 per cent in south Holderness, and 48.9 per cent on the Wolds, were in this size range. The proportion of farms below 100 acres was inversely related to the proportion over 300 acres. Taking the extremes, 48.5 per cent of farms on the Vale of York, and 15.7 per cent on the Wolds, were under 100 acres in 1851.

The broad structure of farm sizes remained fairly stable over the 1850s and 1860s, apart from on the Vale of York where changes proceeded rapidly. Table 3.3 measures movements in size by considering proportional changes in the cultivated acreage in each size interval between 5 and 600+ acres. This was found to be more accurate than using changes in the

1. J. Caird, English Agriculture in 1850-51 (2nd edn, 1965), p.310;
G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit.
pp. 100, 102; S.C. on Agricultural Customs (1848), Q.2608.

number and proportion of farms in each size interval.¹

Table 3.3. Farm structure in selected districts of the East Riding, 1851-71, measured by (a) changes in the acreage and (b) changes in the share of total acreage, in eight size intervals.

District	Year	Acreage in each size interval of 5 acres.								Total
		5-49	50-99	100-99	200-99	300-99	400-99	500-99	600+	
Vale of York	1851	701	2364	7095	4196	-	-	-	-	14356
	1871	504	1263	5144	5362	1631	400	-	-	14304
Middle Holderness	1851	652	1206	7107	7186	2344	940	-	1318	20753
	1871	320	586	6235	3620	3011	1291	500	1300	16863
South Holderness	1851	483	883	5478	5128	3709	5254	4362	3568	28865
	1871	687	863	5157	4073	3637	5251	2214	7562	29444
Wolds	1851	278	379	3602	2485	5981	3415	2139	13934	32213
	1871	376	368	2992	1730	4235	5520	2137	11682	29040
<u>Proportion of farmland in each size interval.</u>										
Vale of York	1851	4.9	16.5	49.4	29.2	-	-	-	-	100.0
	1871	3.6	8.8	36.0	37.4	11.4	2.8	-	-	100.0
Middle Holderness	1851	3.1	5.8	34.2	34.6	11.4	4.6	-	6.3	100.0
	1871	1.9	3.5	37.0	21.4	17.8	7.7	3.0	7.7	100.0
South Holderness	1851	1.7	3.1	19.0	17.7	12.8	18.2	15.1	12.4	100.0
	1871	2.3	2.9	17.5	13.8	12.4	17.8	7.6	25.7	100.0
Wolds	1851	0.9	1.2	11.2	7.7	18.6	10.6	6.6	43.2	100.0
	1871	1.3	1.3	10.3	6.0	14.6	19.0	7.3	40.2	100.0

Sources: Census Enumerator's books, 1851, P.R.O. HO 107/2366; P.R.O. HO 107/2356; P.R.O. HO 107/2365; P.R.O. HO 107/2364; Census Enumerator's books, 1871, P.R.O. RG 10/4811; P.R.O. RG 10/4754.

About one-fifth of the cultivated acreage of the Vale of York was occupied by farms under 100 acres in 1851. This was halved twenty years later. The acreage held by farms between 100 and 199 acres fell by 2,000

1. Basing the analysis only on the number of farms in the sample gives a weighting to small farms which is out of proportion to their economic importance. Using the method shown in Table 3.3 'increases' the effective size of the sample (i.e. the number of acres cultivated in a particular size range might be considered rather than the number of farms). It avoids distortions caused by the increase in the number of very small farms in this period which were often cultivated only on a part-time basis.

acres and this, together with 1,500 acres released principally by farms in the 50-99 acre range, was used to construct farms over 200 acres in size. Such farms occupied one-half of the cultivated acreage in 1871 compared with less than one-third at the beginning of the period. Particularly noticeable was the construction of several farms of 300 acres and one of 400 acres. In spite of the obstacles to changing the basic size of farms in an established farming area, farms were restructured and the basic pattern was given a radical twist. Greater competition between producers, and to a lesser extent, the influence of better drainage, were largely responsible.

The upward trend in farm size was milder in mid-Holderness. The acreage held in units of 5-99 acres and 100-299 acres fell by 3 and 10 per cent, respectively, between 1851 and 1871, while the acreage held by farms over 300 acres increased from under one-quarter of the total to a little under one-third. The most significant gains were made by farms of 300-399 acres.

The upward trend was much weaker in south Holderness and the Wolds. The acreage farmed in units of less than 100 acres increased fractionally in south Holderness, though there was a quite strong increase in very small holdings of less than 20 acres which were cultivated by carters and labourers in their spare time. An expansion of these allotment-styled holdings occurred nationally and falls outside our model of farm size determination, production being mostly for home consumption and not for the market. The acreage farmed in units of 100-299 acres declined from 36.7 to 31.3 per cent of the cultivated acreage, the sharpest fall occurring on 200-299 acre farms. Farms over 300 acres increased their share of total cultivated acreage by a modest 5 per cent but the balance of amalgamation and disintegration among large farms in this range was very fine. The acreage

held by farms in the 300-499 acre range remained unchanged while the acreage of 500 acre farms was cut back to form more farms over 600 acres, the latter's share of acreage rising by 13 per cent. It is extremely unlikely that this represented any structural integration of farms; more likely is the amalgamation of two or more tenancies under one tenant farmer.

On the Wolds there was a 0.5 per cent increase in the acreage of farms under 100 acres and a 2.6 per cent reduction in the acreage of medium sized (100-299 acre) farms. These two groups occupied a little over one-fifth of the cultivated acreage in 1851 and a little under that in 1871. Some important changes occurred on farms over 300 acres and consolidation and fragmentation were associated closely as in south Holderness. The acreage held by farms between 300 and 399 acres contracted while more farms became established in the 400-499 acre, and to a lesser extent, the 500-599 acre ranges. There was a 3 per cent fall in the acreage held by farms over 600 acres.

Larger farms were built up from the piecemeal absorption of land by existing large and medium-sized farms. The number of farms between 100-299 acres fell in each district between 1851 and 1871. The actual increase in farm size was modest on the Wolds and in south Holderness because most farms had already achieved a technically and economically efficient size by 1850. It was much greater on the Vale of York and in mid-Holderness because of the comparative backwardness of their farm structures at that time.

These findings were confirmed relating day wage labour, employed on a regular basis, to the acreage farmed in each farm size interval.¹

1. This was the second method referred to previously for assessing size changes in farms. It is considered to be a more efficient method than the one based on acreage.

An element of inaccuracy crept into the analysis because farmers were not consistent in the census entries about listing women and children among those they employed. However, such groups were not often employed on a regular basis and when they were, they were given a weighting equal to half that of an adult male worker.

Table 3.4 Farm structure of selected districts of the East Riding, 1851-71, measured by changes in the proportion of farm land occupied by farms employing (a) family labour, (b) non-family labour.

<u>Region</u>	<u>Year</u>	<u>Family Labour</u>	<u>Non-Family Labour grouped by size</u>				
			1	2-3	4-5	6-9	10+
Vale of York	1851	10.8	30.6	39.7	18.9	-	-
	1871	7.8	8.9	34.9	25.1	18.2	5.1
Middle Holderness	1851	5.2	11.1	25.0	28.7	15.8	14.2
	1871	5.1	4.1	28.9	27.6	21.4	12.9
South Holderness	1851	1.6	3.8	16.1	19.2	30.2	29.1
	1871	1.8	2.9	18.6	14.0	29.6	33.1
Wolds	1851	0.6	2.7	7.4	13.4	21.6	54.3
	1871	1.1	1.2	8.6	7.4	34.3	47.4

Source: As in Table 3.3.

Table 3.4 shows that there was almost no change in the proportion of cultivated acreage occupied by farms employing family labour only. This was the case even on the Vale of York where farms were being enlarged at a rapid rate. (Their share of total cultivated acreage contracted by 3 per cent.) There were no significant changes in middle and south Holderness though there was a very marginal increase on the Wolds, which again suggests that the economic nexus was not a major factor in determining the viability of farm production at the lowest level, and that factors such as emotional and social attachment to the land were more important. The current debate on small scale hill sheep farming is frequently couched in these terms.

The effects of economic and technical change in farming were much greater on farms employing one labourer only on a regular basis. The

Vale of York was most affected by these changes. Farms in this category occupied nearly one-third of the cultivated acreage in 1851 but occupied less than one-tenth by 1871. The acreage held by such farms in mid-Holderness was cut back by 6 per cent but there were virtually no changes in south Holderness and on the Wolds.

The acreage of farms employing 2-3 labourers remained largely unchanged over the 1850s and 1860s. Farms employing 4-5 labourers gained acreage on the Vale of York, retained a constant acreage in mid-Holderness, and lost acreage on the Wolds and in south Holderness. Farms employing 6-9 labourers grew rapidly on the Vale of York and the Wolds, increasing their share of cultivated acreage by 18.2 and 12.7 per cent, respectively. There was a milder increase in mid-Holderness and virtually no change in south Holderness. The acreage absorbed in farming units employing 10 labourers or more hardly changed between 1851 and 1871. Such farms on the Wolds lost 7 per cent of their acreage but this had little practical bearing on the average size of the largest farms. More than likely it resulted from the surrender of one or two large dual tenancies, separate tenancies being established in their place. There was a slight downward trend in mid-Holderness and minor gains were made in the Vale of York and south Holderness, but again this had no significant effect on the average size of farms.

The two procedures used to measure changes in farm size (ie. size related to the share of acreage in several farm size intervals, and the number of farm labourers employed on farms related to their share of the cultivated acreage), confirms the stability of farm structure in south Holderness and the Wolds. The procedures were less consistent about identifying trends in farm size in mid-Holderness and the Vale.

Table 3.5. Proportional changes in the size structure of farms in selected districts of the East Riding, 1851-71, measured by the concentration of acreage and labour.

Region	<u>Proportional changes in acreage in three broad size intervals</u>			<u>Proportional changes in acreage related to agricultural employment (no. of labourers)</u>		
	5-99	100-299	300+	3 or less	4-5	6+
Vale of York	-9.0	-5.2	14.2	-29.5	6.2	23.3
Middle Holderness	-3.5	-10.4	13.9	-3.2	-1.1	4.3
South Holderness	0.4	-5.4	5.0	1.8	-5.2	3.4
Wolds	-0.5	-2.6	2.1	0.2	-6.0	5.8

Sources: as in Tables 3.3 and 3.4.

Both measures indicate that the average size of farms was raised in mid-Holderness and the Vale of York but they disagree on the amount. The increase was much greater on the Vale using acreage related to employment than using acreage related to specified farm size intervals, and the converse was true of mid-Holderness. The former, however, is probably the more sensitive measure because it is bound up closely with farm technology and capital investment.

Regardless of their precise accuracy, both measures strengthen the hypothesis that the most rapid increases in farm size occurred in those areas which were the least efficient and which were being brought into more direct competition with advanced farming regions by the railway. The secondary influences of better drainage and greater farm mechanisation reinforced the trend towards larger farms and bigger fields.¹

1. A good field structure was essential to general technical improvement on the land. Attention has been given to it in connection with the reaper. For a more general discussion see Appendix II, pp. 426-7.

The trend to larger farms was repeated at an estate level. The records of three estates were found to contain detailed information on farm size. They were Philip Saltmarsh's estate on the southern edge of the Vale of York, the Emanuel Hospital's estate in mid-Holderness and Sir Tatton Sykes's estate on the northern Wolds. Philip Saltmarsh's estate was a little over 3,000 acres; it was progressive and considerable emphasis was placed on farm consolidation. The estate grew from the early nineteenth century and much effort went into improvement, though many of its farms were small and fragmented by mid-century. This changed over the 1850s and 1860s. The task of breaking up old farms and building larger, more consolidated units, is known in detail only for a group of farms on the estate but as these made up about one-third of the estate's total acreage, they give a reasonable basis for assessing estate policy on farm development.

Farms on the estate were described as follows in the early 1850s. Bowser's farm consisted of 92 acres which were scattered about the parish of Laxton. Eland's farm had fields in the north and west of Laxton which were "a considerable distance" from the homestead. Popple's farm was "scattered all over the township some 30 acres only lying in the South Fields in the proximity of the farmhouse which stood in the middle of the village by the blacksmith's shop". Hill's farm consisted of "113 acres, 88 acres of which were in different parts of Laxton, and 25 in the neighbouring manor of Cotness".

Saltmarsh broke up Bowser's, Eland's and Popple's farms and formed a new holding in the northern part of the township. Four compact farms were formed. The Manor Farm was easily the largest at 426 acres, then came North Side Farm, Old Hall Farm and Hill's Farm at 172, 163 and 113 acres, respectively. In addition, 7 small holdings or allotments were

developed - following the national trend - which took up about 80 acres.¹

Farms were less fragmented on the Emanuel Hospital property in 1850 owing to a vigorous policy of farm consolidation carried out prior to 1846.² Even so this did not prevent a strong upward shift in favour of medium-sized holdings between 1857 and 1875.

Table 3.6. Farm structure on the Emanuel Hospital estate at Brandesburton, 1857-75, measured by proportional changes in acreage in seven size intervals.

Size Interval	Acreage in 1857	Proportion of total in 1857	Acreage in 1875	Proportion of total in 1875
5-49	263	8.4	201	6.5
50-99	300	9.6	226	7.3
100-99	643	20.5	467	15.1
200-99	510	16.3	1304	42.2
300-99	947	30.2	381	12.3
400-99	469	15.0	-	-
500+	-	-	512	16.6
<u>Total</u>	3132	100.0	3091	100.0

Sources: Emanuel Hospital MSS, L.C.R.O. E.H. Box 4.2b, 4.2c.

There was a strong mixture of enlargement and disintegration among farms on this estate. The emphasis on smaller farms declined down to 1875 - farms below 100 acres lost 4 per cent of the total acreage - but the effects of this were insignificant. Larger farms became correspondingly more important. The largest farm on the estate was 469 acres in the mid-1850s and well over 500 acres in the mid-1870s, though this was more than counter balanced by a steep fall in the acreage held by farms of 300-399 acres. Several of these farms were divided up into 200 acre holdings,

1. Saltmarsh MSS, (No classification), Hull Central Library.
2. Emanuel Hospital MSS, Report of J. Johnson, October 8, 1846, L.C.R.O. E.H. Box 5.2, pp. 4-5.

the acreage held by 200-299 acre farms more than doubling between 1857 and 1875.

The size of farms at Brandesburton changed substantially after 1875 and by November, 1879, two tenants farmed holdings in excess of 500 acres: W.C. Harrison farmed 512 acres and R.H. Harrison farmed 517 acres.¹ There was still apparently scope for significant adjustments in farm size even on estates which had been modernised, though this did not mean structural integration in the sense previously described. The costliness of such an operation and the shortness of the time period involved (just half a decade) ruled it out. Tenancies were combined in a very loose way so that successful or enterprising tenants could secure purchasing advantages or pass on the separate holdings to their sons when they retired.

Farms on the Sledmere estate were sampled from the parishes of Bishop Wilton, Brigham, Garton, Heslerton, Kirkburn, Sledmere, and Fimber. The sample drew on half of the farms on the estate which amounted to about 15,000 acres in all. These parishes were chosen because changes in farm size could be traced continuously in them between 1850 and 1880. Changes in farm size were more pronounced on this estate than for the region as a whole, the trend over the greater part of the period favouring the development of very extensive holdings.

1. Ibid. Report of Deputation of Governors of Emanuel Hospital, November 14, 1879, L.C.R.O. E.H. Box 5.21.

Table 3.7. Farm structure on the Sledmere estate, 1850-80, measured by changes in the proportion of acreage in 9 size intervals.

Size Interval	1850		1870		1876		1880	
	Acres	Proportion of Total	Acres	Proportion of Total	Acres	Proportion of Total	Acres	Proportion of Total
5-49	91	0.6	82	0.5	81	0.5	103	0.6
50-99	154	1.0	144	0.9	254	1.6	211	1.3
100-99	2000	13.0	1511	9.0	1313	8.0	1308	8.3
200-99	3771	24.4	2127	12.8	2154	13.2	2917	18.4
300-99	1058	6.8	2438	14.6	2431	14.9	3384	21.3
400-99	1287	8.3	2706	16.2	2294	14.1	3102	19.6
500-99	4470	28.9	2172	13.0	2216	13.6	1624	10.2
600-99	1888	12.2	3160	18.9	3177	19.5	3227	20.3
700+	725	4.8	2362	14.1	2375	14.6	-	-
<u>Total</u>	15444	100.0	16702	100.0	16295	100.0	15876	100.0

Sources: Sledmere Estate MSS, E.R.R.O. DDSY/107/4; E.R.R.O. DDSY/107/7-8.

The acreage held by farms under 100 acres remained almost unchanged between 1850 and 1870 while that held by medium sized farms (100-299 acres) fell from 37.4 to 21.8 per cent. The land they released was not taken up evenly by larger farms. Possibly the majority went to enlarge farms in the 300-499 acre range; farms in the 500-599 acre category lost some of their importance and their share of the estate's acreage fell by about one-half. This land was added to farms over 600 acres, their share of acreage almost doubling.

The pattern established by the first half of the 1870s was transformed rapidly as depression took a firmer hold on the Wold's economy. Large holdings over 600 acres were scaled down, the acreage they occupied in 1880 being much the same as in 1850, and farms of 200-499 acres made significant gains as the average farmer's working capital fell. The strength of this movement at Sledmere owed much to particular difficulties faced by the estate's management. The turnover of tenants increased¹ as their confidence in management disintegrated and as some tenants gave up two tenancies and reverted to one.

* * * * *

1. This is analysed in detail in Chapter 11.

Landowners made a real attempt to improve the size structure of farms on those properties¹ where existing structures were out of date and efficiency levels were low. However, there was only a gentle trend, as Table 3.8 shows, favouring larger farms nationally. This reinforces the theoretical notion that the average size of farms was difficult to modify in settled and agriculturally developed regions, though as has been shown, it could be a great deal more flexible at the district or estate levels.

Table 3.8. Farm structure in the East Riding and in 17 English counties measured by proportional changes in acreage in each farm size interval, 1851-71.

Size Interval (In acres)	Farm structure in East Riding 1851 *	Farm structure in East Riding 1871 *	Changes in farm structure (A-B)	Changes in farm structure in 17 English counties 1851-71
	(A)	(B)		
5-49	2.2	2.1	-0.1	-0.9
50-99	5.0	3.4	-1.6	-2.3
100-99	24.2	21.8	-2.4	-6.1
200-99	19.7	16.5	-3.2	3.3
300-99	12.5	14.0	1.5	0.8
400-99	10.0	13.9	3.9	0.9
500-99	6.8	5.4	-1.4	0.7
600+	19.6	22.9	3.3	3.6
<u>Total</u>	100.0	100.0	-	-

Sources: as in Table 3.3; Census of England and Wales, 1871, General Report, Vol. IV (1873), pp. xlv - xlvii.

* This structure is based on amalgamating evidence on farm size in the Wolds, the Vale of York, middle and south Holderness.

1. It should be made explicit that structural changes in the size of farms at district and estate levels were tested to find out whether the changes they revealed were significant statistically. A real change was confirmed in each case at the 0.001 level of confidence.

The obstacles to enlarging farms by physically integrating two or more smaller units were considerable. The problems of structural obsolescence were tackled in this way by some landowners on the Vale of York and perhaps mid-Holderness but outside those areas, and even within them, most size adjustments were the product of such devices as new tenancy arrangements.

4. Changes in farm size at national level.

It is important to know whether the movement in farm structure suggested for the East Riding was typical or not of English counties over the third quarter of the century. This cannot be calculated directly except from a series of county-based studies using the Census Enumerator's books, and such studies are not numerous at present. Reference could be made to the impressions of contemporaries but they were frequently contradictory. The published census does not give a breakdown of the farm size structure at national level except for 1851 but the 1871 Census does give the number of farms, and the number of labourers who worked on them, for 17 English counties over the two census years, 1851 and 1871. This gives a good basis for estimating the national trend in farm size over this period. The counties investigated were Surrey (extra Metropolitan), Kent (extra Metropolitan), Sussex, Hampshire, Berkshire, Essex, Suffolk, Norfolk, Leicestershire, Rutland, Lincolnshire, Nottinghamshire, Derbyshire, Durham, Northumberland, Cumberland, and Westmorland. These were mainly corn producing counties, like the East Riding, and give a reasonable basis for comparison.

The published census data were analysed in two ways. Changes in the distribution of acreage between farms of different sizes were estimated as in the county study. Changes in the concentration of labour were also estimated but they were related in the national analysis to farm size

rather than to the acreage contained within each size interval. The original census data were expressed in a clumsy manner and certain assumptions had to be made about the method by which they were re-worked. The number of labourers was calculated without any loss of accuracy on those farms which employed 10 labourers or less. The number (1, 2, 3, 4, 5 ...10) was multiplied by the number of farms in each size interval. Farms employing over 10 labourers were grouped in the census in employment blocks of 5 (15, 20, 25, 30 ...60) and the mean value in each employment interval (17.5, 22.5, 27.5 ...57.5) was multiplied by the number of farms in each size interval over 5 acres.¹ This gave a reasonable impression of the distribution of labour throughout the entire range of English farms. The estimate of acreage distribution was derived in similar fashion and the mean value of each farm size interval (7.5, 15, 25, 40 ...2000) was multiplied by the number of farms in each interval over 5 acres.

Using the first of these methods, the trend toward the concentration of labour in larger farm units was shown to be fairly moderate.

1. On farms employing 60 labourers and over, the mean value, given the absence of no other census data, was taken as 60.

Table 3.9. Farm structure of 17 English counties, 1851-71, measured by changes in the concentration of farm labour.

Size Interval	1851		1871	
	Number of Labourers	Proportion of Total	Number of Labourers	Proportion of Total
5-19	2,845	1.0	1,520	0.8
20-49	10,543	3.9	6,365	3.3
50-99	24,408	8.9	14,857	7.6
100-99	59,997	22.0	36,769	18.8
200-99	50,698	18.6	34,893	17.9
300-99	37,330	13.6	28,316	14.5
400-99	24,561	9.0	19,700	10.1
500-99	18,319	6.7	14,270	7.3
600-99	28,976	10.6	25,320	12.9
1000+	15,627	5.7	13,456	6.8
<u>Total</u>	273,304	100.0	195,466	100.0

Sources: Census of England and Wales, 1871, General Report, Vol. IV (1873), pp. xliiv - xlvii.

Table 3.9 has several striking features. It shows that there was a considerable reduction in the number of farm labourers over these two decades, and more important, that there was a marginal increase in the proportion of the labour force engaged on farms over 300 acres, and a fall in the proportion engaged on farms below that size. In 1851, 13.8 per cent of the agricultural labour force was employed on farms of 5-99 acres; this was reduced to 11.7 per cent in 1871. The cut back was steeper on farms of 100-299 acres, their share of the total farm labour force falling by 3.9 per cent. Farms over 300 acres raised their share by 6 per cent and provided employment for 51.6 per cent of farm labourers by the early 1870s. The proportional changes in the farm labour force, which are depicted for each size interval in Table 3.9, were very marginal but were found to be statistically significant at a level in excess of .001.¹

1. For chi squared to be significant with 9 degrees of freedom and with $P = .001$ it would have to have a minimum value of 27.88. The calculated value of chi square was 2,056.8.

A movement of this amount was also shown in the analysis using changes in the distribution of farm acreage.

Table 3.10. Farm structure of 17 English counties, 1851-71, measured by changes in the distribution of acreage in 9 size intervals.

Size Interval	1851		1871	
	Acreage	Proportion of Total	Acreage	Proportion of Total
5-49	231,952	2.9	151,960	2.0
50-99	699,087	8.8	481,773	6.5
100-99	1,960,300	24.7	1,386,980	18.6
200-99	1,161,750	14.6	1,332,400	17.9
300-99	1,070,340	13.5	1,060,255	14.3
400-99	749,250	9.4	765,450	10.3
500-99	541,200	6.8	557,700	7.5
600-99	885,100	11.1	1,008,050	13.6
1000+	651,700	8.2	692,000	9.3
<u>Total</u>	7,950,679	100.0	7,436,568	100.0

Sources: as in Table 3.9.

The acreage held by farms under 100 acres declined from 11.7 per cent of the total in 1851 to 8.5 per cent in 1871. There was also a reduction in medium-sized farms, though this was not uniform throughout their range. There was a fairly sharp fall of 6 per cent in the acreage held by farms of 100-199 acres and an increase of 3 per cent in farms of 200-299 acres. Farms over 300 acres increased their share of cultivated acreage from 49.1 to 55 per cent; the trend was upwards throughout the 5 size intervals in the range unlike in the East Riding where it was more varied.

There can be little doubt that the greater concentration of acreage and labour on farms over 300 acres resulted from the modest growth of farms. The number of farms in these 17 counties fell from an estimated 66,598 in 1851 to 57,886 in 1871 and was concentrated entirely among farms between 5-299 acres as there was an increase in the number of farms above 300 acres.

Table 3.11. Farm structure of 17 English counties, 1851-71, measured by changes in the distribution and number of farms in 10 size intervals.

Size Interval (acres)	1851		1871	
	Number of farms	Proportion of Total	Number of farms	Proportion of Total
5-19	10,894	16.4	10,091	17.4
20-49	12,747	19.1	10,604	18.3
50-99	13,451	20.2	10,483	18.1
100-99	14,795	22.2	12,047	20.8
200-99	6,930	10.4	6,251	10.8
300-99	3,313	5.0	3,392	5.9
400-99	1,703	2.6	1,824	3.3
500-99	1,006	1.5	1,098	1.9
600-99	1,267	1.9	1,514	2.5
1000+	492	0.7	582	1.0
<u>Total</u>	66,598	100.0	57,886	100.0

Source: as in Table 3.9.

However, farms between 200-299 acres, although their numbers fell, gained additional land amounting to 170,000 acres and their average size must have increased substantially. The result was a quite solid movement away from farms between 20-199 acres (there was an increase in allotment-sized holdings), as technology moved the balance of economic advantage against the small farm. The greater concentration of acreage in units over 300 acres was compensated somewhat by a marginal increase in the number of farms in that size division, but this was not strong enough to hold back an increase in their average size.

Part of the increase in the size of farms was the result of the physical absorption of small and medium-sized properties, though as in the East Riding, this was probably a minority activity, most of the increases coming from dual tenancies or loose associations of two or more farms. The national study reinforces some of the conclusions about farm development in the East Riding. It shows that there was a general increase in farms below 20 acres and a greater level of structural movement among small

farms, and farms at the lower end of the medium-size range, than was common among farms over 300 acres. This is a good indication of the effects of superior technology and more intense competition on the smaller farms. The national study confirms that there was a modest amount of growth in the average size of farms, taking the entire size spectrum, and that growth was more consistent than in the East Riding (ie. there was no well defined pattern of consolidation and fragmentation within the range of large farms).¹ The study also confirms the very marginal nature of changes in farm size (Table 3.8).

* * * * *

The sensitivity of farm size as an indicator of technical achievement and progress in agriculture has several limitations, particularly for advanced regions with modern farm structures, but also for more backward districts where farm structures were a long way from being efficient. Consolidation of scattered farming units is an indication of general improvement but the degree of improvement varies with the measure of farm size used, whether it be the number of farms or the concentration of acreage or labour within specified farm size intervals. This analysis of farm trends in the East Riding and in the country at large has shown that there was a persistent movement towards larger, and technically more efficient farms, between 1850 and 1880, in spite of the obstacles encountered, and that this was consistent with the requirements of the new technology being applied to farms over the 'Golden Age'.

The most striking developments occurred predictably in areas like the Vale of York where a large proportion of farms were small and scattered

1. The larger sample size in the national study presumably accounts for this.

in 1850, and where farms were inadequately equipped to meet competition from superior farming districts like the Wolds and to absorb innovations like the reaper, the portable steam engine and the steam plough. These limitations were still present in 1880 though some of their worst effects had been moderated. However, the legacy of past farming systems and the lead the Wolds had already established were so strong that a firm break with tradition was impractical. But this should not hide the fact that consolidation of farms and the increase in their average size, both on the Vale and in Holderness, was consistent with general improvement in these districts and acknowledges the efforts of modernising landowners and farmers. The technical efficiency of the average farm was rising and it can be surmised that the gap between the most efficient and least efficient producers was closing.

CHAPTER FOUR

LAND DRAINAGE IN THE EAST RIDING, 1850-80.

1. The cost of land drainage in 1850-1.¹

Effective drainage is the basis of heavy land improvement as other improvements may be wasted without it or may offer less than optimum returns. Drainage improvement on the Vale of York and in Holderness has a long history² but its modern phase dates from the introduction of the horse shoe tile. Some landowners in the Vale of York had experimented with tiles in the 1820s and 1830s but at 30s per thousand, tile draining stiff clays cost between £5 and £6 per acre,³ which was greater than most enclosure schemes in the 1790s and early 1800s.⁴ This inevitably limited the demand for 'scientific' drainage.

Modern field drainage arose out of developments in the production and laying of pipes and tiles. Machinery available from the mid-1840s could turn out over 20,000 cylindrical pipes per day, and productivity gains of this magnitude eventually led to their price falling, in this case by about one-half. The following prices were quoted to David Burton in January 1851 by E.W. Smith, owner of the Tickton Tile Yard near Beverley.

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1. For a discussion of some of the advantages of efficient drainage see J. Caird, The Landed Interest and the Supply of Food (5th edn, 1967), p.87; La Vern Hoelscher, 'Improvements in Fencing and Drainage in Mid-Nineteenth Century England' (hereafter 'Improvements in Fencing and Drainage'), Agric. Hist. 37 (1963); J.C. Morton, Morton's Cyclopaedia of Agriculture (1855), p.672; C.S. Orwin and E.H. Whetham, History of British Agriculture, 1846-1914 (2nd edn, 1971).
 2. The 'rig and furrow' system had been used for centuries and had assisted land drainage slightly. The plug system was tried in several counties in more recent times and brought some improvement for a modest outlay. Wooden blocks were held together by ropes and placed in a trench; they were buried and then withdrawn using the ropes, leaving a temporary arch in the clay.
 3. J.V.B. Johnson, 'A Note on Drainage', Trans. Yorks. Agric. Soc., IX (1846), 60.
 4. J.D. Chambers and G.E. Mingay, op. cit. p.176.

Table 4.1. Drainage pipes at the Tickton Tile Yard in 1851.

Drainage pipes 14 inches long. Size of bore in inches	Price per 1,000 s. d.
1.0	11. 3
1.25	12. 6
1.5	14. 0
2.0	16. 6
3.0	19. 0

Source: David Burton MSS, Cherry Burton Papers, E.R.R.O. DDCB/4/340.

These prices were typical of prices generally in East Yorkshire. They were comparable with those quoted by the Catwick Tile Yard near Sewerby¹ and were within a reasonable margin of the national estimates of La Vern Hoelscher.² The innovation of Fowler's drainage plough around this time also reduced the cost of laying pipes and tiles. According to Chambers and Mingay the cost of draining stiff clays using these techniques worked out at £3 to £4 an acre, giving a saving of 20-40 per cent compared with the older methods;³ but this may be exaggerated as East Riding data indicate a saving of only 20 per cent.

Table 4.2. The cost of draining 75a. 2r. 14p. at Cherry Burton near Beverley, between March 17, 1851, and October 29, 1851.

Items of Expenditure	Cost (£. s. d)
(i) Labour	204. 8. 3
(ii) Miscellaneous - drainage tools, surveying poles, etc.	5.13. 7
(iii) Pipes and collars	95.16. 7
(iv) Fee of drainage engineer Josiah Parkes	<u>18.17. 6</u>
Total	<u>£324.15.11</u>
Cost per acre	<u>£4. 6. 0</u>

Source: As in Table 4.1.

1. Sewerby Estate MSS, E.R.R.O. DDRI/41/3.
2. La Vern Hoelscher, 'Improvements in Fencing and Drainage', loc. cit. p.78.
3. J.D. Chambers and G.E. Mingay, op. cit. p.175.

The cost of drainage at Cherry Burton was closer to the costs quoted by firms which specialised in land drainage than was the Chambers and Mingay estimate. However, costs varied according to the drainage system used. In the Parkes system drains were laid at a depth of 3-4 feet, 4 feet being preferred if a sizeable outfall was available naturally or could be constructed, and drains were dug parallel to each other at a distance of 33 feet. Cost per acre was between £4 and £4.10.0. In the Deanston system drains were at a depth of 30 inches to 3 feet and were arranged in parallel lines 18 to 25 feet apart. Cost per acre was around £5.¹

The total cost of laying 12 inch tiles at depths from 2-6 feet and at distances from 9-60 feet apart is shown in Table 4.3. The evidence relates to a Yorkshire firm which had begun to specialise in drainage work around the late 1840s, and confirms the rough estimate of drainage costs mentioned in connection with the Parkes and Deanston systems. Drains dug to a depth of 4 feet and laid 36 feet apart, as in the Parkes system, cost £4.13.4 per acre inclusive of the cost of laying the main drain. Drains conforming to Deanston's specifications (3 feet deep and laid 24 feet apart) cost £5.5.7 per acre, again inclusive of the cost of main drainage. The slightly higher cost per acre in both these examples, compared with those mentioned previously, resulted from the allowance for main drainage; the costings were identical in all other respects.

1. La Vern Hoelscher, 'Improvements in Fencing and Drainage', loc. cit. p.78.

Table 4.3. Total cost per acre of drainage work by a Yorkshire drainage firm, c. 1850.¹

Depth of Drain (feet)	Distance Between Drains (feet)	Cost of Cutting Drains per Acre	Cost of 12 inch Tiles per Acre at 15s per 1000	Total cost including cost of laying and finishing drain plus cost of main drain
		£. s. d	£. s. d	£. s. d
2.0	9	3. 7. 1	3.12. 9	7.16. 9
2.5	15	2.17. 6	2. 3. 6	6. 0. 0
3.0	24	2.17. 8	1.17. 2	5. 5. 7
3.5	33	2.12. 6	19. 9	4.10. 1½
4.0	36	2.18. 0	18. 1	4.13. 4
5.0	50	2.14. 8	13. 0	4.11. 2½
6.0	60	3. 8. 0	10.10	5. 0.11

Source: as in Table 4.1.

2. Drainage activity in the East Riding c. 1850.

The Emanuel Hospital estate at Brandesburton gives a practical insight into the growing interest in field drainage in the late 1840s and early 1850s. Drainage on the estate was poor in the early 1840s largely because of defects in the Beverley and Barmston Drainage, and several farms were exposed regularly to the threat of flooding. The Hospital Trust took two courses of action to deal with the problem: it compensated tenants who lost income as a result of flood damage, and more positively, it undertook to re-drain the entire estate.

1. The name of the firm is unknown. It is unfortunate that information similar to that contained in Table 4.3 has not been located for the 1870s as this would have given a quite precise impression of advances made in drainage technology over the third quarter of the nineteenth century.

Table 4.4. Drainage investment on the Emanuel Hospital Estate at Brandesburton, 1841-7.

(Expenditure to the nearest £)

Year	Total Receipts of Estates	Expenditure on Drainage	Drainage Expenditure as a pro- portion of total Receipts
1841	4,000 *	763 "	19.1
1842	4,000 *	763 "	19.1
1843	4,000 *	763 "	19.1
1844	4,000 *	1,000	25.0
1845	4,000	533	13.3
1846	4,092	580	14.2
1847	4,350	812	18.7

Source: Emanuel Hospital MSS, Report with Receipts and Disbursements, 1844-8, p.7, L.C.R.O. EH 5.3.

* These amounts are estimates based on receipts from 1846-8. The above mentioned report mentioned receipts for 1848 and not drainage expenditure. It was therefore excluded from the Table.

" These amounts are based on the average spent on hollow drainage between 1841-3.

The financial statement shown in Table 4.4 is fragmentary but is sufficient to indicate the strong commitment of estate resources to drainage improvement. Drainage absorbed about 19 per cent of total estate income from 1841-3, 25 per cent in 1844, and between 13 and 19 per cent from 1845-7. No account has survived for the period up to 1850 but literary evidence suggests a pronounced upswing in investment at least until 1849. In his report of 1846, the Chairman of the Trustees recommended spending £2,000 draining 600 acres of carr land and a further £1,200 tile draining old enclosed land. The tenantry were to pay 5 per cent interest on the capital investment and were reported to be anxious that it was "carried out with as little delay as possible".¹ The

1. Emanuel Hospital MSS, October 8, 1846, pp.8-9, L.C.R.O. EH 5.2.

improvements were made and £2,400 was invested in surface drainage between 1848 and March 1849,¹ which amounted to nearly half the estate's income in this period. It is not certain whether this substantial increase in drainage expenditure resulted from earlier investment programmes or was sanctioned hastily as a reaction to Repeal and the threat of lower prices. More certain is that the estate had tolerably efficient drainage by 1850, though as will be shown later, flooding was still a problem in miserably wet seasons.

There was similar activity on other estates around mid-century but lowland drainage remained mostly inadequate. James Caird estimated that two-thirds of Holderness was without adequate drainage in 1850,² thus contradicting George Legard who had claimed before the Select Committee on Agricultural Customs that it had been drained in the 1840s.³ (Legard later revised his evidence and admitted that there was much still to be done.)⁴ The valleys of south Holderness were the chief exception east of the Wolds to this otherwise dismal record of drainage improvement. Drainage had been efficient there from the early years of the nineteenth century and this applied even to traditional areas of saltmarsh, such as Sunk Island, by mid-century.⁵ Adequate drainage possibly more than any other factor was responsible for the early development of a modern and highly productive agricultural system in south Holderness.

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1. If £3,200 was to be invested in improved drainage and £812 of it had been spent in 1847, this left approximately £2,400 for investment between 1848 and March 1849, when the investment was completed. Ibid. Report dated March 20, 1849, L.C.R.O. EH 5.3.
 2. J. Caird, English Agriculture in 1850-1 (2nd edn, 1968), p.304.
 3. S.C. on Agricultural Customs (1848), Q. 7621.
 4. Ibid. Q. 7622.
 5. J.A. Sheppard, The Draining of the Marshlands of South Holderness and the Vale of York (hereafter The Draining of the Marshlands) (E.Y.L.H.S., No. 20, 1966), pp.11, 13.

The extensive district between Beverley and Barmston in the Hull Valley was prone to periodic flooding. Josiah Parkes referred to the "ruinous losses and waste occasioned by ... frequent flooding" around Beverley, Beeford and Cottingham in the late 1850s,¹ and the Hull Advertiser described farm land around Cottingham as "little better than a swamp" and estimated that decent drainage would raise agricultural output by 30-50 per cent.² Developments elsewhere were more successful. A new main drain was cut in the Tickton-Leven district during the 1830s which opened into the Humber at Marfleet. Existing drains in the Holderness level were straightened and deepened; flooding was reduced and only about one-sixth of the taxable land of the district was exposed to the risk of winter flooding by the mid-1850s. The improvement permitted a shift from grass and livestock to mixed farming.³

The need for drainage improvement on the Vale of York was about the same as in Holderness. The state of its drainage is shown in Figure 4.1. The district around Wallingfen was especially bad and June Sheppard described it as the "least well drained marshland tract in the East Riding".⁴ Drainage was poor around the Ouse and Derwent, and farms "were seldom free from the risk of floods in the winter and spring".⁵ Sheppard thought Howdenshire was free from major drainage problems⁶ but others disagreed arguing that improvements had been piecemeal and largely ineffective because the district lacked an effective outfall.⁷

1. Quoted in the Hull Advertiser, April 2, 1859.

2. Ibid.

3. J.A. Sheppard, The Draining of the Hull Valley (E.Y.L.H.S., No.8, 1958), pp.18-9.

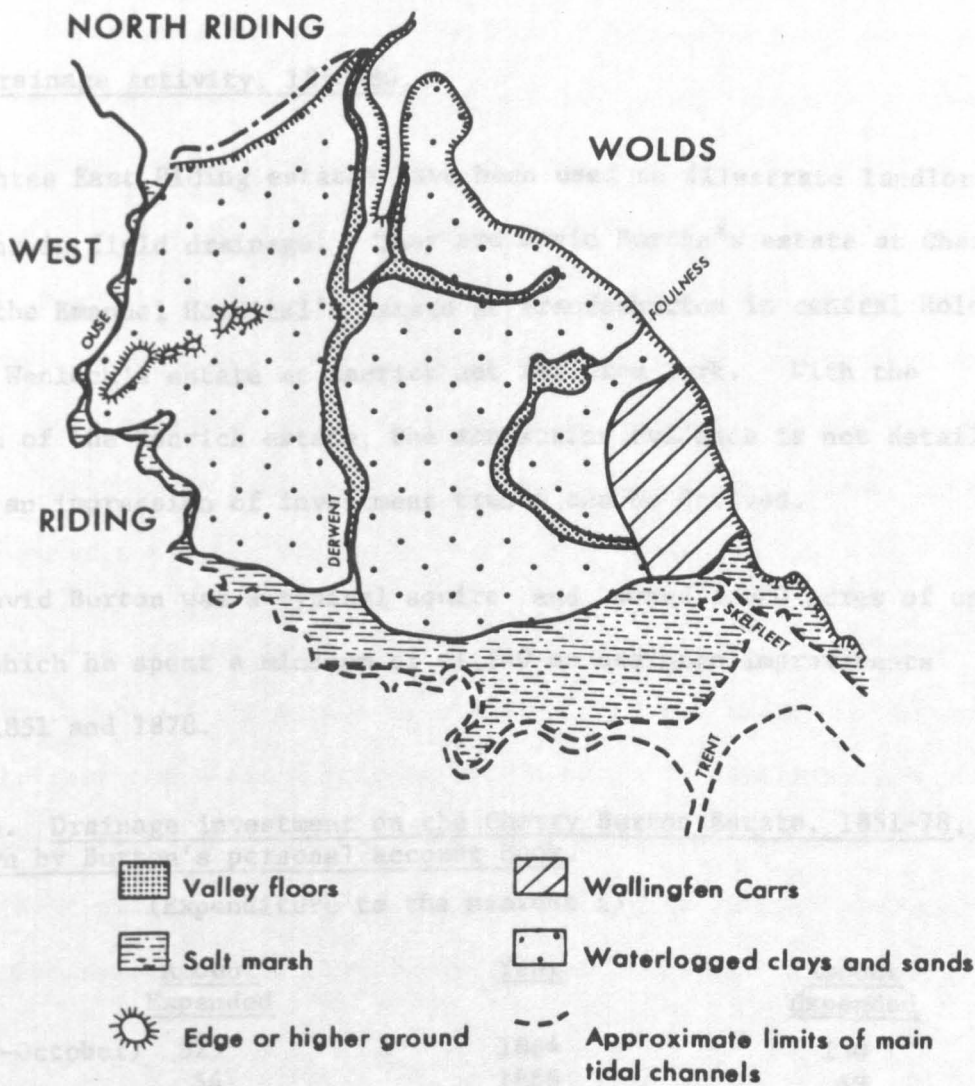
4. J.A. Sheppard, The Draining of the Marshlands, loc. cit. p.2.

5. A. Harris, 'Studies in the Historical Geography of the East Riding of Yorkshire' (Ph.D. thesis, Hull University, 1962), p.116.

6. J.A. Sheppard, The Draining of the Marshlands, loc. cit. p.25.

7. S.C. on Agricultural Customs (1848), QQ. 7627-30.

Figure 4.1 The Original State of Drainage in the Vale of York.



Source: J.A. Sheppard, *The Drainage of the Marshlands* (E.Y.L.H.S., No 20, 1966), p12.

Source: as in Table 4.1

Over half the lowlands of East Yorkshire were without adequate drainage in the years immediately following Repeal. The progress of tile drainage in the field had been outpaced by its progress in the popular (especially liberal) and specialist press. Significant improvements had been made but the degree of progress varied widely from district to district.

3. Drainage activity, 1850-80.

Three East Riding estates have been used to illustrate landlord investment in field drainage. They are David Burton's estate at Cherry Burton, the Emanuel Hospital's estate at Brandesburton in central Holderness, and Lord Wenlock's estate at Escrick not far from York. With the exception of the Escrick estate, the manuscript evidence is not detailed and only an impression of investment trends can be derived.

David Burton was a typical squire and owned 1,600 acres of useful land on which he spent a minimum of £1,540 on drainage improvements between 1851 and 1878.

Table 4.5. Drainage investment on the Cherry Burton Estate, 1851-78, as shown by Burton's personal account book.

(Expenditure to the nearest £)

<u>Year</u>	<u>Amount Expended</u>	<u>Year</u>	<u>Amount Expended</u>
1851 (May-October)	325	1864	130
1852	54	1866	49
1856	22	1867	176
1858	13	1869	17
1859	49	1870	94
1860	223	1871	26
1861	56	1875	30
1862	170	1878	21
1863	85		

Source: as in Table 4.1.

The above account is not a complete summary of drainage investments on the Cherry Burton estate as the drainage account is missing and almost

all references to drainage appear in Burton's personal account book. The source is fragmentary and no consistent line of accounting was followed. Individual tenants were compensated when they completed a drainage operation and the amount was recorded by Burton; occasionally this included an allowance for labour costs while at other times it did not. There were no entries under drainage in some years but this was probably an accounting error or more likely a case of missing evidence rather than an indication that no drainage work had been done. Burton made use of government loans. He received a loan for £324.6.6 to drain 75 acres of heavy land in 1851 and contracted a second loan in 1853 to drain 50 acres of clay land tenanted by Thomas Byass and Robert Purdow.¹ The amount - £184.9.0 - does not appear in Table 4.5 because the source of information was not from Burton's personal accounts. There were no further references to government loans but they cannot be ruled out.

Table 4.5 underestimates the level of expenditure on drainage improvement on the Cherry Burton estate by an unknown amount. However, it suggests that there was a long term commitment of estate resources to drainage activities and confirms that government loans were used. The table's more general value is that it may indicate a similar commitment to drainage improvement by the squirearchy of the clays and marshlands of the county.

The drainage work already undertaken by 1850 on the Emanuel Hospital property was consolidated over the middle decades of the century. £100 was voted annually for this purpose from the mid-1850s and was quite independent of drainage investments made periodically as circumstances warranted. Estate drainage was still imperfect by 1880 owing to the

1. David Burton MSS, Cherry Burton Estate Papers, E.R.R.O. DDCB/4/340.

generally chaotic state of the Beverley and Barmston drainage, and this placed serious limitations on what even an energetic management could achieve.¹ An indication of the drainage problem was given in a report to the Hospital's Trustees early in 1876. Heavy winter rains had caused serious flooding and "... very extensive works were in progress ... repairing the banks [i.e. of the River Hull] which had subsided for more than a mile. It appeared a necessary work for the protection of that part of the Estate, as it was reported to us that the banks had only recently broken lower down the river, flooding the adjacent land and causing considerable damage".²

Drainers were also active on the Vale of York. Efficient drainage was a pre-condition of general agrarian improvement on Lord Wenlock's 16,000 acre estate at Escrick, located as it was between the Ouse and Derwent rivers. Soils varied on the higher ground from light blow-away sands to fertile sandy loams overlaying clay. Clays formed the top soil in the lower districts which made up the greater part of the estate. The problem of defective drainage was tackled earnestly in the 1850s under the Ouse and Derwent Wapentake Act (1855). The Act which was sponsored by Lord Wenlock, helped to set off a train of events which led to a partial improvement in drainage, but it failed to provide relief for the entire district since much of the area around the Ouse and Derwent was excluded from the Act. This land was brought only slowly into a better state of cultivation.³

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1. Emanuel Hospital MSS, November 8, 1855, p.8. L.C.R.O. EH 5.5.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), p.158.
 3. Ibid.

Drainage investment was a high priority on the Wenlock estate and absorbed a large share of the estate's resources by the 1860s.¹ A gang of labourers, usually numbering over one dozen, was employed exclusively on drainage work from February, 1862. (The date might have been earlier but the evidence is not clear.) The park lands of the estate were the first to be drained in the spring and summer of that year, and a new main drainage network was begun at the same time. The gang remained together for many years judging by the level of drainage work undertaken in the 1870s and 1880s.

Funds for drainage work at Escrick came from two sources: estate income provided a small part of the total investment and the Lands Improvement Company provided the bulk. The company, set up in 1853, was one of several established about this time empowered to borrow money from the public through the sale of stock, and to make loans to landowners improving their land. Funds from the Lands Improvement Company were used exclusively for drainage at Escrick; borrowing was heavy.

1. Drainage investment financed out of estate income does not give an accurate impression of the true investment trend. Take for example the balance sheet for 1867.

<u>Debit</u>	£. s. d	<u>Credit</u>	£. s. d
To balance of school a/c	326.19.10	To balance of estate a/c	5899.19. 7½
House	3761.12. 5½	Woods	2464.17. 2
Charities	1031.16. 9	Farms	371.17. 2
Buildings	3591.11. 3		
Gardens	771. 6. 9½	Balance	5015.13. 7
Game	540. 9. 1½		
Moor Farm	174.14. 7½		
Drainage	229. 0. 6		
Stable	1970.13. 1½		
Lord Wenlock	1354. 3. 1		
	<u>£13752. 7. 6½</u>		<u>£13752. 7. 6½</u>

Source: J.T. Ward, op. cit. 21

A glance at Table 4.6 (p.98) is sufficient to show that drainage investment was much greater in the 1860s than at first might be inferred from estate accounts.

Table 4.6. Loans received by Lord Wenlock from the Lands Improvement Company, 1862-8, and the interest paid on them.

(To the nearest £)

<u>Year</u>	<u>Sum Received</u>	<u>Interest Paid</u>
1862	1,609	No record
1863	4,575	195
1864	1,966	466
1865	3,116	678
1866	2,920	881
1867	2,283	645
1868	2,654	983

Source: Wenlock MSS, Yorkshire Estate Steward's Ledger, 1863-8, E.R.R.O. DDFA/37/18.

1867 and 1868 were fairly typical years for the Wenlock estate and indicate the general investment trends of the 1860s. £2,512 was invested in field drainage in 1867 and £2,868 in 1868, excluding the interest repaid to the Lands Improvement Company. Loans amounted to £2,283 and £2,654, respectively, and estate income invested in drainage came to £229 and £214, respectively. Estate records on drainage have been lost for the period from 1869-77 but are detailed for 1878-80. In 1878, £1,523 was spent on drainage, £110 on strengthening the bank of the Ouse or Derwent (the record is not clear), and £304 was paid to the Ouse and Derwent Drainage Authority. In 1879 and 1880, £1,608 and £1,725, respectively, was spent improving surface drainage. There were no further references in the account to other items of expenditure though the annual drainage rate, at the very least, would be paid.¹ Interest repayments to the Lands Improvement Company by the late 1870s were double those for the previous decade; £2,066 was repaid in 1878, £2,061 in 1879, and £2,062 in 1880, as against £645 in 1867 and £983 in 1868. Borrowing had evidently increased in the early 1870s and drainage had received considerable attention.

1. Wenlock MSS, E.R.R.O. DDFA/37/20.

Drainage activity on East Riding estates between 1850 and 1880 was paralleled closely by rapid growth among firms supplying and manufacturing drainage materials. There were few firms of this type prior to the mid-1840s but their numbers grew in the second half of that decade and were established in most districts of the East Riding by the 1850s. Some landowners had even built their own tile yards by the early 1860s.¹

The capacity of the average tile yard was quite small. For example, the owner of the Tickton Tile Yard, Mr. E.W. Smith, had to decide in February 1851 if he was going to divide his existing kiln or "build another round one" in order to complete a quite modest order for tiles and pipes from David Burton and his drainage adviser Josiah Parkes.² Another tile yard, the Catwick Tile Yard in central Holderness, had a total business of £1,321 in 1854, £1,195 in 1855, £1,502 in 1856 and £663 in the first half of 1857. This was not connected exclusively with drainage and the exact level of drainage business is difficult to estimate because of the haphazard state of the firm's accounts. A rough estimate is that the manufacture of drainage tiles and pipes made up about 75 per cent of its total business in 1854, about 90 per cent in the first six months of 1857 and around 80 per cent in the intervening years.³

There were about 70 tile yards operating in East Yorkshire by the early 1870s. They were scattered throughout the county and served local markets, though there was a slight concentration in the Hull-Brough area. In addition, there were four brick and tile merchants who operated out of Brough, Howden and Beverley.⁴ Drainage was good business and much thought and hard cash went into it over this period.

1. W. Wright, op. cit. p.89.

2. David Burton MSS, E.R.R.O. DDCB/4/340.

3. Calculated from Sewerby Estate MSS, Catwick Tile Yard acc., 1854-7, E.R.R.O. DDRI/41/3.

4. Post Office Directory of the East and North Ridings of Yorkshire, with the City of York (Kelly's Directories Ltd, 1872), pp.624-5.

4. Drainage efficiency by 1880.

Lowland drainage had improved by 1880 but progress was very uneven. There had been substantial improvement in some districts such as around Tickton and Leven in central Holderness, and also in Howdenshire, but improvements were modest in most districts and drainage had deteriorated in a few. The Derwent Valley remained a problem area in the Vale of York, especially from Sutton down to Barmby Marsh, where the Ouse and Derwent rivers met. Thousands of acres were exposed to the threat of flooding keeping farm rentals low and restricting farming potential. It was similar around the Foulness River and the Market Weighton Canal. Farm land was naturally good in the area but farming standards were low because no drainage authority had deepened its outfall and excess water could not be removed easily from the land.

Drainage standards had risen in Holderness. According to John Coleman:

Formerly all this lowlying district was a morass caused by the accumulation of the drainage of the county. Now, thanks to the works of the Beverley and Barmston Commission and other bodies, the whole country is well drained and suffers but little from flood waters.

Coleman drew particular attention to the drainage of south Holderness and pointed out that the heavy rains and inclement weather of the late 1870s had increased the pressure on all drainage systems in the county but this was one of the few which had coped with the abnormal run-off without loss of efficiency.¹

The Hull Valley, or at least stretches of it, continued to be the major problem area east of the Wolds. The Beverley and Barmston Level was particularly troublesome in spite of Coleman's assessment of its

1. R.C. on the Depressed Condition of Agricultural Interests (1880)
pp. 139-40.

drainage commissioners, and occasional flooding affected numerous farmers and landlords each winter and spring. The Beverley and Barmston Level had not been neglected but no firm action had been taken to raise its efficiency. In the late 1850s the Beverley drainage authorities and their adviser, Josiah Parkes, produced a report on the "Condition and Practical Means of Improving the Land Drainage". It recommended amalgamating the Beverley and Barmston Drainage Commission with the commissions of all drainage authorities between Beverley and the Humber, and the construction of a new main drain opening into the Humber at Hessele.¹ These, and other recommendations were ignored and it took until 1880 before a local drainage act restored some of the aims of the 1859 Drainage Report.² In the meantime the drainage efficiency of this considerable area depended largely on the vagaries of weather and the effect of drainage improvements elsewhere in Holderness. Faster run-off in some districts swelled the volume of rain water entering the main cuts and drains and the 1880-2 Royal Commission admitted that this alone "rendered further improvements necessary".³ There was little difficulty in dry seasons; "no casualty had taken place to mar the productiveness of the taxable district"⁴ in the good years at the beginning of the 1870s but the land sometimes became unworkable in the abnormally wet seasons at the close of the decade. Lord Leconfield was among the most vocal critics of the Beverley and Barmston Drainage Commission. He thought that drainage "was so inefficient and the outfall so very bad ... that although that [was] the best land [he had] in Yorkshire, the depression

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1. Hull Advertiser, April 2, 1859.
 2. J.A. Sheppard, The Draining of the Hull Valley, loc. cit. pp.20-1.
 3. R.C. on the Depressed Condition of Agricultural Interests (1880), p.139.
 4. Sledmere Estate MSS, Commissioner's Report: to the Proprietors of land in the Beverley and Barmston Drainage, 1874, E.R.R.O. DDSY/103/9

and the difficulties [he had] in dealing with that estate [were] greater almost ... than on the very worst lands in Yorkshire".¹ These comments were made in the light of losses which the Leconfield estate had had to absorb and should be tempered by Coleman's own impression that some improvement had taken place.²

The problems of lowland drainage have not been resolved completely even using twentieth century technology. In the Hull Valley the installation of pumps in the Holderness Drain and at Hempholme have only recently cured serious waterlogging in the Leven Carrs and the North Frodingham Carrs. Further improvements are projected for the River Hull over the next few years and they should ensure that efficient drainage is available throughout the district. Outfalls are reasonably efficient elsewhere in Holderness but the Winestead Drain and the upper end of the Lambwath Stream remain trouble spots and await an adequate solution. Drainage is still inefficient in certain parts of the Vale of York but serious flooding in the area will be prevented in future when a tidal barrage is completed across the River Derwent. Outfalls for underdrainage are inadequate east of the Derwent and north of Foggathorpe and Bubwith as far as Thornton and Melbourne in the north. This area is among the most difficult for underdrainage in the county.³

The task facing the drainer and improver of land in East Yorkshire is formidable even in the 1970s and it is in this light that the struggles and achievements of innovators in the mid-nineteenth century should be

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1. Quoted in A. Harris, 'Studies in the Historical Geography of the East Riding of Yorkshire' (Ph.D. thesis, Hull University, 1962), p.111.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), pp.139-40.
 3. Information supplied by H.W. Smith, Regional Drainage Officer for M.A.F.F., Beverley, East Yorkshire.

judged. The task faced by improvers was an enormous one and it must be admitted that their influence on the farming system, taking the county as a whole, was not as fundamental as many contemporaries wished. Rents were enhanced and farmers benefited, where investments were successful, from 'warmer' soils and the extension of mixed farming, but there was nothing like a marked increase in average cereal yields to reward farmers and landowners for their combined efforts, crop yields not being very different in the mid-1880s from those Caird noted at the beginning of the 1850s.

The evidence on drainage investment between 1850 and 1880 leads to three conclusions: (i) drainage efficiency was increased modestly but results varied widely from district to district, (ii) investors failed to receive a 'full' return on their investments, (iii) drainage activities were subject to powerful constraining influences.

5. Factors encouraging drainage improvement.

The balance of forces assisting and obstructing the work of drainage engineers and landowners was crucial to the progress made in field drainage. The factors encouraging better drainage are well documented and some discussion of them has already taken place. Most fundamental was the growing appreciation by farmers and landlords that drainage efficiency was a prerequisite of better agriculture. Some contemporaries detected a softening in farmers' indifference to drainage from the late 1840s and early 1850s. Low agricultural prices or the threat of them was a powerful influence on this and one leader writer in the Hull Advertiser detected a "marked shift" in attitude from the time of Repeal.¹ This might be a year or so premature and does not accord with actual investment trends. It

1. Hull Advertiser, December 19, 1851.

accords more with the enthusiasm of the liberal press to bring to the countryside the rigour and spirit of advancement which liberal individualism had brought to the town. In a more moderate form a new stirring of interest in drainage can be traced back to the end of the 1840s. Debate in Parliament, in the press, in agricultural journals, and in agricultural societies inevitably helped to remove much of the blind prejudice towards field drainage.

Discussion did not remove it completely. There were many who continued to doubt the economic advantages of drainage and like the labourers in Joseph Ashby's Tysoe thought that farmers would lose their money as "the old folk had known the right depth for drains in clay".¹ Tradition has always been a powerful constraint in the countryside and the arrival of cheap drainage, though dramatic and sudden, and coming after a series of rapid technical developments in the making and laying of pipes, was much slower in being accepted and applied by the average farmer and landowner.

The growing acceptance of drainage technology was the product of several factors. The depression of the early 1850s helped in the short term to shake up traditional thinking, but it was the force of example - the effect of a cheaper and more efficient drainage system, together with government drainage loans - which was the deciding influence over the longer term. Drainage required large amounts of capital and this was made available over the third quarter of the nineteenth century without too much strain on the capital resources of the farming community. Internal sources of finance were supplemented, and in individual cases exceeded, by capital mobilised externally. Loans from public companies specialising

1. M.K. Ashby, Joseph Ashby of Tysoe, 1859-1919 (1961), p.15.

in financing agriculturalists have been mentioned in connection with Lord Wenlock's estate, but these were outweighed by government loans. Government loans offered under the Drainage and Improvement of Land Act, 1847, were a first charge on the estates making use of them; they took precedence over all existing mortgages and were available even to owners of settled estates who would otherwise have had to go through the Court of Chancery to impose such a charge. Loans were at 3.5 per cent and were repayable over twenty-two years.¹

Landowners showed little response to government loans in the first year or so they were available. The Economist commented in 1846 that

Notwithstanding all that /had/ been said on the subject of draining land, the extent to which the first and most important improvement had been carried out /was/ extremely limited.

This statement may have been premature and made before the economic relevance of the legislation had been digested by the agricultural community. Surprisingly if this was the case, there were few applicants for the £2 million loan voted by Parliament in 1849, and the Economist interpreted this as general apathy towards drainage. Agricultural investment did rise strongly in the late 1840s and early 1850s,² in spite of these misgivings, but even so tens of thousands of acres of farm land continued to be partially or totally useless to the community because of ineffective drainage.³

The demand for government loans picked up in the following years and over £7 million was expended on drainage improvements to estates

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1. C.S. Orwin and E.H. Whetham, op. cit. pp.194-5.
 2. F.M.L. Thompson, English Landed Society in the Nineteenth Century (1963), p.
 3. La Vern Hoelscher, 'Improvements in Fencing and Drainage', loc. cit. p.79.

throughout Britain between 1847 and 1872. This was roughly 70 per cent of the total capital resources made available for drainage during this quarter-century. A further £1 million was committed to drainage (approximately one-quarter of the amount loaned) between 1873 and 1882.¹ About £8 million went into drainage work from non-estate sources, including both Treasury and public companies by the mid-1860s and this rose to £12 million by 1878.² This was out of a total of £24 million invested nationally between Repeal and the onset of depression in the 1870s.³

The greater availability of capital together with the lower cost of drainage and its increased efficiency, if properly managed, should have ensured that most districts in need of better drainage either had been drained by 1880 or were in the process of being drained. This was not the case. The enthusiasm for drainage continued over the middle decades of the century but the return on investments was modest, especially by the last quarter of the century. Technical, management and legal difficulties prevented any fundamental changes in agricultural efficiency in many districts and retarded the rate of progress in most.

6. Factors holding back drainage improvement.

Innumerable factors played a part in restricting the success of drainage engineers and practical farmers in their attempts to improve land drainage. Technical difficulties were probably the most difficult to resolve. Field drains required reasonable outfalls otherwise excess water could not be carried away from the land. Large outfalls had to be

1. C.S. Orwin and E.H. Whetham, op. cit. p.196.

2. Ibid. p.195.

3. J.D. Chambers and G.E. Mingay, op. cit. p.177.

constructed on monotonously flat plain land, though very large landowners could often get good results using shallow outfalls and exploiting subtle variations in the height of land. This was not practical on small estates. The problems of securing an efficient outfall could be overcome if landed families co-operated and allowed labourers to make drainage adjustments on adjoining properties. Little could be done without co-operation unless a local drainage authority intervened or one of the involved parties resorted to litigation. Inadequate outfalls blighted Howdenshire's agricultural progress in the 1840s¹ and held back progress in many parts of the Vale of York and Hull Valley in the 1870s and 1880s.

Even assuming adequate outfalls, there were at least three other technical problems to be overcome. First, agriculturalists had a choice between two drainage systems, the Parkes and the Deanston. Each had its own supporters and the debate between them was fierce throughout the middle decades of the century. Support for deep drainage reached its peak in the 1850s and in Lord Ernle's view was responsible for a great deal of wasted time and effort.² G.E. Fussell went further and argued that the influence of Parkes "was responsible for many miles of pipes being put too deep to do their work, and thousands of pounds were sunk in drains that never carried a drop of water away from the land".³ It will be remembered that Parkes was employed by several East Riding landowners and was advisor to the Beverley and Barmston Drainage Authority, and his system had been taken as a model by the county's liberal press.

Shallow drainage also had defects. Large areas between Hull and York were drained according to the Deanston method in the second half of

1. S.C. on Agricultural Customs (1848), Q.7627.

2. Quoted by La Vern Hoelscher, 'Improvements in Fencing & Drainage', loc.cit. p.79.

3. G.E. Fussell, 'The Dawn of High Farming in England', Agric. Hist. 22 (1948), 85.

the 1850s. Drains were laid too near the surface in some instances, and it was claimed that they could be damaged "by allowing a colt to gallop across the fields when the drainage work was finished".¹ This was the view of the Hull Advertiser and could well be biased by its declared support for the alternative system. However, no lasting benefit could come from superficial drainage.

Second, there was nothing particularly wrong with either system if used intelligently but unfortunately many farmers were too inflexible in their approach to drainage. The farmer who buried the greatest number of tiles in a field was still widely acknowledged as an efficient and progressive tenant.² Many were too "bookish" or too orthodox and ignored local conditions. This was the view of Philip Pusey who advised drainers to make use of the ridge and furrow system, which was still visible in many low-land districts, arguing that previous generations of farmers had adjusted the distance between ridge and furrow to suit variations in the heaviness of soil and that this distance was still useful for the construction of more advanced drainage systems. This advice was largely ignored, at least at first, and nearly all of the arable land in Yorkshire drained without reference to the ridge and furrow network had to be redrained after a few years. Where drains had been laid down the old furrows and were serviced by reasonable outfalls, summer fallowing could be safely abandoned and root crops could be introduced.³

Third, an investment in drainage, if it was going to return its initial cost over a relatively short period, had to be associated with

1. Hull Advertiser, April 2, 1859.

2. La Vern Hoelscher, 'Improvements in Fencing and Drainage', loc. cit. p. 78.

3. W. Wright, 'On the Improvements in the Farming of Yorkshire', J.R.A.S.E., XXIII (1861), 110.

an investment in sub-soiling to assist the percolation of excess water through the various soil horizons. It had also to be associated with the careful maintenance of outfalls and ditches, changes in crop rotations, heavier stocking where appropriate, and investments in new farm buildings. This called for flexibility on the part of landowners and farmers in output and method, and for thorough redraining every 20 years, though this varied with local conditions.

Some economic difficulties associated with better drainage proved to be less serious than the technical difficulties. The cost of drainage fell in the 1840s but it was still costly if account is made of drainage rates, surveying and valuation expenses, and the secondary costs of deep ploughing and additional farm buildings. Many managements of entailed estates did not wish to be committed to an investment of this size, despite the provisions made in the Drainage and Improvement of Land Act. Investments in land drainage by tenant farmers may have been discouraged by the absence, particularly in the 1840s and 1850s, of adequate compensation. This may have been significant in the East Riding with its one-year system of tenure but available evidence does not confirm it. It would seem that farmers involved themselves in drainage work without formal guarantee of compensation and that a good relationship between landlord and tenant was usually considered sufficient guarantee of fair treatment.¹

Problems arising out of co-operation between neighbouring landowners were more serious. Co-operation was vital if the drainage problems of large areas were to be tackled with a chance of success, but despite its obvious importance, co-operation was generally lacking in the dealings of landowners. The estate of Joseph Dunnington-Jefferson provides an

1. See below, Ch. 11. 'The Tenant Farmer in East Riding Agriculture, 1850-80'.

interesting case study. Around 1850 William Saltmarsh, owner of 3,000 acres in the parishes of Laxton and Saltmarsh, built a clough to assist drainage in the district. His neighbour, Joseph Dunnington-Jefferson, objected to it, or more to the point objected to the cost of its upkeep. He outlined his objections in a letter to his solicitors in September, 1855. They were as follows:

- (i) His estate derived no real or substantial advantage from the clough.
- (ii) He had not been consulted about the clough's construction and therefore did not feel bound to contribute to its upkeep.
- (iii) He did not want to commit his tenants, along with those on Saltmarsh's estate, to pay for its upkeep.
- (iv) Saltmarsh was in the best position to maintain the drain.
- (v) The clough would not serve Dunnington-Jefferson's estate unless the drain leading to it was kept in good condition and "there seemed to be no means of compelling the persons liable to this drain to keep it in a proper state".¹

In replying to these allegations Saltmarsh also argued on the grounds of neighbourly co-operation. He felt that he could not maintain the clough unless all other parties benefiting from it shared in its cost.

A similar incident occurred five years later. A drain was dug around Thornganby "to the entire satisfaction of everyone". Various sections of it on Dunnington-Jefferson's property were in need of repair by the summer of 1860 but he refused to maintain it unless all the original parties to the agreement contributed to the cost. He argued that he was not obligated to make repairs without assistance as drainage efficiency depended on the state of the entire watershed. The position

1. Dunnington-Jefferson MSS, Letter from Jefferson to his solicitor, September 14, 1855, E.R.R.O. DDJ/40/4.

was explained to the estate solicitor in the following terms:

... he /ie. Dunnington-Jefferson/ cannot be bound to make it /ie. the drain/ competent for additional quantities of water that may now flow through it in consequence of more efficient drainage on the part of the owners of land in the district.¹

If lack of co-operation between landlords was limited to a few of the most intransigent, the obstacle it imposed at county or national level could be dismissed quickly. However, the problem was a good deal more widespread and offered no simple solution. John Coleman noted the need for co-operation between neighbouring landed families in the lower Derwent Valley:

Nothing will be really satisfactory that does not recognise the liabilities of the entire watershed to contribute pro rata towards the doing and maintaining of such improvement works as are required. It is the water from those on higher grounds who are quite often above the flood mark which is now from improved drainage and better cultivation discharged more rapidly and in greater quantities than formerly, and hence causes much of the damage.²

The Vale of York was well known for its tangled pattern of landownership, and legal complications were possibly more extreme there than on the Wolds and in Holderness. Co-operation between landed proprietors, especially over the installation and maintenance of main drains, was vital if large drainage projects were to work with a reasonable degree of efficiency. The alternatives were to put up with waterlogging and periodic inundation, or to resort to litigation. Either way, they were costly, held back farming progress, and hindered the efforts of landowners attempting to improve drainage on their estates.

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1. Ibid. Letter from Agent to Solicitors, July 2, 1860, E.R.R.O. DDJ/40/50.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), p.155.

All these factors, individually or as a whole, helped to lessen the efficiency of drainage investment, though significant improvements were still made. Large sums of public and private money were sunk into drains of one kind or another and the quality of drainage was raised, but at the same time there was no sign, except in only a handful of districts, of any firm break with earlier farming practices. The idea of a revolution on the English clays in this period does not appear to be appropriate. The effects of better drainage were neither pervasive nor powerful enough at county level, if the lowlands of the East Riding were typical, to permit more than a gradual upgrading of its agriculture. A fundamental change was precluded by factors of geography which in some cases not even twentieth century drainage technology has been able to overcome. In others it was the result of not coming to terms with the need for co-operation between landowners, draining too much according to theory, and not developing the flexibility to deal with local and district problems according to their merits.

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How then should farmers and landowners be assessed in their role as land drainers? The simple answer is that the farming community did make a conscious effort to improve drainage in spite of initial misgivings and costly mistakes, and almost certainly came to acknowledge the primacy of efficient drainage in the process of lowland farm improvement. There were numerous instances of tenant farmers draining land at their own expense without formal guarantee of compensation, and of landowners making strenuous efforts to improve estates prone to waterlogging. The effort put into field drainage confirms the developing technical sensitivity of

farmers and landowners, it attests to their increasing professionalism and points to the fact that a business-like attitude was crucial if agriculture was to become more science-based. It also points to some of the obstacles which opposed widespread farm improvement on the lowlands and which rendered much of the improvement there incomplete and piecemeal.

FARM MECHANISATION IN THE EAST RIDING, 1850-80.

1. General factors behind mechanical progress.

Mechanical progress on farms was generally slow prior to 1850 and the traditional stock of farm technology remained more or less intact in many parts of the county. The main exception to this was the horse threshing machine which first appeared in the East Riding in the 1790s and was in strong demand by the opening years of the nineteenth century. Threshers could be hired for one-guinea per day on the Vale of York in the 1830s, the borrower providing the horses.¹ Seed drills were also in use by the 1790s; they had become a standard feature of improved farming by 1830 and achieved a modern design by 1850.² Ploughs underwent various changes. Apart from minor changes in design, the most important development was the gradual transition from wood to metal.

There had been a "general and progressive improvement" in the standard of farm implements and machinery from the 1830s and 1840s³ and basic farm implements in 1850 were generally more serviceable, stood up better to rough handling and were more efficient than they had been a generation earlier. There was a large range of implements which included equipment known and used for centuries (often in its original form) as well

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1. O. Wilkinson, The Agricultural Revolution in the East Riding of Yorkshire (E.Y.L.H.S., No. 5, 1956), p.13.
 2. W. Harwood Long, 'The Development of Mechanisation in English Farming', Agric. Hist. Rev. XI (1963), 19.
 3. J. Almack, 'Report on the Trial of Implements at Bridlington', Trans. Y.A.S. XIV (1851), 27.

as machines like the reaper, the portable steam engine and the drainage plough. Standards of efficiency were not uniformly high in this newer machinery and its price often placed it beyond the reach of ordinary farmers, so that the scope for innovation, though by no means small, was still restricted.

Mechanisation on East Riding farms spanned a broad spectrum. At one end there were farms such as Enholmes where almost every operation was performed mechanically,¹ while at the other end there were hundreds of small farmsteads along the Ouse and Derwent rivers where mechanisation had had no impact. Agriculture as a single industry, and as one of the principal economic activities of the time, clearly lagged behind certain branches of manufacturing industry in its level of technical transformation.

A useful indication of the quickening pace of rural development was the progress of the agricultural machinery and implements industry. Farmers for centuries past had looked no further than the local blacksmith or carpenter for their basic tools, and the majority still did this in 1850, though many were beginning to look elsewhere. Large firms such as Ransomes in Suffolk and Crosskills in the East Riding came to national prominence supplying and manufacturing a wide variety of farm machinery and implements. Standards were high and fitted the requirements of the more discriminating farmer. Small firms serving district and regional markets also sprang up in considerable numbers but the quality of their products was not always high and fierce competition over the following quarter-century eliminated several of the weaker ones and helped to establish more reliable standards

1. For a full discussion of the mechanical progress made on this farm see above, pp. 29-30.

in the rest. There were 22 agricultural implement makers and dealers scattered throughout the East Riding in the early 1870s.¹

The range of farm implements widened over the third quarter of the century, and there were improvements in the standard range of implements including ploughs, harrows, drills, and carts. All leading manufacturers had achieved a rough parity in the production of these latter by the mid-1850s² but there was a great deal of variation in the design and reliability of new products such as the reaper and mower. For example, there were 31 different cutting mechanisms throughout the range of reapers in 1855, though standardisation eliminated most of them in the following decade and the Bell Repear emerged as a model for the others.³ The principle of greater standardisation was applied widely by the close of the 1860s so ending "a period in which manufacturers had experimented with a wide variety of methods and devices ...".⁴

New machines like the reaper and hay maker found a place on a growing number of farms over the 1850s and 1860s and were generally accepted, small farms apart, by the mid-1870s. This growth was a product of several closely related factors. The farming community had begun to recognise the greater reliability, better performance and handling of farm machinery, partly because of practical experience and partly because agricultural societies and farmers' clubs had been active in disseminating

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1. Post Office Directory of the East and North Ridings of Yorkshire with the City of York (Kelly's Directors Ltd., 1872), pp.609-739.
 2. J. Almack, T. Scott and P. Stevenson, 'Judges Report on the Trial of Implements', Trans. Y.A.S. XVIII (1855), 34-42.
 3. C.S. Orwin and E.H. Whetham, op. cit. p.110.
 4. Ibid. pp.102-3.

information gathered from implements trials in the show field. The profitability of farming over the 'Golden Age' and the growing need to substitute capital for labour at harvest time were also factors in modifying farmers' attitudes about the usefulness of machinery, as was the growth and progress achieved within the agricultural engineering industry itself.

Two of these factors, the role of the engineering industry and show societies, will be examined in detail. The growth of the agricultural implements industry, and by implication the greater use of improved technology on the land, is seen in microcosm in the business career of William Crosskill of Beverley. Crosskill trained as a blacksmith and on the death of his father inherited a small blacksmith's shop in Butcher Row, Beverley. In 1825, in conjunction with Anthony Atkinson, he erected the first part of what was later to become the Iron Foundry. The business prospered and at one point employed 800-900 specialist craftsmen making, among other things, agricultural implements.¹ Crosskill's first technical success came with the clod crusher for which the Royal Agricultural Society awarded him prizes in 1843 and 1844 and its Gold Medal in 1846.²

The implements made at the Foundry extended over the farming spectrum and were recognised, both at home and abroad, for their high standard of craftsmanship. Crosskill, for example, was honoured at the Universal Exhibition in Paris in the early 1860s. Throughout the 1850s Crosskill's attention was focused on improving the design of the reaper and he had "the gratification of seeing his improved Bell reaping machine fully recognised as a standard implement".³

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1. Beverley Independent, July 14, 1888. At this peak level of employment, Crosskill was heavily involved with military contracts for the Crimean War and not all his men were working on agricultural implements.
 2. Farmers Magazine, July 1858.
 3. Ibid.

and built a new works at East Gate, Beverley, retiring shortly afterwards. Crosskill's achievements can be taken as an example of transformation within an entire industry. It was symbolic of maturity, quality, inventiveness, and improvement, and while others may not have been as successful, the generalisation still holds.

Farmers owed a considerable debt to local, district and national agricultural show societies as they tested implements and were committed to a policy of improving farm machinery. Many laid aside funds to reward successful manufacturers; all gave gold medals and a gold from one of the national societies was coveted by manufacturers as a symbol of excellence for their products. Exhibitions and trials of implements made it easier for farmers to find out which equipment was judged to be superior in each class, which was far better than purchasing equipment on the strength of market gossip and more practical than a personal tour of manufacturers' workshops and factories. Farmers were slow to take up machinery until they saw it working and until it was demonstrated to reduced costs compared with traditional methods. Agricultural show societies were involved in both these activities and made the results known to rank and file farmers, which was probably their main contribution to agrarian improvement.¹

The show ground also exposed manufacturers to the open gaze of the agricultural community. It encouraged competition between firms, especially at national shows, because of the wide attention given to their outcome. In this way societies probably helped to eliminate weaker producers more quickly, and establish higher technical standards all round, than might otherwise have been the case.² It would be a mistake to over play their

1. Hull Advertiser, August 3, 1859.

2. H.S. Thompson, 'Report on the Exhibition of Farm Implements at the York Meeting, 1848', Trans. Y.A.S. XI (1848), 24-5.

role in encouraging farm mechanisation, but they clearly influenced the adoption of new procedures and techniques by making the farming community aware of them, and by stimulating interest and evaluation.¹

2. Farm implements in the mid-nineteenth century.

In his report on farm implements at the Great Exhibition, Philip Pusey² divided them into the five classes of tillage, cultivation, harvesting, market preparation, and food preparation for stock. This division will be retained here. The range of implements considered extends beyond those used in the East Riding and refers to those used by English farmers as a whole, assuming they had the means to buy them and the soils and farm structure which suited their use. It can be assumed that all farmers in the East Riding, as elsewhere, used the basic implements of tillage, cultivation and harvesting, and that only the more wealthy or technically minded employed more sophisticated machinery such as the reaper, steaming apparatus for fodder, and the portable steam engine, though the use of these machines increased over the third quarter of the nineteenth century. Technical progress in the East Riding was rapid on the Wolds in the 1850s and 1860s, and gathered pace in the lowland districts in the following decade.

