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DAIRYING IN SOUTH WEST DERBYSHIRE IN THE LATE NINETEENTH CENTURY: A STUDY IN HISTORICAL GEOGRAPHY

by

G. A. TOMSON

A Master's Thesis

Submitted in partial fulfilment of the requirements for the award of

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1986

C. by G. A. Tomson, 1986
ABSTRACT

The study analyses the changes in agriculture in S.W. Derbyshire during the period 1870-1900. Before 1870 the main product of the region was farmhouse cheese, but within thirty years this had become a rarity and the emphasis of sales had switched to liquid milk production, with London as the main market. The reasons for the decline of cheese production are investigated, as are the unsuccessful attempts to establish a factory system of production. The growth of the liquid milk industry is analysed in terms of the developing market and the price advantage over other forms of marketing. These changes are also related to changing farming systems within the region. Finally, an attempt is made to assess the relative profitability of farming in the region during the years of agricultural depression 1873-1896.

Throughout the study consideration is given to micro-regional variations within the study area in an attempt to illustrate the influence of farm location and physical environment on farming systems. Extensive use is made of parish summaries of the Agricultural Returns to quantify these variations.
ACKNOWLEDGEMENTS

The completion of this study is due in no small part to the help I have received from many people, to whom I extend my warmest thanks. In particular I should like to mention the staffs of the libraries at Derbyshire College of Higher Education, Loughborough University of Technology, Nottingham University School of Agriculture, Sutton Bonington, and Derby Local Studies Library, for their expert assistance. Much valuable material was obtained from privately owned diaries and accounts, and I am deeply indebted to Mrs. C.W. Hill of Longford, Mr. R.W. Potter of Yeaveley, and Mr. J. Carson of Ashbourne for their generosity in this respect. I would also like to thank Mr. Lance Waud, formerly County Agricultural Officer; Mr. Harry Payne of The Nestle Company; and Mr. John Dilks, Public Relations Officer for the Central Midland Co-operative Society, for their advice and assistance. Colleagues at Derbyshire College have been supportive, and I am particularly grateful to Mr. Andrew Skinner for applying his cartographic skills to the maps, to Mrs. Teresa Redfern whose computing knowledge allowed me to use the data effectively, and to Mrs. Angela Rathbone for her patience and forbearance in typing the manuscript.

It has been my good fortune to have Professor R.A. Butlin as Director of Research and Supervisor, and to him I express my sincere thanks for his guidance and encouragement.

To my family I apologize for my eccentricities over the past three years: their understanding was needed and appreciated.
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ABBREVIATIONS

I.B.G. Transactions and Papers of the Institute of British Geographers
Econ. Hist. Review Economic History Review.
Ag. Hist. Review Agricultural History Review
Jour. Hist. Geog. Journal of Historical Geography
INTRODUCTION

The object of this study is to investigate the changes that occurred in the dairying industry of Derbyshire in the late nineteenth century. Although dairying was widespread throughout the county, only in the southern lowlands were there whole parishes where farmers were almost totally dependent on the sale of dairy products for their livelihood allowing one to equate the well-being of dairying with the whole agricultural economy. Therefore, it is on some seventy parishes in the extreme south western part of the county that attention is focussed. The period of the study has been restricted to the last three decades of the nineteenth century because dairy farmers then were faced with new challenges and opportunities which were essentially national in character. They were the result of rapid changes in English economy and society which transformed the nation in less than a hundred years from its controlling agrarian base to a society in which the urban-industrial interest was becoming the dominant force. Thus, by 1870, Government decisions were decreasingly biased towards the landed interest, and had to take account of a much broader spectrum of society whose interests lay in the further development of overseas trade. At the same time, the demographic transition from a rural based population to a much enlarged urbanized population created opportunities for expansion of food production tempered only by the challenge from imports made possible by spectacular transport improvement. But transport improvement also presented opportunities in England, especially for the production of perishable commodities such as liquid milk, which formerly had been restricted by remoteness from the market. Thus the dairying districts, formerly concentrating on manufactured milk products, should have enjoyed a unique opportunity to expand and intensify production with the sale of liquid milk as the end product. To some extent this proved to be the case, but government strategies made for relative rather than absolute prosperity. This prosperity relative to other sectors of agriculture often has led to assumptions by twentieth century writers, concentrating on the problems of grain production, that dairying was unaffected by the price depression of the late nineteenth century. But the extent to which this thesis has been tested is limited. It is intended that this study will provide more local evidence with which to substantiate or modify such a claim.
For centuries wheat production lay at the heart of English farming, a feature that can be related to the need to be self-sufficient in food production. In 1800 the protection of agriculture was also the protection of the national interest. The Corn Laws, which prohibited the sale of imported grain unless the market price in England was at an acceptably high level, were the means by which agriculture was protected. The changing nature of the economy in the early nineteenth century, with its rapidly developing industrial sector and related workforce, meant that the pre-eminence of agriculture was gradually undermined. Protestations against its privileged position grew stronger and more orchestrated as the century progressed. In 1846, the Corn Laws were repealed, ushering in an age when agriculture was fully exposed to market forces, with cereals proving to be more vulnerable to foreign competition than livestock products. This did not immediately change attitudes within agriculture to the relative merits of arable and grassland farming. The sheep and corn barons remained contemptuous of dairymen and of the dairymen's lifestyle. The care of dairy animals demanded unceasing labour and "dirty boot farming". It was associated also with smaller farms on which the farmer was labourer as well as manager. Taylor(1) sees this bias as hampering the development of the dairying industry because the reluctance to accept the diminishing importance of grain production was shared by landlords and contributors to agricultural journals. The bias extends beyond the nineteenth century literature to modern interpretations of agriculture during the years of depression.

All too frequently one finds agriculture discussed as though it were synonymous with the growing of corn. Yet, by 1869 the wheat crop contributed only 15.4 per cent of gross agricultural output in the United Kingdom and a mere 4.1 per cent in 1911-15(2). General works on the economy are particularly prone to this approach. Dean and Cole(3) limit their comments on dairying to a single reference to increases in the importation of cheese and butter; Ashworth(4) gives the subject rather more attention but only in the context of imports and changing demand in this country; Chambers(5) almost ignores the subject except for reference to improved feeding for milk production. In a more specialized study Ojala(6) examines the purchasing power of farm prices in relation to other commodities. This shows that livestock products appreciated in real value, 1870-1900, whereas "crops" depreciated. Dairying is not
distinguished from other livestock enterprises, and, in this comparative national study of the United Kingdom with Sweden and the USA, regional considerations are excluded.

Agricultural histories also sell dairying short. Lord Ernle's English Farming Past and Present(7), first published in 1912, has been extensively quoted by more recent authors, but even in this monumental work the emphasis is on grain production. For instance, "the nadir of the great depression came in 1894-95, when the price of wheat per imperial quarter fell to 22s 10d ... From that time began a slow but steady rise in prices." Thus depression is measured in terms of wheat, the second statement being true of cereals but not of dairy products. More recently Orwin & Whetham's detailed study of the History of British Agriculture 1846-1914(8) treats dairying in rather more detail, but is largely descriptive and concerned with the possibilities and difficulties of developing dairying as an alternative to cereals in the grain counties. In the extensive statistical tables, milk production and dairy cattle are omitted. The assertion is made correctly that lower cereal prices benefitted stock farmers, but the assumption is made that dairying became more profitable in absolute terms rather than relative to grain production. This was especially held to be the case in the North of England where higher industrial wages created a ready market. "Between the Trent and the Scottish mountains pasture farms and areas of intensive arable supported higher incomes per acre ... than those other regions to the south and west." "There was nothing here which resembled the drastic fall (in profits) which had occurred over so much of eastern and southern England."(9) Thus dairying and even stock-rearing is viewed comparatively in order to establish the severity of the problem for corn farmers.

Historical geography texts usually adopt a similar interpretation. Walton(10) states: "But areas outside the south-east did prosper to a degree hitherto unknown. The so-called Great Depression of the 1880s and 1890s appears to have left more or less unscathed those substantial areas of the north and west which enjoyed expanding urban markets for livestock and dairy products." Hall(11) dismisses dairying in one page and confines his description to the increase in milk production rather than to its profitability.
When an examination is made of the original sources from which these conclusions/interpretations are drawn, one finds that the majority of references are to the two Royal Commissions which investigated the state of agriculture in 1879-81 and again in 1894-97. For instance Hall and Coppock (12) use these sources for some 40 per cent of their references, and most of the other works quoted are secondary sources which have also relied on the Royal Commissions. This is not a criticism, merely a comment on the importance of the Royal Commission reports as the main source for description, analysis and statistical data, regarding agriculture in the late nineteenth century. The verbatim reporting of all the evidence presented also allows an impression to be gained of how the farming community perceived the problem. However, such reliance does demand that the reports are seen in the nineteenth century context.

Fletcher has demonstrated that the first Royal Commission chaired by the Duke of Richmond was heavily weighted in favour of very large landowners and that the witnesses were mainly tenant farmers managing over 500 acres drawn from the east and south. (13) The Derbyshire evidence was presented by a landowner with a "small property" of 2500 acres and a land agent responsible for 40,000 acres on several estates. (14) No small tenant farmers were represented. The second Royal Commission showed a fairer regional balance, but also has limitations as a source of information. The commission was divided and the final report was "a discordant compendium of many voices" (15) reflecting their different interests. The meagre evidence for Derbyshire was presented by a land-agent, (16) and by the chairman and secretary of the Derbyshire Dairy Farmers Association, (17) neither of whom was typical of the small tenant farmer in S.W. Derbyshire. Thus, if twentieth century authors use the Royal Commissions as their major sources, it is likely that modern interpretations will reflect the conclusions of those sources, and it is important to appreciate that there was a vested interest, and that the lot of the small dairy farmer was not examined in great detail.

Another source of valuable information is the contemporary farming journals, of which the most important is the Journal of the Royal Agricultural Society of England. Here, too, one must tread with caution as much of the material deals with innovation in agriculture, and represents the best farming practice which is not necessarily majority practice. Not until 1877 was there a journal devoted to dairy
In a study which attempts to look at profitability of dairying there are major problems associated with obtaining representative farm prices. The problem is compounded by the regional variations which existed, and by variations between summer and winter prices. The difficulties are acknowledged by Taylor in his study of *The Development of English Dairy Farming 1860-1930*. Taylor, while pointing out the degree of generalization contained in work such as Ojala's, is unable to do more than indicate the problem, and demonstrate the nature of dairying economics by an illustrative study of Wiltshire. The inter-relationship of milk, cheese, and butter prices is comprehensively dealt with by Cohen in her *History of Milk Prices* (19) but the starting point is 1906 when prices were more widely published. There were no milk price series in the nineteenth century as there were for wheat, and the fact that milk production had an expanding and protected market and that many farmers did indeed turn to milk production may appear to provide sufficient evidence for the prosperity of dairying. However, at the regional scale the amount of published work is limited.

The outstanding study is Fletcher's analysis of *Lancashire Livestock Farming during the Great Depression* (20) which uses local evidence — newspaper reports, estate papers, and family diaries — as much as the more readily accessible Royal Commission reports and statistics from the Board of Trade. His conclusion that Lancashire farmers enjoyed a larger gross profit margin in the 1890s than in 1870 reinforces the case that no depression occurred in the grass counties. But that conclusion is based partly on assumptions about the increase in yield of milk cows which hardly squares with the evidence available. More recently Mutch (21) has found that the contemporary local press reports in Lancashire indicate that the farmers themselves were certain that agriculture was in a depressed state. Fletcher's findings have been used extensively in subsequent general works, and Mutch's contribution may lead in future to a more cautious assessment of the prosperity of the grassland counties.

In this Derbyshire study an attempt is made to ascertain milk prices from a variety of fragmentary sources including the two Royal Commissions, occasional reports in the Agricultural Gazette, the local Derby Mercury
and three farm account books. The variations in price received by individual farmers leave the results open to questions, but the general trends are clearly established and the sources are corroborative. From these records it is possible to make direct comparisons with prices of locally manufactured butter and cheese to establish the relative profitability of traditional manufactured products and the newly available liquid milk market. More importantly, extensive use is made of the parish summaries of the yearly Agricultural Returns in order to assess when and how changes were made in farming systems. These statistics also present an opportunity to analyse spatial variations at the micro-regional level. It is acknowledged that there are doubts regarding the reliability of the data, but, as Coppock(22) has demonstrated for the Chilterns and Robinson(23) for The Vale of Evesham, this is the only source which allows a detailed reconstruction of nineteenth century land-use and land-use change to be attempted. The problems of interpretation have been fully explored by Coppock(24) and reliability checks are possible by examination of total acreages of parishes over a number of years.

The preceding remarks have treated arable and grassland farming as though they were mutually exclusive. The reality, of course, is different. The agricultural revolution of the 18th century and earlier was essentially about the integration of crops and livestock into an efficient system of mixed farming in which output was maximised by appropriate rotations. In the 19th century the increasing use of artificial fertilizers may have slightly reduced the necessity for such practises, but most farms were to some extent mixed farms. The definitions of arable farms or dairy farms relate to the emphasis placed on such enterprises rather than to the exclusive production of particular products, and they relate to the end product. The mixed farm was one from which cereals and livestock or livestock products were sold. The term obviously embraces a wide variety of farming types, but in the South Derbyshire context dairying was often a part of the mixed farm system. Theoretically the mixed farm should be the most flexible in that the emphasis on cereals or livestock can change to meet changing market conditions. In South Derbyshire where dairying was dominant, there is a correlation between farm size and the proportion of arable. Small farms of thirty acres were usually heavily stocked and entirely grassland; farms of over 100 acres tended to have lower stocking ratios and have more arable land. In the extreme south of the county
where farms were largest there was less reliance on dairying and more on cereals and livestock rearing.

The available evidence allows for a description of the changes that occurred 1870-1900 within a simple framework of profit maximization. However, the individual decisions to change farming systems remain tantalisingly elusive. Very little information is available on the effects of changing from grassland/mixed farming to intensive milk production. When milk production was the most profitable form of land-use, profit maximization based on the sales value of various agricultural products would decree that mixed farms should lean more heavily on dairy production. That they did not do so to any great extent is demonstrated in Chapter VI (p.115 et seq) and from this one may infer that other factors must play an important part in determining the farming system. For instance, the increased winter workload might be viewed differently according to farm size, employed labour, working members of the family, financial resources, skills in cheese-making, distance from a railway station, and, of course, existing profits. It is a truism that farming is a way of life and, while profits are an essential aspect of description and explanation, there are other less tangible factors which influence decision-making. Investigation of such factors would demand greater access to private diaries and account books than has been possible in this study, and might then remain tentative as the Victorian farmer-diarist usually adopted a strictly factual account of daily events on the farm. Thus an approach to changes based on rational behaviour incorporating factors other than the profit motive, perhaps as advocated by Guelke,(25) is hardly possible in this context, and it is acknowledged that the explanations of changes in the agriculture of South West Derbyshire presented here are generalizations.

2. Ibid p.6


9. Ibid p.286


12. Hall, P. (Ch 6) and Coppock, J.T. (Ch 5) in A New Historical Geography of England after 1600 edited by Darby, H.C.


15. Fletcher, T.W. in British Agriculture 1875-1914 p.50.


CHAPTER 1

THE NINETEENTH CENTURY BACKGROUND

Much of this study is concerned with relative prices, and Chapter 7 deals specifically with the question of whether South Derbyshire agriculture was depressed. This entails some assessment of how agriculture prospered relative to other sectors of the economy, and within agriculture, how Derbyshire compared with other parts of the country. In this chapter an attempt is made to set the scene by identifying those aspects of the national economy which had an influence on agricultural prosperity, and then to summarize their varying effects, temporally and spatially, upon different farming systems.

The nineteenth century was a period of falling prices. Those price changes affected all sectors of the economy and do not necessarily give an indication of changes in profitability. A general view of the movement of wholesale prices is given in Figure I. (Page 11) The graph may be divided into shorter-term cycles almost at a whim, but two indisputable points are highlighted. Firstly, the overall trend in prices in Britain throughout the century was downwards. Secondly, from 1873 there was a period of fourteen years in which prices fell unceasingly — with the exception of 1880 — producing a cycle without parallel. A few years of stability in the late 1880s were followed by further price reductions in the 1890s. From 1873 to 1896 wholesale prices were reduced by about one-third and the period was subsequently entitled "The Great Depression", although output and real wages continued to move upwards at an impressive rate. An overall view may be obtained by constructing an amalgamated price index, but different results are obtained depending on what is included, and the weighting given to each commodity. Consequently, it is not possible to obtain an authoritative cost-of-living index. Individual commodity prices moved at varying rates according to their differing circumstances. (2) For instance, Cleveland iron fell by thirty-four per cent recording its lowest price in 1886 whereas London coal prices fell by only nineteen per cent with 1896 as the low point. (3) Figure 2 (p 11) illustrates the relative price movements in three groups of commodities (4)
Wholesale prices in Great Britain 1815-1905
[1900 = 100]

Source: Mitchell and Deane

Wholesale price indices 1871-1900
[1900 = 100]

- Coal and metals
- Textile fabrics
- All cereals

Source: Mitchell and Deane
and demonstrates the need for separate detailed — and even localized — studies to establish the impact of the depression upon any sector of the economy.

Among the explanations of the decline in prices the most contentious relates to the money supply. A simple form of the quantity theory of money places a direct relationship between the supply of money, the level of production, and prices. A widely held view in the nineteenth century was that changes in the money supply had caused the depression and, consequently, only governmental action could reverse the situation. In the early 1870s most West European countries and the USA altered their exchange systems. Where formerly both gold and silver could be coined into full legal tender money, [with a fixed value of gold to silver of 15:1] in 1873 a new gold standard was imposed. This divorce of silver from gold effectively meant a reduction in the money supply at a time when production and trade within and between the major nations of the world were increasing. If there is a direct relationship between the supply of money, level of production, and prices, then it was inevitable that prices would fall. A Royal Commission appointed in 1886 to investigate the post-1873 price falls was unable to agree on any solution. Half of the commissioners advocated that no fundamental changes were necessary, while the other six commissioners thought that if the system which prevailed before 1873 were replaced in its integrity, most of the evils would be removed. Their solution lay in Bimetallism, involving the free coinage of both gold and silver into legal tender money, and the fixing of a ratio between gold and silver. There is no doubt that there was a gold shortage as trading nations sought to build up reserves in order to maintain a fixed rate of exchange. The shortage continued until new discoveries were made and mines opened in Australia and South Africa in the early 1890s, to be followed by the Klondike in 1896, but the maintenance of the gold standard was in Britain's overall interest. The demand for capital overseas was increasing rapidly, and offered better rewards than investment at home. The gold standard was an essential aspect of this great surge of investment abroad with profits returning to Britain. It would have been extraordinary if any government in Britain had championed a change in the exchange system, or advocated protectionism rather than free trade for any sector of the economy. The export of capital and manufactured goods encouraged a return trade, principally in
essential raw materials for manufacturing, but also in agricultural produce. Agriculture, more than most industries, suffered from this laissez faire policy because it encountered increasing foreign competition without enjoying the benefits of a share of overseas markets.

The significance of cost-saving innovations must be embraced in any consideration of price-levels. There were dramatic improvements in the second half of the century. A most obvious example is in transport. The construction of railways overseas opened up whole new areas for development, and ocean transport changed equally significantly with the gradual substitution of iron-hulled steam vessels in place of wooden sailing ships. The speed and volume of cargo space in these vessels brought completely new types of trade within the scope of the transatlantic orbit, and the cost of such movement fell by over sixty per cent in the last three decades of the century. For instance, the cost of shipping wheat across the Atlantic in 1900 was exactly one-third of the cost in 1873. The growth of foreign imports resulting from a free trade policy and transport improvement led to a Tariff Reform movement which by the 1890s was just as strong in the industrial sector as in agriculture. There grew a feeling that some of this competition was unfair because other countries did erect tariff barriers to protect some sectors of their economies. British industrial production continued to increase but there was a deceleration in growth rates. Our visible overseas trade deteriorated from a deficit of £57 million in 1870 to a deficit of £167 million in 1900 contrasting with overseas investment earnings increasing from £35 million to £103 million in the same period.

The last factor in the equation is demand. The population of England and Wales grew from 22.8 million people in 1871 to 32.6 million in 1901 and there was also an advance in real earnings. Yet demand is difficult to quantify. Price is determined by demand and by potential not actual output. Overproduction or the potential to produce more will lower prices. Even when demand is rising, if potential supply is increasing at a faster rate, prices will fall. The transport improvements briefly referred to above certainly increased supply.

In summary, Great Britain in the later nineteenth century was increasingly
involved in a world economy and experienced, in common with other countries on the gold standard, a period of economic difficulty relative to the preceding two decades. Producers, and perhaps most particularly in agriculture, had to adjust to competing in that enlarged system without the protection of import tariffs.

Agriculture

Rowland Prothero (Lord Ernle) writing in 1912(11) recognized two distinct periods of difficulty in English agriculture, the first spanning the decade 1875-84 and a later one of at least equal severity 1891-99. The causes were seen as rather different in the two cases. The 1860s and early 1870s had been years in which farmers and landlords could invest with confidence; years in which agriculture was highly profitable and expansion took place, especially in land improvement through major drainage schemes and new farm buildings to accommodate increases in stock and grain. Artificial fertilizers had become widely available to enhance output, and new farm machinery was beginning to replace the traditional slow labour intensive methods especially in cereal production. In this favourable environment rents increased and some tenants obtained land by tendering rents which could only be sustained in unchanging circumstances. But conditions did change. British farmers had to endure a succession of abnormally wet years starting in 1875 and culminating in the notorious year of 1879 when a long and severe winter was followed by a disastrous sunless summer and autumn in which temperatures were below average in every month and rainfall was excessively high especially in the south and east. This resulted in inferior cereal crops, disease in cattle and sheep, and deterioration of grazing land. At the same time imports were increasing, especially from the USA, as new land was brought into cultivation and as freight rates fell. American cereals, cattle, and cheese glutted the market so that the British farmer not only faced losses through decreased yields, but was unable to offset his losses through higher market prices brought about by supply shortages. Instead, he was faced with falling prices resulting from this intensifying foreign competition. In these early years of the depression it was unfortunate that the poor seasons intervened to blur the impact of imports. The succession of bad harvests led farmers, used to wide variations in weather conditions, to assume that good times would return. Farmers in extreme
difficulty were kept afloat by affluent landowners and only when land was re-let were rents permanently reduced, thus allowing new tenants to benefit. Such was the concern over the well-being of agriculture that a Royal Commission under the chairmanship of the Duke of Richmond sat from 1879 to 1882 to consider The Depressed Condition of the Agricultural Interests. The evidence placed before the Richmond Commission gives a clear indication of the extent of the depression, which sectors of agriculture were most deeply affected, and which regions suffered most. The basis of agriculture at the time, especially in England, was grain production. The accepted interpretation of the effects of the depression is that the large cereal producers of the south and east suffered severely, whilst farmers dependent on a grassland economy were little affected in the 1870s. The most severely affected farms were located in counties such as Huntingdonshire, Cambridgeshire, and Essex where the heavy clay soil suffered most from excess rainfall. The effectiveness of recent drainage schemes was questioned. Referring to the Eastern Counties, Druce reported that "it was a constant complaint that much of the land had been drained at too great a depth" to carry away surface water so that waterlogged land was commonplace. The estimated yield of wheat for the whole of the UK in 1879 was only 52% of the previous year, which coupled with a decrease of 10% in acreage meant that total production was less than half. Although recovery of yield took place, the value of the national crop during the three years in which the Royal Commission functioned was always less than 80% of the 1878 figure. Interestingly, the price of wheat held until 1882 (the year in which the final report was published) and farmers a decade later might have looked back on these years as the good times.

Fletcher has noted that the Royal Commission was biased towards the large grain farmer. Most evidence was taken from large farmers in the south-east (only 4 out of 35 farmed north of the Trent). Members of the commission itself represented the large landowner. The conclusions, therefore, related to grain production, and reflected the considerable distress of both landowners and tenants. Unlike the south and east, the west and north is usually portrayed as having been little affected. Although imports of livestock rose, the demand for animal products was increasing because of the growing population and the increased consumption per head. Additionally, the fall in cereal prices "benefitted the
livestock farms using bought and homegrown grains to supplement their resources in grass, hay and fodder crops". (16) Some distinction was made between meat and dairy products. Druce, (17) in explaining the insignificant impact of depression on small grassland farmers, qualifies the generalization by adding that "it applies to the grass farmers who dairy, not to the grass farmers who graze". And, of course, perishable dairy products were protected from foreign competition although manufactured dairy products - butter and cheese - were being imported in increasing quantities. Druce (18) considered that Derbyshire had been the least affected of the "Eastern Counties" because it was a land of relatively small grassland farms concentrating on dairying. Fletcher, (19) in a consideration of prices for Lancashire, shows that that county was hardly affected before 1882, although his conclusions ignored the impact of adverse weather conditions.

The Final Report of the Richmond Commission detailed an impressive list of burdens on the farmer, including local rates and tithes, whilst stressing the importance of the severe weather and the rising quantity of imports as major factors in creating difficulties. Its recommendations were superficial, the resulting legislation introducing a second Agricultural Holding Act in 1883 and creating a Board of Agriculture in 1889. The enquiry was perhaps more important in highlighting the contrast in profitability between grain and grassland farms, thus encouraging grain producers to shift towards livestock.

If the condition of agriculture warranted full investigation in 1879, by the early 1890s the desperation of farmers in some branches of agriculture necessitated a further enquiry, so that another Royal Commission sat from 1894-1897. This time the composition of the commission was broader, and the witnesses were more evenly drawn from the south-east and north-west of the country. By 1893 there had been two decades of depression in agriculture, varying in intensity over the years but gradually involving a broader spectrum of farmers. During the years 1883-1890, better seasons, remissions of rent, the fall of tithes, and relief from some portion of the burden of rates, had arrested the process of impoverishment. (20) But there had not been a recovery, rather an arresting of further decline in profitability. The cold summers of 1891 and 1892, and the prolonged drought of 1893 coupled with further falls in prices produced this second
crisis. Whereas in the 1870s farmers could adjust and economize, by 1893 there was little 'fat' left in the system. "In some districts, considerable areas have ceased to be cultivated, and there has been a great withdrawal of land from the plough. Broadly speaking, it may be concluded that the heavier the soil, and the greater the proportion of arable land, the more severe has been the depression."(21) The diminution of arable land 1875-1895 was, in fact, 2.1 million acres (11.8% of the 1875 total) of which 1.9 million acres was wheat. The loss in the capital value of land was put as high as 50%; rents were claimed by the Commission to have fallen, on average, by 50% in grain areas while on poor soil no rents could be obtained. Mr. George Lambert(22) in a minority report suggested that landlords' losses had been exaggerated while tenants' losses had been minimized. Tenants were suffering from excessive rents, and remissions were not 50% but ranged from 7.7% in Renfrewshire to 36% in Suffolk and averaged only 19% in England and Wales. The evidence of tenant farmers had been dismissed as being interested. So even at the nadir of the depression the conflict of interest between landowner and tenant was evident.

Nevertheless it is clear that the broad division of the country into the grassland west and arable east, separated along the Tees-Exe line, provides a generalized picture of the varying severity of the depression. The pattern had changed only in that every region was now affected. Perry(23) in a study of agricultural bankruptcies says that "on an objective view the pastoral north and west remained less depressed; in subjective terms the later depression was more keenly felt by reason of the absence of distress in earlier periods."