TILLAGE

(1) The plough was the oldest and most important instrument in arable farming. The 'old fashioned' plough, handed down from father to son, continued to be used extensively in 1850 but it was heavy and

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1. D. Metcalf, The Economics of Agriculture (1969), p.65;
F.E. Emery and O.A. Oeser, Information, Decision and Action (1958).
 2. P. Pusey, 'Report to H.R.H., the President of the Commission for the Exhibition on the Works of Industry of all Nations on Agricultural Implements', Trans. Y.A.S. XIV (1851), 51-90.

cumbersome. The first modern English plough was made by Ransomes; it rested on two wheels and had a mould board which could be adapted to suit different soils. Iron increasingly replaced wood, except on the lightest ploughs, and the wheel superseded the swing plough.

(ii) Rollers had been in common use for centuries but were usually only adaptations of tree trunks. By the 1850s "excellent rollers with iron cylinders" were marketed and were a great improvement over the make-shift methods of the past.

(iii) The 'clod crusher' developed by William Crosskill became one of the most popular instruments of tillage in the middle decades of the nineteenth century. It was used to break down turnip land that had been fed off by sheep in wet weather and afterwards baked in the sun, and also on crops of young winter wheat if the alternate action of freeze-thaw had left soils swollen and roots exposed.¹

(iv) Lavish claims were made by contemporaries about the savings associated with scarifiers, grubbers and cultivators. It was argued that a farmer on stock land could save half his entire labour expenditure (both men and horses) using the cultivator rather than the plough, but many observers remained unconvinced.²

CROP CULTIVATION

(i) The drill had achieved a fair amount of success by mid-century but many farmers still preferred to use the harrow and still others sowed their seeds broadcast. The general purpose drill was described as a "very complete instrument" and was capable of drilling, with or without

1. Ibid. p.56.

2. Ibid. pp.56-8; J. Almack, 'Report on the Trial of Implements at Bridlington', loc. cit. p.27.

manure, wheat, beans and turnips at intervals between 7 and 24 inches to suit individual crops and soils. The common drill economised on the spreading of manure by concentrating it in lines along the rows of turnip plants.

(ii) The horse hoe like many implements in active use at this time had been used by progressive farmers for generations. It was used to clear away young weeds, loosen the top soil and allow the air to circulate, hastening the action of rain and wind. Several products were marketed. Pusey preferred Garrett's version which was capable of cleaning four rows of turnips simultaneously, six of beans and nine of wheat, and roughly halved the cost of hand hoeing.

(iii) Wheat quickly exhausted 'weak' soils which had to be revived with guano or nitrates. Both manures were light and were liable to be carried away by the wind if spread by hand. Holmes of Norwich supplied a manure distributor which overcame this problem.

HARVESTING MACHINERY

The mechanical reaper was the most prominent exhibit in the agricultural section of the Great Exhibition. It had not been tried under English conditions at this time but several models were in competition with each other only a few years later, and many farmers in the light soil districts of the Eastern Counties had experimented with them. The majority of arable farmers came to recognise their efficiency, given suitable conditions, by the 1870s and 1880s.

FOOD PREPARATION

(i) The Royal Agricultural Society encouraged the use of portable steam engines in farming from the early 1840s arguing that they had several

advantages over conventional fixed steam engines. It was claimed that they reduced transport costs on large holdings as corn did not have to be moved to one central point to be threshed. Straw did not have to be transported over similar distances for conversion into manure and an intelligent use of a portable steam engine could cut the distance manure had to be carted back to the fields. The portable engine was also cheaper to run than the fixed engine.

(ii) The threshing machine¹ was the most complex piece of equipment in general use on British farms in the early 1850s. The common threshing machine was powered by four horses, three overcoming the resistance offered by the machinery and one horse in effect doing the threshing. Improved machinery was available. Garrett's machine reduced the dead resistance of the mechanism to two horse power but Crosskill's was generally preferred even though it offered slightly more drag: it was considered to be easier to work and to perform its task more effectively. The cost of threshing a quarter of grain was 2s. using horse driven machinery, 9d. using steam power and 3s.4d. by hand.

(iii) Winnowing machinery was replacing the ancient method of separating wheat from chaff by casting before the wind.²

PREPARATION OF FOOD FOR STOCK

Stock were fed on hay or were turned out to pick up straw in the fields. Sheep were sometimes fed on whole turnips but this type of feeding

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1. A useful background to the innovation of the threshing machine in Britain appears in S. MacDonald, 'The Progress of the Early Threshing Machine', Agric. Hist. Rev. XXIII (1975), 63-77.
 2. P. Pusey, 'Report ... on Agricultural Implements', loc. cit. pp.82-8.

did not maximise their rate of fattening as the action of chewing used up energy which otherwise might have improved their fattening qualities. Turnip cutters were introduced to overcome this and were taken up widely by farmers believing that cutters added an extra ls. to the price of lambs. Chaff cutters helped to shred straw and steaming apparatus cooked fodder, but this latter was used mainly by the interested aristocrat or the larger farmer.¹ Steaming fodder was in its infancy and the machinery used was often unreliable. This was the experience of the East Riding landowner, Joseph Dunnington-Jefferson. He installed machinery in the autumn of 1860 to steam turnips and potatoes, which it did efficiently, but it was "perfectly useless" at steaming chaff for large numbers of cattle for which it had been installed.²

* * * * *

This does not exhaust the equipment available to farmers taking all five categories of agricultural implements and machinery. There were other devices with more specialist functions but this listing demonstrates the variety and range of implements at the beginning of the 1850s. However, it must be stressed that wealth and skill imposed limits on the extent to which many of these could be taken up by the average farmer.

3. Implements and machines on East Riding farms, 1850-80.

Agriculture is a very broad industry covering the raising of crops and livestock; it is also a seasonal industry giving farmers and labourers a variety of tasks to be performed at different times throughout the year.³

1. Ibid. pp.89-90.

2. Dunnington-Jefferson MSS, E.R.R.O. DDJ/40/5.

3. This variety is demonstrated very precisely in G.E. Fussell, Farming Systems from Elizabethan to Victorian Days in the North and East Ridings of Yorkshire (1946), pp.26-8. Sledmere estate records are also useful in showing the diversity of farm jobs.- Sledmere Estate MSS, Labour Journal, E.R.R.O. DDSY/98/56.

This variety meant that nineteenth century farmers and labourers had to be skilled not only at many different tasks but also in the use of a broad range of tools. All working farmers above the level of allotments holders had to have implements and machines to lighten their working loads and meet the requirements of day to day farming. A large mixed farm of 400 acres could be expected to have about £500 of equipment in the mid-1850s¹ and a medium sized farm to have only slightly less.

Equipment varied according to district and the wealth of individual farmers. Every tillage farm had a plough and improved ploughs became more common on East Riding farms over the third quarter of the century. The two horse swing plough had been general on the Wolds up to 1840 but the superior two wheel plough, such as the model made by Ransomes, replaced it over the 1850s and 1860s.² Wooden ploughs continued to give way to metal ploughs as metal became cheaper and its quality improved; hand-forged wrought iron gave way first to cast iron and then to steel in the 1860s and 1870s.³ Steam ploughing was tried on some of the heavy clays of the Vale of York and Holderness but without much success. Philip Saltmarsh showed some interest in steam ploughing in the mid-1850s⁴ and several landowners in Holderness experimented with it in the late 1850s.⁵ Lord Wenlock and fellow landowners in the Vale of York invested in it later in the period⁶ but high costs (a steam plough cost between £250 and £300) hindered development, as did the widely held view that steam ploughing did

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1. J.C. Morton, ed. Morton's Cyclopaedia of Agriculture (1855), p.378.
 2. W. Wright, op. cit. p.126.
 3. C.S. Orwin and E.H. Whetham, op. cit. p.107.
 4. Saltmarsh MSS (unclassified, Hull Central Library).
 5. W. Wright, op. cit. p.125.
 6. Wenlock Estate MSS, E.R.R.O. DDFA/37/19.

not repay the investor as quickly, or with as much certainty, as other farm investments.¹ Steam ploughing was not used on the Wolds because farmers rarely ploughed at a depth greater than 4 inches and more traditional methods were adequate for their purpose.

Several less expensive implements made progress on East Riding farms in this quarter century. Coleman's and Benthall's scarifiers were popular and were used by improving farmers over the 1850s and 1860s. Seed drills, including the liquid manure drill, were fairly common by the middle of the century and the practice of sowing seeds broadcast had been abandoned entirely on the Wolds by 1860.² The turnip cutter was taken up widely and the practice of bruising oats and beans, and cutting chaff by machinery, was general throughout the county by the 1860s; machinery for pulping roots was also used on many farms by this time.³

Threshing and mowing machinery was more expensive. Steam was shown to be an economic source of power for jobs such as threshing by 1850⁴ and the portable steam engine was acclaimed for its usefulness and efficiency at the Yorkshire Agricultural Society's meetings at Thirsk in 1850 and Bridlington in 1851. The effects of these awards on Yorkshire farmers, together with the effects of greater experience in applying steam to threshing, is shown up in the business records of a firm of agricultural implement makers, Messrs. Clayton and Shuttleworth. They sent three portable steam engines to Yorkshire in 1850, 12 in 1851 and 70 in 1852 and "Since then their use has become general; and where farms are not large enough to keep an engine there is an ample supply of locomotive engines with the threshing machines to be let for hire".⁵

1. W. Wright, op. cit. p.125.

2. Ibid. p.126.

3. Ibid.

4. C.S. Orwin and E.H. Whetham, op. cit. p.103.

5. W. Wright, op. cit. p.126.

William Wright reported the widespread use of haymaking or mowing machinery in Yorkshire by 1860¹ but this assessment was probably too optimistic, though it would be accurate for large arable farms by the late 1860s and early 1870s.² Mowing machines had certain advantages over traditional methods, particularly in speed, but their reliability was questionable until the late 1860s. Early machines did their work reasonably well but they were heavy and cumbersome; machines were then built lighter but at the expense of efficiency and durability, and it was not until the late 1860s that machines were heavier and stronger and could cut grass efficiently.³ Mowing machinery was expensive but could be hired from any of 13 specialist firms in the East Riding,⁴ so extending its use to small and medium-sized farmers. The reaper was another expensive item (£25 - £40) which came into more or less general use over the third quarter of the nineteenth century; its innovation is considered in detail later in this chapter.

The general point of the cost of agricultural machinery can be taken up usefully here as it affected the variety and quality of the average farmers' tools. Farming authorities were concerned at the cost of even simple implements like the liquid manure cart which cost £25 in the mid-1840s⁵ and the Norwegian Harrow which cost £26,⁶ and there were veiled suggestions in the 1850s that the Council of the Yorkshire Agricultural Society would take the price of implements into consideration

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1. Ibid.
 2. C.S. Orwin and E.H. Whetham, op. cit. pp.113-4.
 3. H.B. Caldwell, R. Kay and J. Coleman, 'Report on the Exhibition and Trial of Implements at the York Meeting, 1866', Trans. Y.A.S. XXX (1867), 28.
 4. Post Office Directory of the East and North Ridings of Yorkshire with the City of York (Kelly's Directories Ltd., 1872), p.724.
 5. 'Trial of Implements', Trans. Y.A.S. VII (1844), 31.
 6. J. Almack, 'Report on the Trial of Implements at Bridlington', Trans. Y.A.S. XIV (1851), 29.

when arranging its prize lists.¹ The high price of many agricultural implements and machines often made it impossible for small farmers to use improved equipment, but farmers on the whole did improve and add to their equipment over the third quarter of the nineteenth century.

4. The innovation of the reaper in the East Riding.

The appearance of the reaper in the corn fields of eastern Yorkshire was slow and cautious and attended by much controversy. Harvesting machinery was first used in the Drifffield area in 1851, but most farmers showed little interest and only two were reported to have experimented with it.² An insight into the thinking of Yorkshire farmers on this issue was given in the speeches following the Yorkshire Agricultural Society's annual dinner in August, 1852. Some speakers argued that reapers would find a place in the harvest field but thought it was too early to say precisely what it would be. Others like the North Riding squire H.S. Thompson were more specific. He thought machinery was "quite equal to cutting standing corn, even if it was very heavy grain" but was ineffective cutting crops laid close to the ground by rain or hail. Several farmers dismissed reapers altogether stating the commonly held belief that ten men and a boy were required to operate them, that they saved the farmer only 1s. an acre over traditional methods and were therefore a poor investment.³

The debate on the usefulness of reapers continued throughout the 1850s but their economic value had been proven to the satisfaction of a large number of Wold farmers by the end of the decade. The use of reapers increased on the chalk uplands as design and handling problems were overcome

1. Ibid. p.35.

2. Hull Advertiser, January 16, 1852.

3. Ibid.

by experience and further experimentation. Labourers were unaccustomed initially to the reaper's action and this resulted in numerous breakdowns.¹ It is difficult to gauge the importance of reapers by the end of the 1850s. They had had little impact on the lowlands though William Wright suggested that the scythe was giving way to them on the Wolds, just as the sickle had given way to the scythe at the end of the 1840s.² This may exaggerate the change. The Hull Advertiser reported that reapers had been at work on several farms around Driffield during the 1859 harvest,³ which implies a far from general use.

Reapers were innovated rapidly on the Wolds in the 1860s. They were reported to be in "considerable demand" and "much used" by the middle of the decade,⁴ and a man with a scythe was described as a rarity by 1869, "reaping machines having rendered both the scythe and sickle nearly useless".⁵ There was a sharp increase in the use of reapers throughout the East Riding in the early 1870s. They were used widely in Holderness and were in greater demand on the Wolds in 1870 than in any previous harvest, almost no cutting operation being done by the scythe.⁶ Roughly half the Yorkshire harvest was cut mechanically.⁷ The reaper was in general use in Howdenshire and Holderness by 1871 and several models had been designed for the small to medium-sized farmer.⁸ Their rising popularity was noted by a correspondent of the Driffield Times in 1873:

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1. Ibid. October 6, 1858.
 2. W. Wright, op. cit. p.103.
 3. Hull Advertiser, August 13, 1859.
 4. Ibid. August 27, 1864; August 19, 1865.
 5. Hull and Eastern Counties Herald, August 19, 1869.
 6. Ibid. September 1, 1870.
 7. Ibid. August 18, 1870.
 8. H.B. Caldwell, R. Kay and J. Coleman, 'Report on ... the York Meeting, 1866', loc. cit. p.39.

Last year there were many small farmers who did not use a machine. Most of these have now employed a reaper, of which there are so many admirable kinds manufactured in this Country, capable of being worked by a single horse at a time, and cutting from 80 to 100 acres of grain in a fortnight ... ¹

This also applied to large grain producers. The same correspondent continued:

Large occupiers ... as a rule, did not make a practice of reaping all their crops with machinery. A portion was usually mown by scythes, and some also cut by contract at so much per acre by travelling harvesters. [This lapsed and] where one large and powerful reaper was used last year, two in most cases have been employed this year; and the result is that in eight or ten days the whole crop is now cut on the largest occupations. The increasing use of machinery this harvest is a fact which every market and implement maker will testify; and we have reason to believe that the extent of the land cut by such machinery is more than double the amount so reaped in any previous year.

Farmers had come to accept that reapers were more efficient and less costly to operate than traditional alternatives, that they worked with greater speed and used less labour which was becoming increasingly scarce at harvest time.

The lower operating costs of reapers were recognised by some farming experts quite early after their introduction. In 1851 Philip Pusey estimated that the reaper, if used properly, could save the farmer 5s.10d. an acre over the scythe, its most efficient alternative. The cost of reaping 15 acres of corn using the scythe was estimated at 9s. an acre, or £6.15.0 in total, whereas the cost using the reaper was 3s.2d. per acre - £2.7.6 in all - including the cost of labourers, horses and binding.² The financial advantages of the reaper were substantial on this reckoning

1. Drifffield Times, August 30, 1873.

2. P. Pusey, 'Report ... on Agricultural Implements', loc. cit. p.69.

though the precise advantage depended on labour costs, which varied between different parts of the country, and on the suitability of farms for mechanisation. The real saving associated with reapers may have increased as their efficiency rose over the middle decades of the century; alternatively, it may have helped to offset part of the burden of higher harvest wages.

Increased efficiency and reliability were the most important technical criteria encouraging the innovation of reapers. Machines often broke down at first because of clumsy handling and because they were ill-adapted to English conditions, corn crops being much heavier than in the Mid-West where they had been pioneered. These problems were overcome by the 1860s and it was reputed that the modified Bell reaper was able to "charge into a standing crop and cut a road in any direction without assistance of manual labour to prepare a space".¹ It was this model incidentally which had become standard on the Wolds. Speed was another component in the technical success of reapers as harvesting could be got through quicker, and better use could be made of short spells of dry weather.

The state of the crops being harvested was an important non-technical factor in the innovation of reapers. Contemporaries recognised a correlation between fine upstanding grain crops and the demand for machinery. The Hull Advertiser noted the association in 1864 and 1865,² and the Hull and Eastern Counties Herald commented in September 1869 that:

The reaper has this season, in consequence of the crops not having been broken down, been brought into more general use than at any previous harvest.³

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1. H.B. Caldwell, R. Kay and J. Coleman, 'Report on the Exhibition and Trial of Implements at the York Meeting, 1866' Trans. Y.A.S. XXX (1867), 37.
 2. Hull Advertiser, August 27, 1864; August 19, 1865.
 3. Hull and Eastern Counties Herald, September 2, 1869.

Crops which were light in straw, dry and stood erect on firm ground, encouraged farmers to mechanise while laid crops usually required the scythe or sickle. Not all farmers of course had sufficient capital to purchase reapers outright for a small model cost around £18 and a large one £40,¹ but they could be hired cheaply and this extended their market quite considerably.

The increasing scarcity of harvest labour and its rising cost was probably the most powerful motive for using harvesting machinery. The rural labour market was stocked adequately for most farming operations but shortages did appear at harvest time.² As early as 1852 several farmers on the Wolds were predicting the widespread introduction of machinery "as the harvest was very heavy, but with few hands to work".³ In 1858 they were predicting a "still more rapid" rate of introduction "owing to the price of labour during the harvest".⁴ Shortages were much more acute by the 1870s and harvest machinery was brought into general use throughout East Yorkshire in response to it. Immigrant Irish workers, at one time so plentiful during harvest, were no longer as numerous, especially on the Wolds,⁵ and harvest wages rose as a result. This forced the majority of farmers to seek labour saving alternatives.

This combination of circumstances, taken in the context of fuller technical information available through agricultural societies, encouraged

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1. 'Report on the Trial of Implements at the Rotherham Meeting, August 1856', Trans. Y.A.S. XX (1857), 35; H.B. Caldwell, R. Kay and J. Coleman, 'Report on ... the York Meeting, 1866', loc. cit. p. 37.
 2. See below, pp. 354-9.
 3. Hull Advertiser, August 13, 1852.
 4. *Ibid.* October 6, 1858.
 5. The Wolds had gone over to the scythe in the 1840s. Irish labour was more accustomed to the sickle and tended to avoid areas using the scythe.

farmers to invest in harvest machinery or up-grade more traditional technologies in the "hand-tool revolution" described by E.J.T. Collins.¹ But this does not explain the geographical unevenness of innovation or the time lags in innovation from district to district. Two factors were important here: the state of the labour market and the technical efficiency of farms.

Where labour was relatively plentiful as on the lowlands of the East Riding, the need for economy was less than in regions of labour scarcity such as the Wolds. This imbalance of population was a product of the comparative lateness with which the Wolds were brought into active cultivation. Harvest wages were higher on the Wolds than in the lowland districts² and labour saving technology was more sought after. A strong need to mechanise the harvest fields of the Vale and Holderness was not felt until steeply rising harvest wages forced the issue in the late 1860s and especially in the early 1870s.

Several contemporaries recognised the correlation between the physical characteristics of a district and its capacity to 'absorb' new farm machinery. Large fields and flat even surfaces, for example, were noted as factors in the speedy introduction of reapers on the Wolds.³ The mechanisation of the harvest was smoothest where the spirit and physical condition of arable farming was well advanced. Where the farm environment was compatible with advanced agricultural technology the return on investments in it was invariably higher than where farms were out-moded and possibly drained badly, and where districts were dominated by small farms

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1. E.J.T. Collins, 'Harvest Technology and Labour Supply in Britain 1790-1870', Econ. Hist. Rev. 2nd Ser. XXII (1969).
 2. See below, pp. 356-7.
 3. H.B. Caldwell, R. Kay and J. Coleman, 'Report on ..., the York Meeting, 1866', loc. cit. p.37.

and tiny enclosures. The relationship between farm size and the innovation of the reaper is discussed below.

Fields on the Wolds were generally much larger than in the lowland areas. A sample of arable and pasture fields on the Sledmere Estate in 1854 showed that 20 per cent of fields were 9 acres or less, 61 per cent were 10-29 acres, 9 per cent were 30-39 acres, 7 per cent were 40-79 acres, and 3 per cent were 80 acres or more in size.¹ The size of fields outside the Wolds varied from parish to parish but no detailed evidence has survived for the great mass of medium and small farms which dominated the area. A somewhat restricted insight into size structures on the plain is given in the records of the Maxwell-Constable estate at Everingham.² In the early 1860s 17 per cent of fields on this estate were 9 acres or less in size, 70 per cent were 10-19 acres and 13 per cent were 20-29 acres. This was still larger than most fields in the heart land of the Vale of York for then, as now, a much larger proportion of fields were concentrated in the lowest size interval.

Operating costs associated with machinery were higher in this type of environment compared with the more spacious Wolds. Delays were caused by machinery bogging down in ill-drained corners of fields and by continual dismantling for movement between small enclosures. Less time was taken up in short turnings and there fewer "convenient loitering places" for labourers where fields were larger.³ Generally speaking returns per acre were lower where enclosures were small and inconvenient, and a greater acreage had to be reaped to reach a break-even point than in more 'efficient' districts. This factor, taken in conjunction with the uneven distribution

1. Sledmere Estate MSS, E.R.R.O. DDSY/4/247-60.

2. Everingham Estate MSS, E.R.R.O. DDEY/61/12.

3. La Vern Hoelscher, 'Improvements in Fencing and Drainage', p.75.

of agricultural labour, has continued to determine the rate of mechanical innovation down to the present. The combined harvester, for example, is still used less frequently on the Vale of York than on the Wolds partly because of the unequal importance of corn in the two regions and partly because of fundamental differences in their respective farming landscapes.¹

A summary of mechanical progress over the middle decades of the nineteenth century.

Mechanical progress involved the more thorough assimilation of the older technologies and the introduction and establishment of new ones. The first tended to up-grade equipment in common use by rank and file farmers while the second heralded the beginning of a mechanical revolution which was ultimately to challenge the motive power of the horse. It is this latter, focused on the reaper, which has largely concerned us here.

The uneven rate of mechanical innovation between upland and lowland districts of the East Riding comes out strongly in this study. It reinforces the thesis of technical inter-relatedness² but also introduces, and makes out a strong case, for the effect of labour supply on mechanical innovation. This latter may have been the more potent force. Demand for mechanisation was fairly weak in most lowland districts when labour was plentiful and only strengthened when labour became scarce. The innovation of machinery - reapers, steam engines³ and the like - then speeded up in spite of the historical legacy of an obsolete landscape.

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1. W. Harwood Long, A Survey of Yorkshire Agriculture (1969), p.39.
 2. P. David, 'The Landscape and the Machine: technical inter-relatedness, land tenure and the mechanisation of the corn harvest in Victorian Britain' pp. 145-81, in D.N. McCloskey, ed. Essays in a Mature Economy: Britain after 1840 (1971).
 3. Steam engines were unimportant in the East Riding in the 1840s.- S.C. on Agricultural Customs (1848), Q.2596. Steam threshers were tested on the Wolds in the early 1850s.- Hull Advertiser, October 31, 1851; February 20, 1852. Steam threshing was established firmly by the 1870s and companies such as the York District and Cultivation Company were engaged full-time hiring out steam engines to farmers in the county.

This study demonstrates a strong business sense behind investment in new equipment and adds weight to the view that farmers were gaining in professionalism and were more commercially oriented in their approach to husbandry. They were certainly more aware of events and developments occurring outside the parish. If a 'revolution' is to be found anywhere in the agricultural annals of this period it is more likely to be found in the increased information being made available to farmers, and the manner in which they acted upon it, than in the practical achievements themselves.

PART 3: Agricultural

prices and supply responses

CHAPTER SIX

AGRICULTURAL PRICE TRENDS IN THE EAST RIDING, 1850-90.¹

1. The national basis for the price differential between cereal and livestock products, 1850-80.

Demand for agricultural products strengthened over the second half of the nineteenth century and for the first time the majority of Britain's population began to derive some of the advantages of industrialisation and to lift themselves above bare subsistence, though it is well to bear in mind that one-third remained in poverty in 1900² and that the poor health of the nation caused alarm when the Inter-Departmental Committee on Physical Deterioration gave its report in 1904.³ But living standards had increased for the majority. Changing little down to the mid-1860s, except where there was a movement from lower to higher paid employment as in the case of the farm worker who moved to the town, real incomes grew rapidly thereafter and doubled between the early 1850s and the first decade of the twentieth century.⁴

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1. The analysis has been extended down to 1890 to quantify some of the aspects of price change over the depression years of the last quarter of the nineteenth century. The broader perspective is useful in analysing the response made by farmers to changing prices. The analysis is extended down to 1890 in chapters 6, 7 and 9.
 2. C. Booth, Life and Labour of the People of London (A.M.S. edn, 1970), 8, pp. 1-15; B. Seebohm Rowntree, Poverty: A Study of Town Life (1901), pp. 86-118.
 3. B.B. Gilbert, The Evolution of National Insurance in Great Britain (1966), pp.83-91.
 4. Nominal and Real Wages (after A. Bowley). (1900-14 = 100)

Period	Nominal Wage	Real Wage	Period	Nominal Wage	Real Wage
1850-4	55	50	1875-9	80	65
1855-9	60	50	1880-4	77	65
1860-4	62	50	1885-9	79	75
1865-9	67	55	1890-4	87	85
1870-4	75	60	1895-9	92	95
			1900-14	100	100

Source: G.D.H. Cole, A Short History of the English Working Class Movement, 1789-1947 (1947), p.274.

The average industrial wage earners' receipts increased by 48 per cent between 1850 and 1886, assuming no periodic redundancy, while those who continued to work on the land increased their earnings by 30 per cent.¹

The agriculturalists' prosperity seemed to be based firmly and permanently on rising real incomes, rapid population growth and refinements in the transport system associated with the railway. It was felt that demand would press against supply and food prices would continue to rise. However, there were signs, even before the 1870s, that not all food prices responded equally to the general buoyancy of the market. Grain prices rose weakly and wheat prices actually fell, while livestock and dairy prices moved upwards until the mid-1880s. These latter, with the exception of cheese, increased by over 25 per cent between the 1850s and 1870s taking the country as a whole; wheat prices fell by 7 per cent over the same period and oat and barley prices rose by 7 and 10 per cent, respectively.

Table 6.1. Relative price movements in English agriculture: Arable and livestock products, 1851-80.

	1851- 55	1856- 60	1861- 65	1866- 70	1871- 75	1876- 80	Movement 1871-80 as percentage of 1851-60
Wheat	103	98	87	100	100	87	-7.0
Barley	82	98	86	101	103	95	10.0
Oats	90	87	87	101	104	96	7.0
Beef	77	85	87	94	110	103	31.0
Mutton	80	88	93	93	108	105	27.0
Cheese	75	86	84	102	97	85	13.0
Milk	65	84	82	89	91	111	36.0

Source: E.L. Jones, The Development of English Agriculture, 1815-73 (1968), p.21.

Price changes were of a similar magnitude in the East Riding. The average price increases in wheat, oats, barley, beef and mutton

1. J.H. Clapham, An Economic History of Modern Britain (1952 edn), III pp. 450-53.

between 1851-60 and 1871-80 were -4.7, 5.9, 12.3, 31.1, and 33.1 per cent, respectively.¹

Movements in the price of wheat did not set the direction of agricultural prices generally as in the 1840s and earlier. Demand for agricultural products continued to increase and the per capita consumption of wheat in the United Kingdom increased by about 10 per cent between 1851-70 and 1871-80, while the consumption of meat increased by a little over 3 per cent. However, the rate of increase in wheat consumption had slowed down by this time in contrast to meat consumption which continued to rise.² Engel's law shows that the proportion of income spent on food decreases as real living standards rise, other things remaining constant, and suggests that less is spent on bread and more on what were regarded formerly as semi-luxuries such as meat, dairy produce and fruit (the banana became popular from the 1870s).³

How far social expectations were changed, and in turn, how far these were reflected in changes in the composition of household expenditure, depended on how much the average family thought its economic condition had improved. It also depended on the economic priorities of the family. In some households a higher priority would be given to improving accommodation while improving diet would take precedence in others. Possibly the majority distributed their larger purchasing power across all or most of the alternatives open to them. A small improvement in diet (the head of household may have had bacon twice or three times a week instead of once), was in the aggregate a sizable enlargement of the effective demand for

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1. These prices were computed from the Hull Corn Market and from livestock centres at Drifffield, Hedon and Beverley. See below, pp. 142-5.
 2. The per capita consumption of wheat increased by over 25 per cent between 1831-50 and 1851-70.- S. Pollard and D.W. Crossley, The Wealth of Britain (1968), p.218.
 3. E.J. Hobsbawm, Industry and Empire (1970), p.162.

livestock products. James Caird estimated in the 1840s that "not more than one third of the people of this country consumed animal food more than once a week. Now he was writing in 1878⁷ nearly all of them eat it every day ..."¹ This was somewhat exaggerated and needs cautious interpretation as national consumption patterns are generally stable over medium time spans unless the conditions of supply are changed radically.² However, this does not deny the importance for the livestock industry of even marginal increases in demand for animal foodstuffs.

The undeflated value of cereals and animal foodstuffs imported into the United Kingdom increased from a little under £26 millions in 1858 to a little over £100 millions in 1879.³ The volume of imported meat doubled in the 1870s alone; imports of butter, cheese and wheat increased by one-third; imports of other cereals doubled. These developments did not depress meat and dairy prices because demand for better quality foodstuffs continually pressed hard against supply throughout the mid-Victorian period. Demand was more elastic and market conditions were more favourable to growth.

Demand for grain was less elastic. This applied particularly to bread grains following the principle enunciated in Engel's law; it did not apply to barley and oats to the same extent and a perceptible price differential emerged between them and wheat. One of the main reasons for this was that the livestock industry grew throughout the 'Golden Age' and barley and oats, unlike wheat, were important fodder crops which could be

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1. J. Caird, 'A General View of British Agriculture' J.R.A.S.E. 2nd Ser. XIV (1878), 289.
 2. A modern illustration of this point is the very marginal changes in per capita meat consumption in Europe and North and South America between 1939 and 1959-61. Per capita meat consumption changed little over this quarter century even though per capita incomes increased. The ranking of the various countries analysed on a world scale of per capita meat consumption was basically unchanged.— M. Capstick, The Economics of Agriculture (1970), p.62.
 3. J. Caird, The Landed Interest and the Supply of Food (1967 edn), pp.2-5.

used up in the normal course of mixed husbandry. It was also possible to sell a good malting sample of barley to local breweries and this again helped to maintain its price. A further factor in the price differential was the larger volume of internationally traded wheat compared to other cereals. This encouraged wide fluctuations in wheat prices as the level of trade varied and helped to depress its price in the long term.

2. Movements in the price of certain key agricultural commodities in East Riding markets, 1850-90.

Price data on agricultural commodities in the East Riding have been compiled from local newspaper reports on weekly trading in cereals and livestock products in several of the county's market towns. Prices varied only slightly between the different market centres and no attempt will be made to identify price differentials at a district level. Differences between local and national agricultural prices were greater but the margin was not substantial except in the odd year.

The prices quoted in this analysis are September averages and should not be confused with national yearly averages, though they are not greatly different. They have been used in this study partly because the data required could be assembled easily, partly because of precedent (Beveridge used September cereal prices)¹, and partly because of their usefulness in comparing and measuring price movements over time.

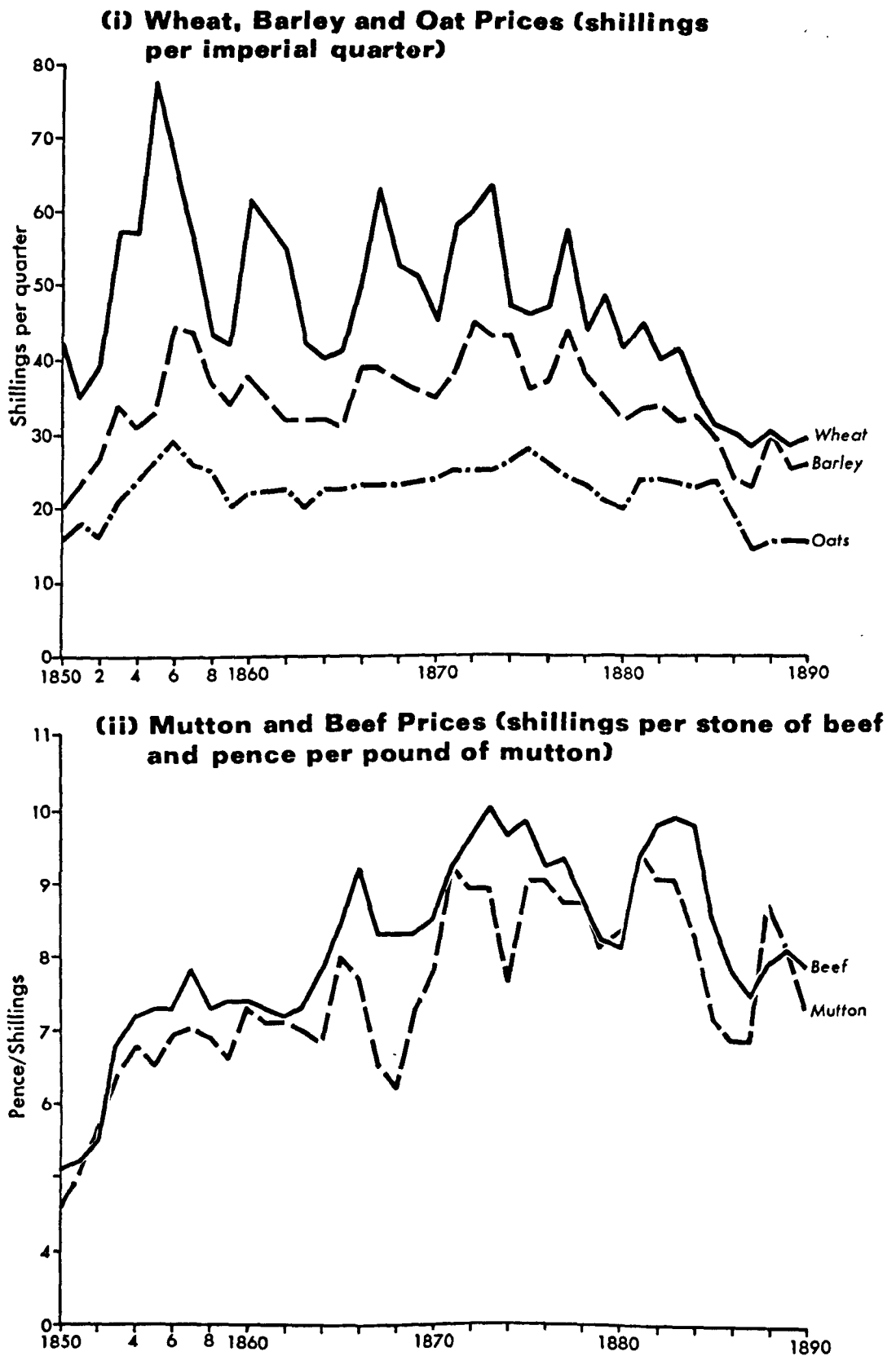
1. W. Beveridge, Prices and Wages in England from the Twelfth to the Nineteenth Century (1939).

Table 6.2. Cereal, beef and mutton prices in the East Riding, 1850-90.

(1865-74 = 100)					
Year	Wheat	Oats	Barley	Beef	Mutton
1850	79	67	52	57	59
1851	66	74	60	58	64
1852	73	66	70	63	73
1853	108	88	87	76	82
1854	107	100	79	81	87
1855	147	111	92	82	83
1856	125	120	113	82	88
1857	107	106	111	88	90
1858	81	104	95	82	88
1859	79	87	88	83	85
1860	117	91	97	83	94
1861	108	91	88	82	91
1862	102	93	82	81	91
1863	78	85	82	82	90
1864	75	93	82	88	87
1865	77	93	80	84	104
1866	96	95	99	103	99
1867	120	95	101	93	83
1868	98	95	96	93	79
1869	95	99	92	93	94
1870	84	100	90	96	100
1871	109	104	97	103	118
1872	114	104	115	103	114
1873	119	104	111	112	114
1874	88	108	110	103	97
1875	86	118	93	110	115
1876	88	104	96	103	115
1877	108	100	113	104	115
1878	82	94	97	99	112
1879	91	87	87	92	104
1880	78	83	83	91	106
1881	84	90	87	101	113
1882	75	90	84	110	115
1883	78	89	83	111	115
1884	66	87	85	110	106
1885	59	89	76	101	94
1886	57	77	62	88	88
1887	54	60	60	83	88
1888	56	64	78	89	106
1889	54	64	66	91	104
1890	57	66	69	91	104

Sources: Weekly trading reports in local press, especially the Hull Advertiser, 1850-5, the Beverley Guardian, 1856-80, and the Hull and Eastern Counties Herald, 1879-80. Cereal prices are quoted for the Hull Corn Market and the Beverley Corn Market. Beef and mutton prices are based on prices in the Driffield fatstock market. The computed price averages are based on September prices and have been averaged and then rounded up or down as follows: 0.5 and above was rounded up and 0.4 and below rounded down.

**Figure 6.1 Grain and Livestock Prices
in the East Riding, 1850-90.**



Constructed from weekly trading reports in local press (listed for Table 6 2).

A linear trend was fitted to each data set shown in Table 6.3 using the least squares method.¹ Annual movements in the price of wheat, oats, barley, beef, and mutton over the three decades after 1850 were calculated from trend values and were estimated at -0.4, 0.5, 0.3, 1.4, and 1.5 per cent, respectively. This amounted to changes of -12.4, 15.0, 9.0, 42.0, and 45.0 per cent respectively by 1880, and confirmed the differentials previously noted. The grip of cereal depression tightened in the 1880s and began to affect livestock and dairy producers from the middle of that decade. Cereal and livestock prices dipped steeply in the 1880s and the annual rate of fall in wheat, oats, barley, beef, and mutton prices over the decade was -5.36, -3.63, -2.71, -1.85, and -1.74, respectively.

The scatter of data points about the linear trend reflected cyclical and non-cyclical influences. They are identified in Figure 6.2 i-v and the cyclical movement in prices is calculated in Table 6.3.

-
1. Price data, like data for any major economic indicator arranged in time series, are liable to show marked fluctuations from year to year. These fluctuations must first be averaged out to observe and quantify overall movements. A convenient way of doing this is using the least squares method to calculate the linear trend. This gives a line which passes closest to each of the data points in the series and is the most appropriate line to represent the long term trend. It is calculated in two stages:

- (i) The intercept (ie. the point at which the regression line cuts the vertical or 'y' axis of the graph) is calculated using the following formula.

$$a = \frac{\Sigma Y - \Sigma b X}{N}$$

where 'a' is the intercept, 'Y' the data values, 'X' the time units around 1850, 'b' the slope of the line and 'N' the number of years analysed.

- (ii) The slope of the line is calculated using the formula

$$b = \frac{N \Sigma XY - (\Sigma X)(\Sigma Y)}{N \Sigma X^2 - (\Sigma X)^2}$$

The symbols represent the same values as in (i). The 'least square' approach is more accurate in calculating growth rates than alternatives such as using the first and terminal years within a series or the first and terminal decades because it makes use of all available data.

Table 6.3. Annual rates of change in East Riding farm prices, 1850-90.¹

	1850-9	1860-9	1870-9	1880-9	1850-90	1850-80
Wheat	2.3	-0.8	-1.6	-5.3	-1.1	-0.1
Oats	4.7	0.9	-1.2	-3.6	-0.4	0.5
Barley	6.6	1.0	-0.6	-2.7	-0.2	0.3
Beef	4.6	2.1	-0.5	-1.9	0.8	1.4
Mutton	3.9	-0.6	-0.1	-1.7	0.8	1.5

Source: As in Table 6.2.

The price of wheat, barley, oats, and beef rose strongly during the Crimean War and mutton prices rose moderately. Grain prices peaked between 1855 and 1856; wheat reached 57s. per imperial quarter on the Hull Corn Market in 1853 and 1854, 78s. in 1855 and 67s. in 1856. Prices then fell rapidly. Wheat sold for 57s. per quarter in 1857 and for 42s. and 43s. in 1858 and 1859; the price of barley peaked in 1856 when it reached 44s. per quarter; oat prices peaked in the same year reaching 29s.² Livestock prices increased but the movement did not parallel that in grain. Price levels were soon restored from the low levels of the early 1850s and the average price of a stone of beef in the Drifffield Fatstock Market was 7s.4d. in 1854, which continued almost unchanged until the second half of the 1860s apart from a slight peak of 7s.9d. in 1857. The absence of a wartime peak seems unusual but it was also absent from the mutton price series, where again there was a minor peak in 1857 when prime mutton reached 7d. per pound.³ Price movements in the livestock market, though not unaffected by the war, were affected mostly by recovery from the Post Repeal depression and buoyancy in the home market for meat and dairy products over the following 25 years. This view is supported

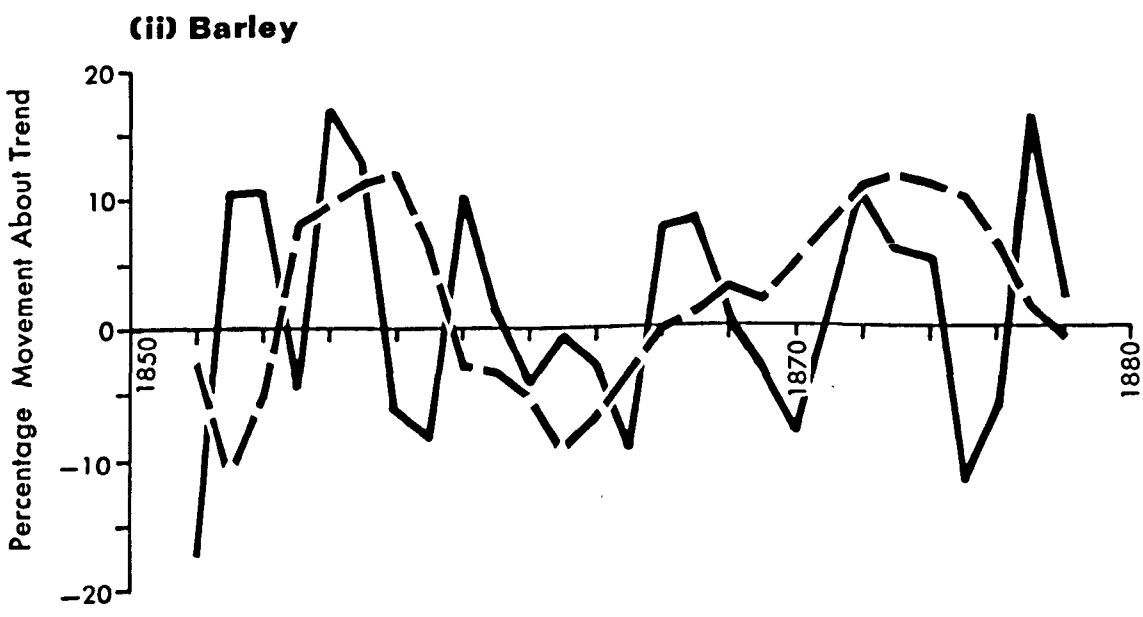
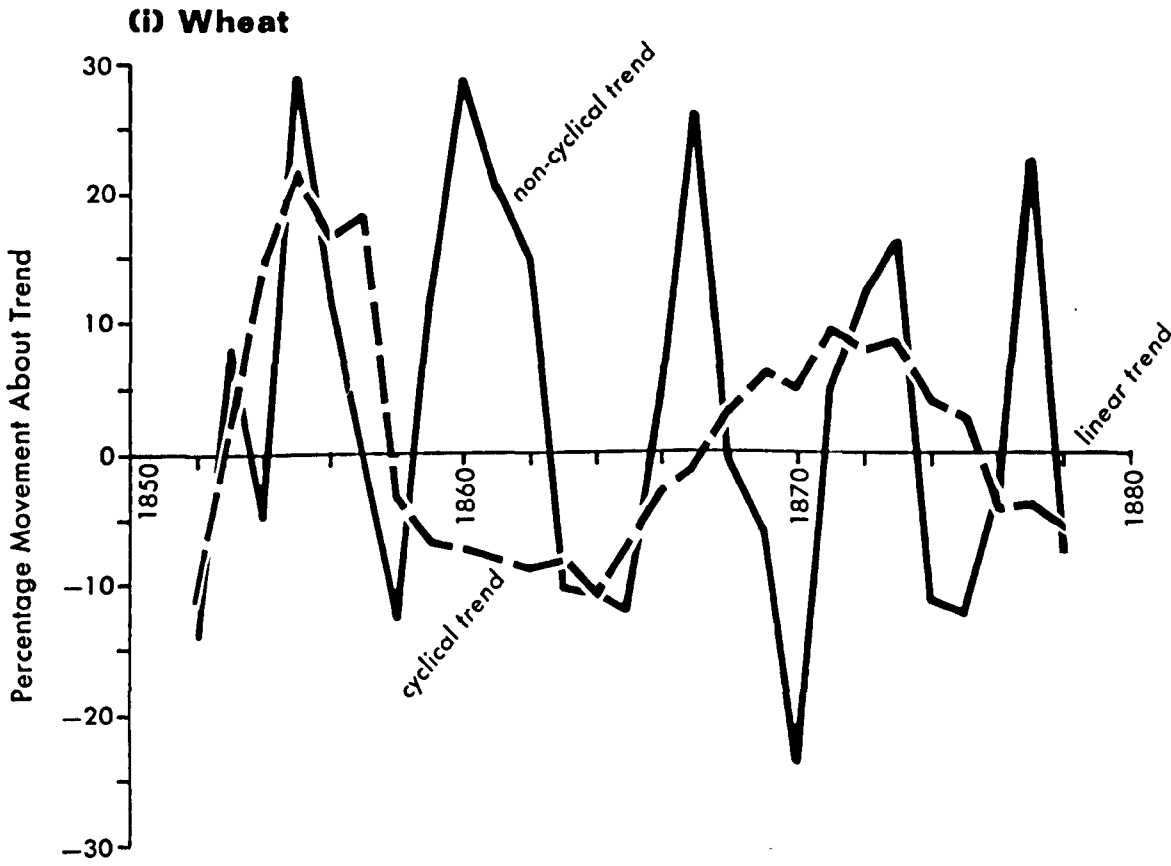
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1. The upward trend in each series in the early 1870s was less than the downward movement in the second half of the decade.
 2. Cereal price trends at national level were similar to those in the East Riding.- B.R. Mitchell, British Historical Statistics (1961), pp. 488-9. These are given in Appendix V, p.433.
 3. National movements in mutton and beef prices conformed closely to East Riding prices.- E.H. Whetham, 'Livestock Prices in Britain, 1851-93', Agric. Hist. Rev. XI (1962).

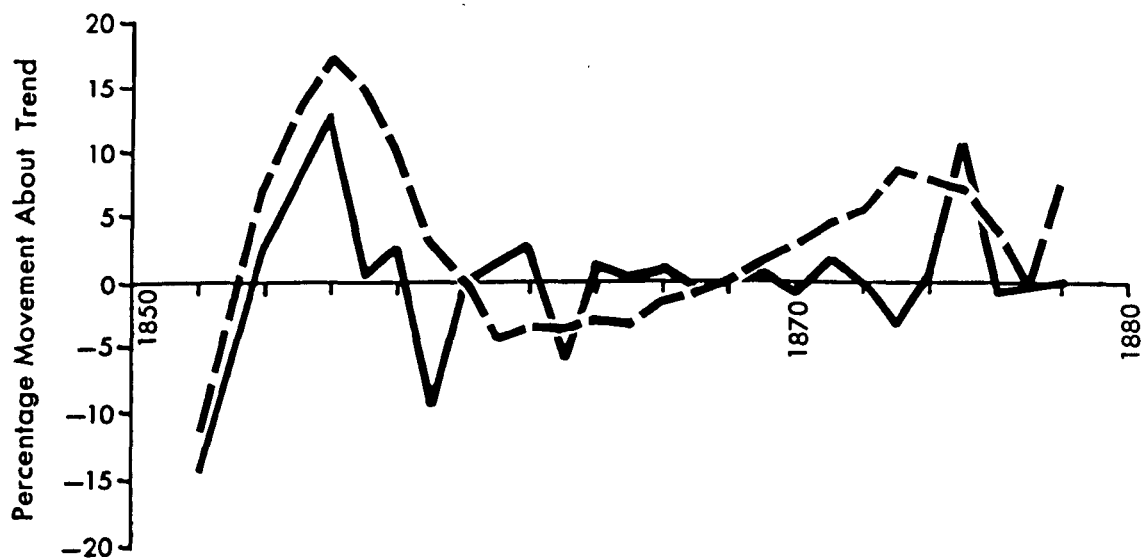
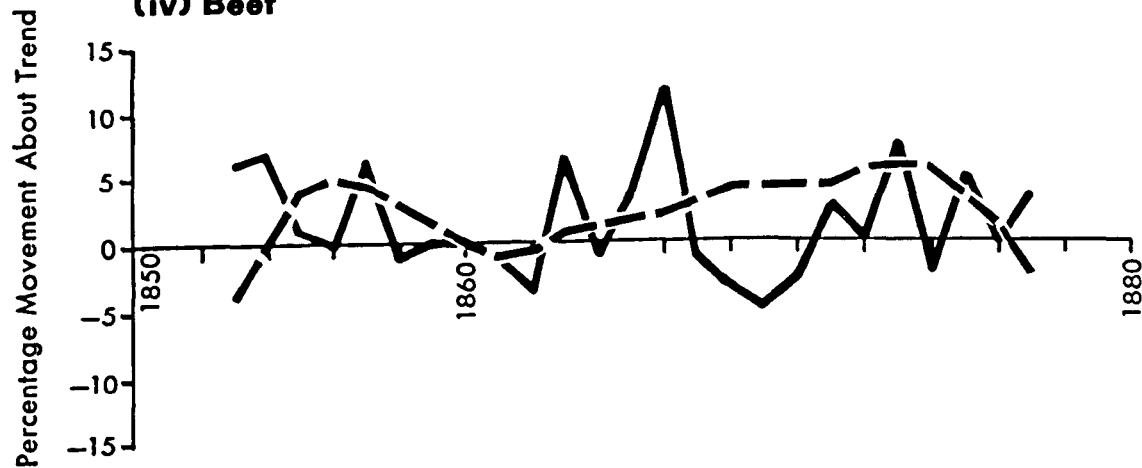
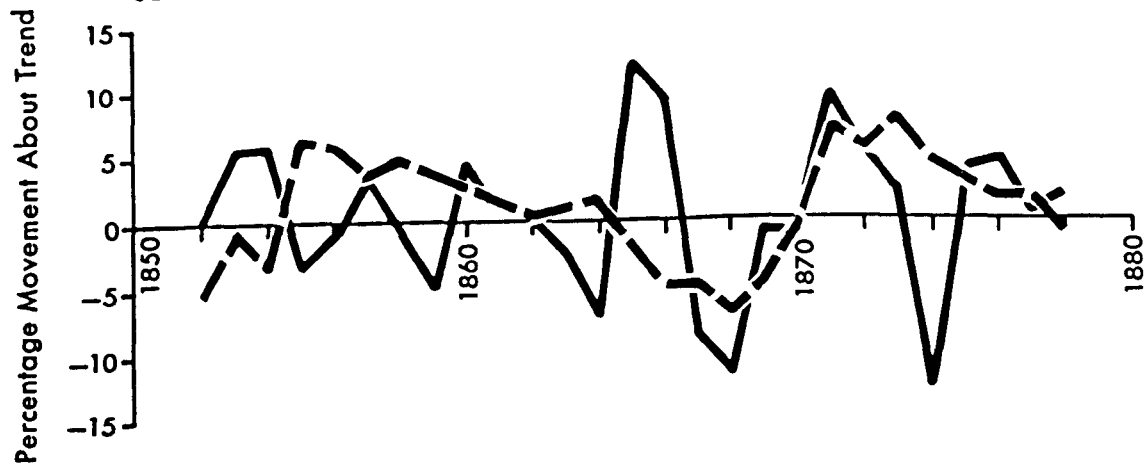
by the very minor fluctuations in the non-cyclical price series. In the grain market, on the other hand, and particularly in wheat, prices were affected strongly by war and its aftermath. Movements in the non-cyclical price series reflect this and were very pronounced, and were scaled downwards roughly from wheat, barley to oats according to the degree of war-induced pressure.

A perceptible dip is noticeable in each of the price indexes in the first half of the 1860s. Using a five-year moving price average for cereals and mutton and a seven-year average for beef,¹ it seems clear that prices continued downwards from the end of the 1850s until at least the early 1860s when they stabilised. The cyclical trend in wheat prices was sharply downwards to 1858-9 and then slackened off in the early 1860s, when prices rallied, and the trend was upwards in the second half of the decade. The average rose powerfully for the first year or two of the 1870s and then levelled out only to fall throughout the remainder of the decade. Barley prices on the five-year moving average moved sharply downward after 1858 though they steadied between 1860 and 1863 reaching their lowest level in the latter year. Their recovery was slow but persistent in the following years; the moving average peaked between 1872 and 1875 and then fell in the second half of the decade, though at a slower rate than in wheat. Cyclical price movements in oats were similar to those in barley. After reaching a peak in the mid-1850s the cyclical trend was sharply downward until 1861; it then stabilised over the next few years and rose mildly after 1865-6, the highest point on the moving average coming between 1873 and 1875.

1. There was roughly a seven-year interval between peaks in the beef price series compared to five years for cereals and mutton.

Figure 6.2 Grain and Livestock Prices in the East Riding, 1852-78: Cyclical and Non-Cyclical Deviations from Trend.



(iii) Oats**(iv) Beef****(v) Mutton**

Similar movements occurred in beef and mutton prices. Beef fell steadily in price from 1855-6 to 1860-1. Prices then stabilised, showed some indication of increasing in the middle and late 1860s and then levelled out. Beef was around 9s.6d. per stone about this time (the late 1860s) in the Drifffield market but its price rose quickly on the moving average during the early 1870s, only to fall almost as rapidly in the second half of the decade. Mutton prices behaved differently. Prices held until the mid-1860s and then fell in the second half of the decade, the fall being heaviest on the moving average between 1865 and 1866. It was then checked and a full recovery began around 1869. The trend was steeply upward to 1871, held steady at the higher level up to 1874-5, and then declined slowly. This contrasted with beef and cereal prices which fell more rapidly with the onset of depression.

The cyclical movement of prices about their respective trends requires explanation as it is repeated in each price series. It is plausible that changing levels of rural prosperity in the 1850s influenced the level of aggregate activity in the economy as agriculture was still the single most important national industry absorbing about one-fifth of the occupied labour force. It is also plausible that changing levels of economic activity in the industrial sector began to determine activity levels in farming by the last quarter of the century by controlling the demand for foodstuffs. This would have had an obvious effect on agricultural prices.

The British economy passed through six business cycles between 1850 and 1880, and their turning points are shown below. There was no precise relationship between these turning points and cyclical movements in farm prices. There was an upward movement in agricultural prices in the first half of the 1850s which coincided with an important upswing in the economy after 1848 but the cycles of 1855-7 and 1858-60 produced little

Table 6.4. Turning points in trade cycles, 1848-83.

Trough	Peak
1848	1865
1855	1857
1858	1860
1862	1866
1868	1873
1879	1883

Source: D.H. Aldcroft and P. Fearon, British Economic Fluctuations, 1790-1939 (1972), p.77.

or no response in the agricultural price indexes of the East Riding. Agricultural prices were generally falling over these years but this was not surprising as neither cycle generated substantial long term investments or produced conditions of full, or near full employment, even at their peaks. On the other hand, the major cycle which peaked in 1866 was reflected in almost every price index by a parallel upward shift in agricultural prices and there was a similar parallelism in the major cycle which peaked in 1873. The intervening downturn, which reached its trough in 1868, was associated strongly, in the case of wheat and barley, less strongly in oats and livestock, with a slowing down in the rate of price increase. The downturn in the economy after 1873 was also marked by a general price slide in each price series which continued down to 1879-80. Barley and oats prices stabilised somewhat in the following upturn but wheat prices continued to fall; the price of beef and mutton increased sharply.

On balance there appears to be a relationship between the prices paid for agricultural commodities in East Riding markets and the level of activity in the economy, but this is a long way from arguing that there was a causal relationship between the two. Purely agricultural factors played a part in price determination. Seasons tended to be poor in the low priced years of the early 1850s and farmers no longer derived any price advantage from inclement weather and below average yields. Weather conditions were more favourable to farmers in the years of rising prices

in the mid-1850s. The harvest of 1854 was abundant, that of 1855 was described as "fine" and the corn harvest of 1857 was in "good condition". Seasons were harder and more testing in the lower priced years of the early 1860s. A long spell of cold wet weather in 1860 caused heavy damage to hay, cereals and root crops, and contributed to an outbreak of foot rot among sheep. Grain crops were thin in 1861 and a serious summer drought in 1864 ruined root crops and drought damaged cereal crops in 1865. Agricultural prices moved upwards in the second half of the 1860s and early 1870s even though seasons continued to be difficult, which stands in contrast to the pattern described so far. On the other hand, excessively bad seasons from 1877 onwards contributed to the general price fall.¹

It is difficult to assess the influence of weather and the business cycle on farm prices. Movements in the business cycle had some impact on the demand for agricultural products and goes some way to explaining fluctuations in the price of meat and other quality foods. It does not explain fluctuations in cereal prices, demand for them being more inelastic. The weather cycle operating over periods of about half a decade had some influence on prices by influencing the aggregate supply function for domestically produced agricultural products,² but its precise relevance is by no means clear.

Random price fluctuations were superimposed on the regular cyclical movement and were caused by temporary jolts to the economic system; the Crimean War, harvest failure in the late 1870s and cattle plague in the mid-1860s were of this type. Random influences were moderate in most years, negligible in some, and usually made up no more than one or two per cent of the market price of agricultural commodities. They were

1. E.L. Jones, Seasons and Prices (1964), pp.169-75.

2. The relationship between cycles in agricultural output and price movements will be considered in Chapter 9.

important only occasionally. Non-cyclical factors made up 20 per cent or more of the market price of wheat in 1855, 1860, 1862, 1867, 1870 and 1877, but never achieved comparable significance in barley or oats. The sensitivity of wheat prices to changes in the political and economic climate was noted by Francis Waide, a local farmer.

There was an immediate though temporary fall in the price of wheat with the coming of Repeal. Waide wrote in July 1846:

In consequence of a Repeal of the duty upon corn, and the immense supply of foreign in ... this country, wheat is declining in price every week. Mr. Melstrop tells me that he has not bought wheat so low since he has been a miller as he did Friday the 24 at Wakefield.¹

Waide made various observations about the price of wheat during the Crimean War. 1854 was a good year but with "bouts of nervousness"; wheat prices fell by 8s. per quarter in early January 1855 owing to increased supply and to rumours that the Tzar wished to negotiate a truce.² 1855 was "ever memorable for the devastating war with Russia and the high price of corn".³ News arrived in England in January 1856 that the Tzar had unconditionally accepted the Allied peace terms and by February "the price of Grain with the exception of Barley have lowered (sic) during this Month owing to the Peace question without any real cause - except the fear of it causing lower prices - which may have caused many Farmers to thresh more freely - and caused a greater show in the Markets - the buyers hang back very much". Thinking of a later war Lord Ernle commented on how news of the Russo-Turkish War in 1877 pushed up the price of wheat.⁴

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1. Waide MSS, Dairies 1836-48, S.R.O. Acc. 1152.
 2. W. Harwood Long, 'Farmer Waide's Diary', Farmers Weekly (Feb. 1, 1974), p.viii.
 3. Ibid.
 4. R.E. Prothero (Lord Ernle), English Farming Past and Present, (6th edn, 1961), p.379.

The livestock price series was similar to that of barley and oats. Non-cyclical factors were relatively unimportant and made up about 10 per cent of the total movement in beef prices only in 1866 owing to the impact of rinderpest. Vagaries in the weather were also shown up as random fluctuations. Weather conditions influenced livestock prices by controlling the amount of fodder available to farmers, particularly before the widespread introduction of artificial feedstuffs. A long drought as in the mid-1860s or a severe winter as in 1859-60 could reduce the supply of fodder in the fattening areas of the country (the plains of Holderness and the Vale of York being among them) to the level where farmers were forced to cut back their purchases of store cattle. Store prices would then fall but fatstock prices received a temporary stimulus¹ because fewer beasts were fattened. The non-cyclical influence approached 10 per cent of the entire price movement in the mutton series in 1865, 1866, 1867, 1868, 1871 and 1874; the clustering around the mid-1860s was probably a response to the effects of the cattle plague. Beef prices rose rapidly at this time which must have encouraged many consumers of livestock products to substitute lower priced alternatives, mutton being one of them.² The output plans of farmers were generally unresponsive to small changes in costs and prices because of the production lag in increasing the number of marketable sheep and cattle.³ It is therefore unlikely that the

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1. A severe drought burns up pastures and reduces the quantities of hay available to the farmer. A severe winter can destroy root crops. Even a less severe winter interspersed with sharp spells of frosty weather can damage and even destroy root crops through the action of freeze-thaw.
 2. This suggestion is supported by observations taken from the modern British and American housewife. They appear not to take prices very much into account in their spending decisions. Price elasticities of demand for most foodstuffs are below 0.5, but elasticities greater than 1.0 were calculated for pork, beef and some processed foods. Products with a high elasticity will not be purchased at their former level, if their prices rise, and other products will be substituted.- M. Capstick, The Economics of Agriculture (1970), p.65.
 3. E.L. Jones, Seasons and Prices (1964), p.72.

supply of mutton could have been increased substantially to meet this temporary swelling in demand. Prices rose in response. To this might be added the carry over effects of drought in the mid-1860s. Root crops were thin in light soil districts and many farmers reduced the number of store sheep they bought-in causing prices to fall. Store lamb and breeding ewe prices were 30 per cent down on previous years in the autumn sales of 1864.¹ On the other hand the price of fat lambs and sheep for the butcher moved strongly in the opposite direction, the line of causation being much the same as in store and fat cattle prices when fodder was scarce.

Year by year fluctuations in non-cyclical mutton prices in the 1870s can be attributed to irregularities in the agricultural economy and possibly to out of trend fluctuations in the national economy. This might also be true of the other price series. Non-cyclical fluctuations in mutton, wheat and barley prices were sometimes considerable and were associated in each instance with rapidly rising prices. A modestly strong random element was evident occasionally in the composition of beef prices but unlike the other commodities it was not associated with sharply rising prices.

The structure of agricultural prices underwent major changes in the 30 years of Repeal. Wheat prices fell continuously after their war time peak in the 1850s and oat and barley prices increased mildly. Beef and mutton showed the greatest gain and their price advanced by nearly one-half by the close of the 1870s. A quite pronounced regular and irregular trend ran through all five price series, the approximate phasing of each upswing and downswing in the regular cycle being the same in each series, which suggests that the movements were not determined independently

1. Ibid. p.96.

but were bound up with a common and widespread influence such as was imparted through the business cycle, the weather cycle or more fundamentally, the rhythm of agricultural production itself. Irregular movements in prices were important in total price determination in a handful of years only, usually at times when the level of movement in the regular cycle was greater than normal. Their importance was greatest in wheat.

CHAPTER SEVEN

ARABLE AND LIVESTOCK TRENDS IN EAST RIDING AGRICULTURE, 1850-90.

1. Movements in the composition of agricultural output, 1850-68.

The Statistical Department of the Board of Trade began to publish annual statements on the condition of the agricultural industry in the United Kingdom from 1866. Prior to this there had been little firm evidence on changes in the composition of agricultural production apart from the impressions of contemporaries and the often incomplete records of local estates. The Tithe Surveys of the late 1830s and 1840s were the principal exception to this and contained useful information on the distribution of arable and grassland, but their quality was uneven judging by the survey of the East Riding.¹

The trend in Scottish agriculture at this time may be a significant indicator of developments further south. The Highland and Agricultural Society conducted several farm surveys in the 1850s which showed that the area under wheat reached its peak during the Crimean War and then declined slowly. Wheat growing was confined to the arable belt in the eastern districts of Scotland by the 1860s, its place taken by oats, potatoes and turnips which returned a greater profit to the farmer. Wheat was subject to roughly similar price changes in England and was less profitable relative to other cereals and livestock products. A fall in its acreage after 1854-6 is therefore likely.

J.D. Chambers and G.E. Mingay have inferred from this that there was a fall in the total cereal acreage in England.² This has much to recommend it. Wheat was a more important cereal than in Scotland, forming

1. Only 35.1 per cent of the East Riding was included in the Tithe Survey largely because so much (40.1 per cent) had been included in the Enclosure Acts. It is generally thought that the Tithe Surveys, taken as a whole, were accurate apart from a few clerical errors.- H.C. Prince, 'The Tithe Surveys of the Mid-Nineteenth Century', Agric. Hist. Rev. VII (1959), 21, 23-5.

2. J.D. Chambers and G.E. Mingay, op. cit. p.183.

about one-quarter of the arable output in 1870 and equalling the combined values of beef and mutton production.¹ It formed 43 per cent of the East Riding's cereal acreage. If the Scottish trend was paralleled in England, and there is no reason to believe it was not, it is plausible that a secular fall in the wheat acreage would have forced down the total cereal acreage. This rests on the assumption that there was no countervailing movement in the acreages sown down to barley and oats, not to mention the minor cereals, which maintained or even raised the cereal acreage.

A countervailing movement of this sort was not unlikely. There had been a high level of investment in arable farming in the late 1840s and early 1850s as a response to the widely held fear that free trade would permanently lower the price of grain. Investors tried to secure a reasonable return on their outlays, their appetites for profit wetted by war-induced prosperity in the mid-1850s, and this undoubtedly gave a powerful boost to cereal farming which continued into the following decade.

The acreage under permanent grass and meadow pasture contracted throughout most of the East Riding between the 1840s and the mid-1860s. A fall of 8 per cent has been calculated as a rough approximation for the county, but it was over 10 per cent in Buckrose, south Holderness and Howden-shire, and over 20 per cent in Mid-Holderness. The grass acreage fell in six out of the eight districts examined in Table 7.1; it increased in the other two but the upward trend was strong only in Dickering. This general shift away from grass down to the 1860s does not in itself prove that land passed out of pasture into arable, but there are reasonable grounds for such an assertion. There is evidence that the cereal acreage increased on Maxwell-Constable's estate at Everingham up to the early 1870s and that it remained stable, or increased slightly, on other local estates.²

There is also scattered evidence that

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1. T.W. Fletcher, 'The Great Depression in English Agriculture, 1875-93', Econ. Hist. Rev. 2nd Ser. XIII (1961)
 2. Everingham Estate MSS, E.R.R.O. DDEV/61/10-23; Emanuel Hospital MSS, L.C.R.O. EH 5.19.

Table 7.1. Grass acreage in eight districts of the East Riding in 1840 and 1867.¹

District	No. of Parishes Sampled	1840 (i)	1867 (ii)	Change in Acreage (ii) as a % of (i)
Howdenshire	17	4772	3956	-17
Bainton Beacon	12	4924	4980	-1
Ouse & Derwent	9	3904	3332	-15
S. Holderness	11	6093	5745	-6
Mid Holderness	9	3817	2916	-24
N. Holderness	10	3717	3779	1
Buckrose	12	7662	6762	-11
Dickering	5	1218	1543	27
East Riding	80	36071	33013	-8

Sources: Tithe Survey of East Yorkshire, 1840; Board of Trade Parish Summaries, 1867, P.R.O. MAFF 68.

a weak trend in favour of cereals persisted in other eastern counties, or parts of them, into the 1860s and possibly into the 1870s, as was the case in south Lincolnshire² and on the Duke of Bedford's Buckingham and Bedford estates.³ The trend was weaker on two Northumberland estates owned by the Earl of Grey and the Duke of Northumberland but there was still "no appreciable conversion of arable to pasture" until after 1870.⁴ Further research is necessary on agricultural trends in the 1850s and 1860s but it would seem that sufficient has been done to indicate that there was no continuous trend towards grassland farming over the third quarter of the nineteenth century and that there may have been a fairly general and persistent movement towards arable in eastern England in the first half of the period.

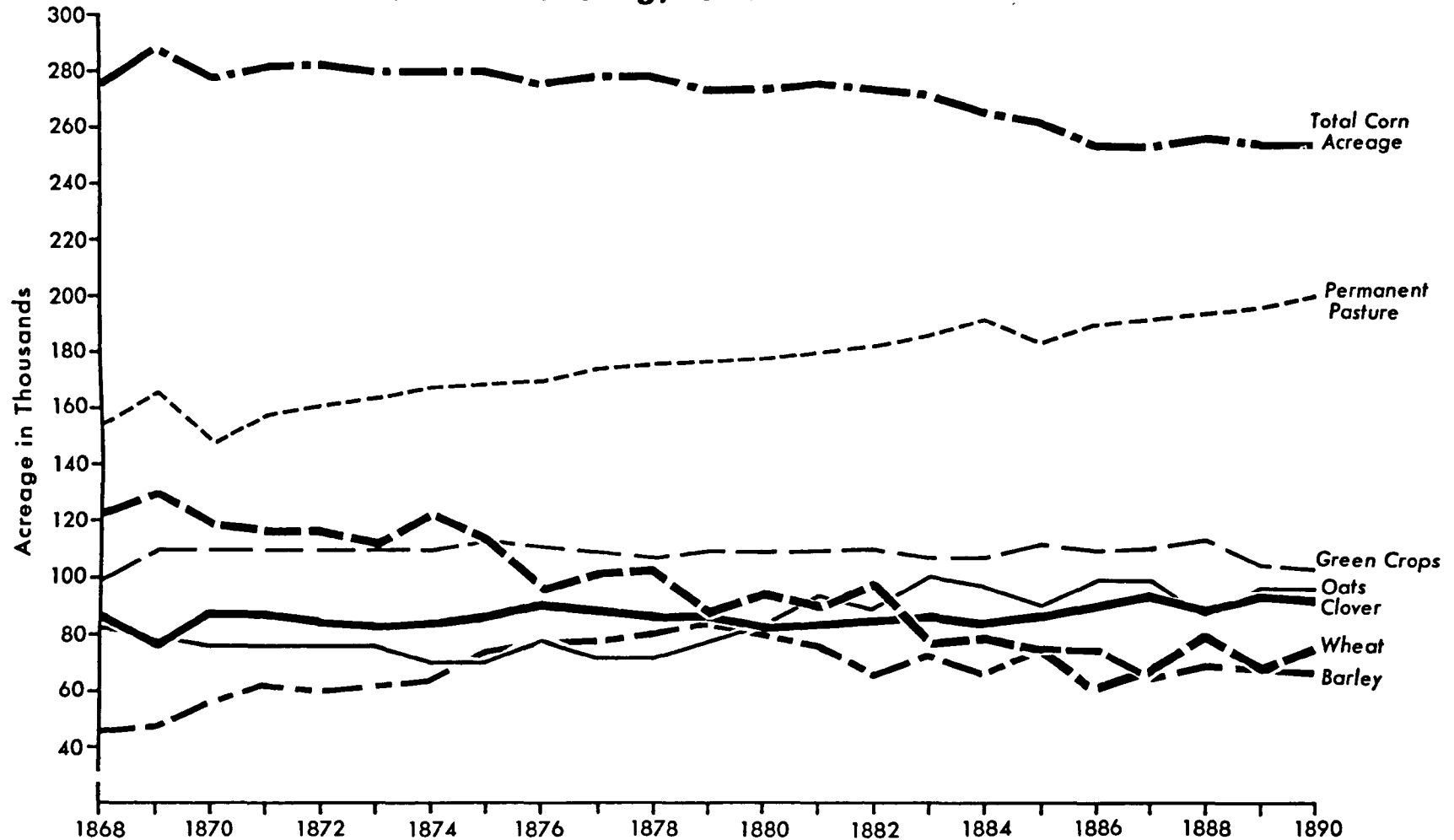
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1. Table 7.1 is based on acreages under permanent grass and meadow and excludes the acreage under rotated grasses.
 2. D. Grigg, The Agricultural Revolution in South Lincolnshire (1966), p.117.
 3. R. Perren, 'The Landlord and Agricultural Transformation', Agric. Hist. Rev. XVIII (1970), 49.
 4. A.D.M. Phillips, 'Underdraining and the English Claylands, 1850-80: A Review', Agric. Hist. Rev. XVII (1969), 51-4.

2. Movements in the composition of agricultural output, 1868-90.

The government's decision in the mid-1860s to collect and publish an annual census of agriculture marks a turning point in the study of modern agrarian British history. A comprehensive and continuous body of data now existed for the first time on the state of farming at parish, county and national levels. It is assumed in this study that the census became reliable from about 1868 though data for 1866 and 1867 have been incorporated in specific instances.¹ Farmers were initially reluctant to co-operate in the collection of agricultural data suspecting that it portended a new tax on landed property. The suspicion was groundless but it was given plausibility by the fact that the census was carried out by the Inland Revenue Department, and their excise officers, and not the Poor Law authorities as had been originally intended.² Inaccuracies in the returns continued into the early 1870s. The Board of Inland Revenue reported in 1869 that the "reluctance of the owners and occupiers of land in England to give the information required [had not] much diminished",³ and in 1874 that the occupiers of large farms were generally the most obstinate in supplying information.⁴ The decision to base this analysis on the agricultural returns and to choose 1868 to begin it seems justified on several grounds. First, some of the early difficulties in the design of the census had been ironed out by this time. Second, as The Times commented, the cattle plague helped to get rid "of some of the unreasonable prejudice against Returns".⁵ Third, farmers must have begun to realise

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1. 1867 is used without much loss of accuracy in Chapter 9.
 2. The switch was made for purely administrative reasons.
 3. Report of the Commissioners of H.M. Inland Revenue, No. 13 (1869).
 4. Ibid. No. 18 (1874).
 5. The Times, January 1, 1868, quoted in L. Napolitan, Century of Agricultural Statistics, 1866-1966. (1968).

**Figure 7.1 The Acreage Under Grass, Green Crops and Cereals
in the East Riding, 1868-90.**



Constructed from M.A.F.F. Agricultural Statistics, 1866-74, 1875-83, 1884-92.

that this was not a device to levy additional taxation and it was in their interests to base output decisions on reliable information.

Movements in each of the key components of East Riding agriculture between 1868 and 1890 are depicted in Figures 7.1, 7.3 and 7.4. At least two things stand out:

(i) The total corn acreage of the East Riding was stable¹ down to the early 1880s. It then declined, stabilising in the last half of the decade.

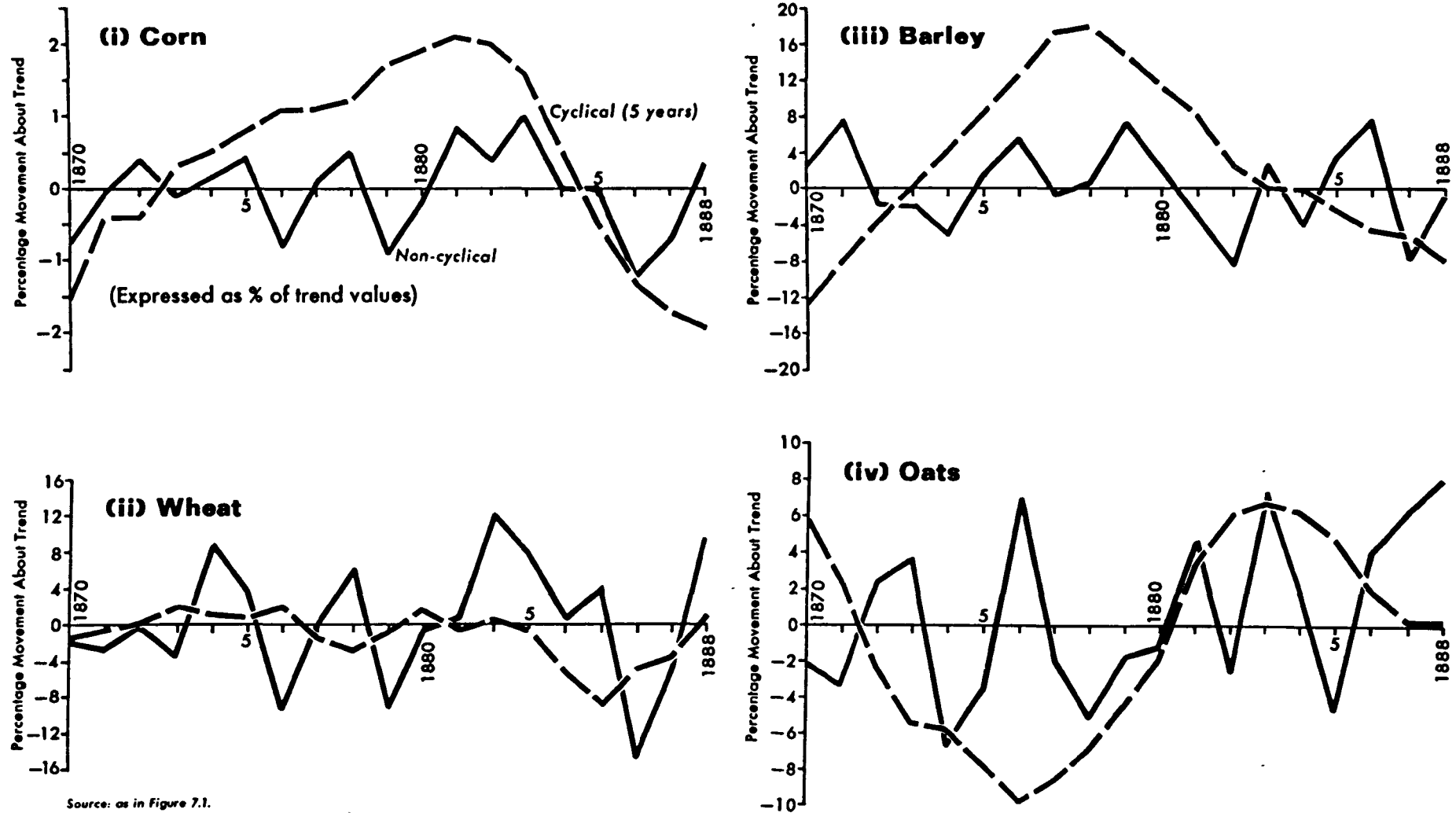
(ii) Movements in the acreages of pasture, clover and green crops were of uneven strength and diverged from the trend in livestock.

The apparent stability in corn conceals several changes in the relative importance of the various cereals. Wheat acreage declined continuously from 120,000 acres in the late 1860s, to 92,000 acres in 1880 and 70,000 acres at the close of the 1880s, the contraction in planted acreage being steepest in the mid-1870s and early and mid-1880s. The oat crop benefited most from the onset of depression, its acreage expanding from the second half of the 1870s as farmers began to abandon wheat, and to a lesser extent barley, in its favour. Oats were grown more extensively than wheat by 1883 and in terms of acreage, though not necessarily in economic importance, had become the principal grain crop of the county, 90,000-100,000 acres being sown regularly in the 1880s compared with 70,000-80,000 in the preceding decade.

A more detailed reconstruction of the East Riding's cereal economy is developed in Figure 7.2. It shows the linear trend in the acreages of wheat, barley and oats, and associated cyclical and non-cyclical fluctuations about trend. Cyclical movements in the total cereal acreage

1. The term stable seems appropriate in spite of the slight fall in total corn acreage from the late 1860s.

**Figure 7.2 The Acreage Under Grain Crops in the East Riding, 1870-88:
Cyclical and Non-Cyclical Deviations from Trend.**



are depicted by a five-year moving average. On this average the corn acreage was roughly 12,000 acres higher, when it reached its peak in 1881, than a decade or so earlier, though this was set amid a trend which was firmly downwards by this time. The area under cereals then fell quickly by about 10,000 acres or 4 per cent of the cereal acreage, stabilising only in the last year or so of the 1880s. Non-cyclical fluctuations were modest throughout the period.

The overall direction of change in the cereal economy is complicated by the divergent trends in each of the main cereal crops. The five-year moving average of wheat acreages followed closely the linear trend, which was predictable owing to the strength of the downward movement in wheat production. Non-cyclical factors played a significant part in acreage adjustment in certain years, especially the mid-1870s and the early and mid-1880s, just as they did in the determination of wheat prices. They were associated with steeply falling prices and with farmers, hesitant about the action they should take, first boosting wheat production and then cutting it back sharply.

Non-cyclical movements about trend in barley and oats were subordinate to trend and cyclical movements over the entire series. The East Riding barley acreage increased by about 20,000 acres on the five-year moving average over the 1870s and fell by approximately that amount during the 1880s. Acreage fell rapidly from 1879-82; the rate of fall then slackened and the planted acreage contracted by a further 5,000 acres on the moving average in the years down to 1888. The trend in oats production was the reverse of that in barley. The moving average declined by over 10,000 acres in the first half of the 1870s; it then swung upwards at a more or less constant rate in the late 1870s and early 1880s making good the previous fall in acreage by the mid-1880s. It then fell slightly down to 1890.

Figure 7.3 The Wheat, Barley and Oats Acreage of the East Riding, 1867-90.



Source: as in Figure 7.1.

Table 7.2. Variables in the Wheat, Barley and Oats Relationship in the East Riding, 1867-90. (acres in '000s).

Year	Acres of Wheat (Y)	Acres of Barley (X ₁)	Acres of Oats (X ₂)
1867	111.7	50.5	82.4
1868	123.3	46.0	81.2
1869	130.8	48.1	78.6
1870	119.0	55.7	74.8
1871	116.1	61.6	72.6
1872	116.7	60.0	74.7
1873	112.3	63.0	74.9
1874	122.2	63.7	67.9
1875	113.4	72.2	69.7
1876	96.8	77.8	77.5
1877	101.0	77.8	73.1
1878	102.3	79.8	72.7
1879	89.0	84.4	79.2
1880	94.0	77.8	83.4
1881	89.5	74.6	94.2
1882	97.5	65.9	90.8
1883	76.9	72.5	101.7
1884	77.6	86.4	97.7
1885	74.0	73.3	92.4
1886	59.9	75.5	99.1
1887	66.2	64.0	101.4
1888	79.3	68.3	85.6
1889	69.4	68.8	96.8
1890	72.8	66.5	94.8

Source: Figures 7.1 and 7.3.

The regression equation¹ expressing the relationship between acreage movements in barley, oats and wheat between 1867 and 1890 is:

$$\begin{array}{rclcl}
 1. & Y & = & 269.852 & - & 0.799X_1 & - & 1.417X_2 \\
 & & & (14.948) & & (0.155) & & (0.154) \\
 & & & R^2 & 0.869 & & D-W & 0.54848
 \end{array}$$

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1. Many of the terms used here and the nature of the regression equation which has been calculated to express the relationship between wheat, barley and oats acreage, are not defined or explained here. For a description of the statistical techniques used, see Chapter 9. Briefly, the figures in brackets are the standard errors of estimate of the regression and are well within acceptable limits in this case. The R^2 statistic represents the proportion of variation in the dependent variable, in this example wheat, which is associated with the joint and separate effects of the independent variables, barley and oats. The Durbin-Watson statistic indicates the level of correlation in the error term. The amount of autocorrelation in this example (Equation 1) is unacceptably high.

Nearly 87 per cent of the movement in wheat acreage was associated with changes in the acreage under the other main cereals. However, this statistic cannot be taken at face value as the low Durbin-Watson statistic confirms autocorrelation in the independent variables. The original data (Table 7.2) were transformed using the coefficient of autocorrelation with the intention of deriving a model "whose random variable satisfied the assumptions of classical least squares";¹ in other words deriving a model which removed the influence of autocorrelation.

Table 7.3. Transformed variables in the wheat, barley and oats relationship in the East Riding, 1867-90.

Year	Acres of Wheat (Y)	Acres of Barley (X ₁)	Acres of Oats (X ₂)
1867	32.0	46.0	36.0
1868	62.0	18.3	36.0
1869	63.2	22.9	34.1
1870	47.3	29.3	31.7
1871	50.8	31.0	31.6
1872	53.1	26.2	34.9
1873	48.3	30.1	33.9
1874	60.6	29.1	26.8
1875	46.4	37.3	32.5
1876	34.6	38.2	39.3
1877	47.9	35.1	30.6
1878	46.9	37.1	32.6
1879	32.9	40.6	39.3
1880	45.2	31.5	40.0
1881	37.9	31.9	48.5
1882	48.4	24.9	39.1
1883	43.4	36.4	51.9
1884	24.5	46.6	41.9
1885	31.4	25.9	38.8
1886	19.3	35.3	48.4
1887	33.4	22.6	47.0
1888	42.9	33.2	29.9
1889	29.9	31.3	49.9
1890	34.7	28.8	41.7

The regression calculated from the transformed data is:

$$\begin{array}{rclcl}
 2. & Y & = & 118.184 & - & 0.812X_1 & - & 0.992X_2 \\
 & & & (10.87) & & (0.24) & & (0.22) \\
 & R^2 & & 0.798 & & D-W & & 1.2146
 \end{array}$$

1. A. Koutsoyiannis, Theory of Econometrics (1973), p.211.

The strength of the association between movements in wheat acreage and the acreage under oats and barley is slightly less in Equation 2 than in Equation 1, explaining about 80 per cent of the movement in wheat supply in terms of shifts in the supply of oats and barley.¹ The possibility that the parameter estimates are biased is again less than in Equation 1 but the presence of autocorrelation cannot be ruled out as the Durbin-Watson statistic is indeterminate. As the solution to this problem lies in increasing the number of observations in Table 7.3,² which is clearly impractical, the results of the analysis should be viewed cautiously. Equation 2, taken at face value, indicates that an increase of 1,000 acres in the acreage sown down to oats was associated with a fall of 992 acres in the planted wheat acreage between 1868 and 1890, and an increase of 1,000 acres in the barley acreage with a fall of 812 acres in wheat.

There was evidently a high level of substitution between the three main cereals in the East Riding though further analysis shows that it was more common between wheat and barley than between wheat and oats, the 1880s apart. Substitutions of this type were a feature of the corn economy nationally. The production of one cereal did not require skills and equipment which differed substantially from those required for the production of other cereals, though the close association between the growing of oats and the extension of the grassland economy did limit substitution between wheat and oats. Generally, farmers were encouraged to replace wheat in their rotations with barley, and to a lesser extent with oats, because these grains placed fewer 'demands' on the soil, were less of a gamble in wet weather and held their price better over the second

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1. Acreage data are commonly used to indicate supply trends in agricultural output. For a discussion of this, see below, p.215.
 2. A. Koutsoyiannis, op. cit. p.207.

half of the nineteenth century. They were also suitable as livestock feeds and gave a reasonable return converted into fat sheep and cattle.¹

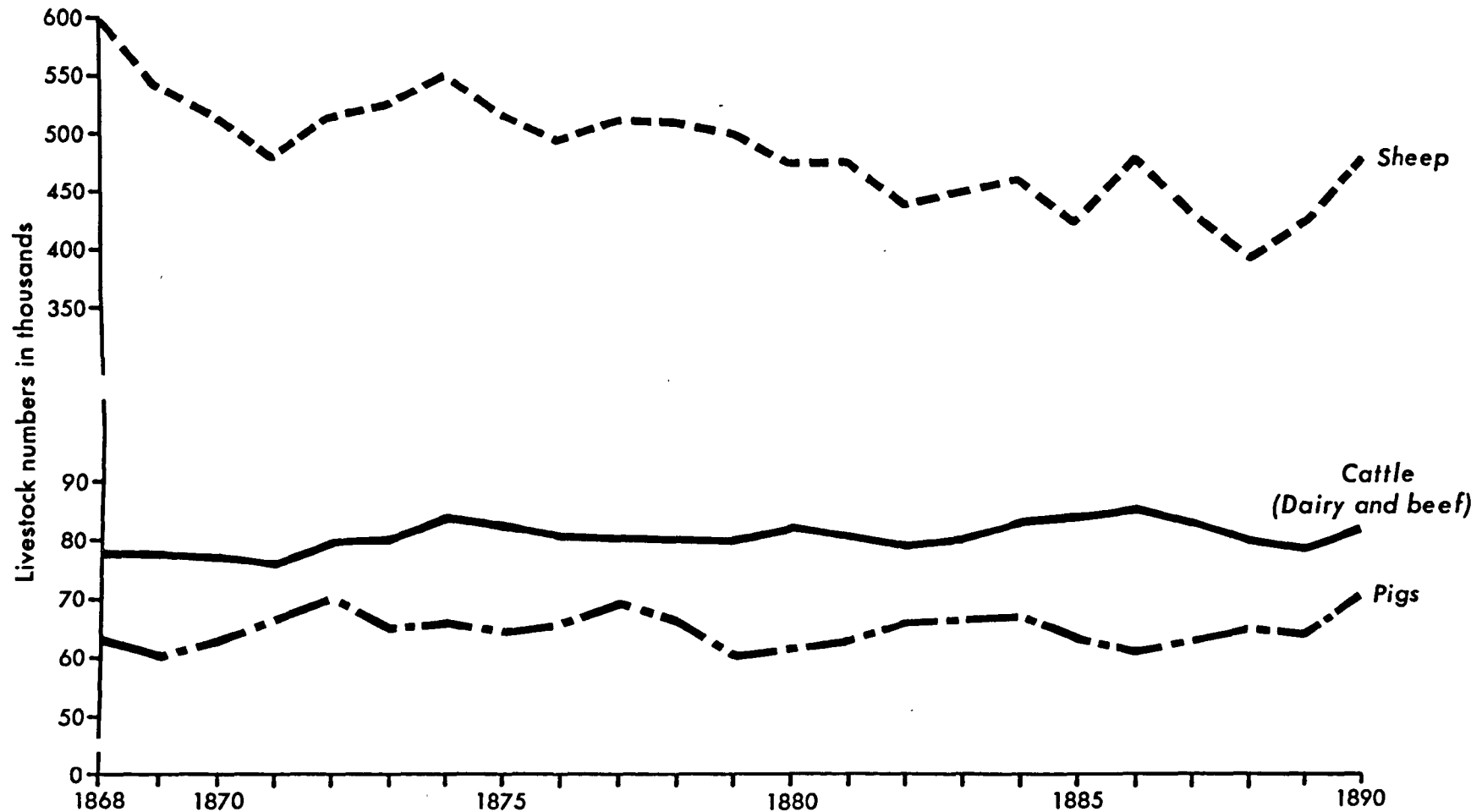
There was a moderate movement to grass, livestock and fodder in the East Riding between the late 1860s and the late 1880s. The acreage under permanent pasture increased by roughly one-third but the acreage under fodder crops (turnips, swede, vetch and lucerne) hardly changed and the acreage under clover increased only marginally. Dairy and beef cattle numbers rose from about 80,000 head in the mid-1870s to 90,000 a decade later; pig numbers increased by roughly the same proportion but the increase was very erratic in the short run. The sheep population was cut back from 600,000 in the late 1860s to around 400,000 - 450,000 in the late 1880s.

Fluctuations around the main trend values of grass, livestock and fodder are depicted in Table 7.5 (i-v). Changes in the acreage under pasture and clover can be dealt with quickly as there was no well defined cyclical movement about their respective linear trends. There was a temporary fall in the clover acreage in the late 1870s but this was corrected in the first half of the 1880s. A very shallow wave-like pattern showed up in the East Riding's beef and milk cattle population. These fluctuations were in the order of about 1,000 beasts either side of the main trend values and apart from a small peak in 1875 affected no more than one or two per cent of the county's cattle. It was almost certainly part of the calf to slaughter cycle of maturity.

Non-cyclical factors generally had more impact on sheep farming than cyclical factors. The years when this occurred, the middle and late

1. P.J. Perry, British Farming in The Great Depression 1870-1914 (1974) pp.107-8.

Figure 7.4 Cattle, Sheep and Pig Numbers in the East Riding, 1868-90.



Source: as in Figure 7.1.

1870s and the middle and late 1880s, were associated with sudden collapses in wool prices followed by partial recoveries. A substantial increase in sheep numbers followed by a sharp decline, particularly in the cycle of the late 1880s, seems to have been the typical response.

The unstable state of pig meat production was confirmed by the very pronounced swings in the non-cyclical component of supply. An outline of the relationship between pig meat production and price will be given here as it is not discussed in Chapter 9. Pig production over the long term was determined by the effects of technology, especially developments in breeding and intensive feeding, and by the price of feed grains. Production was extremely unstable in the short term as is shown in the following hypothetical situation. Assuming flexibility in the market for pig meat, low prices and rising demand for pork and bacon, production would contract initially in response to lower prices and demand would exceed supply. Prices would then rise causing production to expand; demand would then contract, prices would fall again and supply would be scaled down. This sequence would carry on over successive cycles and was the traditional cause of instability in pig numbers before the introduction of guaranteed prices.¹

The annual rate of change in crop acreages and livestock densities has been estimated for each of the principal categories of farm output in the Riding between 1868 and 1890, and over the decades 1868-77 and 1878-87.

1. M. Capstick, The Economics of Agriculture (1970), pp.89-90.

Table 7.4. The annual percentage rate of growth in the basic categories of East Riding farming.

	All Corn Crops	Wheat	Barley	Oats	Green Crops	Perm- anent Pasture	Clover	Cattle	Sheep	Pigs
1868-90	-0.6	-3.2	1.0	1.6	0.0	1.2	0.2	0.4	-1.2	0.3
1868-77	-0.2	-2.4	5.9	-2.1	0.7	1.2	0.6	1.1	-1.0	2.3
1878-87	-1.0	-5.0	-2.0	3.4	0.1	1.0	0.6	1.1	-0.7	-0.1

Sources: Figures 7.1 and 7.4.

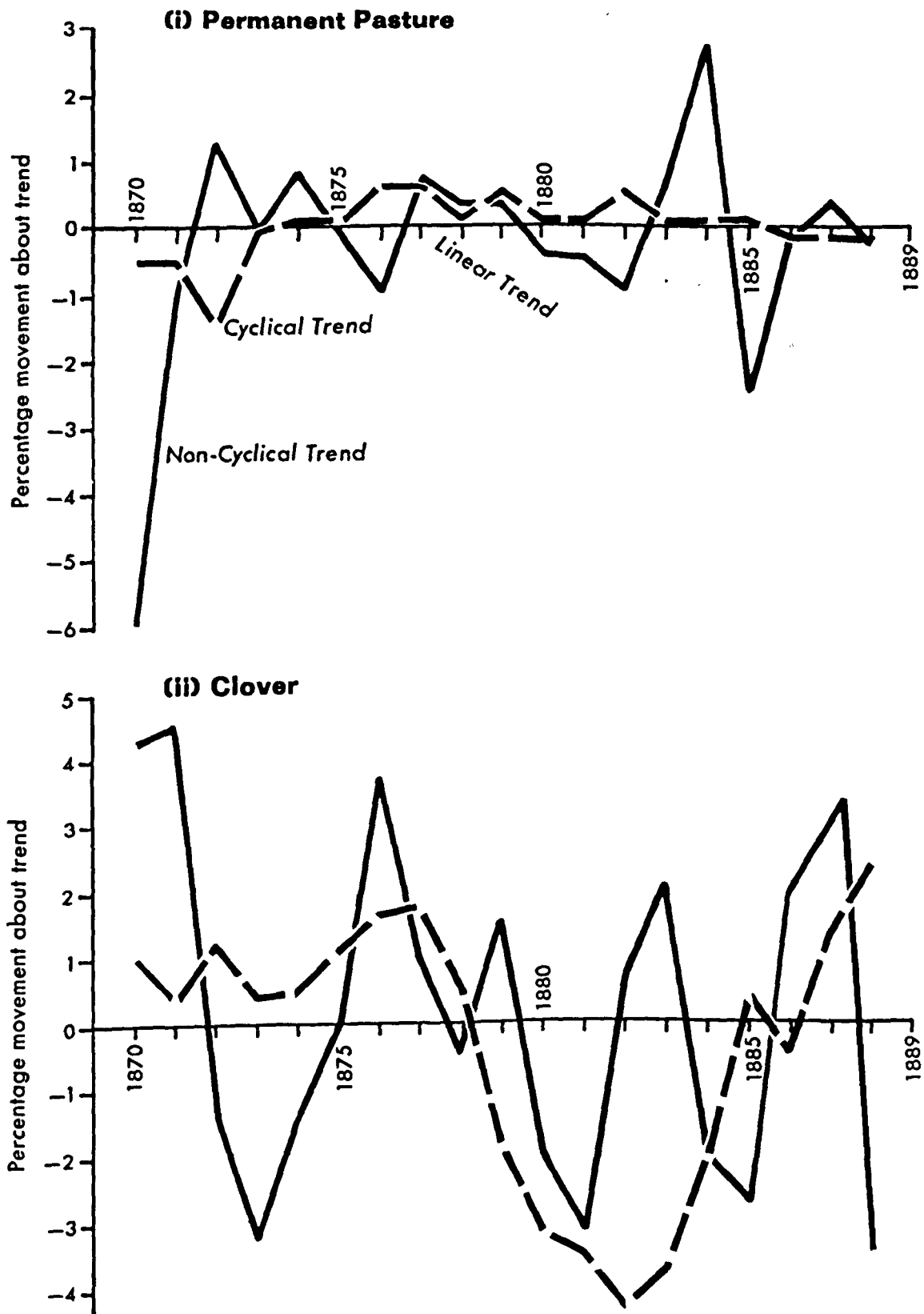
The computations for 1868-77 are important to this study because the impact of depression was still awaited and the trends isolated here may shed further light on the agricultural economy between Repeal and the mid-1860s. This is speculative and much depends on realizing the predictive limitations of the data. The break in continuity which has been suggested in the region's agricultural development¹ indicates that any judgement passed on the decade 1868-77 cannot be extrapolated backwards in an indiscriminating or uncritical way.

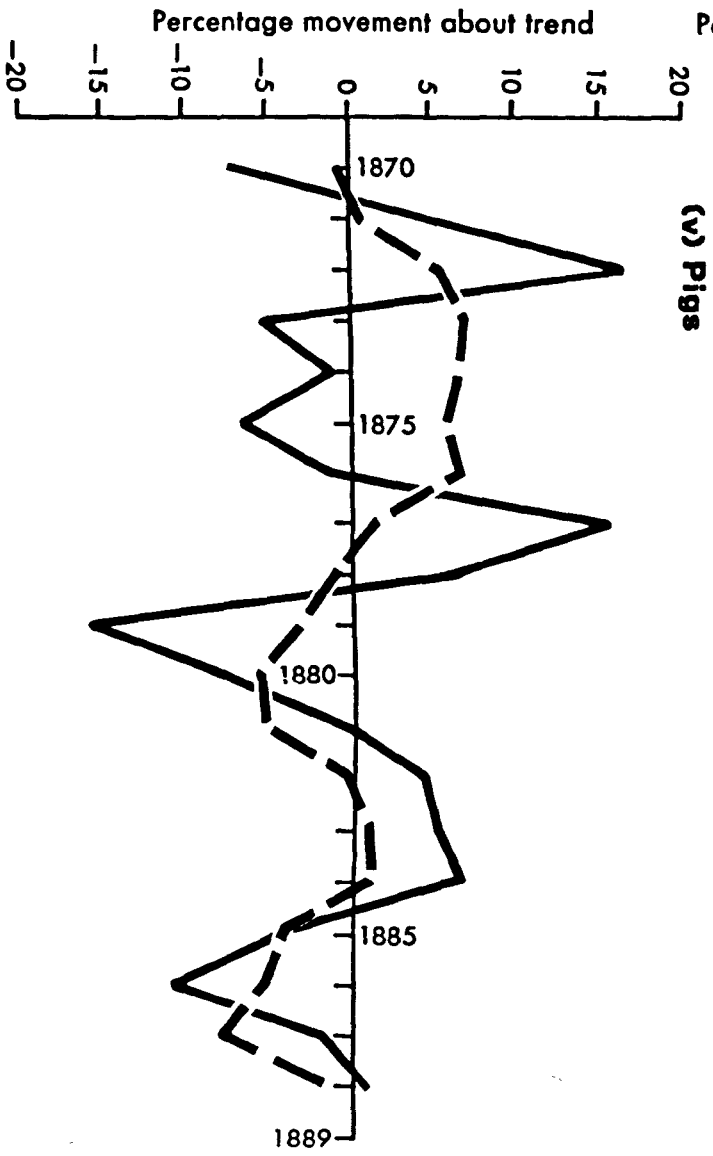
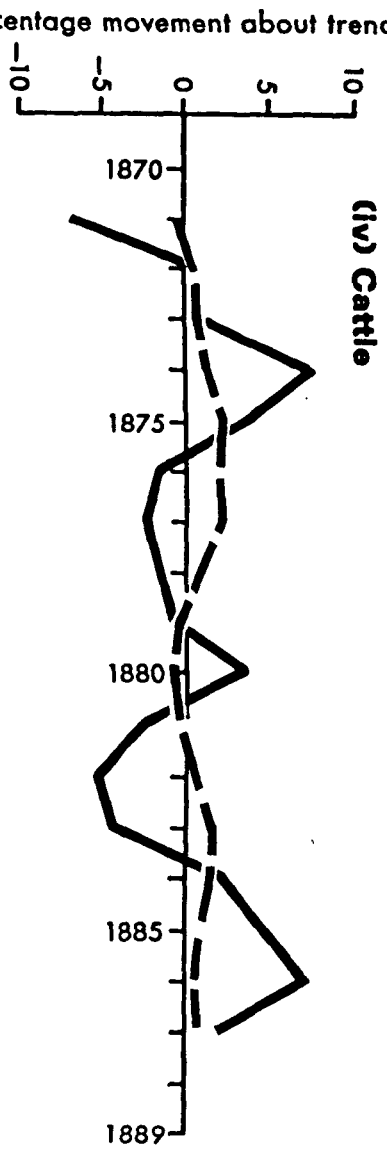
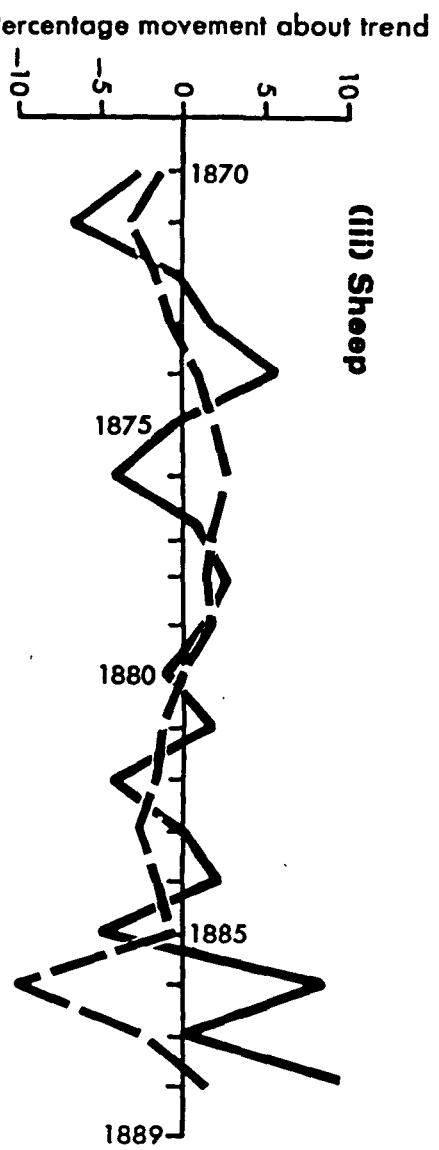
Table 7.4 shows a moderate contraction in the total cereal acreage over the late 1860s and 1870s which may be consistent with a moderate increase in the sown acreage over the preceding decade or so. Some of the arguments in support of this case have been put forward previously;² others which come out of the 1868-90 analysis can be assessed here. First, the movement out of wheat gathered pace in the 1870s and especially the 1880s, the sown acreage falling by about 20 per cent between 1868 and 1877 and by nearly 50 per cent between 1878 and 1887. A level of contraction significantly below 20 per cent seems probable during the two preceding decades because the wheat acreage is known to have expanded during the Crimean War; the

1. See above, pp. 157-8.

2. See above, pp. 157-8; 161-8.

Figure 7.5 Grass Acreage and Livestock Numbers in the East Riding, 1870-88: Cyclical and Non-Cyclical Deviations from Trend.





per capita consumption of wheat increased nationally between 1850 and 1870,¹ and prices were not too unfavourable for producers.² Acreage is likely to have remained either stable or to have declined marginally. Second, it is probable that the very strong movement towards barley production noted during the 1870s was part of an historically longer movement which only the severity of depression in the 1880s halted. As a rule of thumb indicator the cultivation of barley on the Everingham estate increased powerfully from at least the 1850s.³ Finally, the cultivation of minor cereals such as rye, beans and peas, which accounted for about one-tenth of the East Riding's sown cereal acreage, shared much the same cycle of expansion and contraction as barley over the period 1868-90.⁴ This may also have been the case in the 1850s and 1860s. Judging by the evidence gathered from the later part of the period it seems probable that the total cereal acreage of the county grew at least up to the early 1860s.

A modest increase in the acreage under green crops, similar to that calculated for 1868-77, possibly occurred between 1850 and the mid-1860s. The acreage under turnips, for example, was enlarged owing to additions to arable flocks on most lowland farms and to drainage improvements which in some cases made it practical to grow root crops on wheat and bean land.

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1. E.J.T. Collins, 'Dietary Change and Cereal Consumption in Britain in the Nineteenth Century', Agric. Hist. Rev. 23 (1975), 112-5.
 2. See above, p. 142.
 3. Everingham Estate MSS, E.R.R.O. DDEV/61/10-23; E.R.R.O. DDEV/59/92-3.
 4. The acreage of Rye, Beans and Peas in the East Riding, 1868-90.

	Rye	Beans	Peas
1868	2,227	13,370	8,772
1873	1,799	14,522	14,289
1878	2,058	10,238	11,127
1883	1,812	12,335	7,669
1888	2,857	7,566	11,817
1890	1,977	7,093	9,933

Source: M.A.F.F. Agricultural Statistics, 1866-74, 1875-83, 1884-92.

The area under green crops remained unchanged in the East Riding in the late 1870s and 1880s. This was in contrast to several other cereal producing regions where farmers attempted to trim costs by scaling down labour intensive activities like the cultivation of root crops.¹ The stability of the East Riding acreage is an illustration of the way high farming continued as a system, admittedly in a less ambitious form, into the fourth quarter of the century.

Little can be added to the discussion of pasture farming between 1850 and 1865 except to emphasise that the reduction in grass acreage was marginal. Most covenants outlined very carefully the conditions under which permanent pasture could be converted into arable and in every case, judging from covenants enforced on East Riding estates, the landowner or his agent had to approve the conversion. Approval was not given unless the operation could be carried out efficiently and would not upset the economic balance of the farm concerned. Unilateral action by the tenant was subject to heavy penalties. The reverse movement, converting arable into pasture, gathered pace after 1870 and especially from the early 1880s. Grassland was increased in three ways: it was laid down scientifically according to the rigorous standards outlined in journals like the Journal of the Royal Agricultural Society of England; arable land was allowed to degenerate into rough grazing through natural re-seeding; temporary grasses laid down initially for two or three years were allowed to become permanent. The former required deep ploughing and efficient drainage, the first to break up the shallow pan left by generations of light, superficial ploughing, and the second to remove standing water. Both operations were expensive. The cost of converting unprofitable arable into useful pasture was around

1. J.T. Coppock, 'Agricultural Change in the Chilterns, 1875-1900', Agric. Hist. Rev. IX (1961), 70, 73.

£12.10.0 per acre in 1880;¹ there was also a lengthy gestation period before the investment became profitable. It is therefore unlikely that any large area in the East Riding was sown down to grass in this manner during the depression, although there is evidence that several landowners in the Vale of York and Holderness invested in it in the 1870s.² It is far more likely that the increased grass acreage came from the 'permanency' of grass leys and the natural re-seeding of arable where farmers lost confidence in raising crops.

The trend to meadow pasture in the East Riding was not entirely at the expense of corn, green crops or clover, at least up to the early 1880s, and the arable acreage remained substantially unchanged until that time. There are two possible explanations for the increased grass acreage in the 1870s. The first is that the area under permanent pasture was raised by extending the margin of cultivation. The total acreage in the Riding under crops of all kinds, bare fallow and grass rose from 646,465 acres to 667,628 acres between 1868 and 1874, and the acreage under permanent pasture increased from 155,008 acres to 168,824 acres, thereby absorbing the greater part of this 'new' agricultural land.³ This view of grassland development suffers from several weaknesses, the most important being that enclosure was almost complete by the mid-nineteenth century and the margin of cultivation was already determined given peace time conditions.⁴ The second view concerns local government boundary changes in the early 1870s. These changes increased the statutory area of the East Riding by nearly 34,000 acres,⁵ and although this newly acquired land was not necessarily

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1. R.C. on the Depressed Condition of Agricultural Interests (1880) p.157.
 2. Ibid. pp.157-8; W. Wright, op. cit. p.109.
 3. M.A.F.F. Agricultural Statistics, 1866-74.
 4. This argument cannot be dismissed as the discussion of changes in cultivated acreage at district level reveals. See below, pp. 198-9.
 5. M.A.F.F. Agricultural Statistics, 1866-74.

laid down to pasture, the trend to grass quickened in the following years and part must have been absorbed within the mixed farming-grass system.

This second view is largely confirmed by the agricultural census. The total cultivated acreage was raised by approximately 11,000 acres between 1872 and 1880, and after allowing for a reduction of 7,000 acres in the corn acreage and 600 acres in the green crop acreage, well over 18,000 acres of agricultural land became available throughout the East Riding for alternative use. The area under permanent pasture increased in these years by roughly 17,400 acres while that under clover increased by about 2,500 acres.¹ The cultivated acreage contracted in the 1880s. The corn acreage fell by 23,000 acres and bare fallow and green crops declined by 5,000 acres and 3,500 acres, respectively. Meanwhile, 14,500 acres were added to pasture and meadow, and 9,000 acres to clover, making 23,500 acres in all.² The importance of boundary changes as a factor in increasing the grass acreage had diminished by the 1880s. Far more important was the transfer of land out of unprofitable arable into more profitable grass.

An extension of the cultivated area not associated with boundary changes cannot, however, be dismissed. Table 8.5³ shows an increase in the cultivated acreage of districts like the northern Wolds and south Holderness which were largely unaffected by boundary changes. The addition of new warp lands along the north shore of the Humber may explain part of the increased cultivated acreage of south Holderness, but there is no apparent explanation for the Wolds unless waste was still being absorbed into the farming system and was being recorded for the first time in the agricultural census.

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1. Ibid. 1866-74; 1875-83.
 2. Ibid. 1875-83; 1884-92.
 3. See below, p. 198.

Movements in the clover acreage down to the mid-1860s are predictable less from the decennial calculations of Table 7.4 than from the observations of contemporaries. Many of the light soil districts of southern and eastern England were "clover sick", and rye, sainfoin and lucerne were being substituted for clover in rotations, though the results were often unsatisfactory measured by the quality of the succeeding corn crop. By mid-century crop rotations were sometimes lengthened to seven or eight shifts, depending on soil conditions and farming skill, to reduce the regularity of the clover ley and control disease in that crop. This policy was carried out on the Eastburn Farm near Drifffield in the 1860s¹ and on Lord Londesborough's extensive East Riding properties.² If the practice was general it must have checked the expansion of clover and a contraction in acreage cannot be ruled out over the 1850s and 1860s. If acreage expanded, on the other hand, it is unlikely to have exceeded the modest progress noted for 1868-77. There was no close association between the trend in clover and permanent pasture, the 1880s possibly excepted, to undermine this suggestion.

Stock densities are less useful than crop and pasture acreages in assessing economic trends. Available evidence suggests a moderate rate of increase in the cattle population from 1868-90 but this ignores important improvements in bloodstock. Many landowners and the wealthier among the tenantry improved their herds of short horns with the infusion of 'fashion blood' and the competition for the services of proven bulls was intense by 1850. The cost of this service in Yorkshire was about 100 guineas in 1850 and 200 guineas ten years later, and demand still trailed behind

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1. 'Farm Report, Eastburn Farm, nr. Drifffield', J.R.A.S.E. 2nd ser. V (1869), 405.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), p.145.

supply even at the higher rate.¹ This was much more than the average farmer could afford but surprisingly the main improvement in livestock after 1850 was less in pedigree herds than in mixed herds; William Wright claimed that the general diffusion of the short horn breed extended down to the cattle grazing the country lanes by 1860.²

The absence of a major increase in the cattle population after 1868, and the suggested absence in the preceding years, demands careful explanation as there was obvious interest in cattle improvement and market trends were favourable to graziers and mixed farmers. The outbreak of rinderpest in the mid-1860s exerted some influence on cattle numbers but its effects lasted for no more than half a decade. More significant in the long term were improvements in the milking and beefing qualities of cattle. Stock matured earlier, were heavier, and turn-overs were faster³ than in the first half of the century, which increased the quantity of meat and dairy produce on the market independently of increases in livestock numbers. An indication of the growing importance of livestock in the United Kingdom was the 80 per cent increase in their capital value between 1853 and 1878⁴ which was far in excess of the numerical increase.

The greater profitability of livestock measured in the above terms is probably the best explanation of the divergent growth trends in pasture and stock. Quicker fattening required artificial feed stuffs and may also have required access to more grass per animal, though there is no certainty about this. There is some evidence, as has been indicated, that the margin

1. W. Wright, op. cit. p.119.

2. Ibid. p.120.

3. E.L. Jones, 'The Changing Basis of English Agricultural Prosperity, 1853-73', Agric. Hist. Rev. X (1963), 114.

4. Ibid. p.115.

of cultivation was pushed out in districts like the northern Wolds in the 1860s and 1870s, and the provision of extra fodder for beef herds, which were being added to at this time, may have been a factor in this.

The trend in sheep numbers probably paralleled that in cattle up to the mid-1860s. There is no indication that the steep decline in the sheep population during the 1870s and 1880s was a continuation of earlier trends. Wool prices continued to rise throughout the 1850s and 1860s, and flocks must either have been increased during this period or been maintained at a high level. Large increases were unlikely owing to natural setbacks like outbreaks of rot in the early 1850s, serious losses among breeding ewes in hill flocks in the severe winter of 1860, and losses during the summer droughts of the mid-1860s.¹

Movements in the pig population of the East Riding are difficult to estimate for the 1850s and 1860s. The annual growth rates calculated for 1868-77 and 1878-87 are probably misleading and greater reliance should be placed on the 1868-90 figure. The possibility of slow secular growth after 1850 rests on the assumptions that there was corresponding growth in the milk industry, that pig farmers were able to benefit from the increased output of offal and waste dairy produce, and that higher living standards broadened the market for pig meat.

3. Contemporary observation and a summary of conclusions.

The basic fabric of the agro-economic structure of the East Riding was not radically different by 1880, or even 1890, from the time of Repeal. The area under permanent grass had been enlarged and the integration of livestock and arable was closer, but there had been no dramatic changes.

1. E.L. Jones, Seasons and Prices (1964), p.85.

The argument that it "had become necessary to abandon 'high farming' and to economise in every possible way" (ie. as a result of depression) and that a "striking change had occurred in the pattern of agriculture"¹ was wide of the mark in East Yorkshire, though it was true that farmers were forced to economise. There were elements of a broader structural change, the enlarged acreage under permanent pasture being the most noticeable example, but to many capable farming observers at the time, the mid-nineteenth century order marched on into the last quarter unprepared for, and in some cases unmindful, of the need to adapt to new circumstances.²

Wheat continued to be the main cereal crop in Holderness in the early 1880s and the total cereal acreage was well maintained. John Coleman found that "no considerable quantity of land had been laid down to grass" there, and "little or no alteration had been made in the system of farming". He estimated that three-quarters of Holderness was under arable in the late 1870s³ whereas Alan Harris estimated it at two-thirds in 1850,⁴ but it seems unlikely that the arable system showed a net increase over the third quarter of the century. The evidence presented in Chapter 8 largely rules this out though it confirms that the cereal acreage was maintained at a high level, the combined acreage under wheat, barley and oats falling by only four or five per cent between the mid-1860s and late 1870s.⁵ This stability was remarkable in the face of strong market forces favouring grass and livestock, and remarkable also because Holderness contains large tracts of strong soils. The temptation to let more wheat and bean land

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1. M. Tracy, Agriculture in Western Europe (1964), p.50.
 2. An illustration of this was that on Lord Scarbrough's estate in South Yorkshire "There is little evidence of any change in farming practice to meet the difficulties /ie. of the Great Depression/. Piecemeal conversions of arable to pasture went on between 1886 and 1894, but the total area tackled over the whole estate was only 325 acres". This was about 5 per cent of the estate's acreage.- T.W. Beastall, 'A South Yorkshire Estate in the late Nineteenth Century', Agric. Hist. Rev. XIV (1966), 44.
 3. R.C. on the Depressed Condition of Agricultural Interests (1880), p.140.
 4. A. Harris, Rural Landscape of the East Riding of Yorkshire, 1700-1850 (1961), p.111.
 5. See below, pp.189-95.

tumble down to grass after 1880, or to be seeded down to rotated or permanent grasses, must have been hard to resist.¹

The response of farmers on the Vale of York was more varied than in Holderness owing to the greater diversity of its farming. The potato continued to be the mainstay of the farm economy of Howdenshire but the fattening of cattle, and to a lesser extent of sheep, increased in importance.² Elsewhere, the area under grass crept upwards but without appreciably affecting the balance of the rural economy. Grassland formed roughly one-fifth of the cultivated acreage on the heavier clays in 1880, which was not much more than in 1850, though there were several notable exceptions. On Lord Wenlock's Wressle and Escrick estates farmers on the stronger clays who had stubbornly resisted changing to grass farming over the 1870s sowed much of their land with grass in the following decade, and farms which had been principally arable were converted into pastoral holdings with no more than one-quarter, or at best one-third, of the cultivated acreage under crops. The trend to grass and livestock was comparatively slow on lighter soils where crops and grass had been integrated traditionally.³

Changes in the overall structure of agricultural output should not be exaggerated. Even by the mid-1890s when the tide of depression had more or less run its course, Hunter Pringle in his report to the Second Royal Commission on Agricultural Depression remarked that much of the Yorkshire lowlands still retained the features of a corn-growing county.⁴

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1. There may have been strong personal preference for the production of cereals which dulled the economic drive to grass.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), p.157.
 3. R.C. on the Agricultural Depression (1895), p.922.
 4. Ibid.

The extent to which livestock replaced or supplemented cereal growing in lowland farming, as has been shown for Lord Wenlock's estate, depended largely on soil types. Coppock made the same point about the Chilterns but added that a second factor, accessibility, was also important in determining the rate of change in the structure of farm output. Access to the railway encouraged the early adoption of dairying and potato growing.¹

Farmers were slow to adjust their husbandry on the Wolds along the lines suggested by the widening differential between cereal and livestock prices. Some adjustment was necessary by the late 1870s but Coleman "could not find that much had been done by way of experiment" to achieve it.² He recommended to the Richmond Commission that landowners on the Wolds should revise their system of cropping to allow at least the 'weaker' soils to be let down to grass. This had the advantage of increasing the relatively small amount of permanent pasture capable of carrying beef and dairy stock and could in time form the basis of a more extensive cattle industry. Hunter Pringle made a similar suggestion 15 years later. He thought that grassland farming would lead to "increased fertility, lessened expenditure, and more certain profits".³

There are several explanations for the stability of agricultural output on the Wolds. Any fundamental change would have affected the cereal farmers' style of husbandry and would have largely ended an association with corn which many farmers regarded as a way of life, not just a business undertaking. Such a move would have been resisted. A major shift to grass also involved increased expenditure on fold yards and

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1. J.T.Coppock, 'Agricultural Change in the Chilterns, 1875-1900', loc. cit. pp.74-5.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), p.143.
 3. R.C. on the Agricultural Depression (1895), p.921.

other buildings to house extra stock, and would have been viewed critically at a time when profits were being squeezed. However, whatever the precise reasons for procrastination, Wold farmers did little to alter the basis of their farming over the depression years.

* * * * *

The impression of a slow and continuous movement in favour of grass farming must be rejected for the East Riding between 1850 and 1880. The arable acreage increased at the expense of grass in the 1850s and 1860s, and the cereal acreage was maintained at a high level until the early 1880s by replacing wheat with barley and oats.

The annual rate of increase in the cattle population failed to keep up with the rate of increase in pasture land between the late 1860s and 1890 but this conceals a significant improvement in the quality of cattle themselves. The increased level of stocking in the county and the increased acreage under pasture points to the gradual decline of cereals within the mixed farming system and marks a positive movement towards livestock specialisation, though this was always limited in eastern England by the relative dryness of pastures. It should therefore not be exaggerated.

The expanded acreage under pasture did not come from abandoned arable land though this was frequently the case from the 1880s. The increase in the case of the East Riding came mainly from local government boundary changes and from possible extensions of the margin of cultivation in some districts. High farming did not collapse completely with the onset of depression though most East Riding farmers attempted to trim their costs and the extension of grass helped this by cutting back on labour, the

farmers' biggest cost. "The general tendency was to lighter and lower farming, made possible by lower rents, and a return to a minimum outlay system of farming which prevailed before high farming was developed."¹

A movement in this direction was inevitable but what is remarkable is that so much of the cereal-based economy of East Yorkshire survived into the 1890s. Farming in many districts was only slightly 'lower' than before; there was no mass abandonment of land and fields continued to be cultivated efficiently and the basic agricultural structure remained intact.

1. P.J. Perry, British Farming in the Great Depression, 1870-1914 (1974), p.113.

CHAPTER EIGHT

DISTRICT AND REGIONAL TRENDS IN THE COMPOSITION OF FARM

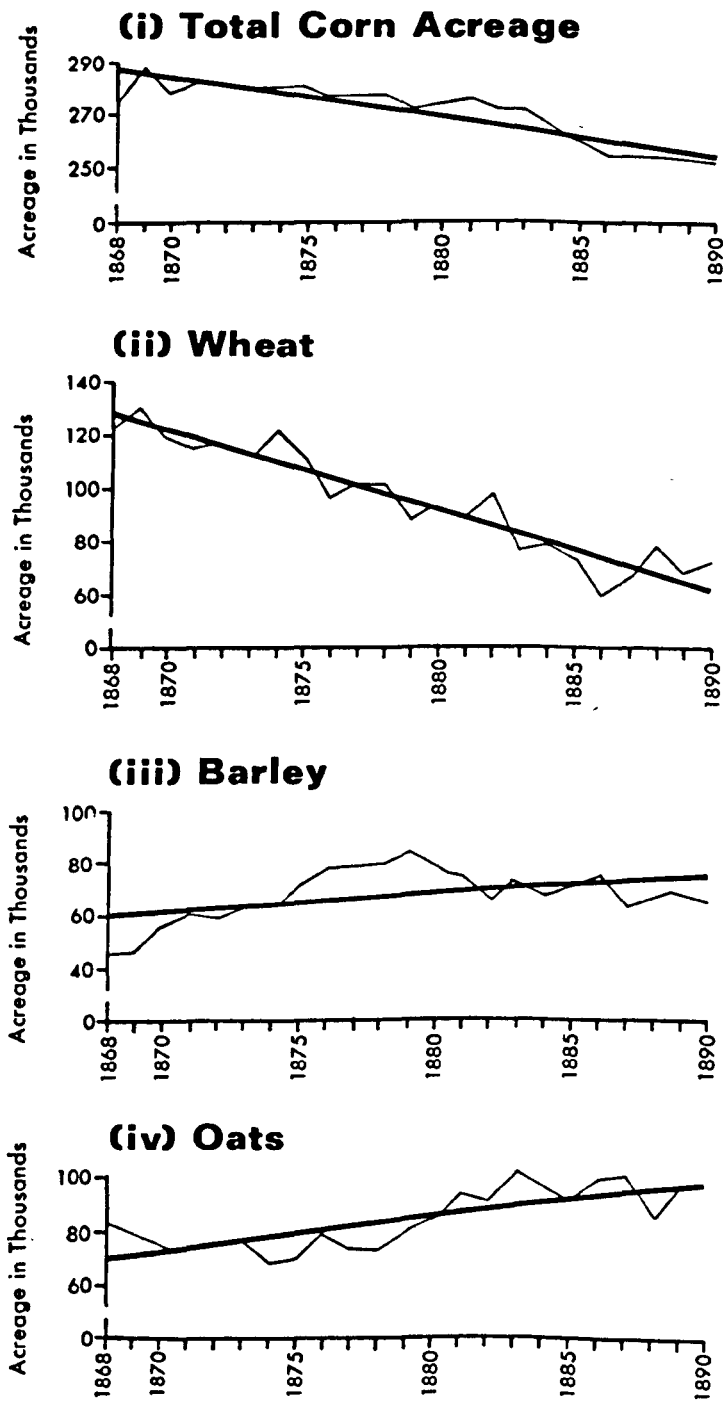
OUTPUT IN THE EAST RIDING, 1850-80.

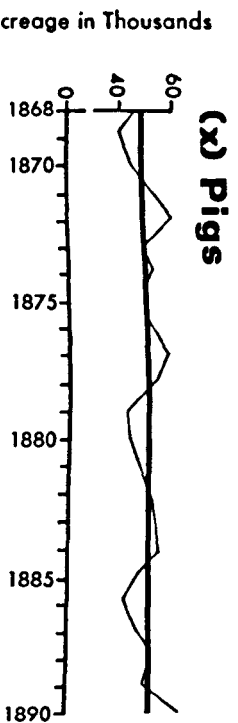
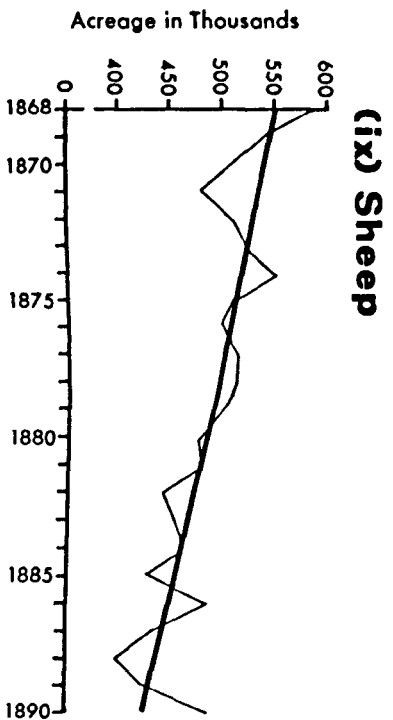
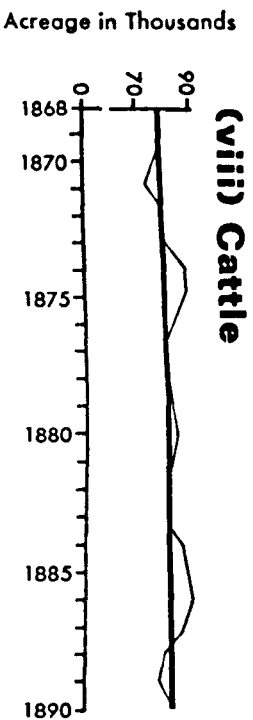
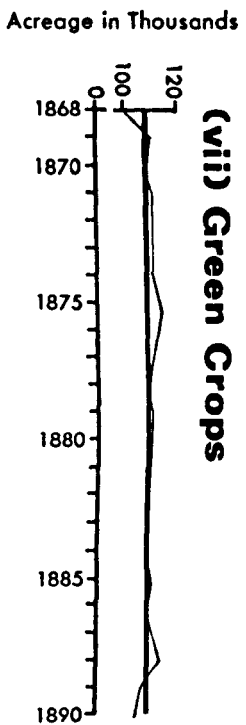
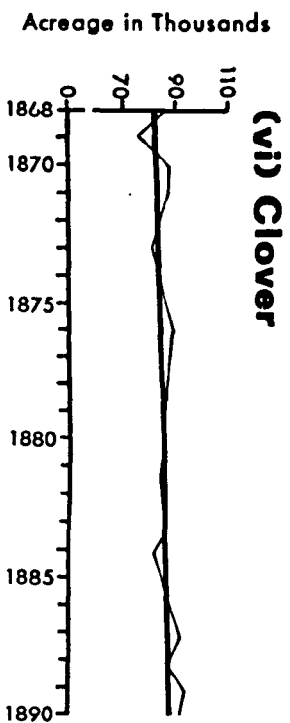
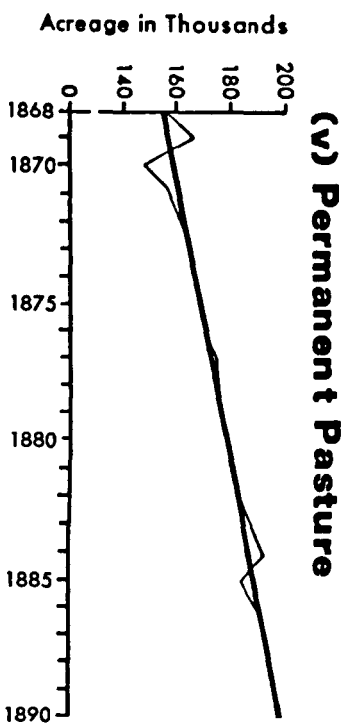
The quantification of shifts in the composition of farm output at district level is less precise than at county level because of the type of data available. The materials used in this study are those collected by the Board of Inland Revenue for the agricultural census, and consist of a mass of unpublished parish returns, lacking any classification on a district basis apart from in 1866. Only certain years were sampled because of the weight of detail contained in the parish returns and the length of time necessary to compile a year-by-year index of developments at district level: 1867, 1875 and 1880 were chosen to investigate district changes in arable and grass farming, and 1866, 1869, 1875, and 1880 to investigate changes in livestock. It was felt that the impact of rinderpest in the mid-1860s could be studied more adequately using this latter combination of years, though this view was later modified.

The use of non-continuous time series data raises several interpretative problems because of the cyclical movement present in each of the acreage and livestock series. The resulting distortion was insignificant in wheat, pasture and sheep. It was a minor problem in cattle and clover, and a quite significant problem in oats and barley, and precise estimates of expansion and contraction in their planted acreage are not wholly accurate, though the broad direction of change is revealed.¹ The main value of the analysis, taken in its entirety, is that in spite of several limitations, it indicates the range of output responses at the district level and the

1. The distortion produced can be assessed visually by measuring the distance between the data points traced out for each crop, etc. over the years 1866, 1869, 1875 and 1880, and the linear trend values calculated for each agricultural series between 1868 and 1890.

Figure 8.1 The Relationship Between Trend (as depicted by regression lines) and Data Values for Grass, Livestock and Grain in the East Riding, 1868-90.





degree to which each region conformed, or failed to conform, to the growth rates in agricultural production calculated for the East Riding as a whole. (See Table 7.4.)

Eight districts were examined which together made up about two-thirds of the land area of the county. The districts chosen were Howdenshire, Bainton Beacon on the northern Wolds, Ouse and Derwent in the Vale of York, Buckrose in the north west, Dickering in the north east, and Holderness which was divided into its northern, middle and southern sections.

This was not a precise division of the county in the technical and economic sense. It was a political division and to some extent ignored physical factors such as solid geology, soil and aspect which were vital determinants of regional farming types. The usefulness of this arrangement can be assessed by comparing Figure 8.2 with Figure 1.1. Only Dickering and Buckrose were geographically diverse areas incorporating large outcroppings of chalk, clay and sand within the same administrative/political division, and, while there was some geological overlapping in other districts, these administrative divisions were generally appropriate and delineated districts with fairly homogeneous agricultural structures. They therefore seem quite suitable for a regional study of crop and livestock trends.

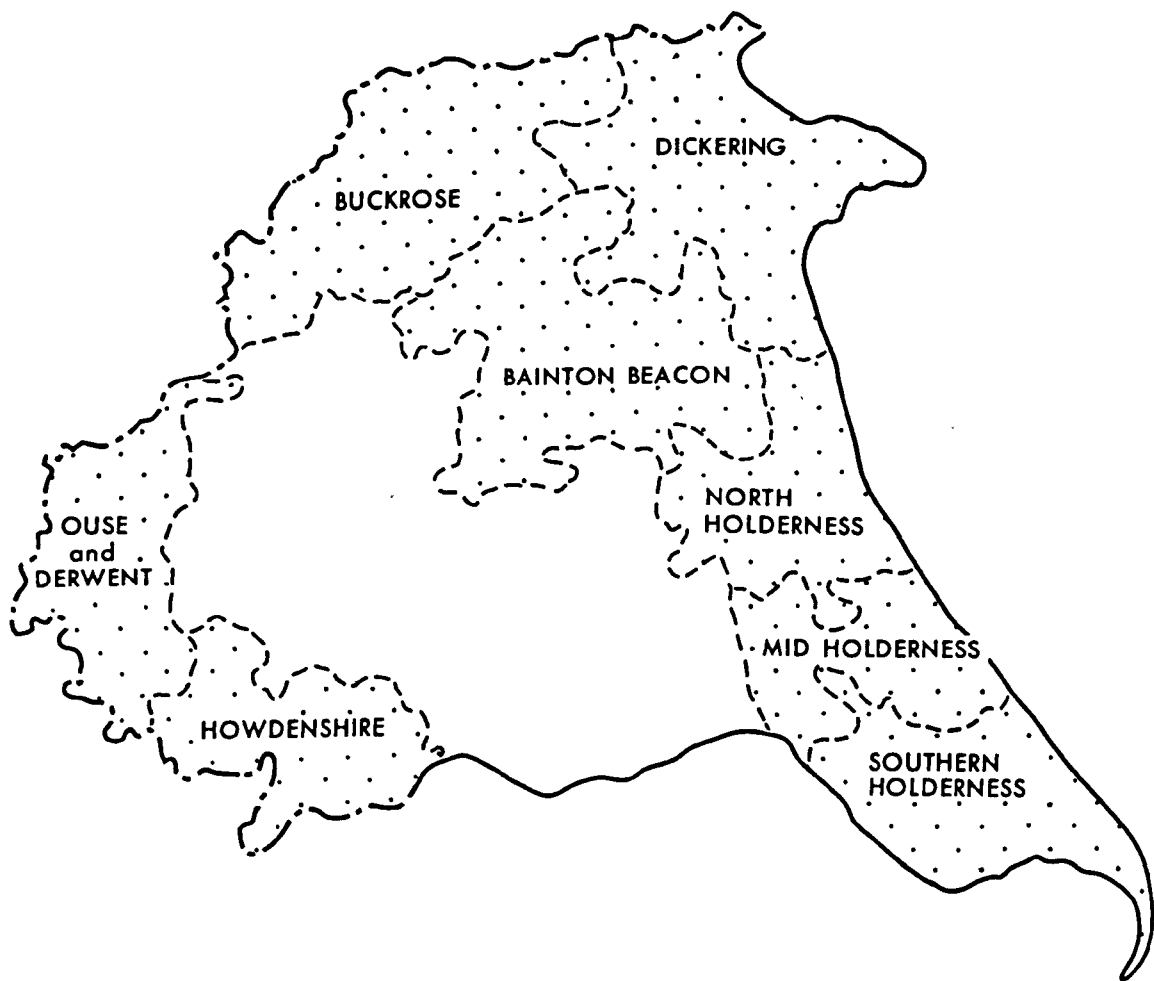
Table 8.1. Regional variations in the East Riding corn crop, 1867-80.
(in acres* and percentages)

District	1867 (1)	1875 (2)	1880 (3)	Percentage movements over time		
				2 as % 1	3 as % 2	3 as % 1
Howdenshire	12,506	15,314	13,272	22.5	-13.3	6.1
Bainton Beacon	29,177	29,570	32,723	1.3	10.7	12.2
Ouse & Derwent	14,046	14,724	14,439	4.8	-1.9	-0.7
South Holderness	17,487	17,130	17,410	-2.0	1.6	-0.4
Mid-Holderness	17,834	18,140	15,660	1.7	-13.7	-12.2
North Holderness	14,883	14,967	15,000	0.6	0.2	0.8
Buckrose	28,550	29,071	29,580	1.8	1.8	3.6
Dickering	26,886	27,493	27,815	2.3	1.2	3.5

Source: Agricultural returns of B.O.T., Parish Summaries of East Riding,
P.R.O. MAF 68 153; MAF 68 438; MAF 68 723.

* These acreages are from aggregating wheat, barley and oats. They exclude minor cereals.

Figure 8.2 The Administrative Divisions of the East Riding Referred to in Table 8.1.



Corn acreage showed a varied pattern of response to market changes at a regional level. Acreage increased in every district except for south Holderness between 1867 and 1875, but the increases were very modest, failing to exceed 5 per cent apart from in Howdenshire. The regional pattern of production¹ was more varied in the second half of the 1870s. The sown acreage remained virtually stationary in north and south Holderness, Dickering, Buckrose, and the Vale of York, but contracted strongly in Howdenshire, which may indicate that cereal expansion had been too vigorous in the late 1860s and early 1870s and adjustments were necessary to restore regional equilibrium. The even sharper contraction in mid-Holderness (13.7 per cent) was probably the result of a simple transfer in land use from arable to grass, though no other district in Holderness, or for that matter in the Vale of York, recorded changes in land use of this magnitude. The sharp increase in corn production on the Wolds in the 1870s, which occurred in spite of poor harvests and unfavourable markets, was the product of several factors, the most critical being that farmers lacked an economic alternative to corn. The area under grass increased and a sizeable beef and dairy industry was built-up in Bainton Beacon, but this was untypical of many parts of the northern Wolds, which were remote from lines of easy communication, and of the high Wolds as a whole. Before the twentieth century water resources were generally too deficient above the boulder clay flanks of the lower Wolds to support dairying and large scale beef production,² and the decision to expand corn production was therefore logical for want of an alternative. The substitution of barley for wheat was a tempting way to maintain income.

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1. Acreage and production are used here as synonymous terms. For an explanation of this, see below, p.215.
 2. Water supply technology has undergone rapid changes in the twentieth century and has gone far towards making good the natural deficiency of the high Wolds.

Regional changes in corn output were minor in all but three districts, Howdenshire, Bainton Beacon and mid-Holderness, between the mid-1860s and 1880. Acreage increased by 6.1 and 12.2 per cent in Howdenshire and Bainton, respectively, and there was a sharp cut back of 12.2 per cent in mid-Holderness.

Table 8.2. Regional variations in wheat, oats and barley in the East Riding, 1867-80.

(in acres and percentages)

District	1867 (1)	1875 (2)	1880 (3)	Percentage movements over time		
				2 as % 1	3 as % 2	3 as % 1
<u>WHEAT</u>						
Howdenshire	6,567	7,462	5,109	13.6	-31.5	-22.2
Bainton Beacon	14,382	14,441	13,651	0.4	-5.5	-5.1
Ouse & Derwent	4,277	4,237	3,482	-0.1	-17.2	-18.6
South Holderness	10,663	11,230	9,171	5.3	-18.3	-14.0
Middle Holderness	9,022	9,124	8,075	1.1	-11.5	-10.5
North Holderness	8,103	7,452	6,415	-8.0	-13.9	-20.8
Buckrose	10,661	9,673	8,471	-9.3	-12.4	-21.5
Dickering	12,605	12,454	10,202	-1.2	-18.1	-19.1
<u>BARLEY</u>						
Howdenshire	2,036	4,050	4,279	98.9	5.7	108.7
Bainton Beacon	3,929	5,992	7,155	52.5	19.4	82.1
Ouse & Derwent	5,211	6,192	6,230	18.8	0.6	19.5
South Holderness	1,295	1,780	3,356	37.5	88.5	159.2
Middle Holderness	1,722	3,129	3,064	81.7	-2.1	77.9
North Holderness	1,580	3,518	3,393	122.7	-3.5	114.8
Buckrose	9,093	11,345	11,520	24.8	1.5	26.7
Dickering	3,522	5,572	6,314	58.2	13.3	79.3
<u>OATS</u>						
Howdenshire	3,903	3,802	3,884	-2.6	2.2	-0.5
Bainton Beacon	10,866	9,137	11,917	-15.9	30.4	9.7
Ouse & Derwent	4,558	4,295	4,727	-5.8	10.1	3.7
South Holderness	5,529	4,120	4,883	-25.5	18.5	-11.7
Middle Holderness	7,090	5,887	4,521	-17.0	-23.2	-36.2
North Holderness	5,200	3,997	5,192	-23.1	29.9	-0.2
Buckrose	8,796	8,053	9,589	-8.4	19.1	9.0
Dickering	10,759	9,467	11,299	-12.0	19.4	5.0

Sources: as in Table 8.1.

Table 8.2 shows that although movements in the output of the three principal cereals were of unequal strength in the various districts, they were broadly similar to those calculated in Table 7.4 for the county as a

whole. Regional variations in the planted wheat acreage were modest down to the mid-1870s. Acreage fell in north Holderness, Buckrose, Dickerling, and Ouse and Derwent, but the reductions were trivial in the two latter. Minor increases occurred in Bainton Beacon and mid-Holderness, and there were stronger increases in Howdenshire and south Holderness. The sown acreage of wheat contracted by 5-18 per cent in every region in the late 1870s, except Howdenshire, where a quite sizeable reduction probably represented a return to more normal production after the inflated and out of trend increases of the late 1860s and early 1870s.¹ By contrast wheat held currency on the Wolds into the 1880s and although its acreage contracted, the rate of fall was well below the average for the county.

Regional variations in barley output were roughly in line with the East Riding average. Barley acreage expanded by about 50 per cent in Bainton, south Holderness and Dickerling between 1867 and 1875, nearly doubled in Howdenshire and north Holderness, and increased by about one-quarter in the central and northern districts of the Vale of York. Regional variations in barley production became more pronounced after 1875 with barley acreage contracting slightly in north and mid-Holderness, increasing in each of the other districts and expanding strongly in south Holderness, where it probably represented a delayed response by farmers to a cereal price structure which was increasingly favourable to barley and oats producers. (South Holderness was one of the few districts which had raised its barley acreage by less than 50 per cent between 1867 and 1875.) Taking the period 1867-80, the area sown down to barley more than doubled in Howdenshire and north and south Holderness, increased by 75-80 per cent on the Wolds, Dickerling and mid-Holderness, and increased by 20-25 per cent in the central and northern districts of the Vale of York.

1. The sown acreage of wheat in Howdenshire had increased by 13.6 per cent between 1867 and 1875.

District trends in oats production conformed roughly to the county trend but the precise extent to which individual districts converged or diverged from the county norm cannot be estimated because of defects in the 1875 data. 1875 was untypical for oats production in the East Riding, the planted acreage falling short of the computed average for 1868-77 by 10,000 acres.¹ 1880 was more typical. The effect of this has been to exaggerate the level of contraction in planted acreage in the late 1860s and 1870s and to understate expansion in the following period. The broad direction of change at district level has not been affected unduly.

The area under oats fell in each district between the mid-1860s and mid-1870s. The fall was very slight in Howdenshire, the central part of the Vale of York and Buckrose, and it is possible that the planted acreage may have remained unchanged using more reliable data. There was a more severe contraction in the other regions but this was reversed in the second half of the 1870s except in mid-Holderness where acreage continued to drop.

The enlarged production of oats was associated with grass and livestock farming which rose in importance in all parts of the East Riding, though emphasis varied widely. The area under grass increased in nearly every district between 1867 and 1875 and the trend quickened between 1875 and 1880. In the earlier period grass acreage contracted in Howdenshire and north Holderness but the loss of acreage was so slight that it could easily have resulted from minor defects in the data used, and it is probably safer to interpret developments in these districts as maintaining the status quo rather than continuing the trend towards arable cultivation. The acreage under grass increased strongly only in Dickerling and mid-Holderness;

1. See Figure 8.1, p.189.

the increase was scarcely perceptible on the Wolds and was only slightly stronger in south Holderness and the central and northern parts of the Vale of York. The trend to grass strengthened after 1875 and positive gains were made in every region though they varied from the central plains of the Vale of York, where they were strongest, to north Holderness and the Wolds where they were much weaker. This was very much the pattern taking the entire period.

Table 8.3. Regional variations in grassland in the East Riding, 1867-80.
(in acres and percentages)

District	1867 (1)	1875 (2)	1880 (3)	Percentage movements over time		
				2 as % 1	3 as % 2	3 as % 1
<u>TOTAL GRASSLAND OF ALL KINDS*</u>						
Howdenshire	14,133	14,120	15,808	-0.1	12.0	11.9
Bainton Beacon	24,382	24,837	26,117	1.9	5.3	7.1
Ouse & Derwent	16,441	17,484	21,408	6.3	22.4	30.2
South Holderness	19,952	20,750	23,283	4.0	12.2	16.7
Middle Holderness	18,296	19,978	22,145	9.2	10.8	21.0
North Holderness	16,545	16,510	16,642	-0.2	0.8	0.6
Buckrose	31,335	32,929	35,156	5.1	6.8	12.2
Dickering	20,277	22,704	23,234	12.0	2.3	14.6
<u>CLOVER</u>						
Howdenshire	4,117	4,364	4,098	5.7	-6.5	-0.4
Bainton Beacon	11,663	11,248	11,513	-3.7	2.3	-1.3
Ouse & Derwent	4,390	4,101	4,305	-7.1	4.7	-1.9
South Holderness	4,531	4,607	4,832	1.7	4.7	6.6
Middle Holderness	4,016	4,054	4,489	1.0	9.7	11.8
North Holderness	4,767	4,183	4,098	-14.0	-2.1	-14.0
Buckrose	11,799	10,829	10,873	-9.0	0.4	-7.8
Dickering	10,300	10,918	10,190	5.7	-7.1	-1.1
<u>MEADOW AND PASTURE (NOT ROTATED)</u>						
Howdenshire	6,734	6,792	9,059	0.9	33.4	34.5
Bainton Beacon	11,466	13,005	13,523	13.4	4.0	18.0
Ouse & Derwent	10,338	12,130	15,551	17.3	28.2	50.4
South Holderness	10,188	11,363	13,065	11.5	14.9	28.2
Middle Holderness	12,114	13,163	14,170	8.7	7.7	17.0
North Holderness	9,854	10,735	10,244	8.9	-4.6	4.0
Buckrose	18,880	21,537	23,402	14.1	8.7	24.0
Dickering	9,736	11,651	12,862	19.7	10.4	32.1

Sources: As in Table 8.1.

* This includes clover under rotation, meadow and pasture under rotation, and bare fallow.

The strength of regional movements in the clover acreage was more varied than in meadow and pasture probably because of the unevenness of 'clover sickness'. By the late 1860s the East Riding was divided into a bloc of districts where clover was declining in importance and a bloc where it was expanding slowly. The northern Wolds, north Holderness and the central and northern districts of the Vale of York fell into the first group, while Howdenshire, Dickering and middle and south Holderness fell into the second. This divided the county, with the exception of Howdenshire, into an eastern and western bloc, the Wolds being the rough dividing line. The pattern of clover production changed slightly in the middle and late 1870s, and a movement against clover was just strong enough to reverse the earlier trend in Howdenshire and Dickering, but by and large the county trend remained stable over the 1860s and 1870s.

Changes in the acreage under meadow and pasture were more important. Their acreage increased by 1,000-2,000 acres in nearly every district except Howdenshire up to the mid-1870s. Inter-regional variations were slightly more pronounced after 1875. Ouse and Derwent, Howdenshire and south Holderness recorded the most significant increases in grass acreage in absolute, as well as in relative terms, but reasonable increases were also found in mid-Holderness, Buckrose and Dickering. There was a much slighter increase on the Wolds which might easily have been larger if the sample had included more parishes in the high Wolds. There was a movement against grass only in north Holderness but this was of little consequence and the district trend was upwards for the period as a whole. Over all, there was an expansion in grass acreage in excess of 20 per cent in six out of the eight districts sampled between 1867 and 1880.

The analysis of clover, meadow and pasture leads to three conclusions. First, there was a strong correlation between changes in clover acreage and the acreage under non-rotated grasses. It is a

matter for speculation whether clover sickness was responsible. Second, and not directly connected with the grass economy, was the trend in bare fallow. The acreage figures for total grassland (Table 8.3) unavoidably included the acreage under bare fallow and an accurate impression of the movement in fallow was built up by taking the acreage under clover and non-rotated grasses from the total grass acreages in each region. A movement away from fallowing in the late 1860s and early 1870s was shown clearly in every region, except middle Holderness, and is a good indication of the thriving condition of agriculture throughout much of the third-quarter of the century.

Table 8.4. Regional variations in fallow land in the East Riding, 1867-80.
(in acres and percentages)

District	1867 (1)	1875 (2)	1880 (3)	Percentage movements over time		
				2 as	3 as	3 as
				% 1	% 2	% 1
Howdenshire	3,282	2,924	2,651	-10.9	-9.3	-19.2
Bainton Beacon	1,283	584	1,081	-53.4	85.1	-13.7
Ouse & Derwent	1,713	1,253	1,552	-26.9	23.9	-9.4
South Holderness	5,233	4,780	5,396	-8.7	12.9	3.1
Middle Holderness	2,166	2,761	3,486	27.5	26.3	60.9
North Holderness	1,924	1,592	2,300	-17.3	44.5	19.5
Buckrose	656	563	881	-14.2	56.5	34.3
Dickering	241	135	182	-44.0	34.8	-24.5

Sources: as in Table 8.1.

The slightly rising trend in the latter half of the 1870s and early 1880s was a symptom of the increasing grip of depression. The uneven distribution of fallow was a function of the heaviness of the soil.

Third, it is unlikely that regional increases in grass acreage were underpinned by contractions in the cropped acreage until at least the late 1870s and early 1880s. This can be verified by combining the separate regional analyses of corn, grass and green crops,¹ calculating

1. The acreage calculations for green crops do not appear in the text for the sake of brevity though they have been used in Table 8.5.

the total agricultural acreages of each district in 1867 and 1880 and then comparing them with the regional changes in grass, both rotated and non-rotated. This is done in Table 8.5.

Table 8.5. Movements in the cultivated acreage at district level, 1867-80.¹

District	Increase in total grass acreage (approx.)	Change in grain acreage, 1867- 1880 (approx.)	Change in green crop acreage (approx.)	Change in fallow (approx.)	Net change in cul- tivated acreage (approx.)	Increase/ decrease as % of 1880 acreage
Howdenshire	1,675	760	-900	-1,300	2,170	6.0
Bainton Beacon	1,735	2,700	450	250	5,000	8.0
Ouse & Derwent	4,970	-100	-400	-80	4,400	10.0
South Holderness	3,230	-70	-550	0	2,750	6.0
Middle Holderness	3,850	-2,200	0	2,600	320	0.75
North Holderness	100	100	-300	720	-450	-1.0
Buckrose	3,820	1,000	-1,100	1,300	2,600	3.4
Dickering	2,960	1,000	-3,000	0	900	1.5

Sources: as in Table 8.1.

The reduction in crop acreage (and the acreage under fallow in the case of Howdenshire), was sufficient to explain the expanded area under grass in terms of a simple shift in land use only in Howdenshire, Buckrose and Dickering. It was not possible in the other districts. The area under grain crops increased more rapidly in Bainton than that under grass and there was also a small increase in the green crop acreage. The reduction in crop acreage was so slight in Ouse and Derwent and south Holderness that it could not have underpinned a large increase in grass, while the fall in grain acreage in mid-Holderness was more than counter balanced by an

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1. Some acreage cannot be accounted for if the net change in acreage is computed against changes in all forms of agricultural land use. This does not apply to Bainton Beacon, Ouse and Derwent, south Holderness and Dickering: increases in total acreage can be matched against increases in grass, fallow, etc. This was not the case in the other districts. The acreage left unaccounted was -1,000, 2,600, 720, and 1,300 in Howdenshire, middle and north Holderness, and Buckrose, respectively. It is possible that the acreage left fallow in middle and north Holderness was greater than that recorded in the agricultural census. There is no apparent explanation for the short fall in acreage in Howdenshire.

increase in the acreage left fallow. Again, the expansion in the grass acreage, in this case amounting to nearly 4,000 acres, cannot be explained by a shift in land use. More important since it concerns seven out of the eight districts is the net increase in cultivated acreage. This was of no significance in some districts but it amounted to between 6 and 10 per cent of total acreage in Howdenshire, Bainton Beacon, Ouse and Derwent, and south Holderness. Simple boundary changes could not have accounted for all of this, which reinforces the suggestion that the margin of cultivation was extended in this period.

Table 8.6. Regional variations in the number of beef and dairy cattle in the East Riding, 1866-80.

District	1866	1869	1875	1880	Percentage movements				
	(1)	(2)	(3)	(4)	over time				
					2 as % 1	3 as % 2	4 as % 3	4 as % 2	4 as % 1
<u>MILK CATTLE</u>									
Howdenshire	864	1,348	1,356	1,803	56.0	0.6	33.0	33.8	108.7
Bainton Beacon	1,840	2,078	2,111	2,195	12.9	1.6	4.0	5.6	19.3
Ouse & Derwent	1,094	1,845	2,003	1,901	75.9	8.6	-5.1	3.0	81.2
South Holderness	1,289	1,572	1,811	1,641	22.0	15.2	-9.4	4.4	27.3
Middle Holderness	1,841	2,128	2,346	2,084	15.6	10.2	-11.1	-2.1	13.2
North Holderness	1,154	1,109	1,660	1,517	30.8	10.0	-8.6	0.5	31.5
Buckrose	1,722	1,992	2,111	2,195	15.7	6.0	4.0	10.2	27.5
Dickering	1,667	1,935	1,954	2,062	16.0	1.0	5.5	6.6	23.7
<u>BEEF AND OTHER CATTLE</u>									
Howdenshire	2,165	3,133	3,773	4,403	44.7	20.4	17.6	40.5	103.4
Bainton Beacon	3,375	3,213	5,291	5,907	-4.8	64.7	11.6	83.8	75.0
Ouse & Derwent	2,634	4,470	4,965	4,708	69.7	11.1	-5.2	5.3	78.7
South Holderness	4,217	4,884	5,080	4,708	15.8	4.0	-7.3	-3.6	11.6
Middle Holderness	3,080	4,790	5,855	4,822	55.5	22.2	-17.6	0.7	56.6
North Holderness	3,216	4,305	4,244	4,200	33.9	-1.4	-1.0	-2.4	30.6
Buckrose	4,383	4,323	5,477	5,728	-1.3	26.7	4.6	32.5	30.7
Dickering	2,583	3,923	4,097	3,923	51.9	4.4	-4.2	0.0	51.9

Sources: as in Table 8.1.

The trend to grass was associated principally with the production of livestock for meat and dairy produce. There were two distinct phases in cattle production between the mid-1860s and 1880. Re-stocking was carried out vigorously in every district of the East Riding in the years

immediately following the rinderpest outbreak of 1865-6, and was associated later with genuine expansion which continued into the early 1870s both for dairy and beef cattle. The rate of increase slackened after 1870, picked up again around 1873 and numbers peaked in the following year. The figures for 1875 exaggerate the increase after 1869, the cattle population being significantly above its trend level,¹ but there is no doubt about the overall increase.

The pattern of regional development was decidedly less even in the second phase which began in the mid-1870s. The cattle population continued to expand in some regions, especially Howdenshire and to a lesser extent the Wolds, Buckrose and Dickering. It fell in the others though only in middle Holderness, and possibly in south Holderness, was it more than a marginal re-adjustment, and even there the negative movement was not powerful enough to undermine the gains made in the preceding decade. It appears on superficial examination, though this is modified later, that Howdenshire and the central districts of the Vale of York experienced the fastest growth in cattle numbers over the whole period. These were also the areas, along with Dickering and south Holderness, which absorbed the major share of the East Riding's increased grassland.

The notion of a geographical differential in cattle production is in line in some respects with the nineteenth century view that economic activity in agriculture was zoned around market centres. This theory, advanced by J.H. von Thunen, suggested that land located close to market centres would be used mainly for the production of crops and commodities with a high value per acre, dairying and market gardening for example,

1. See Figure 8.1, p.189.

and that cultivation would be more extensive as the distance from market centres increased with more emphasis given to grain crops and beef, subject to the limitations of soil and aspect.¹ Geographical location would not determine their production because grain could be stored for long periods without deteriorating, and beef and mutton, whether as live or dead weight, could withstand the cost of transportation because of their high value to weight ratios.

Zoning inter-regionally and within regions was developed on the cost of horse transport and must have been undermined by the effects of the railway in the second half of the nineteenth century. The importance of zoning in von Thunen's sense has been examined in connection with the East Riding dairy industry and raises several basic questions. First, did access to the expanding markets of York and Howden explain the expansion of dairying on the Vale of York and in Howdenshire? Second, if this was so, why did the Hull market, which was much larger and faster growing than either the York or Howden markets, fail to encourage similar expansion in Holderness? Third, assuming the importance of local markets for dairy producers implicit in the theory of zoning, how could a fairly large dairy industry establish itself in some districts on the Wolds which were distant from population centres?

There is a close historical relationship between producers and markets in the dairy industry. Those engaged in it had to be able to market their produce easily which implied ready access to retail outlets. Producers also needed a stable demand which would not fluctuate excessively from month to month or from season to season. These market constraints applied to all dairy farmers though the producer of liquid milk was the most

1. M. Capstick, The Economics of Agriculture (1970), p.24.

vulnerable. Milk producers in the nineteenth century were generally able to exercise firmer control and hedge against market difficulties the closer they stood to the market. However, it is unlikely that increases of 80-100 per cent in the dairy cattle population of Howdenshire and the central Vale of York, especially given the possibility of rising milk yields, could be explained by correspondingly favourable marketing conditions in Howden and York. If it were otherwise the expanding markets of Hull, Bridlington and Malton should have encouraged similar growth in mid-Holderness, Dickering and Buckrose. The Hull market was the most attractive in the East Riding for milk, butter, cheese, and eggs. Its influence was felt throughout Holderness and many dairy farmers were completely dependent on its markets.¹ There is therefore the paradox of sluggish growth in the parishes of mid-Holderness, which served a large and growing market, and much faster growth in the parishes of the central Vale and Howdenshire which served smaller and slower growing market centres.