Farming in the traditional grain areas had survived partly by farmers living off their capital or receiving massive rent reductions thus throwing some of the burden onto landowners. There were great variations in reductions on different estates, and tenants on encumbered estates seem to have fared worst of all. Owner-occupiers who had purchased land in better times were shackled with mortgages and could not recoup losses by selling land as its value had fallen so steeply. Survival had also been achieved by changing farming systems to make the sale of livestock or livestock products the major part of income. Essex probably suffered more than any other county and it was to that county that Scottish dairy
farmers moved to acquire cheap land and exploit the growing liquid milk market of London. Arable farmers allowed some of their land to "tumble down to grass" providing very poor grazing and often colonized by wild thorns and briars.\(^{(24)}\) This was still the case at the end of the century as Rider Haggard discovered on his tour.\(^{(25)}\) Near Maldon in Essex on the "finest wheat growing county in England" . . . "few fields seemed to produce a crop of grass high enough to hide a lark". Thus while wheat could not be produced at a profit, adaption to other use required capital which few could afford. Where farmers did change to beef production they found that prices of that commodity also fell and this was also attributed to imports. Nevertheless, the best farmers with capital and energy weathered the storm, and some localities, e.g. the Fenland, suffered but little, and the lighter soils of the Lincolnshire Wolds and Heath were "as highly farmed as ever". So, even in the east, the impact of the depression was patchy, dependent on the individual farmer and the attitude of his landlord, as much as on the type of soil which he farmed and the end products of his farming system. But all farmers had to face the reality of a startling fall in prices. Wheat prices, which exhibited the greatest fall, showed a drop of 52% in the two decades 1876-1895, while beef prices had slumped by 40%, although first quality beef showed a fall of only 24%.\(^{(26)}\)

In the western half of Britain the depression began to have its effect. Smaller amounts of cereals were produced and consequently more land was laid down to grass. The falling price of beef had its effect, but modern writers tend to stress the advantages which this zone enjoyed. For instance, real wages were rising so that more money was available to be spent on meat and dairy products. Bread was cheaper, so again the consumer had more to spend on a more varied diet. The population was still growing rapidly, some ten million more people needing food in 1901 than in 1871. Fletcher\(^{(27)}\) notes that the producer appears to have been favourably placed, and that home output of animal products rose 10% during the depression period despite the rise in imports. Most writers (Fletcher, Whetham, Hall) stress the advantage of low cereal prices to the livestock farmer. Hall adds the benefit of cheaper manure.\(^{(28)}\) Thus there is a general consensus of opinion, drawn usually from evidence presented to the Royal Commission, that while the livestock farmer suffered from falling prices, there were compensating factors which more
than offset the lower prices enabling one to contrast the west with the east. There remains the case of the milk producer. Despite some small quantities imported in the 1890s especially from Holland, peaking at 160,000 gallons in 1894, milk was protected from foreign competition by its perishability. A growing population, consuming more liquid milk per head, enabled more farmers to switch to this lucrative trade. Although the price of milk fell by perhaps 25% there were the compensating factors already alluded to in the above discussion. Fletcher is critical of the Royal Commission for under-estimating and only briefly referring to the great fall in feed relative to livestock prices. In his study of Lancashire Livestock Farming he contends that "the maintenance of the milk price during a period of generally falling prices was clearly a powerful factor in supporting farmers' incomes and encouraging expansion of output". Furthering the argument he states that "a fair degree of equilibrium existed between farmers' net returns from the sale of milk and the making of cheese or butter", [it should be noted that his source is Cohen who dealt only with the relationship after 1906] and he is therefore able to conclude that "a rise in the value of output with no increase in costs indicates a larger gross profit margin" and "no great depression of agriculture existed in Lancashire in the last quarter of the nineteenth century". Fletcher's detailed study has been used to generally exemplify the position in the west (e.g. Orwin & Whetham p.286) and it has been left to Mutch to broaden the investigation beyond pure economic considerations, to include farmers' perceptions of their situation. He shows that, from the evidence of newspaper reports, there was a lack of confidence during the 1890s caused by low prices. The response was the development of farmers' organizations in order to articulate demands for economic improvement, for instance by permanent rent reductions. Landlords were generally hostile to such organizations because the traditional pattern, in which solutions were based on their largesse, was questioned. Such organizations were also looking for national solutions to their problems. Mutch does not argue that there was deep depression in Lancashire, rather that low prices in Lancashire and information about much worse conditions elsewhere in the country had their effects on the farming industry. Changes were as much social as economic and resulted from farmers' perceptions of their position. Changes should be judged from this standpoint rather than from a simple examination of costs and revenue.
The findings of the Royal Commission\(^{(33)}\) show a unity in that the cause of depression was ascribed to the severe fall in prices and that British farmers laboured at a disadvantage because of the various tax burdens on the land compared with their overseas brethren. However, there was considerable discord on the remedies required, ten of the fourteen members of the Commission being signatories to a supplementary report advocating a return to bimetallism as the only long term solution. The recommendations seem peripheral to the main problems, and the remedies adopted by the legislature were superficial. Useful changes included: protection against adulteration of cake, fertilizers, and dairy produce; a requirement that all foreign animals be slaughtered at the ports to give protection against contagious diseases; and an Agricultural Rates Act which with its later amendments eased the burden of local taxation.

The agricultural depression did not end suddenly in 1896. Rather, as Fletcher indicates "the agricultural interest learned to accept, if not embrace, the new England" with its emphasis increasingly on urban interests and the landed interest wielding less political influence. While industrial prices recovered sharply in the late 1890s, agricultural prices edged back slowly as the new century dawned, and it was not until 1914 and disruption of foreign supplies that the nation again accorded to farmers the sort of respect to which they thought they were entitled.

In relation to dairying in South West Derbyshire the foregoing discussion would indicate that it was one of the most favoured areas of the country in the period 1870-1900. It specialized in dairying which was the only farming system free from foreign competition if the end product was marketed in the form of fresh milk. Furthermore, the difficulties experienced by the cereal producers gave the dairymen a further advantage in the form of cheaper feeding stuffs. Certainly milk prices declined, but so did all other prices. Therefore there can be little doubt that this region suffered less than most parts of the country. The main question to be addressed is not how the district fared relative to other areas, but how the district fared in absolute terms from 1870 to 1900, and whether the price changes altered the balance of profitability.


4. Ibid. p.476.

5. Everett, R.L. Royal Commission on Agriculture; Final Report BPP c.8540 1897 Vol XV p.190-203.

6. Royal Commission on Recent Changes in the Relative Values of the Precious Metals; Final Report. BPP c.5512 1888 Vol XLV.


18. Ibid. Question 29,705.


27. Fletcher, T.W. 'The Great Depression of English Agriculture 1873-96.'

29. Agricultural Notes.  

30. Fletcher, T.W. 'The Great Depression . . .'

31. Fletcher, T.W. 'Lancashire Livestock Farming . . .'


33. Royal Commission on Agriculture: Final Report; Summary of Recommendations. BPP c.8540 Vol XV. p.156-159
CHAPTER 2

DERBYSHIRE AGRICULTURE BEFORE 1870

Derbyshire is a land of contrasts. To travel from the bleak moorlands of the Dark Peak, across the well-tended grazing lands of the White Peak, to the rich lowlands of the Trent Valley is to experience a range of agricultural landscapes that encapsulate England in microcosm. Derbyshire lies on the divide between the perceptual north west and south east. The contrasts are evident in its geology, soils, and climate, and in its agriculture. Even today, and most certainly in the nineteenth century, agricultural practices may be regarded as a measured response to the physical environment. The division of the county into agricultural regions as promulgated by Henderson\(^{(1)}\) mirrors the distinctive geology. The northern regions consist of a Carboniferous limestone plateau flanked on three sides by gritstones, the two being separated by softer shales especially on the eastern side of the plateau, where the River Derwent marks their presence and provides the main north-south routeway. Eastwards, the gentle dip gradually reveals the Coal Measures succession stretching beyond the River Erewash into Nottinghamshire, and, in the north east, the county boundary extends to include a small area of the overlying Magnesian Limestone. In contrast with these stark northern landscapes, south of a line through Ashbourne lie the lowlands of the Trias, comprising a variety of materials from pebble-beds to fine mudstones and formerly broadly classified as Bunter sandstone and Keuper Marl. In this zone the variations in superficial deposits are of particular significance in determining the character of the landscape and the variations in land-use.

Map 1 (p.25) shows the major land use regions as proposed by Henderson using the records of the Tithe Redemption Commission\(^{(2)}\) and the Crop Return of 1801. The Gritstones provided the poorest agricultural environment and were characterized by sheep farming and grouse moors. Although south of Matlock the lower altitude and greater diversity of structure, relief, and soils allowed a mixture of stock rearing and dairying to be practised. The Limestone Plateau, mostly at an elevation approaching 1000 feet, was principally concerned with livestock farming of a mixed nature, the rearing of sheep and cattle being of roughly equal
Agricultural regions of Derbyshire in the Nineteenth Century
(after Henderson)

Map 1

- Gritstone Moorlands
  - Sheep
- Carboniferous Limestone Plateau
  - Stock rearing and fattening
  - Dairying
- Shales
  - Stock rearing and fattening
  - Dairying
- Coal Measures
  - Mixed farming
- Magnesian Limestone
  - Arable and livestock
- Triassic Lowlands
  - Dairying

Ashbourne

Derby
importance with dairying. Here arable crops, especially oats and turnips for stock feed, occupied a small but important part of the land. On the Coal Measures of East Derbyshire the proportion of arable was much larger especially where soils were developed on sandstones such as the Wingfield Flags. Henderson distinguishes between the Lower and Middle Coal Measures, the latter showing a consistently higher arable acreage. Within this zone wheat production was at least as important as oats and some parishes produced an appreciable amount of barley. Compared with the upland west this region may be truly described as an area of mixed farming. The small Magnesian Limestone region in the north east was much more akin to Eastern England in its agriculture with all three cereals figuring prominently and turnips also grown extensively, reinforcing the argument that sheep and corn were mainstays. (3)

In all four regions mentioned above, dairying existed as an important component of the agricultural economy, but in none of the regions was it practised to the exclusion of stock rearing or fattening. Furthermore, there were often other industries in the countryside that influenced the nature of agriculture: the eastern parts of the Peak District had lead workings which promoted a dual economy and encouraged small holdings as for instance around Winster; the coalfield was developing throughout the nineteenth century with coal extraction, the associated iron industry, and textiles, all providing for an expanding population which created a local market for agricultural produce.

In the south of the county conditions were different. The underlying geology is Triassic, but there are many sub-regional variations in topography and agriculture which relate to distinctive superficial deposits (see Map 2, p 27). The region focuses on the valley of the River Trent, which, with its tributaries the Dove and the Derwent, has deposited a broad swath of alluvium forming a zone some two to four miles wide of negligible relief: much of this land was subject to flooding in the nineteenth century and was mainly grazing land. Flanking the alluvium on the northern side are extensive stretches of terrace gravels providing naturally drained but stony soils. Beyond the gravels on the Keuper or Red Marl the soils are of a heavy and imperfectly drained silty clay. Their character varies with slope and aspect, and is complicated by the existence of discontinuous patches of drift materials, sometimes sands and
Relief and Rainfall of South-West Derbyshire

Height above sea level
metres feet
200 655
150 490
100 330
50 165

Annual rainfall
(Map units in inches)
mm inches
899 35.0
826 32.5
762 30.0
699 27.5

River
Stream
Map 4

Location of Study Area

Manchester

Sheffield

Stoke on Trent

Ashbourne

Study area

Nottingham

Derby

Derby Hills

Parishes of South-West Derbyshire

1 Somersal Herbert
2 Alkmonton
3 Osliston & Thurvaston
4 Trusley
5 Dalbury Lees
6 Little Chester
7 Osmaston
8 Sinfin & Arleston
9 Chellaston
10 Swarkestone
11 Foremark
12 Stanton by Bridge
13 Derby Hills

See also Reference Map P210
gravels, but usually boulder clay. (4) The incidence of the boulder clay increases towards the northern edge of the Trias and forms a continuous zone in the parishes immediately to the south of Ashbourne. These rather cold and heavy soils were mainly permanent grassland areas. In contradistinction, the soils developed on the Bunter Sandstone which outcrops around Mercaston in the north, and Foremark, Repton and Bretby south of the River Trent, are free-draining sometimes to excess. (5) The amount of arable in the nineteenth century corresponded quite closely with soil drainage characteristics, so that, with the exception of the sandy Mercaston district and the river flats, arable increased from north west to south east. Map 3 (p 28) shows that annual rainfall also diminishes towards the south east, from 34 inches (850 mm) near Ashbourne to 26 inches (650 mm) in the Melbourne area. Thus the lowlands of south Derbyshire, although usually described as a dairying district, shows contrasts in the degree of emphasis on dairying, with the southern areas less specialized, and relying much more on grain, beef cattle, and sheep.

The study area (Map 4, p 29) has been restricted to that part of the lowlands which was remote from the industrial zone of east Derbyshire and the developing Derby-Nottingham region. In this way it is hoped that a study of the dairying industry will have more relevance to other regions of Western Britain than would have been the case had the coalfield zone been included. The most detailed account of the area before 1870 is Farey's (6) which was drawn up for the consideration of the Board of Agriculture in 1815. The situation at mid-century was reviewed by Rowley (7) in his prize essay of 1853, although most of his remarks relate to the northern parts of the county. However, ample evidence for this period is available at the parish and individual farm level from the records of the Tithe Redemption Commission. The Royal Commission of 1879-81 provides a third marker to give an indication of progress through the nineteenth century. Farey was impressed by the agriculture of the district. "The best land which I saw in or near Derbyshire was on the Red Marl, about Barton Blount and Ash. In general, however, the Derbyshire Red Marl is inclined to be too tenacious and cold". (8) He discovered that there was a diversity of rotations in south west Derbyshire. The old system of summer fallowing still existed although it was in decline. The more common practice was to grow green crops, especially turnips and cabbages, as a break crop where formerly there would have been fallow.
Indeed, his three-fold classification of crop rotations was based on the use of the land between cereal crops. (9)

The simplest rotation was a three year cycle of fallow, wheat, and beans or oats. There was no green crop. This would seem to represent the relic of a system which existed for centuries and was gradually abandoned in the seventeenth and eighteenth centuries as new crops became available. It is surprising that it should survive so late in a livestock region demanding winter fodder, but Farey notes that it was commonplace in the parishes of Hollington and Sutton on the Hill.

Other rotations seem to reflect the varying degree of emphasis placed on livestock. Thus the second type, which ensured no successive crops, had at one extreme the system of Mr. Francis Mundy of Markeaton which was a simple three-year rotation giving as much clover as possible for his stock. (1. Fallow or turnips, 2. Barley undersown with Red Clover, 3. Red Clover). Where more cereals were required the clover or seeds (Red Clover, White Clover, and Rye grass) could be followed by oats in a four-year rotation as favoured by Thomas Harvey of Noon Hay. A further variation involved leaving the seeds for three years to give a six-year rotation, used for instance by Francis Blaikie on the Earl of Chesterfield's light gravelly land at Bretby:

1. Fallow and turnips
2. Barley and seeds
3. Seeds (mown for hay)
4 & 5 Seeds (pastured with sheep)
6. Oats

The third type of rotation involved successive cereal or white crops and was most common on farms where there was a greater emphasis on cereals. Thus John Smith at Repton, on the Red Marl, used a five course rotation consisting of turnips, wheat or barley, wheat, seeds, oats. John Holland at Barton Fields - in a district with more dairy cattle - increased the output of oats and clover by employing a six course rotation of: fallow or turnips, wheat, barley or oats, seeds, seeds, and oats.
Therefore we cannot speak of a south west Derbyshire rotation system. The emphasis on particular crops seems to have depended on soil characteristics and the degree to which the farmer was committed to dairying, the two being inextricably linked. Wheat thrived on the heavy land where it was adequately drained. Farey noted that Richard Harrison of The Ash (Sutton on the Hill) obtained 24 cwts to the acre of spring wheat, a figure some 50% in excess of the national average in the late nineteenth century. The land had to be well limed, otherwise the crop was susceptible to smut. Barley, although featured in all Farey's examples of rotations, was not grown in such large quantities, although the proximity of the Burton and Derby breweries provided a convenient outlet. Oats were an important stock-feed, and also were used extensively by the poorer people to make oat-bread or Haver-cake as it was commonly called. By 1815 green crops were an accepted part of rotations. Turnips were usually fed on the land by sheep, and cabbages provided a useful substitute when snow and frost made the turnips inaccessible. Farmers were beginning to use both crops for the winter stall-feeding of dairy cattle, although potatoes were more popular for that purpose. Cattle subsisted through the winter mainly on hay.

Having dwelt at some length on the tillage crops, it should be emphasised that in all parts of the region permanent grass occupied well over half the cultivated area, and in many parishes at least three quarters. Although permanent, this was improved grassland as "throughout Derbyshire the ancient grasslands seem to have been all ploughed". Farey states that "the proportion of grassland to that under tillage is considerable in this county, owing to the highlands in the northern part being better adapted to pasture than to the cultivation of corn, and to the great prevalence of cheesemaking, or dairying as it is called, in the southern part of the county." This begs the question of whether cheese-making determined the amount of grassland or was merely the convenient end product of a grass region.

The evidence from the Tithe Files (c.1840) and from Rowley's essay (1853) suggests that the system of farming which was well established in Farey's time continued with very few changes up to the middle of the century. Kain has noted that assistant commissioners and local tithe agents were struck by the backwardness of much Derbyshire farming; they found
little to remark on by way of improvement. The detailed evidence from the Tithe Files shows that while the emphasis remained on permanent grass and livestock, most farmers grew cereals for sale in a dairying/mixed farming system. It is also clear that environmental considerations were less important than individual attitudes. Thus, from specific farm evidence for a sample area on the Red Marl around Sutton on the Hill, considerable variations in crops and rotations are discernible. At The Ash, the Harrisons favoured wheat just as they had in 1815. On 171 acres, 46 acres (27%) were arable of which 20 acres were under wheat. On the adjacent Bald Fields farm, 35% of the 161 acres were arable, but barley featured as prominently as wheat. The nature of the rotations can only be inferred, but clear differences can be seen on the two farms. Where George Rose at Bald Fields had roughly half his arable land under rotation grass (25%) and fallow (28%), the Harrisons favoured turnips and so had only a small amount (6 acres) of fallow. Close by, in Longford parish, further examples show a similar general pattern. Hannah Hawkesworth at The Spath farmed 279 acres. Of the 77 acres (28%) of arable, 31 acres of wheat and 17 acres of fallow occupied the major part, while the rest (29 acres) was equally divided between clover and peas and beans with a very small acreage of oats. There were no root crops. The rotation was probably the same as Farey found in 1815. At neighbouring Suffield House, on 140 acres with 26% arable, William Dakin favoured an even greater proportion of fallow. The record shows 21 acres of cereals, mainly wheat, 12 acres of fallow, and 4 acres of peas and beans. There were no rotation grasses and no root crops. George Holmes farmed only 75 acres, but the proportion of arable was still 24%. There were four arable fields containing wheat, wheat, seeds, and oats. Again there was no root crop. What is clear from these examples is that the farms in this district mostly had approximately one quarter of their land cultivated and the rest under permanent grass, regardless of size. The arable land was principally geared to wheat production, and fallowing was still an integral part of rotations. On few farms had turnips been introduced, and livestock obviously were sustained through the winter mainly on meadow hay. In 1853 Rowley noted that "travelling north-west towards Ashbourne (from Derby) there is some indifference and carelessness: some practices which ought to be exploded, some fine land neglected, hedges in a wretched state, a sad deficiency of root crops, very few sheep, and little barley grown on the farms. Root crops are, without doubt, extending in the south as well as
the north, but there are some parts of the county where no efforts are made to accomplish this, and the district above referred to may be pointed out as falling in these praiseworthy efforts."(18) The sparsity of roots may be linked with the small numbers of sheep. Roots were used primarily as sheep fodder, and, by inference, we may conclude that at mid century a more varied winter diet for dairying cattle had not been adopted. Nor was it necessary in a farming year that relied on spring calving and summer milk production for cheese-making. Thus this northern part of the study area, which in the latter part of the century is labelled as a specialist dairying region, is more properly described as a dairying region with an interest in cereal production, mainly wheat, at mid century. The major variation from this economy was the district south of the River Trent where there was a higher proportion of arable. For instance, in Ticknall parish 44% of the farmed land was arable.(19) The greater portion of this was devoted to wheat and barley production. The lighter, naturally draining soils of this southern area were obviously important in greater emphasis being placed on cereals in what was truly a mixed farming region. While the Tithe commissioners had found little to remark on by way of improvement, Rowley was impressed by two aspects of capital improvement in 1853. Draining of the Red Marls was going forward using the newly available machine-made pipe drains, and farm buildings were "improving and improving" after "many years of indifference and neglect".(20)

Despite the attention which has been paid to arable crops in the above description, the dairy was the heart of nearly every farm. Cheese-making was practised throughout Derbyshire but was the dominant produce only in the south and west. Thomas Brown in 1794 proclaimed that cheese was "the chief, if not the only, article of provision which the natives can spare out of their own county."(21) Analysis of probate inventories of 70 farmers for the years 1700-1701 has suggested that, at that time, there was little specialization in cheese production to the exclusion of other branches of agriculture.(22) The specialization must have increased through the eighteenth century for Pilkington to record, in 1789, the increase in pasture farming and to remark upon the large size of dairies in the Dove Valley in Egginton and Scropton parishes.(23) Was specialization the result of new enclosure or a response to a growing market?
The marketing of cheese took a number of forms. It could be sold in the local markets for local use. Much greater quantities were sold at the special cheese fairs. Farmers normally prepared their cheese to be ready in three lots: the produce of the early summer by August; that of the late summer by October; and the small amount of inferior winter cheese by March. The cheese fairs were timed accordingly. Ashbourne's, for instance, were held in September, November, and March. At these fairs cheese was either sold in small quantities to consumers, or else in bulk to local provisions dealers or to the cheese "factors" who really controlled the trade. Much of the cheese, especially the better quality produce, was not consumed locally but found its way to Eastern England, to London, and even to the continent. Local factors were commissioned to purchase cheese and organize its carriage to London. "The West Country, the Midlands and Cheshire were tapped by the Londoners in the eighteenth century in order to satisfy the ceaseless demands of the metropolis." The purchasing gradually extended beyond the cheese fairs to individual bargains between farmer and factor, and the export trade undoubtedly was greatly facilitated by the creation of the canals, with the Trent and Mersey (1777) cutting through the region, and the feeder Derby canal (1796) serving the county town. Farey was in no doubt about the importance of this new transport system: "since the making of the Trent and Mersey, the Derby, the Erewash and other canals, the trade in the staple commodity of Derbyshire farming has been much changed and is now conducted . . . at several wharfs on these navigations where large cheese warehouses have been built." By 1815 a complicated system of payment had emerged. In August the factors travelled the county, inspecting cheese and bargaining with farmers. In many cases - "fully half" - a price would not be fixed. Rather, an agreement for supply and purchase was made. The farmers then delivered to warehouses on the canal side at Derby, Shardlow, Willington or Horninglow (Burton-on-Trent). The price would not be fixed nor final payment made until November. "The prices are subsequently fixed, or pretended to be so, by the prices at Derby St. Luke's Fair in the middle of October." Farmers would often be short of cash in summer and factors would lend money as an advance payment for cheese. The size of the trade was substantial, some of the factors buying more than 2000 tons annually, principally on commission from London dealers or for dealers who had Government contracts. It can be seen that the method of marketing was unsatisfactory. Some farmers
that Farey interviewed, like Mr. William Smith of Swarkestone Lows, were scornful of the whole system. To agree to the disposal of a whole summer's produce without knowing the price may seem incomprehensible, but against that was the relief of an assured market. The great difficulty was that cheese varied so much in price and demand; cracked cheeses might be worth less than half the price of top quality cheeses. Even after the local fairs had been held the farmer would not know whether he had received a reasonable price.

The livestock which provided the milk for these famed Derby cheeses was usually the New Longhorn. Some breeders had tried a type of shorthorn but reverted back to longhorns. A few leading farmers persevered with shorthorns—Francis Bradshaw of Barton Blount, Edward Coke of Longford, and William Etches of Sturston are named by Farey—but the general feeling was that longhorns yielded a far superior quality of milk for cheese-making. John Harrison of The Ash kept a herd of 50 milkers derived from stock obtained by his father from Dishley. By mid-century other factors were causing farmers to change to shorthorns, although the opinion still existed that the slightly larger quantity of milk was more than offset by the poorer quality, thus less cheese resulted. In Adam Bede, set near Ashbourne, reference is made to the "large quantity but inferior quality of milk yielded by the shorthorn which had been bought on experiment."(28) This bias was not to last for long. Although Rowley gives little indication of changes in breeds, the third quarter of the century saw the "shorthorn craze". The typical dairy cow that was popular by the 1870s was not the pedigree that purists such as Gilbert Murray would have liked to see, but a practical milking beast that sold more profitably for meat than the longhorn. John Coleman noted that "our farmers combine milk selling with meat producing. The lean cows they kept 25 years ago sold for £7 or £8 . . . they now make £17 to £20."(29) The judges of the Derby Prize Farm Competition of 1881 described the herd of Mr. Hellaby of Twyford thus: "We know not where to look for 36 such grand dairy cows as the Twyford herd. For size of frame, for quality and character, for meat and milk producing properties all combined and in such perfection, they would be hard to beat. He says they have no pedigree, but . . . it is a home-made pedigree."(30) This sort of home-bred shorthorn, probably evolving over a quarter of a century, was much more suited to local agriculture in the later nineteenth century when the
increasing demand for meat gave farming more flexibility.

It would appear then that the longhorn had largely disappeared by 1880. Although it had been admirably suited to a cheese-making district, the attractions of a dual purpose animal like the Improved Shorthorn, developed in North East England, had proved irresistible. Just when the change occurred is unclear for, as Walton(31) has shown, the only registered pedigree breeders as late as 1850 were in the immediate vicinity of Burton on Trent and in the north at Chatsworth. Thereafter, registered shorthorn breeders became rather more numerous in the southern lowlands, but their numbers remained small. Walton explains that such breeders were often untypical of working farmers, being landed proprietors attracted by status rather than profit. The Herd Book cannot provide more than an indication of the timing of the switch from Longhorns, and intelligent farmers undoubtedly used the shorthorn characteristics to improve the beef quality of their own herds without forfeiting the milking qualities of the Longhorn. Knowledge of the qualities of the Durham breed would spread quickly when pedigree herds became established in the district, but that would not guarantee any increase in registered pedigree cattle. The debate about the new breed had already started when Rowley visited North East Derbyshire in 1853(32) and by 1879-81 (The Royal Commission) had changed to pedigree versus homebred shorthorn. So the third quarter of the century would seem to mark the demise of the Longhorn and the development of the home-bred shorthorn.

Between 1800 and 1870 the changes in agriculture in south west Derbyshire continued slowly. Apart from the switch from longhorns to shorthorns, there was an increasing emphasis on dairying which meant more permanent pasture. Although most farms kept a small flock of sheep the numbers declined as cattle became dominant. From 1800 to 1867 the decline for the whole of Derbyshire was from 362,000 to 258,000(33) and most of that reduction must have been in the southern part of the county. Crop rotations changed but little except that by 1853 it was "now a common practice to allow seeds to lie down two years"(34) to provide more hay and grazing. Root crops were replacing bare fallows, and barley was less important. An important winter feed was grains from the Burton breweries which were "bought largely by all the farmers within the reach of ten or twelve miles".(35) Although Rowley mentions artificial manures, which
were freely available, for the Magnesian Limestone district of north east Derbyshire, they are ignored in his description of the south. Liming was the means of ensuring a plentiful crop of sweet grass. Much under-drainage was going ahead in the 1850s using the new tile drains. "What the steam engine is to the manufacturer the tile-machine is to the farmer". (36)

The railway came to Derbyshire in 1846 and the Derby-Birmingham line followed the route of the Trent Valley. Its arrival must have eased the lot of the working farmer. Transport of fertilizers and lime became possible, and very importantly, coal. On larger farms, coal to drive new machinery, but even on small farms coal to steam animal fodder, to facilitate cheese-making, and to provide plentiful hot water for cleaning and domestic purposes. Many farmers purchased a railway wagon of coal at a time, hauling it from the local station to the farm by wagon. But most important of all, the railway provided the rapid transport which allowed the Derbyshire farmer to change completely from cheese production to the supply of liquid milk to London, Birmingham, and the large cities of the north of England.