Part of the paradox can be explained by reference to the effects of rinderpest. The validity of inter-regional comparison based on percentage calculations for 1866-80 is questionable because of the seriousness of rinderpest in the mid-1860s. Data for 1866 are doubtful, and more important, the effects of the cattle plague were probably felt unevenly throughout the county. This is suggested in the Dunnington-Jefferson papers already cited and is hinted at in Table 8.6. If it is assumed that cattle densities in each region in 1869 were only slightly more inflated than immediately prior to the outbreak of plague, which is reasonable on the assumption

1. 'Yorkshire Farm Prize Competition, 1883', J.R.A.S.E. 2nd ser. XIX (1883), 537. A list of dairy producers serving this market could be drawn up by referring to any contemporary trades directory.

that re-stocking continued vigorously at least down to 1869-70, then two things follow. First, cattle numbers in 1866 were depressed by disease, and second, the difference between cattle numbers in 1866 and 1869 is a crude indicator of the losses caused by rinderpest.¹ Using these criteria the cattle industries of Howdenshire and the Vale of York appear to have been hit harder by the outbreak than districts east of the Wolds.²

If this is plausible the removal of the 1866 data from the calculation of inter-regional growth rates is necessary to produce more reliable results. Variations in the regional growth rates of dairy herds were much less pronounced with this done and only Howdenshire recorded an increase significantly above the 0-6 per cent range found in the other districts between 1869 and 1880. There is therefore no need to make out a special market/industry relationship for the Vale of York, though this might still be necessary for Howdenshire.

This does not explain the sluggish growth of the mid-Holderness dairy industry up to the middle 1870s and actual contraction during the remainder of the decade. The pastures of mid-Holderness carried more dairy cattle than any other in East Yorkshire in the late 1860s and early 1870s largely owing to the historical influence of the Hull market. Hull had been the shaping force and had gone a long way to zoning agricultural activity. However, this special market relationship was being undermined from the 1850s and 1860s and dairy herds contracted by 2.1 per cent between 1869 and 1880. This was at a time when living standards were rising, the population of Hull was growing, and the local market for dairy produce was presumably buoyant. More cereal land was sowed down to grass in

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1. The measurement is not exact because the census figures for 1866 underestimate cattle numbers, and natural growth and re-stocking were parallel developments.
 2. This is suggested strongly by the dairy cattle index and less strongly by the beef cattle index.

mid-Holderness than in any other district and a vigorous increase in its dairy herds was predictable if zoning had continued to play an important role in the economics of agricultural location. In the event it was beef herds which were built-up in the early 1870s in response to sharply rising prices, though herds contracted by over 17 per cent in the late 1870s. The sharpness of the upward trend in beef herds in the early period might partly explain the strong parallel increase in grass acreage, but it cannot explain the increase over the following quinquennium.

There is no substantial evidence to explain the diminished influence of Hull on the dairy industry of mid-Holderness, and the suggestion that the temporary increase in beef herds was at the expense of dairy cattle seems improbable.¹ No contemporaries sought answers to this question and the problem may be more important retrospectively in the context of transport economics. The most probable answer lies in the impact of the railway, especially the extension of the branch line system in the 1850s and 1860s. Hull was the focus of the East Riding rail network and mid-Holderness dairy producers were exposed for the first time to effective competition in the Hull market from suppliers elsewhere in the East Riding and from beyond. The English beef industry, on the other hand, was geared less to local markets than to the London market, and to a lesser extent the markets of the industrial West Riding and Lancashire.² The railway for a time may not have increased competition in the local beef market as much as in the butter and liquid milk markets. This is speculative but if correct would

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1. It seems unlikely that farmers would have reduced their investments in dairying and increased their investment in beef even if beef prices increased more strongly than milk and butter prices in the early 1870s. Beef cattle are not a close substitute for dairy cattle. Also one must consider the 2-4 year gestation period of making investments in beef rather than in milk; the initial investment would also be expensive involving the scrapping of milk parlours, etc.
 2. The East Riding beef industry was geared primarily to the West Riding market.

justify a slower, possibly even negative development in the mid-Holderness dairy industry, and a slightly positive development in the beef industry over the longer term. The number of dairy cattle in the more distant districts of Holderness (ie. distant from Hull) increased mildly in the 1870s possibly because of easier access to the Hull market. The much stronger increase in Howdenshire's cattle population could only have been founded on access to larger markets than were available locally. Better communications with Hull and the towns of the industrial West Riding probably provided the means and incentive to build up the region's dairy industry.¹ Generally, however, the impression from the revised data (ie. excluding 1866) is of fairly even development throughout the East Riding industry.

If the easing of marketing arrangements assisted more balanced growth in the dairy industries of the Vale of York and Holderness, variations in farm size helped to perpetuate some market imperfection. Farms in Howdenshire and the Vale of York were smaller than on the Wolds, and to a lesser degree in Holderness, and this favoured intensive forms of agricultural production such as pig meat, poultry, butter, milk and eggs. Large farmers in the East Riding, and in the Eastern Counties generally, concentrated more on corn and beef. The expansion of butter and milk production on the numerous 20-50 acre holdings in Howdenshire, the Vale and some districts of Holderness was therefore a logical way of attempting to maximize the regional 'factor mix' and boost profits. The precise importance of this factor cannot be measured but insofar as farms were smaller west of the Wolds, the incentive to develop or deepen the commitment

1. The market for milk grew very quickly in the industrial West Riding and dairying was the principal cattle enterprise there by 1910.- E.H. Whetham, 'The Changing Cattle Enterprises of England and Wales, 1870-1910', in W.E. Minchinton, ed. Essays in Agricultural History, II (1968), p.214.

to dairying might have been marginally greater than in Holderness. However, farm size was no more than a secondary influence for improved transport and higher living standards exerted much greater pressure on the location and growth of the dairying industry.

Dairying was of little importance on the uplands of the East Riding, and Bainton Beacon in this particular case did not reflect general conditions on the Wolds. Bainton straddles part of the high Wolds but is set firmly on the boulder clay flanks where farms were more numerous, villages more nucleated and communications easier with the market towns of the Vale of York. Water was also more abundant than on the high Wolds owing to shallow wells and springs, and pastures were richer because of this and the presence of deep loamy soils. A sizeable dairy industry was impractical on the more remote slopes owing to the limitations of nineteenth century technology, distance from market centres and the geographical unsuitability of the area for dairying. Curiously, the development of dairying in Bainton Beacon was similar to development in mid-Holderness. Dairy herds were considerable in both districts by the 1860s but there was no significant expansion over the following decade, though beef production expanded. Whether the sequence of causation was similar in both cases cannot be verified.

Adjustments to beef and dairy herds were roughly similar in most districts of the East Riding between 1869 and 1880. Data and trend values for these years lie close together and calculations based on them are accurate and are not just approximations of the direction and magnitude of movements in the cattle population. Dairy and beef cattle numbers increased rapidly in Howdenshire and Buckrose, and beef herds nearly doubled in Bainton Beacon,¹ but with these exceptions changes were very

1. Clearly the increased acreage laid down to grass in Bainton Beacon was used to carry additional beef herds.

minor in the other districts.

Unlike cattle, the regional distribution of sheep, and shifts in their economic significance over time, varied greatly from district to district. Most of the county's sheep, about 65 per cent in the sample used here, were concentrated on the chalk uplands of Bainton Beacon, Dickering and Buckrose. Sheep were generally of secondary importance outside these districts though most farmers in Holderness, and to a lesser extent in the Vale of York and Howdenshire, kept arable flocks to manure crop lands and provide wool and mutton.

Table 8.7. Regional variations in the number of sheep in the East Riding, 1866-80.

District	1866 (1)	1869 (2)	1875 (3)	1880 (4)	Percentage movements over time				
					2 as % 1	3 as % 2	4 as % 3	4 as % 2	4 as % 1
Howdenshire	7,424	7,793	8,821	8,608	5.0	13.2	-2.4	10.5	15.9
Bainton Beacon	44,113	72,020	73,128	69,938	63.3	1.5	-40.4	-2.9	58.5
Ouse & Derwent	14,355	15,404	14,958	13,723	7.3	-2.9	-8.3	-10.9	-4.4
South Holderness	17,900	33,892	29,019	25,695	89.3	-14.4	-11.5	-24.2	43.5
Middle Holderness	15,625	34,300	31,341	26,138	22.0	-8.6	-16.6	-23.8	67.3
North Holderness	18,871	31,115	30,094	29,202	64.9	-3.3	-3.0	-6.2	54.7
Buckrose	59,774	79,676	79,802	68,717	33.3	0.2	-13.9	-13.8	15.0
Dickering	44,308	79,423	77,540	70,416	79.3	-2.4	-9.2	-11.3	58.9

Sources: as in Table 8.1.

Sheep numbers fluctuated with the price of wool in West Riding markets. Flocks were increased rapidly in all districts in the second half of the 1860s and holdings were almost doubled in some. The strength of the upward trend is exaggerated because of omissions in the first agricultural census but the broad direction of change is not in doubt. Only Howdenshire and the central districts of the Vale of York failed to increase their holdings significantly. Flocks were cut back in the 1870s as industrial demand for wool slackened; they were maintained or increased only in Howdenshire and the chalk districts of Bainton Beacon, Dickering and Buckrose, and even there, with the exception of Howdenshire, they were

reduced in the late 1870s. This overall contraction in the 1870s can be easily exaggerated for the chalk districts. Bainton Beacon lost only 2.9 per cent of the stock reared or fattened in 1869. (1869 is a useful year for comparison with 1880 owing to the closeness of trend and actual values.)¹ Buckrose and Dickering lost 13.8 and 11.3 per cent, respectively. Similar losses were made in Howdenshire, the Vale of York and north Holderness, but losses ran at 23-24 per cent in middle and south Holderness.

Moving to regional trends in pig keeping, there is little to add to the discussion of county trends. A useful district analysis requires continuous time series data to chart the production cycle over the short term. Only one or two general observations can be made without it. Pig production is principally the occupation of the small lowland farmer though its importance varies even among this group. For example, there are currently twice as many pigs per thousand acres in Holderness than on the Vale of York, and three times as many than on the Wolds,² though this may have been different in the nineteenth century. Pig keeping is associated with milk production and is largely confined to lowland farms or to farms on the boulder clay flanks of the lower Wolds.

* * * * *

This regional study has confirmed that no district, or group of districts in the East Riding, persistently responded to changing agricultural prices in a manner not consistent with the general development of the county's agricultural economy. Farmers on the plains of Holderness conformed most closely to the computed averages of supply adjustment for the county shown in Table 7.4. This applied to cereal grains and grass though

1. See Figure 8.1, p.189.

2. W. Harwood Long, A Survey of the Agriculture of Yorkshire (1969), p.26.

not to livestock. The degree of conformity to county averages lessened outside Holderness. Changes in the output of barley followed the county trend in Howdenshire but the trend in grass and livestock diverged from it and the trend in sheep was completely opposed to it. On the Wolds wheat production continued at a high level into the second half of the 1870s though it had begun to fall rapidly elsewhere in the county. Beef cattle numbers rose more strongly, and sheep numbers were maintained more evenly, than in other districts. Barley production expanded more slowly in Ouse and Derwent than in the other districts, while the acreage under oats contracted more slowly in the late 1860s and early 1870s, and expanded more sluggishly in the second half of the 1870s. The trend towards grass and the emphasis on livestock conformed closely to the county average. Buckrose and Dickering occupied a 'middling' position. Buckrose followed the county trend in livestock and Dickering followed it in wheat and barley, and to a smaller extent in pasture and livestock. Changes in the oats crop were strongly perverse in both districts.

Three conclusions can be drawn from this regional study. The first concerns district and regional responses to changing agricultural prices. It would seem that Holderness, especially mid-Holderness, was the most typical district of the East Riding and reflected most closely the computed averages for the county. The agricultural structure of the Wolds with its emphasis on grain and sheep remained more or less intact by 1880 and what changes had taken place, particularly in livestock, were minor apart from in beef production where important gains were made. Deviations from the average, though at times very pronounced, as in Howdenshire, were generally modest in the other districts. Second, the railway had a critical effect on the county's dairy industry. The dairy industry of mid-Holderness failed to expand over the 1860s and 1870s even though it served Hull, the largest and most buoyant market for dairy produce in the East Riding. Access to wider markets helped to develop

dairying in districts where it had been of little or no importance owing to restricted markets, Howdenshire being a good example. The railway probably helped to raise the level of competition in the Hull market and lowered the optimum level for dairying in mid-Holderness.¹ Third, the margin of cultivation seems to have been pushed out over the third quarter of the nineteenth century. Part of the increase cannot be explained by local government boundary changes, and expansion through warping and the absorption of the few remaining areas of waste seems probable.

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1. The role of the railway in explaining the absence of growth in the dairy industry of mid-Holderness in the 1860s and 1870s - at a time when Hull was growing rapidly - is clearly only a partial answer to the problem. Other explanations, though again they rely on speculation, are that (a) Hull was overwhelmingly proletarian and (b) had a fairly small skilled working class. Both of these factors could conceivably have worked to the detriment of the mid-Holderness dairy industry by limiting the demand for dairy produce.

CHAPTER NINE

THE RELATIONSHIP BETWEEN CEREAL PRICES AND OUTPUT IN THE EAST RIDING, 1867-90.

1. Factors affecting farm output.

The responsiveness of businessmen and farmers to short and long term movements in the price of their products lies at the heart of much recent discussion on the quality of nineteenth century entrepreneurship. Farmers had to adapt themselves after 1846 to an environment changed by free trade. How, and in what manner they reacted to it, in particular, how they reacted to changes in the cereal price structure, will be examined in this chapter. Agriculturalists must have been aware of the new turn in prices, at least by the late 1860s and 1870s, though few thought it would be sustained. Many adapted output along the lines suggested by changing market conditions, and the decline in wheat cultivation after the Crimean War, and particularly after the mid-1870s, bears witness to it. This also applies to crops generally down to 1890 as the agricultural economy moved slightly in favour of grass and livestock.

Prices and output did not interact in a closed system. Economic, institutional and psychological factors helped to weaken the relationship suggested by pure theory between farm prices and output. Factors of production were not perfectly flexible - skill in cereal farming, for example, was not transferred easily to the raising of livestock. Legal restrictions encumbered landowners and tenant farmers. Land laws complicated land transactions and strict settlement kept many landed families burdened with debt and unable to finance investments necessitated by altered market conditions. Covenants regulated crop rotations and limited the output alternatives open to tenant farmers; and on a social level, land was sometimes held for prestige or sport and economic

considerations were often of secondary importance to its owners. All these features of the agricultural economy opposed a pure Marshallian relationship between prices and output. Each is discussed but an analysis here on only one of them - covenants - is sufficient to introduce the point.

Covenants regulating cropping were enforced on the majority of East Riding estates,¹ and were usually very explicit and were determined unilaterally by estate managements. The Sledmere, Sewerby and Grimston estates give a useful impression of the range of cropping agreements. Rotations at Sledmere combined (i) summer fallow, turnips or rape, (ii) corn, (iii) seeds, fallow, turnips or rape, (iv) corn, (v) seeds, fallow, turnips or rape, and (vi) corn. "Under no circumstances were two crops of corn to be taken in immediate succession without the written consent of Sir Tatton Sykes, or his Agent."² Tenants on the Sewerby estate of Yarburgh-Graeme were not entitled to take

more than two crops of White Corn or more than three crops of Corn or Grass ... without previously summer fallowing the same in a clean proper and husbandlike manner or sowing the same with Turnips or Rape to be eaten off with sheep.³

Cropping was controlled even more tightly on small gentry estates.

Colonel Grimston gave his tenants a choice of three well defined rotations:

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1. There were several important estates which did not enforce specific rotations. Among the most notable were Henry Bethell's estate at Rise and Sir Talbot Constable's extensive Holderness estate.- R.C. on the Depressed Condition of the Agricultural Interests (1880), p.140; 'Yorkshire Farm Prize Competition, 1883', J.R.A.S.E. 2nd ser. XIX (1883), 542.
 2. Sledmere Estate MSS, Tenancy agreement, October 17, 1854, E.R.R.O. DDSY/4/247; E.R.R.O. DDSY/4/260.
 3. Sewerby Estate MSS, Tenancy agreement, March 20, 1842, E.R.R.O. DDLG/43.

- (i) Summer fallow, wheat, seeds, oats.
- (ii) Summer fallow, oats or beans, seeds, wheat, beans.
- (iii) Summer fallow, wheat, beans, oats.¹

Cropping regulations were based on the four course principle and had potentially harmful effects if applied too inflexibly. Violation of cropping agreements were a frequent cause of legal action and in one of the most notable cases, *St. Quintin v. Lett*,² a tenant farmer was prosecuted for growing white crops three years in succession. The farmer had done this in a scientific manner preparing the land with additional farm yard manure and chemical fertilisers, secured above average yields, and gained a reputation for efficiency, but *St. Quintin* imposed a fine of £20 per acre on each acre cultivated out of rotation and was unlucky to have the court ruling go against him.³ However, the outcome of the case is not important. More important is that landowners still found it necessary in the 1860s and 1870s to restrict the actions of their tenants in basic farming operations.

This interference imposed a great burden on farmers in the depressed years at the close of the century. Thomas Carter, a tenant on the Sledmere estate, summed up his frustration at the inflexibility of cropping in a letter to the estate management written in February, 1879. He argued:

I am hard pressed now and if you /Sir Tatton Sykes/ will not allow me to sow more corn I do not see how I am to raise money to pay rent, labour rates and the common necessities of life, and in addition having a family of seven to bring up. (sic).⁴

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- 1. Grimston MSS, Tenancy agreement, October 9, 1848, E.R.R.O. GR/11/9.
 - 2. W. Harwood Long, 'Some Farming Customs and Practices in the Late 1860s: The Case of *St. Quintin v. Lett*', Agric. Hist. Rev. 23 (1975), 78-9.
 - 3. The plaintiff was supported by agents from neighbouring estates, estate valuers and extensive tenant farmers on the Wolds and in Holderness. The defendant drew support from the smaller tenantry and fortunately for him, the jury was composed mainly of small and medium-sized tenant farmers.- *Ibid.* pp.80-2.
 - 4. Sledmere Estate MSS, E.R.R.O. DDSY/101/77.

This and similar requests were rejected. The tenant's ability to control production and to respond to market prices as personal judgement suggested, were very restricted for years of depression.

Cropping policies have been discussed in some detail to indicate that it was not always easy for farmers to adjust output to changing conditions. Farmers were probably much less free to respond to market forces than the nineteenth century factory owner, though this argument should not be taken too far as several historians have commented on the generally close relationship between farm output and price, especially in wheat production. A.H. John suggested that a combination of falling wheat prices and stickiness in the agriculturalists' cost structure in the first half of the eighteenth century "forced adjustment in the practice of husbandry and in the organization of the land ... and that the pressure was more powerful because of the downward trend in prices".¹ G.E. Mingay concluded that the generally low level of agricultural prices in the decade or so after 1820 encouraged subtle changes in the composition of farm production, especially increased concentration on livestock.² E.L. Jones noted a slight shift to grass and livestock in the third quarter of the nineteenth century in response to the widening price differential between cereal and livestock prices;³ and T.W. Fletcher pointed to the close association between falling wheat prices and a greatly diminished wheat acreage in the last quarter of the century.⁴ Price was clearly the major determinant of farm output. But

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1. A.H. John, 'The Course of Agricultural Change, 1660-1760', in L.S. Pressnell, ed. Studies in the Industrial Revolution, presented to T.S. Ashton (1960), pp.145-6.
 2. G.E. Mingay, 'Agricultural Revolution in English History: A Reconsideration', Agric. Hist. 37 (1963), 126.
 3. E.L. Jones, 'The Changing Basis of English Agricultural Prosperity, 1853-73', loc. cit. p.110.
 4. T.W. Fletcher, 'The Great Depression of English Agriculture, 1873-1896', Econ. Hist. Rev. 2nd ser. XIII (1961).

the effect of legal and economic rigidities in the farming system was to make the relationship between price and output less smooth than it might otherwise have been. They could not undermine it.

2. A preliminary study of the relationship between cereal prices and output in the East Riding.¹

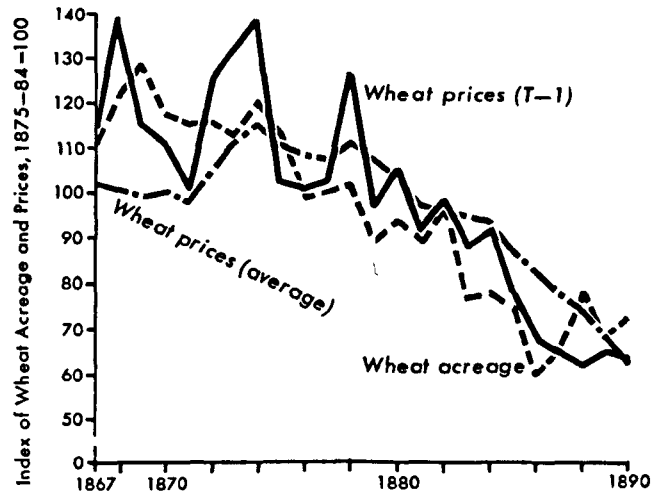
Supply is defined here in terms of what farmers intended to produce rather than the quantity of cereals reaching the market. It is assumed, as is the normal practice, that supply can be measured accurately by changes in the cereal acreage.² Prices are undeflated money prices recorded in a sample of local markets and have several disadvantages for use in an analysis of supply. Economists generally accept that movements in real prices underpin production decisions but this can be questioned in the context of eighteenth and nineteenth century farming when farmers planned

their harvest operations and future marketing with little more information than the prices current in their local market and a knowledge of the state of crops in their own locality ... The dearth of reliable information ... assured that the relevant decisions by producers, middlemen and consumers alike would be taken in an ill-lit fog.³

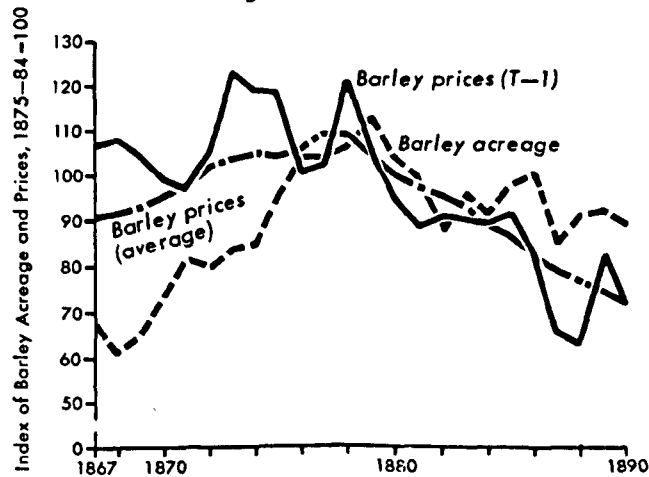
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1. A note on the relationship between the supply of livestock and movements in meat and dairy prices appears in Section 7, pp.247-9.
 2. This assumption is made in the following works:-
D.A. Ingersent, 'The Responsiveness of the Potato acreage to changes in Price', Journ. of Agric. Econ. XV (1962); B.E. Hill, 'Supply Responses in Crop and Livestock Production', Journ. of Agric. Econ. XXII (1972); M. Olson and C.C. Harris, 'Free Trade in 'Corn': A Statistical Study of the Prices and Production of Wheat in Great Britain from 1873 to 1914', Quart. Journ. of Econ. 73 (1959) (hereafter 'Free Trade in Corn'). This practice overcomes the need for production data, especially on local crop yields, of which there is very little.- J. Caird, English Agriculture in 1850-51 (2nd edn, 1968), p.320; Victoria County History of York (1912), II, p.476.
 3. E.L. Jones, Prices and Seasons (1964), pp.51-2.

Figure 9.1 The Relationship Between Septennial Grain Prices (lagged one-year and as a five-year moving average) and the Acreage Under Grain Crops in the East Riding, 1867-90.

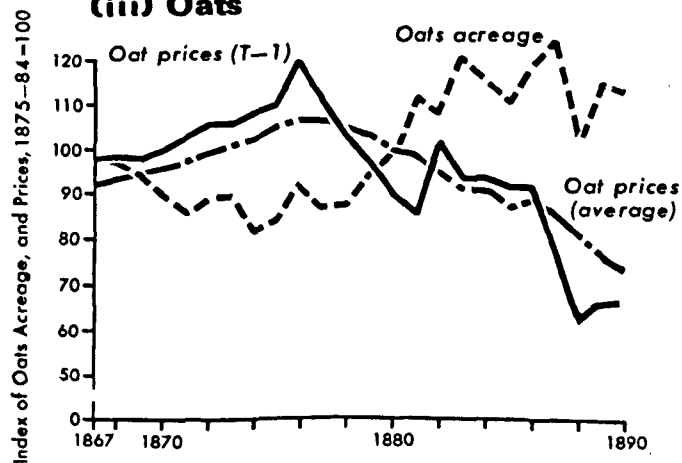
(i) Wheat



(ii) Barley



(iii) Oats



Planning had improved by the second half of the nineteenth century owing to the collection and publication of agricultural statistics, but it would still be hazardous to assume that real price or real value was meaningful in an empirical sense to more than a tiny minority of English farmers. This was even the conclusion of a study of British agriculture in the 1960s and 1970s.¹

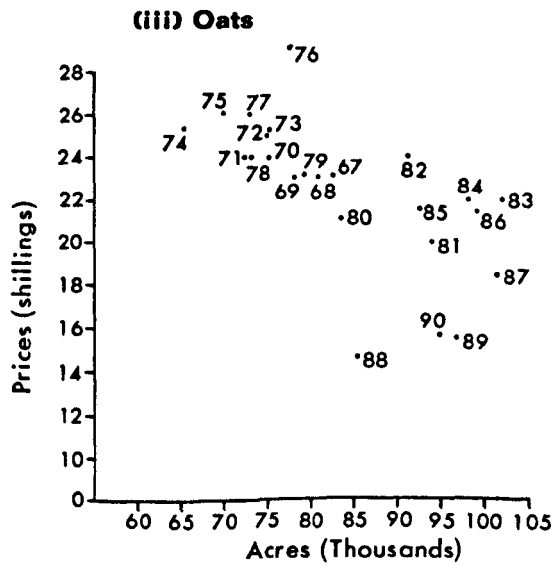
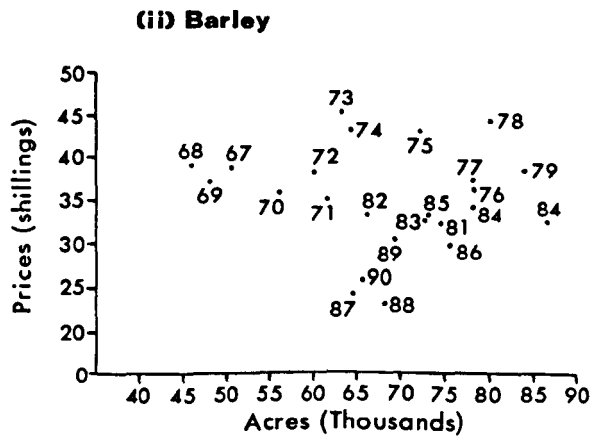
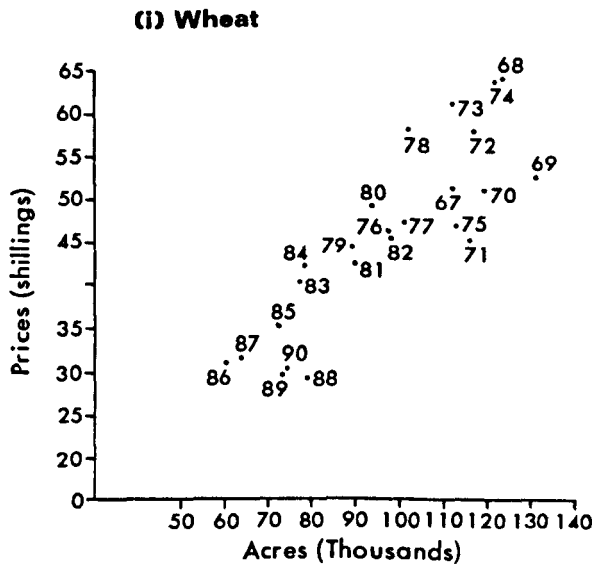
Decisions by farmers about what and how much to produce were based on their expectation of future prices. Their judgement was guided by price levels in the immediate and recent past and some researchers have concluded that prices in the period immediately preceding planting were the main determinants of output. For example, less spring corn would be planted if grain prices were low in the first quarter of the year and more if they were high.² Alternatively, farmers may have been guided by prices over a two-year period, or over a five to seven-year period if the price trend was clear.

Figure 9.1 (i-iii) depicts the relationship between cereal prices and output in the East Riding. Two prices are shown: one-year lagged prices and a five-year moving average. The relationship between price and output was strongest in wheat and much weaker in oats and especially barley. The rapid expansion of barley production between 1867 and 1879 was not associated with strongly rising prices, though prices did rise; the association was firmer in the 1880s. A perverse relationship in oats suggests the presence of external influences, the livestock-grass economy being the most likely.

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1. B.E. Hill, 'Supply Responses in Crop and Livestock Production', Journ. of Agric. Econ. XXIII (1972).
 2. M. Capstick, The Economics of Agriculture (1970), p.84.

Figure 9.2 The Relationship Between the Acreage Under Grain Crops and Grain Prices Lagged One-Year in the East Riding, 1867-90.

Shown in the form of scattergrams.



The argument developed by some agricultural economists that the supply of cereals was flexible and was determined by price changes in the immediately preceding period¹ is too simplistic as it ignores certain output constraints and assumes a homogeneity in cereal output which did not exist. This is also suggested in Figure 9.2 (i-iii) which shows the relationship between cereal acreage and one-year lagged prices in the form of scattergrams. A strong linear relationship was found only in wheat. The arrangement of data in this form shows the difficulty of interpreting supply trends, as a line fitted by eye to the data points in Figure 9.2 (i) is upward-sloping and suggests a normal supply curve, while the points are more scattered in Figure 9.2 (ii) and no line drawn by eye is obvious. Figure 9.2 (iii), on the other hand, suggests a downward-sloping line in the form of a demand curve. This introduces the identification problem which is discussed at length elsewhere in this chapter. It is not possible to identify either a demand or supply curve on the basis of price and quantity data alone without further testing or the development of new assumptions.

3. The method of analysis.

Analysis in this chapter leans heavily on the techniques of basic econometrics. It is in two parts: the first part uses simple and partial correlation techniques to measure the association between price (however formulated) and cereal output; in the second part a set of estimating equations are derived which combine the most efficient price regressors in multiple regression models, the purpose being to show the effect of a specified price change on farm output. The XDS3 computer package was used to analyse and test data throughout this study.

1. M. Capstick, op. cit. pp.84-5.

Before beginning the main analysis a survey will be made of the econometric techniques used, and technical terms and procedures will be explained. Econometrics deals with the measurement of economic relationships such as elasticities of supply and demand, and propensities to save and spend. Its base is economic theory. A model is built which as far as possible is consistent with the underlying corpus of theory, and if specified correctly contains the major economic variables within the system it seeks to describe. It will suggest and help to measure the degree of relatedness between factors. Models are tested empirically to verify whether a hypothesis, the original starting point of enquiry, is demonstrable in the real world.¹

This is outwardly a simple process but is more complex in practice. A model, which may use as few as two variables, might describe an involved economic relationship. In this study the supply of cereals is examined as a function of price. This does not exclude the influence of variables such as changing levels of consumer income, the level of cereal imports and random elements like war, fluctuations in harvest and economic crisis. The model simply postulates that these and similar influences are absorbed by the error term in the regression equation. This leads to some inexactness in the model's specifications but it is necessary in the interest of simplicity and the meaningful estimation of parameters if a single equation model is to describe a complex supply and demand relationship.²

The experimental approach to model building has been used here. Following the procedure of Olson and Harris,³ a simple working hypothesis

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1. C.M. Dollar and R.J. Jenson, Historian's Guide to Statistics (1971), pp.9-21.
 2. A. Koutsoyiannis, Theory of Econometrics (1973), p.21.
 3. M. Olson and C.C. Harris, 'Free Trade in Corn', Quart. Journ. of Econ. 73 (1959) is the standard work on prices and corn output in the United Kingdom in the second half of the nineteenth century. It is reprinted in R. Flood, ed. Essays in Quantitative Economic History (1974).

was developed which on a priori grounds accorded with economic theory and offered the possibility of reasonable statistical results when tested. New variables were added and some subtracted depending on whether they improved the 'fit' of the regression. The 'fit' was determined using correlation and regression techniques. Correlation estimates the association between two variables, in the case of simple correlation, and between three or more in multiple correlation. A third type, partial correlation, measures the degree of association between two variables holding all others constant. The correlation coefficient shows the variance in the regressand (ie. the independent variable, in this case cereal output) which can be explained or be associated with, movement in the regressor(s), in this case price.

Regression can be simple or multiple for the same reason as in correlation. A two variable, or simple model, takes the form

$$Y = b_0 + b_1 X + u$$

where Y is the value of the regressand, b_0 is a constant, b_1 a parameter of X, and u the random or unexplained variation in Y. The component $(b_0 + b_1 X)$ is the explained variance in Y.¹ The pattern is identical in multiple regression except that more variables are introduced.²

The usefulness of regression analysis depends on non-violation of the assumptions of Ordinary Least Squares (OLS) which are built into the linear stochastic regression model. A line or plane is fitted to a set of observations such that it will "minimise the sum of the squares of the deviations of the observations from it".³ OLS assumptions fall into

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1. A. Koutsoyiannis, op. cit. p.53.
 2. Ibid. p.112.
 3. Ibid. p.60.

stochastic and non-stochastic categories. The former deal with the randomness of the disturbance term. If errors are not random, any 'u' value may in any time period 't' be correlated with one or more of its previous values. This would take the form $(u_t, u_{t-1}, u_{t-2}, \dots, u_{t-k})$ and would cause estimates from the regression model to be suspect and possibly "wide of the target".¹ The parameter estimates of the equation(s) and the estimates of the variance of the standard error could be seriously underestimated and the model could be inefficient as far as prediction or the estimation of factor inter-relationships are concerned.² The non-stochastic assumptions are (i) that there should not be a high level of inter-correlation between regressors (ie. multicollinearity). Some is inevitable owing to the nature of economic phenomena but if variables in a model are highly correlated with each other, the standard errors of the parameter estimates are increased and this can lead to the mis-specification of the model. (ii) The relationships being estimated are identified by the explanatory variables of the model and are not a response to other, possibly unknown variables. (iii) All important variables are identified and specified in the model.³

The significance of relationships was determined by first and second order tests. First order tests test the possibility of the true value of a statistic (ie. the value that would be derived if it was possible to observe an entire population rather than a sample) lying within a defined distance of the estimated sample statistic. Small samples ($n < 30$) have been taken and were tested as follows. (i) R^2 was used

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1. R.J. Wonnocott and T.H. Wonnocott, Econometrics (1970), pp.136-8.
 2. A. Koutsoyiannis, op. cit. pp.202-5.
 3. Ibid. pp.225, 229.

to measure the explanatory capabilities of regression. (ii) The standard error test was applied to the parameter estimates of regressions to verify whether they were significantly different from zero. (iii) The student 't' test, which was designed for small sample work, showed the statistical probability of the significance of difference between two means, the sample mean and the true population mean. The test follows the simple rule that a parameter estimate is significant in samples containing more than eight observations if the observed 't' value (t^*) is greater than two. It is invalid if less than this and there is no association between the sample and true means. (iv) Confidence limits were set at the 5 per cent and occasionally at the 1 per cent levels. Confidence limits were calculated from 't' statistics which in turn were used to test the significance of the sample correlation coefficient 'r'. (v) The analysis of variance measured the scatter of a distribution. Total variance is broken down into components which exert some influence on the dependent variable being studied. Estimates are made of the variation from the mean within each sample and between group means. An F statistic or Variance Ratio is calculated from these and if its calculated value (F^*) exceeds its tabulated value, the parameter estimates are considered to differ significantly from zero and a line of causation is accepted between regressor and regressand. The converse is also true.¹

Second order tests were used to detect autocorrelation and multicollinearity. Serious multicollinearity can arise in regression models when lagged endogenous variables are used. Some collinearity was found, but there was no conclusive evidence to show its effect on parameter estimates.

1. It has been the general practice to place more emphasis on R^2 and the standard error than other first order tests.

Autocorrelation was the most difficult technical problem encountered in this study of prices and output. The difficulty was to eliminate first order autoregressive schemes produced where two successive values of the error term 'u' were correlated. Autocorrelation was tested using the Durbin-Watson 'd' test.¹ A null hypothesis was put forward that the error terms were not correlated:

$$H_0 : p \neq 0 \text{ (where } p \text{ is the coefficient of the autocorrelated relationship)}$$

This was tested against the alternative hypothesis that the error terms were correlated:

$$H_0 : p = 0$$

The calculated value of 'd' (d*) was compared against the tabulated values of 'd' with n-k degrees of freedom where 'n' is the number of observations and 'k' the number of parameters.

The original data values were transformed once autocorrelation was detected and a new model, based on the revised data, was constructed which satisfied, or attempted to satisfy, the OLS assumptions. This required estimating the coefficient of the autocorrelated relationship 'p' which was simple once 'd*' had been calculated. The formula used was

$$\hat{p} = 1 - \frac{1}{2}d^* \text{ (The dipthong cap on } p \text{ indicates that the value has been estimated)}$$

OLS was then applied to the transformed variables.

1. A very popular method of dealing with autocorrelation is linear transformation using logarithms but it was not used because of its unsuitability in series such as wheat and barley in the 1870s and 1880s where there was a marked change in trend half way along the series.— R. Floud, Essays in Quantitative Economic History (1974), p.30.

Autocorrelation was considered to be at an acceptable level where 'd' was inconclusive. This unorthodox approach was adopted out of necessity as more conclusive results hinged on increasing the number of observations in the sample data which was impractical owing to the time limits (1867-90) imposed on the study.

This leaves the identification problem. Only the supply side of the market has been defined so far in terms of neo-classical theory. But output and price are determined jointly in the market by the interaction of supply and demand curves. They intersect and are equal at one price-quantity combination in the market. This can be represented graphically or as a simultaneous equation system. Supply (S) and demand (D) are a function of price (p) and supply equals demand in equilibrium.

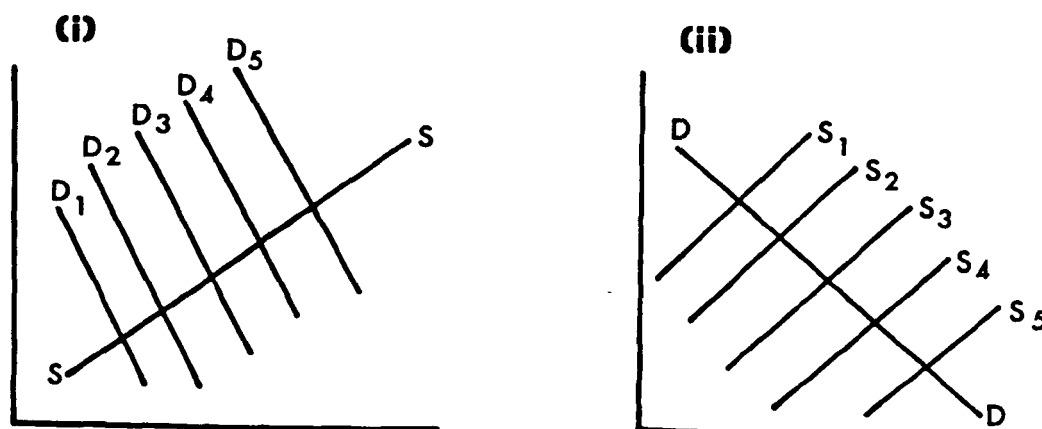
1. $S = f(p)$
2. $D = f(p)$
3. $S = D$

This simple simultaneous equation system, derived from economic theory, is not identified. It is not possible to identify a supply or demand curve because two equations out of the three are identical when supply equals demand, and no particular solution exists for the system.

The above equation system is, for econometric purposes, a misspecification of the true supply and demand relationship in the agricultural product market in the second half of the nineteenth century. Suppose, as is done in Figure 9.3 (i), that the supply curve was constant between 1867 and 1890 but the demand curve fluctuated because of changes in income or taste. The demand curve would shift outwards as demand increased and would trace out, or identify, a supply curve. On the other hand, if the demand curve remained stable and the supply curve fluctuated because of unpredictable harvests, the price of cereals, or technological

change, the supply curve would shift downwards and would identify a demand curve as in Figure 9.3 (ii).

Figure 9.3 The Identification Problem.



Formal econometric theory can be used to construct simultaneous equation systems where the supply and demand equations are functions of more than one independent variable. If the demand for corn is a function of price and taste (t), and supply is a function of price, supply equals demand and the market is cleared.

$$4. \quad D = f(p, t)$$

$$5. \quad S = f(p)$$

$$6. \quad S = D$$

There are formal rules for identifying simultaneous equations in econometrics. The first rule is the order condition. The variables in equations four and five are either endogenous (S , D , p) or exogenous (t). The order condition requires that the total number of variables in the system, in this case four, minus the number of endogenous and exogenous variables in the equation being identified, say equation five, must be greater than, or equal to, the number of equations minus one for the equation to be identified. The supply curve is identified in the above

example since $4-2 = 3-1$. The second rule for identification is the rank condition. "In a system of G equations any particular equation is identified if and only if it is possible to construct at least one non-zero determinant of order $(G-1)$ from the coefficients of the variables excluded from that particular equation but contained in the other equations of the model."¹ The value of the determinant was of order 2 in our example. The variables in equations 4, 5 and 6 can be represented as follows:

	D	p	t	S
1st	1	1	1	0
2nd	0	1	0	1
3rd	1	0	0	1

The rows containing the equation to be identified were deleted along with the columns containing variables of that equation.

	D	t
1st	1	1
3rd	1	0

The determinant was found to be positive meaning that equation five identified a supply curve. These formal procedures are required to test equation systems before applying first and second order tests. Regression equations have little economic content if they are not identified formerly.

Equations showing the relationship between cereal prices and output are set out in section six of this chapter. It can be suggested that a serious identification problem does not exist and that the models describe

1. A. Koutsoyiannis, op. cit., p.343.

supply and not demand. There are several reasons for this, the most important of which is the hypothesis that supply in year 't' is a function of the average price of grain - wheat, barley or oats - over the preceding five or seven-years, and a price ratio of close substitutes, barley and wheat for example. Current prices in year 't', which are the major determinant of demand, are excluded. It is therefore not unreasonable that the models identify supply and that the logic of the equation systems shown on page does not apply.

This argument is strengthened by historical developments after 1850. Supply equals demand and the system is in equilibrium in the classic model of the identification problem. However, the price of grain in the East Riding or even in Yorkshire as a whole, was not determined by local supply and demand conditions. It was determined in the national, and increasingly the international, grain markets. Cereal supply for the United Kingdom can be expressed as follows:

$$S_t = Q_{ts} + C_t + I_t$$

where Q_{ts} is current production, C_t the stocks carried over from previous years, and I_t the level of imports. East Riding cereal farmers produced only part of Q_{ts} and C_t and did not satisfy the total regional demand (especially the West Riding demand) for grain products. They did not determine market price collectively; there was no simple market clearing equation and local supply and demand schedules were significantly different.

4. The Olson-Harris Model of wheat supply.

This study of the relationship between farm prices and output is based on Mancur Olson's and Curtis Harris's work on wheat prices and wheat production in Great Britain between 1873 and 1914, and aims at testing their model using East Riding data. Their methodology and analytical

procedures have been incorporated to estimate the supply response in each of the main cereals.

Olson and Harris found that movements in wheat acreage between 1873 and 1914 were explained best by the seven-year average price of wheat (labelled by them X_4) and a ratio of barley and wheat prices (X_5). The regression equation using these variables is:

$$1. \quad Y = 0.97 + 0.0043X_4 - 0.77X_5$$

The multiple correlation coefficient was calculated at 0.95 and explains about 89 per cent of the variance in wheat acreage (Y).¹

The model stands without need of revision for the period 1873-94. Wheat prices were falling more or less continuously and Olson and Harris reasoned that farmers planned future output on the basis of the price trend, not on seasonal fluctuations in price. The regression equation for the period up to 1894 is:

$$2. \quad Y = 1.59 + 0.0038X_4 - 1.15X_5$$

The multiple correlation coefficient is 0.93 and explains 86 per cent of the movement in wheat acreage over the period.²

The price trend was less distinct after 1894. Prices fluctuated from year to year and it was hazardous to base output decisions on projections of the price trend. Price factors did not explain as much of the variance in wheat supply as they did earlier, and factors such as entrepreneurial and institutional rigidities rose in importance. The most efficient model for the period included wheat prices lagged by one-

1. M. Olson and C.C. Harris, 'Free Trade in Corn', in R. Flood, ed. Essays in Quantitative Economic History (1974), p.204.

2. Ibid. p.205.

year (X_1), trend price (X_4) and the barley-wheat price ratio (X_5). The resulting equation is:

$$3. \quad Y = 2.35 + 0.0028X_1 + 0.0017X_4 - 0.86X_5$$

The multiple correlation R_{y145} was 0.471 and explained a little over 20 per cent of the changes in wheat acreage, but was no improvement over the highest simple correlation r_{y5} calculated at -0.465.¹ The simple regression equation for X_5 is:

$$4. \quad Y = 2.62 - 0.99X_5$$

Olson and Harris argued from this that under normal circumstances the barley-wheat price ratio would have been the most important factor influencing the acreage laid down to wheat over the entire period.

It seems that, but for the severity of the downward trend before 1895, which made farmers abandon wheat in favour of grass ... and other crops as well as barley, the price ratio would have been the most important variable for all of the years between 1873 and 1913. The importance of X_5 after 1894, and the fact that it is often easy for farmers to switch from one crop to another, suggest that it is by no means always helpful to use Marshallian analysis in its simplest, most 'partial' sense in studying supply responses and prices for particular grain crops.²

5. The role and importance of price in farmers' decision making:
a statistical analysis of trends in East Riding farm output, 1867-90.

(1) The supply of wheat.

The techniques developed by Olson and Harris were applied to the East Riding without serious modification. The results compared closely and the differences that emerged were more in degree than in principle.

1. Ibid. p.205.

2. Ibid. p.204.

Table 9.1. Variables in the wheat-price relationship in the East Riding, 1867-90. *

Year	Acres of Wheat '000s	Acres T-1 Minus T	Price T-1	Price T-2 Minus T-1	Price T-2	Seven Year Price Ave.	Five Year Price Ave.	Barley Wheat Price Ratio	Barley Prices	Oats- Wheat Price Ratio	Time
	Y	y	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X _T
1867	111.7	4.4	51.3	-10.0	41.3	50.2	47.8	0.75	38.6	0.45	0
1868	123.3	-11.6	64.1	-12.8	51.3	49.4	49.9	0.61	39.2	0.46	1
1869	130.8	-7.5	52.4	11.7	64.1	48.9	52.1	0.72	37.5	0.44	2
1870	119.0	11.8	50.8	1.6	52.4	49.3	52.7	0.71	36.0	0.47	3
1871	116.1	2.9	45.1	5.7	50.8	51.9	54.1	0.78	35.0	0.54	4
1872	116.7	-0.6	58.2	-13.1	45.1	54.7	53.5	0.65	38.0	0.43	5
1873	112.3	4.4	61.1	-2.9	58.2	56.5	55.8	0.74	45.0	0.41	6
1874	122.2	-9.9	63.7	-2.6	61.1	54.1	55.0	0.68	43.1	0.40	7
1875	113.4	8.8	47.1	26.6	63.7	53.2	55.3	0.92	42.9	0.55	8
1876	96.8	16.6	46.2	0.9	47.1	52.6	55.0	0.79	36.3	0.61	9
1877	101.0	-4.2	47.0	-0.8	46.2	54.5	52.4	0.79	37.3	0.55	10
1878	102.3	-1.3	58.0	-11.0	47.0	52.5	48.5	0.76	44.0	0.41	11
1879	89.0	13.3	44.1	13.9	58.0	50.7	48.8	0.85	37.7	0.51	12
1880	94.0	-5.4	48.7	-4.6	44.1	47.5	47.9	0.70	34.0	0.34	13
1881	89.5	-4.5	41.6	7.1	48.7	47.2	47.4	0.77	32.0	0.48	14
1882	97.5	-8.0	44.8	-3.2	41.6	46.3	43.8	0.75	33.5	0.54	15
1883	76.9	20.6	40.0	4.8	44.8	45.6	43.4	0.81	32.3	0.55	16
1884	77.6	-0.7	41.9	-1.9	40.0	42.3	44.7	0.76	32.0	0.53	17
1885	74.0	3.6	35.1	6.8	14.9	40.5	38.6	0.93	32.8	0.62	18
1886	59.9	14.1	31.4	3.7	35.1	37.9	35.8	0.94	29.5	0.68	19
1887	66.3	-6.4	30.5	0.9	31.4	36.1	33.5	0.79	24.0	0.61	20
1888	79.3	-13.0	28.7	1.8	30.5	34.0	31.2	0.80	23.0	0.51	21
1889	69.4	9.9	30.2	-1.5	28.7	32.4	29.9	0.99	30.0	0.51	22
1890	72.8	-3.4	28.8	1.4	30.2	30.5	29.4	0.89	25.5	0.54	23

Sources: M.A.F.F. Agricultural Statistics, 1866-74, 1875-83, 1884-92;
Beverley Guardian, 1879-89; Hull and Eastern Counties Herald, 1867-90.

* The data were worked in the following manner:

- Y relates to the acreage of wheat standing in June of each year.
y is the rate of change in acreage between year T and year T-1.
X₁ is the price of wheat in shillings and decimals of a shilling.
Prices have been lagged by one-year.
X₂ is the rate of change in wheat prices. A decrease in price is shown
as a 'plus'.
X₃ is the price of barley lagged two-years.
X₄ is a seven-year moving average of wheat prices.
X₅ is a five-year moving average of wheat prices.
X₆ is a ratio of barley prices in T-1 divided by the price of wheat also
in T-1.
X₇ is the price of barley lagged one-year.
X₈ is a ratio of oat prices in T-1 divided by the price of wheat in T-1.
X_T is an independent time variable calculated around 1867.

The variables in the wheat-price relationship are set out in Table 9.1; correlations calculated from it are set out in Table 9.2.

Table 9.2. Correlations of wheat prices and output in the East Riding, 1867-90.

<u>Simple</u>		<u>Partial</u>		<u>Multiple</u>	
r_{Y1}	0.867	$r_{Y1.T}$	0.379	$R_{Y.46}$	0.345
r_{Y2}	0.332	$r_{Y4.6}$	0.79	$R_{Y.56}$	0.894 (transformed data)
r_{Y3}	0.781	$r_{Y6.4}$	-0.429	$R_{Y.56}$	0.85
r_{Y4}	0.794	$r_{Y6.T}$	0.223		
r_{Y5}	0.86				
r_{Y6}	0.659				
r_{Y7}	-0.71				
r_{Y8}	-0.762				
r_{YT}	-0.93				
r_{1T}	-0.855				
r_{46}	-0.554				
r_{6T}	-0.659				

Source: Table 9.1.

There was an apparently strong correlation between wheat prices in the year prior to current sowing (X_1) and acreage (Y). For the period 1867-90, r_{Y1} was calculated at 0.867, and for 1867-79 and 1880-90 at 0.52 and 0.8, respectively. These were significant at the one per cent level

and demonstrate the strong, though uneven relationship through time, between these variables. Over the whole period r_{Y1} explained about three-quarters of the variation in wheat acreage which was almost identical to the findings of Olson and Harris.

It would appear that the price of wheat in the year preceding current planting was the prime determinant of movements in wheat supply.¹ This was tested in various ways along the lines suggested by Olson and Harris. First differences of prices and acreages were taken: wheat prices lagged by one year (T-1) were subtracted from prices in the preceding year (T-2), and acreage in year T was subtracted from the acreage of the previous year (T-1). The two sets of differences were correlated and according to Olson and Harris

If the direction and magnitude of the price changes in the two years preceding planting help to determine whether the farmer plants more or less, it should be reflected in this correlation between first differences in price (X_2) and acreage (y).₂

First differences mask the influence of time, though they do not remove it, and give a better indication of the real association between variables. The correlation r_{Y2} was slightly higher than the national estimate but was still insignificant at 0.332. The lowness of the correlation coefficient is inconsistent with the strength of the r_{Y1} correlation. Wheat prices lagged by two-years were then correlated with acreage and the result was impressive: r_{Y3} was 0.781 and tended to confirm the significance of r_{Y1} . However, Olson and Harris dismissed it in their analysis arguing that prices two-years before planting, in isolation from price movements in other years, could not form the basis of farmers' intended output. There was no genuine

1. Ibid. p.200.

2. Ibid. p.201.

line of causation between the two variables and by implication, no line of causation between X_1 and Y .

More important than this was the close association between wheat prices lagged one-year and time. The correlation r_{1T} was -0.855 which suggests that over three-quarters of price variance in the East Riding was a function of the passage of time. The correlation between wheat acreage and time was still higher: r_{YT} was -0.93 and suggests that time explains 85 per cent of the movement in wheat acreage between 1867 and 1890. This was rejected¹ and time had clearly to be removed from the correlation if any meaningful estimate of r_{Y1} was to be made. This was done using partial correlation. Wheat acreage was correlated with one-year lagged prices holding time constant: $r_{Y1.T}$ was insignificant. The high value of r_{Y1} was therefore a reflection of the strong time trend in the data and did not demonstrate a powerful causal relationship.

This reasoning led Olson and Harris to consider other factors which may have influenced the supply of wheat. The most likely one in view of the strong correlation with time was that the price trend itself guided the actions of farmers. A seven-year average of wheat prices in East Riding markets (X_4) was correlated with wheat acreage (Y); r_{Y4} was 0.794 which made it much weaker than the 0.91 calculated by Olson and Harris. The former explained 63 per cent of the variation in wheat acreage while the latter explained 83 per cent. At this lower level r_{Y4} was unlikely to have contributed decisively to the planning of East Yorkshire's wheat production.

The basis of r_{Y4} was revised to test whether there were sound historical reasons for the lower correlation or whether it was a matter of

1. Even if time had stood as a dummy variable for technological change, it is unlikely that it could have played such an important role in supply adjustment.

chance. A five-year moving price average replaced the seven-year average. Olson and Harris had used a seven-year average because it "was computed by the Government to assess tithes ... it was published and made known to many British farmers in that day".¹ However, the number of farmers who were aware of it, and who used it in planning future output, must have been tiny. The seven-year average on these grounds had no unique advantage over other averages, whereas the five-year average was consistent with the rough five-year cycle running through the cereal price series.² The five-year moving price average (X_5) was correlated with acreage: r_{Y5} was 0.86 and explained a little less than three-quarters of the variance in wheat supply. This fell short of r_{Y4} computed nationally but the difference was slight³ and it is reasonable to assume that East Riding farmers differed little from farmers elsewhere in the country in their response to trend prices.

The supply of wheat was also influenced by the price of other cereals. Table 9.2 expresses the price of barley (X_6) as a ratio of wheat prices for each year between 1867 and 1890; X_8 does the same for oats. The price of wheat fell relative to the price of other cereals, as the upward trend in the ratio shows, and it is reasonable to assume that farmers profited by substituting barley, and to a smaller extent oats, for wheat. The barley-wheat price ratio varied between 0.61 in the late 1860s and 0.99 in the late 1880s, and the oats-wheat price ratio varied between 0.46 in 1868 and 0.68 in 1886, just before the general slide in oat prices. There was a persistent upward trend in each price series although ratio values sometimes varied erratically from year to year. Both ratios were correlated with wheat acreage: r_{Y6} was -0.659 and r_{Y8} was -0.762, and were significant

1. Ibid. p.202.

2. See Ch.6, 'Agricultural Price Trends in the East Riding, 1850-90'.

3. M. Olson and C.C. Harris, 'Free Trade in Corn', loc. cit. p.203.

at the one per cent level. In spite of its larger size, r_{Y8} was discounted on historical and economic grounds as it was felt that its size reflected an important, though unspecified relationship with grassland farming. The r_{Y6} correlation was examined critically. The correlation was weakened by removing the price trend: $r_{Y6.4}$ was -0.429 . The partial correlation was reformulated and the seven-year price average was correlated with wheat acreage this time holding the barley-wheat price ratio constant: $r_{Y4.6}$ was 0.79 and was significant at the one per cent level. This is a powerful demonstration of the importance of the price trend in the 1870s and 1880s for a less powerful variable would have been stripped of most of its explanatory capability in a correlation holding X_6 constant.

As a further test of the significance of non-wheat prices on wheat output, barley prices lagged one-year were correlated with wheat acreage. The correlation r_{Y7} was -0.71 and was fractionally more powerful than the barley-wheat price ratio and only slightly less powerful than the seven-year trend in wheat prices. It explained 50 per cent of the variance in wheat output.

(ii) The supply of barley.

There was hardly any correlation between barley prices lagged by one-year (X_1) and acreage (Y). The r_{Y1} correlation was -0.107 for the period 1867-90, 0.14 for 1867-79, and 0.551 for 1880-90. The stronger relationship in the 1880s was probably the result of developments in the wheat economy. Barley was substituted for wheat in the 1870s and its supply was determined largely by changes in the price of wheat. In the 1880s wheat was replaced increasingly by oats and external factors played a much smaller role in the supply of barley, which inevitably made barley prices a stronger influence on its own output than previously.

Table 9.3. Variables in the barley-price relationship in the East Riding, 1867-90. *

Year	Acres of Barley '000s	Acres T-1 Minus T.	Price T-1	Price T-2 Minus T-1	Price T-2	Ave. Price Seven Year	Ave. Price Five Year	Wheat- Barley Price Ratio	Oats- Barley Price Ratio	Wheat Price	Time
	Y	y	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X _T
1867	50.5	-6.0	38.6	-7.4	31.2	34.2	34.6	1.33	0.6	51.3	0
1868	46.0	4.5	39.2	-0.6	38.6	34.6	35.7	1.64	0.59	64.1	1
1869	48.1	-2.1	37.5	1.7	39.2	35.2	36.5	1.4	0.61	52.4	2
1870	55.7	-7.6	36.0	1.5	37.5	35.6	37.3	1.41	0.66	50.8	3
1871	61.6	-5.9	35.0	1.0	36.0	36.5	37.2	1.3	0.69	45.1	4
1872	60.0	1.6	38.0	-3.0	35.0	38.5	38.3	1.53	0.66	58.2	5
1873	63.0	-3.0	45.0	-7.0	83.0	39.1	39.5	1.36	0.56	61.1	6
1874	63.7	-0.7	43.1	1.9	45.0	39.6	40.8	1.48	0.59	63.7	7
1875	72.2	-8.5	42.9	0.2	43.1	39.5	41.1	1.1	0.61	47.1	8
1876	77.8	-5.6	36.3	6.6	42.9	39.7	41.0	1.27	0.78	46.2	9
1877	77.8	0.0	37.3	-0.9	36.3	40.9	40.8	1.62	0.70	47.0	10
1878	79.8	-2.0	44.0	-6.7	37.3	40.9	39.7	1.32	0.55	58.0	11
1879	84.4	-8.6	37.7	6.3	44.0	39.3	37.9	1.2	0.60	44.1	12
1880	77.8	6.6	34.0	3.7	37.7	37.7	37.0	1.43	0.62	48.7	13
1881	74.6	3.2	32.0	2.0	34.0	36.4	36.3	1.3	0.63	41.6	14
1882	65.9	8.7	33.5	-1.5	32.0	53.8	33.9	1.34	0.74	44.8	15
1883	72.5	-6.6	32.3	1.2	33.5	35.1	32.8	1.24	0.69	40.0	16
1884	86.4	4.1	32.0	0.3	32.3	33.5	32.6	1.31	0.66	41.9	17
1885	73.3	-4.9	32.8	-0.8	32.0	32.3	32.1	1.07	0.72	35.1	18
1886	75.5	-2.2	29.5	3.3	32.8	30.9	30.2	1.06	0.73	31.4	19
1887	64.0	11.5	24.0	5.5	29.5	29.6	28.3	1.27	0.77	30.5	20
1888	68.3	-4.3	23.0	1.0	24.0	29.1	27.9	1.25	0.63	28.7	21
1889	68.8	-0.5	30.0	-7.0	23.0	28.1	26.4	1.01	0.52	30.2	22
1890	66.5	2.3	25.5	4.5	30.0	27.2	25.7	1.13	0.61	28.8	23

Sources: As in Table 9.1.

* The lay-out of Table 9.3 corresponds to Table 9.1 in columns Y, y, X₁ - X₅ and X_T.

X₆ is the price of wheat in T-1 divided by the price of barley in T-1;

X₇ is oat prices in T-1 divided by barley prices in T-1;

X₈ are wheat prices in T-1.

Table 9.4. Correlations of barley prices and output in the East Riding, 1867-90.

<u>Simple</u>		<u>Multiple</u>	
r_{Y1}	-0.107	$R_{Y.46}$	0.743
r_{Y2}	0.083		
r_{Y3}	0.086		
r_{Y4}	0.375		
r_{Y5}	0.083		
r_{Y6}	-0.514		
r_{Y7}	0.165		
r_{Y8}	-0.364		
r_{YT}	0.364		

Source: Table 9.3.

The overall weakness in the relationship between barley prices and output was confirmed by correlations involving prices lagged by two-years and first differences, both correlations being insignificant. The association with trend prices was somewhat stronger. The five-year price average was discarded as r_{Y5} was only 0.083, but the seven-year price average was just significant: r_{Y4} was 0.375 and could explain between 13 and 14 per cent of the variance in barley output. Farmers did not see a strong time element at work in the barley economy as the correlation of barley acreage and time (r_{YT}) was 0.56 and lends little support to either X_4 or X_5 .

There was a moderately strong association between the production of barley and the price of other cereals, especially wheat, taking the period as a whole.¹ Barley acreage (Y) was correlated with the wheat-barley

1. There was a strong correlation taking the 1870s alone.

price ratio (X_6) and r_{Y6} was calculated at -0.514 , which made it significant at the one per cent level and capable of explaining roughly one-quarter of the variance in barley acreage. This was a logical reaction by farmers attempting to maintain incomes by concentrating on products which were less affected by the depression. The wheat-barley price ratio reached its highest point in the late 1860s when it stood at 1.64 and its lowest at the end of the 1880s when it was 1.01 . Wheat prices slumped significantly over this period and a shift in the composition of output was inevitable. What is surprising is that r_{Y6} was not higher for the whole period. The ratio of oat and barley prices can be dismissed as an effective influence on barley supply: r_{Y7} was 0.165 .

(iii) The supply of oats.

The production of oats differed from that of wheat and barley in several ways. Supply responded more strongly to changing prices than in barley and less strongly than in wheat, and the supply curve itself sloped negatively in contrast to the more orthodox supply curves for the other cereals. The decision to sow a greater acreage of oats in the 1880s was determined by factors other than its own price and the price of other cereals, and was tied in closely with the gradual shift to grass and livestock farming between the late 1870s and mid-1890s.

Oat prices in the year prior to current sowing were a modest influence on output: r_{Y1} was -0.659 and explained 43 per cent of the movement in oats acreage. The negative form of the relationship was maintained for most of the period: r_{Y1} was calculated at -0.52 for 1867-79 and 0.184 for 1880-90, but its validity over the whole period was suspect for similar reasons as in wheat. The correlation of first

differences in oats acreage and price was insignificant and undermined the rationale of the otherwise impressive correlation between acreage and oat prices lagged by two-years. It also cast doubt on the r_{Y1} correlation according to the Olson and Harris argument.¹ The strongest criticism of r_{Y1} came from correlations involving time as both acreage and oat prices lagged by one-year were associated with time (r_{YT} was 0.747 and r_{1T} was -0.532), and its influence, though unspecified in r_{Y1} , must have been responsible for part of the correlation's explanatory capability. This was confirmed by correlating X_1 and Y holding the statistically weaker of the two price trends, X_4 , constant: $r_{Y1.4}$ was insignificant. The implication of this, following the Olson-Harris model, was that the price trend was an important variable. The seven-year (X_4) and five-year (X_5) price averages were correlated with the acreage under oats: r_{Y4} was -0.678 and could explain 43 per cent of the variance in oats output, and r_{Y5} was -0.743 explaining 55 per cent of the variance.

The influence of price changes in the other cereals was limited. The correlation of the wheat-oats price ratio (X_6) and acreage (Y) was calculated at -0.471 and the partial correlation $r_{Y6.4}$ was insignificant at -0.346. This questions seriously the usefulness of r_{Y6} but it was decided to retain it since the influence of grain prices generally, and of wheat in particular, must have been felt in some way. Oat prices held up moderately well against the tide of depression and some farmers, especially in the 1880s, must have planted oats in preference to wheat to secure a small price advantage. The correlation r_{Y6} , taken at face value, explains about one-fifth of the variance in oats supply between 1867 and 1890.

1. M. Olson and C.C. Harris, 'Free Trade in Corn', loc. cit. p.201.

Table 9.5. Variables in the oats-price relationship in the East Riding, 1867-90. *

Year	Acres of oats '000s	Acres T-1 Minus T	Price T-1	Price T-2 Minus T-1	Price T-2	Price Ave. Seven Years	Price Ave. Five Years	Wheat Oats Price Ratio	Barley Oats Price Ratio	Acres of Grass '000s	Time
	Y	y	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X _T
1867	82.4	-7.3	23.0	-0.5	22.5	22.2	22.3	2.23	1.68	145.8	0
1868	81.2	1.2	23.0	0.0	23.0	22.4	22.8	2.79	1.70	155.0	1
1869	78.6	2.6	23.0	0.0	23.0	22.6	23.1	2.28	1.63	166.4	2
1870	74.8	3.8	23.8	-0.8	23.0	23.1	23.4	2.13	1.51	147.7	3
1871	72.6	2.2	24.2	-0.4	23.8	23.5	23.8	1.86	1.45	158.1	4
1872	74.7	-2.1	25.0	-0.8	24.2	23.9	24.2	2.33	1.52	160.7	5
1873	74.9	-0.2	25.0	0.0	25.0	24.2	24.7	2.44	1.80	164.6	6
1874	67.9	7.0	25.5	-0.5	25.5	24.6	25.2	2.50	1.69	167.9	7
1875	69.7	-1.8	26.0	-0.5	25.5	25.4	26.0	1.81	1.65	168.8	8
1876	77.5	-7.8	28.4	-2.4	26.0	25.7	26.2	1.63	1.28	170.2	9
1877	73.1	4.4	26.0	2.4	28.4	25.7	26.0	1.81	1.43	175.2	10
1878	72.7	0.4	24.0	2.0	26.0	25.4	25.5	2.42	1.83	175.9	11
1879	79.2	-6.5	22.7	1.3	24.0	24.8	24.5	1.94	1.66	177.2	12
1880	83.4	-4.2	21.0	1.7	22.7	24.0	22.8	2.32	1.62	178.1	13
1881	94.2	-10.8	20.0	1.0	21.0	23.7	22.4	2.08	1.60	181.2	14
1882	90.8	3.4	24.0	-4.0	20.0	22.8	22.0	1.87	1.40	183.3	15
1883	101.7	-10.9	22.0	2.0	24.0	21.0	21.8	1.82	1.47	186.1	16
1884	97.7	4.0	22.0	0.0	22.0	21.9	22.0	1.90	1.45	193.3	17
1885	92.4	5.3	21.6	0.6	22.0	21.7	22.3	1.63	1.52	184.2	18
1886	99.1	-6.7	21.5	0.1	21.6	21.4	21.2	1.46	1.37	190.2	19
1887	101.4	-2.3	18.5	3.0	21.5	21.6	19.7	1.65	1.30	191.5	20
1888	85.6	15.8	14.5	4.0	18.5	19.4	18.4	1.98	1.59	192.8	21
1889	96.8	-11.2	15.5	-1.0	14.5	18.4	17.1	1.95	1.93	195.7	22
1890	94.8	2.0	15.5	0.0	15.5	17.6	16.0	1.86	1.65	200.2	23

Sources: As in Table 9.1.

* The lay-out of Table 9.5 corresponds to Tables 9.1 and 9.3 in columns Y, y, X₁ - X₅ and X_T;

X₆ is the price of wheat in T-1 divided by the price of oats in T-1;

X₇ is oat prices in T-1 divided by the price of barley in T-1;

X₈ is the price of grass in year T.

Table 9.6. Correlations of oat prices and output in the East Riding, 1867-90.

<u>Simple</u>		<u>Partial</u>		<u>Multiple</u>	
r_{Y1}	-0.659	$r_{Y1.4}$	0.0265	$R_{Y.46}$	0.624
r_{y2}	-0.167	$r_{Y6.4}$	-0.346	$R_{Y.468}$	0.832
r_{Y3}	-0.634			$R_{Y.56}$	0.529
r_{Y4}	-0.678				
r_{Y5}	-0.743				
r_{Y6}	-0.471				
r_{Y7}	-0.22				
r_{Y8}	0.742				
r_{56}	0.239				
r_{58}	-0.623				
r_{YT}	0.747				
r_{1T}	-0.532				

Source: Table 9.5.

Finally, an attempt was made to quantify the relationship between the supply of oats and the livestock-grass economy. Correlations involving oats acreage and cattle numbers were insignificant because cattle numbers, as indicated previously, are a poor indicator of changes in their economic value. To overcome this oats acreage was correlated with the acreage under grass. This was not intended to reveal a line of causation between the two variables because it would not exist in that form, but it is interesting that the association was moderately high: r_{Y8} was 0.742. If a subtle web of factors linked the production of oats and livestock, and both a priori reasoning and the statistical evidence contained in correlations r_{Y1} to r_{Y5} suggest that it did, it would have been rational for farmers to expand the production of oats in the face of falling oat prices to secure some of the advantages of grass and livestock husbandry.

6. Models of the relationship between cereal prices and supply.

(i) Wheat.

The model which best explained changes in wheat supply in the East Riding used the five-year moving price average of wheat and the barley-wheat price ratio.¹

$$1. \quad Y = 75.102 + 1.609X_5 - 66.691X_6$$

(31.29) (0.296) (27.28)

R^2 0.779 D-W 1.0595

The model explains 77.9 per cent of the changes in wheat supply between 1867 and 1890,² but its parameters are probably biased by positive autocorrelation. An attempt was made to improve it by estimating 'p' and the multiple regression was recalculated using transformed wheat data.

$$2. \quad Y = 44.213 + 1.657X_5 - 51.959X_6$$

(19.4) (0.266) (23.38)

R^2 0.7896 D-W 1.2363

Equation 2 explains slightly more of the movement in wheat acreage than equation 1 but the Durbin-Watson statistic is indeterminate and there is uncertainty whether autocorrelation has been removed or not.

The statistical status of equation 2 is the same as the estimating equation derived by Olson and Harris for 1873-94. Their data were recomputed because they had made no precise estimate of autocorrelation;

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1. The numbers in brackets in each equation in this section are the standard errors of the parameter estimates. All equations in this section have been identified formerly as supply equations.
 2. R^2 was tested using the F test. This was repeated throughout the analysis. F was found to be satisfactory unless stated otherwise in the text.

wheat was made a function of its seven-year average price (X_4) and the barley-wheat price ratio (X_6),¹ and the resulting equation is:

$$3. \quad Y = 1.7509 + 0.0037X_4 - 1.3036X_6$$

(0.6868) (0.0005) (0.5327)

R^2 0.874 D-W 1.1271

The Durbin-Watson statistic is again indeterminate. Olson and Harris apparently foresaw this but thought that no serious error would result from it.² This also seems plausible for equation 2.

Attempts were made to improve the wheat supply model by introducing a weather variable. Weather is inevitably an important influence on agriculture. Long sunny days in summer interspersed with periods of 'warm' rain encourage a full harvest while a fine autumn gives the farmer an early opportunity to plough and harrow in preparation for winter corn. More winter wheat is planted if the weather is settled than if soils are sodden after heavy rain and the planted acreage of spring wheat is a function of the acreage of winter wheat, which in turn is some function, among others, of weather.³ According to E.L. Jones there is a close relationship between the level of rainfall in the first and last quarters of the year and the acreage under wheat. This variable was added to the regression model using rainfall statistics collected for Kew and Greenwich⁴ but it

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1. The barley-wheat price ratio was labelled X_5 in the Olson-Harris analysis. It is labelled X_6 here to be consistent with the convention used for wheat.
 2. Olson and Harris argue that the estimates were not biased, which is correct, but the sampling variances are large and the variances underestimated.— 'Free Trade in corn', loc. cit. p.214; J. Johnson, Econometric Methods (1963), p.240.
 3. E.L. Jones, Seasons and Prices (1964), pp.47-56.
 4. Kew Gardens and Greenwich are not ideally located geographically for a Yorkshire study. Their records were used, however, because (i) there is no continuous data covering the period for any town or area in North East England and (ii) the East Riding is part of that bloc of eastern counties which, along with the London area, receive fairly moderate rainfall.— W.A.L. Walker, A Century of London Weather (1952).

added nothing to the model's explanation of supply changes and raised the standard errors of the parameters estimates to unacceptable levels.¹ It was therefore dropped. This does not discount weather as an important influence for a priori reasoning alone confirms it. All it indicates is the unsuitability of the weather variable in its present form for inclusion in a model of wheat supply. This endorses Jones' qualitative judgement that "no uniform economic result can be predicted from the weather, except in the most extreme cases ..."² The model shown in equation 2 remains unchanged.

(ii) Barley

The model which was found to be most efficient in explaining the supply of barley between 1867 and 1890 included the seven-year average price of barley (X_4) and the wheat-barley price ratio (X_6).

$$4. \quad Y = 86.336 + 1.368X_4 - 52.1804X_6$$

$$(15.103) \quad (0.3966) \quad (10.768)$$

$$R^2 \quad 0.552 \quad D-W \quad 1.2845$$

It explains about 55 per cent of the variance in barley supply but the Durbin-Watson statistic is again indeterminate, which could affect its reliability. The model might have been improved by including a weather variable but no tests were made because of its insignificance in the wheat

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1. Both autumn and winter rainfalls were tested in the model. The equation derived for autumn is shown below. It is typical of the result obtained using winter rainfall and the combined autumn and winter rainfalls. Autumn rainfall is labelled X .

$$Y = -0.1617 + 1.7345X_5 + 0.4962X_8 - 0.0032X$$

$$(15.548) \quad (0.555) \quad (0.796) \quad (0.042)$$

$$R^2 \quad 0.722 \quad D-W \quad 0.9164$$

(It should be noted that barley prices were used in this model in place of the usual wheat-barley price ratio (X_8); the price trend is labelled X_5).

2. E.L. Jones, Seasons and Prices (1964), p.56.

model and its exclusion from some projection models of present day barley supply.¹ There is no satisfactory explanation for the 45 per cent of variance in output which the model does not explain, but the answer lies presumably with some subtler association with wheat. An involvement with grass and livestock through the mixed farming system is also likely.

(iii) Oats.

The model suggested for oats is tentative because of the unknown level of association between its supply and the supply of livestock products. A model was devised which combined oats supply, the acreage of grass, the seven-year average price of oats, and a ratio of wheat and oat prices. However, it was abandoned in spite of the impressive size of $R_{Y.468}$ because the standard errors of the parameter estimates were unacceptably high.

Grass was removed and the model's explanatory capabilities were predictably weakened using the remaining variables, X_4 and X_6 .

$$\begin{array}{rcll}
 5. & Y = & 179.651 & - & 3.142X_4 & - & 11.825X_6 \\
 & & (16.31) & & (0.681) & & (4.577) \\
 & R^2 & 0.4 & & D-W & 1.0677
 \end{array}$$

The model explains 40 per cent of the variance in oats supply between 1867 and 1890 but it suffers from the omission of important variables. This is the most likely explanation of the low Durbin-Watson statistic. The model was revised and the five-year average of oat prices (X_5) was substituted for the seven-year average (X_6) but this unaccountably weakened it. Of the known elements tested, the five-year price average was the strongest element affecting supply. The Olson-Harris approach

1. A.M.M. McFarquhar and M.C. Evans, 'Projection Models for U.K. Food and Agriculture', Journ. of Agric. Econ. 22 (1971), 332.

to estimating supply was of little importance for oats without much fuller information being available on the exact relationship between oats production and the livestock-grass economy.

7. A note on beef production and prices in the East Riding.

Price changes in the short term can be virtually dismissed as a significant influence on livestock production largely because of the lengthy time span covered by an investment of this type. Nine months separated the decision to breed from beef and dairy cattle and the birth of a calf, and a further 3-4 years elapsed before cattle were ready for the butcher, though the precise time depended on the type of beasts being raised and the intensity of feeding.¹ The supply of beef was fixed in the short term and could not expand in response to minor price changes unless older dairy cattle were slaughtered, which would only happen if milk prices were low with no prospect of recovery in the foreseeable future.

The expansion of beef supplies was a function of price though the mechanics of expanding herds depended on the number of breeding stock at a given time. This in turn depended on the number of breeding stock in the immediately preceeding period, the number of replacements brought into the fattening districts in the current period and the number of culls taken.² Price influenced each of these variables: the number of replacements was related to fatstock prices and the number of culls was related to a combination of price and technical factors.³

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1. The estimate of 3-4 years applies to the nineteenth century and would not apply to today.
 2. B.E. Hill, 'Supply Responses in Crop and Livestock Production', loc. cit. p.290.
 3. Ibid.

The seven-year average price of beef in East Riding markets was correlated with the county's beef cattle population and the correlation explained a little over 40 per cent of variance in beef cattle numbers between 1867 and 1890. This would have been greater if variables reflecting the capital value of livestock and increased carcass weight had been introduced, but a very high correlation was unlikely even then.¹

T.W. Fletcher exaggerated the price flexibility of livestock producers in the late nineteenth century. Granted "every fall in the price of cereals, so damaging to the corn growers, was to them, the livestock producers, clear gain because it meant a reduction in the price of their most important input - feed".² But to go further and argue that this, or the general buoyancy of livestock prices, made the movement into grass and livestock relatively simple and safe, is to miss several important constraints on farmers' price flexibility.

"... the grazier's business demanded less time and constant attention, but more skill and judgement than cereal cultivation or dairying."³ The livestock farmer had to know which store cattle would fatten quickly and sell at the best price; he also had to understand fickle changes in the price of stores and fatstock and use his accumulated knowledge and expertise to predict them. Several months separated the buying of stores and the sale of fat cattle, but fatstock and feed prices could change significantly in the mean time. Profits were to be made if producers could predict market trends, but they could be lost if forecasts were inaccurate. The mobility of skill and enterprise between cereal and livestock farming was far from perfect in the mid-nineteenth century and

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1. There were powerful constraints on increasing the output of live-stock products even in the long term. Some of them are discussed below.
 2. T.W. Fletcher, 'The Great Depression of English Agriculture, 1873-1896', in P.J. Perry, ed. British Agriculture 1875-1914 (1973), pp.40-1.
 3. P.J. Perry, op. cit. pp. xvi-xvii.

there were considerable problems associated with supplying capital to finance transfers into an essentially new business. This even applied to mixed farmers with some of the basic buildings to house livestock since they needed more buildings and sheds to house extra cattle and more storage space for feed. All these factors combined to make the movement into grass and livestock very cautious.

The conclusions reached in this short study are tentative because of the complexity of the livestock industry, its varied connections with arable farming, and the slender information available on prices, costs and supply. However, it would seem that the price trend over a period of about half a decade was the most important price variable influencing beef output in the 1870s and 1880s. This can also be extended to the 1850s and 1860s because of the lengthy gestation period associated with investments in beef. Secondly, farmers did not take full advantage of the price differential favouring livestock production because they recognised the obstacles in the way of a large scale shift of resources from crops into livestock and grass. This reluctance to change their mode of farming was not the result of bad entrepreneurship.

8. Conclusions.

This study has dealt with the period after 1867 but suggests several general characteristics of cereal supply in the 1850s and early 1860s. First, the absence of a strong price trend in cereals, especially in wheat, may indicate that farmers were influenced by price movements over the preceding year or so. This was the case in Britain between 1895 and 1913 under broadly similar conditions¹ and it may have credibility for the East Riding between 1850 and 1865. Second, the price of close substitutes was

1. M. Olson and C.C. Harris, 'Free Trade in Corn', loc. cit. p.204.

a less important influence on cereal supply since it became profitable to substitute barley and oats for wheat only from the late 1860s; wheat prices had held fairly well up to that time.

These predictions for the 1850s and 1860s, and the detailed analysis of the cereal economy after 1867, are based on the work of Olson and Harris. This study has aimed at testing their model not only for wheat, which was its initial area of application, but also for barley and oats. The emphasis placed on the price trend and the price of close substitutes seems justified in a period when prices were generally falling. Both sets of prices helped to determine cereal output, though their influence on oats and barley was not as strong as on wheat.

Olson and Harris based their model on two critical assumptions. The first was that trend prices were important determinants of supply, and the second was that correlations between acreage and time were insignificant. Both assumptions have been accepted in this study but they are open to criticism. Taking the first of them, questionnaire data drawn from a sample of American farmers indicates that farmers underestimate actual changes in farm prices.¹ This suggests, for example, that in a period of falling prices farmers would expect future prices to fall less than they actually did, and that decision making is, and was in the nineteenth century, based on 'normal' prices and not on projections of trend prices. Olson and Harris anticipated this in their analysis of wheat supply between 1895 and 1913 and showed that output decisions were based on one-year lagged prices. This does not contradict the validity of trend prices over the 1870s and 1880s. Farmers may have underestimated the extent of the price fall, and the durability of the high farming system

1. M. Nerlove, The Dynamics of Supply: Estimation of Farmers' Response to Price (1958), p.50.

supports this, but the depression was so clear by the late 1870s that farmers could not have based output decisions on normal prices. More likely, if they underestimated future prices, they underestimated their projection of trend prices.

The second criticism of Olson and Harris arises from their insistence that "... time per se could not have been a cause of the changes in wheat acreage".¹ This is outwardly quite obvious but time is often introduced into regression equations where there is autonomous growth in the dependent variable. Technology advanced across a broad front over the third quarter of the nineteenth century and the time trend could be an indicator of the pace of mechanisation. However, this is unlikely because the time correlations were so high. It seems impossible that devices like the reaper were a major influence on supply.

The Olson-Harris model has been superseded by Nerlove's partial adjustment model² but it has provided a sound base for analysing data,

1. M. Olson and C.C. Harris, 'Free Trade in Corn', loc. cit. p.201.
2. Nerlove's adjustment model is in the following form. Quantity supplied in year t is considered to be a function of price in the immediately preceding period ($t-1$), technology, and the quantity supplied in the immediately preceding period. It can be written as follows:

$$1. \quad Q_t = A + A_1 P_{t-1} + A_2 T = A_3 Q_{t-1} + v_t$$

where A is a constant, P_{t-1} is price in the immediately preceding period, T is technology and Q_{t-1} is output supplied in the immediately preceding period; v is an error term.

The complete simultaneous equation system must be specified before the equation can be estimated. This means that the demand curve must be specified. As already argued the demand curve for agricultural products tends to be inelastic and theoretically this is due to the inclusion of income, Y , in the demand function. If the demand function depends upon price (P) and income (Y), then the simultaneous equation system can be written:

$$2. \quad D = c_0 + c_1 P_{t-1} + c_2 Y_{t-1} + e_t$$

$$3. \quad S = A_0 + A_1 P_{t-1} + A_2 T + A_3 Q_{t-1} + v_t$$

$$4. \quad S = D$$

The order and rank conditions are satisfied. A model constructed on these lines will identify a supply schedule.
A. Koutsoyiannis, op. cit. pp.300-3.

and its emphasis on the price of close substitutes and the price trend appears well-founded. It has helped to demonstrate that farmers planned cereal production shrewdly, despite the restrictions within which most of them operated. They adjusted output to price levels in the year preceding current planting during the 1850s and for most of the 1860s, and to the price trend and the price of close substitutes when economic conditions changed towards the end of the century. The smoothness with which this was done, and the measured response of farmers to price changes, especially in wheat, speaks highly of their business ability.

PART 4: The farming community.

CHAPTER TEN

THE LANDOWNER IN EAST RIDING AGRICULTURE, 1850-80.

This analysis is concerned with the composition of landowners' income, especially rent and the factors which encouraged rent changes, and the level of estate capital formation. It is built on manuscript evidence and surveys the attitude of landowners to agrarian investment and their means of financing it. Estate incomes rose by roughly one-fifth between 1850 and 1880, though this varied from estate to estate depending on changes in their size and the precise change in rent per acre. Rent increases more than kept pace with the rise in the general price level and the average landowner seems to have had the resources from his farming enterprises, which could be supplemented with government and private funding, to add actively to estate capital formation and to undertake improvements. The willingness to do this has been demonstrated in previous analyses of drainage and farm consolidation. But this point is made here more forcefully in connection with the growth of professional estate managements, and the close relationship between estate investment in farm buildings and movements in estate income, principally rent. The main aim of this chapter is to present the landowner of the 1850s and 1860s as a generally efficient business man who understood thoroughly the business of farming.

1. The sources of the landowners' income.

The landowners' main source of income were their estate(s) for only a minority drew incomes from mining, urban property, government stock, or commerce, which exceeded their estate revenues. Farm and cottage rents naturally formed the bulk of estate income, the former being by far the larger, but income was also generated by the sale of timber,

produce from the home farm and the sale of shooting rights. The typical squire, as well as the aristocratic landowner, also drew a small income from non-estate sources, especially from investments in government stock.

Manuscript evidence on the sources and structure of landlord income in the East Riding is fragmentary and relates to only two landowners, David Burton and Chichester-Constable. A quite wealthy squire like David Burton of Cherry Burton had a total annual income of about £5,500 in the 1850s and well over £6,000 in the 1870s. However, part was money 'in hand', that is, cash brought forward from the preceding year. If this is excluded, Burton's annual income was closer to £4,300 in the 1850s and £5,800 in the 1870s. Predictably, most came from estate rentals though an unusually large amount came from dividends and other business investments. Cherry Burton rent receipts made up 69 and 63.7 per cent of David Burton's total income, less cash in hand, in the late 1850s and 1870s, respectively.¹ If profits from the sale of timber, tiles from the brickyard and produce from the home farm are included, the Cherry Burton estate provided Burton with 75.6 per cent of his income in the 1850s and 66.5 per cent in the 1870s. Non-estate income was of two types. Burton had a regular income from London property and other investments, notably government stock, and an irregular 'income' from legacies and the occasional sale of property. The latter was important in 1856 and 1874-5; the former made up 24.7 per cent of total income, less cash in hand, in 1858-61, and 29.4 per cent in 1870-77. This rose to 35 per cent in the early 1870s reflecting the industrial and commercial boom which peaked in 1873. However, it was untypical at this level both of the Burton estate and even of larger properties where non-estate incomes were more common.

1. The years chosen were 1858-9 and 1870-7. They are rather unusual but were chosen because of imperfections in the manuscript sources. It was not possible to use more conventional base years and still show that rent receipts retained a virtually constant share of total income over these two decades.

Table 10.1. Sources of David Burton's income in selected years
1856-78.₁ (To nearest £)

Year	Cherry Burton Rental	London Rental	Interest/ Divid- ends	Wood A/c	Farm A/c	Brick A/c	Others	In Hand January 1st	Total
1856	2,819	66	426	122	-	168	1,956	N.M.	5,557
1858	2,896	126	835	50	-	96	-	316	4,319
1859	2,930	162	936	172	25	213	-	932	5,370
1860	2,942	170	897	302	58	44	-	1,581	5,994
1861	3,100	170	918	-	16	-	-	1,382	5,586
1869	3,429	175	900	-	-	-	13	1,487	6,004
1870	3,354	181	885	167	78	-	-	763	5,428
1871	3,478	218	1,233	19	-	-	50	1,465	6,463
1872	3,422	273	1,920	38	-	-	102	1,036	6,791
1873	3,513	218	1,861	103	51	-	-	1,716	7,462
1874	3,618	263	2,068	288	55	-	310	1,486	8,088
1875	3,531	240	1,465	155	15	-	2,413	1,728	9,547
1876	3,988	240	991	156	49	-	29	1,820	7,273
1877	4,274	340	1,070	113	-	-	-	1,163	6,960
1878	4,332	349	1,029	271	-	-	-	N.M.	5,981

Sources: David Burton MSS, Accs. 1854-6, E.R.R.O. DDCB/25/5;
 1869-79, E.R.R.O. DDCB/25/6.

In Column 'others', the larger amounts were made up as follows.
 The figure for 1856 was made up of the sale of quit rents (£400)
 and the Chapter Manor (£1,556); the figure for 1874 of a legacy
 (£300) and a manor fine (£10); and the figure for 1875 of a legacy.

N.M. Cash in hand did not appear in the accounts in 1856 and 1878.
 It is very unlikely, however, that some cash was not carried over
 from the previous financial year.

Farm and cottage rentals were also the main components of
 Chichester-Constable's income.² Chichester-Constable was a much larger
 landowner than Burton owning 20,000 acres in Holderness. The main
 components of his income remained virtually unchanged throughout this
 period and the simplified account for 1878, reproduced below, shows many
 of its features. Table 10.2 is not a full summary of Chichester-
 Constable's income because it excludes income from Consols and other
 investments. There was no statement on the size of these investments,

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1. Income data relate only to certain years owing to major gaps, especially in the 1860s, in the Burton MSS.
 2. The sale of lead ore and seaside gravel in the 1860s added significantly to Sir Talbot Chichester-Constable's total income.

Table 10.2. Sources of Chichester-Constable's income in 1878.
(To nearest £)

Farm rents	18,133
Cottage rents	995
Home farm and game	880
Timber	626
Horses	1,134
Money in hand	<u>5,604</u>
Total	<u>27,372</u>

Source: Chichester-Constable MSS, Accs. 1874-83, E.R.R.O. DDCC/11.

or the income they generated, in any of the accounts examined. However, it was recorded that Consols valued at £3,162 were traded between December 1878 and February 1880, and it is possible that the total holding was much larger and yielded a substantial regular income.

The impression which emerges from these case studies is the predictable one that estate rentals made up the majority of landlord income and underpinned their ability, along with capital from government and private companies specialising in agrarian investment, to finance estate improvement.¹ Estate rentals also helped to maintain the 'social style' of the landed classes. Incomes from non-estate sources were mostly of secondary importance: the proportion of David Burton's income derived from non-estate sources was almost certainly larger than that of the average squire and even of many aristocratic landowners.

2. Rent Movements 1850-80.

Most agricultural historians have estimated that rents increased nationally by between one-fifth and one-quarter over the third quarter of the nineteenth century. Caird estimated an increase of 21 per cent between 1857 and 1875,² Chambers and Mingay an increase of 25 per cent

1. For a contrary view using twentieth century farming data see D.R. Denman, Estate Capital (1957).

2. Quoted in P.J. Perry, British Farming in the Great Depression 1870-1914 (1974), p.74.

between 1851-2 and 1878-9,¹ and F.M.L. Thompson an increase of 10-30 per cent between 1853 and 1878 to take account of regional variations in the amount of corn grown. According to Thompson, rents increased at a slower rate in areas where corn predominated and at a much faster rate in areas where grazing and mixed farming had gained the upper hand.² R.J. Thompson, writing at the turn of the century, gave no precise estimate of rent movements, but from the rental values he quoted, increases of 14.9 per cent and 15.6 per cent have been calculated for the periods between 1850-9 and 1870-9, and 1851-2 and 1878-9, respectively.³ A sizeable rent increase was also confirmed by income tax returns. The farmland of England and Wales was assessed at over £44 millions in 1863 and at nearly £52 millions in 1877.⁴

The general price level rose over the greater part of this period, the 'overall index'⁵ of the Sauerbeck Statist prices index rising by 5.9 per cent between 1850-9 and 1870-9, and by 10 per cent taking the different base years 1851-2 and 1878-9. Rental values therefore increased strongly in real terms.

The timing of rent movements in the East Riding closely followed the national trend. Landowners generally raised rents in the mid-1850s, held them steady in the 1860s, though several did not, and raised them in the early 1870s. Rents were remitted and in some cases revalued in the last years of the 1870s. The rent books of six East Riding estates

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1. J.D. Chambers and G.E. Mingay, op. cit. p.159.
 2. F.M.L. Thompson, 'English Great Estates in the Nineteenth Century, 1790-1914', First International Conference of Economic History (1960), 394.
 3. R.J. Thompson, 'An Enquiry into the Rent of Agricultural Land in England and Wales during the Nineteenth Century', J.R.S.S. LXX (1907), 598-9.
 4. G.R. Brodrick, English Land and English Landlords (2nd edn, 1968), p.85.
 5. The 'overall' index included a weighting for vegetable products, animal products, sugar, tea and coffee, minerals, textiles, fibres, and sundries.—B.R. Mitchell, Abstract of British Historical Statistics (1962), pp.474-5.

have been examined in detail. The estates investigated differed from each other in soils, farming type and especially in size. Two estates, those belonging to Sir Tatton Sykes and Sir Talbot Chichester-Constable, were each over 20,000 acres, while those belonging to David Burton, the Emanuel Hospital Trust and the Langdales of Houghton were about 3,000 acres. The sixth 'estate' was part of a much larger property belonging to Lord Wenlock and was made up of the landholdings of the Wenlock family in the parishes of Escrick and Wheldrake.

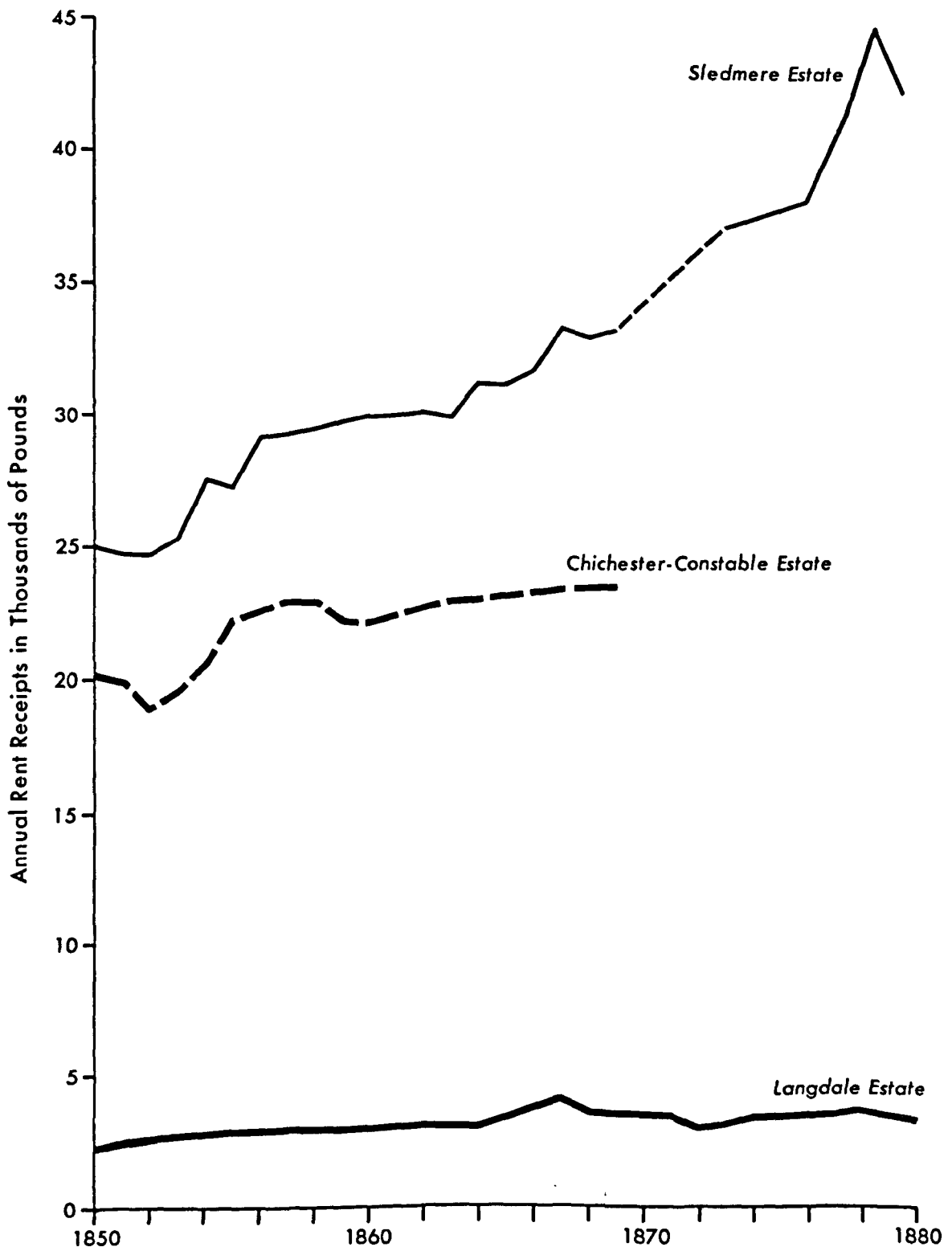
Figure 10.1 shows the general upward drift in total rent receipts in four of these estates. Rentals at Sledmere rose by 76.6 per cent between 1851-2 and 1878-9, and by 51.5 and 16.6 per cent between 1851-2 and 1874-5, and 1874-5 and 1878-9, respectively. A great deal of the increase, as will be pointed out presently, came from the physical growth of the estate rather than from a dramatic increase in the level of rent per acre, though rents per acre did increase by more than the national average.

There was a 40 per cent increase in rent receipts at Houghton between the early 1850s and the late 1870s. Again, a significant part of it can be attributed to the physical enlargement of the property rather than from an abnormally large increase in rent per acre. The recorded increase was much smaller on farms worth £60 or more in annual rent on the Escrick and Wheldrake properties of Lord Wenlock. Rent receipts at Escrick were only 11.1 per cent higher in 1871-4 than they had been in 1850-2, and they were 12 per cent higher at Wheldrake. It is not possible to estimate the exact increase in total rent receipts on the Cherry Burton estate for this quarter century owing to gaps in the rental account, but available evidence suggests increases of around 17-18 per cent.

Increases in gross rentals seem to have varied considerably not only on these estates but elsewhere in the county. Rents on Henry Bethell's estate in Holderness rose by one-half between 1850 and 1880,¹ and rents on

1. R.C. on the Depressed Condition of Agricultural Interests (1880), p.140.

Figure 10.1 Annual Rent Receipts on the Sledmere, Chichester-Constable and Langdale Estates 1850-80.



Constructed from the Sledmere Estate MSS, E.R.R.O. DDSY/107/4; E.R.R.O. DDSY/106/106-8.
Chichester-Constable MSS, E.R.R.O. DDCC (1) 41; E.R.R.O. DDCC (2) 9.22; Langdale Estate MSS,
E.R.R.O. DDLA/34/5.

the 1,400 acre estate of the Bower family of Welham rose by approximately 20 per cent.¹ In contrast, there were no regular rent re-valuations in this period on Lord Londesborough's 30,000 acre property on the Wolds possibly because there had been a very considerable increase in the 1840s and rents, following the custom, were reviewed on the death of tenants.

Movements in total rent receipts do not stand in place of movements in rent per acre unless the size of estates remains constant. Possibly the majority of estates showed no tendency to increase or decrease in size over this period and movements in their total rent receipts can be accepted as reliable indicators of the trend in rent per acre. Rent books were sufficiently detailed on some estates to make this assumption unnecessary. They occasionally included statements on whether farms had been split up or enlarged, and some even recorded farm acreages over time. The former applied to the Chichester-Constable and Langdale estates. Seven farms out of a total of 64 on the Chichester-Constable estate were identified as not having changed in size between 1850 and 1880; this applied to 9 out of 20 farms on the Langdale estate. Movements in the total rental value of these farms, and by implication, movements in rent per acre, have been calculated in Table 10.3. Rents rose by 18.7 per cent on the Chichester-Constable estate between 1850-8 and 1870-8 and by 17.6 per cent on the Langdale estate. This latter was far more realistic than the 40 per cent increase estimated earlier from gross rentals.

1. J.T. Ward, East Yorkshire Landed Estates In The Nineteenth Century (E.Y.L.H.S. No. 23, 1967), pp.40-1.

Table 10.3. Movements in total rent receipts on farms with an unchanged acreage on the Chichester-Constable and Langdale estates, 1850-80.

<u>Chichester-Constable Estate</u>				<u>Langdale Estate</u>			
1850	77	1866	90	1850	82	1866	89
1851	77	1867	90	1851	82	1867	89
1852	74	1868	90	1852	82	1868	89
1853	74	1869	91	1853	82	1869	89
1854	78	1870	91	1854	83	1870	89
1855	88	1871	91	1855	83	1871	89
1856	88	1872	97	1856	83	1872	89
1857	91	1873	99	1857	83	1873	89
1858	91	1874	100	1858	82	1874	100
1859	90	1875	100	1859	82	1875	100
1860	90	1876	100	1860	82	1876	101
1861	90	1877	100	1861	82	1877	100
1862	90	1878	100	1862	82	1878	99
1863	90	1879	100	1863	82	1879	99
1864	90	1880	100	1864	82	1880	98
1865	90			1865	90		

Sources: Chichester-Constable MSS, Holderness estate rentals, E.R.R.O. DDCC (1). 41; E.R.R.O. DDCC (2). 9.22; E.R.R.O. DDCC/11; Langdale MSS, estate rentals, E.R.R.O. DDLA/34/5.

The rent books of the Sledmere and Cherry Burton estates were the most detailed encountered in this study of the East Riding as exact farm acreages were recorded throughout the period. The computation of changes in rent per acre on the Sledmere estate was based on farms valued at £30 or more in annual rent in the parishes of Bishop Wilton, Brigham, Garton, Heslerton, Kirkburn, Sledmere, and Thixendale. The computation for Cherry Burton was based on a sample of 64 per cent of all farms on the estate. Rent per acre at Sledmere increased by about one-third between 1850-8 and 1870-8, which was less than half the calculated increase using gross estate rentals, and is an important indication that the estate was expanding over the middle years of the century. The increase at Cherry Burton was 19.1 per cent which was almost the same as the increase calculated from total rent receipts.

Table 10.4. Movements in rent per acre on the Sledmere and Cherry Burton estates, 1850-80.₁ 1874 = 100

<u>Sledmere Estate</u>				<u>Cherry Burton Estate</u>			
1850	80	1866	92	1850	85*	1866	100
1851	80	1867	92	1851	85*	1867	100
1852	80	1868	92	1852	86	1868	100
1853	80	1869	92	1853	88	1869	100
1854	87	1870	92	1854	86	1870	100
1855	87	1871	92	1855	87	1871	100
1856	87	1872	99	1856	89	1872	100
1857	87	1873	99	1857	89	1873	100
1858	87	1874	100	1858	91	1874	100
1859	87	1875	100	1859	91	1875	100
1860	87	1876	100	1860	92	1876	100
1861	87	1877	110	1861	95	1877	100
1862	87	1878	116	1862	95	1878	100
1863	87	1879	116	1863	95	1879	100
1864	90	1880	110	1864	98	1880	98
1865	90			1865	100		

Sources: Sledmere Estate MSS, rent accounts, E.R.R.O. DDSY/107/4-8;
Cherry Burton MSS, rent accounts, 1851-86, E.R.R.O. DDCB/25/1.

* These figures are inferred.

The Emanuel Hospital estate at Brandesburton also provided information on farm rents and acreages but these data were not incorporated into Table 10.4 because they applied only to the years 1846 and 1875. Average rent per acre was 22s.7d. in 1846 and 24s.2d. in 1875.² The increase, which was around 7 per cent, barely covered the general rise in prices.

1. In order to demonstrate the manner in which this index was constructed, some of the information used for the Sledmere Estate is reproduced below.

Year	Acreage in Sample	Total rent on Acreage to nearest £	Average rent per acre in shillings to one place of decimals
1850	18,606	15,282	16.4
1854	18,650	16,190	17.4
1858	18,573	16,368	17.6
1862	18,626	16,375	17.6
1866	19,478	18,488	19.0
1870	20,400	18,664	18.3
1874	20,308	22,038	21.7
1878	20,745	27,974	27.0
1880	20,761	25,127	24.2

The calculation in Table 10.4 was based on the computed average per acre.

2. Emanuel Hospital MSS, L.C.R.O. EH 5.2; L.C.R.O. EH 5.19.

Several significant points have come out of this analysis. The most important is that rent increases in the East Riding were slightly lower, on average, than the increases computed nationally, though the timing of rent adjustments followed the national trend closely. In the six estates studied in detail, one-half recorded increases of 17-19 per cent and the spectrum of adjustment extended from 7 per cent to over 30 per cent. The slightly below average increase for the East Riding fits F.M.L. Thompson's argument that rent increases were tied to the importance of corn growing. On the other hand, the high rent increases on the Sledmere estate, where corn growing predominated, and the more modest increases on some lowland estates where mixed farming was generally more advanced, suggests that Thompson's argument requires qualification. In particular, it ignores the perverseness of many estate managements in matters like rent adjustment. This alone seems to explain rent increases on the Sledmere estate in the late 1870s, despite vocal opposition, and the very marginal increases on the Brandesburton and Londesborough estates over the 1850s and 1860s. The analysis also shows that farm rentals did not collapse in 1879 as R.J. Thompson believed.¹ On the contrary it helps to reinforce the views of H.A. Rhee that rents fell only gradually from the late 1870s.²

3. Factors influencing rent movements.

The upward trend in farm rents over the greater part of this period is a measure of the predominantly prosperous state of the agricultural industry. Farm prices were mostly high and many agriculturalists improved their farms. Adjustments to rents naturally reflected the growing efficiency of the farming system. In a wider context the economic prosperity of mid-Victorian England helped to inflate the demand for

1. Average farm rents in Thompson's index fell by one-quarter between 1878 and 1879.- R.J. Thompson, op. cit. pp.598-9.

2. D.K. Britton and H.A. Rhee, The Rent of Agricultural Land in England and Wales, 1870-1946 (1949).

agricultural land¹ and expand the resources available for rural investment, again encouraging increased rents. Several historians have commented on the relationship between movements in the domestic price level and agricultural rents.² The mid-1850s and the early 1870s were associated with rising rents while periods of low or falling prices, such as the early 1850s and the late 1870s, were associated with rent reductions and remissions. The timing of rent movements in the East Riding conformed closely to this pattern.

The most decisive influence on rent movements was investment in land improvement. This has been argued by Chambers and Mingay and by F.M.L. Thompson, though he added the qualification that rent increases were not proportional to increases in investment and that the railway sometimes had a more powerful effect on rents than direct investment in farm improvement.³ This point about the railway was very relevant for districts specialising in activities like dairying and market gardening, access to the urban market being crucial. It did not apply as forcefully to corn counties like the East Riding and the relationship between land improvement and rising rentals requires no, or little, qualification.

This was understood by contemporaries. Assistant Commissioner Coleman, for example, thought that the 50 per cent increase in Henry Bethell's rent receipts spoke "volumes as to the large amount spent on improvement".⁴ This impression is also conveyed in estate rent books. Tenants usually paid 5 per cent interest on drainage improvements financed by their landlords. This was the case on the Sledmere estate in the mid-

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1. See below, pp.286-7.
 2. Lord Ernle (R.E. Prothero), English Farming Past and Present (6th edn, 1961), p.374.
 3. F.M.L. Thompson, 'English Great Estates in the Nineteenth Century, 1790-1914', loc. cit. p.394; English Landed Society in the Nineteenth Century (1963), p.256.
 4. R.C. on the Depressed Condition of Agricultural Interests (1880), p.140.

1850s and on Lord Wenlock's estate in 1857 when rents were raised not only to cover a 5 per cent charge on drainage investments but also an additional rate imposed by the Ouse and Derwent Drainage Authority.¹ Rents were also revalued in some cases to take into account improvements financed by tenant farmers themselves. More rarely landlords charged their tenants interest on capital invested in new or renovated buildings. At Escrick the rent paid by Charles Chatterton and David Long was raised by 5 per cent per annum in the mid-1870s to pay for two newly completed dutch barns,² and at Wheldrake, Francis Carr's rent was raised by a similar amount again as a result of landlord investment in new farm buildings.³ Such actions were unusual by the standards of larger estates and were more characteristic of small gentry estates where economy measures of this sort were often necessitated by their limited resources.⁴

The discussion of rent movements can be placed in a broader historical context by considering the implications of a recent study by Denman and Stewart on rent changes in England and Wales in the decade or so after the Second World War. They conclude that

Rents are likely to change ... with a change in tenancy, as the outcome of a general rent review, as a consequence of landlord improvements or the alteration of farm boundaries, or the terms of tenancies - especially terms touching repair obligations.⁵

Denman and Stewart attempted to quantify the most frequent causes of rent adjustment between 1945 and 1957. They found that a general rent review

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1. Wenlock Estate MSS, rent accs. 1837-59, E.R.R.O. DDFA/5/25.
 2. Ibid. E.R.R.O. DDFA/41/18.
 3. Ibid. E.R.R.O. DDFA/41/19.
 4. Sewerby Estate MSS, tenancy agreement, 1856, E.R.R.O. DDLG/43/756.
 5. D.R. Denman and V.F. Stewart, Farm Rents (1959), p.125.

accounted for 42 per cent of the total changes in farm rentals, improvements made by landlords for 17 per cent, changes in tenancy for 18 per cent, alterations to boundaries for 6 per cent, and a combination of these factors or 'miscellaneous' causes accounted for the remainder.¹

It is impossible to say with certainty whether this, or a similar ordering of factors, was at work in mid-nineteenth century agriculture. There was something like a general review of farm rents in the mid-1850s and early and late 1870s, and there were strong connections between landlord investment (and sometimes tenant investment) and rent adjustments, and similarly between rent adjustments and changes in tenancy. This latter was conveyed very forcefully in the manuscript evidence and applied to changes of tenancy within the family - son succeeding father - as well as to changes involving 'outsiders'. An ordering of the causes of rent adjustment similar to that given by Denman and Stewart cannot therefore be ruled out for the nineteenth century, though the precise weighting of individual factors may have differed significantly.

Investments in farm improvement were stepped up sharply in the early phases of depression² suggesting a paradox of falling rents and rising investment. This does not undermine the logic of the rent-investment nexus discussed so far. Investments undertaken in the early phases of depression were aimed usually at maintaining rental values or lessening their fall. Investment would fall off as depression deepened and rent increases would be either checked or reversed by a policy of remissions and rebates. This could lead to a general rent review if the depression was particularly severe, as happened on the Emanuel Hospital estate when rents fell by upwards of 30 per cent towards the end of 1879. The estate

1. Ibid.

2. See below, pp. 280-2; 289-92.

management reasoned that

... if the tenants should leave and the Governors fail to find new tenants they must either let the land go out of cultivation or find large capital to pay the outgoing tenants their interest in the farms and to stock them. (sic)₁

4. Landowners and the growth of professional management.

The East Riding was an aristocratic county with a heavy concentration of large landed estates. There were 12 families at the top of its landed hierarchy each owning over 10,000 acres at the time of the New Domesday survey. They controlled between them 213,606 acres or 30 per cent of the farming land of the county and drew £267,445 annually in rent. The three largest landowners owned 87,519 acres and received £101,781 in rent.² Using John Bateman's classification of the landholdings of peers and 'great landowners', for practical purposes defined as those owning 3,000 acres or more, the East Riding had a greater concentration of landed estates in this size range than the majority of eastern and south-eastern counties.

Table 10.5. Landownership in seven eastern counties in 1873 arranged in units of 3,000 acres and over.

County	Total acreage in size range 3,000 acres and over	'A' as a per- centage of the acreage of the county
East Riding	356,254	50.1
West Riding	678,212	41.6
North Riding	502,975	39.3
Northumberland	794,245	65.1
Durham	213,329	37.6
Lincolnshire	672,492	41.7
Norfolk	517,270	41.5
Essex	270,773	28.3
Suffolk	365,648	39.7
ENGLAND & WALES	14,226,678	41.2

Sources: J. Bateman, The Great Landowners of Great Britain and Ireland (4th edn, 1883), pp.501-15; The Great Landowners of Great Britain and Ireland (1971 edn), introduction by D. Spring, p.18.

1. Emanuel Hospital MSS, Report November 14, 1879, L.C.R.O. EH5.20, p.4.
2. J.T. Ward, op. cit. p.3.

The greater concentration of larger landowners in the East Riding gave its agricultural industry several advantages. It meant that the leaders of the industry were not encumbered by routine tasks like rent collection and book-keeping, the usual occupations of the small squire, and had more time for policy matters and for familiarising themselves with business and technical developments. A resident agent, who would have considerable executive powers, would normally be employed on estates of 5,000 to 10,000 acres and would always be employed on larger estates. The growth of a professional class of land agents did much to raise farming standards and the quality of estate administration during the nineteenth century. It also reinforced the trend towards greater professionalism on the part of landowners themselves.¹

One of the main functions of the landlord was to supply the farming system with fixed capital, tenant farmers supplying working capital. Landowners became increasingly involved in creating a framework which could sustain improved methods and foster new ideas,² though only a small minority ever involved themselves in the practical details of technology and the day-to-day practices of the farmer.³ David Spring dated this shift in aristocratic involvement in agriculture from the 1830s.

It would be an exaggeration to suggest that nineteenth century landowners as administrators of their estates were altogether different from their eighteenth century predecessors. They did not become enterprising overnight for the simple reason that they had never been totally lacking in enterprise - whatever the nostalgic defenders of rural innocence may argue to the contrary. But it may be suggested ... that there was an appreciable difference in the sense that more of the waking hours of most landowners were devoted to the business of agriculture and their estates, and that in fact they were more competent and knowledgeable about such affairs.⁴

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1. D. Spring, The English Landed Estate in the Nineteenth Century: its Administration (1963), pp.3-8.
 2. S.C. on Agricultural Customs (1848), Q.706; Hull Advertiser, October 11, 1850.
 3. G.E. Mingay, 'The Large Estate in Eighteenth Century England', First International Conference of Economic History (1960), 378.
 4. D. Spring, 'Victorian Aristocracy', Victorian Studies, 6 (1963), 274.

Spring explained this in terms of the rise of evangelicalism, the growth of the professional middle class and the greater professionalism of estate stewards.¹ Not mentioned, but possibly of importance, was the spreading influence of an urban-industrial society. The commercial spirit of the town could not be excluded from the countryside once the network of railway feeder lines had begun to thicken.

Esme Wingfield-Stratford was among several writers to take up the theme of improved estate leadership. He argued that the mid-Victorian squire and magnate was "intimately concerned with the improvement of his land as any farmer or yeoman, besides being far more enlightened and progressive".² This might be too generous applied to the finer details of estate improvement but is accurate applied to policy matters. J.T. Ward noted a similar trend in the East Riding.³ The picture of oafishness and indolence, accepted by many as the hallmark of landed proprietorship, and given its more unrestrained expression in the campaigns of the Anti-Corn Law League, was mostly inaccurate.

The quality of landownership in the East Riding even won the approval of the liberal press. The Hull Advertiser argued that the county was "justly proud of them". They had been responsible for creating a class of "industrious, enterprising, improving and thrifty tenants; and such tenants fill the land with an abundance of the prime necessities of life ...".⁴ Some landowners were publicly acknowledged for their contributions to agriculture. Sir Tatton Sykes was acknowledged by the conservative Driffild Times for his attention to soil fertility, the quality

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1. Ibid. p.275.
 2. E. Wingfield-Stratford, The Squire and his Relations (1959), p.335.
 3. J.T. Ward, op. cit. p.69.
 4. Hull Advertiser, April 5, 1856.

of stock which grazed his pastures, and the neat and spacious homesteads which made up the Sledmere estate.¹ Robert Denison of Waplington Manor gained recognition as the first East Yorkshire landowner to undertake the commercial cultivation of flax. Most landowners had held back from this discouraged by the belief that flax impoverished the soil. Denison demonstrated that land could be revived using guano and phosphates and that flax could be introduced on strong soils as an alternative to beans, and on lighter soils after oats or barley. Denison built a large flax works at Pocklington and became a rural entrepreneur of no small importance.²

The bulk of landowners rarely, if ever, came to the notice of the general public except perhaps in their capacities as magistrates and chairmen of boards of guardians. However, their collective contribution to East Riding agriculture made it one of the most progressively farmed districts in the country. Squires like the Legards, Stricklands, St. Quintins, Vavasours, and Hildyards were known as keen improvers.³ Some landowners, particularly in south Holderness, gained a reputation for drainage and land reclamation;⁴ others like the St. Quintins were pioneer livestock breeders,⁵ and still others like the Bethells and Dunnington-Jeffersons were well known for their improvements to farm buildings.⁶

An insight into the views and achievements of progressive estate owners comes out in case studies of changing policies towards home farms and farm buildings. Home farms, although used sometimes to develop new techniques and propagate ideas, were mainly the provisioners of manor house and stables, and were run invariably at a loss. It was probably

1. Drifffield Times, May 20, 1865.

2. The Drifffield Observer and Literary Journal, November 16, 1853.

3. J.T. Ward, *op. cit.* p.6.

4. *Ibid.* p.9.

5. *Ibid.* p.31.

6. R.C. on the Depressed Condition of Agricultural Interests (1880), p.133.

little different in the East Riding but home farms on several estates did make a profit through careful management and close attention to business detail. Lord Wenlock's home farm made an average yearly profit of £419 between 1872 and 1879 on a capital of £8,000. The rate of return was 5 per cent and was considerably below the 10 per cent a prudent tenant farmer would have wanted. None-the-less it was substantial enough for John Coleman to think it "very unusual" and an indication of the "profitable nature of high farming, when judiciously carried out".¹

A more detailed breakdown of home farm finances was constructed from the records of the Sewerby estate. Table 10.6 shows the yearly surplus/deficit between 1857 and 1881.

Table 10.6. The profitability of the Sewerby Home Farm, 1857-81.
(To the nearest £)

Year	Profit	Year	Profit
1857	169	1869	-18
1858)		1870	119
1859)	Missing	1871	-35
1860)		1872	118
1861)		1873	-337
1862	-1	1874	183
1863	98	1875	-224
1864	280	1876	1
1865	186	1877	50
1866	-234	1878	39
1867	-280	1879	16
1868	-1	1880	190
		1881	61

Sources: Sewerby Estate MSS, accounts 1857-69, E.R.R.O. DDLG/43/10;
accounts 1870-81, E.R.R.O. DDLG/43/13.

There were eight years between 1862 and 1881 when expenditure exceeded receipts and the loss incurred was £1,130. The profit in the remaining years amounted to £1,341 giving an overall surplus of £211 or £10 per annum averaged over the whole period. No tenant farmer could have

1. Ibid. pp.158-9.

survived on this, but this is not the issue. What is important is that a home farm, seemingly no different from the great majority, was not abandoned to the loss principle. The record does not show whether this was becoming a feature of the better run estate generally, but if it was, it would be in line with the drift towards higher professional and business standards on the land.

The case for greater professionalism in agriculture is illustrated more strongly in a case study of building developments on Dunnington-Jefferson's estate. Two themes were developed in the business correspondence of this landowner and his estate agent, William Burland. Requests were made for information on new designs and methods of constructing farm buildings, and there was a clear determination to encourage landowners and progressive farmers to examine farm buildings on the estate. It was thought that their criticisms would help to improve existing buildings and, in a more general sense, help to spread interest in the 'science' of farm architecture.

The Dunnington-Jefferson manuscript is filled with insights into the workings and policies of a progressive mid-nineteenth century estate. For example, William Burland had this to say to H.S. Thompson, a prominent North Riding squire and a member of the council of the Yorkshire Agricultural Society, about erecting new farm buildings at Thicket Priory, a farm 100 acres arable and 200 acres grass on the Dunnington-Jefferson estate.

I have carefully and with interest read the different Essays on the construction of Farm Buildings in the Royal Agricultural Society's report - I have also been to see several sets of farm buildings, among others those of Prince Albert at Windsor and Lord Macklesfield at Shelborne Castle. It has occurred to me that from the interest you take in farming matters you may be able to give me some suggestions.

Burland then asked Thompson the following questions:

- (i) What were the best sort of buildings for a farm such as Thicket Priory?
- (ii) Who was the best architect to design them?
- (iii) Who was the best engineer to erect a steam engine?
- (iv) Was it worthwhile visiting the Agricultural College at Cirencester and Alderman Mechi's farm?¹

Dunnington-Jefferson was equally anxious to collect accurate information. He discussed Prince Albert's farm buildings with Colonel Hood and indicated his willingness to "adopt them in their entirety".² He also showed interest in farm buildings on Lord Bernes estate:

When I had the pleasure of being with you last Autumn I was much pleased with the arrangements for the corn stack between the Barn and the Stocks. I have seen nothing of a similar kind elsewhere. I have various ideas of making a similar arrangement behind my New Buildings, and if my Clerk of Works were allowed to inspect what your Lordship has done, I think he would get some useful hints.³

Dunnington-Jefferson showed a willingness on several occasions for farmers and landowners to view his buildings. He wrote to J.W. Lawley:

I shall be glad to make them /ie. the farm buildings/ as useful to others as I can, and to give every explanation in my power, that they may copy what is right and avoid whatever may be wrong.⁴

Similar invitations were sent to Joseph Shuttleworth, Lord Bernes, Samuel Hill, and R.B. Cooke.⁵ Quite clearly an important source of agrarian

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- 1. J. Dunnington-Jefferson MSS, letter dated November 16, 1857, E.R.R.O. DDJ/40/4.
 - 2. Ibid. May 14, 1858.
 - 3. Ibid. May 18, 1860, E.R.R.O. DDJ/40/5.
 - 4. Ibid. March 4, 1859, E.R.R.O. DDJ/40/4.
 - 5. Ibid. June 13, 1859; May 18, 1860; February 20, 1861. E.R.R.O. DDJ/40/5.

progress was the spread of ideas among landed proprietors themselves and their land agents.

Dunnington-Jefferson was well ahead of most East Riding squires and the landed aristocracy in his concern for the improvement of farm buildings. The generally poor state of buildings, especially on the Wolds, was referred to by Charles Howard in the mid-1830s,¹ George Legard in the late 1840s,² and William Wright in the early 1860s.³ It was also a widespread feature of English farming as the Yorkshire Agricultural Society pointed out:

There is scarcely one farm yard in ten, which is spouted to keep off the rain water which descends upon the roofs of the buildings; there is not one in a hundred which has a floor impervious to water; and fewer still which have the plane of the floor so inclined that the liquid portions shall be drained off, and be collected in a reservoir, instead of being evaporated into the atmosphere.⁴

This was in the 1840s and was changing. The growing concern for improvement in East Yorkshire was noted by Coleman in the late 1870s and more especially by Hunter Pringle in his report to the second Royal Commission on the Agricultural Depression. He commented on the high standard of farm buildings and drew particular attention to the winter quarters of livestock. On some estates covered fold yards were a feature of every farm and had become a symbol of progressive farming.⁵

The impression that landowners were more dedicated to agrarian efficiency in this period is biased to some extent by the availability of

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1. C. Howard, Agriculture of the East Riding (1835), p.102.
 2. S.C. on Agricultural Customs (1848), Q.7597.
 3. W. Wright, 'On the Improvement in the Farming of Yorkshire since the date of the last Reports in the Journal', loc. cit. p.104.
 4. W. Thorp, 'Report of the Committee on Agricultural Geology', Journ. of the Yorks. Agric. Soc. IV (1841), p.93.
 5. R.C. on the Agricultural Depression (1895), p.916.

manuscript evidence. It was the more dedicated and methodical landowner who usually compiled accounts capable of withstanding the effects of time. The efficiency of estates run by men of lesser ability and interest, being less well documented, have sometimes failed to receive the attention they deserve in the assessment of progressive landlordism. This study, particularly in the choice of examples, has absorbed this bias, but the evidence on balance shows that landowners, large and small, were becoming more adept in handling their business affairs. It suggests that an increasing number of them were anxious to be informed about farming developments and to provide, as far as they were able, a framework which could sustain efficiency and improvement.

5. Landlord Investment.

Evidence on estate capital formation in the East Riding is generally of poor quality. Landowners usually made no distinction between the costs of routine maintenance and the capital costs of financing new investments. Nor did they always make clear the purpose of their investment. It was sometimes difficult to decide whether an account referred to an improvement to drainage, to the construction of new farm buildings, or to some other area of development. Accounts also tended to be fragmentary which limited their usefulness in reconstructing the business life of individual estates, and by implication, of the county.

Several broad trends were recognised. First, estate managements did not invest a constant proportion of total estate receipts or total estate rentals, whichever the case might be, in land improvement and maintenance. R.J. Thompson's estimate that 25 per cent of estate rent receipts went into repairs and improvements,¹ although correct for certain

1. R.J. Thompson, 'An Enquiry into the Rent of Agricultural Land in England and Wales during the Nineteenth Century', loc. cit. p.604.

years, was not confirmed by East Riding data for the period as a whole. The proportion re-invested fluctuated widely from year to year and was generally much less than the Thompson estimate. Second, investment as a proportion of estate income tended to rise during periods when rents were rising, hold steady when rents were steady, and to increase during the early stages of depression and to slump in the later stages of a depression. Third, there was a great deal of variation between estates in the proportion of their resources used for improvement. This reflected the attitudes, prejudices and policies of landlords themselves, as well as adjustments to changing economic and weather conditions.

Data on estate incomes and the sums allocated for investment are summarised in Table 10.7. They describe investment in farm buildings and maintenance on the David Burton, Chichester-Constable, Emanuel Hospital, and Wenlock estates.¹ The 1850s falls into two parts from the point of view of estate investment, the dividing line being the Crimean War. Investment seems to have been on a minor scale throughout most of the first half of the decade, though the data were not complete enough to throw any light on the pattern of investment during the depression of the early 1850s.² Funds allocated for building improvement and general maintenance on the Cherry Burton estate never exceeded 5 per cent of David Burton's total income between 1854 and 1856. The amount was slightly higher on the Emanuel Hospital and Wenlock estates. Expenditure on building and draining took 5.4 per cent of the Emanuel Hospital's rent balance in 1854 and 4.6 per

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1. An attempt was made to use some of the evidence on drainage investment contained in Chapter 4 in this general analysis of estate investment, but the data were not sufficiently detailed or continuous to make this possible. However, it might be expected that trends in drainage investment followed trends in estate income quite closely, just as in building and maintenance. Manuscript and secondary sources suggest that drainage investment peaked in the difficult years of the late 1840s and early 1850s, and also in the late 1870s and early 1880s, and that it was maintained at a fairly high level during the years of rising rents in between.
 2. It is possible that investment in land improvement increased substantially between 1850 and 1852 in line with the high levels of investment in the late 1840s.

Table 10.7. Expenditure on buildings and maintenance on four East Yorkshire estates 1851-80.

Year	<u>Cherry Burton Estate</u>		<u>Chichester-Constable's Estate</u>	<u>Emanuel Hospital Estate</u>		<u>Lord Wenlock's Escrick Estate</u>	
	Buildings/repairs as % of total income	Buildings/repairs as % of total rental	Buildings as % of Holderness Rental	Buildings/tiles as % of estate rental	Buildings/tiles, plus repairs as % of estate rental	Buildings/repairs as % of total income	Buildings/repairs as % of total rental
1851						7.7	
1852						6.5	
1853						6.5	
1854	1.8			5.4	6.7	7.0	
1855	4.2			4.6	9.5	7.3	
1856	4.2			3.8	6.2	8.8	
1857				27.3	41.2	9.9	
1858	17.7			12.8	15.0	6.3 #	
1859	8.2		3.8	6.9	11.7	12.8	
1860	10.3		5.5			9.1	
1861	5.0		6.6			11.4	
1862			9.3			6.6	
1863			9.2			14.0	
1864			11.2			10.6	
1865			7.7			9.3	
1866			6.2			13.1	
1867			11.7				
1868			7.4				
1869	8.8	15.4	6.2				
1870	10.0	16.0					
1871	7.8	14.6					
1872	7.9	15.7					
1873	7.0	14.8					
1874	6.3	14.0					
1875	5.3	14.3					
1876	7.9	12.3					
1877	11.0	17.9					
1878	14.9	20.6				18.8 "	25.5
1879						16.0	21.5
1880						16.5	22.1

Sources: Cherry Burton MSS, accs. 1854-60, E.R.R.O. DDCB/25/5; account book, 1854-79, E.R.R.O. DDCB/25/3; Chichester-Constable MSS, Holderness rental and disbursements, 1859-69, E.R.R.O. DDCC (I)-(II); Emanuel Hospital MSS, receipts and expenditure L.C.R.O. EH 5.5; expenditure 1854-60, EH Box 40, No.5; Wenlock MSS, Yorkshire Steward's daily ledger, 1851-6, E.R.R.O. DDFA/37/15; 1857-63, E.R.R.O. DDFA/37/16; 1863-6, E.R.R.O. DDFA/37/17; 1878-80, E.R.R.O. DDFA/37/19.

* Total income refers to all sources of income to which the estate owner had access. This also applies to Lord Wenlock's estate.

The 6.3 calculation is heavily biased by an inheritance in that year. The proportion of income spent on buildings and repairs would have been about 11 per cent if estate income had been at its normal level.

" The figures for 1878-80 are estimates. Total income is not known although total income from estate rentals is known. The estimates were derived on the assumption that total estate income was approximately £27,500 per annum.

cent in 1855. Allowing for repairs it took 6.7 and 9.5 per cent, respectively, of the rent balance. The amount invested on Lord Wenlock's estate throughout the first half of the 1850s varied between 6 and 7 per cent of estate income.

The Crimean War had few immediate effects on estate capital formation. Expenditure was pushed up on the Cherry Burton, Emanuel Hospital and Wenlock estates but the increase was minor in each case. Its longer term effects were more important. Farmers have traditionally benefited from high wartime prices and landlords from higher rents. It is probable that estate managements drew up plans for land improvement under the stimulus of wartime prosperity and that these were carried out in the post-war period. Expenditure on buildings and repairs increased several fold on the Cherry Burton estate between 1856 and 1860. Building and drainage investments increased from 3.8 per cent of the Emanuel Hospital's rental in 1856 to 27.3 per cent in the following year, and expenditure on repairs increased from 3 per cent of the rental to 14 per cent, though these levels were not maintained. Building, drainage tiles and repairs absorbed 15 per cent of the Hospital's rent receipts in 1858 and 11.7 per cent in 1859.

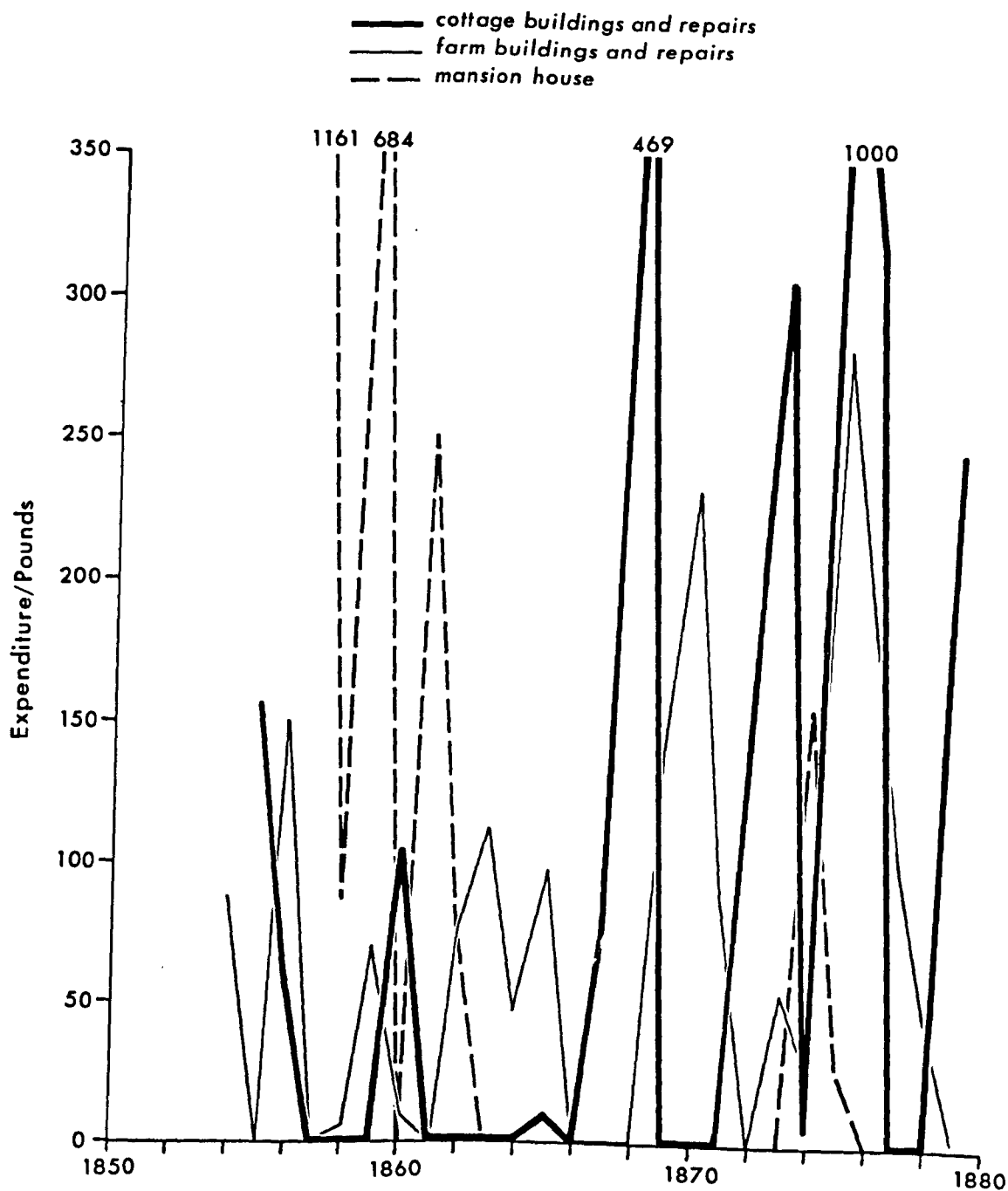
The effects of war were less obvious on Lord Wenlock's estate. Estate investment was 2-3 per cent higher in the immediate post-war period, compared with the preceding half decade, which may partly have been a response to wartime conditions. On the other hand Lord Wenlock's interest in drainage improvement seems to have pre-dated the War. The higher levels of investment in the following period may therefore have been part of a long term policy to commit more of the estate's resources to technical and economic improvement.

Investment was well maintained on Lord Wenlock's estate throughout the 1860s and absorbed a little over 10 per cent of estate income. The amount set aside for repairs and improvements almost doubled on the Chichester-Constable estate between 1860 and 1864. Estate investment took 6.6 per cent of the Holderness rental in 1860 and 11.2 per cent in 1864, though the level fell in the second half of the 1860s except for a sharp rally in 1867.

Investment was stable in the first half of the 1870s. Outpayments on the Cherry Burton estate, including allowances for the construction of new buildings and the maintenance of existing ones, averaged about £500 per year or 14-15 per cent of rent receipts.¹ Investment levels then rose quickly in 1877 and 1878: 17.9 per cent of rent receipts were set aside for investment in 1877 and 20.6 per cent in 1878. This was paralleled on other estates. Investment on Lord Wenlock's estate was higher in the closing years of the 1870s than in the previous decade, building and repairs taking between one-fifth and one-quarter of rent receipts and about one-third if drainage is included.² It was higher on Lord Hotham's estate. John Coleman estimated it at one-half.³ David Grigg showed a similar trend in the Lincolnshire estates he examined. For example, expenditure on repairs and new improvements on the Welby estate increased from slightly less than 7 per cent of gross rental to a little under 16 per cent in the middle and late 1870s. The increase on the Thorold estate was from 25 per cent of gross rental at the beginning of the 1870s to between 35 and 40 per

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1. In this example total rent receipts are a more reliable index for evaluating estate investment than landlord's total income because of the considerable variation in non-estate income during the early 1870s.
 2. The computations for 1878, 1879 and 1880 were 30.3, 29.3 and 30.6 per cent, respectively.
 3. R.C. on the Depressed Condition of Agricultural Interests (1880), p.143.

Figure 10.2 Expenditure on the Cherry Burton Estate on Farm Buildings and Repairs, Farm Cottages and Repairs and the Mansion House, 1854-79.



Source: Cherry Burton MSS, accs. 1854 -79, E.R.R.O. DDCB/25/3.

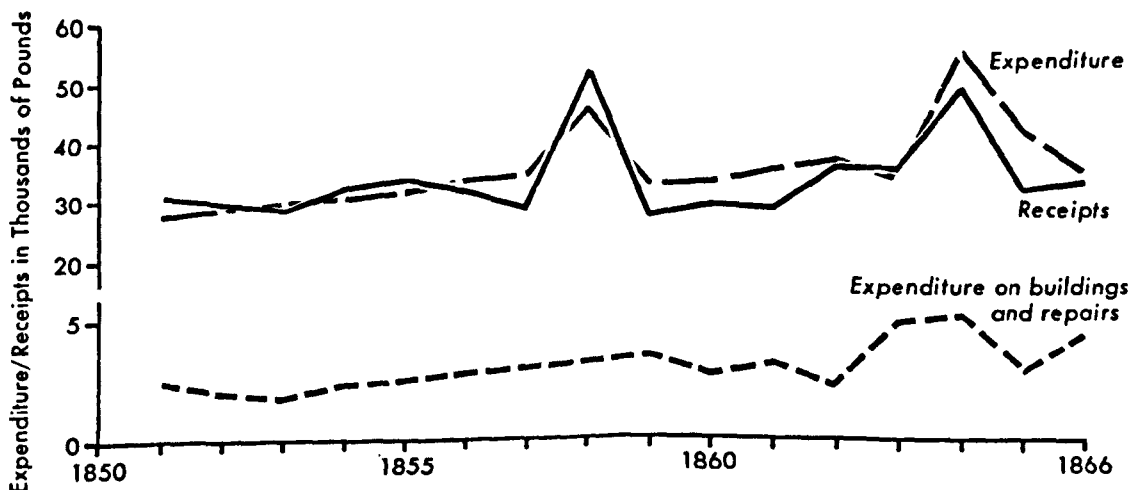
cent by the close of the decade.¹

Estate investment was influenced by two basic factors. First and inevitably, landowners had to gauge the opportunity cost of one improvement over another, and second, gross investment was associated closely with estate income. Taking the first of these there were several investment alternatives open to landowners, some of which are demonstrated in a case study of the Cherry Burton estate's building programme. This had three parts: the erection and maintenance of farm buildings and farm labourers' cottages, and the periodic renovation of the mansion house. The cyclical pattern traced by these elements has been reconstructed for the period between 1854 and 1879 and is depicted in Figure 10.2. Its outstanding feature is the way each element in the investment cycle (cottages, farm buildings and manor house) interlocked with the others. When one peaked the others were generally at a low level and investment in them dried up in one or two instances. Improvements to the mansion house absorbed the greater part of the resources allocated for building in the late 1850s. There was little building activity in the early 1860s and what there was was centred on the repair of farm buildings. This was followed by phases of cottage building and the maintenance of existing cottages in 1867, 1872-3, 1875-6, and 1879; the building of farm outhouses in 1869-71 and 1875-6, and improvements to the mansion house in 1874. Two important cycles moved upwards together only in 1875-6. The timing of different investments was clearly planned and helps to underline the business-like approach to estate management of Burton himself, and by implication may reveal some of the business qualities of squires elsewhere in the Riding.

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1. David Grigg's analysis confirms the findings of the East Riding study. Expenditure on improvements on the Thorold and Welby estates fell away from a peak about 1860, and the fall continued until the early 1870s. Estate investment was maintained better on East Riding estates but it did dip in the second half of the 1860s. Expenditure on repairs and improvements rose both on Lincolnshire and East Riding estates in the middle and late 1870s.- 'A Note on Agricultural Rent and Expenditure in Nineteenth Century England', Agric. Hist. 39 (1965), 151.

Taking the second of the factors which influenced investment, there was a firm association between estate income and the capacity and willingness of landed proprietors to finance new projects. The proportion of estate rentals retained for investment varied between estates and from year to year but it was maintained at a reasonable level over the middle decades of the century. The rising trend in farm rents in the second half of the 1850s was associated with a rising trend in estate investment. A more stable rent structure in the 1860s was associated with a fairly stable investment structure. In the 1870s rents continued to rise on several estates until late in the decade, investment peaking between 1879 and 1881.

Figure 10.3 Total Receipts and Building Expenditure on Lord Wenlock's Yorkshire Estates, 1851-66.



Sources: Wenlock MSS, Yorkshire Steward's daily account book, 1857-63, E.R.R.O. DDFA/37/16; 1863-6, E.R.R.O. DDFA/37/17.

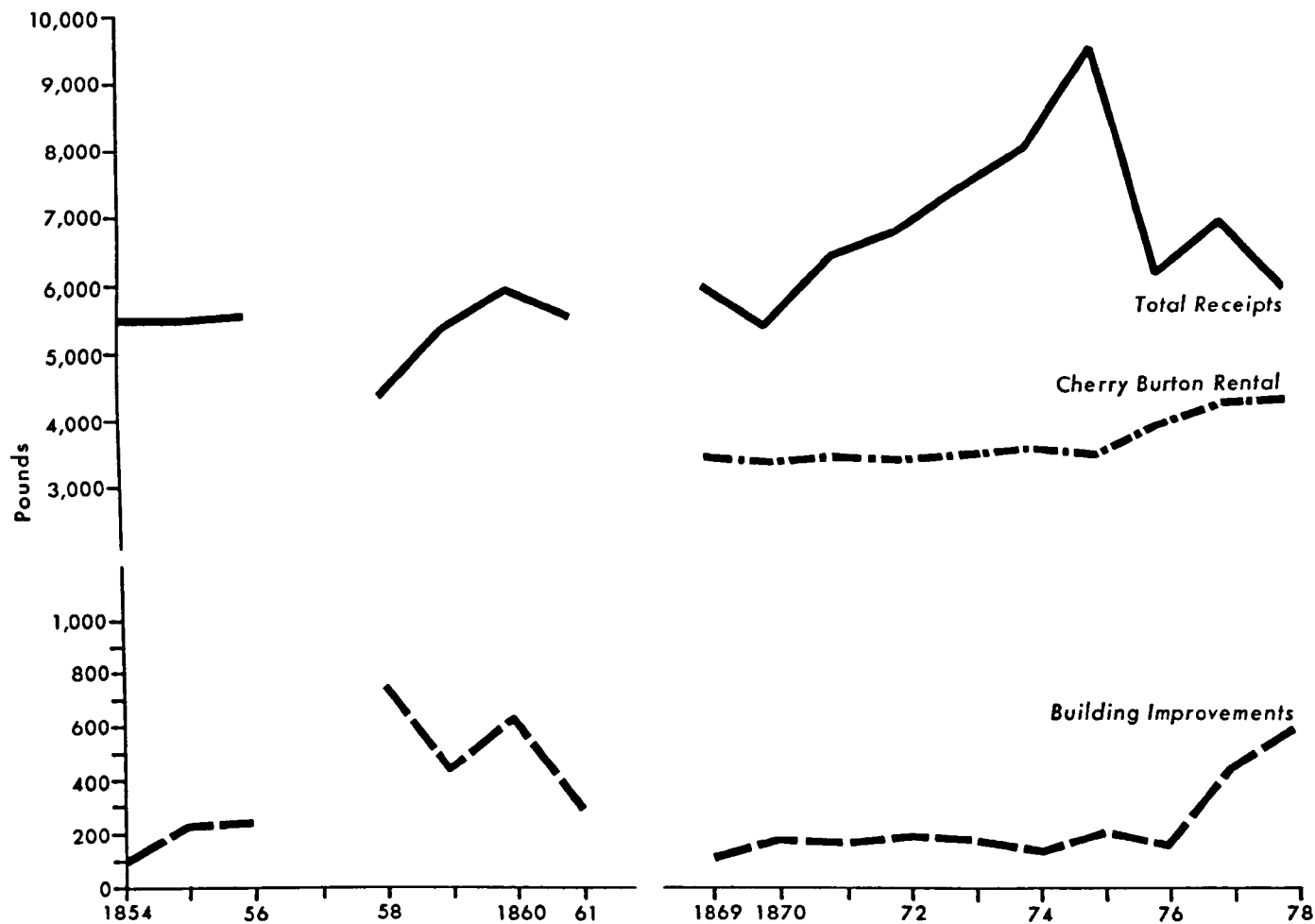
1. The cost of drainage tiles has been included sometimes in the building costs. The accounts were not always clear and these additional elements could not be excluded.

The closeness of the relationship between estate income and gross investment is shown up in studies of the Wenlock and Cherry Burton estates, and in the pattern of land investment in the second half of the nineteenth century. Estate expenditure at Escrick moved closely in line with estate rent receipts. This applied both to general estate expenditure, which included non-investment items, as well as to specific expenditure on buildings and repairs. Building expenditure peaked in 1859, one year after a major increase in estate receipts. More noticeable was the close relationship between estate receipts and investment in the first half of the 1860s. Investment lagged behind movements in estate income, again by one-year, up to 1864. The upturn in estate receipts in 1859-60 was associated with an upturn in expenditure on buildings and repairs in 1860-1; the slight fall in receipts in 1860-1 with a fall in investment in 1861-2; the sharp increase in receipts in 1861-2 with an even sharper increase in investment in 1862-3; and the levelling off in receipts in 1862-3 with a levelling off in investment in 1863-4. The trend after 1864 was different. Expenditure and investment both peaked in 1864, fell away together in 1864-5 and then recovered in 1865-6.

The data are incomplete on David Burton's total income (including estate and non-estate income) and investment in the Cherry Burton estate, but there appears to be no similarity between the two either in the middle and late 1850s or the 1870s. The manuscript evidence offers no explanation for this though it is possible that non-estate income was re-cycled back into urban businesses and government stock, and therefore was never part of estate resources in any real sense. This view is not supported by Denman's research into estate investment. He stressed the association between investment and the total resources of the landowner.¹ However,

1. See below, p.289.

Figure 10.4 Total Receipts, Annual Rents and Building Expenditure on the Cherry Burton Estate 1854-78.



Sources: Cherry Burton MSS, Estate Accounts 1854-61, E.R.R.O. DDCB/25/5; Accounts 1869-78, E.R.R.O. DDCB/25/6.

* Data for 1857 and 1862-8 are missing from Estate estate records.

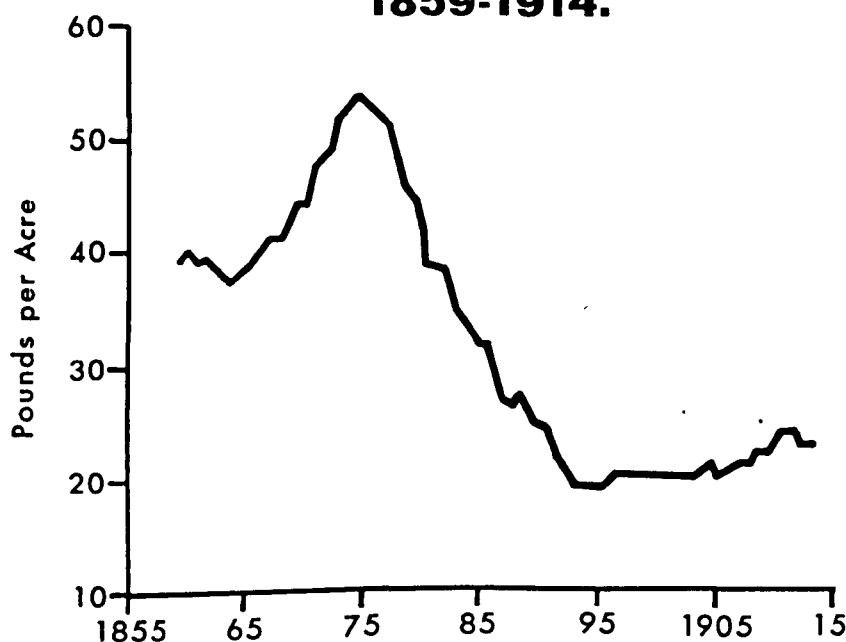
there was a well defined association between rent receipts and building investment over the 1870s. Total rentals were fairly stable between 1869 and 1875, as was expenditure on building improvements, but slight increases in rent were generally followed a year later by minor increases in building expenditure. The converse was also true. Similarly, there was a close association between these variables in the second half of the 1870s. A fairly marked increase in estate rentals after 1875, associated with estate expansion, was paralleled by a rapid increase in building expenditure after 1876.

The relationship between agricultural incomes and investment comes out strongly in national land investment. Land was bought and sold briskly when farming was prosperous, but the number of land transactions fell in years of depression. In these years the reserve price imposed by the seller, which was "based on a more or less conventional idea of the value of his estate", might not be reached and no sale would be made. Land was in greater demand in years when rents were rising and investors were optimistic, and land prices were usually forced above their reserve.¹ An idea of the changes in the level of land investment, and how it was tied to the prosperity of agriculture, is shown by movements in farm sale prices. Prices rose through most of the 1860s and early 1870s and peaked in 1875. They then fell continuously down to the mid-1890s.

The factors which influenced estate capital formation can be summarised as follows. First, an investment was undertaken when the present value of the discounted stream of its future earnings exceeded the price of the asset. Past levels of estate income were important in giving a rule of thumb guide to future trends and in determining the

1. F.M.L. Thompson, 'The Land Market in the Nineteenth Century', Oxford Economic Papers, 9 (1957), 292.

Figure 10.5 Farm Sale Prices in England and Wales, 1859-1914.



Source: P. J. Perry, *British Farming in the Great Depression 1870-1914* (1974), p 77.

resources available for investment. Estate investment throughout most of this period can be seen as part of a cyclical process in which new investment helped to push up rentals, which in turn provided the means for later investment. (The special case of investment in the early stages of depression is dealt with separately at the end of the chapter.)

Second, as agricultural output expanded owing to the application of newer and better methods of husbandry, landlords attempted to prevent the over-use of existing assets by extending or deepening their investments. They tried in other words to maintain their capital-output ratio. Third, government assistance helped landowners to improve their estates especially

in the area of drainage. Fourth, a knowledge of better farming techniques and practices was spreading among the rural community. The activities of men such as Dunnington-Jefferson in the East Riding and Alderman Mechi and the Prince Consort nationally, made new methods more acceptable and hastened their adoption. Fifth, landowners may have launched new programmes of investment because they wanted to be considered progressive. The concept of prestige investment can be turned easily into what David Spring has called investment for social leadership. He used this concept to explain investment in estate improvement even when landowners were not getting the 5 per cent return normally expected from business and government investments.¹ Sixth, estate managements had to order their investment priorities in such a way that they would maximise estate income. The price of different inputs had to be considered in relation to the price of the final output and expectations about future price movements. Finally, some landowners were unable to finance new investments. John Coleman mentioned that several landowners in the East Riding were over-burdened with debt and were largely incapable of investing in fold yards, dutch barns and better drainage even though they were highly profitable.² Strict settlement was the usual cause of indebtedness.³

It would be impossible on the historical evidence presented here to quantify the proportion of estates which were competent to form estate capital entirely from estate income. The analysis has suggested that many landowners financed improvements out of current income and that there was a strong correlation between movements in rent and movements in estate investment.

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1. D. Spring, The English Landed Estate in the Nineteenth Century: its Administration (1963), p.50.
 2. R.C. on the Depressed Condition of Agricultural Interests (1880), p.133.
 3. G.E. Mingay, 'The Large Estate in Eighteenth Century England', First International Conference of Economic History (1960), 372.

It has also shown that landowners increasingly sought to supplement investment income with funds from government, public investment companies, stocks and shares, the sale of estate produce, and the occasional sale of land, and that at least part of this went into estate capital formation.¹

6. Investment during periods of falling prices: a historiography.

This epilogue to the discussion of landlord investment is not offered as a qualification to the themes developed already. It is intended to demonstrate and explain the historical association between depression, particularly in its early stages, and rising estate investment.

Various historians have considered the relationship between falling prices and estate capital formation. G.E. Mingay found examples of "innovation and improvement" in the agricultural depression of the 1730s and 1740s. In particular, he noted that investment was at a higher level then, than in the prosperous years which followed.² A.H. John also argued this case claiming that a combination of falling wheat prices and stickiness in agricultural costs in the first half of the eighteenth century "forced adjustments in the practice of husbandry and the organisation of the land"

1. D.R. Denman has argued that estates in the decade after the Second World War were largely unable to finance estate capital formation out of rents. He suggested that no estate was capable of financing more than 50 per cent of estate capital formation from estate income alone; 51 per cent were able to finance up to that level and 49 per cent were wholly unable to finance estate improvements from internal sources. These figures cannot be applied in an arbitrary way to East Riding agriculture in the mid-nineteenth century because conditions were very different. Presumably more estates then were able to finance new investments from internal sources; estates for example were not encumbered by death duties. The importance of Denman's work in the present context is that it stresses the importance of rent and the income drawn from the sale of land, government stock and share equities in new capital formation. These were also important in the nineteenth century. Denman's estimate that stocks and shares and the sale of land and timber made up two-thirds of the funds used in estate investment is probably exaggerated for the nineteenth century. — Estate Capital (1957), pp.44-54.

2. G.E. Mingay, 'The Agricultural Depression, 1730-50', Econ. Hist. Rev. 2nd ser.VIII(1955), 30.

where it was possible. According to John, the years between 1730 and 1763 were the "culmination of the first stage in agricultural improvement".¹

There was also progress in the unsettled quarter century following the French and Napoleonic Wars. Lincolnshire farmers and landowners reasoned that only large injections of capital would reduce farming costs and bring about the adjustments required under conditions of lower prices. Grigg believed that this was the basis of Lincolnshire's progressiveness in the nineteenth century.² Lord Ernle argued that the collapse of prosperity between 1813 and 1837 "spurred the energies of both landlords and tenants, who could only hold their own by economising the cost and increasing the amount of production. Within limits, low prices and keen competition compelled improvement."³

Ernle had much the same to say about the depression at the beginning of the 1850s. The investment it generated was a significant element in preparing for the 'Golden Age'.⁴ Caird also noted the connection between low prices and the level of productive investment.

... it is rather to the stimulus of low prices that we must look to provide the increased quantity which is to make up, safely and satisfactorily to the producer for falling markets ... It may be added that the great agricultural improvements, which have taken place since the peace, and which are still in progress, while they negative the notion of an uninterrupted series of losses on the part of the cultivator, are in great degree, a consequence to the stimulus to exertion supplied by low prices.⁵

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1. A.H. John, 'The Course of Agricultural Change, 1660-1760', in L.S. Presnell, ed. Studies in the Industrial Revolution (1960), pp.145-7.
 2. D. Grigg, The Agricultural Revolution in South Lincolnshire (1966), p.128.
 3. Lord Ernle (R.E. Prothero), English Farming Past and Present (6th edn, 1961), p.352.
 4. Ibid. p.373.
 5. J. Caird, English Agriculture in 1850-51 (2nd edn, 1968), p.504.

This theme has been developed more recently by F.M.L. Thompson. He reasoned that the large additions to landlord capital made between 1850 and 1852 reflected the need for estate managements to attract farmers with substantial means. It also represented a move towards more liberal farming.¹ The general feeling that Repeal would cause prices to stabilise at a lower level, as has been stressed already, was an important stimulus behind large scale investments in estate improvement.

The upswing in estate capital formation between 1879 and 1881 was also aimed at raising efficiency. It assisted the tenant by reducing farming costs, assuming the investments were successful, and assisted the landlord by stabilising rents. Increased investment was a feature of both arable and livestock counties at this time; most went into drainage in an obvious attempt to cope with the abnormally wet conditions. Perren found a modest correlation ($R_s = -0.67$) between increased capital formation and a below average decline in rent and net estate income on eight estates in arable and livestock areas.² He also found a tendency for estate investment to fall off in the 1880s and argued that this indicated the success of the economic transformation carried through toward the end of the preceding decade and the first year or so of the 1880s.³ However, a more accurate explanation may be that landowners were unable to maintain a high level of investment for more than a few years.

Periods of depression gave powerful jolts to the farming system by temporarily raising the level of investment going into estate capital formation. The motive was to maintain income. This contrasted with

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1. F.M.L. Thompson, English Landed Society in the Nineteenth Century (1963), pp.239-40.
 2. R. Perren, 'The Landlord and Agricultural Transformation, 1870-1900', in P.J. Perry, ed. British Agriculture 1875-1914 (1973), pp.110-117.
 3. Ibid. p.115.

periods of prosperity when the motive for increased investment was to raise income above already comfortable levels. Several contemporaries noted this and it was used, particularly by liberals, to show that economic protection and prosperity brought wealth but not the determination for change. Their argument had some merit but was biased and ignored the progress achieved in the high price years at the end of the eighteenth century and the beginning of the nineteenth. The relationship between the early stages of agricultural depression and rising estate investment does not stand as an alternative to the 'prosperity thesis' outlined in this chapter, but it is an important relationship and should be acknowledged.

CHAPTER ELEVEN

THE TENANT FARMER IN EAST RIDING AGRICULTURE, 1850-80.

Various aspects of the farmers' business will be described in this chapter and an attempt will be made to show the relationship between the progress of scientific agriculture and the willingness of farmers to invest in farm improvement. Whereas landowners were responsible for providing the framework within which progressive agriculture could develop, farmers were responsible for its practical implementation. Three points are made in the following discussion. First, farm profits rose substantially for most of this period and the majority of farmers had adequate resources to invest in new techniques and to contribute to estate capital formation. Second, tenant right was extended to include tenant compensation for drainage, the use of artificials, and investments in marling and farm buildings. The increased security of tenant capital led to increased investment in farm improvements. Third, one-year tenancies were not an obstacle to farm improvement in the East Riding. Relations between landlord and tenant were good and tenancies lasted usually for a decade or more, again providing a sound basis for tenant investment.