5. Ibid. pp.62-3, 96-7

6. Farey, J. *General View of the Agriculture of Derbyshire* (London 1815)

7. Rowley, J.J. 'The Farming of Derbyshire'

8. Farey, J. Vol I p.148

9. Farey, J. Vol II pp.102-110

10. Ibid. p.117


12. Farey, J. Vol II p.125

13. Ibid. p.143,151

14. Ibid. p.175

16. P.R.O. IR 29/8/8

17. P.R.O. IR 29/8/134

18. Rowley, J.J. p.62

19. P.R.O. IR 29/8/211


23. Pilkington, J. View of the Present State of Derbyshire 1789 Vol I pp.291-301

24. Henstock, A. p.39

25. Ibid. p.40

see also Fussell, G.E. 'The London Cheesemongers of the 18th Century,' Economic History Vol I (1926-9) pp.394-8


27. Ibid. p.63

28. George Eliot Adam Bede (1858) Ch.7

29. Royal Commission on Agriculture. c.2778 Vol XV pt.1 Evidence of John Coleman. Question 5801


32. Rowley, J.J. pp.55-56


34. Rowley, J.J. p.61

35. Ibid. p.60

36. Ibid. p.62
CHAPTER 3

THE MILK TRADE

In the mid-nineteenth century the opportunity to sell fresh milk was limited to farmers adjacent to urban areas, and to specialist producers on the urban fringe or even within the built-up area. Opportunity was also limited by the relatively small consumption per head of population. Consumption also varied according to income, those on low incomes consuming very little. Consumption per head did rise in the later years of the century, but a general appreciation of the nutritious value of milk belongs to the early years of the present century. The most detailed estimate of consumption relates specifically to London in 1891 when 11.55 gallons per head of population were purchased.\(^1\) Using this figure it is possible to estimate the demand in the Derby area. The population of Derby rose from 61,000 in 1871 to 94,000 in 1891.\(^2\) Demand for milk in 1871 would be 704,000 gallons or less, the product of about 1400 cows. At the time over 300 cows were kept in the town or on adjacent pastures, and in the parishes contiguous with the urban area (and within the study area) were another 1300 milk cows. Thus the demand for milk in Derby could be easily met by farmers living within about two miles of the town centre. Twenty years later despite a fifty per cent increase in population the situation was not dissimilar, in that neighbouring parishes could supply the needs of Derby's population.

For the rural parishes of south-west Derbyshire, remote from any urban area, milk had to be manufactured into cheese in order to transport it to the areas of demand. Even the steady development of railways did not alter the situation. That is, until the 1860s, when suddenly a chain of events completely altered the market situation, and Derbyshire became a supplier of milk to major cities of the Midlands and North of England, but especially a supplier to London.
The London Milk Market

London’s milk supply traditionally came from cows kept within or on the fringe of the urban area. The essence of these town dairies was milk output. Cows were purchased and sold with great rapidity and their life in the town dairy was often only a few months. The rapid turnover of cattle, many of them originating on the continent where prices were lower, meant that the risk of disease being introduced, and spreading rapidly in confined quarters, was high. The three most debilitating and contagious diseases were rinderpest, pleuro-pneumonia, and foot-and-mouth disease. While they were not fatal they very seriously affected milk production. The growth of London and consequent growth of urban cow-keeping increased the incidence of these diseases. It became common-place to purchase well fleshed cattle which would command a reasonable price from the butcher to whom they were sent at the first suspicion of disease. This high turnover of cattle enabled the cow keeper to maintain very high yields per stall, but it also involved him in considerable financial losses on the livestock. In the twenty years after 1834 the number of cows kept in London grew very slowly although the human population increased by some thirty per cent. The threat of disease was a diseconomy of scale. The number of dairies increased, but herd sizes decreased. There developed a gap between the demand and supply of milk. Some of that gap was overcome by the addition of water to the milk, but such malpractice could not continue to cater for an ever growing urban population. Some increase in dairy cattle numbers obviously took place and by 1862 an estimated 18,000-20,000 were kept within the Metropolitan Board of Works area. "This number undoubtedly represented the peak of London’s urban and suburban milk production, all subsequent developments conspiring to make a decline inevitable."(3)

In the mid-nineteenth century there was great concern regarding sanitary conditions in London, and urban cow-keeping and its proximity to housing was part of that concern. But it was not until 1862 that a general provision for licencing such establishments was created under the Metropolis Self-Management Amendment Act. Local authorities varied in their interpretations: some virtually outlawed the urban cow by their demands for expensive improvements; others were exceptionally lenient. Improvement most certainly occurred, and some cow-keepers went out of
business altogether. There was an estimated fall in the number of premises of some four per cent within three years. The role of the local authority sanitary inspectors increased in the latter part of the century, and the knowledge of alternative sources of milk no doubt encouraged them to interpret the law more strictly as time progressed. (4)

In 1865 and 1866 there occurred the event which features in most accounts of the burgeoning railway milk trade. On June 27th 1865 rinderpest disease was diagnosed at a dairy in Lambeth and within eighteen months over half the herds in London had been afflicted. The impact was enormous. As early as November 1865, of the 4873 cows owned by the East London Cow-Keepers Association 1185 had been destroyed and 2749 sold at a loss i.e. 80% of the total herd. Some other areas were just as badly hit, although a few, such as Fulham and Chelsea, escaped almost untouched. Bankruptcies were commonplace and many cow-keepers left the business while still solvent. (5)

The obvious result was a shortage of locally produced milk, and it was at this time that the railways became a vital source of milk for those milk suppliers who remained in business but were reluctant to replenish their herds. There was a psychological effect too, in that it became an accepted idea that railway milk could effectively meet urban demand. It would be wrong to suggest that the cattle plague of 1865-66 alone brought about a complete change from urban to rural milk production. The further visitations of pleuro-pneumonia and foot-and-mouth disease had their effect. So too did centralised inspection and licencing after 1880, part of a movement to improve the environment and provide healthier living conditions. It is ironic that such action should introduce more country milk often produced in far worse conditions than obtained in London. A third factor was the developing organization of railway milk which enabled it to compete effectively with locally produced milk. So the urban cow-keeper did not simply disappear, but numbers dwindled gradually.
Table 1 London: Number of Herds and Total Number of Cattle (6)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cows</th>
<th>Herds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1864</td>
<td>c. 18,355</td>
<td>1,361</td>
</tr>
<tr>
<td>1870</td>
<td>11,992</td>
<td>1,269</td>
</tr>
<tr>
<td>1880</td>
<td>13,000</td>
<td>1,044</td>
</tr>
<tr>
<td>1890</td>
<td>9,104</td>
<td>628</td>
</tr>
<tr>
<td>1900</td>
<td>5,050</td>
<td>320</td>
</tr>
<tr>
<td>1910</td>
<td>3,055</td>
<td>199</td>
</tr>
</tbody>
</table>

Railway Milk

The earliest record of milk being transported by rail is 1845 from South Essex to London. Other large cities also began imports in the 1840s e.g. Liverpool. The trade increased in the 1850s and early 1860s in London as population grew. The early trade drew on producing areas close to London, with the Eastern Counties Railway carrying over 90% of the milk. Although it was only transported short distances—usually less than thirty miles—'railway milk' quickly gained a bad reputation. The journey constantly vibrated the cans, churning the milk and making it difficult or impossible to set, so that skimming the cream off was not easy. This process was particularly important in dairies where cream was sold to affluent customers and skimmed milk retailed cheaply to the poor. Consequently dealers preferred urban milk which had not been subject to disturbance in transit. It would appear that, apart from a few institutions such as St. Thomas' Hospital, this early trade was mainly in the form of "accommodation milk" which was brought into the capital to supplement supplies in times of shortage, and sold on the station platform. Certainly this was true in 1865-66 when the cattle plague gave the great impetus to the railway milk trade. It was only when regular supplies of this sort had become an established practice that contracts with individual farmers, guaranteeing them a set price, developed as the normal method of working. The exact amount of milk moving to London is difficult to quantify but Atkins, using a variety of contemporary sources gives the following estimates:
Table 2  

<table>
<thead>
<tr>
<th>Year</th>
<th>Railway Milk Imported into London (Million Gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1853</td>
<td>0.9</td>
</tr>
<tr>
<td>1864</td>
<td>2.2</td>
</tr>
<tr>
<td>1865</td>
<td>3.4</td>
</tr>
<tr>
<td>1866</td>
<td>7.0</td>
</tr>
<tr>
<td>1867</td>
<td>6.1</td>
</tr>
<tr>
<td>1868</td>
<td>7.5</td>
</tr>
<tr>
<td>1869</td>
<td>8.7</td>
</tr>
<tr>
<td>1870</td>
<td>9.3</td>
</tr>
<tr>
<td>1880</td>
<td>23.8</td>
</tr>
<tr>
<td>1890</td>
<td>40.5</td>
</tr>
<tr>
<td>1900</td>
<td>53.5</td>
</tr>
<tr>
<td>1910</td>
<td>78.7</td>
</tr>
</tbody>
</table>

Although these are estimates, there is little reason to doubt their veracity. For instance, the figure for 1866 is derived from a contemporary report in the Journal of the Royal Society of England published in 1867 and other sources include Local Government Board figures. Assuming reasonable approximation, we can speak of an incipient trade until the shortages of 1865-66, followed by a period of consolidation until c. 1870, after which the volume of railway imports grew inexorably until the First World War. With experience, the techniques for transporting milk so that it arrived in a wholesome condition improved, and, with an ever-increasing demand, the hinterland enlarged to the extent that dairying counties of the west and north Midlands not only participated in the evolving system, but became major suppliers. This was particularly true of Wiltshire in the west and Staffordshire and Derbyshire in the north.

Railway Milk in Derbyshire

The growth of the railway milk trade in Derbyshire can be clearly dated to the decade of the 1870s even if its precise origins are obscure. Mr. Druce's report to the Richmond Commission on Agriculture in 1882 shows this quite clearly. He explained that the Midland Railway Company was unable to furnish him with any details of the amount of milk carried over the previous decade, but John Noble, its General Manager is quoted thus:—"Roughly speaking I may say that in 1872 the traffic represented something like 940,000 gallons, and this increased to about 5,500,000 gallons in 1880". Noble added that Wirksworth was the most northerly point from
which milk was sent to London. A witness to Mr. Druce remarked in a letter,

"the great and rapid development of our dairy and milk interests . . . contingent on the introduction of the factory system . . . has made Derbyshire one of the chief milk producing counties of England. Ten years ago it was nearly an unknown traffic to our Midland Railway; now it has grown into one of the most important and paying traffics and for which they are laying themselves out to cultivate by building special milk vans and running special milk trains."(9)

The evidence of Mr. John Coleman of Park Nook, Quarndon, to the Richmond Commission is corroborative. His estimate of the value of the trade for 1880 was £250,000 per year whereas "ten years ago there was not £250 worth sent." This represents some six million gallons in 1880 at an average price of 10d per gallon. Coleman gave the prices received as varying between

- summer 7d - 8d per gallon
- winter 9d - 12d per gallon

He also estimated the various destinations of the milk as being three quarters of the total to London and one quarter to other cities principally in the north, the longest journey being to Newcastle.(10)

The direction of the trade related to transport costs and to the enthusiasm of wholesale milk dealers in establishing the system. In this context the railway charges quoted by Druce are illuminating. Midland Railway rates in 1881 were:

- 0 - 20 miles ½d per imperial gallon
- 21 - 40 miles d per imperial gallon
- 41 - 100 miles 1d per imperial gallon
- 100 - 150 miles 1½d per imperial gallon
- 150+ miles 1½d per imperial gallon

The special rate to London was 1d.(11)
In fact the London rate was slightly cheaper than Druce quoted: it was 2d per barn gallon of 17 pints. (12) The barn gallon was then in common usage because of the doorstep sellers' habit of giving extra measure to allow for spillage and wastage. (13) The favourable London rate meant that Derbyshire milk could be transported as cheaply as milk from counties much nearer to London. This was true of the southern part of the county; from the Peak District the orientation was much more towards the expanding markets in Lancashire, and North East Derbyshire looked towards Yorkshire. The destination of any farmer's produce depended on the location of his farm relative to the railway network. The London rate remained constant throughout the whole period of this study.

Most of the milk transported by rail from Derbyshire was carried by the Midland Railway, and it was not until 1st October 1868 that the London Extension to St. Pancras was opened thus creating a direct link between Derbyshire and London. Gilbert Murray, steward to the Elvaston Estate, categorically stated that "the conveyance of milk from Derby to London dates from 1869" (14) Atkins work detailing the amount of milk reaching London on the Midland Railway reveals that there was a rapid and continuous increase from 1869 to 1883. Thereafter the supply increased much more slowly and actually decreased in the 1890s so that the volume in 1900 was identical to 1884 at 6 million gallons. (15) The estimates for railway milk from Derbyshire for all destinations show a different pattern, with a fairly uniform rate of increase through the whole period, with perhaps a quickening of the rate near the end of the century. From the close correlation of the graphs (Figure 3 p.50) up to 1883 it is clear that most of the Midland Railway milk originated in Derbyshire. After 1883 it would seem that destinations other than London began to take on greater importance for Derbyshire producers. Those destinations depended on efficient rail links, thus Sheffield and Manchester attracted trade from the north of the county and Birmingham was a developing market for S.W. Derbyshire. (16) Furthermore, the Great Northern Railway line opened in 1878 carrying milk eastwards from Etwall, Mickleover, and Friargate stations. Where London milk had been the main traffic in the early 1880s, it constituted only 40% of the total by 1895.

The rate at which farmers changed to marketing liquid milk was not only dependent on prices. The location of the farm relative to a railway...
station was important, as three to four miles was about the limit that milk could be transported by road. Many farmers, even in south west Derbyshire where the railway network was densest, were excluded from participation. Improvements in transport were slow to develop, and for those most remote farms the opportunity to change did not occur until the end of the century.

The Marketing of Liquid Milk

The growth of the liquid milk trade depended on improving the Londoner's perception of the quality of such milk. One improvement was in transport. The farm cart and railway wagon subjected the milk to much buffeting in transit so that it became homogenised, breaking up the globules of butterfat, limiting its use and giving it a different taste. Careful handling reduced this effect and the farm cart was superceded by the "float", a light, well sprung vehicle, which cushioned the milk from the worst effects of uneven roads on its journey to the station. By the early 1880s the traffic had increased to the extent that special vehicles were in operation on the railways, having such features as louvred side walls for ventilation and, in some instances, white painted roofs to reflect sunlight. Great attention was also paid to springing. The advent of special milk trains instead of wagons attached to normal passenger services also meant a reduction of the churning effect.

Milk cans, or churns as they quickly became known, were improved in design. These were made in a variety of sizes as indicated by reports of the exhibits at the Royal Show held in Derby in 1881. However the 17-gallon churn (8 barn gallons) became standard in the London trade. These were conical or tapering in shape, and despite their weight, were easy to move by rolling on the bottom rim. They remained in common usage until the mid-twentieth century. Initially made of iron, by 1880 they were constructed of tinned steel plate so that they were rust resistant and could be sterilized easily.(17)

Bacterial infection was general in the early days and this meant that milk soured very quickly. It was known that cooling directly after milking delayed the souring process and in the first instance milk churns were placed in water troughs to cool them. By 1870 the Lawrence cooler was
Estimated volume of milk from Derbyshire

Sources
1 Midland Railway estimates
2 T. Stirton, 1888
3 G. Murray, 1892
4 G. Murray, 1895
5 Mean estimates of London Milk arriving at St. Pancras on the Midland Railway
   P. J. Atkins (thesis) p178
being widely adopted. (18) This was a simple device consisting of a series of horizontal metal tubes through which cold water ran; milk warm from the cow was placed in a container at the top and allowed to trickle under gravity over the cold metal and into the churn. In the 1870s many farmers had to employ this method of cooling as part of their contractual obligations, and its general use was most important in the development of milk transport over long distances. Derbyshire farmers were acutely aware of their remoteness from the market and were not slow to adopt the method. They were fortunate in that most of them had access to spring water which could effectively lower the temperature.