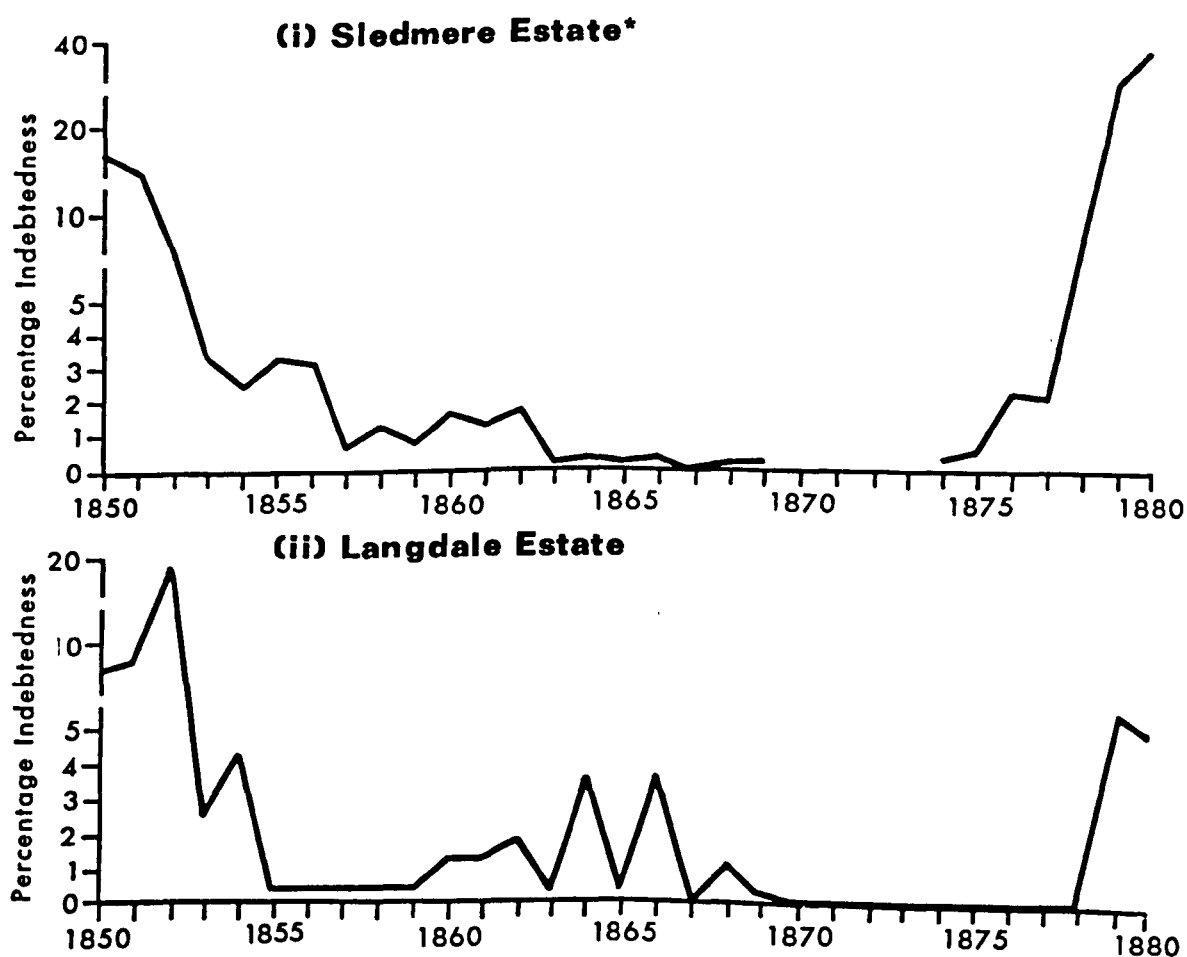
1. The profitability of farming, 1850-80.

It is difficult to generalise about farmers as an economic group just as it is about landowners. Farmers were, and still are, highly individualistic in their approach to farming,¹ the type of farming they were engaged in, and the size of farms they managed. The difficulty of generalising is increased by the virtual absence of farm accounts dealing

1. For profiles of farmers see A.G. Street, Farmer's Glory (1932) and M.K. Ashby, Joseph Ashby of Tysoe 1859-1919 (1961).

with the East Riding industry. Farmers were not recognised for their accounting. Some kept no written record of their transactions, though a few kept diaries or rough accounts of market prices, the state of crops, the weather, the sheep and cattle bought and sold, and the balance of profit and loss. However most of these records have been lost or have remained in the possession of individual farming families and are unavailable for study.

Figure 11.1 Tenant Indebtedness on the Sledmere and Langdale Estates, 1850-80, as a percentage of total rental.



Sources: Langdale Estate MSS, Rent Accounts, 1843-83, E.R.R.O. DDLA/34/5; Sledmere Estate MSS, Rent Accounts, 1850-80, E.R.R.O. DDSY/34/5-8.

* Gap in Sledmere data. 1870-3.

An impression of the profitability of farming in this thirty-year period has been built up from less ideal material. Estate data on tenant indebtedness are detailed for the Sledmere and Langdale estates, though they are very fragmentary for Lord Wenlock's estate and are missing from the records of other local estates.

Farming was depressed in the late 1840s and early 1850s and rent arrears on the Langdale estate came to one-quarter of the entire rental in 1849, despite a policy of rent remissions, 8.5 per cent in 1850, 9 per cent in 1851, and 19 per cent in 1852. Arrears then fell sharply in 1853 and were mostly insignificant over the next quarter-century. At Sledmere 15 per cent of the rental was unpaid in 1850 and 1851, 8 per cent in 1852, and 4 per cent in 1853.

The financial state of farmers at this time, and their recovery over the middle years of the 1850s, is suggested more precisely for Breaks Farm on the Everingham estate. The tenant, an able man later becoming Sir Maxwell-Constable's steward, lost nearly £500 in 1851 and similar amounts may also have been lost in 1850 and 1852, but the record is incomplete and does not show them. The suggestion that further losses were incurred is supported by the fact that the tenant had to obtain a loan for £1,000 some time after 1852 to help him meet the farm's fixed commitments.

Table 11.1. Receipts and outpayments at Break's farm, Everingham,
1851-57. (to the nearest £)

<u>Year</u>	<u>Receipts</u>	<u>Outpayments</u>	<u>Profit</u>
1851	413	910	-497
1854	1,541	1,091	450
1855	2,062	1,373	689
1856	1,641	1,569	72
1857	1,624	1,485	139

Source: Everingham Estate MSS, E.R.R.O. DDEV/56/331-5.

Similar difficulties were faced by Francis Waide. Waide may well have been "ahead of his time in commercial outlook"¹ but this did not prevent him from loosing over £200 in 1849 before the full force of the depression had even been felt.²

A combination of rising prices, expanding markets and sizable injections of new capital over the 1850s and 1860s underpinned recovery at Breaks farm in the mid-1850s and also on farms throughout the county. Indebtedness fell away to less than 0.5 per cent of the total rental at Houghton between 1855 and 1859; it then rose slightly in the early 1860s and came to 3.6 per cent of the rent bill in 1864 and 1866, the latter perhaps as a consequence of the cattle plague. Rents were fully paid in 1867 and in the years between 1870 and 1878. Recovery from the Post Repeal depression was as strong at Sledmere though about 3 per cent of rents went unpaid between 1853 and 1856. Indebtedness was around 1-2 per cent of the total rental between 1858 and 1862 and 0.05 per cent or less in the middle and late 1860s. It was presumably about this level in the early 1870s but the manuscript evidence is missing; it was 0.13 per cent in 1874 and 0.55 per cent the following year, after which indebtedness began to rise more strongly.³

The "wind was set fair for arable England"⁴ and especially for mixed farmers, graziers and dairymen. The Hull Advertiser commented that East Riding agriculture recovered from the spring of 1853 and that thereafter "The condition of the Agriculturalist [was] one of unexampled

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1. W. Harwood Long, 'Farmer Waide's Diary', loc. cit. p. v.
 2. Waide's cash receipts amounted to £493 and his outpayments to £703.—Waide MSS, Diaries 1849-61, S.R.O. Acc. 1152.
 3. An almost identical pattern of tenant indebtedness was charted on the Ancaster, Welby and Thorold estates in Lincolnshire.—D. Grigg, 'A Note on Agricultural Rent and Expenditure in Nineteenth Century England', Agric. Hist. 39 (1965), 150.
 4. E.L. Jones, 'The Changing Basis of English Agricultural Prosperity 1853-73', loc. cit. p.103.

prosperity [every change adding] to the value of land in a high state of cultivation".¹ It was even reported two years later that a confident tenantry on Sir Clifford-Constable's estate requested that their rents be increased by 5 per cent.² The financial context for this improbable event was steadily rising farming profits at least equal to the tenant's annual rent.³

The buoyant state of tenant farming is also suggested by the absence of serious discussion on farm profits at meetings of local agricultural societies. Until the end of the 1870s farmers would grumble about their crops and the occasional outbreak of sheep rot and were genuinely alarmed by the rapid spread of rinderpest in the mid-1860s, but these problems did not focus their attention for long periods or interrupt seriously the succession of good seasons. Indeed, minor interruptions were inevitable over a lengthy period which has never claimed to be uniformly 'golden'. The issues which claimed the attention of local farmers were practical ones like mechanisation and farm improvement, the over-keeping of ground game by some landowners,⁴ the burdens of local taxation which they believed pressed "unfairly and injuriously upon the agricultural interest",⁵ child labour on farms,⁶ and the reform of statute hirings.⁷ The confidence and security of farmers⁸ was based simply on the fact that they were making money, despite rising rentals, and had been for nearly a generation.

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1. Hull Advertiser, May 13, 1853.
 2. Ibid. November 10, 1855.
 3. G.E. and K.R. Fussell, The English Countryman: His Life and Work A.D. 1500-1900 (1955), p.141
 4. Hull and Eastern Counties Herald, January 6, 1870.
 5. Ibid. January 12, 1871; February 9, 1871; May 11, 1871.
 6. Ibid. March 12, 1868; March 19, 1868; June 12, 1873.
 7. Ibid. October 1, 1874; October 8, 1874.
 8. R.E. Prothero (Lord Ernle), op. cit. p.378.

There is insufficient evidence to suggest the amount by which farm incomes rose in the East Riding but national sources confirm that it was substantial. Bellerby estimated that farmers' incentive income, defined by him as the "return for initiative, effort, management, decision and risk", rose from £21.4 millions in 1851 to £43.9 millions in 1870-3. Farmers' incentive income per man-week rose from £0.514 to £1.038, and, relative to incentive incomes in industrial occupations, rose from 49.5 per cent to 77.3 per cent, again over the same period.¹ The effective doubling of incentive incomes over the 1850s and 1860s reflected the major gains made by livestock producers, dairymen and vegetable growers.² Grain specialists in the East Riding would have benefited less, but the incomes of mixed farmers and market gardeners, like those around Cottingham, may have doubled in some instances.

Farm incomes fell after the early 1870s. Averaging £37.9 millions between 1874 and 1878, the incentive income of the national farming community slumped to £23.7 millions between 1879 and 1883, and incentive income per man-week fell to £0.49, slightly below the 1851 level.³ Tenant indebtedness rose. Rent arrears on the Langdale estate climbed from nothing in 1878 to 6 per cent of the total rental in 1879 and 5 per cent the following year.⁴ On the Wheldrake estate of Lord Wenlock, 13 per cent of rents went unpaid in 1879 compared with 5 per cent in 1878 and 3.6 per cent in 1877.⁵ Indebtedness was more serious on the Sledmere estate and on the Wolds generally, the price of wool having fallen dramatically. Twenty-nine per cent of the Sledmere rental was unpaid in 1879 and 36.3 per cent in 1880.

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1. J.R. Bellerby, 'National and Agricultural Income 1851', Econ. Journ. LXIX (1959), 103.
 2. J.D. Chambers and G.E. Mingay, *op. cit.* p.182.
 3. J.R. Bellerby, 'National and Agricultural Income 1851', *loc. cit.* p.103.
 4. See Figure 11.1.
 5. Wenlock Estate MSS, Wheldrake rent accounts, E.R.R.O. DDFA/41/19.

The precarious state of farm finance on the Wolds is described in the correspondence of William Hudson of Brigham, a tenant of Sir Tatton Sykes. He wrote the following to the estate management in October, 1880:

I am glad Sir Tatton has consented to reduce the Rent - otherwise we should have left - as my brother, who is the principal farmer, was determined not to go on loosing money after this fashion any longer - with all his painstaking, he finds that during the last few years - he is about £1,000 out of pocket.¹

During 1879 agricultural societies turned their attention to the depression. F. Johnson, a tenant farmer from Bishop Burton, near Beverley, proposed to the East Riding Chamber of Agriculture that landlord-tenant relations in the county could be improved by landowners protecting less ground game and reducing farm rents by 10s. per acre. He claimed that these measures, if adopted, would create better feelings between landlords and tenants, and that labourers would also benefit "for all must swim in the same boat".² The majority of farmers and landowners in the Chamber clamoured, as they did in farmers' clubs and agricultural societies throughout the country, for the setting up of a Royal Commission to investigate the agricultural industry. Their lobbying was successful and the East Riding Chamber of Agriculture was one of many rural societies to send a vote of thanks to 'Squire' Chaplin in August 1879 for the able manner in which he had moved for the Royal Commission and brought the problems of agriculture before the attention of Parliament.³ The Chamber then busied itself in devising ways to collect evidence to lay before the Assistant Commissioner appointed under the Royal Commission.⁴

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1. Sledmere Estate MSS, Letter to estate agent, Mr. Archer, dated October 6, 1880, E.R.R.O. DDSY/101/83.
 2. Driffield Times, March 8, 1879. The strain on Landlord-tenant relations was inevitable at the close of the 1870s, but it is argued later in this chapter that relations remained generally good.
 3. *Ibid.* August 9, 1879.
 4. *Ibid.* October 25, 1879.

The fortunes of farmers, especially arable and sheep farmers, had turned full circle by the end of the 1870s and had returned to the leanness and uncertainty of a generation earlier. Their style of living, which in numerous cases had come to resemble that of the small gentry, had to be scaled down. But depression did not result in widespread bankruptcy among the county's farmers, though the ranks of bankrupt farmers increased. The failure rate in the East Riding was between 0.12 and 0.15 per cent of the farming population of 1871 between 1871 and 1873, it rose to between 0.4 and 0.49 per cent of the farm population of 1881 between 1881 and 1883, and then fell to a very low level in the 1890s.¹ It seems that farmers who had gone through the good years had amassed sufficient capital to cope under the most testing conditions of the last quarter of the century, and that most bankruptcies were among those who had gone into farming in the late 1860s and early 1870s, attracted by easy profits, and who had insufficient capital and possibly skill to adapt to the harder going.

2. Farmers and agricultural improvement in the East Riding.

The main contribution of farmers to agricultural improvement was their attention to new and improved seeds and their willingness to buy artificial feedstuffs, manures, new machinery, and equipment. Their involvement extended occasionally to the improvement of livestock but this was expensive and beyond the means of all but the wealthiest and scientifically inclined farmers. It also extended to estate capital formation, a function normally associated with the landowner alone. A tiny group of farmers, estimated by the Hull Advertiser at less than one in 500 in the 1850s,² showed an interest in agricultural chemistry, and

1. P.J. Perry, British Farming in the Great Depression 1870-1914 (1974), pp.26-9.

2. Hull Advertiser, October 11, 1850.

their experiments with guano and nitrate of soda were reported from the early 1840s in journals like the Transactions of the Yorkshire Agricultural Society.¹

The involvement of farmers in agricultural improvement turned on three factors: the resources they commanded, their skill, and their willingness to invest. This latter involved tenant right, one-year tenancies and the landlord-tenant nexus and is the central theme of the chapter.

Some indication has been given of the resources available to farmers over the third quarter of the nineteenth century and it is certain that the average farmer had adequate resources to finance improved farming operations, assuming he did not over reach himself and farm too large an acreage. Farming skill determined how efficiently these resources were used but not all contemporary observers believed that skills were highly developed. Someone as highly placed as the Superintendent of the National Farm came to the conclusion that there were "fewer good tradesmen among Agriculturalists, according to the relative number employed, than to any other occupation whatever", and attributed this to the absence of formal apprenticeships in farming and to the lack of skill in small farmers.²

These comments applied more to the south and south west of the country than to the East Riding, parts of Holderness and the Vale of York excepted. Enough has been said about the East Riding farmers' involvement in drainage and mechanisation, and about the thoroughness with which local landowners chose their tenants, to dismiss the suggestion that farmers were poor "tradesmen". However, a more general and quite forceful

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1. M. Milburn, 'Experiments with Guano', Trans. Y.A.S. VI (1844), 71; 'The Best Time and Mode of Application of Guano and other Hand Tillages to Green and Cereal Crops', Trans. Y.A.S. XV (1853), 51-5.
 2. Hull Advertiser, October 11, 1850.

criticism of farmers, both in the East Riding and in other counties, was their underlying conservatism. A.G. Street probably overstated the case when he wrote:

One didn't farm for cash profits, but did one's duty by the land. This was one of the chief reasons for the inherent conservatism and mistrust of new things so prevalent at that date /the late nineteenth and early twentieth centuries/ among the agricultural fraternity, both masters and men. If any new methods were tried, one didn't look for its advantages, one ignored them, but one missed no opportunity to point out its defects.¹

As pointed out in earlier discussion, this simplistic view of farmers was already out of date in some areas by the 1840s and 1850s, a consequence of greater attention to science and professional management, but it remained true of most and delayed the introduction of new techniques and equipment. The slow innovation of the harvest reaper on the lowlands of East Yorkshire is a case in point.

A more specific criticism of farming skills in the county was the scant attention given by large farmers to matters of farm economy. Their attitude was that economy was suitable for small farmers but was petty and inconsequential for themselves.² It was common to waste upwards of 200-300 acres of straw on an average Wolds farm in the 1840s instead of making it into good manure,³ and money was therefore wasted purchasing manure which could otherwise have been made on the farm. There was also the possibility of farming badly if farm manure was neglected and other tillage was not purchased, but the potential loss this represented had diminished considerably by the beginning of the 1860s as farmers became

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1. A.G. Street, Farmer's Glory (1932), pp.32-3.
 2. F. Hannan, 'The Economy of Waste Manures', Trans. Y.A.S. V (1843), 44.
 3. W. Throp, 'Report of the Committee on Agricultural Geology', loc. cit. p.94.

more aware of the value of manure (this was associated on the Wolds with the slow growth of herds), and as artificial manures came into more general use.¹

Even assuming adequate resources and advancing skills, the willingness of farmers to invest in farm improvement was ultimately a function of the security of their capital. Farmers were generally uninhibited about laying out their own capital on improvements if they had confidence in fair treatment from landlords. For example, tenants on the Wolds often absorbed the total cost of oil cake in the early 1850s, which was equal to an average farm's annual rent, even though most covenants gave no formal guarantee of compensation. The amount of oil cake used in this district doubled in the decade after 1850 and according to William Wright had possibly "brought about the greatest improvement" in its agriculture.²

The confidence to invest in farm improvement extended to estate capital formation and was a feature of both Wold and lowland farmers. James Johnson of Brigham, on the Sledmere estate, constructed several farm buildings and drained many fields using his own capital, and even proposed building a new farm house in September, 1876.³ William Grandon, another of Sir Tatton Syke's tenants, had a similar policy which he explained to the estate agent, Mr. Archer.

I have always managed the farm as if it were my own with the full hope and confidence of being allowed - at some time - to reap the benefit of my outlay. All the farm has made has been spent on it to bring it into its present state ...⁴

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1. W. Wright, op. cit. p.103; R.C. on the Depressed Condition of the Agricultural Interests (1880), p.143.
 2. W. Wright, op. cit. pp.102-3.
 3. Sledmere Estate MSS, letter to Archer, September 25, 1876, E.R.R.O. DDSY/101/82.
 4. Ibid. letter to Archer, September 30, 1876.

Unfortunately for the tenants on this estate, the accord with management broke down in the last years of the 1870s; investment was cut back and large numbers of tenants gave notice to quit. Confidence in management continued on other estates during the depression and tenant involvement in agrarian improvement held, though at a reduced level.

Tenant farmers in the Vale of York and Holderness were active land drainers, though not all had security for their investments as defined in a 'modern' tenancy agreement. John Coleman referred to a 1,300 acre farm in Holderness drained entirely by the tenant, and to a 750 acre farm at Haverfield, near Patrington, where the land had been drained, the farm house rebuilt and land reclaimed from the north shore of the Humber, entirely at the tenant's expense and without a written guarantee of compensation. These were not isolated examples, for "... on the old estates the confidence in fair treatment was so general that tenants often laid out their money on landlords' work without security."¹ This occurred on such a scale that it was criticised strongly by Coleman in his report to the Richmond Commission.

The only conclusion to be drawn is that farmers who are content to lay out their capital on such items, are wanting in that caution and prudence which characterises good businessmen. Every now and then there is a rude awakening from a fool's paradise.²

In spite of this, tenants' trust in their landlords seems to have been well founded in most cases, as is shown by the continued willingness of many farmers to contribute to estate capital formation and to undertake expensive operations like liming and the feeding of stock on artificials. Coleman's assessment was correct only for a small minority of farmers,

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1. R.C. on the Depressed Condition of Agricultural Interests (1880), pp.130-2.
 2. Ibid. p.140.

though the national campaign for tenant right does indicate a growing uneasiness about the size of the tenants' commitment to farm improvement, which had risen significantly over the 1840s and 1850s often without formal compensation for unexhausted improvements.

The strength of the landlord-tenant nexus can be attributed to the length of the average tenancy and the frequency with which tenancies were passed down within families, often over several generations.¹ It seems certain that long standing confidence in landlords was the basis of much of the tenantry's investment in East Riding farming, and this did not change in any major way during the depression at the end of the 1870s though it did encourage a sense of economy and a determination for additional security.

The matter of tenant security introduces the complex question of tenant right and its role in stimulating tenant involvement in progressive farming. The growth of tenant right in the East Riding certainly encouraged more farmers to use the methods of high farming and in some cases to invest more freely in farm buildings and drainage, a job normally associated with the landlord. James Caird thought that a modern tenant right² "had the advantage of encouraging tenants to embark their capital freely", and considered this especially important in counties like the East Riding and Lincolnshire where long leases were unfashionable and the problems of tenant security were correspondingly greater.³ The Hull Advertiser took up this point in the 1850s. It argued that a tenant right "adjusted on an equitable basis" would give Yorkshire farmers a greater measure of financial security, help raise farming productivity and

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1. The length of tenancies is discussed later in this chapter. See below, pp. 324-30.
 2. This is defined on p. 307.
 3. J. Caird, English Farming in 1850-1 (2nd edn, 1968), p.194.

provide a better solution to the problems of the agricultural industry than a return to protection.¹ This view has been accepted by David Grigg who traced the "rapid transformation of Lincolnshire farming between 1815 and 1850" to the broadening of tenant right.² The view was also accepted by Joan Thirsk in connection with the development of the Lincolnshire Wolds over the second quarter of the nineteenth century. She mentioned three factors which encouraged tenant investment in improved farming methods. The first was low rentals relative to the lowland districts which gave upland farmers a bigger return on their investments; the second was the larger size of farms which allowed farmers more flexibility in their choice of methods; and the third was tenant right.³ Thirsk claimed that tenant right "struck a fair balance between the claims of the two parties /i.e. the ingoing and outgoing tenants/. It did not burden the incoming tenant with a heavy debt, nor did it deal unjustly with the outgoing tenant ...".⁴ On the contrary, it provided a sound basis for tenant investment.

It seems inevitable that the growth of tenant right in the East Riding, especially in the 1850s when it was very rapid, should have encouraged tenant investment just as it had in Lincolnshire. But one can question the view that

Because tenant right involved improvements requiring considerable capital, as well as a grasp of modern methods of cultivation and management, security for the farmer's financial investment in his acreage became the uncontested prerequisite for realising those scientific and commercial innovations defined as high farming.⁵

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1. Hull Advertiser, August 16, 1852.
 2. D. Grigg, The Agricultural Revolution in South Lincolnshire (1966) p.135. Caird also argued this in the case of Lincolnshire.- English Agriculture in 1850-51 (2nd edn, 1968), p.185.
 3. J. Thirsk, English Peasant Farming (1957), pp.263-7.
 4. Ibid. p.267.
 5. J.R. McQuiston, 'Tenant Right: Farmer Against Landlord in Victorian England, 1847-1883', Agric. Hist. 47 (1973), 96.

Broadening the scope of tenant right raised the security of the tenant's capital and gave progressive landowners an opportunity to use revised covenants to educate farmers in the use of new feedstuffs, manures and rotations. Tenant right therefore assisted in raising the quality and quantity of farm investment but it was in no sense a prerequisite for more effective and more scientific farming, as the progressive forces encouraging this had been active in several districts of the East Riding from the early nineteenth century.

3. The national movement for tenant right.

Tenant right was defined by the Select Committee on Agricultural Customs as "conferring a claim to remuneration on an outgoing tenant, for various operations of husbandry, the ordinary return of which he [was] precluded from receiving by the termination of his tenancy".¹ Compensation was given traditionally for crops sown by the outgoing tenant but reaped by the ingoing. A separate right was also given, depending on local custom, for soils prepared for sowing by the outgoing tenant, and for any hay, straw or manure made by the outgoing tenant but left for the new tenant. Lincolnshire was the first English county to extend the ancient principle of tenant right to meet the needs of modern farming, and the 'Lincolnshire Custom', as it became known, broadened the scope of compensation to include practices like the use of artificial feedstuffs, manures like guano and phosphates, the application of marl, chalk and lime; and investments in land drainage, buildings, and sometimes miscellaneous items like ponds.

A vigorous debate was taking place by the 1840s on the desirability of broadening tenant right and giving compensation for unexhausted

1. S.C. on Agricultural Customs (1848), p.iii.

improvements the force of law. Some saw a close association between agrarian improvement, capital investment and legal security, while others acknowledged the association between the first two variables but questioned the usefulness of the third. They argued instead that long leases and one-year tenancies, backed by an understanding between the landlord and tenant, gave adequate security, and considered that government involvement would be harmful and would undermine the landlord-tenant relationship.

The campaign for tenant right opened with Philip Pusey's attempt in 1847 to win Parliament's approval for his Agricultural Tenant Right Bill; but the attempt failed even though it had well-placed support. The Select Committee on Agricultural Customs reported in the following year that it would be beneficial to compensate outgoing tenants for unexhausted improvements and that legislation was necessary to bring it about. Legislation would "give a useful guide line to some [i.e. landlords]" and perhaps coerce the minority of ignorant or unthinking men who exploited their tenants". The Committee argued that legislation should be permissive rather than compulsory.¹

The compromise struck after the first round of debate was the Tenant Right Act of 1851. It was a diluted version of Pusey's original bill and was stripped of such important clauses as those relating to compensation for chalking and marling. The Bill was 'defeated' by landlord opposition. They argued that legislation, especially if it involved compulsion, gave tenants greater freedom while it limited their own. They also opposed the principle of greater government interference in

1. S.C. on Agricultural Customs (1848), quoted in J.R. Fisher, 'Public Opinion and Agriculture, 1875-1900' (unpublished Ph.D. thesis, Hull University, 1972), p.159.

agriculture. Several experts criticised the Act in its revised form. Caird, for example, conceded that security was essential if tenant investment was to be maintained or increased, but he thought long leases would provide that security and legislation was unnecessary.¹

There was little obvious interest in standardising the legal basis of tenant right in the following two decades. This may have been due to the death of Pusey in July, 1855,² as he was easily the most energetic and best known spokesman the movement had. It probably owed most to the economic prosperity of the period. Farm incomes grew and farmers were generally less anxious about the investments they made and the security which landlords offered in return,³ though this needs to be qualified by mentioning that the national revival of the tenant right movement occurred in 1873, when the continuation of farming prosperity still seemed assured. A ground swell of dissatisfaction with customary arrangements for tenant compensation must have been growing in the intervening period but it was not prominent and was not to become an important issue until the mid-1870s and more especially the late 1870s and early 1880s.

The developments of the mid-1870s were largely exploratory though legislation followed. The Central Chamber of Agriculture set up a committee in 1873 to determine the extent and type of tenant right in the United Kingdom, and reported that the most advanced systems operated

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1. East Riding landowners were opposed to the principle of long leases. They thought that it would involve the surrender of economic control over their tenants for long periods.
 2. P.E. Coletta, 'Philip Pusey, English Country Squire', Agric. Hist. 18 (1944), 83, 91.
 3. The development of tenant right in Lincolnshire is instructive here. A modern tenant right was developed sometime after the mid-1820s and broadened over the following quarter century. It had the advantages of securing tenants' capital in a period of squeezed profits and avoided the incumbrances of long leases in a county which farmed under a system of yearly tenancies.— J. Thirsk, *op. cit.* pp.263-7. There is a strong correlation between major movements for tenant right and depressed conditions on the land.

in Lincolnshire, the West Riding of Yorkshire and Staffordshire.¹ The Agricultural Holding (England) Act was on the Statute Book two years after the commencement of the enquiry but it proved to be ineffective, allowing "everybody to do exactly what he could do at present without it, and compelled nobody to do anything which he had not hitherto done or did not wish to do".² Many landowners contracted out of the Act but it was not a complete failure. Some landowners revised covenants to incorporate part of its provisions, and skilful tenants were able to use the Act as a lever to improve the scale and scope of compensation, though success depended on the pliability of individual landlords.

The Agricultural Holding Act, 1883, was the first effective legislation on tenant compensation and covered all agreements for agricultural tenancies of one year's duration or more. It laid down that the minimum notice to quit should be one year and that it should be possible for a tenant, on giving up a tenancy, to receive compensation for all the unexhausted improvements he had undertaken. It also confirmed that landowners should receive compensation where damage had been caused through a tenant's neglect or inability.³ Taking the second of these provisions, the procedure laid down for tenant compensation took two forms. Tenants could be compensated for investments in liming, artificial feedstuffs, fertilisers, and seeds for temporary pastures, without having gone through the intermediary stage of obtaining their landlord's approval for the type and scale of investments made. These and similar activities on the part of tenant farmers were considered to be a normal part of progressive husbandry not requiring the sanction of management. On the other hand,

1. J.R. McQuiston, op. cit. p.107.

2. C.S. Orwin and E.H. Whetham, op. cit. p.172.

3. A.S. Watson, 'Landownership, Farm Tenancy and Farm Labour in Britain', Agric. Hist. 17 (1943), 76.

tenants could be compensated for long term investments in drainage, farm buildings and permanent pasture only if the operations had been approved by the estate management and had been carried out according to its instructions. The value of unexhausted improvements was to be determined jointly by the landlord and tenant.¹ The main principles of the 'Lincolnshire custom' had therefore been given the force of law and introduced on a national basis.

The swiftness with which legislation followed the campaign for tenant right in the 1870s contrasted with the results of the earlier campaign. Several factors help to explain it but probably the most important is that farmers were represented more heavily in Parliament than a generation earlier and were better able to safeguard their economic interests. Farming was certainly more capitalised and farmers were more firmly resolved to secure their own capital, the financial squeeze of the late 1870s and 1880s encouraging both an appreciation for economy and a need for security.

The debate on tenant right has broadened recently along the lines of social conflict. McQuiston has argued that the technology of modern farming "slowly but inevitably undermined the traditional understanding between the landlord and farmer ...", and that by the 1880s had left a "deep-seated schism" corroding the "customary bonds of deference and responsibility that had once united all who acknowledged the primacy of the land". State intervention, according to this argument, was necessary to protect farmers whose interests no longer harmonized with those of the landlord.² Developments throughout the nineteenth century had placed greater emphasis

1. Ibid.

2. J.R. McQuiston, 'Tenant Right: Farmer Against Landlord in Victorian England, 1847-1883', loc. cit. pp.95-6.

on the innovative capacity of the tenantry, which in turn had led to a greater capital commitment and a greater need for security. But it is doubtful whether this led to a breakdown in landlord-tenant relations except perhaps in the odd instance. Perry saw no indication of it in the last quarter of the century¹ and there is no proof of it occurring in the East Riding. There was some grumbling in local agricultural clubs and societies about rents being too high, and there was perennial hostility among farmers to the over protection of ground game, but there was no real conflict between estate managements and tenants except at Sledmere, and normalcy was restored quickly even there.

4. Tenant right in the East Riding, c.1850.

Tenant right was discussed keenly in East Yorkshire just as in other parts of the country. Most commentators accepted that a more comprehensive tenant right would encourage increased farm investment but there was no general agreement on the merits of government action to standardise tenant right or to give it a legal basis. The feelings generated over these issues come out strongly in the evidence taken before the Select Committee on Agricultural Customs.

George Legard and Edward Page, both from the East Riding, were among those called before the Committee. Legard as previously mentioned was a Wolds farmer, a man of capital, an enthusiast for agricultural chemistry, and a leading personality in the county's agricultural clubs and societies. Page was a land surveyor and estate agent in the Beverley area and had surveyed roughly half the agricultural land in the county during his career.² These two authorities between them had a detailed

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1. P.J. Perry, British Farming in the Great Depression 1870-1914 (1974), p.69.
 2. S.C. on Agricultural Customs (1848), Q.2551.

knowledge of farming conditions in the upland and lowland districts, though it did not lead to a common view on tenant right. Their differences reflect the national debate in microcosm.

Legard was a conservative in matters of customary law. He conceded that the extension of tenant right might be potentially useful in certain cases: he was "quite willing to go so far as that".¹ He thought that it would be useful on the Wolds in connection with oil cake and would encourage its greater use, but he doubted the value of extending tenant right in the lowland districts arguing that the majority of farmers there were unable to afford cake and would be incapable of responding to a revision in the system of compensation.²

Legard showed little interest in applying the principles of tenant right to land drainage as he found the old practice of an away-going crop satisfactory both to the outgoing and ingoing tenants. This was the majority view among the county's tenantry at this time.³ A wider system of compensation embracing at the very least a 'right' for bones and marl, was considered unnecessary because the departing tenant could take an away-going crop from those fields manured, or otherwise prepared for cultivation, in the new way. Compensation was in the higher cereal yields and the more valuable away-going crop. It was argued that this held even in the extreme circumstances of a tenancy being terminated by sudden death.

1. Ibid. Q.7679.

2. Ibid. QQ.7652-60.

3. Ibid. Q.7668. Wold farmers in particular were among the most conservative in the county on the issue of land law, though paradoxically it was in their area that a modern tenant right had made its greatest inroads by 1850. The large capital means of the more substantial farmers, together with their confidence in landlords and the quality of the agricultural system, made them suspicious of major revisions in the landlord-tenant agreement. This feeling was possibly paralleled in the business world by the reluctance of most large and well established firms to accept limited liability in the 1850s. Confidence in a well tried, though potentially risky system, was hard to shake.

The away-going crop would then belong to the tenant's widow or to his executors, and would repay the initial investment with interest assuming a reasonable yield per acre.¹ The faith in the general usefulness of the away-going crop was based on the belief that most land improvements offered an immediate and full return to the farmer. It therefore denied by implication that the beneficial effects of manures like crushed bones, chalk and marl extended over several years, that tenancies might be terminated before such improvements had been exhausted, and that the outgoing tenant might be compensated inadequately as a result.

The 'status quo' view, as this argument might be called, was extended to include items of fixed investment. Farm buildings are a case in point. The normal practice in construction work was for the landlord to supply materials and the tenant to supply labour. Where this was done it was thought that the outgoing tenant should not be entitled to compensation as buildings, chiefly sheds for the housing of livestock, gave an immediate and full return if used efficiently. Additional compensation was unnecessary.

A minority spoke out for change. Edward Page argued that a more secure and comprehensive tenant right would produce better farming.

I have no doubt that the present custom that prevails in the East Riding was an admirable custom at one time, but since the improvements made by the introduction of bones and the use of chalk, I think the custom wants extending, and compensation making, in order to induce people to take advantage of improving their lands ... by those means.²

Page attributed part of the blame for the relatively small number of improvements in land drainage, chalking and marling in lowland districts

1. Ibid. QQ.7674-5.

2. S.C. on Agricultural Customs (1848), Q.2691.

to restrictive and old fashioned tenancy agreements.¹ This was only a half truth but he understood that more adequate compensation for the outgoing tenant "would be a great encouragement to the farmer to do what he did not do at the present, namely to improve his land; indeed most of the farmers who have capital would lay it out, if they had a reasonable prospect of compensation".² What can be described loosely as the 'extension argument' saw a useful tenant right in terms of graduated compensation for drainage, chalking, marling, fencing, and unexhausted manures.

The case of chalking clashed head-on with the 'status quo' view developed before the Select Committee. Page maintained that chalking had made little headway on the Wolds because it was not covered by any specific tenant right. The result was a high incidence of 'finger and toe' disease among turnips, thinness, inferior quality and late ripening in the corn crop, and an abundant harvest of weeds.³ The Select Committee on Agricultural Customs shared this view, thereby rejecting part of Legard's evidence, and pointed out that agricultural deficiencies of this type were less prevalent on the Lincolnshire Wolds where there was a tenant right for chalking.⁴ A restricted tenant right, so the argument ran, slowed down the rate of agricultural progress.

There was almost no common ground between the supporters and opponents of parliamentary intervention to standardise tenant right. Evidence is again taken from the Select Committee's report. Legard, along with the majority of landowners and tenant farmers in the county, believed

1. Ibid. Q.2640.

2. Ibid. QQ.2633, 2591.

3. Ibid. Q.2567.

4. Ibid. Q.232.

that parliamentary involvement was unnecessary because the East Riding was farmed progressively under existing arrangements and legislation would complicate, and possibly undermine, the understanding between landlords and tenants. Legard was very explicit about this.

I cannot but think that if it [i.e. tenant right] was made compulsory, the rack rent system would be introduced, and that farms would then possibly be let to the highest bidder, instead of being now let at a modest rent, the tenant carrying out such improvements from time to time as are requisite.

He did not have the same objection to permissive legislation but he remained critical of it.¹

Edward Page believed that compulsory legislation alone would give farmers the confidence needed to boost investment in new buildings, drainage projects, artificial manures, and feedstuffs.

If a man has spent his £2,000 or £3,000 in improving the land, and has not the opportunity of getting it back again, I think there should be a law to compel the next tenant or landlord to make compensation in fairness to the outgoing tenant.²

Page's views were unrepresentative of opinion generally at this time. The large majority of tenant farmers did not feel disadvantaged by the away-going crop system, and Legard's argument on the inappropriateness of compulsory legislation reflected public feeling. The strength of what has been called that 'status quo' view of tenant right owed a great deal to the limited impact of scientific farming in 1850, though this cannot be stressed too strongly in view of the rapid technical developments on the Wolds and in districts like south Holderness.

1. Ibid. Q.7643.

2. Ibid. Q.2638.

Customary law in the East Riding offered tenant farmers the following privileges and rights to compensation. Farms were let on a yearly basis and tenancies changed on Lady Day, as in other parts of eastern England,¹ so enabling new tenants to start spring sowing without delay. New tenants had a right of pre-entry after January 1st. in the final year of tenancy which meant that winter ploughing, the leading and spreading of manure, and the preparation of fallows could be completed, or nearly completed, before formal entry. Custom entitled the outgoing tenant to an away-going crop which was harvested and valued later in the year. The size of this crop varied from district to district. Tenants were entitled to one-third of the arable in Holderness and Howdenshire, and to one-quarter or one-third, depending on the location, on the Wolds.² The crop could be taken from any part of the farm. Rent, parochial taxes and the cost of harvesting were deducted from the market value of the crop.³

Valuation normally included manure made in the last year of the tenancy and left for the use of the incoming tenant⁴ but complications arose over oil cake which was becoming a significant element in the quality of manure. Oil cake was not covered under customary law because of its recent introduction, and although Sir Tatton Sykes and several fellow Wolds' landowners had given separate rights for oil cake in the early 1840s,⁵

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1. Lady Day (March 25) was the principal time of entry in Cheshire, Dorset, Huntington, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire, Rutland, Shropshire, Somerset, Staffordshire, Warwickshire, the North and East Ridings, and north Wales. Northumberland and Durham had May entries but the custom of entry was identical to those counties with Lady Day entries. Michaelmas (September 29) was the principal time of entry in most other English counties.- C. Cadle, 'Farming Customs and Covenants of England', J.R.A.S.E. 2nd ser. IV (1868), 146-7.
 2. S.C. on Agricultural Customs (1848), QQ.2555-7, 7571.
 3. For a precise statement on the scope of the valuation see Appendix IV, pp. 431-2.
 4. S.C. on Agricultural Customs (1848), QQ.7571, 7573.
 5. Ibid. QQ.7615; 7651.

the practice was not general and was unheard of on the lowlands. Three-quarters of manure made on Holderness farms belonged to the land, not to the tenant, and Edward Page knew of no tenant in the lowland districts who had been compensated for using artificial feedstuffs and manures.¹ The contrast between the lowlands and chalk districts reflected their respective agricultural attainments. The use of oil cake may have been limited on the Wolds in 1850 but it was much more limited in Holderness and the Vale. Tenants had no legal guarantee of compensation for unexhausted improvements outside these provisions. This applied to the spreading of crushed bones, marl and chalk (except in the loose sense mentioned previously by Legard), land drainage,² and the erection of farm buildings.

A more detailed account of the scope of customary law and its application to tenant compensation has been built up from case studies of individual estates. Tenancy agreements were examined for six lowland estates and one Wolds estate. The lowland estates were all bound by traditional agreements with only slight differences between them;³ the landlord-tenant agreement made between Yarburgh-Graeme and Mr. Richard Rex was typical and is set out below. It concerned a farm at Sewerby and was dated March 20, 1842; the form of the agreement did not change until the 1850s.⁴ Its main provisions were as follows:

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1. Ibid. Q.7662.
 2. Ibid. QQ.7585-7.
 3. The estates investigated were as follows and are listed by estate owner - W. Binnington of North Dalton, E.R.R.O. DDPY/13/1; J. Christie of Melbourne, E.R.R.O. DDCS/4/3; J. Clough of North Newbald, E.R.R.O. DDJ/12/16; R.F. Shawe of Brantingham, E.R.R.O. DDHB/4/12; Yarburgh-Graeme of Sewerby, E.R.R.O. DDLG/30/756.
 4. Sewerby Estate MSS, E.R.R.O. DDLG/30/776.

- (i) Yarburgh-Graeme or the incoming tenant had the right, on or after January 1st "preceding expiration of the Tenancy to enter upon such part of the farm as shall then be in corn stubble and plough sow manure and cultivate the same without making any allowances to the said Richard Rex for the same". Richard Rex was covenanted to provide lodging and stabling room for the incoming tenant over the transitional period.
- (ii) An away-going crop of corn could be taken by the outgoing tenant up to one-third of the tillage land. The crop was to be sold to the landlord at a price determined by two disinterested persons, one to be chosen by the landlord, the other by the outgoing tenant.
- (iii) Valuation was subject to the deductions previously outlined except that no reference was made to a deduction for rent on each acre sown with the away-going crop.
- (iv) The straw of the away-going crop belonged to the landlord "without any charge of compensation whatsoever".
- (v) The outgoing tenant would receive compensation for the original cost of all grass seeds sown in the spring and summer of the final year of tenancy, but two conditions were imposed. First, the tenant had to produce vouchers in support of his claim for compensation, and second, the seeds sown had not to have been eaten, or in any other way damaged by sheep or cattle, after being sown.

Tenancy agreements on Sir Tatton Syke's estate¹ were far more advanced than those on Yarburgh-Graeme's. Many provisions were standard and could be found in the tenancy agreements of most estates in the county,

1. Sledmere Estate MSS, E.R.R.O. DDSY/4/247.

but a few broke the bounds of custom and borrowed heavily on the 'Lincolnshire custom'. They are set out below.

- (i) Linseed cake fed to beasts in the fold yard and to sheep in the fields was to be paid for, in part, by the landlord or the incoming tenant. One-third of the original cost of cake was allowed if used in the last year of tenancy and one-sixth if used on land from which the away-going crop was taken. One-sixth of the original cost was also allowed for cake used in the penultimate year of tenancy.
- (ii) A tenant able to show that he had spread "good and well burnt lime upon any part of the land requiring such lime" received compensation on a graduated basis. The full cost of lime was reimbursed if it had been spread in the final year of tenancy. Compensation extended over a five-year period, proportional amounts being deducted with the passing of each year.
- (iii) A similar procedure was followed for bones and marl except that compensation extended over a seven-year period. Compensation for the unexhausted portion of the improvement was calculated in units of one-seventh. The full cost, including carriage, was met by the landlord if the improvement had been carried out in the final year of occupancy, six-sevenths if in the penultimate year, and so on down to the seventh year.
- (iv) The construction of ponds, a very important task in an area generally deficient in water, was also compensated over a seven-year period.

Estates on the Wolds were exceptional in their advanced covenants. But the developments of high farming, taken as a whole, were mostly too few in 1850 to seriously disrupt customary tenant right and it continued to meet the requirements of farmers and landowners.

5. Tenant right in the East Riding, 1850-80.

Many estates in the East Riding broadened the basis of tenant right in the 1850s and 1860s and it was common practice by 1860 to provide compensation for linseed and oil cake, lime, bones, and artificial manures.¹ It was also usual to provide compensation for permanent improvements undertaken by the tenant by the late 1860s.² The importance of the early years of the period in extending tenant compensation is brought out clearly in estate documents. The restricted tenancy agreements on Yarburgh-Graeme's estate have been commented upon but they, along with covenants on other local estates, had broadened considerably by 1860.³ Yarburgh-Graeme's covenants included the following by that time:

- (i) "... the cost of such bones or lime as he [i.e. the farmer] shall have laid upon the fallow or turnip fallow, eaten off with sheep (from which no away or off-going crop is taken) during the last year of his denise [will be returned to the tenant] on producing vouchers for the same."
- (ii) A four-year right for drainage was conceded provided it was carried out with the consent of the landlord and receipts were produced in support of the claim. The full cost of the investment, excluding the cost of transport, was returned to the tenant if no crop had been taken from the field(s) that had been drained; three-quarters was returned if one crop had been taken; one-half if two crops and one-quarter if three crops.

1. W. Wright, op. cit. p.97.

2. C. Cadle, 'The Farming Customs and Covenants of England', loc. cit. pp.147-65.

3. Sewerby Estate MSS, E.R.R.O. DDLG/30/784. The form of the tenancy agreement on the Sewerby estate did not change between 1860 and 1880. E.R.R.O. DDLG/30/785; E.R.R.O. DDLG/30/789.

- (iii) One-third of the cost of linseed and oil cake used in the last year of occupancy was returned to the tenant if the manure it had helped to make was used on land other than that sown with the away-going crop, and providing vouchers were produced in support of the claim.

The growth of tenant right was more modest on many of the small gentry estates. For example, the most noticeable addition to tenant right on Thomas Craven's Driffild estate by the 1860s was the inclusion of a right for oil cake. One-third of its cost in the last year of occupancy was returned to the tenant if this amount did not exceed the average of the preceding two years.¹

Tenancy agreements at Sledmere and other comparable Wolds estates had taken a modern form by 1850² and there was little need for adjustment. Compensation for drainage was excluded from the Sledmere covenant but this was unimportant on an estate established for the most part on free draining soils. However, the estate management conceded a seven-years right for drainage after 1865 provided tenant farmers provided both capital and labour.

The growth of tenant right on East Riding estates appears to have slowed down after the early 1860s leaving a sizable minority of tenants still farming under customary arrangements. A good indication of the extent of tenant right by the end of the period is given in John Coleman's report to the Richmond Commission.³ The evidence relates to a wide variety of

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1. Tenancy agreement between Thomas Craven and Michael Goodlass, May 1, 1865, E.R.R.O. DDHB/30/45.
 2. Sledmere Estate MSS, E.R.R.O. DDSY/4/256.
 3. The evidence relates to the estates of Henry Bethell, the Emanuel Hospital, W. Gilby, J. Jessop, Lord Herries, Rev. Hudson, Lord Leconfield, Lord Londesborough, The Mayor and Aldermen of London, Lord Middleton, St. Thomas' Hospital, Sir Tatton Sykes, G. Wyndam, and Yarburgh-Graeme. -
R.C. on the Depressed Condition of Agricultural Interests (1880), pp.140-83.

estates throughout East Yorkshire. Each estate compensated its outgoing tenants with an away-going crop; about three-quarters of the estates offered compensation for oil cake, lime, bones, and sometimes chalk and marl; three-fifths compensated tenants for unused manures; and one-half compensated for investments in farm buildings and field drainage. This latter would certainly have been higher if many landlords had not made special arrangements with tenants engaging in these activities.

There is no need to describe the tenancy agreements in force on the more progressive estates in the late 1870s as they had not changed from the 1850s and 1860s. More important is to stress that there were still numerous estates, regardless of size, where tenant right was inadequate. William Harrison-Broadley, a large proprietor of some 15,000 acres, offered nothing beyond the custom of the county except where specific agreements had been drawn up.¹ W. Gilby, a small squire owning less than 1,000 acres around Beverley, gave no tenant right other than an away-going crop. The fact that he was classified as a "lunatic" may explain the backward and run-down condition of the estate.² The Trustees of St. Thomas' Hospital also gave only what the custom of the county offered.³ Absenteeism may have been a factor here but the point cannot be taken too far as the Trustees of the Emanuel Hospital estate, who were also absentee landowners, controlled a highly efficient estate and offered a tenant right which covered the full range of farming activities.⁴

The extension of tenant right on estates throughout the East Riding was an acknowledgement of technical progress in agriculture and was bound up closely with the whole process of agrarian improvement. It also assisted

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1. Ibid. p.179.
 2. Ibid. p.180.
 3. Ibid. p.177.
 4. Ibid. p.177.

in the introduction of better farming methods because it offered more security for tenants' capital. A backward tenant right, on the other hand, was often a symbol of old farming methods and the presence of weak management, though it was not necessarily a factor contributing to them. Confidence in fair treatment from landlords was invariably so strong in the East Riding, even by 1880, that paper guarantees of compensation were often unnecessary.

6. One-year tenancies and farm investment.

Although not widely accepted, the one-year tenancy system in the East Riding seems to have been as effective as the long lease in encouraging tenant investment. Contemporaries and historians have usually judged one-year leases to be undesirable pointing out that tenants were in the power of landlords, or their agents, and that insecurity made farmers less innovative than those farming under long leases.¹ This was a criticism levelled at farmers in Holderness and the Vale of York,² and the Economist went one step further and questioned the much talked of 'understanding' between farmers and landowners.

Supposing that the high character of a landlord may be sufficient security that he will deal fairly with his tenants, who can guarantee the latter against the successor to the estate, who may be a grinding man, or, from his extravagance or other causes, may think proper to sell it ... no man in his senses would invest his capital in the land of another without the protection of a lease.³

It recommended a twenty-one year lease, terminable after fourteen years, and with a two-year notice to quit on either side. The Economist argued

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1. L. Morton, The Resources of Estates (1858), pp.152, 154.
 2. S.C. on Agricultural Customs (1848), Q.2643; J.T. Ward, op. cit. pp.9-10.
 3. Quoted in Hull Advertiser, June 23, 1855.

that this would provide a stable basis for investment, help raise farming standards above those where land was let by the year, and raise the performance of the duller tenant in periods of rapid technical change.¹

The advantages of the long lease are not denied nor are the potential weaknesses of yearly agreements. But it should be added that not every district farmed under long leases was progressive and that districts bound by yearly agreements were not necessarily backward. Criticism of yearly tenancies was generally wide of the mark in the East Riding. Agreements were framed in a strict manner and offered the same scope for 'educating' the poorer tenant and encouraging the progressive tenant² as the long lease. They also offered tenants a comparable level of security. East Riding farmers in fact rejected a move to replace one-year tenancies with eight to ten-year leases in the spring of 1872, the East Riding Chamber of Agriculture carrying the following resolution unanimously:

That this Chamber is of the opinion that yearly tenancies of farms, subject to twelve months notice to either party to quit, are best for this district ...³

This decision may have been influenced by landlord opposition to long leases⁴ as landlords were an important force within the Chamber, but

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1. L. Morton, op. cit. p.151; C.S. Orwin and E.H. Whetham, op. cit. pp.158-60.
 2. Covenants could sometimes work against the interests of the progressive tenant when quick, possibly unorthodox action, was required to meet changing circumstances. For an illustration of this during the depression see pp. 213-4.
 3. Hull and Eastern Counties Herald, April 11, 1872.
 4. Landlord objections to long leases, as they emerged from the debate in the East Riding Chamber of Agriculture, were as follows:
 - (i) Landowners hesitated about relinquishing control over land for periods of eight to ten-years or longer.
 - (ii) They thought long leases would help to sever personal ties between landlord and tenant, and that this might lead to the dispossessing of deserving tenants who were unable to keep up with progressive methods.
 - (iii) Rents would increase.

farmers did not have to yield to their pressure. On the contrary there was a general feeling that medium or long leases provided no additional advantage over existing arrangements.

One of the most sensitive indicators of tenant security in counties using yearly tenancies is the average length of tenancy, which was established at between ten and twenty years in the East Riding.

Table 11.2. The length of continuous occupation by a single tenant on some East Riding estates, 1850-80.

Estate	Number of tenancies in each time interval (in years)					Percentage of tenancies in each time interval.				
	Under 2	2-4	5-9	10-19	20+	Under 2	2-4	5-9	10-19	20+
Sledmere	-	-	3	7	16	-	-	11.5	27.0	61.5
Houghton	2	3	1	6	12	8.3	12.5	4.2	25.0	50.0
Burton Constable	7	17	11	13	17	10.8	26.1	17.0	20.0	26.1

Sources: Sledmere Estate MSS, rent books, E.R.R.O. DDSY/107/4-9; Houghton Estate MSS, E.R.R.O. DDLA/34/5; Chichester-Constable Estate MSS, E.R.R.O. DDCC (1) 41, E.R.R.O. DDCC (2) 9.22.

The majority of tenancies on the three estates shown in Table 11.2 were for periods of twenty years or more, though the average was lower on the Burton Constable estate. Long tenancies were also the rule on other local estates. A little over one-half of the tenants occupying farms of 5 acres or more on the Emanuel Hospital estate in 1846 continued to occupy the same farms in 1875.¹ One-third of the tenants at Escrick in 1850 continued to work the same farms twenty years later, and the proportion is increased significantly if tenancies passed on to sons and other close relatives are included.² It was similar at Wheldrake³ and Cherry Burton.⁴ When the head of household

1. Emanuel Hospital MSS, L.C.R.O. EH 4.2b; L.C.R.O. EH 4.3c.

2. Wenlock Estate MSS, E.R.R.O. DDFA/5/25; E.R.R.O. DDFA/41/18.

3. Ibid. E.R.R.O. DDFA/41/19.

4. Cherry Burton MSS, E.R.R.O. DDCB/25/1.

died before his children were old enough to take over the tenancy, the farmer's widow would sometimes take on the tenancy herself and farm until they were old enough to take over the responsibility themselves. An extreme example of this is the case of Mrs. Flowers who farmed on the Cherry Burton estate from 1852, when her husband died, until the early 1870s when her son Thomas took up the tenancy. Transitions of this sort, though usually over shorter periods, were a feature of all the estates examined.

The average length of tenancy started to fall in the 1870s. One-third of all tenancies begun at Sledmere between 1851 and 1880 were concentrated into the last five-years of the period, and there was also some quickening in the rate of turnover at Houghton and Escrick, but the trend was much weaker. The trend was reversed on the Chichester-Constable estate, the turnover of tenants slackening in the second half of the 1870s for no apparent reason.

The generally shorter duration of tenancies over the 1870s was the result of capital becoming scarcer and tenants seeking smaller tenancies, the bankruptcy level among farmers rising slightly. But taking the period as a whole it seems clear that tenancies were entered into as a long term prospect and that the close understanding which often developed between landlord and tenant over these lengthy periods, irrespective of yearly covenants and even the extent of tenant right, provided the essential context for tenant investment in farm improvements.

The average length of tenancy, however, is still only part of this context. The system of yearly tenancies was compatible with spirited and progressive husbandry because the relationship between landlord and tenant was not confined merely to the duration of a single tenancy. Families touched and merged down the generations. A study of 18 parishes in south Holderness showed that 43 per cent of farmers in 1871 farmed in the parish of their birth, nearly 14 per cent farmed in parishes bordering the parish

of birth and a further 24.6 per cent farmed within eight miles of the parish of birth (ie. this excludes those born in bordering parishes). Ten per cent of farmers were born elsewhere in the East Riding and about 9 per cent were born in another county, usually Lincolnshire.

Figure 11.2 The Parishes of South Holderness.

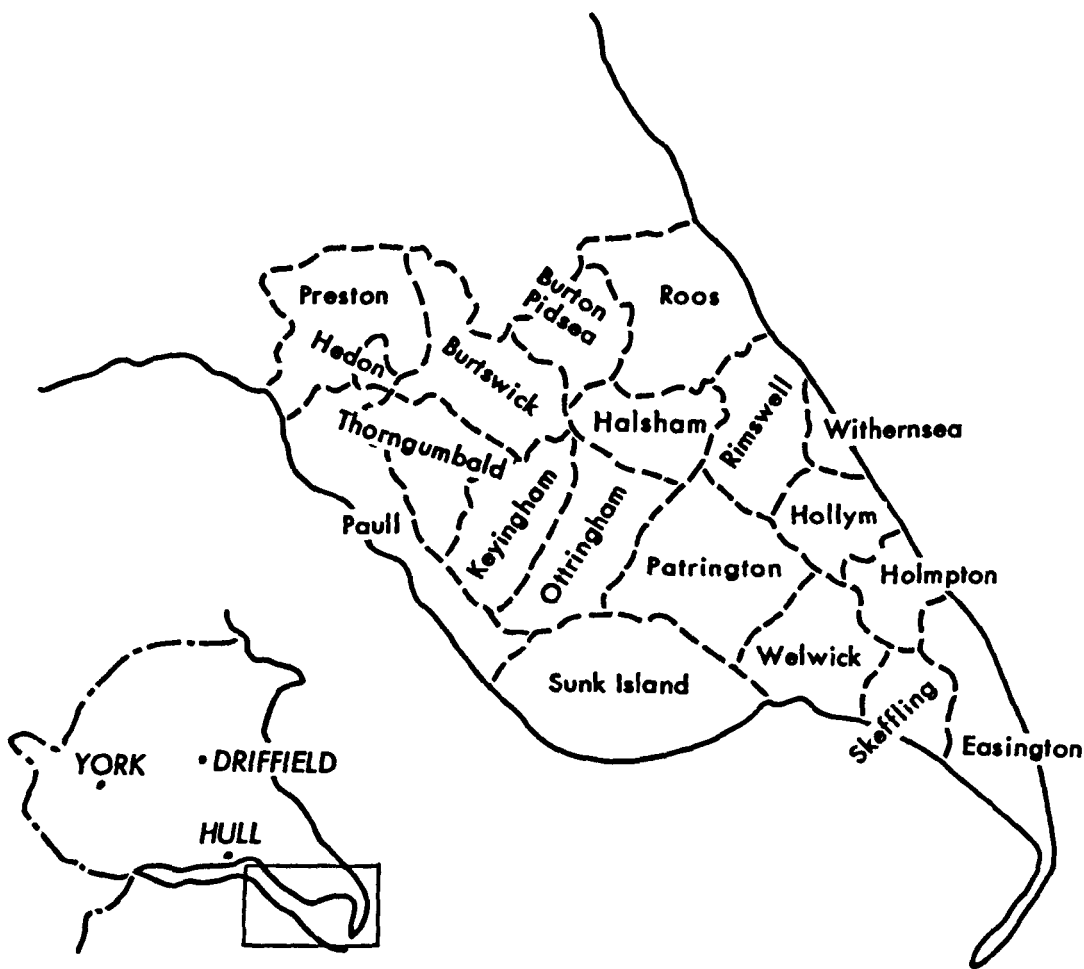


Table 11.3. The relationship between the parish of birth of farmers and where they farmed in south Holderness in 1871.

Parish	Born & farm in same parish	Farm in parish bordering parish of birth	Farm in parish within 8 miles of parish of birth (excluding ii & iii)	Born elsewhere in the East Riding	Born outside the East Riding
(i)	(ii)	(iii)	(iv)#	(v)	(vi)
Keyingham	20.0	20.0	26.7	13.3	20.0
Ottringham	78.6	14.3	-	7.1	-
Patrington	38.9	5.6	38.9	5.6	11.0
Holmpton	50.0	12.5	25.0	-	12.5
Sunk Island	52.6	10.5	15.8	15.8	5.3
Paull	54.5	27.3	9.1	-	9.1
Thorngumbald	33.3	22.2	22.2	11.1	11.2
Burstwick	29.4	17.6	47.1	-	5.9
Easington	43.5	-	30.4	21.7	4.4
Skeffling	27.3	18.2	27.3	27.2	-
Welwick	46.7	13.3	26.7	6.7	6.6
Roos	33.4	-	44.4	-	6.6
Burton Pidsea	50.0	12.5	25.0	12.5	-
Hedon	37.5	12.5	-	12.5	37.5
Hollym	33.3	27.8	16.7	22.2	-
Withernsea	42.9	-	42.9	14.2	-
Owthorne	44.4	-	44.4	11.2	-
Halsham	58.3	33.4	-	8.3	-
AVERAGE*	43.0	13.8	24.6	10.5	9.4

Sources: Census Enumerators Books, 1871, P.R.O. RG 10/4798;
P.R.O. RG 10/4799; P.R.O. RG 10/4778.

* This is a rough average and has been distorted slightly by rounding the information contained in columns (ii) to (vi). The sum of these averages is 101.3 per cent.

The distance of 8 miles is measured from the centre of the parish of birth.

The binding power of the land (Table 11.3 shows that well over three-quarters of farmers farmed within eight miles of their place of birth), the strong family ties which developed among the tenantry at parish and district levels, and the close contact established on hereditary estates between the different sections of the landed interest, all gave a solid social dimension to the business of farming. It also gave a feeling of economic security and a willingness to invest on the part of the tenant, which in many cases transcended the legal strictures examined in this chapter.

This may possibly have been in the mind of the Duke of Bedford when he wrote of his own estates towards the close of the nineteenth century that

... the system of land tenure which allows a great estate to descend unimpaired from one generation to another, secures to those dwelling on the soil material and moral advantages greater than those promised under any alternative system.¹

It might also have been implicit in Rider Haggard's comment that the gentry in some districts of Yorkshire knew "every field of their own and were often on terms of intimacy with every tenant".²

* * * * *

Tenant right broadened between 1850 and 1880 and strengthened the resolve of tenant farmers to improve farms and methods of husbandry, and was very much a part of the success of high farming in that period. But it was not a pre-requisite for the development of high farming in the East Riding. A modern tenant right came into being without much pressure from farmers in the county and there was even the paradox of a broader tenant right being introduced on the Wolds in the 1840s and early 1850s when most farmers and a large number of landowners remained convinced that customary tenant right met the needs of tenant compensation. A very significant part of tenant investment in East Riding farming was the stability of the landlord-tenant relationship. The growth of a modern tenant right did not stand in place of this 'understanding' but it went a long way to enrich it and to give farmers additional confidence to invest in the costly processes and infra-structure of modern farming.

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1. Duke of Bedford, The Story of a Great Agricultural Estate (1897), p.3.
 2. R. Rider Haggard, Rural England: Being An Account Of Agricultural And Social Researches Carried Out In The Years 1901 And 1902 (1902), II, p.283.

INCOME TRENDS AMONG FARM LABOURERS IN THE EAST RIDING, 1850-80.

1. The composition of the agricultural labour force and related themes.

The business characteristics of the East Riding's agricultural industry have been examined from several different standpoints - the investment strategies of local landlords, the spread of farm mechanisation, the ability of farmers to respond quickly and accurately to price changes, and their willingness to invest in improved farming techniques - but the study has said little about the labourer, without whom the industry could not have functioned. This chapter, and the one that follows, seeks to redress this imbalance and examines the farm worker's efficiency, his earnings, and those of his family, his standard and quality of living, and the measures which local philanthropic and reforming groups took to bring about some amelioration in his condition.

These wider social themes are left to Chapter 13. This chapter is concerned with wage trends and the factors behind them. It charts movements in day wages (the basic earnings of the agricultural labourer), task and piecework earnings, and farm servants' wages, and attempts to explain the high rate of wages paid on East Riding farms in terms of the greater productivity of its work force, the tightness of the local labour market and the impact of rural trade unionism in the early 1870s.

The study of farm workers is not a study of an undifferentiated mass of unskilled labourers.¹ The agricultural labour force was, and still

1. Thorold Rogers outlined some of the skills of a good agricultural labourer in a speech at Oxford in 1878. He commented that ploughing a straight furrow was "as difficult as painting pictures, and that a man that /had/ not a good education in this direction /was/ as incapable of learning it, except for a long and painful course of training, as a man who paints pictures". He also suggested that sheep sheering, rick building, and ditching and hedging were as difficult.- Quoted by J. Arch, Joseph Arch: The Story of His Life (2nd edn, 1898), pp.318-19.

is, made up of various groups of workers who were distinguished from each other by their skills and by the terms of their engagements. The basic division in northern England was between labourers who 'lived in', that is, boarded with the farmer or his foremen, and those who received day wages and lived separately with their families in nearby villages or in tied cottages on the various estates. This division partly reflected different stages in the farm worker's life. He was far more likely to hire himself out as an annual servant up to getting married and raising a family than he was to become a day wage labourer. The converse was true after marriage¹ though the precise form of employment depended ultimately on the needs of the farming system. Farmers on the Vale of York, for instance, required more day labourers and fewer servants, while Wold farmers required proportionally more servants and fewer day labourers.²

Differences in skill and experience led to significant differences in farm workers' earnings and status and affected the regularity of employment of day wage labourers. Skills ranged from the supervisory skills of foremen, and the specialist skills of horsemen, cowmen, waggoners, and shepherds, to the more general and part skills of ploughmen, assistants to the livestock supervisors, 'third men',³ and pig boys. In addition there were other labourers, mostly women and young children, who performed casual duties about the farm during periods of peak activity like harvest

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1. M.C.F. Morris, The British Workman Past and Present (1928), pp.3-37; Returns of the Diocese of York, 1865 (Borthwick Institute of Historical Research, unclassified).
 2. Variations in the concentration of servants and day labourers are shown in Figure 12.1.
 3. This term was used frequently in local newspaper accounts and seems to include ploughboys and other young labourers.

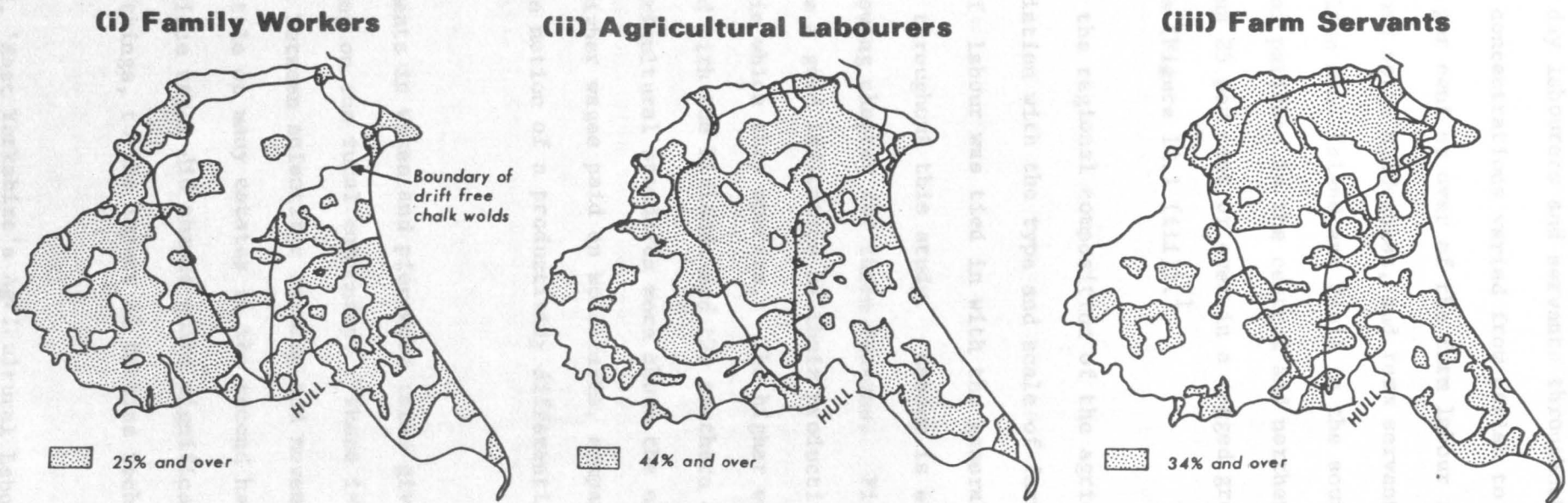
and haysel.¹ Their wages were low, women earning between one-third and one-half the wage of adult male labourer, but they were important in supplementing the earnings of the chief breadwinner and are considered in detail in Chapter 13.

The composition of the agricultural labour force, even after allowing for variations in skill, was not uniform throughout the county. Day labourers formed 43 per cent of the total in the 1850s, farm servants 33 per cent and family labourers 24 per cent. The district concentration of these groups varied according to the size of farms and the availability of labour. As Figure 12.1 (i) shows, family labourers predominated in many parts of the Vale of York, Holderness and Howdenshire where small scale farming was the norm. The land was worked intensively by upwards of 4-5 labourers per farm, several of whom would be family members, while additional labour was recruited from nearby villages. Farm servants were prominent on the Wolds and in parts of Holderness (Figure 12.1(ii)), where farms were both larger, often giving employment to ten labourers or more, and were remote from population centres. Family labour inevitably made up only a small part of their total labour requirements and physical distance from villages made the hiring of yearly servants preferable to the hiring of day labourers.

Farm size was nearer to the county average in Holderness and farms were usually closer to villages and an accessible source of labour. The farm labour force reflected this and there was a fairly even sprinkling

1. Migratory workers, usually Irish or, in the case of the East Riding, farm workers from the North Yorkshire Moors, the Pennines and some industrial workers from the West Riding, also helped to bring in the harvest. Their wages were equal to those of regular adult labourers except for the Irish who were paid slightly less. For a full discussion see 'Task and Piecework Earnings in the East Riding, 1850-80, pp. 354-9. For a discussion on migratory workers see E.J.T. Collins, 'Migrant Labour in British Agriculture in the Nineteenth Century', Econ. Hist. Rev. 2nd ser., XXIX (1976). References to the East Riding appear on pp. 42-3.

Figure 12.1 The Composition of the Agricultural Labour Force in the East Riding in 1851.



Source: J.A. Sheppard "East Yorkshire's Labour Force in the Mid-Nineteenth Century", *Agric. Hist. Rev.* IX (1961), 49-51.

of family labourers, day labourers and servants throughout the district, though their precise concentrations varied from parish to parish. Day labourers made up 44 per cent or over of the farm labour force in several parishes in central and south Holderness, and farm servants 34 per cent or over in parishes like Sunk Island and Paull in the south of the district, and in a broad band of parishes in the central and northern districts. Family workers made up 25 per cent or over in a ragged group of parishes in central Holderness (Figure 12.1 (iii)).¹

Variations in the regional composition of the agricultural labour force, and its association with the type and scale of farming, suggests that the economics of labour was tied in with the general economic framework of farming discussed throughout this study. Labour is examined in detail here and in the following chapter for three reasons. First, the wages paid to labourers are a good indication of their productivity and that of the farm system within which they operate. The higher wages paid in the East Riding, compared with the Midlands and the southern counties, supports the view that its agricultural standards were above the national average, while the slightly higher wages paid on Wold farms, compared with lowland farms, reinforces the notion of a productivity differential within the county itself.

Second, movements in wages and piecework rates gives a clue to the impact of high farming on the rural community. There is certainly no precise relationship between scientific farming and movements in day wages as day wages changed little on many estates in the second half of the 1850s and the 1860s, but piece rates did change quite significantly which can be traced, among other things, to the impact of machine technology and rising

1. J.A. Sheppard, 'East Yorkshire's Agricultural Labour Force in the mid-Nineteenth Century', loc. cit. pp.46-51.

productivity. The charting of wage movements takes up most of the second half of this chapter.

Third, wages were only part of the elements which determined the labourer's standard of living. The wider social issues involved here require study because the rural labourer and his family, unlike the landlord and tenant farmer, lived only slightly above the subsistence level, even in the high wage counties. A study of wages in isolation from considerations of cottage rentals, allotments and gardens, supplementary earnings, purchasing patterns, the provision of education, and the social systems of the village, would tell us little about the real welfare gains or losses of farm labourers in this period.

2. Farm wages in the north compared to other regions, 1850-80.

The wages paid on northern farms were significantly higher than those paid on southern and southwestern farms, and were modestly above those paid in the Midland counties. The East Riding, being part of the north-eastern block of counties, paid the high wages associated with the district but it did not rank among the highest paying counties. Day wages in Durham, Northumberland, Cumberland, and Westmorland were 4-11 per cent higher in 1860 and several north Midland counties were on parity.¹ This did not change much by 1880 though several farming districts which were close to metropolitan or mining centres in the Home and Midland counties paid wages close to the northern average.²

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1. F. Purdy, 'Earnings of Agricultural Labourers in England and Wales, 1860', J.R.S.S. XXIV (1861), 342.
 2. S.B.L. Druce, 'The Alteration in the Distribution of the Agricultural Population of England and Wales, between the Returns of the Census of 1871 and 1881', J.R.A.S.E. 2nd ser. XXI (1885), 109.

James Caird noted regional variations in the level of English farm wages in 1850-1 and attributed the higher wages paid on northern farms (for nominally the same amount of work), to the impact of mining and manufacturing, which was either absent in the south or was on a more limited scale. He estimated that these activities added 37 per cent to the wages of northern farm workers.¹ Regional differences in farm wages are shown in detail in Table 12.1 for the period 1850-1 to 1879-81.

Table 12.1. Weekly cash wages of agricultural labourers, 1850-1 to 1879-81. *

	1850-1	1860-1	1867-71	1879-81
Division 1	12s. 2d.	12s. 3d.	15s. 1d.	16s. 2d.
Division 2	10s. 1d.	12s. 6d.	13s. 4d.	14s. 5d.
Division 3	8s. 4d.	10s. 4d.	11s. 4d.	13s. 4d.
Division 4	7s. 9d.	9s. 7d.	10s. 7d.	12s. 4d.
Division 5	8s. 8d.	10s. 7d.	11s. 7d.	13s. 0d.
Division 6	9s. 1d.	11s. 10d.	11s. 8d.	13s. 10d.
Division 7	7s. 10d.	11s. 1d.	11s. 0d.	12s. 0d.
Average	9s. 7d.	11s. 7d.	12s. 5d.	13s. 9d.

Source: C.S. Orwin and B.I. Felton, 'A Century of Wages and Earnings in Agriculture', J.R.A.S.E. 2nd ser. XCII (1931), 233.

- * The divisions are as follows:
 Division 1 - the northern counties;
 Division 2 - central Midlands;
 Division 3 - west Midlands;
 Division 4 - south-west;
 Division 5 - east Midlands;
 Division 6 - Home Counties;
 Division 7 - East Anglia.

This regional imbalance in wage rates emerged in a very basic form in the eighteenth century. Rural migration had begun to embarrass farmers in Lancashire and the West Riding by the end of that century causing the agricultural labour market to tighten and farm wages to rise.² A generation

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1. J. Caird, English Farming in 1850-51 (2nd edn, 1968), pp.510-11.
 2. E.W. Gilboy, Wages in Eighteenth Century England (1934), pp.186-8.

later Cobbett commented on the converse of this in certain grain producing counties in the south where the labour market was overstocked, wages were low and labourers existed under degrading conditions.¹

The free market economy was notably inefficient in removing these regional variations in farm wage rates because labour was fairly immobile and standards of farm efficiency varied from one part of the country to the other. Wage rates depended ultimately on what workers were willing to receive rather than leave the land. Wages were low where labour was oversupplied and clung to the soil, and appreciably higher where there was movement into higher paying employment in manufacturing industry or mining.² This is not to suggest that there was a precise graduation in wage rates according to distance from urban centres. Farm wages were not sharply different between the more remote districts of Lancashire and the farming districts which bordered the towns and mining areas;³ and in the East Riding wages were higher on the Wolds than in districts close to Hull. Differences in productivity and/or labour supply (the northern labour market was generally tightening over the third-quarter of the nineteenth century, but it was tighter in some parts than in others), made any strict geographical gradation in wage rates unlikely.

Structural unemployment in the south, especially among farm workers in former Speenhamland counties, persisted up to 1850 and possibly to 1914, and this more than any other factor depressed farm wages. Rural migration

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1. Quoted in C.S. Orwin and B.I. Felton, 'A Century of Wages and Earnings in Agriculture', loc. cit. p.240.
 2. J.R. Bellerby, Agriculture and Industry: Relative Income (1956), pp.37-8.
 3. J.D. Marshall, 'The Lancashire Rural Labourer in the Early Nineteenth Century', Lancashire and Cheshire Antiquarian Society 71 (1961), 98, 104-5.

occurred on a large scale in the second half of the nineteenth century and removed part of it but probably did not remove the entire labour surplus disguised by underemployment and peak harvest demand.¹ The marginal supply price of labour therefore continued to be low and blunted the economic incentive to mechanise and improve.

The personal and social immobility of farm labour in the south (even though rural migration was a persistent feature of most agricultural counties there throughout the second half of the nineteenth century),² can be attributed to several factors. Poverty and ignorance limited the farm worker's knowledge of market conditions outside his own district.³ Migration was mostly over short distances⁴ and the industrial centres of the north and south Wales were a long way off. Probably the most important economic factor binding labour to the land was the expense of removing entire families, which was inevitable if tied cottages were involved, at a time when the head of household was looking for work and was not in receipt of wages.⁵ Northern labourers had an advantage here in that their higher wages, and possibly greater savings, gave them additional resources to meet the strains of transition from country to town.

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1. E.H. Hunt, 'Labour Productivity in English Agriculture', Econ. Hist. Rev. 2nd ser. X (1967), 289; H.J. Little, 'The Agricultural Labourer', J.R.A.S.E. 2nd ser. XIV (1878), 771. E.L. Jones has dissented from this view arguing that there was a change in the national agricultural labour market "from conditions of glut to partial, but structural shortage at least from the Crimean War". He cited the impact of a maturing economy and the labour requirements of the railway system and of the expanding towns and cities. - 'The Agricultural Labour Market in England, 1793-1872', Econ. Hist. Rev. 2nd ser. VIII (1965), 322. However, it seems certain, for the reasons given by Hunt, that the main effects of this "structural shortage" were felt in the north and were associated with increasing mechanisation, especially of the harvest.
 2. J. Saville, Rural Depopulation in England and Wales 1851-1951 (1957), pp.11-12; 44-61.
 3. For example, this is demonstrated in Thomas Hardy's description of Wessex Labourers.
 4. J. Saville, *op. cit.* pp.38-9.
 5. R. Lennard, Economic Notes on English Agricultural Wages (1914), pp.31-2.

At an administrative level the Poor Law was a powerful institutional obstacle in the way of free migration of labour. A settlement had been made easier in the course of the nineteenth century, the time qualification for permanent residency falling from five to three years by 1861, and to one year by 1865 when the Union Chargeability Act was passed. The main purpose of the Act was to shift the administration of the Poor Law from the parish to the union, but its relevance can be questioned in the context of farm wages because the division between high and low wage counties existed not at the union or even county levels but at the national level. And, while the union continued to be the basic unit of settlement, it stood in the way of the free circulation of labour just as the parish had done earlier. This holds in spite of the considerable movement off the land from the 1850s¹ as presumably more labour would have drifted into the towns if circumstances had been more favourable.

The oversupply of labour in the south and the tighter labour market in the northern counties affected farm wages directly, but it also influenced them indirectly via differences in farm productivity and efficiency. It was not accidental that northern farming, especially in the eastern belt of counties from Lincolnshire up to the Lothians, was the most highly productive in the country. Northumberland farming was a model of improvement in the 1840s and continued to be so in the 1870s.² This was also true of Lincolnshire and of the East Riding to a smaller extent, but it was substantially untrue for most of the other major farming regions. High farming had a limited impact in the south west, the great majority of the

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1. The movement away from the land began to affect the absolute size of the farm labour force during the second half of the nineteenth century. A total decline in the population in rural districts became common in the 1850s and although "there was a slowing down in the rate of decline, and in some areas even reversal in the 1860s, depopulation continued during the next three decades to the end of the century". — J. Saville, *op. cit.* p.11.
 2. G.E. Fussell, 'High Farming' in the North of England, 1840-1880', Econ. Geog. XXV (1949), 296, 298-9.

farmers there preferring the slow "jog-trot" methods of their ancestors.¹ Progress in the West Midlands was blighted by drainage difficulties and a profusion of small farms which were unsuited to the requirements of modern farming.² Advances in methods of production and farm management were also held back in the Home Counties, and the region, acknowledged as backward in 1850, showed only sporadic evidence of coming to terms with its problems over the following three decades.³

Part of the superiority of northern farming - the greater willingness to use new and improved systems of cropping, better implements and machines, imported and chemical fertilisers, artificial concentrates, soil drainage, and modern farm buildings - has been discussed previously, especially in connection with the innovation of the harvest reaper. Some emphasis was placed at that time on the physical advantages of the region. But the labour market and the high wage economy were also factors contributing to better farming. The relative shortage of labour and the increasing labour bill were spurs to mechanisation, and in turn, higher wages probably ensured that northern labourers were better fed and more capable of efficient work than many of their southern colleagues. For example, the East Riding, as has been pointed out earlier, had one of the highest levels of harvest labour productivity in the country, 1.7 bushels of corn being harvested per unit of labour in 1850 compared with 1.64 bushels on the Lincolnshire Wolds, 1.04 bushels in Durham (a fairly average county

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1. G.E. Fussell, ' 'High Farming' in Southwestern England, 1850-1880', Econ. Geog. XXIV (1948), 53, 73.
 2. G.E. Fussell, ' 'High Farming' in the West Midland Counties, 1840-1880'. Econ. Geog. XXV (1949), 179.
 3. G.E. Fussell, 'Home Counties Farming, 1840-1880', Econ. Journ. LVII (1947), 322, 344.

by northern standards) and considerably below one bushel in most southern and southwestern counties.¹

The greater use of machinery played a part in raising wages, and increasing labour costs provided an incentive to substitute capital for labour. Higher labour costs were a feature of farming throughout the country by the early 1870s² but the strong upward shift in wage rates on northern farms, coupled with the initially higher rates there, imposed a heavier burden on its farmers. The wage bill on the Sledmere home farm increased by over 50 per cent between the mid-1860s and mid-1870s³ and it may have been similar elsewhere. Farmers had therefore to be flexible enough to modify their husbandry or suffer the consequences; on the other hand the more favourable labour market in non-industrial counties blunted these economic pressures and gave farmers a greater opportunity to continue in the old ways.

Wage levels probably exerted a second round of effects based on the labourer's incentive to work harder and his capacity to maintain maximum effort for longer periods. Low wages almost certainly destroyed the incentive to be industrious and replaced it, in the words of J.R. McCulloch,

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1. P.A. David, 'Labour Productivity in English Agriculture, 1850-1914: Some Quantitative Evidence on Regional Differences', Econ. Hist. Rev. 2nd ser. XIII (1970), 510.
 2. F. Purdy, 'The Labour Bill in Farming', J.R.A.S.E. 2nd ser. XI (1875), 70-81.
 3. The total labour bill on the Sledmere Estate home farm 1864-1875.
(To the nearest £)

1864	547	1868	600	1872	703
1865	487	1869	no data	1873	760
1866	492	1870	670	1874	826
1867	579	1871	631	1875	860

Source: Sledmere Estate MSS, E.R.R.O. DDSY/98/37.

with "sloth, ignorance and improvidence".¹ Inadequate nutrition reinforced these tendencies.² It was different in high wage counties for not only was "the mental and physical condition of the farm labourer ... much better",³ making him capable of greater effort, but the very fact of higher wages, substantial piecework earnings and possible promotion within the labouring hierarchy all acted as strong inducements to work more competently.

Differences in productivity between northern and southern farming possibly never influenced farmers' decisions about wage payments in any conscious way. Farmers gave the wages common to a district but implicit in this was the state of the labour market, the impact of industry and mechanisation, and the condition of the labourers themselves. Wages were higher on northern farms because labour was in shorter supply, mechanisation was more advanced and labourers had more incentive to be hard working.

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These conditions, though they can be generalised about at a national level, varied quite significantly from county to county irrespective of the geographical bloc to which they belonged. Table 12.1 demonstrated

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1. J.R. McCulloch, The Rate of Wages and the Condition of the Labouring Classes (2nd edn, 1854), p.37.
 2. R. Lennard, op. cit. pp.6, 86, 88-90; W.A. MacKenzie, 'Changes in the Standard of Living in the United Kingdom, 1860-1914', Economica (1921), 216, 225-6; R. Groves paints a very bleak picture of the labourer in the southwestern counties: he breakfasted "on tea-kettle broth - hot water poured on bread and flavoured with onions - /dined/ on bread and hard cheese at two pence per pound, with cider very washy and sour, and /supped/ on potatoes or cabbages greased with tiny bits of bacon fat".- Sharpen the Sickle: The History of the Farm Workers' Union (1948), p.33.
 3. E.H. Hunt, 'Labour Productivity in English Agriculture', loc. cit. p.289. A good description of the standard of living of the northern labourer is contained in L. Hindmarsh, 'On the State of Agriculture and the condition of the Agricultural Labourer in the Northern Division of Northumberland', J.R.S.S. I (1838), 404-5.

this in terms of average wage rates in seven English regions, but the diversity of economic conditions, and the corresponding diversity in wage rates, extended ultimately to the separate farming districts making up individual counties. For example, this East Riding study has shown that farming on the Wolds was superior to that in the majority of lowland districts, and that for historical reasons the labour market was tighter on the Wolds than in traditional farming areas like the Vale of York. Agricultural wage rates reflected these differences and were appreciably higher on the Wolds. The wage gap between northern and southern counties can therefore be seen in microcosm, and in a much more 'diluted' form, in the advanced and less advanced districts of individual counties.

3. The East Riding labour market, 1850-80.

There has been no detailed analysis of the relationship between farm productivity and wage rates in the East Riding but it would be covering old ground to prove the relationship formally.¹ The nature of the labour market, on the other hand, and its effect on local wage rates has not been discussed at any length, and this is therefore a good opportunity to do so. This discussion also provides part of the background to the rapid introduction of new farming methods in the county, especially the mechanisation of various farming operations, though the connecting lines are not drawn in.²

There is little evidence at first glance that the East Riding labour market tightened between the 1850s and 1870s. As Table 12.2 shows, the number of farm labourers and servants actually rose over the 1850s, though

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1. The progress and efficiency of East Riding agriculture over the middle decades of the century has been described in chapters dealing with farm size, mechanisation, drainage, and the competence of local farmers and landowners. The general links between wages and agrarian productivity have been defined in section 2 of this chapter.
 2. Some of the connecting lines were drawn in Ch. 5 'Farm Mechanisation In The East Riding, 1850-80'.

it fell slightly in the following two decades as labour drifted into the Middlesbrough-Cleveland district and the Hull Docks.

Table 12.2. The number of farm labourers, servants and shepherds on East Riding farms, 1851-81.

Year	Farm Labourers	Farm Servants	Shepherds
1851	11,470	7,451	177 *
1861	11,730	7,550	304
1871	9,494	6,885	471
1881	15,104 #	-	409

Sources: Census of England and Wales 1851 (1854), II, p.691;
Census of England and Wales 1861 (1863), II, p.689;
Census of England and Wales 1871 (1873), III;
Census of England and Wales 1881 (1883), LXXX.

* This figure appears to be rather low.

The classification of agricultural labourers changed slightly in the 1881 Census. There was no separate enumeration of labourers and servants. The figure given includes these two groups and cottagers.

By the mid-1860s it was being argued that the shortage of rural labour in the East Riding was transforming farmers into the slaves of servants and servants into masters.¹ This was a gross exaggeration as farmers never looked like losing their authority, but there were undeniable signs that the labour market was tightening and that labourers' bargaining power over wages and conditions was increasing. There was continuous emigration of farm workers and their families throughout the period, peaking during periods of rural distress, and was so important in some districts in the early 1850s that it featured in the policies of Lord Hotham and the Hon. Captain Duncombe when they defended their county seats in the General Election of 1852.² Emigration agents were active and

1. D. Legard (ed.) More About Farm Lads (1865), p.3.

2. Hull Advertiser, April 16, 1852; May 14, 1852; July 16, 1852.

agricultural labourers, road makers, quarrymen, and tradesmen were eagerly sought after.¹

Labour was drained into the army. Recruitment peaked during the Crimean War² but it was also active during peacetime. For example, one sergeant was reported to have recruited 200 "fine fellows" from the Drifffield area between January and September 1859.³ It is difficult to see the advantages of nineteenth century army life but it seems that many unmarried men found the prospect of 2s.6d. per week, plus free lodging, clothing and food, and an extra 7d. per week after three-years of service, preferable to remaining on the land.⁴

The bulk of labour moving off East Riding farms neither emigrated nor enlisted but headed for Middlesbrough or Cleveland, or the industrial centres of the West Riding. Middlesbrough was a fast growing industrial centre from the 1840s and 1850s⁵ and Cleveland mines were producing one-third of England's iron output by the 1870s, an extraordinary achievement given their small contribution just 20-years earlier.⁶ The Middlesbrough-

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1. A typical advertisement run in the Drifffield Times in 1865 tried to encourage emigration to Queensland: "Assisted passages are now granted to a limited number of eligible persons at £8 per head (adult); female domestic servants £4. The class of persons alone eligible are ploughmen, road makers, quarry men, professed gardeners and a few miners, carpenters, masons, wheelwrights, shipwrights, and female domestic servants of good character. Apply to G.R. Jackson, Exchange Street, Drifffield." January 7, 1865.
 2. Hull Advertiser, February 17, 1854.
 3. *Ibid.* June 11, 1859; September 10, 1859. Recruitment into the Army in 1859 must have been connected with the war scare with France and the emergence of the volunteer movement. The whole country became very jingoistic.
 4. Hull and Eastern Counties Herald, March 5, 1868.
 5. A. Briggs, Victorian Cities (1963), pp.253-62.
 6. A. Birch, An Economic History of the British Iron and Steel Industry (1967), p.136; J.S. Jeans, Pioneers of the Cleveland Iron Trade (1875), p.v; S. Griffiths, Guide to the Iron Trade of Great Britain (1873), p.119.

Cleveland region registered net inflows of migration throughout the period 1851-81.¹ A large part of this was made up initially of iron workers from Staffordshire² but the demand for general labourers increased as the mining-industrial complex expanded. The prospect of higher wages attracted large numbers of agricultural labourers in the early 1870s, many of whom were put to work minding draught animals in the mines. The Hull Docks exerted a similar pull on labour except that its catchment area extended into Lincolnshire.³ By this time farmers were complaining of labour shortages and were finding difficulty in attracting good workers even at improved wages. Their problems were only partly resolved on the Wolds, where the labour shortage was most acute, by the general introduction of harvesting and haymaking machinery. The better stocked labour market in the lowland districts, coupled with mechanisation, gave farmers a freer hand, though wages still rose. However, it should be stressed that labour shortages appeared only during periods of peak demand and that there was normally a pool of unemployed labour in many districts during the winter months.

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This then is the background to wage movements on East Riding farms. Day wages, piecework earnings and farm servants' wages will be analysed in detail in the following sections. Emphasis is placed on charting wage movements, though attention is also given to the wage gap between upland and lowland farms and to relating the stocking of the labour market and farm efficiency to prevailing wage rates.

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1. J. Saville, Rural Depopulation in England and Wales 1851-1951 (1957), p.46.
 2. S. Griffiths, op. cit., p.124.
 3. Hull and Eastern Counties Herald, April 18, 1872.

4. Day wages in the East Riding, 1850-80.

Day wages rose by 25-30 per cent in the East Riding between the early 1850s and the early and mid-1870s in line with the national increase. (A.L. Bowley and G.H. Wood estimated increases of 28 and 24 per cent, respectively, in the average wages of English farm workers between 1855 and 1874.)¹ Most historians and statisticians have been less precise in their estimates of wage movements but have conveyed the impression of a significant upward drift in farm wages after the Post Repeal depression.² They have argued that farm wages kept pace with industrial wages in the second half of the nineteenth century which they had failed to do in the first half.³

Day wages were often expressed in composite terms, an allowance being made for piece and task work earnings, but these additional elements have been largely removed from the present enquiry and are discussed later in the chapter. Day wages stood at around 2s. per day in the East Riding in the late 1840s⁴ but were reduced in the early 1850s. Caird estimated the average daily earnings of farm labourers at 2s. in the lowland districts of the county in 1850, which meant that the day wage had fallen to a level

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1. A.L. Bowley, 'The Statistics of Wages in the United Kingdom during the last 100 years (Part IV) Agricultural Wages', J.R.S.S. LXII (1899), 563-4; Wages and Income in the United Kingdom Since 1860 (1937); G.H. Wood, 'Real Wages and the Standard of Comfort Since 1850', J.R.S.S. LXXII (1909), 93.
 2. R. Giffen, 'The Progress of the Working Classes during the last half Century', J.R.S.S. XLVI (1883), 612, 621; J. Clapham, An Economic History of Modern Britain (1963), II, p.451; J.E. Thorold Rogers, Six Centuries of Work and Wages (1909), p.411.
 3. Labourers in ship building, engineering, cotton, and building increased their average wages by 20, 19, 42, and 33 per cent, respectively, between 1855 and 1874.- G.H. Wood, 'Real Wages and the Standard of Comfort Since 1850', loc. cit. p.93.
 4. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.125; F. Purdy, 'Earnings of Agricultural Labourers in England and Wales, 1860', J.R.S.S. XXXI (1861), 342-3; W. Wright, 'On the Improvements in the Farming of Yorkshire Since the date of the last Reports in the Journal', loc. cit. p.104.

where the benefits of piece and task work earnings in the spring and summer had been wiped out.¹

Day wages rose to 2s.4d. on the Wolds by the mid-1850s and were around 2s.2d. in the lowland districts; higher rates were paid to foremen, shepherds, horsemen, and cowmen in both regions.² The average day wage was 2s.3d. by 1860³ and 2s.6d. on many estates by the mid-1860s, and E.B. Portman in his report on the employment of women and children in East Riding agriculture took the view that this was the standard wage paid in all districts of the county.⁴ However, estate records show that it was the wage paid to labourers on the Wolds and that labourers in the Vale of York and Holderness were generally paid between 2s.2d. and 2s.4d. per day depending on their skill.⁵ Hired labourers on the small family-run farms of the Ouse and Derwent valleys were presumably paid less, reflecting their lower productivity, or perhaps more accurately, the lower technical efficiency of small farms. Alternatively, if wage rates were not actually lower, employment was sometimes more intermittent than on larger farms which reduced the effective day wage indirectly.

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1. Piece and task work normally boosted labourers' earnings to between 2s.3d. and 2s.4d. per day in the spring and summer. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. cit. p.125; J. Caird, English Farming in 1850-51 (2nd edn, 1968), p.318.
 2. Sewerby Estate MSS, E.R.R.O. DDLG/43/8; Everingham Estate MSS, E.R.R.O. DDEV/56/331-5; E.R.R.O. DDEV/61/11-12.
 3. F. Purdy, 'Earnings of Agricultural Labourers in England and Wales, 1860', loc. cit. p.342; Returns of the Average Rate of Weekly Earnings of Agricultural Labourers in Unions of England and Wales (hereafter 'Returns on Weekly Earnings') (1861); Newmarch, 'The Life of the Farm Labourer', Cornhill Magazine XXIV (1864), 178; F. Watkins, A Letter to the Archbishop of York on the State of Education in the Church Schools of Yorkshire (1860), p.1.
 4. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.363-90.
 5. Sewerby Estate MSS, E.R.R.O. DDLG/43/9; Everingham Estate MSS, E.R.R.O. DDEV/61/11-15.

The level of day wages remained unchanged during the late 1860s and the first year or so of the 1870s. Returns for Malton gave the winter rate at 2s.7d. per day in 1869¹ but this was not widespread. The major upturn in farm wages began in the February of 1872 as farm labourers began their agitation for higher day and task work earnings. This was essentially a national movement and, like 'Swing' a generation earlier, was strongest in the lower wage districts of southern England.² However, it developed its own momentum and overflowed into high wage counties like the East Riding. Striking farm workers convened meetings throughout the county, although there was a notable concentration of activity on the Wolds. Workers demanded 3s. per day and various increases for task work.³

Most farmers either met the demands of their labourers in full or gave them a substantial part of what they asked. Labourers on the Wolds

who /meated/ themselves realised from 16s. to 18s. per week /ie. for a six-day week/ whilst those with large families and were only receiving 7s. or 8s. with meat, now /received/ 9s. and 10s. with a shilling and their meat for Sunday work in the fold yard.⁴

Efficient adult labourers in south Holderness were also given a basic day wage of 3s.⁵ but the majority of lowland farmers paid 2s.6d., though a considerable minority on the Vale of York paid 2s.8d. and rates as high as 3s.6d. were quoted for shepherds and other specialist labourers. Only a small proportion of farmers failed to concede anything. Typical of this

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1. Returns on Weekly Earnings (1869).
 2. E.J. Hobsbawm and G.E. Rude, Captain Swing (1969), pp.165, 168-70 ff.
 3. Hull and Eastern Counties Herald, February-April, 1872; Drifffield Times, February-April, 1872.
 4. Drifffield Times, February 17, 1872. Labourers who meated themselves provided their own food unlike those meated by the farmer who were paid partly in cash and partly in food.
 5. Hull and Eastern Counties Herald, March 14, 1872.

group were farmers around Leven in the Hull Valley who warned their labourers that they were standing against property and that "property must prevail in the end". They threatened to lower wages and not re-hire those who had gone on strike.¹

The wage rates won in the early 1870s continued to be paid through to the winter of 1878-9. Wages then came under increasing pressure as farmers tried to meet the growing economic crisis by economising on labour, their biggest cost. Wages fell by about 5d. per day for an adult male labourer over the following year but the exact amount varied considerably from farm to farm and much of the earlier homogeneity in the district wage structure collapsed in the resulting confusion. The following wage data were collected for six unions in the East Riding in 1880. Day wages varied from 2s.6d. to 3s.4d. in the Skirklaugh Union near Hull for a ten-hour day in summer and an eight-hour day in winter. Wages were 2s.8d. to 3s.6d. around Beverley for an eleven-hour day in summer and an eight to nine-hour day in winter; 2s.6d. in the Pocklington Union; 2s.6d. to 2s.8d. around Selby at the southern edge of the Vale of York; 2s.6d. to 3s.6d. in the York Union; and 2s.8d. to 3s.2d. in the central Wolds.²

Part of these variations were the result of differences in skill and responsibility among farm workers themselves, but part, certainly at the level of the union, were the outcome of farmers making different responses to the deepening depression. Orwin and Whetham have commented on the homogeneity in the wages paid to farm workers within individual areas and have suggested that a tacit agreement may have existed between local farmers not to undercut wages or poach labour.³ Such agreements, and the wage

1. Beverley Guardian, February 24, 1872.

2. R.C. on the Depressed Condition of the Agricultural Interests (1880), pp.177-97.

3. C.S. Orwin and E.H. Whetham, History of British Agriculture 1846-1914 (1964), p.204.

norms associated with them, had clearly lost their force by the late 1870s and early 1880s.

Estate records are a valuable supplemental source of information on wage trends. They confirm the general phasing of wage movements described here and reveal the wage scales associated with the various classes of farm labour. The Sewerby estate of Yarburgh Lloyd-Graeme provides the most abundant, and the most complete run of wage data, encountered in this study. A wage index for the estate's home farm¹ has been constructed and is shown as Table 12.3.

Table 12.3. Movements in day wages for foremen, specialist labourers and general labourers on the Sewerby estate home farm, 1850-86.
(1865-74 = 100)

	Foremen	Horsemen/ Cowmen	Ordinary Labourers
1850	92	91	86
1854	92	91	93
1858	104	98	93
1862	92	98	96
1866	98	98	96
1870	98	98	96
1874	104	110	111
1878	116	116	121
1882	116	116	121
1886	116	116	121

Sources: Sewerby Estate MSS, E.R.R.O. DDLG/43/7-14.

Day wages increased by over one-quarter at Sewerby between 1850 and 1880. The earnings of foremen and specialist labourers increased by 26 per cent while those of ordinary labourers such as assistant cowmen and ploughmen increased by 41 per cent. The stronger increase in the wages of the less skilled can be traced to the effects of depression in the early 1850s as

1. The wages paid on the home farm of an estate were usually higher than those paid in the surrounding districts. This should be borne in mind since much of the following estate material relates to home farms. - A. Wilson Fox, 'Agricultural Wages in England and Wales during the last Fifty Years', J.R.S.S. LXVI (1903), 273.

their wages were cut back at that time while the wages of the more skilled held firm. The earnings of both groups rose strongly and uniformly in the two decades after 1855, foremen and specialist workers increasing their basic wage by 26-27 per cent and ordinary labourers increasing theirs by 30 per cent. Surprisingly there was no cut back in wage rates in the late 1870s and 1880s but this is probably explained by the ability of home farms to weather unfavourable seasons more easily than the average farm.¹

The difference in the wages of supervisory workers and ordinary labourers was predictably large. The foreman on the home farm earned 2s.8d. per day in 1850, the shepherd 2s.6d., the horseman and cowman 2s.4d., and non-specialist labourers 2s. Their day wages by 1880 were 3s.4d., 3s.2d., 3s., and 2s.8d., respectively.

Wages were similar on farms on the Everingham estate. The foreman and shepherd at Breaks Farm were paid 2s.6d. per day in 1851 and other labourers 2s, which remained unchanged until 1853. The foreman's day wage then rose to 2s.8d., the shepherd's remained unchanged and the basic day rate for ordinary labourers was increased to 2s.2d., and in some cases 2s.4d. depending on skill and responsibility. The basic day rate rose to 2s.4d. during the Crimean War but there was no change in the wages of either the shepherd or foreman. Wartime rates continued to be paid up to 1857 but they returned to 2s.2d. the following year,² and, judging by evidence from the neighbouring Petersfield Farm, remained at that level until the spring of 1872. The following rates were paid on the eve of the rural strike. The shepherd was paid 2s.8d. per day, the horseman and cowman, 2s.6d., assistant horsemen and superior ploughmen 2s.4d., assistant cowmen and non-specialist workers 2s.2d.³ The day wage earnings of

1. Ibid.

2. Everingham Estate MSS, Breaks Farm Account Book 1851-8, E.R.R.O. DDEV/56/331-5.

3. Ibid. Petersfield Farm Accounts, E.R.R.O. DDEV/61/11-22.

labourers of all types had therefore increased by only 7-8 per cent in the 20-year period covered by the Breaks and Petersfield manuscripts.

Wage rates on the Wolds were generally in advance of those on the lowlands. For example, the day wage of ordinary labourers and the foreman/shepherd was 2s.6d. and 3s.4d., respectively, on the Sledmere estate from the Crimean War down to the February of 1872. Wages then rose rapidly in the following months, ordinary labourers making between 2s.10d. and 3s., and the foreman and shepherd making 3s.8d. The basic earnings of general labourers rose by 15-20 per cent in these months and the earnings of supervisory workers rose by around 10 per cent.¹

The wages of general labourers were 7-13 per cent higher on the Wolds than in the lowland districts in the period up to early 1872, and those of specialist or supervisory workers were 20-25 per cent higher. This gap was not removed as a result of the upward shift in earnings in the 1870s; indeed it widened among general labourers though it narrowed somewhat among supervisory workers. A differential of 11-17 per cent was calculated for the former and 5-18 per cent for the latter.

5. Task and piecework earnings in the East Riding, 1850-80.

Task and piecework in mixed farming involved threshing and hedging and ditching in the winter, turnip hoeing in the spring and haymaking and harvesting in the summer. Most of these activities were concentrated in the late spring and summer months and the earnings from them raised the labourer's wage above the basic winter rate. Task and piecework rates showed a general tendency to rise in these three decades, which applied even to the 1860s when day wages remained stationary on many estates throughout

1. Sledmere Estate MSS, E.R.R.O. DDSY/98/37.

the county. But although their trend was upwards, task and piece rates fluctuated strongly about their basic trend values. An increase in one year could be followed by a reduction in the next and a sharp increase the year after, which was untypical of movements in day wages and can be attributed chiefly to fluctuations in the demand for casual labour. The earnings associated with turnip hoeing, grass mowing, threshing, and corn harvesting are discussed below.

Turnip hoeing was an arduous task and hoers were paid 3s.6d. per acre in the late 1840s,¹ about 3s. in the early 1850s, and upwards of 6s. on lowland estates during the Crimean War.² Farm workers were then in short supply and task rates were presumably higher on the Wolds where the labour shortage was more acute. Earnings from turnip hoeing fell after the war and the rate varied between 5s. and 5s.6d. per acre in the late 1850s and early 1860s.³ This was also the rate on the Wolds until 1864; it then rose to 7s. in 1865 and was quoted variously at 7s. and 8s. the following year. This continued down to 1872 when the rate was increased to 8s.6d.⁴

The average rate for hand mowing varied from 2s.9d. to 3s. per acre in the late 1840s,⁵ and from 3s.6d. to 4s. for most of the 1850s. Five shillings per acre was quoted on some estates in the early 1860s but this was exceptional. Rates fell considerably with the coming of mechanisation. Mowers were paid 4s. an acre on the Wolds in the 1860s,

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1. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.111.
 2. Sewerby Estate MSS, E.R.R.O. DDLG/43/8.
 3. Ibid. E.R.R.O. DDLG/43/9.
 4. Sledmere Estate MSS, E.R.R.O. DDSY/98/37.
 5. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.111.

3s.6d. in the early 1870s¹ and 3s. was quoted for the Sewerby estate in 1873.² However, labourers increased their total earnings as they could cut a greater acreage in a shorter period than prior to mechanisation.

The standard payment for threshing was 2s.6d. per day in the 1850s,³ though lower rates were quoted occasionally. Three shillings was paid on several lowland farms by the late 1850s and was common by the 1860s; 3s. to 3s.2d.⁴ was paid on the Wolds and remained at this level until 1872 when the rate was increased to 4s.⁵

The corn harvest was the most important time of the year for task and piecework. Harvesters were paid 7s.6d. an acre for cutting wheat in the late 1840s⁶ and James Caird found this unchanged in 1850-51.⁷ Piece rates were higher on the Wolds, especially in the more remote districts where 10s. an acre was paid for reaping wheat in 1860. This compares with 9s. on the lower Wolds in 1864, 8s.6d. in 1865 and 10s. in 1866.⁸ Piece rates for harvesting other cereals were about 20 per cent lower than for wheat.⁹

Data on task work earnings during the corn harvest are much more detailed than for piecework. Harvesters were paid 3s.6d. per day in the late 1840s¹⁰ and ancillary workers such as gatherers and binders were paid around 3s.

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1. Sledmere Estate MSS, E.R.R.O. DDSY/98/37.
 2. Sewerby Estate MSS, E.R.R.O. DDLG/43/12.
 3. Everingham Estate MSS, E.R.R.O. DDEV/56/331-5;
Sewerby Estate MSS, E.R.R.O. DDLG/43/7.
 4. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.98, 363-74.
 5. Hull and Eastern Counties Herald, February-March, 1872; Driffeld Times, May 8, 1875; Sledmere Estate MSS, E.R.R.O. DDSY/98/37.
 6. G. Legard, 'Agriculture in the East Riding of Yorkshire', loc. cit. p.125.
 7. J. Caird, English Farming in 1850-51 (2nd edn, 1968), p.318.
 8. Sledmere Estate MSS, E.R.R.O. DDSY/98/37.
 9. Ibid.
 10. G. Legard, 'Agriculture in the East Riding of Yorkshire', loc. cit. p.125.

These rates remained in force on most Vale and Holderness farms until the Crimean War when the rate for harvesters rose to as high as 4s.¹ It remained at this level on the home farm of the Sewerby estate in the second half of the 1850s but fell on the Everingham estate and presumably on the majority of estates throughout the county. Even at Sledmere, where wages were above the county average, harvest wages were only 3s.6d. per day in the mid-1860s, though they rose to 5s. in 1872 and remained at this level until the late 1870s. The corresponding wage on lowland estates varied between 4s.2d. and 4s.8d.²

Farm labour requirements peaked during the corn harvest and outside labour had to be hired on most farms. The wages paid for the four weeks of harvest were recorded in the local press and give both an excellent insight into the overall trend in task work earnings and the reasons for periodic fluctuations in their size. Farmers hired mowers for between £3.12.0 and £4 at the Bridlington hirings of 1852. These rates were above those for 1851 and reflected the almost total absence of Irish labour and the effects of increasing emigration - a response to the rural depression.³ Wages were low on the Wolds in 1854 partly because labour was abundant and partly because the corn harvest was slow to ripen thereby limiting the demand for labour. The very best mowers received £3.4.0 to £3.12.0 while other labourers received £2.16.0.⁴ Harvesters were in strong demand in 1857 and wages were higher than any previously recorded; crops had ripened rapidly and farmers were in desperate need of additional labour. Mowers were paid £4.4.0 to £4.16.0 while gatherers and binders were paid £3.12.0

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1. Everingham Estate MSS, E.R.R.O. DDEV/56/333-5; Sewerby Estate MSS, E.R.R.O. DDLG/43/8.
 2. Sewerby Estate MSS, E.R.R.O. DDLG/43/12.
 3. Hull Advertiser, August 13, 1852.
 4. Ibid. August 26, 1854.

to £4.¹ Wages also rose quickly in 1859. Labour was again in short supply owing to emigration, recruitment into the army and delays in the southern harvest which hindered the northward drift of migratory harvesters. Mowers were paid £5 for the month and in some cases £6.²

A similar combination of circumstances influenced harvest wage movements in the 1860s³ and 1870s, though additional factors became important in the later period. The harvests of 1871 and 1872 were poor and attempts to raise wages through strike action failed. Harvest earnings in fact fell in 1872, when the labourers' movement was at its strongest in the East Riding,⁴ and remained low in 1873, in spite of rising prices which eroded labourers' living standards and made higher wages desirable on social grounds.⁵ Wages rose strongly in the mid-1870s. Harvesting conditions were excellent and labour was relatively scarce and mowers were engaged for between £5 and £6 for the month, stookers for £4.18.0 to £5, and binders for £3.12.0.⁶ This was the high water mark in harvest earnings as task rates were affected immediately by the onset of depression. Wages fell by 8s. to 12s. for the harvest month for each category of labour in 1877⁷ and the fall accelerated between 1878 and 1880. The economic position of harvesters was aggravated by depression in the Cleveland and north Yorkshire mining industry which released large numbers

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1. Ibid. August 29, 1857.
 2. Ibid. August 13, 1859.
 3. Ibid. August 27, 1862; Hull and Eastern Counties Herald, August 19, 1869.
 4. Drifffield Times, August 14, 1872; August 24, 1872.
 5. Ibid. August 30, 1873.
 6. Ibid. August 19, 1876.
 7. Hull and Eastern Counties Herald, August 23, 1877.

of miners and factory workers on to the rural labour market. It was also aggravated by the unwillingness of farmers to maintain their demand for rural labour as successive harvests had been damaged by heavy rain and were slow to ripen.¹

By 1880 harvesters still continued to attend statute hirings in large numbers in each of the county's market towns but only the very best men, capable of thatching and known to be sound and trustworthy workers, were paid anything like the rates prevailing in 1877. Irish labourers earned £3 to £3.8.0 for a month's engagement while English labourers hired at £3.4.0 to £4, and youths who followed the reaper made £2.12.0 to £3.² A plentiful supply of labour coupled with weak demand enabled farmers to drive a hard wage bargain.

6. Farm servants' wages in the East Riding, 1850-80.

Farm servants' wages increased in line with the wages of day labourers. A foreman on the Wolds earned between £22 and £25 per annum in the late 1840s, a waggoner £14 to £16, a plough lad £8 to £12, and a shepherd £21 to £23, food and lodging being provided free by the farmer.³ Wage rates were a pound or two lower for each category of labour in the lowland districts, south Holderness excepted, and remained unchanged until the Crimean War when they rose briskly. Wages were "rather high for all descriptions of servants" at Bridlington in 1856⁴ and also in Howdenshire,⁵ an area dominated by small farms. At the opposite end of the county's

1. Ibid. August 22, 1878.

2. Ibid. August 26, 1880.

3. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.125.

4. Hull Advertiser, November 15, 1856.

5. Ibid. November 22, 1856.

farming spectrum, male and female servants on the Wolds stood out for increased wages and many obtained them,¹ their hand strengthened by the effects of war, and to a lesser extent the effects of emigration, which had created a temporary shortage of labour.

Farm servants were in a much weaker position in the second half of the decade and wage levels came under increasing pressure. Their continued demands for higher wages met firm resistance and Wold farmers, and possibly others throughout the county, responded by substituting less experienced, and cheaper labour, for the better class of servants who were leading the drive for higher wages.²

The wages paid to farm servants, though they varied from time to time according to demand and the state of the labour market, remained fairly constant between 1850 and 1870, and most foremen, ploughmen and waggoners earned only slightly more in 1870 than 20-years earlier.³ The wage gap between the more advanced districts and the less advanced remained unchanged. Foremen and waggoners hired for £18 to £24 per year in north Holderness⁴ and the Vale of York; for £18 to £30 in south Holderness, and for £16 to £25 on the Wolds, more experienced foremen being paid between £28 and £30.⁵

There was a mixed response to the labourers' movement in the early 1870s. Servants increased their wages by £1 to £2 per year in some parts of the Wolds in 1872⁶ but farmers opposed higher wages in Malton and the

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1. Ibid. November 15, 1856; Beverley Guardian, November 10, 1856; November 27, 1856.
 2. Hull Advertiser, November 21, 1857; November 19, 1859.
 3. Ibid. November 22, 1862; Hull and Eastern Counties Herald, November 19, 1864; November 21, 1867; November 17, 1870; December 1, 1870; R.C. on the Employment of Children, Young Persons and Women (1867), p.94.
 4. Hull and Eastern Counties Herald, November 19, 1864.
 5. Driffild Times, November 14, 1868.
 6. Ibid. November 16, 1872.

northern Wolds.¹ This must also have occurred in lowland areas because of the high level of rural unemployment in the winter of 1872-3. Unusually severe weather in the autumn of 1872 coupled with demands for higher wages encouraged farmers to hire fewer ploughmen and general servants.²

The trend towards higher wages was unmistakable in each district in the mid-1870s. Foremen on the Wolds were paid £25 to £30 and in a few instances £32 to £33; young waggoners accepted £18 and experienced waggoners £20; strong ploughlads settled for £13 to £15.³ Rates continued to be slightly lower in Holderness and the Vale of York. Experienced foremen were paid £28 to £32 at the York statutes, inexperienced foremen £20 to £26, waggoners £17 and upwards, and ploughlads £10 to £14.⁴ Foremen were paid £30 to £35 at Hedon in mid-Holderness, waggoners £17 to £20, and ploughlads £12 to £14.⁵ The social cost of higher wages was unemployment. Wold farmers tended to hire youthful servants rather than adult labourers and unemployment was reported to be widespread on the Vale of York, but curiously, the demand for higher wages continued into 1876 and even 1877. There was some justification for the high wage movement in parts of the Wolds, the demand for labour "being general and unabating",⁶ but it made little sense in the north of the county, the Vale of York, and Howdenshire where many farm servants were unemployed throughout the winter months.⁷

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1. Hull and Eastern Counties Herald, November 14, 1872; November 21, 1872.
 2. Ibid. December 5, 1872; December 12, 1872.
 3. Driffield Times, November 14, 1874.
 4. Hull and Eastern Counties Herald, November 17, 1873; November 12, 1874.
 5. Ibid. November 19, 1874.
 6. Driffield Times, November 11, 1876; November 18, 1876.
 7. Hull and Eastern Counties Herald, November 23, 1876; December 7, 1876; November 8, 1877; November 15, 1877; November 29, 1877.

1876 and 1877 marked a turning point in farm wages. Wage movements had been very uncertain in 1877, some farmers raising their servants' wages slightly, others forcing reductions. But there was no uncertainty about wage movements in the following few years. Would farmers cut wages by between £2 and £5 per year in 1878,¹ and the demand for labour contracted so considerably in Howdenshire, and presumably elsewhere in the lowlands, that ploughmen and waggoners lost between £4 and £5 - about one-fifth to one-quarter of their yearly income, exclusive of food and board. Foremen's wages were less affected.²

The movement against wages gathered pace in 1879 and the greatest cuts were now made in the wages of foremen, and to a lesser extent in the wages of waggoners and other senior servants. Demand for ploughboys increased, principally for reasons of economy, and in the same vein, demand for foremen decreased as farmers began to take over more supervisory duties. By 1880 foremen could be hired at Drifffield, Howden and Malton for between £24 and £28, waggoners for £16 to £18, and ploughboys for £10 to £14,³ indicating that wages had fallen but were still above the levels prevailing in the 1850s and 1860s.

7. Rural trade unionism in the 1870s.

The effects of trade unionism were mostly short lived and the organisation of agricultural workers into an effective trade union was never accomplished on a permanent basis in the nineteenth century.

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1. Ibid. November 14, 1878; Drifffield Times, November 16, 1878.
 2. Hull and Eastern Counties Herald, November 21, 1878.
 3. Ibid. November 18, 1880; Drifffield Times, November 13, 1880.

There were various reasons for this. Rural labourers were scattered among a multitude of farms. Their meetings lacked the sense of strength and collective security which the meetings of factory labourers conveyed, and, in the conservative atmosphere of the countryside where the landowner was "in league with the farmer, and the clergyman in league with both ...", the "Act of joining the union appeared not so much like joining hands with a host of fellow workers ... as like an eccentric action, which would certainly be talked about in the village and might be reported to the individual's employer".¹ Technical factors also made it difficult to organise labour. Comparatively low wages made it hard to pay union subscriptions. Weak unionisation led to weak bargaining power, particularly where labour was plentiful, and this in turn reinforced the trend towards low wages. Farm workers, in fact, might have been unable to co-ordinate their strike action without the organisation of the Primitive Methodists.²

Whatever the difficulties of rural organisation, the farm labourers' movement for better wages and conditions swept through many parts of England between 1872 and the onset of depression at the end of the decade, though much of its momentum was lost by the summer of 1872 with the farmers' victory in the Eastern Counties lock-out. Total union membership had reached 150,000 out of 650,000 agricultural labourers in England at that time,³ its early success being largely an outgrowth of the success of unskilled trade unionism in the towns and cities, and of increasing working class radicalism in the 1860s and 1870s.⁴ In the East Riding, for example,

1. R. Lennard, Economic Notes on English Agricultural Wages (1914), p.16.

2. J.E. Thorold Rogers, op. cit. p.150.

3. J.P.D. Dumbabin, 'The Revolt of the Field. The Agricultural Labourers' Movement of the 1870s', Past and Present, 26 (1963), 68. The National Union headed by Arch had 80,000 members in its own right. J.P.D. Dumbabin, Rural Discontent in Nineteenth-Century Britain (1974), p.75.

4. Examples of this would be Fenianism, neo-Malthusianism, secularism, republicanism, The Land and Labour League, the Nine Hours Movement. See J. Saville, 'The Background to the Revival of Socialism', Bulletin of the Society for the Study of Labour History 11 (1965).

there had been considerable industrial unrest from November-December 1871. Seed crushers in Hull formed a committee to investigate wages, hours and conditions; Hull sawyers demanded a nine-hour day; and Hull building unions demanded a 49.5 hour week. Similar requests were made by employees of the North Eastern Railway Company, and by workers in Beverley and Malton.¹ The determination to strike created its own momentum and echoes of unrest were heard from as far apart as the Hull police force, which 'requested' an eight-hour day, longer holidays and increased wages,² and the washer women of Bridlington who gave notice that they would not work for under 1s.6d. per day and outside the hours of 7 am to 5 pm without extra payment.³

The major economic upswing of the early 1870s underpinned this industrial activity, as well as the growth of unionism among farm workers, but almost equally important "was the widespread and largely successful urban movement in 1871-2 for a nine-hour day; this clearly inspired similar demands on the part of farm servants in Scotland, in north Warwickshire, and above all, in Lincolnshire ...".⁴ Urban radicalism filtered down to the country worker through many channels. The railway freed the countryside from its traditional isolation; rural craftsmen such as cordwainers had a long tradition of radicalism and it is likely that they were aware of political developments occurring beyond the parish boundaries; and above all, agricultural labourers themselves must have been increasingly aware of industrial action in the urban centres through the cheap press.

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1. Hull and Eastern Counties Advertiser, November 30, 1871; December 7, 1871; December 14, 1871; February 22, 1872.
 2. Ibid. April 4, 1872.
 3. Ibid. April 18, 1872.
 4. J.P.D. Dumbabin, Rural Discontent in Nineteenth-Century Britain (1974), p.74.

The labourers' movement of the 1870s bore none of the sinister features of 'Swing' partly because it was inspired by hope in a better future, while earlier 'revolts' were based on despair and revolved around the destruction of farmers' property, and partly, and more importantly, because the cheap press freed the farm workers' leaders from their previous anonymity, and articulated their demands for better wages and conditions in a clear and sympathetic way. The impact of the cheap press was ably summed up by an East Riding labourer in the following terms:

The movement hasn't come upon me unexpected. Cheap papers have had something to do with the movement. Thank God for the poor man's paper, says I. "Late this morning" says master, looking sour and crabbed. "Yes sir, I had to wait 5 minutes for my paper". "What do yah want wi a paper?" he says. The fact is they can't bear education but its come.¹

Agricultural labourers began their own press during the 1870s. William Banks, leader of the Amalgamated League (a Lincolnshire based union), started the Labour League Examiner which came out weekly and sold for one penny, and the Labourers Union Chronicle circulated in parts of Lincolnshire. Banks also sold copies of the Beehive.²

The Labour League had contact with labourers in the East Riding. It had an organising agent at Kilham and a branch in Hull,³ and William Banks and his colleagues made several lecture tours of the Riding paying particular attention to the Wolds. The policy was successful and a branch of the Amalgamated League was established in Driffield in February 1873 following a lecture tour.

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1. Eastern Morning News, March 22, 1872.
 2. R. Russell, The Revolt of the Field in Lincolnshire (1956), p.50.
 3. *Ibid.* pp.39-40.

Historians have generally considered that agricultural trade unionism was unimportant in the northern counties. T.E. Kebble writing in the 1880s thought that little was "known of Mr. Arch higher up than Lincolnshire"¹ and Reg Groves, writing more recently, has given a similar impression.² But these views are now being challenged. Dunbabin has shown that the nine-hours movement was strong among farm workers in Northumberland in the early 1870s and that they formed the Northumberland Agricultural Labourers' Union in 1872, though it did not organise any strikes and had little impact on wages.³ A little further south, East Riding labourers also responded positively to unionisation. Labourers in the Hull Valley demanded higher pay and shorter hours, and strikes and union meetings were commonplace on the Wolds.⁴ Agricultural labourers formed a labour league at Bridlington, which extended over the entire parish, and established a strike fund.⁵ A branch of the Agricultural Labourers' Protection Society was formed in the parish of Kilham and the Nine Hours Movement of the Yorkshire agricultural labourers was officially begun there amid great celebrations.⁶ Agricultural labourers formed a labour club in Hedon in April, 1873, which aimed at assisting emigration and labourers who had been dismissed from their jobs because of union membership.⁷ The Kilham Agricultural Labourers' Protection Society joined the Amalgamated Labour League at the end of 1873.⁸ Numerous other clubs and societies were formed and agitation continued even in parishes such as Leven where the formal setting up of a union had been rejected.

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1. T.E. Kebble, The Agricultural Labourer (2nd edn, 1887), p.16.
 2. R. Groves, op. cit. pp.54-8.
 3. J.P.D. Dunbabin, Rural Discontent in Nineteenth-Century Britain, pp.155-6; 161ff.
 4. Beverley Guardian, February 10, 1872;
Hull and Eastern Counties Herald, February 29, 1872.
 5. Hull and Eastern Counties Herald, March 7, 1872.
 6. Ibid. February 27, 1872.
 7. Ibid. April 11, 1872.
 8. Driffeld Times, December 28, 1872.

Agricultural trade unionism in the East Riding was very similar to that in Lincolnshire during 1872 and early 1873, both movements being organised on the basis of small, and often competing, local societies. Trade union organisation underwent little change in the East Riding in the following months, whereas in Lincolnshire it went under the umbrella of the Amalgamated League and the National Union.

It is difficult to access the precise influence of trade unionism on agricultural wages. The labour market certainly tightened during the expansive phase of the business cycle and this, coupled with increased investment - it will be remembered that reaping machinery first became important on the lowlands of the East Riding in the early 1870s - would have forced wages upwards. However, the process of wage adjustment would have taken much longer without trade union intervention. Martin Maxwell, a labourer who was quite prominent in the East Riding movement, went one step further and asserted that there would have been "a long silence on the subject" from farmers.¹ Most farmers conceded their labourers' demands arguing that market conditions were against the farmer and that profits were being eaten away by rising rents, this latter even being conceded by Arch.² What agricultural trade unionism did was reinforce the pressure for higher wages during the expansive phase of the business cycle, though it was unable to exert much pressure when the business cycle turned downwards.

8. Some conclusions on agricultural wages.

Two things are quite clear from this study. First, money wages rose for the greater part of the period between 1850 and 1880, and second

1. Beverley Guardian, March 9, 1872.

2. J. Arch, op. cit. p.128.

wage rates were significantly higher on the Wolds than in either the Vale of York or Holderness. The general rise in wages was in line with the upward drift in the earnings of most skilled and part-skilled workers in industry, as well as with the growing efficiency of the agricultural industry itself. Regional differences in wage rates can be traced to the fact that labour was in short supply on the Wolds, and labour saving technology was tried and used there much sooner than on the lowlands, which were held back by a tangled pattern of landownership, a traditional farming landscape, and the fact that farmers had access to a reasonably large pool of available labour.

CHAPTER THIRTEEN

SOCIAL ASPECTS OF FARM LABOURING IN THE EAST RIDING, 1850-80.

Evidence on total family earnings, unemployment, charity, education, and social reform will be considered here with the intention of producing a general statement on rural living standards over the third quarter of the nineteenth century. No attempt will be made to estimate real incomes precisely because this would require much fuller data on prices and cottage rentals than was available locally, and also more evidence on the size of earnings in kind. Farm workers were in varying degrees partially independent of the market for basic foodstuffs. Part of their flour came from gleanings; milk and butter were free on some farms or were available at below retail prices on the majority; and cottage gardens and allotments provided an ample supply of vegetables. Cottage rentals were also subsidised, especially in 'close' villages,¹ again making it difficult to estimate non-cash earnings in a manner suitable for generalisation. Indeed, non-cash earnings were so variable that labourers themselves were often unable to determine their own income with any precision.² This statistical haziness makes a strict standard of living analysis impractical and suggests the value of a more impressionistic study.

1. Trends in family earnings: The earnings of the head of household.

The earnings of the head of household formed the largest component

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1. 'Close' villages or townships were owned and controlled by perhaps a single landed family or at most a small group of landowners. 'Open' villages were owned by numerous small proprietors. They were overcrowded and often insanitary and second class cottages were let at exorbitant rents.-
B.A. Holderness, ' 'Open' and 'Close' Parishes in England in the Eighteenth and Nineteenth Centuries', Agric. Hist. Rev. 20 (1972), 126.
 2. C.S. Orwin and E.H. Whetham, op. cit. pp.205-6.

of family income, though the intermittent earnings of his wife and children were often necessary to raise the family above the poverty line.¹ A labourer's income varied with his skill and status on the farm and the regularity of his employment. Assuming full employment an ordinary labourer in Holderness or the Vale of York earned between £30 and £35 per year in the early 1850s, and a foreman or shepherd earned about £40. This had risen to upwards of £37 for an ordinary labourer by the early 1860s, £39 for a waggoner and £44-£45 for a foreman.² These incomes were calculated for labourers on the Sewerby estate and were slightly above the average for the lowland districts, but they are reasonably representative of the area and agree closely, for example, with the total cash earnings of North Riding labourers.³

Incomes were higher on the Wolds. A good foreman was paid £50 or more in the 1860s, a shepherd or cowman received much the same as a foreman in the lowland districts, and an ordinary labourer was paid between £38 and £40. The wage increases of 1872 added a further £3-£4 to yearly earnings. In contrast a competent labourer on the lowlands earned about £40 and an experienced foreman about £45.⁴

These estimates are based on the assumption of full employment. Workers who followed the threshing machine in the winter and took a succession of casual jobs during the spring and summer must be excluded,⁵

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1. T.E. Kebble, The Agricultural Labourer (2nd edn, 1887), p.57.
 2. Sewerby Estate MSS, E.R.R.O. DDLG/43/7-9.
 3. A. Wilson Fox, 'Agricultural Wages in England and Wales during the last 50 years', J.R.S.S. LXVI (1903), 286.
 4. Sewerby Estate MSS, E.R.R.O. DDLG/43/12; Sledmere Estate MSS, E.R.R.O. DDSY/98/37.
 5. This group included the Irish labourers who came to England for the hay and corn harvest, and, with the East Riding in mind, labourers from grazing districts like the North Yorkshire Moors and Pennines.- E.J.T. Collins, 'Migrant Labour in British Agriculture in the Nineteenth Century', Econ. Hist. Rev. 2nd Ser. XXIX (1976), 42-5, 51. Wold Rangers formed a small part of the East Riding labour force and were notorious for their migratory way of life and their brushes with the law.- J. Fairfax Blakeborough, Sykes of Sledmere (1929), p.93.

but the estimates of money earnings apply to the bulk of workers who had regular jobs but lost the odd day's work each winter. Unemployment always rose at this time because severe weather reduced the amount of outdoor activity, and because autumn ploughing, if it was well advanced, reduced demand for ploughmen and other senior labourers until the following February or March. However, unemployment was not serious on East Riding farms, apart from under very testing conditions such as in the late 1870s, and the annual cash earnings mentioned above were fairly representative of the county.

This impression of stable employment in agriculture is based on the following observations. Intermittent employment was associated more with small farms and regions with inadequate capital resources¹ than with more spacious² and wealthy counties like the East Riding. This stands despite the shortcomings of several lowland districts. Second, the labour market was much tighter than in southern England which ensured that a large pool of unemployed labour did not form over the winter period. And finally the mixed farming system provided a wide variety of employment over the agricultural year.

This last point is worth taking up in detail because it gives a useful insight into the breadth of activities performed by East Riding labourers. October began the agricultural year and was a busy period with the first ploughing of spring corn, hedging and ditching, and work with livestock. November and December were devoted to hedging and ditching, general repairs to farm buildings and equipment, indoor work like threshing, and tending livestock which was a major winter task. January was spent

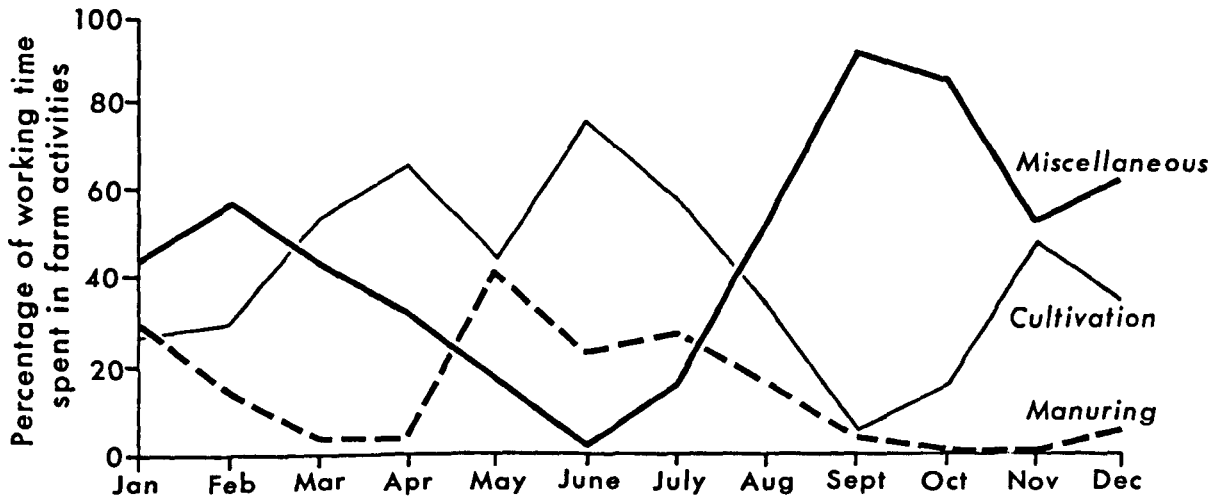
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1. A. Wilson Fox, 'Agricultural Wages in England and Wales during the last 50 years', loc. cit. p.295.
 2. East Riding farms were above the average size for England and Wales. See Chapter 3: 'Farm Size and Economic Progress in the East Riding, 1850-80'.

ploughing barley land, more hedging and ditching, spreading manure, and felling and carting timber. February and March were occupied with lambing, sowing oats, vetches, peas, beans, and turnips; cross ploughing potato land, double ploughing barley land, and harrowing and rolling wheat under-sown with clover. Field work became hectic from March and this continued through April and May. Especially important in this period was the making, carting and spreading of manure. June was taken up preparing for the hay harvest, hoeing potatoes, liming, sheep dipping and sheering, while July brought hay-making, more liming and manuring, weeding potatoes and turnips, and ploughing the fallow. August and September were dominated by the corn harvest.¹

Trimmer has estimated that mixed farming increased the total demand for labour on a year round basis by about 40 per cent compared with the old practice of two white crops and a fallow. This "did not put any added pressure on labour supplies in the critical harvest period"² but it did create two new peaks in the demand for labour between February and April and between May and July, which was an important factor in increasing the stability of farm employment in counties like the East Riding.³

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1. G.E. Fussell, Farming Systems from Elizabethan to Victorian Days in the North and East Ridings of Yorkshire (1946), pp.26-38.
 2. C.P. Trimmer, 'The Turnip, The New Husbandry, And The English Agricultural Revolution', Quart. Journ. of Econ., LXXXIII (1969), 392, 394.
 3. The March peak was the result of the double hoeing of barley made necessary by the planting of turnips in late February. The peak in May and June was traceable to ploughing and sowing, again related to turnip husbandry.

Figure 13.1 The Apportionment of Labourers' Time Between Different Farm Duties Defined as Cultivation, Manuring and Miscellaneous, on the Sledmere Estate Home Farm, c. 1860.*



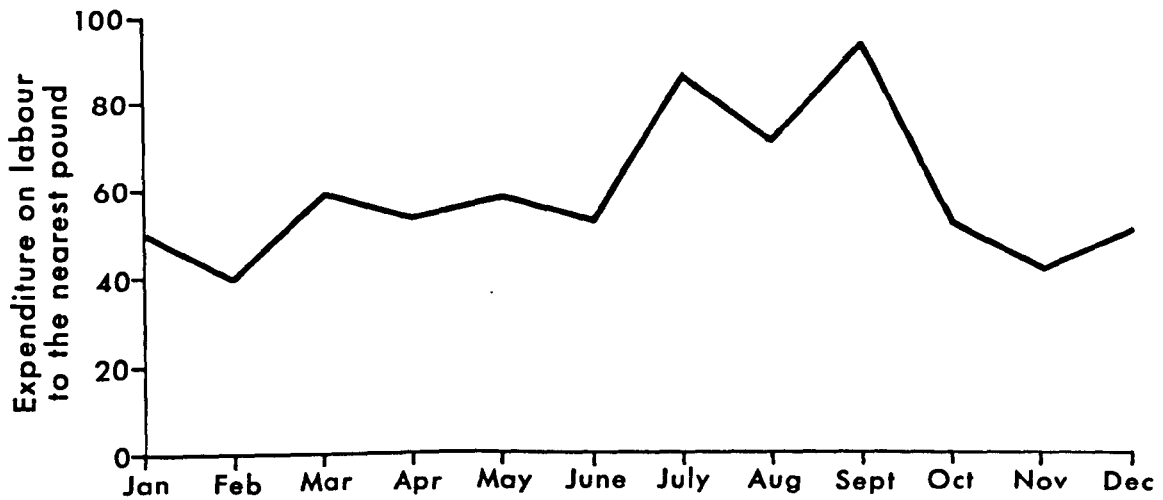
Source: Sledmere Estate MSS, Labourers' Journal, E.R.R.O. DDSY/98/56.

* Cultivation encompasses the following activities: ploughing, harrowing, rolling, and sowing. Manuring: the preparation, carting and spreading of manure. Miscellaneous: in winter threshing, repairing roads and buildings, feeding livestock, cleaning turnips, and carting; and in summer hay-making and corn harvesting.

The work profiles constructed for the Sledmere estate home farm were probably typical of many mixed farms in the East Riding and indicate that there were a wide variety of farm jobs even during slack periods. Seasonal fluctuations in demand for labour were also typical with demand rising in the spring (Figure 13.2 shows minor peaks in March and May), and peaking between July and September.¹

1. This agreed, for example, with the pattern of demand outlined by C.P. Trimmer, 'The Turnip, The New Husbandry, And The English Agricultural Revolution', loc. cit. p.394.

Figure 13.2 The Level of Employment on the Sledmere Estate Home Farm as shown by the Labour Bill, c. 1870.



Source: as in Figure 13.1.

These seasonal peaks were met by engaging women and children, itinerant labourers, and in the case of the Sledmere estate, switching foresters to the corn fields.¹

The labour requirements of the Sledmere home farm, and of mixed farms elsewhere in the county, were fairly high throughout the year and this, coupled with the tightness of the local labour market, the generally progressive nature of East Riding farming and the greater 'morality' of farmers in matters relating to employment,² ensured that the great bulk

1. The two most important periods in the foresters' year are March-April and October-December judging by the foresters' monthly wage bill on the Sledmere estate.- Sledmere Estate MSS, E.R.R.O. DDSY/98/37.
2. From the 1840s an increasing number of landowners came to realise that casting labourers on to the parish in the slack season was not only a great hardship for the labourers and their families but was a positive injustice.- G. Nicholls, 'On the Condition of the Agricultural Labourer; with Suggestion for its Improvement', J.R.A.S.E. VII (1846), 9.

of labourers found engagements throughout the year. Under these circumstances it seems reasonable to assume that there was continuous employment during most of the years between 1850 and 1880, and that workers' earnings did not depart too much from those calculated earlier.

2. Trends in family earnings: The earnings of women.

Women who engaged in farm work earned considerably less than men and their wages, also like those of male labourers, varied from district to district. A day wage of 8d.-10d. was common in many lowland parishes in the 1840s, with 10d.-1s. for hay-making and turnip hoeing, and 1s.6d.-2s. for harvesting corn. This summer rate was also paid on the Wolds but the standard day wage was higher, 10d.-1s. being common. Wage rates rose slightly over the following two decades and then rapidly in the early 1870s with summer wages about 18 per cent higher in 1873 compared with 1869, and 35 per cent higher compared with the 1840s.¹

Wage levels were not the main determinant of womens' annual earnings by field work. The crucial variable was the regularity of employment which was influenced by the standard of farming in the various districts and the labour requirements associated with the principal crops. Female employment fluctuated by the mile but the overall pattern, despite the complexities at parish level, was quite distinct. The potato growing areas² made the most intensive use of female labour and employment was available virtually on a year round basis for women who wanted it. There were fewer employment opportunities on the Wolds but employment levels were still above the county average. This also applied to several parishes in the Vale of York outside the potato growing districts, but it did not apply to Holderness.

1. Reports of Special Assistant Poor Law Commissioners on the Employment of Women and Children in Agriculture (hereafter Reports on the Employment of Women and Children in Agriculture) (1843), p.284; R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.358; Returns on Weekly Earnings (Liii 701, 1873).

2. See Figure 1.4, p. 6.

In the best parts of Holderness, there was really not much call for the services of women and children, no potatoes or line being grown, and in the better classes of farms, not much weeding (the land not being subject to ketlocks), therefore apart from hay-time and harvest, the work of the farm consisted very much of the heavy operations of draining, banking, hedging etc. in which women and children were of no service ...¹

At a more detailed district level, female employment varied as follows in the early part of the period. Two-thirds of females belonging to the "labouring classes" were employed at field work for some part of the year around Dunnington in the Vale of York; four-fifths were employed around Osbaldwick, and female employment was described as a necessity in the Selby area.² In contrast only one-quarter of able bodied females in parishes like Patrington and Ottringham in south Holderness found employment either weeding in the immediate harvest period or harvesting in the August/September period. Central Holderness and the Hull Valley were similar except for the district around Cottingham where market gardening gave continuous employment to some women. Women labourers were in strong demand on the Wolds, especially the high Wolds. Turnip hoeing was important in April and May and many females were employed from spring until the end of the corn harvest:

... the soil there /was/ subject to brassocks or ketlocks, turnips /were/ extensively cultivated, and ... villages /were/ very thinly scattered and farmers /were/ glad to avail themselves of any extra aid they /could/ procure when field work /was/ pressing.³

The use of female labour reached its peak in the 1850s and 1860s and then declined, many contemporaries noting a quite sharp fall from the second half of the 1870s. The fall was hardly perceptible in Holderness

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1. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.370.
 2. Reports on the Employment of Women and Children in Agriculture (1843), pp.308-16.
 3. Ketlocks and brassocks are varieties of weeds.- R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.370.

largely because female workers had always been used sparingly, but it was noticeable in many parishes in the Vale of York, the majority of women being employed for the harvest-period only. Females continued to work in large numbers in the potato growing districts but there was now greater variation in the level of employment offered compared with a generation earlier. In the Selby area women were still employed for most of the year hoeing turnips in the spring, hay-making and harvesting in the summer, and lifting potatoes in the autumn, and it was quite common for Howdenshire women to work alongside gangs of Irish labourers during periods of peak activity. On the other hand there were several parishes where women were not employed at manual tasks or where employment was much reduced.¹

The decline in female employment can be traced to mechanisation and increased productivity on the land, which lessened the need for large drafts of casual labour, and to improvements in the condition of rural labourers. This latter point was made by several East Riding farmers and by T.E. Kebble for agricultural labourers nationally. He argued that raising labourers' wages was the key to eliminating child and female employment in agriculture² and mentioned £1 per week in this connection. Wages rose sharply in the early 1870s and although they fell at the end of the decade, labourers were still better off in real terms than at the end of the 1860s.³ However, it is debatable whether this improvement was sizable enough to make labourers markedly less dependent on the intermittent earnings of their family. Weekly wages had not risen anywhere near the £1 mark, even in the high wage counties, though higher wages must have affected the

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1. R.C. on the Depressed Condition of the Agricultural Interests (1880), pp.177-98.
 2. T.E. Kebble, The Agricultural Labourer (1870), pp.13, 20.
 3. T.E. Kebble, The Agricultural Labourer (2nd edn, 1887), pp.56-9.

level of female employment if only marginally.¹

The earnings of the 'average' female labourer are also debatable. Many able bodied women never worked regularly even in districts where female labour was common, and earnings, especially from piecework, were not always recorded in labour journals.² To add to the uncertainty, earnings fluctuated over time in response to changes in wage rates and the number of weeks worked.

Francis Doyle in his report on Yorkshire farming in the 1840s estimated that the 'average' female added £5.4.0 per year, or 2s. per week, to family income. This assumed that 15 weeks were worked each year, that the standard day wage was 10d., and that wages rose to 1s.10d. per day over the corn harvest. Doyle admitted three exceptions: £10 per year was considered realistic in the potato growing districts, £5-£6 was a reasonable expectation on the Wolds, while in many parishes in Holderness "a few shillings added to the 10s. or 12s. ... from perhaps three consecutive weeks following the scythe in the corn field [made] up the whole income from outdoor work".³ It seems reasonable to infer from Doyle's evidence that womens' earnings made up about 10 per cent of family income, that this probably amounted to around £6 per year by the early 1870s, assuming the proportion did not change in the meantime, and that this contribution fell by an unknown amount during the late 1870s and 1880s.

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1. A further factor lay behind the drop in female employment. It was commonly believed that field work 'coarsened' an unmarried girl, and the bad reputation earned in field work during the 1850s and 1860s gave country girls a distaste for 'goin afield' by the 1870s and 1880s.- F. Thompson, op. cit. p.49.
 2. The names of women engaged in farm labour were sometimes omitted from labour books entirely as wages were paid directly to their husbands.- A. Wilson Fox, 'Agricultural Wages in England and Wales during the last 50 years', loc. cit. p.300.
 3. Reports on the Employment of Women and Children in Agriculture (1843), p.283.

3. Trends in family earnings: The earnings of children.

Children assisted in farm work at certain times of the year and their earnings provided a much needed supplement to family income. Casual employment began around the age of eight or ten depending on the district.¹ Children on the Wolds began tenting,² brassocking³ and flint gathering at the age of eight; work in the potato fields began at the age of seven, and in some cases six, in Howdenshire; while ten was the normal age in Holderness, many farmers considering younger children unsuitable for field employment.⁴

Wages varied slightly between the different districts. In the 1840s 6d. per day was paid for tenting, planting potatoes and hoeing turnips in the Vale of York, around Goole and in central Holderness; 5d. was paid in Howdenshire; 4d.-5d. in south Holderness; and 4d.-6d. on the Wolds, thereby reflecting differences in the age and type of work performed by the child labourers.⁵ These rates continued into the mid-1850s without significant change, though higher rates were paid on a minority of farms, usually home or model farms.⁶ Wages rose in the late 1850s and this probably continued into the 1860s for the Royal Commission on child employment in farming noted that children were paid 6d.-9d. per day for tenting and weeding

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1. This applies more to the 1850s and 1860s than to the 1870s. Legislation on primary education later forced some uniformity.
 2. Tenting involved looking after pigs and other livestock. The term was sometimes used in connection with bird scaring.
 3. Weeding.
 4. Farmers were asked whether they thought a minimum age limit, enforceable through law, should be imposed on employment in farming. The extremes were Holderness farmers who thought ten was appropriate, and Wold farmers who favoured eight or nine for brassocking and ten for turnip hoeing. A ground swell of opinion favoured no age restriction whatsoever.- R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.363-4, 376, 380.
 5. Reports on the Employment of Women and Children in Agriculture (1843), p.283.
 6. Hull Advertiser, August 16, 1850.

in Holderness, 6d.-8d. in the Vale of York and Howdenshire, and 6d.-10d. on the Wolds. Considerably higher wages were paid for planting potatoes, tending livestock, hay-making, and corn harvesting in all districts. Wages rose by one-third during the early 1870s. For example, girls entering farm service for the first time hired for £5-£6 per year in 1868¹ and for £9-£10 in 1872.² The rate then stabilised at £8 by the mid-1870s³ and continued at this level throughout the remainder of the decade.⁴

Regularity of employment, just as with female labourers, was the main determinant of childrens' total earnings, farm servants excepted. Employment was concentrated in the period between spring and early autumn:

If a farmer has, even for one day, a pig or a cow to keep from straying, away goes one boy from his books to tend the animal ... In winter, it [i.e. the school] is tolerably well frequented; but as spring advances, first one scholar drops off, and then another, till towards harvest ... in places where children are much employed, half the school is in the fields; it then shuts up for six weeks altogether. After harvest it reopens; the attendance at first is thin, but it keeps getting better till about November ... it is at its height again.⁵

Children were not employed normally for the whole of the spring and summer. They spent four to six weeks tenting and weeding during the spring in south Holderness and were employed over the harvest month.⁶ Children were employed for much of the spring in mid-Holderness and the central districts

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1. Drifffield Times, November 14, 1868.
 2. Ibid. November 16, 1872.
 3. Ibid. November 13, 1875.
 4. The demand for juvenile farm servants showed no signs of diminishing in the late 1870s and 1880s.
 5. Reports on the Employment of Women and Children in Agriculture (1843), p.293; E.B. Portman developed this argument further and appended several attendance schedules for local schools in his report. These supported Doyle's earlier findings.- R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.366.
 6. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.363-4.

of the Hull Valley, and a few children were hired for upwards of six months keeping birds away from the crops, hoeing turnips, gathering stones, and tending stock.¹ Child labour was used intensively on the Wolds and farmers in the odd parish employed children all year round, though casual engagements between early spring and the onset of winter were more usual.²

Private gangs, and to a lesser extent public gangs, were active in several parts of the East Riding, especially the Wolds, during the 1850s and 1860s. Private gangs contained a minimum of ten children but 40 or 50 were normally employed for weeding and hoeing turnips.³ The children were organised by an individual farmer who set them to work in his own fields under the supervision of a regular farm labourer. In public gangs, on the other hand, children were recruited by gang masters; they travelled from farm to farm, often at a considerable distance from their homes, and were supervised by the gang master or mistress. The Agricultural Gangs Act, 1867, regulated the activities of public gangs by prohibiting the employment of children under the age of eight and the mixing of boys and girls in the same gang. It also required that public gang masters, and gang mistresses if girls were employed, should be licensed by the local justices.⁴ Public gangs were not important in the East Riding by the mid-1860s and only three were reported to be operating illegally in 1867, significantly on farms on the Wolds. Private gangs were far more numerous but there were still many parishes in Holderness, and some in the Vale of York, where the practice was quite alien.⁵

1. Ibid. pp.364-5.

2. Ibid. p.374; Sledmere Estate MSS, E.R.R.O. DDSY/98/37.

3. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.381; W. Hasbach, A History of the English Agricultural Labourer (1966 edn), pp.193-203.

4. W. Hasbach, op. cit. p.269.

5. Gangs of adult Irish labourers were common in many parishes in the Vale of York but gangs of children were a rarity.

The use of child labour fell in the 1870s following legislation on primary education, and this obviously affected childrens' earning power in the long run, though it must be admitted that legislation probably had no immediate effect.¹ The Agricultural Childrens' Act, 1873, made it illegal for farmers to employ children under the age of eight. Children aged between eight and ten could be employed providing they made a minimum of 250 school attendances during the year, and children between ten and twelve could be employed if they made 150. This legislation did not apply to employment during hay-making and the corn harvest, and it was inoperative if there was no school within a reasonable distance of the child's home.² However, this latter provision was not important in the East Riding as a fairly comprehensive system of rural education had been built up by about 1850.³ The 1873 legislation came into effect on January 1, 1875, but was quickly replaced by the Education Act of 1876 which increased the stringency of regulations relating to the employment of younger children. It was now illegal to employ children under the age of ten except where local authorities gave their approval, and even then the period of employment was not to exceed six weeks. Children aged between ten and fourteen were eligible for employment provided they could supply evidence of passing a certain grade and of having made the required number of school attendances.⁴

The immediate impact of this legislation was disappointing.

Children on the northern Wolds were employed in field work when they lacked

1. See below, p. 383.

2. W. Hasbach, op. cit. p.270.

3. T.W. Bamford, The Evolution of Rural Education (1965), p.24.

4. W. Hasbach, op. cit. p.270. However, even with the increased stringency of educational legislation, the required number of attendances could be reached in most cases during the autumn and winter, so enabling children to help their parents in the spring and summer.- H.J. Little, 'The Agricultural Labourer', loc. cit. p.795.

the required number of school attendances, and many children missed three to four months of schooling each year.¹ As late as 1877 only 65-70 per cent of children enrolled in schools in the Malton Union actually attended classes.² This was probably an extreme case but the problem of keeping children away from the fields was a general one since necessity forced many parents to send their children to work. The problem was complicated by school attendance committees. They were adjuncts of Boards of Guardians and were guided in country areas by ratepayers, mainly farmers and landowners, who were on the whole unsympathetic to the cause of primary education. The East Riding Chamber of Agriculture reflected these prejudices in its stance against the 1876 Education Act. It considered that legislation, though useful to protect factory children from a "vitiating atmosphere", was unnecessary for country children as they benefited from the open air and the practical experience of farm work. The importance of this informal apprenticeship, and the relative unimportance of formal education,³ must have been uppermost in the minds of spokesmen for the East Riding Chamber of Agriculture as they campaigned in 1876 and 1877 for a reduction in the minimum number of school attendances from 250 to 150, and a lowering in the age requirement for casual employment.⁴

It is hard to gauge the precise effect of the education acts on juvenile employment by 1880, but the weight of evidence suggests that it declined. Farmers in central Holderness complained that they had been forced to replace child labour with more expensive adult labour, and Wold farmers admitted to employing fewer children, though it was claimed that

1. Drifffield Times, July 28, 1877.

2. Ibid. August 25, 1877.

3. This feeling was by no means confined to the East Riding. For example, M.K. Ashby mentioned it in the context of Tysoe - Joseph Ashby of Tysoe 1859-1919 (1961), p.39.

4. Hull and Eastern Counties Herald, June 8, 1876.

children were employed at their former level in some parts of the Wolds and that the education acts had had the unexpected result of making child labour more attractive since they had raised wages.¹ This was clearly exceptional; childrens' employment was now regulated with some care and this must have eliminated many casual jobs and reduced the earning power of children substantially.

The amount children contributed to an average family's income cannot be estimated exactly for reasons similar to those given for female labourers, though qualitative evidence suggests that the contribution was fairly sizeable. This was endorsed by the Rev. Digby Legard² who had experience in several rural parishes in the East Riding over the middle decades of the century; local farmers thought along similar lines and used the size of childrens' earnings to justify their opposition to compulsory education.³ This theme was also taken up by labourers thinking quite realistically that they would suffer on account of their childrens' schooling. The press described the case of George Cook, an agricultural labourer from Ganstead near Hull. He had five children to support on 15s. per week, and like many others in his position felt that school fees, plus the loss of his children's earnings, had "lessened" his "means of living". He was also convinced that children "were kept at school two years longer than was necessary".⁴

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1. R.C. on the Employment of Children, Young Persons and Women (1880), p.177.
 2. D. Legard ed. More About Farm Lads (1865), p.68.
 3. R.C. on the Depressed Condition of the Agricultural Labourer (1880), pp.176-84. Legislation on education was described by the East Riding Chamber of Agriculture as being "mischievous and injurious to the welfare of the community".- Hull and Eastern Counties Herald, June 12, 1873. Farmers also feared that rural education would not only deprive them of casual labour in the short term but might incline the new generation away from farm work.- T.E. Kebble, The Agricultural Labourer (2nd edn, 1887), p.67.
 4. Ibid. p.179.

The value of children as wage earners is shown up in the labourers' struggle against poverty. Newmarch investigated poverty among farm labourers in the 1860s and found, like later urban studies did, that poverty was most acute at the beginning and end of the labourer's married life. In the first few years of marriage a labourer had to feed and house an expanding family, hire furniture and settle the monthly account with the 'bagman' clothier and shoemaker.¹ This was done largely without assistance from his wife, who was occupied almost entirely raising children, or from the children who were all possibly too young to work. The burden was eased by the time the family was complete. The eldest son might be in regular work and the younger children might earn the odd 6d. tenting or helping the shepherd; the labourer's wife was also freer to work in the fields. The margin above subsistence increased further after about 20-years of marriage with older sons and daughters in farm service and perhaps the youngest child still at home contributing 6s. per week to family income. This was a time of relative affluence for the farm worker and his wife; "they were not in debt to the broker, and were punctual in their payments to the bagman - and could keep a better table".² But this was not to last for old age and possible infirmity reduced the labourers' ability to work and in many cases renewed the earlier struggle against poverty.

Some of these conclusions were confirmed by Harold Mann's study of Ridgmount in Bedfordshire. Ridgmount was a purely agricultural village at the turn of the century and although wages were lower than in the East Riding, the basic factors producing poverty were probably very

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1. It was common in the East Riding to purchase shoes and clothing with harvest earnings.
 2. Newmarch, 'The Life of a Farm Labourer', Cornhill Magazine, XIV (1865), 178-85; A. Wilson Fox, 'Agricultural Wages in England and Wales in the last 50 years', loc. cit. p.298.

similar. Nearly 40 per cent of labouring families were in primary poverty.¹ This was attributed to low wages in one-third of the cases, but illness or old age was responsible for 16 per cent and too many children below working age in a family was responsible for a further 20 per cent. Mann estimated that one-quarter of families above the poverty line owed their position to supplementary earners.² This was true even on the Wolds in the early 1870s and it was claimed that the typical labourer used up his wages paying for rent, food and shoes and had nothing left "to buy trousers, jacket or slop".³ The luxuries that entered the home, and this included the ability to save, came from the supplementary earnings of wife and children.

However, supplementary earnings were a significant element in family income for only a relatively short period. Many children entered farm service⁴ as soon as they were capable of working, as occurred at Aughton near York, or as soon as they left school as occurred at Bainton near Driffield. They then ceased to make any substantial contribution to family income,⁵ though a transfer of income from child to parent, or payment of wages direct to the parent, was usual in the case of very young farm servants up to the age of about twelve.⁶ In one impressively documented

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1. Primary poverty is where earnings are insufficient to provide for basic physical efficiency.
 2. H. Mann, 'Life in an Agricultural Village', Sociological Papers (1904), 189.
 3. Driffield Times, March 2, 1872.
 4. This comment is confined to those districts in the East Riding where farm service was an important ingredient of farm life. See Figure 12.1, p. 334.
 5. York Diocesan Visitation Returns, 1865 (Borthwick Institute of Historical Research, unclassified).
 6. The advantages of a child going into farm service were not only in terms of monetary gain. More space was created in the parental cottage, which was almost certainly overcrowded; parents were relieved of the burden of feeding an extra mouth; and young girls received the training to become good wives and mothers.

piece of evidence, M.C.F. Morris reconstructed the life history of William Blades, a farm labourer born in Nafferton near Drifffield in 1839 and described as typical of his class. Blades entered farm service at the age of eight and received no payment, other than his food and lodgings, for the first four years of his working life, and, "If he had any coming [i.e. wages], the trifling amount was handed to his father". He was paid directly from the age of twelve and apparently had no restrictions placed on him as to how his earnings should be spent; there is no evidence that he supplemented family income.¹

It was similar among girls on the Wolds and in those parts of Holderness and the Vale of York where servants formed a sizeable part of the total agricultural labour force. Girls entered service around the age of ten and contributed to family income for the first year or so, but there is little evidence to show that older girls continued the practice. The presumption is that they did not.

4. Total family earnings.

It is difficult to place a precise figure on the total earnings of an average labouring family because of the diversity of customs relating to the employment of women and children as field labourers, differences in wage rates between upland and lowland districts, and the complexities of payments in kind. There is only very scanty evidence on the money earnings of farm labouring families in the East Riding. Francis Doyle gave details of the earnings of John Allen's family from Bolton Percy near York between March 1, 1841, and February 28, 1842, and the Eastern Morning News gave a similar account for labouring families on the Wolds in the late 1860s and early 1870s. Both accounts are reproduced below.

1. M.C.F. Morris, The British Workman Past and Present (1928), pp.18, 22.

Table 13.1. Two labouring families' income in the 1840s and late 1860s.