The purchaser of milk had hazards to contend with other than sour milk. It was quite common for water to be added to milk which was an obvious way for the retailer to increase his profits. Railway milk was more susceptible to this practice than milk from other sources because it passed through so many hands in transit. Adulteration of this kind is considered in a chapter 7, but it should be noted that such treatment was another reason why railway milk was not the first choice of the Londoner.

The great problem from a Derbyshire perspective was the difficulty of communication with a distant market. There were many different types of milk sellers in London - food shops selling milk, specialist dairy retailers, street sellers who purchased milk and engaged in doorstep deliveries, producers who also had retail outlets in the form of shops or street deliveries, and producers who might also purchase milk to 'top-up' their supplies. There were also dealers who engaged in the business of equalizing the supply throughout London. The shortage of supplies in 1865-66 led to an increase in the number of wholesale dealers who quickly became associated with railway milk. In theory it was possible to sell Derbyshire milk in London by a number of methods: either direct to a particular dairy; to a wholesaler; or, least satisfactorily, as accommodation milk on the railway platform. Although this latter method had been common in the early years, it was unsatisfactory from the farmers' viewpoint since prices varied almost on an hourly basis. The system which soon prevailed in Derbyshire was for the farmer to strike a bargain with a wholesaler or retailing dairy and obtain a binding contract to supply milk for a fixed period of six or twelve months. Even when he has secured his contract the farmer's problems were not over. There were
many instances of unscrupulous dealers defrauding their suppliers in a variety of ways, and litigation was often beyond the means of the individual. Although there are reliable estimates for the wholesale price of milk, the price to the individual farmer depended on his negotiating skill and his nerve. He wanted and needed to participate in this method of marketing milk, but he negotiated with little knowledge of the economics of the whole process. Price depended on supply and demand which were subject to a host of variables. These included variations in yield due to circumstances of weather, competition from farmers who before the Depression had concentrated on grain production, profits made by the wholesaler in the previous year [the wholesaler could easily be left with surplus milk on his hands], and even the construction of new railway lines in other parts of the country. The farmer did not know for certain what price his neighbour obtained: he operated in isolation. Into this chaotic scene came the Derbyshire Dairy Farmer's Association, formed principally to establish some sort of order to the milk selling scene and to exert influence by speaking with a single voice and also by disseminating information to its members so that they could negotiate more effectively. Such is the individuality of the farming class that thirty years later it was still struggling to meet these objectives.

The Derbyshire Dairy Farmers Association was formed in 1878 and the credit for the initial formation is given to Mr. John Coleman, of Park Nook, Quarndon, land agent to Lord Scarsdale and formerly at Holkham and Woburn. He had also been closely involved with the cheese factory movement and the marketing of cheese, and was intensely interested in the closer cooperation of farmers to improve the marketing side of agriculture. Mr. Radford, of Church Broughton, is also given credit for helping to form the original committee.(19) The composition of the Association was very similar to the Derbyshire Agriculture Society which preceded it by almost twenty years and reflected the deferential nature of the agricultural community in Victorian England. The president was the largest land owner in Derbyshire - namely the Duke of Devonshire - and the committee comprised land agents and prominent farmers. Landowners were generally honorary members. Throughout the period from its inception until the First World War the same names appeared on that committee as appeared in the minutes of The Derbyshire Agricultural Society.(20) The annual dinner and general meeting was held on Friday (market day) every January
and was well reported in the local press. Although much information is available from these reports, the nature of the discussion suggests that the presence of powerful aristocratic landowners inhibited any "full and frank" exchanges. There are indications, too, that the members were hardly a representative cross-section of the Derbyshire farming community, rather that they comprised the larger farmers drawn mainly from south and south west Derbyshire. Although plaintive cries for relief from their financial burdens were sometimes voiced, in general these men would have substantially more capital on which to draw in hard times than the small producer on his forty acres who was just as typical of Derbyshire agriculture as the man with over two hundred acres.

As the association developed it changed its character in one particular sense: it became very much an organization controlled by, and run for, tenant dairy farmers. The great landlords were still associated with it, but their interest was as patrons rather than participants and this contrasts with the Derbyshire Agricultural Society. One would not expect it to be otherwise. The Agricultural Society had changed direction to concentrate on its annual show, whilst the D.D.F.A. was involved in the practical detail of obtaining fair rewards for farmers' labours. The lack of interest shown by the landowners was commented on by the Duke of Devonshire in his presidential address to the gathering at the annual dinner at the St. James' Hotel in January, 1903. He called attention to "the excuses which had been received from various gentlemen expressing their regret at their inability to attend". He named among others Lord Scarsdale, the Earl of Harrington, Mr. John Gretton (M.P.), and Mr. Walter Evans, and would have been "very glad if he could have been supported by a larger number of landlords of the district". This was an unusual rebuke, but the Duke suggested that their lack of interest reflected the attitude of the great majority of tenants, and he then encouraged the association to seek out new members by every possible means. Mr. Burnett, in response was sufficiently confident of his audience to express a wish that other landlords should show the same practical interest in the Association as his lordship always did, and regretted that they were all too often conspicuous by their absence. He hoped that, now the matter had been raised, they would come forward and lend their support. The Association needed their financial assistance, and the work done was of interest to landlords as well as tenants. Although this is the clearest indication of
dissatisfaction with landlords' support in the reports, it was a subject which had been raised twenty years earlier. (21)

Contracts

The early years of the milk trade - in the 1870s and early 1880s - presented the farmer with relatively rich returns, certainly better than any alternative systems of marketing. There were many pitfalls however. The whole system being new, and the farmer operating individually, gave ample scope for scoundrels to intercede between producer and consumer. Hard luck letters and letters of warning were not uncommon in the local press and the sort of fraud which might occur is illustrated by the following letter published in the Derby Mercury:

"Sir - Permit me through your valuable paper to protest against the dastardly manner in which a certain firm are advertising for farmers' milk in various papers, without either the wish or the desire to pay. I, with others, have fallen a victim to this scandalous and unpardonable conduct of men who only advertise to cheat and defraud. Their centres are Liverpool and Manchester, and different names appear to the advertisements in various papers. Signed "a tenant farmer". (22)

Even when no such problem was encountered, every farmer faced the difficulty of obtaining a satisfactory price and of ensuring that he disposed of all of his milk. There were several ways he could tackle the problem. By far the most popular was to strike a personal bargain with a wholesaler who visited the district. A contract was signed and the farmer then had an outlet for his milk for the ensuing year. A common practice among the dealers was to visit the Derbyshire Agricultural show where they could probably complete all their business in one day instead of having to seek out farmers in their homes, a much more laborious task. Correspondence in the local press illustrates the concern that inadequate contracts might ensue.

Sir - The Derby Agricultural show will soon be held and as this is the time when London milk dealers come "not for business but just on a visit", meet with milk producers, judiciously select a few weak or
more pliable ones, and get contracts at a very low figure, it is well
to be on the look-out. Such contracts will, later on, be
confidentially (?) produced to other sellers for the purpose of
getting them to sell at a ruinous price and so, unintentionally, the
first weak seller does much mischief to all his fellow farmers ... 
New proposals are made to form farmers' dairy companies in London and
in Derby, and if better prices are not obtained it will be the
producers own fault. How dairy farmers associations have been formed
and increased activity is manifested everywhere. It is to be hoped
that dairy farmers will in future show a little more spirit and more
loyalty to those who are trying to help them than they have done in
the past. — Signed M.D.D.F.A.(23)
(preumably Member of Derbyshire Dairy Farmers Association).

The above letter provoked further correspondence in which the best time to
enter into a contract was discussed. October or November was given as the
best time because milk was scarce and market prices for dairy cows were
high. The farmer then was acutely aware of the cost of maintaining his
winter supply, whilst the dealer was more anxious to settle than when milk
was in plentiful supply. One correspondent exhorted the milk producer,
immune from ruinous foreign competition, to make the most of his monopoly.
Derbyshire, so long famed for its splendid dairy cattle, might
appropriately be the locality where the reasonable trades unionism of the
farmer could originate, if every farmer joined the Association.(24) This
correspondent was flying in the face of reality, because farmers regarded
themselves as being in competition with each other and were loth to
discuss their business openly. At the annual dinner of the D.D.F.A. in
1889 a speaker remarked that "the difficulty they laboured under in north
Derbyshire was the fact that the farmers would cut each other's
throats".(25)

Another method of obtaining a contract was to reply to an advertisement in
the local press. The following may be regarded as typical in the 'wanted'
columns:
"Milk, Milk, Milk. Pryce and Harris are now negotiating for the
season 1890-91. Quote prices and full particulars to the above at
Craven Yard, Drury Lane, London."
and also:
"Milk contracts made for 12 months. Farmers state lowest price and all particulars. Abbott Bros. Gun Lane, Limehouse, London."(26)

These advertisements appeared very shortly before the commencement of the season - March 25th or April 1st. They might be answered by farmers who had failed to obtain their normal contract. One can begin to understand that a prime objective of the D.D.F.A. was to achieve a more uniform price. Gradually the idea of a recommended price developed.

There could not be a single price for the year, because the price of milk varied between summer and winter. The winter price was much higher because of the extra costs incurred in its production. There were two sorts of contract, the Whole Dairy Contract and Level Dairy Contract. The former was more advantageous to the farmer but could present problems of shortage or surplus to the dealer. The latter, while guaranteeing level supplies, could lead to farmers sending some milk as accommodation milk. Contracts in Derbyshire were usually Whole Dairy Contracts. While Atkins found the six month contract to be the norm, (27) what seems more usual in Derbyshire's case was that contracts were negotiated either in the spring or the autumn but lasted for twelve months. In 1893, in connection with a major dispute with the Midland Railway over a proposed increase in carriage rates, the D.D.F.A. (28) surveyed its 440 members with the following results:

| Contracts terminating in autumn | 92 |
| Contracts terminating in spring | 148 |
| No contract                     | 11 |
| No reply to questionnaire       | 189 |
|                                | 440 |

Here is clear evidence that the individual obtained a contract for the whole year, but it could run from Lady Day or Michaelmas. The survey also reveals the lack of co-operation even among members of the Association. Those farmers without a contract were forced to look towards local factories or to send all of their milk as platform or accommodation supplies. That was not necessarily the road to ruin; much depended on the weather in a particular year and whether demand outstripped supply. The relative price of accommodation milk to contract milk has been detailed by Cohen for the period 1906-1914 and we may assume that the relationship was
not dissimilar in the late nineteenth century. In general the two patterns were similar except that accommodation milk was usually higher priced in mid-winter and in early and late summer. This reflects the shortage of mid-winter and the surplus of mid-summer when lush grass provided the richest supplies.

It should be noted that the retail price did not vary with the season. For many years it stood at or near 16d per gallon. The diagram illustrates why it is necessary to be wary of farmers statements about the contrast between producer prices and retail prices. Producer prices did momentarily drop to ruinously low figures and these could be quoted to exemplify the vast profits of the "Middle-man". But on at least four occasions between 1906 and 1914 producer prices rose above the retail price. The short-term fluctuations in price were often very great. They reflect the vagaries of the weather which in turn affected supply, and the attitude of the dealers in response to such fluctuations. This can be illustrated by looking briefly at the year 1895 in which contrary to the usual pattern, high prices were more frequent in the summer than in the winter.

1895 began with a prolonged cold spell which so reduced the milk supply that imports from France were called upon. The milder weather of early
spring, coinciding with spring calving, brought a glut and low prices just when contracts were being negotiated. Many farmers decided to return to cheese-making rather than accept the low price contracts. That may have been forced upon them as they held out for improved contracts which never materialised. The late spring and summer was a drought period which eventually affected yields. This in turn led to a milk shortage and high prices tempered only by milk from factories which reduced their cheese making activities as liquid milk sales became much more lucrative. The summer price varied between 7.5d and 9.5d for several weeks – exceptionally high. In August the drought broke and there was a period of beautiful growing weather and this, coupled with the holiday season, left dairymen with a surplus. Supplies remained plentiful until the time for winter contracts. Contracts were delayed because dealers offered very low prices because they were still smarting from their recent financial losses, while farmers realized that the shortage of winter fodder resulting from the drought would increase the costs of winter production. For several days around Michaelmas there was such a shortage that prices reached £2 per churn (2/4d or 28d per imp. gallon) as farmers resisted the dealers and withheld supplies.

However the summer cheese-makers had witnessed the collapse of cheese prices and were determined to return to liquid milk production, accepting what was on offer. Other farmers simply had to fall into line if they were geared for winter production, the station prices having slumped. Into November these reached an unparallel low of 7d per gallon. Thereafter there was improvement until 11d was reached in mid-December. An extreme example of even shorter term fluctuations is provided. On December 24th the price was 11d in the early morning. It was anticipated that this price would prevail throughout the day, but "as it turned out a miserably wet day" the price suddenly dropped to 9d at mid-day and remained at that level.(30)

In this example of 1895 we can see some of the problems facing the dairy farmer. The price of milk cannot be viewed in isolation; it must be set in the context of the price of manufactured dairy products – cheese, butter and cream – which, not being perishable, were subject to fierce competition from overseas. Furthermore, there were large fluctuations in the price of station milk which reflected predictable seasonal differences
in production and costs between summer and winter, and in the shorter term reflected the vagaries of the weather. To these inevitable variations must be added the effect of past decisions - farmers opting for cheese-making, wholesalers reacting to shortage of supply with increased contract prices which could place them in financial difficulties. Thus it appears that, by the 1890s the Derbyshire farmer lived in some sort of nightmare world where his future costs were known with a fair degree of certainty, but his revenue could never be forecast with accuracy. He could only retain his sanity by adopting an optimistic attitude about milk prices, but in the economic climate of the late nineteenth century when prices of nearly all goods continued to fall, that optimism was ill-founded. Many farmers must have spent much of their working lives waiting for the up-turn in prices.
The Role of the Derbyshire Dairy Farmers' Association

It has been noted that the D.D.F.A. was formed by a small group in 1878. Its development was very slow, and the number of members remained very small, only 104 farmers participating by 1886. The early work of the Association was principally concerned with assisting members who had to resort to litigation in their dealings with milk buyers. The eighth annual report in 1887 illustrates this work. "The committee has assisted Mr. Tomlinson of Bradley Pastures in compelling a milk dealer to fulfil his contract. The case was settled with the dealer paying costs and making a satisfactory arrangement for the future".\(^{(31)}\) Members were often assisted by the Association's solicitors in the resolution of disputes. In March 1887, Mr. Locket of Ratton Fields was charged by his dealer with adding water to his milk, and threatened with proceedings unless he paid £20 for loss and damage, and forfeited the amount due for milk. A letter from the solicitor quickly resulted in full payment and nothing more was heard of the watering charge.\(^{(32)}\)

The Association was not always successful, nor were the dealers always the opponents. A minor case which highlighted a major problem concerned the labelling of milk churns. Each farmer had his own name stamped or plated on the churn. A case in 1887 involved an instance of a churn on which a name plate had been rivetted over the original name stamping of an Association member. An action was entered in the County Court for loss and damage, and tried before a jury which gave a verdict in favour of the defendant. The Association was hopeful that despite the adverse verdict, the publicity would deter others from perpetrating similar acts.\(^{(33)}\)

By the late 1880s the Association had sufficient experience of the trade to be able to protect its members from what Mr. J.G. Crompton, the treasurer, described as "the attacks of the middlemen". Individual farmers were "like sheep attacked by a wolf", but in association it was possible to avoid unscrupulous dealers.\(^{(34)}\) The secretary exhorted his members to consult him before dealing with an unknown customer, and the inference is that a list of approved dealers had been compiled. By 1891 it was possible to obtain, on the payment of sixpence to Messrs. Harrison & Co., Solicitors, prompt and reliable information of any trader. The extent to which this service was used is unclear because reference is made
to the exceptional number of cases in 1891, most of them for non-payment by unknown dealers. All of them were pursued by the Association. In the few cases where the miscreant escaped it was because of "a deplorable want of caution on the part of members concerned". (35)

By the late 1880s the Depression was biting hard even in Derbyshire and the main thrust of the Association was moving towards price maintenance. At the annual meeting in January 1887 it was first mooted that a price for milk should be fixed. A committee member, Mr. Kidger, explained that such a step had been considered several times, but had been dismissed as impractical as they could not get members to combine. It was also acknowledged that it would be difficult for Derbyshire to act in isolation if they were to make dealers 'submit'. (36) Consequently a meeting was held at the Guildhall in Derby during September to consider the price for the following winter. "This was one of the largest meetings of farmers held for many years and did much good as it told the milk buyers that farmers intended pulling together and insisting on a fair price. Still all must bear in mind that it is one thing to fix a price, and another to get it". At the next annual meeting in 1888 it was stated that many members had achieved the price, although not inconsiderable numbers had had to bow to the inevitable [unfortunately the price is not quoted]. There was also a suggestion that there should be an annual meeting of dairy farmers associations throughout the country for 'the discussion of trade interests' foreshadowing what did occur in the 1890s. (37)

Prior to 1887, therefore, one can estimate milk prices only from estimated prices paid in London. After that date, although press coverage is meagre, we can begin to see in the recommended prices the top prices which farmers managed to achieve. The emphasis on milk prices resulted from the fall experienced in the second half of the 1880s. It is clear that at no stage was the Association able to control prices: the exercise did little more than remove local anomalies. Even when Derbyshire joined with other counties in a Central Association of Dairy Farmers there was little that could be done to raise prices without first finding an outlet for milk surplus especially in summer, and that outlet was blocked by the massive and increasing imports of manufactured dairy produce.
Following the introduction of recommended prices the next step was for the Association to act as agent for the farmer in obtaining a milk contract. Initially this was done by the secretary and was on a very small scale.

A statement in the local press read: (38)

**Derbyshire Dairy Farmers Association**

Notice is hereby given that, by wish of the committee, I have again agreed to act as AGENT for the SALE OF MILK of members of the Association. I have arranged to be at the following places at the times mentioned below, viz:-

<table>
<thead>
<tr>
<th>Place</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporation Hotel</td>
<td>10.30 - 12 noon</td>
</tr>
<tr>
<td>Bell Hotel, Sadlergate</td>
<td>1.30 - 3 p.m.</td>
</tr>
</tbody>
</table>

on the THREE coming Fridays, March 10th, 17th and 24th.

Samuel Osborne
Secretary
Quarndon, Derby.

Friday was market day, and the Corporation Hotel was located in the cattle market and, until its demolition in the 1970s, was the meeting place for farmers. Mr. Osborne had first performed this function in September, 1892 when he had negotiated 37 sales. Prices ruled a full penny per barn gallon higher than previous contracts. This may be regarded as the start of the agency system. Osborne was well placed to understand the economics of marketing. He farmed at Quarndon, some three miles from the centre of Derby, but he also owned a shop in the town (Green Lane) selling the produce of three other farmers as well as his own. The shop specialised in every sort of dairy and other farm produce, and was quite a large business, there being eleven employees in addition to his wife who ran the business.

Although the Central Association initiated an agency in London, there was little improvement in Derbyshire until a full-time agent was employed.

In 1900 the D.D.F.A. joined forces with the Staffordshire Farmers Association to establish a London milk agency. The two counties obtained similar prices for their milk and it was considered to be a logical step to operate together, as well as cost saving. A new joint committee was
formed to develop the agency and Mr. W.H. Edwards was appointed the first agent at a salary of £150 plus commission. His duties involved finding reliable customers at good prices for milk and other produce. It was hoped that he would be instrumental in obtaining an increased price and also increasing the volume of sales from the district. He would also act for members who had cheese to sell, providing a new and more direct market outlet instead of the local cheese fair or dealings with the cheese factor. Further miscellaneous duties involved helping locate missing churns, a problem which was a source of irritation and not inconsiderable expense. The two associations would receive part of the commission and it was hoped that this would make the agency self-financing.(39) The existence of the new agency was widely publicized and advertisements were placed in trade journals calling attention to its principles and objects.

Soon after his appointment Mr. Edwards wrote to the joint committee recommending minimum prices of 19d per barn gallon (8.94d/gallon) in winter and 14d per barn gallon (6.59d/gallon) in summer. The committee accepted that recommendation and decided that the agent should not sell any milk below these prices. Two years later the annual report noted that "The London Agency Scheme had fully realized the best and most hopeful expectations formed with respect to it". Better prices had been obtained for milk sold through the scheme, and the agency had managed to sell all of the milk offered at the fixed price. The agency had been of great value in recovering lost churns. Another important aspect of the success was in attracting new membership. There had been "a tendency on the part of the most sceptical to recognise the value of such a practical scheme".(40) The significance of this was not lost on the committee of an association which, after nearly a quarter of a century, had the backing of about one-fifth of the Derbyshire producers, and, therefore, could not operate as the mouthpiece of Derbyshire agriculture. Yet even at this stage it was necessary to deplore the action of some members for selling their milk at less than its market value. One wonders why they paid five shillings to be members of an association and then ignored its obvious benefits.

By 1903 further agencies were under consideration in Manchester and Birmingham. This would have a double benefit in that prices in those cities would become stabilised and, especially in the case of Manchester,
a direct link would increase membership from North Derbyshire and adjacent areas of Staffordshire. The joint committee already had plans, and such confidence resulted from the London experiment which had proved to be self-financing and had improved prices in other cities as farmers - even non-members - were very much aware of the market value of their milk.(41) The Manchester agency was duly opened in the autumn of 1904, in cooperation with Cheshire as well as Staffordshire.(42)

An aspect of the general depression in agriculture which adversely affected Derbyshire was the switch from grain production to livestock. This had been recommended by the Richmond Commission and the result was surplus milk production especially in the early summer months, with its consequent impact on prices. The suggestion of a factory to manufacture the surplus came in 1887. A sub-committee considered the whole question and recommended that: a central factory be erected near to Derby station; that in outlying districts separators be established, the cream being sent to the Derby factory. Members would be required to take shares to the value of ten shillings per cow. In March 1888 all members were asked for their approval but only fifty were in favour. The committee felt that the lack of enthusiasm reflected a lack of information about the profits of butter-making as much as wariness about investing some £20 each in a new venture. The matter was dropped, but the problem of milk surplus remained. Mr. Gilbert Murray of Elvaston spoke of the need to establish such centres in each town on co-operative principles.(43)

Some seven years later the problem of surplus milk was still a major topic of discussion and the idea of a D.D.F.A. factory was again raised. Capital of £2000 would be needed to establish a business capable of dealing with 2,000 gallons per day. Gilbert Murray was no longer in favour of a butter factory, but thought that cheese sold at 55/- cwt. would pay as well as liquid milk selling. "It is not very apparent where the £2000 is to be found unless the landlords provide it". Mr. Murray indicated that the Eastern Counties were raising £50,000 to establish co-operative businesses and Derbyshire hoped to follow their example.(44) The following year it was reported that there was little hope of fulfilment of the scheme, especially as the premises they hoped to rent - the extensive unused cellars of the London and North Western Railway at Derby Station - were unobtainable.(45)
A different approach was therefore tried to relieve the problem of surplus. This was the bounty system, a scheme which had been tried successfully by the Eastern Counties for two years. It involved cooperating with the dealer by attempting to regulate the supply. Farmers would pay a levy of one shilling per cow into a central fund, and landlords would be asked to contribute an equal amount to that paid by their tenants. Members who could not sell their milk for a satisfactory sum (1s 2d in summer; 1s 7d in winter equivalent to 6.59d and 8.94d per imp. gallon) would be asked to withhold their supply and make cheese. In compensation they would be able to draw from the central fund 3d per barn gallon (1.4d per imp. gallon) for all their produce for a period of up to eight weeks. The scheme was accepted and the Duke of Devonshire at once signified his approval and also added a handsome subscription thus ensuring that landlords participated. (46)

The scheme came into operation on 26th March, 1898, and proved to be something of a damp squib. Only seven farmers drew from the fund in the summer and none in the winter. Fears that such a scheme might encourage increased supplies of fresh milk being imported from France "at prices which would ruin a British producer" proved unfounded. In fact there was little surplus in 1898, a year where one can discern the beginnings of fresh outlets for milk. The bounty system continued, but the problem of surplus diminished with the development of long life milk products. In 1900 the committee reported that, although prices were still low, milk was easily sold. By then large amounts were being sent to South Africa. Milk from Derbyshire was railed to Newcastle, sterilized, bottled and exported to South Africa. This was a government purchase with fewer risks as well as helping solve the spring and early summer surplus problem.

One must question the effectiveness of the Derbyshire Dairy Farmers Association. Its origins some ten years after the start of the London milk trade reflect the problems of that early trade in dealing with unknown purchasers and its work with respect to injustices seems to have been very effective. As prices dropped in the 1880s it was inevitable that there should be increasing discussion on ways of maintaining prices. The Association was fortunate in its leadership. Men of the calibre of John Coleman of Kedleston and the prolific agricultural writer Gilbert Murray of Elvaston were a constant source of ideas and inspiration, but
their efforts were doomed to comparative failure for one particular reason. Their rallying call was co-operation, but that was something which was never achieved either at national, regional or local level. The Association membership was always small. Initially it was a single grouping based on Derby and until 1887 the maximum number was 134. In that year other branches were started, at Ashbourne, Wirksworth and Ashby, giving an 1888 membership of 324. Through the 1890s further sub-groups emerged, for instance at Belper, Regworth in N. Leicestershire, Chapel-en-le-Frith in N. Derbyshire, and Uttoxeter in Staffordshire. Nevertheless membership in 1897 had reached only 700, and after the formation of a separate Staffordshire Association in 1897, membership in Derbyshire actually declined so that by 1903 there were less than 500 supporters. (47) So throughout the period under consideration, only in the bleakest part of the depression did support exceed ten per cent of the farming community. Certainly membership was likely to be limited to those engaged in the liquid milk trade which accounted for not much more than half the total production in the 1890s, but there were three thousand farms in the range 50 - 300 acres in addition to some six thousand small holdings of 5 - 50 acres, many of which were milk producers. (48) Given a spirit of co-operation it is unlikely that membership would have been below 3000. A survey of the membership in 1893 conducted to provide information for the Royal Commission revealed in an incidental way that the average acreage of the respondents was 170 acres. (49) By Derbyshire standards this represented a large farm and gives a clue to the type of member. Although this is suggested without corroborative evidence, the bulk of the members seem to have been those who used Derby as their market town; they were men with much larger than average holdings; they would employ several full-time labourers rather than depending on family labour; and they would be more likely to have the time to attend meetings and exchange views with their contemporaries. One is tempted to contrast the genial discussions in the Corporation Hotel in the cattle market on Fridays with the lot of the small farmers dependent on family labour whose work on market day would be very similar to the rest of the week - two milkings, cheesemaking or the trip to the station with the churns, feeding, mucking out, sterilizing equipment, before turning to any work on the land that might be required. There is, then, a suspicion that the Association was untypical of the average producer in Derbyshire. Additionally, farmers traditionally were in competition in the market
place. The best cheese and the best butter sold most easily and at the best prices. Co-operation in the liquid milk market would require completely new attitudes, especially difficult when farmers were most certainly in competition for contracts. Additionally, farmers have to adopt a philosophical attitude to bad years and it is only with hindsight that we can view the whole of the depression period. For men living through those years there had to be constant hope of improvement without recourse to combining to 'rig' the market. For these and possibly other reasons, the Association never developed into a closed-shop union, although it was the only voice - and an important one at that - of Derbyshire producers.

In a wider context it could never have been possible for Derbyshire to dictate prices without becoming part of a national organization. An editorial in the Cowkeeper and Dairyman's Journal discussing the proposal to withhold surplus milk by manufacturing it suggests that "for Derby to carry out its proposals ... would be giving a premium to the farmer in Leicester, who would get the benefit of the Derbyman's absence from competition", and continues "Dairymen cannot be expected to give Derby 2d a (barn) gallon more than he is offered by Wiltshire, nor show a preference to Leicester that demands a higher price than Norfolk." The 'national' organization was the Central Association of Dairy Farmers of which Derbyshire was the largest member. Although it attempted to harmonize prices, different carriage costs in different parts of the country obviously made it difficult to fix a national floor price below which farmers would not sell. So for a period of thirty years from its inception the Derbyshire Dairy Farmers' Association was constantly exhorting local farmers to combine together, but never really succeeded. The problems of the low price of milk resolved itself in the late Edwardian period and in the Great War.