Annual earnings	Vale of York in 1840s*	Wolds in late 1860s
Head of household	34. 4. 0.	40. 0. 0.
Wife	8.10.10.	6.10. 0.
Eldest child (aged 12)	5.18. 7.	6.10. 0.
Second child (aged 10)	-	4. 0. 0.
Child aged 8	-	2. 0. 0.
	<u>£48.13. 5.</u>	<u>£59. 0. 0.</u>

Sources: Reports on the Employment of Women and Children in Agriculture (1843), p.283; Eastern Morning News, March 13, 1872.

* Only one child was reported as having worked in this year.

John Allen was described as "an intelligent and industrious person"¹ and his meticulous accounts imply a more than average level of competence which may well have influenced the earnings of his family.² The profile of family finances on the Wolds was published during the farm labourers' strike and was probably influenced by the fact that labourers and their supporters had a vested interest in understating earnings in order to press their claims for better wages. However, in spite of their limitations, both accounts give a rough approximation of total family earnings on the Vale of York and the Wolds at the beginning and end of the period respectively, and are valuable in revealing the magnitude of supplementary earnings.³

Crude estimates of family income, which might have more general relevance, were not made because of difficulties involved with estimating childrens' earnings and the size of payments in kind. As a half way measure the cash earnings of a married couple were estimated and were put

1. Reports on the Employment of Women and Children in Agriculture (1843), p.302.

2. It is very noticeable that Allen's wife earned far more than the £5 average mentioned earlier.

3. Taking an extreme case, a labourer with four working children over the age of ten could virtually double his annual income.-
W. Hasbach, op. cit. p.226.

at about £41 per year on the lowlands and £45 on the Wolds in the mid-1850s, and at £45 and £48, respectively, by the early 1870s.¹

Cash earnings of course give only a partial indication of the agricultural labourers' economic condition. Earnings in kind were often considerable and may have grown in line with the increase in money wages over the middle decades of the century,² especially in southern England where the labour market was at last beginning to tighten and labourers could exert greater pressure on farmers. But northern labourers also benefited and Wilson Fox mentioned that farm workers in Yorkshire enjoyed a variety of 'perks' which ranged from free cottages and gardens, potato ground which was manured and ploughed at the landlords' expense, down to free beer during hay-making and harvest and straw for their pigs. The allocation of these benefits went according to the strength of the various groups which made up the labour hierarchy. For example, foremen and shepherds on the larger estates were normally the recipients of free cottages but all workers probably shared in the smaller benefits. The produce of cottage gardens and allotments was of this type and was a substantial component of labourers' non-cash income. Some of its implications are considered below.

5. Cottage gardens and allotments.

Cottage gardens, and especially allotments, were seen by an increasing number of nineteenth century landowners as a factor in raising "a more comfortable, contented and moral peasantry".³ Bold claims were made:

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1. Sledmere Estate MSS, E.R.R.O. DDSY/98/37; Sewerby Estate MSS, DDLG/43/9; R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.96-7; Hull and Eastern Counties Herald, November 17, 1870, December 1, 1870, November 16, 1871.
 2. E.L. Jones, 'The Agricultural Labour Market in England, 1793-1872', loc. cit. pp.331, 334.
 3. The Labourers' Friend: A Selection from the Publications of the Labourers' Friend Society (1835), p.3.

... the possession of a quarter of an acre of ground may, and often will, make to the labourer and his family the difference between want and sufficiency, between privation and comfort, between a contented mind and the cheerful fulfilment of the duties of his station, and a mind soured, hardened and dissatisfied prepared to yield to vicious promptings, and to rush recklessly into breaches of the law.¹

This clearly overstates the case but it underlines the significance of garden land to the average labourer. An allotment or large garden could add £3-£4 per year to family income;² it meant that a pig could be kept and "a good pig fattening in the sty promised a good winter";³ vegetables could be grown in abundance thereby lessening dependence on the grocer; and the income generated, or the savings from reduced expenditure on food, was partial compensation for the reduced earnings of children in the 1870s. From the point of view of ratepayers there is evidence that sizeable cottage gardens and allotments helped to lower the poor rate.⁴

Objections were raised as soon as plots went above quarter of an acre. Farmers claimed that their cultivation was at the expense of efficient farm work and schoolmasters complained that gardening kept children from school.⁵ These objections did not apply to cow pastures, which were often five acres or more in size, because less manual work was involved and tasks like milking were done by the labourer's wife. The annual value of a cow was put at £12 in the 1870s.⁶

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1. G. Nicholls, 'On the Condition of the Agricultural Labourer; with Suggestions for its Improvement', J.R.A.S.E. VII (1846), 20.
 2. The Labourers' Friend: A Selection from the Publications of the Labourers' Friend Society (1835), pp.10-13.
 3. F. Thompson, Lark Rise to Candleford (World Classics edn, 1957), p.9. In addition it was claimed that pig keeping was one of the chief sources of pleasure for the labourer and his family.- Reports on the Employment of Women and Children in Agriculture (1843), p.295.
 4. For example the poor rate fell by one-half in the township of Frodingham (Central Holderness) following the setting up of allotments in the early 1850s.- Hull Advertiser, November 12, 1852.
 5. T.E. Kebble, The Agricultural Labourer (1870), pp. 72-3; G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.75.
 6. T.E. Kebble, op. cit. p.75.

The spread of allotments and sizeable cottage gardens was more a response to the initiative of landlords than of government. The Enclosure Act, 1845, placed some emphasis on allotments but its provisions in this respect were carried out unsatisfactorily.¹ Allotments first appeared in the East Riding in the mid-1820s when Lord Wenlock reserved land for this purpose in each township on his estate.² Other local landowners followed suit.³ Cow pastures also gained in popularity and the Strickland family involved itself in setting up village cow clubs in the 1840s and 1850s which attempted to protect labourers against the risks of owning livestock, though only a handful had been established by 1850.⁴ This did not dampen enthusiasm for cow pastures and they became a standard feature of many estates, especially on the Wolds. For example, about half the labourers on the Sledmere estate rented cow pastures of three acres or more in the early 1870s.⁵

Farm labourers in the East Riding seem to have been quite well off in terms of gardens and allotments but two points should be made by way of qualification. The first is that there were fewer allotments per capita in the north than in other parts of the country, and second that allotment rentals tended to be lower in 'close' villages than in 'open' villages.

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1. W. Hasbach, op. cit. p.241.
 2. G. Legard, 'Farming in the East Riding of Yorkshire', loc. cit. p.127.
 3. There were numerous references to allotments in the local press particularly in the early 1850s and late 1870s. The association with agrarian depression is immediately noticeable.
 4. The labourer paid one-half penny in the pound per month to insure his cow. The monthly payments ceased when the amount paid reached 3 per cent of the cow's insured value, but were resumed when the cow club's funds were reduced by losses.
 5. Sledmere Estate MSS, Cottage rent accounts 1870-3, E.R.R.O. DDSY/107/7.

Table 13.2. Regional differences in wage rates and the number of allotments and garden allotments held by labourers in the early 1870s.

Region	Average number of allotments ($\frac{1}{4}$ to 1 acre in size in each county within the region in 1872.	Average number of garden allotments in each county within the region in 1872. *	Average wage level in 1867-71. s. d.
1. Northern Counties	308.4 #	1971.0	15.1
2. Central Midlands	881.5	8818.8	13.4
3. West Midlands	1066.0	5451.3	11.4
4. South West	1248.8	7618.8	10.7
5. East Midlands	2397.9	8528.6	11.7
6. Home Counties	464.3	3797.5	11.8
7. East Anglia	2923.3	8777.7	11.0

Sources: Agricultural Returns for Great Britain (1872), pp.24-5; Agricultural Returns for Great Britain (1873), p.17; C.S. Orwin and B.I. Felton, 'A Century of Wages and Earnings in Agriculture' loc. cit. p.233. Note that the counties making up the various regions conform to those used by Orwin and Felton.

* Garden allotments were detached from labourers' cottages and include holdings of less than one-quarter of an acre.

This average includes the three Ridings of Yorkshire. If they are excluded the average falls to 32.8.

Table 13.2 shows a broad association between the number of allotments and garden allotments in the different regions and the money wages of agricultural labourers. The northern counties had the smallest number of allotments, taking all seven regions, but paid the highest money wages, while it was the converse in East Anglia and the South West. Income was a major variable in the regional distribution of allotments but it was not the only variable of substance. Garden allotments were common in the central Midlands and were quite common in Yorkshire (both areas belonged to the high wage bloc of counties), and most cottages there had large

gardens and many had cow pastures and potato land close by.¹ There were 799 allotments between one-quarter of an acre and one-acre in the East Riding by 1872 and 1,781 cottage allotments by the following year. There were considerably more in the North and West Ridings² but even so, only a minority of Yorkshire farm workers actually rented additional land, the majority having cottages with attached gardens, some of which were up to one-eighth of an acre in size. These were certainly sufficient to make rural families partially independent of the village grocer and to give them an extra source of income.

Part of the profitability of gardens and allotments depended on the direct rent, in the case of allotments, and the composite rent in the case of cottages with garden land attached. It is a matter of record that rents were lower in 'close' villages than in 'open' villages.³ Property owners in the latter were drawn mainly from the ranks of local farmers and tradesmen and their resources were often too limited to permit social considerations to enter their business dealings - social leadership was an expensive business and subsidies on rent were better left to major landed proprietors. The higher rents in 'open' villages must therefore have lessened the profitability of allotments and gardens. Two rather extreme cases may go some way to illustrating this. Sir Tatton Sykes provided allotments at very low rents in the late 1870s and 1880s, which were taken up rapidly by labourers throughout the Sledmere estate. Some of the best land was used

1. W. Hasbach, op. cit. p.236.

2. The number of allotments between one-quarter of an acre and one acre in the West and North Ridings was 874 and 896, respectively, in 1872. The number of cottage gardens was 6,876 and 4,731 in 1873. The impact of industrial workers on the figures for allotments and garden allotment must have been significant in the West Riding.

3. B.A. Holderness, ' 'Open' and 'Close' Parishes in England in the Eighteenth and Nineteenth Centuries', loc. cit. p.126.

for this purpose; allotments were close to labourers' homes and the scheme was considered to be successful in reducing the level of rural distress.¹ Around the same time allotments proved to be a dismal failure in the 'open' township of Drifffield, all 150 tenants abandoning their plots in 1876 complaining that escalating costs had made them uneconomic.²

No attempt will be made here to generalise from either example, but one or two points should be stressed. Cottage gardens and allotments played an active part in raising the standard of living of agricultural labourers in this period and they cannot be ignored in a general consideration of family income, but their contribution to total earnings was so variable that generalisation is not easy. A more tentative observation is that the lower rentals in 'close' villages, of which there were so many in the East Riding, particularly on the Wolds,³ meant that the contribution of allotments and gardens to total family income was greater there than in the more numerous 'open' parishes.

6. The economic and social condition of agricultural labourers, 1850-80.

An impression has been given at various points in this study of a rise in rural living standards over the mid-nineteenth century. Family incomes rose and the basic day wage increased by 20-25 per cent while the general price level increased by only 5-10 per cent.⁴ Certain key items of expenditure such as cottage rents remained virtually stationary on some

1. Beverley Independent, July 14, 1888.

2. Drifffield Times, February 3, 1877.

3. 43 per cent of townships on the Wolds were 'close' townships which was higher than in any other part of England.- B.A. Holderness, ' 'Open' and 'Close' Parishes in England and Wales in the Eighteenth and Nineteenth Centuries', loc. cit. p.135.

4. See above p.258.

of the larger estates, though they drifted upwards in 'open' villages and presumably on many of the smaller estates. It is not surprising under these circumstances that contemporaries should have been aware of slight changes in living standards. Kebble noted that "the condition of the agricultural labourer was slowly on the rise" over the 1850s and 1860s,¹ and talked of an "immense improvement" by the late 1880s.² Hasbach likewise detected a "slow recovery in the labourer's standard of life, moral and material" and traced it back to the mid-1830s.³

These and similar comments have been accepted by modern historians particularly in connection with "fringe benefits like garden allotments, better cottages on the bigger estates, the provision of village schools, cottage hospitals and reading rooms".⁴ Reference has been made to cottage gardens and allotments; the provision of better schools and cottages will be discussed presently. However, there is much broader evidence which suggests an upward shift in living standards. For example, the Hull Advertiser noted an improvement in farm labourers' dress:

If one is allowed to judge ... the condition of the farm servants generally, from their outward appearance in dress etc, the conclusion would be that they are in comfortable circumstances especially when compared with their costumes and general demeanour a few years since; whether these altered appearances are to be attributed to more economy than formerly - to cheaper clothing, to higher wages, or to all these together, it is certain that the change is great and that the people /are/ much improved of late, at least in appearance.⁵

The success of savings banks and benefit societies is another useful indicator of advancing prosperity among farm labourers. The Driffeld

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1. T.E. Kebble, The Agricultural Labourer (1870), p.221.
 2. T.E. Kebble, The Agricultural Labourer (2nd edn, 1877), pp.56, 59.
 3. W. Hasbach, op. cit. p.217.
 4. E.L. Jones, The Development of English Agriculture 1815-1873 (1968), p.32.
 5. Hull Advertiser, November 18, 1854.

Savings Bank, for instance, had deposits totalling nearly £34,000 at the end of 1853, nearly £2,000 of which had been deposited by farm servants in the fortnight after Martinmas. The Bank interpreted this as "pleasing evidence of the provident habits of the industrious classes".¹ The Howden Savings Bank was also reported to be in a flourishing state in the late 1860s,² as were other banks located in agricultural districts.³ Benefit clubs and clothing societies, of which there were large numbers in the East Riding by the late 1860s, were in a similar condition; they were well managed with less "revelling and waste" than in former years.⁴

These impressions could be extended to include the improved health and cleanliness of children in church schools in Yorkshire, the growth of leisure activities like cricket,⁵ and more significantly the 40 per cent fall in commitments for poaching in Great Britain between the mid-1850s and early 1870.⁶ But the essential point is that farm labourers' living standards were still appaulingly low by the 1870s even in the high wage counties. Their finances were balanced precariously, the threat of

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1. The Drifffield Observer and Literary Journal, December 21, 1853.
 2. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.109.
 3. Hull and Eastern Counties Herald, December 8, 1870.
 4. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.108-9.
 5. F. Watkins, A Letter to the Archbishop of York on the State of Education in the Church Schools of Yorkshire (1860), pp.6, 14.
 6. Judicial Statistics for Great Britain, 1856-70. It was commonly believed that poaching increased when times were hard and fell when they improved. This was developed in several contemporary accounts, among them A. Somerville, Whistler at the Plough (1852); Report of the Select Committee appointed to Enquire into the Causes of the Increases in the Number of Criminal Commitments and Convictions in England and Wales (1826). The theme has also been developed by later historians.- J.L. and B. Hammond, The Village Labourer (1948); J.D. Chambers and G.E. Mingay, The Agricultural Revolution 1750-1880 (1966); F.M.L. Thompson, English Landed Society in the Nineteenth Century (1963).

poverty was always close at hand, and charity was a necessary part of life in nearly every parish and township of the East Riding during a hard winter. Special relief funds were then set up with support from local landowners and farmers, and flour, bread and coal, and occasionally soup, were distributed among the poor.

Labouring families were vulnerable on the odd occasions when prices rose faster than wages, as happened briefly in the mid-1850s and early 1870s. Many families just barely subsisted during the winter of 1853-4. The winter had been severe and prices had risen strongly producing considerable distress on the land and a very sharp fall in real wages.¹ Indeed the Crimean War was a period of hardship generally and many labouring families were forced to rely on gleanings and supplies of bread and meat from farmers.²

The winter of 1871-2 was similar and the Driffield Times had this to say about the effects of rising prices on agricultural labourers:

... it is a fact well known to all that the cost of the necessities of life has increased; have the wages of the employed in any thing like proportion to this extra draw upon them? We all know they have not. And if such be the case how is the man who had just sufficient before to pay his way and keep his family from want, to continue to do this now, when nearly every article which he has to buy has sensibly risen in price ... Family after family falls by degrees into debt and difficulty and becomes less and less able to maintain itself in the ranks ... If men find that a week's honest labour will not procure the necessities of existence for themselves and their families what are they to do? They incur debt which they have no means of paying ... /the labourer/ lives on a sliding scale of which the probable end is pauperism and can we expect him to maintain his self respect and self help? It cannot be. A system where the needful expenditure is greater than total income is one leading to total ruin ...³

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1. Hull Advertiser, January 13, 1854.
 2. M.C.F. Morris, op. cit. pp.37-8.
 3. Driffield Times, March 2, 1872.

Farm labourers developed this theme during the early months of 1872 as the agricultural strike gathered momentum. One point raised in several strike meetings was that a labourer supporting a large family on 15s. to 16s. per week had approximately 1d. to spend on each meal for each member of his family after paying for coal and rent.¹

Table 13.3 shows the yearly expenditure of a labouring family in the early 1870s where the head of household received part of his earnings in food.

Table 13.3. Annual expenditure of a farm labourer's family, c.1870.

	f. s. d.
Rent	5. 0. 0
Highway and poor rates	15. 4
Shoes for family	1.17. 2½
2¼ stones of flour weekly	12. 4.10
Club pay	1. 2. 6
Coal	3. 0. 8
½ pound of soap weekly	8. 8
½ pound of treacle weekly	6. 6
1 ounce of tea weekly	13. 0
1½ pounds of candles weekly for 20 weeks	5. 0
2 cotton shirts	3. 4
2 flannel shirts	4. 0
2 pairs of stockings	3. 0
1 flannel petticoat	2. 6
2 neck ties	1. 6
Yeat and matches	3. 2
Oil, thread and tape	2. 8
4 tin mugs; 6 tin plates	1. 0
Broom and salt	8
Cup and saucer	1½
18 herrings for husband	9
	<hr/>
Total expenditure for year	26.16. 1
	<hr/>
Total cash earnings for year	26.19. 0

Source: Eastern Morning News, March 13, 1872.

1. Ibid. February 24, 1872; Hull and Eastern Counties Herald, March 2, 1872.

It was generally acknowledged that being 'meated' by the farmer, as the system of payment in cash and kind was called, was worth 1s. per day or about £15 per year, which raised the labourer's earnings in the above case to about £40-£41. The family's expenditure on food would have been higher if earnings had been entirely in cash, but as it was expenditure on necessities absorbed all cash earnings leaving almost nothing for children's clothing, schooling, doctors bills, furniture, and new necessities like postage stamps and newspapers. This reinforces the earlier argument that labourers were dependent on the supplementary earnings of family members and highlights the moral justice of the rural strike.

The rise in rural living standards between 1850 and 1880 should therefore not be exaggerated. The labourer was still bound by a repressive social code which preached subservience to an ordered hierarchy of authority;¹ and rare acts like rick burning, which were invariably unconnected with discontent on the land, still struck an ancient cord of alarm with the authorities² for the labourer remained too close to poverty for old fears to be erased completely. But despite the precariousness of their condition,

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1. For example Sir Tatton Sykes would decapitate flowers growing in the gardens of labourers on his estate believing that vegetables were more suitable for the working classes. More serious was his dislike for villagers using the front doors of their cottages. Sykes reacted by erecting cottages lacking the offending door and ordering tenants in older cottages to keep their front doors locked permanently.- J. Fairfax Blakeborough, Sykes of Sledmere (1929), pp.156-7.
 2. East Riding magistrates were always relieved when a rick burner was discovered to be a tramp or travelling sweep who had no connection with the farming community. This also applied, though to a lesser extent, to farm labourers who had acted on impulse and not out of malice as in the case of the farm servant who fired a stack of oats because his ploughing had been criticised. But the suspicion still lingered that incendiarism was connected with strained relations between farmers and labourers, and it was on this assumption that Lord Wenlock carried out an investigation into incendiarism on the Wolds in the early 1860s. His brief was to report on a possible connection between recent wage reductions and rural discontent, but the connection was not established.- Hull Advertiser, March 26, 1847; November 2, 1849; May 11, 1849; June 29, 1849; Hull and Eastern Counties Herald, January 6, 1864; January 9, 1864, January 20, 1864; January 30, 1864; Driffield Times, January 30, 1864.

labourers were better off in material terms in 1880 than a generation earlier, and had also reaped some benefit from the work of social reformers.

7. The agricultural labourer and the reformer, 1850-80.

It was typical of the nineteenth century that those who were most familiar with agricultural labourers, and who sought to raise their standard of living, rarely thought in terms of raising wages. They might hope for an eventual increase, as Keble did, but reformers were generally caught up in the mesh of classical economic thinking which took wages as the simple product of the supply and demand for labour in the market place, and acknowledged no duty on the part of employers to pay wages above the 'natural level' to make workers more secure. Reformers argued instead along the lines of self help. Education and improved living conditions assisted labourers without making them dependent on others, and might lead in time, or so it was hoped, to the creation of a more moral workforce which was a vital concern of churchmen and many lay reformers.

Education, as seen by the clergy and members of the laity like Mary Simpson,¹ was a means of raising labourers from the "grossest sensuality" and "darkest ignorance" and "acquainting them with simple truths of religion" and the duties owed to God and "their earthly masters". It was a campaign against the "Pagan condition" of Yorkshire.²

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1. Mary Simpson of Boynton, near Bridlington, belonged to one of the East Riding's largest landed families and was very active in the night school movement. For a full description of her work see C.B. Freeman, Mary Simpson of Boynton Vicarage (E.Y.L.H.S. No.28 1972).
 2. "Here (ie. Yorkshire) is a field at our own doors, wide enough for all our Missionary enterprise. No need of sending Bibles to Florence or lay road-side preachers to Ireland, so long as moral Yorkshire is in the Pagan condition so graphically presented by Mr. Eddowes".- Hull Advertiser, April 7, 1854. Note that the Rev. John Eddowes, referred to above, was vicar of Garton-on-the-Wolds in the 1850s and had written a pamphlet entitled "The Agricultural Labourer As He Really Is". This was an account of labourers in the East Riding and was a crushing indictment of supposed rural 'bestiality'.

Strangely this narrow view of education was not confined to the evangelical wing of the Church but was taken up by many local farmers and the Hull Advertiser. The latter accepted the argument that education would "increase the intelligence, improve the morals, and elevate the condition of the labouring population" and concluded that

Every one who stands in the way of establishing a school, whether for adults or children, is so far an opponent of the free circulation of the Scriptures. We are surprised that this plain and obvious view of the whole question of education has impressed itself so little upon the national conscience.¹

This religious stance on education fitted in with national thinking, despite the Hull Advertiser's comment to the contrary, but it also reflected the strength of Wesleyanism and Primitive Methodism in the East Riding, which were virtually the only religions with any hold on the local workforce.² A practical extension of this view was that education would make labourers more active and self reliant and therefore worth better wages.³

The state of rural education left much to be desired in the early 1850s. On the one hand there was an elementary school in almost every village in the East Riding (there was about 650 schools of all kinds outside Hull in 1851), which was far better than in most English counties at the time.⁴ On the other hand village schools, with their restricted curriculum and ragged attendance, were criticised as offering only a period

1. Ibid. May 5, 1854.

2. F. Digby Legard, ed. Ploughing and Sowing (1861), pp.98, 137-9; H. Woodcock, Piety Among the Peasantry: Sketches of Primitive Methodism on the Yorkshire Wolds (1889); C.B. Freeman, op. cit. pp.28-9. The strength of non-conformity in the East Riding and the charge of paganism seem to be irreconcilable. However, the criticism was made invariably by members of the Established Church. There was also a reluctance among some Dissenters to extend the term 'Christian' to other religious groups.- F. Digby Legard, ed. Ploughing and Sowing (1861), p.139.

3. Eastern Morning News, January 9, 1872.

4. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.98; T.W. Bamford, op. cit. p.7.

of "physical deterioration, incurred by wasting time in crowded and unwholesome rooms".¹ This was an extreme view and was correct only in part for conditions were improving despite generally inadequate facilities.² The involvement of local landowners in financing village schools was generally far greater than in other counties with the typical squire supporting two or three schools and the larger landowner supporting all schools on his estate.³ The Anglican Church also endowed schools and the number of church schools in Yorkshire rose from 48 in 1844 to over 600 in 1860;⁴ the Church was also active in the night school movement.

Numerous ideas were in circulation for improving education especially in market towns where the rural labour force was reasonably compact. Most centred around establishing small libraries and evening classes for adults,⁵ but there were also suggestions for hiring itinerant schoolmasters in thinly populated districts and for setting aside rooms on remote farms specifically for teaching purposes.⁶ The growing emphasis on adult education reflected the churchman's fear of moral decay, the inadequacy of the regular school system and the high level of illiteracy among adults. An insight into the problem of illiteracy was given in a survey of 17 country parishes and chapelries in the East Riding which showed that 24 per cent of all bridegrooms and 37 per cent of all brides were unable to sign their names in the 1850s, and that 16 and 12 per cent, respectively, were still unable to do this in the 1870s.⁷ Actual illiteracy was inevitably

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1. Reports on the Employment of Women and Children in Agriculture (1843), p.292.
 2. T.W. Bamford, op. cit. p.12.
 3. Ibid. pp.9-10; Drifffield Times, March 25, 1876.
 4. F. Watkins, op. cit. p.8.
 5. Hull Advertiser, May 5, 1854.
 6. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), p.101.
 7. W.P. Baker, Parish Registers and Illiteracy in East Yorkshire (E.Y.L.H.S., No.13, 1961), p.12.

higher and various commentators estimated it at between one-half and two-thirds of the agricultural labour force in the 1860s.¹

Night schools proved to be unable to cope with the problem, even though 20 per cent of all churches in the archdeaconry of the East Riding ran night classes in 1865 and a further 23 per cent had experimented with them.² The consensus of opinion in the late 1860s was that night schools had failed³ because of opposition from farmers who were more concerned that their horses were fed at the traditional time of 8 p.m. than that their labourers were given a few hours of instruction. There was also indifference among farm labourers and even among sections of the clergy and teaching profession, as well as the unresolved problem of providing an adequate system of education in districts where the population was thinly scattered.⁴

The failure of this experiment should not be seen as the failure of the education movement in the East Riding, though it was an important part of the overall effort. The number of schools built and maintained by local landowners and various church groups increased significantly over the 1850s and 1860s and only about one-fifth of the rural inhabitants of East Yorkshire had to be covered by school boards following the Education Act of 1870, the great majority of established schools being able to raise their standards without aid from the rates.⁵ Illiteracy declined but the element of compulsion introduced in the 1870s often had no immediate impact on school attendance, leaving absenteeism and limited educational attainment unresolved problems.

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1. F. Digby Legard, Ploughing and Sowing (1861), p.30; W.P. Baker, op. cit. p.17; C.B. Freeman, op. cit. p.11.
 2. W.P. Baker, op. cit. p.19.
 3. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1880), p.100.
 4. York Diocesan Visitation Returns 1865 (Borthwick Institute of Historical Research, unclassified); F. Digby Legard, ed. Ploughing and Sowing (1861), pp.24, 61, 66, 263ff; F. Digby Legard, ed. More About Farm Lads (1865), pp.9, 77; F. Watkins, op. cit. p.26.
 5. T.W. Bamford, op. cit. p.26.

Education was not emphasised as strongly by all reformers, some arguing that the withdrawal of wives and daughters from field labour and the improvement of housing, dress and food were higher priorities.¹ The state of cottages is a case in point for study was clearly impractical in overcrowded hovels.² Raising the moral tone of agricultural families, on the principle that dirt and dark went together, was a constant theme of the advocates for cottage improvement.³ But a more substantial argument related to the insufficiency of cottages on East Riding farms. The Drifffield Farmers' Club took up this point in the mid-1850s and encouraged local landed families to erect more cottages on their estates explaining that it would improve labour relations, enable children to do more farm work, and removed the burden of long walks to and from the fields (it was estimated that a 2-3 mile walk, morning and evening, added ten hours to the working week).⁴

The lack of cottage accommodation was still being debated in the 1860s⁵ and 1870s,⁶ though some improvement had taken place. New cottages had been built on the Sledmere estate and there was regular investment in new cottages and the maintenance of existing ones on other local estates.⁷ The Union Chargeability Act helped here because landowners were forced to accept some responsibility for the relief of the poor and could not side step it as easily as before by hiring labour from parishes outside their

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1. T.E. Kebble, The Agricultural Labourer (1870), p.84.
 2. Hull Advertiser, August 2, 1850; August 6, 1856.
 3. J.C. Morton, op. cit. pp.550-3; G. Nicholls, 'On the Condition of the Agricultural Labourer; with Suggestions for its Improvement', loc. cit. pp.16-18.
 4. Hull Advertiser, June 3, 1854; August 2, 1854.
 5. R.C. on the Employment of Children, Young Persons and Women in Agriculture (1867), pp.101-4.
 6. Hull and Eastern Counties Herald, February 22, 1872; March 7, 1872.
 7. Information supplied by Sir Richard Sykes, Estate Office, Sledmere.

estates.¹ But even so progress was still far from satisfactory both in 'open' and 'close' villages. The high rents charged in the former often made large families take in lodgers, so adding to overcrowding, while the low rentals charged in the latter gave landowners a minimal return on their investments² which dampened the incentive to provide more housing.

The third major area of social involvement was the reform of statute hirings. The church was the main force here and aimed at repairing some of the moral 'damage' done during the Martinmas hirings.³ It based its case on three observations. First, it alleged that

The spectacle of so many human beings huddled together to be examined like cattle, with a view to the purchase of their toil and fidelity for a whole year, /had/ ... associations /with/ an Eastern Bazaar for the disposal of the swarthy sons of Ethiopia, or the fair maidens of Georgia and Circassia.⁴

Statute hirings, according to this argument, degraded, destroyed self respect and were offensive in a civilized land. Second, it was claimed that hirings depraved young people by exposing them to beer shops, dancing, card playing, bad language, and even sex, so undoing the careful work of the parochial clergy.⁵ Third, and more plausibly, they encouraged farm servants to be more mobile than they might otherwise have been, for many regarded moving to a new engagement almost as a matter of duty. This policy prevented farmers and servants developing strong associations over

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1. H.J. Little, 'The Agricultural Labourer', loc. cit. p.779.
 2. 6 per cent was a reasonable return on investment in urban housing in the 1870s but a country landlord was lucky to get 2½ per cent after rates, taxes and repairs had been taken into account.- T.E. Kebble, The Agricultural Labourer (1870), p.44; F. Clifford, 'The Labour Bill in Farming', loc. cit. p.113.
 3. Martinmas hirings attracted about one-third of the agricultural workforce of the East Riding.
 4. Hull Advertiser, November 11, 1854.
 5. Ibid. April 24, 1854; Hull and Eastern Counties Herald, November 25, 1869.

the years and often made their relationship a purely business one.¹
 (This of course did not apply to farm labourers who were more settled, had families and often stayed with the same farmer for several years.)

The attempted reform of statute hirings developed in four stages. During the mid-1850s several prominent Anglicans proposed setting up registry offices in all the market towns of East Yorkshire where records would be kept of the character and skills of individual farm servants. These would be available to farmers on request and it was hoped that they would protect farmers from servants lacking "approved habits of morality and industry".² A long term hope was that the system would contribute to the moral improvement of country labourers generally.³ A county-wide system of registries met with some success and the Drifffield Farmers' Club agreed to the scheme as early as the summer of 1854. It took longer in other areas but registries were working successfully in York, Malton, Selby, and Drifffield in the early 1860s.⁴

The second stage began around 1860. The Yorkshire Society for the Supplanting of Statute Hirings, established in 1861, began to rent large halls where female servants could be hired away from the open gaze of the market place. Heating was provided by the Society, refreshments were available, and clergymen were on call to read lessons prepared for the occasion. Hand bills were also distributed among the girls urging obedience to God and parents and outlining the value of savings banks!⁵ The separation of males and females in this manner - nothing was done for

1. Hull Advertiser, March 24, 1854; November 11, 1854.

2. Ibid. April 21, 1854.

3. Ibid. July 1, 1854.

4. Ibid. November 12, 1862.

5. Ibid. November 15, 1862; Hull and Eastern Counties Herald, November 12, 1863.

male servants¹ - was extended to trains bringing farm servants to Martinmas hirings. Requests were made to the North Eastern Railway Company that carriages should be set aside for females only; this was agreed to but such carriages were invariably deserted.² However, the separation of the two sexes was claimed to be successful in the market context with only the "roughest girls ... standing the market with the lads", and the Hull and Eastern Counties Herald noted with some satisfaction that these girls were not hired as readily as those under the supervision of clergy and gentry.³

Buoyed by this the Yorkshire Society for the Supplanting of Statute Hirings moved to abolish hirings altogether but its attempts failed. Farmers favoured the existing system because of the large number of servants they could choose from, and because they were less concerned with servants' morality than with their potential for hard work.⁴ This pragmatic stance was endorsed by the county's landowners. They acknowledged that "statute hirings entailed many evils, much vice ... [but] as long as farmer's servants were to be hired ... how were farmers to hire them if statute hirings were to be abolished"?⁵ Labourers were equally in favour of the traditional practice since yearly contracts provided security and the

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1. Driffield Times, November 16, 1867.
 2. Hull and Eastern Counties Herald, November 19, 1863; December 1, 1870.
 3. Hull Advertiser, November 19, 1862; Hull and Eastern Counties Herald, November 19, 1863; November 15, 1866.
 4. Driffield Times, November 4, 1876; T.E. Kebble, The Agricultural Labourer (1870), pp.120, 130.
 5. Driffield Times, January 29, 1876. The move to abolish statute hirings, which had failed in 1870, was revived in the mid-1870s though it quickly lapsed. What interest was generated in statute hirings in the second half of the 1870s did not concern moral questions but the practical question of making verbal agreements between labourer and farmer legally binding. The problem was that hirings were held in the period immediately preceding Martinmas and engagements, being technically for a period slightly in excess of one year, were not enforceable in law unless in writing.

carnival atmosphere of the hirings with their feasting, drinking, dancing, and side shows, gave farm servants their only real holiday of the year, Christmas being of little importance. Faced with this opposition church groups compromised and from about 1870 started to explore the possibility of two hirings in the year; one at Martinmas for male servants and the other on May Day for female servants.¹ However, this also failed for farmers were wary of the added disruption to farm life and doubted whether the device would keep the sexes apart.

The crusade to raise the moral condition of farm servants failed in its primary aim of suppressing hirings but reformers still had, for what it was worth, a network of registry offices and the now well established practice of providing female servants with covered and separate accommodation away from the market place. The great pity is that agricultural labourers would have been in a far sounder condition by the 1870s if the effort poured into the reform of hirings (which was second only to education among the priorities of local reformers), had gone into practical reforms like erecting more cottages on the larger farms.

8. Conclusions

Agricultural labourers and their families enjoyed a higher standard of living by the 1870s than in the early 1850s partially because attention had been given to allotments, cottage gardens, improved cottages, and education. But in spite of this, the average labourer still found it difficult to manage on his earnings alone, and the supplementary earnings of women and children were in many cases a necessity if extra clothing was to be bought and the family's diet improved. It has been argued that the

1. Ibid. April 10, 1875.

farm labourers' acceptance of compulsory education is proof of a substantial rise in their social and economic condition but this is hard to accept because labourers genuinely feared the consequences of reduced childrens' earnings and this found expression in the high level of absenteeism from school over the 1870s. The only appropriate conclusion seems to be that contemporaries were correct in observing a small rise in living standards but it was grossly inadequate and failed totally to remove the fear of eventual pauperism.

CHAPTER FOURTEEN

AN OVERVIEW OF AGRICULTURAL DEVELOPMENT IN THE EAST RIDING,

1850-80.

A considerable amount of research has been completed in recent years on agricultural development over the middle decades of the nineteenth century. This study is built on some of this work and many of the ideas discussed here were developed originally in investigations of other counties or of the country as a whole. Large sections of this study therefore make no claim to being original except in the sense of reinforcing certain points and adding qualification to others. However, the study has attempted to go beyond this in some areas, notably in arguing that corn acreage was very stable in the East Riding down to the early 1880s; in denying the continuous trend to grass, in spite of the price advantages associated with beef and dairying; and in emphasising the mature business qualities of the majority of the county's farmers and landowners.

The geographical limitations placed on this study restrict it in several respects but some of its conclusions may be significant for other counties in eastern England. Attention has been given to the closeness of agricultural developments in the East Riding and Lincolnshire, particularly in connection with the stability of the corn economy, and this may well apply to other eastern counties. One difficulty encountered in the present study, which may bias some of its conclusions, is that manuscript evidence refers mostly to large estates or to well managed estates. Many of the illustrations given here, and some of the interpretations offered of historical developments, are based on evidence collected from only a relatively small number of estates, though this has been judged as far as possible in the context of 'average' farming conditions, and the degree of bias is hopefully small.

High farming claims some uniqueness in connection with the impact of farm mechanisation and the easier transmission of technology and improved business practice, but in most senses it was only a continuation and broadening of existing progressive tendencies in the agricultural industry. High farming gave a modern appearance to East Riding agriculture in some districts but the forces it generated in science, estate administration and practical husbandry were not strong enough to remove the imbalance between the light and heavy soil districts of the county. The areas which had built up momentum for change and improvement in the late eighteenth and early nineteenth centuries continued to be the main practitioners of the art of modern farming, rapidly coming to terms with artificial manures and feedstuffs, comprehensive tenancy agreements and advanced machinery.

• The efficiency gap between light and heavy soil farming narrowed somewhat by 1880 but cheap drainage did not underpin a major transformation of the soggy clays which made up a considerable part of Holderness, Howdenshire and the Vale of York. This had little to do with the efficiency of the mass produced drainage tile or of equipment associated with it like the drainage plough, as they did their work reasonably enough. This study suggests that deficiencies in land drainage can be traced in the first place to the sheer physical difficulty of draining large tracts of land, and equally important, to lack of co-operation in drainage operations between neighbouring landed families, ignorance about how to drain properly, and the substantial cost of drainage which fell only about 20 per cent during the 1840s and 1850s. The inadequacy of drainage in the East Riding was revealed by the inability of several drainage systems to cope with the increased run-off during the abnormally wet seasons at the end of the 1870s.

Bad drainage was only one of the obstacles in the way of farm improvement in the lowland districts. Small farms and fields, which were unsuited to modern farming operations and which helped to raise production

costs proportionally above those on farms with more efficient lay-outs, were an important legacy from the lowland's long history of cultivation. The problem was to up-grade this traditional farm structure but farm enlargement in the sense of physically integrating existing small farms into larger units involved an enormous investment. Some buildings had to be scrapped and others erected at the central point of the new farm; new roads had to be constructed, fences up-rooted and fields re-designed. These constraints, independent of those relating to how landowners would attract farmers with sufficient capital and expertise to farm the enlarged holdings, limited the extent to which farms could grow by physical integration, at least over a relatively short period. However, some landowners such as the trustees of the Emanuel Hospital's estate at Brandesburton and Sir Philip Saltmarsh accepted the high costs of re-modelling farms, though the majority of landowners in relatively backward areas preferred to enlarge farms by combining tenancies and sanctioning minimal structural changes only. This produced farms which were inferior to the extensive properties on the Wolds and in south Holderness, but it ensured that more lowland farmers gained an advantage from buying farm supplies in bulk and were in a better position to mechanise.

Progressive husbandry involved educating farmers and landowners both in the scientific techniques of modern farming and in certain older techniques, familiar to a few of the best farmers for several generations past, but mostly outside the practical experience of the rest. More technical information reached the ordinary farmer during the third quarter of the nineteenth century than ever before. Farmers' clubs and societies sprang up in considerable numbers between the 1830s and 1850s and helped to guide developments in the farming community through a combination of well-informed discussion and debate, and in particular through the sponsorship of agricultural shows. Agricultural shows, for instance, played an important part in breaking down some, though not all, of the old prejudices

regarding the usefulness of farm machinery. They helped to instruct farmers in the value and use of artificial manures and feedstuffs, and demonstrated the results of successful livestock breeding.

The growth in information available to farmers was a development of high importance. The expansion of farming skills and technology, and its transmission throughout large parts of the farming community, was an evolutionary process in which farmers in each generation became better acquainted with improved techniques, but the acceleration over the middle decades of the century outstripped previous developments for reasons often independent of agriculture itself. High farming is sometimes considered to be the corollary of rapid industrial development in the towns and cities. This oversimplifies agrarian progress for the impact of the machine, and the science which lay behind it, was far more piecemeal than in the urban centres. There were many parishes in the East Riding, and certainly in the country as a whole, where high farming made virtually no impact either for want of capital or the physical difficulties of modifying the existing farming structure. This 'patchiness' was not so obvious in urban industry though of course it still existed. However, there are elements of truth in the suggestion that urban and agricultural developments were linked in this period. The railway symbolised this and not only speeded up the movement of goods between the two sectors but exposed farmers to new and larger markets, and to new ideas - technical as well as managerial. The old isolation of the countryside was broken down more completely in the 1850s and 1860s than in the whole of the first half of the century, affecting the way farmers approached the art, and in some cases the science, of farming. Newspapers reinforced the theme of progress and canvassed the philosophy of more enlightened farming to an audience far greater in size than that reached directly by the journals of agricultural societies.

Landowners played a crucial role in advancing the agricultural industry. Rents increased by slightly less than one-fifth in the East Riding between 1850 and the mid-1870s; income from government and industrial stock, which most landowners seem to have drawn on, increased by a similar amount; and loans were available from government and private companies specialising in agricultural investment. These three sources provided a substantial number of landowners with the funds necessary for systematic investment in farm and estate improvement. High standards were adopted by many of the local gentry confirming the view that they were more business-like and competent in estate administration than their predecessors. Only a minority, on the evidence presented here, preferred to do nothing. The lessons learnt from the low price years of the 1820s and 1830s, and the fears that Repeal would permanently lower the price of grain, help to explain why possibly the majority of landowners came to accept that agriculture should develop on the basis of large injections of capital and improved efficiency in the post-Repeal period. The call for protection was muted after 1852-3 and was not heard again from responsible quarters until the late 1870s.

The efforts of landowners were reinforced by the work of farmers. Mixed farmers benefited considerably between the Crimean War and the onset of depression from a combination of rising livestock prices, moderately stable grain prices and sizeable injections of new capital. Many East Riding farmers co-operated with estate managements and purchased new equipment, improved seeds, and artificial feedstuffs and manures which were central to the high input system of farming. Some also co-operated in field drainage but it must be stressed that cost was an essential component in all these activities and numerous farmers, especially small farmers or large farmers whose capital was spread thinly, were unable to accept the added costs.

Tenant farmers' contribution to farm improvement hinged on the

resources at their disposal, their knowledge of how to use them productively, the size of the physical and structural problems they faced, and their willingness to invest. There is no evidence that East Riding farmers as a body showed much reluctance to use their capital to improve farms, though simple logic suggests that tenant farmers with less than about £10 of working capital per acre were seriously constrained as to what they could do. Landlord/tenant relations were apparently good in most cases and long standing confidence between the two parties often encouraged heavy investment from the tenantry, invariably without formal guarantees of compensation before the end of the 1850s. However the tenant right movement shows some dissatisfaction with customary arrangements for tenant compensation going back to at least the end of the 1840s when a small and unrepresentative group of farmers in the county began to demand specific compensation for the whole range of investments made popular during the high farming period. Many East Riding estates introduced a modern covenant by the late 1850s and the majority had them by 1880, which can be regarded as more a recognition of the scope of changes brought in during the third quarter of the century rather than the outcome of specific agitation for covenants. However, the more comprehensive arrangement for awarding compensation must have been an element in raising tenant investment.

Traditional textbooks argue that yearly tenancies, such as existed in the East Riding, placed farmers at a disadvantage compared to those protected by long leases. There is no support for this from the East Riding study. Farming standards in the county were above the national average, despite the patchiness at district level, and tenant farmers gave no indication of being constrained by limited tenure. The average tenancy on the estates investigated in this study was about 20 years and tenancies were often passed down within families. Local evidence suggests that the system of yearly tenancies was compatible with spirited farming and in no way constrained tenant investment.

The tightness of the local agricultural labour market was another powerful factor encouraging farmers to improve farming standards. The labour market tightened considerably in the 1860s and especially the 1870s as an increasing number of farm workers found alternative work in industry and mining. Wages in the East Riding were not as high as those paid on farms in other northern counties but they were considerably above those in the agricultural districts of the south and south west, and rose by a further 25-30 per cent, following the national average, between the early 1850s and mid-1870s. This encouraged farmers first on the Wolds, where pressure from the labour market was greatest, and a decade or so later in Holderness and the Vale of York, to invest in labour saving machinery, though presumably many family-run farms managed quite adequately with more traditional equipment. The innovation of machinery was a complex affair involving psychological re-adjustment on the part of farmers and changes to the farming landscape itself, but the rising bill for farm labour often provided the incentive for local farmers to take up new equipment or up-grade existing equipment. For example, the transition from the sickle to the scythe and from the scythe to the reaper was inconceivable in the space of only 30-40 years without strong pressure for change. This study has argued that pressure came mainly from the increasing scarcity and cost of harvest labour.

Most farmers in this period understood the mechanics of their business and are revealed to be perceptive businessmen in their own right. Their contribution to farm improvement supports this, as does their measured response to price movements, the association between prices and farm output being fairly strong in most cases. Farmers appear to have been influenced by trend prices in the 1870s and 1880s but the strongest influence over the period 1850-80 was probably the price of close substitutes, which underpinned the movement out of wheat, which fell steadily in price, into barley and oats which held their prices better.

The acreage under crops rose in the East Riding in the 1850s and for part of the 1860s, and the acreage under grass and meadow contracted slightly. Farmers did not act irresponsibly in expanding the cropped acreage. Cereal production was given a powerful boost by the Crimean War; the per capita consumption of wheat increased down to 1870; and the price differential between cereals as a whole and livestock products was not obvious and farmers benefited by replacing wheat in their rotations with barley and oats. There was therefore no gradual or continuous trend to grass in the East Riding over the third quarter of the nineteenth century, but the increasing emphasis on oats and barley, together with the perceptible trend to grass in the 1870s and especially the 1880s, made livestock farming more important in most regions at the end of the period than at the beginning. The high Wolds were an exception largely because lack of water gave farmers there no viable alternative to grain and sheep. There were also farmers and landowners in other areas, where greater flexibility was possible, who could not afford the cost of shifting more resources into beef or milk production once profits and rents came under heavy strain. The result was that large areas of eastern Yorkshire remained under grain in the 1880s and 1890s, though the balance of the mixed farm economy leaned more heavily towards livestock.

The farming interests' prosperity over most of the period between 1850 and 1880 extended down to the agricultural labourer. Money wages rose faster than prices and labourers benefited, in varying degrees, from more allotments and gardens, better education, and in a pitifully small number of cases, better cottages. Nonetheless, labourers remained close to poverty in the 1870s and wages were often insufficient to meet all family requirements unless supplemented by the earnings of other family members. Charity was an accepted part of life and was particularly important during hard winters when unemployment rose, and during periods when prices rose temporarily faster than wages. The 'Revolt of the Field'

is instructive here because one of its main causes, if the strike meetings held in East Riding villages can be generalised from, was a simple reaction to the hardships of the early 1870s. The agricultural labourer benefited least from the improvements of the third quarter of the nineteenth century, though he did comparatively better than his masters in the next quarter.

What then can be concluded about the agricultural industry in the East Riding and the community which supported it? It would seem that many of the trappings of the industry remained unchanged between 1850 and 1880: farm workers continued to receive paltry wages; many farmers continued to show indifference to technical and marketing developments; large areas of the lowlands remained badly drained; and the farming advantage still lay with the light soil districts, though depression was to sit heavily on light soil farmers who did not increase the role of livestock in their husbandry. But with this said it seems reasonable to argue that high farming marks a point in the agricultural history of the East Riding when the bulk of its farmers became exposed to a recognisably modern and increasingly scientific mode of farming, and when they, and the county's landed families, realised the need for more enterprising and resourceful farming, though there was quite a tradition of this by 1850. High farming was in many ways a disappointment, especially for landowners calculating the return on earlier investments at the end of the century, but on the positive side it accelerated the dynamic of progress in the agricultural industry; it introduced modern farming in a very real sense; and it helps to explain some of the ingenuity and resourcefulness shown by farmers and landowners in adapting to harder conditions in the last quarter of the nineteenth century.

THE HISTORICAL ASSOCIATION BETWEEN FARM SIZE

AND AGRARIAN PROGRESS

Hermann Levy, perhaps the most authoritative writer on farm size in the early twentieth century, traced the "origin of the modern large farm ... to the time corn growing flourished",¹ and placed the 'disappearance' of small farms between 1760 and 1815:²

A complete revolution in agricultural conditions had in fact been brought about by the uninterrupted rise in the price of corn due to the combined results of the bad harvests which ruled from 1760 onwards, the French wars lasting almost a quarter of a century, and the Continental System. The enhanced price of corn had made arable farming more profitable than any other branch of agriculture. Accordingly, the unit of holding more suitable for arable farming, namely the large farm, became the rule ... the old agricultural system had to be broken down before the new could be built up. The small farms and peasant properties, and the little holdings of the cottager and labourer, had to be sacrificed. The industrious small agriculturalist had to give way to the large farmer possessed of capital and education.³

Levy accepted that parliamentary enclosure gave a new form to an agricultural system already in the throes of revolutionary change. E.C.K. Gonner shared this view and drawing liberally on Marxist philosophy argued that parliamentary enclosure brought the yeoman and capitalist into conflict, the capitalist winning:

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1. H. Levy, Large and Small Holdings (1911), p. 3.
 2. Ibid. p. 29.
 3. Ibid. p. 44.

Capitalist farming had been increasing /i.e. during the early eighteenth century/ and with the opportunity for capital, the small owner had experienced increasing difficulty in holding his own ... the struggle had now definitely gone against him. The yeoman farmer who had owned and cultivated his land, though not wholly driven out, survives as from the past to remind a new age of a time when he and his fellows constituted the strength of the Country. The small tenant farmer likewise undergoes decrease. Their place is taken by large proprietors and large farmers.¹

The more conservative historian, J.H. Clapham, also endorsed the view that "the unit of cultivation throughout Great Britain was increasing in size /i.e. during the reign of George III/, by the throwing together of ancient small holdings and the creation of new large holdings from heath down and fen".²

According to this argument the pace of structural transformation on the land began to slacken with the ending of the French and Napoleonic Wars. Levy wrote: "Chronologically, the extension of the large farm system may be described as first constituting an agrarian revolution and then continuing slowly but surely for more than sixty years",³ extending well into the third quarter of the nineteenth century.⁴ Economic and technical progress on the land were an intimate part of this. The small independent farmer had virtually disappeared by 1850⁵ and the "large farm system reached its highest level" between 1850 and 1880. The small farm showed "little capacity for survival"⁶ in a period of "engrossing" and "constant agricultural progress".⁷ Although the pace of farm development have slackened after Waterloo, historians still saw landowners making a

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1. E.C.K. Gonner, Common Land and Inclosure (1912), pp. 378-9.
 2. J.H. Clapham, An Economic History of Modern Britain (2nd edn, 1950), II, p.98.
 3. H. Levy, op. cit. p.67.
 4. Ibid. p.45.
 5. Ibid. p.51.
 6. Ibid. p.64.
 7. Ibid. pp.61, 65.

determined effort to construct larger farms, and it was suggested that each decade witnessed some fresh change and laid a claim to 'seeing off' the small farmer.

This view of the demise of the small farm has an obvious defect in common with the supposed deterioration of the agricultural labourer in the second half of the nineteenth century. Both matters were often talked about and widely believed, but they never seemed to eventuate. Small farmers remained numerous and the smallest among them showed a remarkable tenacity in the face of market forces which were no longer favourable to them. The 'gradualist view' scales down the importance of enclosure and the consequences which followed from it. It sees enclosure as "the final rather than the first stage in the process of reorganisation ... and its effects on farming methods and on the village community [were] ... not always very great".¹

This does not deny that enclosure gave a unique opportunity for modernising agriculture and that the opportunity was often seized. There is much truth in the statement that areas of ancient enclosure lagged behind those enclosed more recently because they lacked the stimulus of Parliamentary enclosure.² There are also grounds for supposing that fundamental improvements could be made on old enclosed land, as occurred on the Emanuel Hospital estate at Brandesburton when 800 acres were added to the estate in 1846 following an enclosure award. This led to hectic activity in which farms were remodelled, fields were sub-divided and fenced,

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1. G.E. Mingay, Enclosure and the Small Farmer in the Age of the Industrial Revolution (1968), p.18.
 2. A. Harris, The Rural Landscape of the East Riding of Yorkshire, 1700-1850 (1961), p.125; J. Thirsk, English Peasant Farming (1957), p.257.

and new roads were built to serve new farm centres.¹ What happened on this estate must have happened on many others in long settled districts. However, there was no unique association between the thoroughness of parliamentary enclosure and the size of farms at county level. For example, a high level of enclosure between the mid-1750s and the end of the Napoleonic Wars was not associated with a correspondingly high level of extensive farms (ie. over 500 acres) in counties like Northamptonshire and Rutlandshire, while a low level of parliamentary enclosure in Berkshire, Wiltshire and Gloucestershire was associated with a fairly high level of extensive farms.

Enclosure and farm size in selected English counties

County	Percentage of county enclosure by act of Parliament	Farms of 500 acres and over as a percentage of the total
Northamptonshire	51	3.8
Huntingdonshire	46	4.8
Rutlandshire	46	1.0
Bedfordshire	46	4.1
Oxfordshire	45	3.9
East Riding	40	3.7
Cambridgeshire	36	4.8
Buckinghamshire	34	2.5
Berkshire	25	8.6
Wiltshire	24	12.1
Gloucestershire	22	5.1

Source: D.B. Grigg, 'Small and Large Farms in England and Wales: their distribution and size', Geography, 48 (1963), 274.

A simple correlation of the level of enclosure and the proportion of farms over 500 acres in the eleven counties mentioned above was computed at 0.661. There was obviously some association between the two variables but enclosure

1. Emanuel Hospital MSS, L.C.R.O. E.H. 5.2, pp. 5-6.

was far from being the sole cause of regional variations in the distribution of large farms.¹

A basic movement towards larger farms appears to date from at least the Stuart Restoration, and Habakkuk and Mingay argue that there was a decline in the number of small farms in the following century.² Part of this can be attributed to short term influences such as low prices, agrarian depression, and rising taxes to finance two foreign wars between 1688 and 1714. But part was of a secular nature. Buoyancy in the land market may not have been confined only to the first half of the eighteenth century as is commonly supposed.³ If the case of Lincolnshire was typical, aristocratic involvement in the land market receded after 1750 and the drift towards larger estates stabilised, but investment in country estates was maintained by the continuing inflow of metropolitan capital, gentry capital, and capital from the professional and factory-owning classes seeking social respectability in landownership.⁴

Small farmers could sell their freeholds without much difficulty, if they had a mind to, and either move off the land or use their capital to stock and equip larger holdings on a tenant basis. The combination of rural depression and increasingly attractive alternatives to agriculture

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1. D.B. Grigg, 'Small and Large Farms in England and Wales: their distribution and size', Geography, 48 (1963), 275.
 2. For example, G.E. Mingay noted a fall in the number of farms below 100 acres on the Bagot estates in Staffordshire, especially between 1724 and 1744, and associated it with the severity of the agricultural depression. The number of farms in the size range 21-100 acres fell by 37 per cent between 1724 and 1744, and by a further 14 per cent between 1744 and 1764. Meanwhile the acreage of the average farm increased by nearly 29 per cent between 1724 and 1744, and by 40 per cent taking the entire period 1724-64. - 'The Size of Farms in the Eighteenth Century', Econ. Hist. Rev. 2nd Ser. XIV (1962), 481-2.
 3. H.B. Habakkuk, 'English Landownership, 1680-1740', Econ. Hist. Rev. 2nd Ser. X (1940).
 4. B.A. Holderness, 'The English Land Market in the Eighteenth Century: The Case of Lincolnshire', Econ. Hist. Rev. 2nd Ser. (1974), 557, 574.

in trade and the professions probably encouraged a shift away from smaller holdings in the early part of the eighteenth century. The ubiquitous influence of changing agrarian technology and practice provided the dynamic to produce a slightly more efficient farm structure, though the process was far from successful in many districts as the history of East Riding farms in the mid-nineteenth century has shown.

The size of farms was evidently increasing in the century prior to parliamentary enclosure. Much remained to be achieved before a recognisably modern farm structure was produced, and this was the task of landowners and farmers who enclosed under Act of Parliament, and those who attempted to modify the farming landscape down the nineteenth century. However, the difficulties of amalgamating small holdings by a process of structural integration were still enormous by the middle of the nineteenth century, and there was only a slight drift to larger farms. The East Riding showed this in general terms, though farms were enlarged in the most backward districts by amalgamating tenancies, and it is also confirmed by farm studies of Lincolnshire.

The farm structure of Lincolnshire, 1851-71.

Size Interval	Percentage of farms over 5 acres in each size group	
	1851	1871
1000 acres +	0.59	0.64
500-999	3.5	4.6
300-499	7.4	8.4
100-299	17.9	15.8
50-99	26.3	23.8
5-49	44.9	47.0

Source: D.B. Grigg, 'Small and Large Farms in England and Wales: their size and distribution', Geography, 48 (1963), 270.

Indeed, on a broader scale, there has been no marked change in farm size in England and Wales as a whole, taking the entire century after 1851.¹

1. D.B. Grigg, 'Small and Large Farms in England and Wales: their size and distribution', loc. cit. p.270.

It would seem that those historians who have argued that parliamentary enclosure had a decisive effect on farm size and layout, although correct in part, have generally overestimated the importance of George III's reign in British agricultural history, and have underestimated the difficulty of modifying the existing farm structure. On the other hand, a development drawing on the ancient tap roots of agrarian progress frees itself from the constraints of the "heroic" view of Ernle and others, and still confirms the association between advancing technology, keener competition and larger farms. This longer term view is flexible enough to admit that the relationship between these variables was stronger in periods of active progress and weaker during the rest, but it denies that the average size of farms, in any large and long-settled area, could change markedly over a relatively short period of time. Instead, the evidence seems to suggest that the growth of farms, in the sense of the physical absorption of smaller holdings, was a long drawn out process continually opposed by powerful obstacles.

FIELD STRUCTURE

The field structure of several lowland parishes in the East Riding improved slightly in the quarter century after 1850. William Wright commented on a 450 acre farm in Howdenshire where old and useless hedges had been up-rooted and its original 51 fields had been reduced to a more manageable 17, so adding 4 per cent to the cultivated acreage of the farm.¹ This was repeated on other farms but the process never went far enough to equip the majority of lowland farms with an efficient field structure. This was not a result of poor husbandry, though the two often went together. More important were the high costs of modifying the existing field structure, which was a powerful deterrent to all but the richest or boldest landowners, and geographical constraints which sometimes took field enlargement beyond the control of estate managements. For example, as late as the 1960s farmers in the Vale of York made strenuous efforts to increase the average size of fields but they were restricted by the fact that the close network of hedges acted, in some parishes, as a windbreak against blowing sand² and gave shelter to cattle. However, it should be pointed out that the field structure of the East Riding was not as outdated, generally speaking, as that encountered in certain southern and eastern counties.³ The Hull Advertiser made this point forcefully arguing, not without bias, that the East Riding's "arable park" appearance was vastly superior to the "rubbishing fence and hedgerow country" found in other counties.⁴

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1. W. Wright, 'On the Improvement in the farming in Yorkshire since the date of the last Reports in the Journal', loc. cit. p. 96.
 2. W. Harwood Long, A Survey of Yorkshire Agriculture (1969), p. 39.
 3. La Vern Hoelscher, 'Improvements in Fencing and Drainage in Mid-Nineteenth Century England', loc. cit. p. 75.
 4. Hull Advertiser, March 26, 1847.

Nonetheless there were considerable economic costs associated with retaining an out of date field structure in the age of high farming. The arguments relating to technical inter-relatedness have been outlined and demonstrate the difficulties of farm mechanisation, but there were also other problems of some consequence. A profusion of small enclosures hindered the natural action of sun, rain, wind, and air on the land. Soils were slower to warm up in spring, delaying harvest and autumn ploughing; mildew and blight were greater risks as large areas of crop land were in permanent shade; the cultivated acreage was reduced and the natural line of field drainage was often broken.¹ Any successful attempt to rationalise the field structure of well established farms lessened these negative influences and lowered labour costs by increasing the efficiency of men and horses, less time being taken up in short turnings and moving equipment from field to field.

1. La Vern Hoelscher, 'Improvements in Fencing and Drainage in Mid-Nineteenth Century England', loc. cit. p. 75.

THE CAPITAL REQUIREMENTS OF TENANT FARMERS, c. 1850.

Morton's Cyclopaedia of Agriculture detailed the capital requirements for what it termed a "certain livelihood in the business of farming". Farmers were advised to occupy farms whose acreage placed no strain on their capital resources. In this way, it was argued, "a reserve may exist on which to draw either during an adverse season, or whenever any extra investment offers the prospect of extra-ordinary returns". It was conceded that the precise level of capital required by farmers was a function of the type of farming undertaken and the fertility of the soil.

A capital sum of £9.10.0 per acre was estimated to be the minimum a tenant should have if he was to cultivate a 400 acre farm efficiently. £11.7.0 was thought necessary for a farmer with 240 acres, and £11 and £14.10.0 for farmers with 120 and 20 acres, respectively. To prevent unnecessary repetition, a break down of capital requirements is given here for a farm of 400 acres. Assumptions are made that a four course rotation of wheat, barley, turnips, and clover was in operation and that the incoming tenant took up the tenancy on Lady Day.

Capital requirements on a 400 acre farm.

1.	Sums payable to outgoing tenant for cultivation, manuring, etc.	
		£. s. d.
(a)	The preparation of 100 acres of wheat which are up and in braid - constitutes cost of sheep folding, ploughing, harrowing, drilling, and price of seed	156. 5. 0.
(b)	The preparation of 100 acres of turnips	60. 0. 0.
(c)	The sowing, preparation and manuring of 100 acres of barley	168.15. 0.
(d)	Manure used on a green crop prior to the sowing of barley	325. 0. 0.
(e)	The sowing, preparation, etc. of 100 acres of young clover	75. 0. 0.
(f)	Manure left in fold yard	410. 0. 0.
	TOTAL	<u>1,195. 0. 0.</u>

2.	<u>Implements of cultivation required on a farm of 400 acres.</u>	
	No allowance is made for dairying equipment following the assumption that the farm concentrates on corn and meat	£. s. d 520. 0. 0
3.	<u>The labour bill for one year.</u>	
	(a) Cost of 10 horses and their keep	356.12. 6
	(b) Wages of manual labourers, including tradesmens' bills	<u>614. 6. 0</u>
		<u>970.18. 6</u>
4.	<u>Purchase of seed.</u>	
	Wheat and barley seed bought by outgoing tenant. Therefore the ingoing has only to buy clover seed and roots	97.10. 0
5.	<u>Cost of stock to consume produce of farm.</u>	
	(a) 200 ewes with lambs, bought in May at £2 a head	400. 0. 0
	(b) 60 head of oxen at £15 a head	900. 0. 0
	(c) Grain, oil cake for oxen	100. 0. 0
	(d) Cost price of 4 breeding cows	<u>14. 0. 0</u>
	TOTAL	<u>1,414. 0. 0</u>
6.	<u>Rent and taxes.</u>	
	Estimated at 32s. per acre	640. 0. 0
	TOTAL COST (1-6)	<u>4,837. 8. 6</u>
	TOTAL COST PER ACRE	12. 0. 0

The incoming tenant would not need this entire amount.

1. Half the rent bill would be paid in the year following the commencement of the tenancy, and the other half could be paid out of farm profits made before Martinmas.
2. The winter labour bill could be met from the sale of produce.
3. Autumn stock could be paid for from farm profits.

Taking these three items into consideration reduces the capital required by the incoming tenant by £1,000 ie:

	f. s. d
(a) Rent - excluding taxes	500. 0. 0
(b) Latter half-year taxes	70. 0. 0
(c) Winter labour	200. 0. 0
(d) A portion of bought winter stock	<u>230. 0. 0</u>
TOTAL	<u>1,000. 0. 0</u>

The minimum capital required by an incoming tenant on a 400 acre farm in the 1850s, if the farm was to be managed efficiently, was £3,837. 8. 6., or £9.10. 0. per acre

SCOPE OF VALUATION AGREEMENTS BETWEEN OUTGOING AND
INGOING TENANTS

There are many surviving manuscripts which give the precise form of valuation agreement between outgoing and ingoing tenants. The one given here concerns William Jackson, the outgoing tenant of a farm at Laxton in the parish of Howden, and Philip Saltmarsh, Esq., of Saltmarsh, the owner and incoming tenant. The agreement, dated 27 August, 1878, included the following:

1. Garden and orchard : all fruit trees.
2. Farm premises : inventory of all farm equipment, eg. steam engine boiler, threshing machine, piping, potato steamer. Also in the farm yard were 3 tons of mangolds, one and a half tons of turnips, together with hen manure, clover hay and straw.
3. Farm : Seed bill and the cost of sowing 70 acres with seed. One-half of the bill for oil cake. The cost of ploughing 133 acres, some of which was ploughed twice over.
4. Blacksmith's shop : 1 bellows, 1 anvil, 1 vice, several tongs, etc.
5. Foreman's cottage : Grate and oven, door bolts, two benches, 16 bacon hooks, etc.

TOTAL VALUE (1-5) set at £1,122.14. 2.

6. Value of away-going crop : The acreage from which the away-going crop was taken was made up as follows:

	a.	r.	p.	
Pennythorpes	47.	2.16		wheat on potatoes
Part of Sandfields	1.	1. 0		"
Ings Field	19.	2.12		"
Part of Brick Hill	2.	0. 0		wheat on turnips
Wilfe Field	24.	3.20		wheat on fallow
Sand Field	12.	1. 7		wheat on mangolds
Out Gangs	12.	2.10		"
TOTAL	120.	0.25		

The valuers directed that Philip Saltmarsh, after deductions were made for rent and rates, etc., should pay to the Trustees of William Jackson £471.14.2 plus £32.7.3 being half the cost of the valuers.

After consideration of certain debts owed to Mr. Saltmarsh by the tenant, it was fixed that the former should settle with the Trustees to the amount of £437.13.10.

NATIONAL AGRICULTURAL STATISTICSTable 1. Cereal prices in the United Kingdom, 1850-90.
(per imperial quarter)

	Wheat s. d.	Barley s. d.	Oats s. d.
1850	40. 3	23. 5	16. 5
1851	38. 6	24. 9	18. 7
1852	40. 9	28. 6	19. 1
1853	53. 3	33. 2	21. 0
1854	72. 5	36. 0	27.11
1855	74. 8	34. 9	27. 5
1856	69. 2	41. 1	25. 2
1857	56. 4	42. 1	25. 0
1858	44. 2	34. 8	24. 6
1859	43. 9	33. 6	23. 2
1860	53. 3	36. 7	24. 5
1861	55. 4	36. 1	23. 9
1862	55. 5	35. 1	22. 7
1863	44. 9	33.11	21. 2
1864	40. 2	29.11	20. 1
1865	41.10	29. 9	21.10
1866	49.11	37. 5	24. 7
1867	64. 5	40. 0	26. 0
1868	63. 9	43. 0	28. 1
1869	48. 2	39. 5	26. 0
1870	46.11	34. 7	22.10
1871	56. 8	36. 2	25. 2
1872	57. 0	37. 4	23. 2
1873	58. 8	40. 5	25. 5
1874	55. 9	44.11	28.10
1875	45. 2	38. 5	28. 8
1876	46. 2	35. 2	26. 3
1877	56. 9	39. 8	25.11
1878	46. 5	40. 2	24. 4
1879	43.10	34. 0	21. 9
1880	44. 4	33. 1	23. 1
1881	45. 4	31.11	21. 9
1882	45. 1	31. 2	21.10
1883	41. 7	31.10	21. 5
1884	35. 8	30. 8	20. 3
1885	32.10	30. 1	20. 7
1886	31. 0	26. 7	19. 0
1887	32. 6	25. 4	16. 3
1888	31.10	27.10	16. 9
1889	29. 9	25.10	17. 9
1890	31.11	28. 8	18. 7

Source: B.R. Mitchell, Abstract of British Historical Statistics (1962), pp. 488-9.

Table 2. Livestock prices in Britain: price indices for wool, mutton and beef, 1851-90.
(Average of 1865-74 = 100)

	Wool	Prime	Mutton Middling	Prime	Beef Middling
1851	63½	72	69	65	62
1852	63	72	69	65	64
1853	89½	89	86	80	80
1854	59½	89	86	88	88
1855	69½	87	84	88	90
1856	86	87	84	85	84
1857	100½	89	84	85	86
1858	70½	84	80	83	84
1859	92	87	86	85	84
1860	120	92	91	88	86
1861	91	90	91	87	86
1862	100	87	87	81	80
1863	117½	89	87	83	84
1864	149	90	93	88	90
1865	119	105	106	94	94
1866	117½	100	100	94	97
1867	88	90	91	92	92
1868	85½	84	86	88	88
1869	85½	95	93	97	94
1870	82	95	95	99	99
1871	115	103	107	106	109
1872	115½	110	111	104	107
1873	94	116	115	115	115
1874	103	102	97	110	105
1875	102½	116	107	113	113
1876	86	118	106	110	107
1877	86	113	98	108	101
1878	77	111	100	108	101
1879	65½	105	95	97	92
1880	74½	108	98	103	101
1881	67	113	104	99	99
1882	60	118	109	106	105
1883	56½	120	111	108	105
1884	56	105	97	103	101
1885	54½	92	86	92	90
1886	59½	102	91	87	82
1887	65	85	77	76	74
1888	59	95	86	85	80
1889	60	103	91	83	80
1890	59½	97	82	83	78

Source: E.H. Whetham, 'Livestock Prices in Britain, 1851-93',
Agric. Hist. Rev. XI (1963), 29.

Table 3: Quantities of wheat, barley and oats imported into the United Kingdom, 1859-80.
(in millions of cwt.)

	Wheat and Wheat Flour	Barley (exclusive of meal)	Oats (exclusive of meal)
1859	20.7	6.2	4.6
1860	30.6	7.5	6.3
1861	36.1	5.0	5.1
1862	48.2	6.6	4.4
1863	29.6	7.4	6.5
1864	27.7	4.9	5.6
1865	24.9	7.8	7.7
1866	28.1	8.4	8.8
1867	38.2	5.7	9.4
1868	35.7	7.4	8.1
1869	43.1	8.1	7.9
1870	35.7	7.2	10.8
1871	43.4	8.6	10.9
1872	46.5	15.0	11.5
1873	50.1	9.2	11.9
1874	47.8	11.3	11.4
1875	58.0	11.0	12.4
1876	50.4	9.8	11.2
1877	61.6	13.0	12.9
1878	57.7	14.2	12.8
1879	70.3	11.5	13.5
1880	65.8	11.7	13.8

Sources: Agricultural Returns for Great Britain with Abstract Returns for the United Kingdom.
(1878), pp. 88-9; Ibid. (1880), p. 135; Ibid. (1881), pp. 73, 77.

Table 4: Value of live cattle, sheep, pigs; corn, grain, flour;
dead meat and provisions, imported into the United Kingdom, 1859-80.
 (Value per head of population).

	£. s. d.		£. s. d.
1859	17. 0	1870	1.14. 4
1860	1. 9. 1	1871	2. 1. 3
1861	1.11. 1	1872	2. 6. 8
1862	1.14. 5	1873	2.10. 5
1863	1. 6.10	1874	2.10. 4
1864	1. 4. 6	1875	2.12. 8
1865	1. 6. 9	1876	2.13. 9
1866	1.12.10	1877	2.19. 7
1876	1.18. 3	1878	2.18. 8
1868	1.16. 2	1879	2.19. 3
1869	1.17. 5	1880	3. 4.11

Sources: Agricultural Returns for Great Britain with Abstract
Returns for the United Kingdom (1878), p. 111; Ibid. (1880), p. 157;
Ibid. (1881), p. 95.

Table 5: Number of live cattle, sheep and swine imported into the United Kingdom, 1859-80.

	Live cattle	Live sheep	Live swine
1859	85,677	250,580	11,086
1860	104,569	320,219	24,479
1861	107,096	312,923	30,308
1862	97,887	299,472	18,162
1863	150,898	430,788	27,137
1864	231,733	496,243	85,363
1865	283,271	914,170	133,280
1866	237,739	790,880	76,541
1867	177,948	539,716	48,164
1868	136,688	341,155	33,769
1869	220,190	709,843	69,488
1870	202,172	669,905	96,172
1871	248,611	917,076	85,562
1872	172,993	809,822	16,100
1873	200,802	851,116	80,978
1874	193,862	758,915	115,389
1875	263,684	985,652	72,170
1876	271,576	1,041,329	43,558
1877	201,193	874,055	20,037
1878	253,462	892,125	55,911
1879	247,768	944,888	52,366
1880	389,724	941,121	51,191

Sources: Agricultural Returns for Great Britain with Abstract Returns for the United Kingdom (1878), pp. 82-3; Ibid (1880), p. 129; Ibid (1881), p. 67.

Table 6: Quantity of manures imported into the United Kingdom, 1861-80. (in tons)

	Bones, etc.	Oil Cake
1861	239,858	108,826
1862	205,568	113,725
1863	305,998	101,156
1864	200,878	88,566
1865	312,625	105,570
1866	217,008	109,962
1867	271,140	129,023
1868	259,363	121,832
1869	309,238	162,339
1870	397,104	159,295
1871	351,950	158,453
1872	348,284	162,804
1873	346,895	134,300
1874	335,600	138,193
1875	402,560	157,718
1876	489,127	180,379
1877	483,002	190,281
1878	517,006	163,606
1879	356,597	201,325
1880	350,675	217,184

Sources: Agricultural Returns for Great Britain with Abstract Returns for the United Kingdom (1878), pp. 64-5; Ibid. (1880-1).

Table 7: Size of farms in English counties in 1870.
(Expressed as a percentage of all holdings in each county.)

County	Not exceeding 20 acres	20-99 acres	100 acres +
Bedfordshire	58	21	21
Berkshire	53	21	26
Buckinghamshire	53	22	25
Cambridgeshire	56	24	20
Cheshire	59	29	12
Cornwall	60	30	10
Cumberland	35	43	22
Derbyshire	59	30	11
Devonshire	44	36	20
Dorset	50	25	25
Durham	48	28	24
Essex	43	28	29
Gloucestershire	59	22	19
Hampshire	58	20	22
Herefordshire	55	23	22
Hertfordshire	51	23	26
Huntingdon	56	22	22
Kent	47	30	23
Lancashire	55	38	7
Leicestershire	51	29	20
Lincolnshire	59	25	16
Middlesex	60	27	13
Monmouthshire	50	35	15
Norfolk	61	22	17
Northamptonshire	46	27	27
Northumberland	43	22	35
Nottinghamshire	60	24	16
Oxfordshire	47	23	30
Rutland	51	30	19
Shropshire	59	20	21
Somerset	54	29	17
Staffordshire	61	26	13
Suffolk	45	29	26
Surrey	56	26	18
Sussex	45	32	23
Warwickshire	53	25	22
Westmorland	35	47	18
Wiltshire	57	19	24
Worcestershire	57	25	18
East Riding	53	22	25
North Riding	53	28	19
West Riding	63	28	10
Total for England	54	28	18

Source: Agricultural Returns for Great Britain with Abstract Returns for the United Kingdom (1870).

Table 8: The number and acreage of holdings of $\frac{1}{4}$ -1 acre in English counties in 1872.

County	Total number	<u>Holdings $\frac{1}{4}$ - 1 acre</u>		
		Total acreage	Number held by labourers as allotments	Total acreage held as allotments
Bedfordshire	3,712	1,571	3,512	1,483
Berkshire	1,019	461	705	319
Buckinghamshire	2,907	1,181	2,615	1,025
Cambridgeshire	3,672	1,291	3,443	1,171
Cheshire	525	256	98	31
Cornwall	887	362	559	171
Cumberland	98	50	24	11
Derbyshire	612	236	383	124
Devonshire	2,284	949	1,442	551
Dorset	2,566	984	2,103	789
Durham	85	49	4	2
Essex	896	354	627	218
Gloucestershire	3,319	1,551	2,447	1,173
Hampshire	1,235	560	627	313
Herefordshire	419	165	296	103
Hertfordshire	735	315	146	53
Huntingdon	289	115	209	71
Kent	703	286	306	137
Lancashire	336	162	11	4
Leicestershire	2,172	737	2,094	696
Lincolnshire	3,168	1,242	2,276	824
Middlesex	198	102	64	34
Monmouthshire	232	110	44	18
Nottinghamshire	1,134	433	791	299
Norfolk	3,494	1,401	1,414	562
Northamptonshire	5,248	2,093	4,917	1,747
Nottinghamshire	158	90	60	20
Oxfordshire	2,171	1,010	1,793	836
Rutland	269	86	258	81
Shropshire	650	308	194	85
Somerset	1,889	816	1,015	364
Staffordshire	1,096	528	403	206
Surrey	859	314	722	243
Suffolk	7,140	2,299	6,689	2,087
Sussex	956	391	461	139
Warwickshire	1,981	809	1,754	701
Westmorland	10	5	-	-
Wiltshire	1,814	828	1,125	528
Worcestershire	2,649	1,019	1,452	502
East Riding	1,069	419	799	317
North Riding	1,213	450	896	295
West Riding	1,550	588	874	314

Source: Agricultural Returns for Great Britain with Abstract Returns for the United Kingdom (1872), pp. 24-5.

Table 9: The number, acreage and average size of garden allotments in English counties in 1873.

County	Total number	Total acreage	Average size (in acres)
Bedfordshire	8,364	3,206	.38
Berkshire	5,007	1,146	.23
Buckinghamshire	8,632	2,203	.26
Cambridgeshire	9,596	2,501	.26
Cheshire	929	248	.27
Cornwall	1,762	288	.16
Cumberland	410	46	.11
Derbyshire	5,628	798	.14
Devonshire	4,062	1,814	.26
Dorset	7,322	1,701	.23
Durham	1,000	139	.14
Essex	8,269	1,468	.18
Gloucestershire	7,552	2,802	.37
Hampshire	6,712	1,571	.23
Herefordshire	997	192	.20
Hertfordshire	5,197	727	.14
Huntingdon	3,376	1,035	.31
Kent	4,150	741	.18
Lancashire	992	102	.10
Leicestershire	17,168	2,829	.16
Lincolnshire	7,430	2,181	.29
Middlesex	689	107	.16
Monmouthshire	569	251	.44
Nottingham	6,400	1,628	.25
Norfolk	16,447	4,294	.26
Northamptonshire	968	148	.15
Nottinghamshire	11,317	2,104	.19
Oxfordshire	9,088	2,360	.26
Rutland	1,252	327	.26
Shropshire	1,002	230	.23
Somerset	9,503	2,015	.21
Staffordshire	5,444	1,116	.20
Surrey	11,664	3,442	.30
Sussex	2,782	519	.19
Warwickshire	12,794	2,734	.21
Westmorland	52	6	.12
Wiltshire	15,445	4,310	.28
Worcestershire	4,919	1,908	.39
East Riding	1,781	759	.43
North Riding	4,731	1,240	.26
West Riding	6,876	1,385	.20

Source: Agricultural Returns for Great Britain with Abstract Returns for the United Kingdom (1873), p. 17.

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