Impressions gleaned from newspaper reports are bound to be lop-sided. The D.D.F.A. was concerned with problems: there are no reports of satisfied farmers. Yet there must have been many who had few complaints. Those who dealt directly with retailers are most likely to have established a friendly working relationship. A farmers' diary for 1898 reveals that Mr. Blackwell, a Manchester retailer, happily travelled to Yeaveley to stay with his supplier and to enjoy a day's shooting as well as conduct
business. The diary also reveals that the price was more than the D.D.F.A. recommended price. There are other stories in the district, as for instance retailers' children enjoying farm holidays in Derbyshire, which indicate that the farmer-retailer contract had many advantages over the wholesaler's contract. Thus a more balanced view would envisage a significant proportion of farmers supplying a known and trusted retailer, confident of future contracts, and able to resolve problems on a personal basis. Such people would have little interest in joining an association which appeared to treat the milk purchaser as an adversary. It is not possible to estimate the proportion who fell into this category, but this could be one explanation of the refusal of Derbyshire farmers to combine for the purpose of establishing a satisfactory price for milk.


4. Ibid. pp.43-47


12. Coleman, J. Royal Commission on Agriculture, Question 5792


16. Murray, G. p.18

17. Report of the Royal Show exhibits Derby Mercury 20 July 1881

18. Whetham, E.H. p.374


20. Derbyshire Agricultural and Horticultural Society, Minute Books. Derby Local Studies Library DL 143/1


22. Letter Derby Mercury 20 July 1882

23. Letter Derby Mercury 31 Aug 1892

24. Letter Derby Mercury 7 Sept 1892


26. Advertisements Derby Mercury 5 March 1890 and 27 Feb 1889

27. Atkins, P.J. (thesis) p.226


33. Ibid

34. Report *Derby Mercury* 30 Jan 1889


36. Report *Derby Mercury* 26 Jan 1887

37. Report *Derby Mercury* 1 Feb 1888

38. Advertisement *Derby Mercury* 24 Feb 1893

39. Report *Derby Mercury* 5 Dec 1900

40. Report *Derby Mercury* 2 Mar 1902


42. Report *Derby Mercury* 8 Mar 1905

43. Report *Derby Mercury* 30 Jan 1889


47. Annual Reports, D.D.F.A. 1887-1905 *Derby Mercury*


49. Report *Derby Mercury* 31 Jan 1894
50. Editorial, Cowkeeper & Dairyman's Journal, reprinted in *Derby Mercury* 19 Feb 1896

51. *Diary of Mr. Samuel Potter, Yeaveley.* Lent by Mr. R.W. Potter
CHAPTER 4

THE FACTORY SYSTEM

Contemporaneous with the development of the sale of liquid milk, there came a strong movement to develop a system of factory production of dairy products in Derbyshire. Like the railway milk trade, its origins lie in the 1860s, but the expansion of the system occurred in the 1870s. Since cheese rather than butter had been the staple product, it was in cheese production that Derbyshire became a pioneer county. It is perhaps surprising that the movement was so late, since the benefits of such a system seem so obvious with hindsight, and it was indeed unfortunate that it was so late, because from its inception it was in competition with the railway milk trade and success depended on the relative prices of milk and cheese, except in remoter areas where farmers did not have immediate access to the railway. Even in the formative years the balance of prices was in favour of liquid milk sales, so that arguments for co-operation by farmers fell on deaf ears as they perceived a more lucrative solution to their marketing problems. Thus the movement grew slowly and not always in a fashion which was most beneficial to the producer. Cheese prices hardly encouraged investment in long term ventures, and many of the factories that were established came into existence as a result of the actions of interested landlords rather than through any collective decision and investment by producers. The difficulties experienced by the Derbyshire Dairy Farmers Association in prompting a spirit of co-operation are mirrored in the evolution of the factory movement, so that a network of factories serving the region, especially those remoter parts which continued to depend on manufactured products, was never achieved.

Origins

The traditional Derbyshire farm produced cheese. Like the arable farmers of the grain counties, Derbyshire farmers came face to face with foreign competition at mid-century. In repealing the Corn Laws, Peel's government had also removed the import duties on live animals, and reduced the protection on dairy products, bacon, and eggs. Further reductions took place in 1853 and final elimination of any preferential treatment occurred in 1860. The growth of imports of dairy products followed closely upon
the removal of these tariffs. Initially it was West European countries which benefitted most, Holland supplying three quarters of the cheese imports in the 1850s, but by 1865 North America was our largest supplier of cheese as the transatlantic trade opened up. Disturbingly, this new product proved popular with the consumer because of its uniform quality and low price, and immediately had its impact on the marketing of English cheese. Good quality cheese sold easily and commanded a good price, but there were enormous variations in the skills of farm cheese-makers, and inferior produce in particular quickly experienced a downward pressure of price resulting from this new foreign competition, and some cheeses became almost unsaleable. American cheese was of uniform quality because much of it was factory produced. There was, therefore, a strong stimulus for improvement in manufacture of cheese in England. That Derbyshire should be the first county to move in this direction is hardly surprising: not only was it a county which had a long tradition of cheese making, but the local landowners seem to have been particularly interested in improving the manufacturing and marketing side of the product on which, ultimately, their own income depended. Heading the list of these landowners was Lord Vernon of Sudbury.

Augustus Henry, sixth Baron Vernon, was one of those rare aristocrats who devoted their energies to agricultural improvement rather than contenting themselves with their estate as residence and, possibly, power base. His interests were at the national as well as local level for he was elected to the Council of the Royal Agricultural Society at the age of thirty in 1859 and subsequently served on numerous sub-committees. He was to become President of the Society in 1870 and serve on the Royal Commission on Agriculture [the Richmond Commission] which sat from 1879-1882. Thus he was almost uniquely placed to have access to information on developments at home and overseas as well as understanding the increasing problems of farmers in his own locality. In 1868 he moved that the R.A.S.E. inquire into the working of the American factory system of cheese-making following which a report appeared in the Journal in 1870. The report showed that the factory system had started in the USA in the 1850s, suddenly flourishing in 1863-64 when 321 new factories were built in New York State alone. Butter factories also existed. Consequently very little manufacturing took place on the farm. The system had been
widely adopted in Canada and was also gaining ground in Europe. Here was substantial evidence that the English dairy counties would have to change their methods to meet the increasing challenge of overseas farmers now competing in a free market. The report was delayed because of the illness of the editor of the Journal, but in the meantime moves were made in Derbyshire of a more practical nature, and the guiding hand of Lord Vernon can again be detected. At the annual dinner of the Derbyshire Agricultural Society in September 1869 the need for prompt action to improve quality was stressed by the Chairman, Mr. J.G. Crompton, a Derby banker and local landowner. In December that year at the A.G.M., Lord Vernon proposed that a committee be formed to investigate the problem. That committee produced a report within two months which was presented to the Society in February 1870. It detailed the advantage of factories (see below) and proposed that an experimental factory should function in the Summer of 1870. In order for this to occur, interested landlords would need to contribute to a guarantee fund, and backing for a total of £5,000 was received so that immediate plans could be made. The original scheme had envisaged a single pilot factory but Mr. Roe, a timber merchant, placed at the disposal of the committee a former cheese warehouse free of rent in a central part of Derby adjacent to the canal. It was decided, therefore, to develop two factories, the second one to be in a rural area. The search for a suitable location involved meetings in various villages - Sudbury, Longford, Etwall, Shardlow and Weston Underwood - to discuss the proposal with local farmers to establish how many were prepared to participate, and how much milk would be available. The proposed price for milk was 6½d per gallon, a figure which was arrived at after much discussion, since most cheese-producing farmers were unaware of the precise value of liquid milk. It was thought necessary to start with at least 400 cows, located within three miles of the factory. Such a radius embraced an area of some 18,000 acres, enough to support several factories if all farmers were involved. A completely new building would be erected and the trial would run for three years. After due consideration of farmers' response, landowners' willingness to co-operate, and such factors as ample unfailing water supply, the Longford district was chosen. The Hon. E.K.W. Coke, the landowner, would provide a building subject to the guarantee that 40% of the cost would be reimbursed if the experiment failed.
Through contacts in the American cheese export trade a practical cheesemaker with factory experience was engaged at £200 for the season with travel paid. Mr. Cornelius Schermerhorn arrived in Derby on 11th March 1870 just three weeks after the meeting at which the committee's proposals had been presented. The speed of action was remarkable but necessary if the experiment were to start in 1870. It had been anticipated that Schermerhorn would superintend both factories, but after discussions with him, and in view of the importance of success for future developments, his brother Levi was engaged on similar terms and arrived in mid-April.

The Longford factory had to be built, and both it and the Derby factory equipped. Again, the committee moved with commendable speed, cheesemaking starting in Derby on 8th April and at Longford on 27th May. The urgency partly related to participating farmers not having engaged dairymaids for the season as in previous years. We are not told what the mood of the farmers' wives was prior to 27th May.

It is instructive to reflect on the type of building that could be erected so quickly and yet be regarded as ideal for its purpose. The Longford structure was wooden, measured 94 ft x 34 ft, and cost £500. It was fitted out similar to the best American factories, and although it had specifically been located adjacent to the Longford brook, the sluggish summer flow exposed to direct sunlight produced water at too high a temperature for good cheesemaking, necessitating the piping of water for almost a mile. This considerably increased the initial costs. Facilities in the factory were sufficient for working the milk of 600 cows.

The Derby factory in Siddals Lane was not purpose built, consisting of three floors, but the lower floor was a basement which helped to ensure uniform temperatures. It attracted a great deal of interest in its first season and Gilbert Murray spoke of a constant influx of visitors every day.

The original committee having completed their task, a new central committee was appointed by the guarantors to run what was to be known as the Derby Cheese Factory Association, with managing committees for each factory. A strict set of rules was established and milk suppliers were
obliged to sign an undertaking to operate within that framework.

Farmers had to deliver their milk twice a day to arrive before 7.30 a.m. in the morning, and 7.30 p.m. in the evening. They had to deliver all of their milk, and ensure that it was in a suitable condition. The benefit in return was that they were paid a standard rate of 6½d per gallon and received a cheque on the first Friday of each month. At the end of the season each farmer received a share of the profits proportional to the amount of milk supplied. The benefit of that monthly milk cheque must have been an enormous advantage to farmers who normally had cash flow problems. Under the traditional system of farm cheesemaking it had been commonplace to borrow money from cheese factors, thereby limiting freedom of action in selling the cheese. Indeed, the attractiveness of such a scheme is reflected in the records of the first year of the Derby factory at which the milk supply was limited to the aggregate of 300 cows drawn from only thirteen farms. The committee, from "a sense of their inexperience and a fear that they should involve the interests of the guarantors" deemed it prudent to act with caution although at least twice as many farmers would have liked to have participated. (6) This, for a cheese factory in central Derby, suggests that farmers with relatively easy access to the railway - from whence might be despatched milk to other cities - viewed the experiment favourably. However, there were opinions based not only on natural conservatism, which indicated that the movement would not have the whole-hearted support of dairy farmers. One might even speak of firm resistance in some instances.

The first year was a difficult time for the committee. Apart from the late start, the financial aspects were worrying. The milk price had been agreed at 6½d per gallon, but the quantity of cheese which could be produced from each gallon was not known with certainty, but was thought to be less than one pound weight. The Derbyshire hundredweight of 120lbs, allowing for loss of weight as cheeses matured (some 8 per cent) would therefore cost 77s 6d, with additional overheads of some 4s, giving a minimum selling price required of 81s 6d. The average price of cheese at the time was 9s below this figure in Derbyshire, although top quality cheeses commanded a price roughly equal to the estimated selling price.

The Hon. Edward Coke explained the Derbyshire hundredweight in terms of
ease of calculation of prices:-(7)

1d per pound = 10s per hundredweight = £10 per ton

This worry over price explains the reticence of the committee in the amount which they were prepared to make in that first year. However, results showed that initial calculations had most certainly erred on the side of caution.
Advantages and Disadvantages

J.C. Morton in his study of cheesemaking in 1875(8) gives a clear indication of the doubts that existed, even of the resistance to change. On his visit to the North Midlands he found that the farms on some estates were admirably equipped for cheese production with modern dairies recently built at considerable expense. For instance the Tollemache estate at Peckforton in Cheshire had "everything that the most accomplished cheesemaker can desire" by way of well laid out buildings with ample storage, water supply, whey disposal systems to adjacent piggeries, and even lifts to diminish the arduous nature of the dairyman's task. All the farmers were happy with the existing system and produced cheese which commanded a high price: they had no desire to change. Similarly, on Lord Vernon's Sudbury estate in Derbyshire, the dairy arrangements were as perfect as the landlord could possibly provide. [The fact that Lord Vernon was one of the prime movers of the factory system tends to negate the argument]. On estates such as these a new factory would invalidate the work of the landlord. Farmers on these estates were fortunate, but it was also believed that if factories were built then landlords who had not invested in modern buildings would be relieved of any obligation to do so and this might apply to buildings other than the dairy.

Another concern was existing pig-units. Pig-feeding was an integral part of the farm economy, using the whey from cheesemaking mixed with purchased meal. It provided an important second source of income as well as increasing the available supply of organic manure. The value of whey was variously estimated to be worth between £1 and £2 per cow per year. Farmers did not relish the loss of this valuable side-line, but, of course, their argument was not particularly relevant since a factory also generated large quantities of whey and many contracts stipulated that milk suppliers had to take whey in return.

A few farmers had a much more reasonable objection. Those with the knowledge, skill, and experience were already producing high-quality cheese that was always in demand. They would lose money if they joined a co-operative which paid a uniform price. The judges of the 1881 farm competition found such a person in Mr. Milner, of Alfreton. He was a regular prize-winner at local shows, and his cheese was always disposed of
locally at very good prices. He had no intention of changing his methods although his farm was only a quarter of a mile from the railway station and he could easily have switched to liquid milk production. Furthermore, his dairy-room was by far the worst that the judges encountered. It was "most inefficient in its requirements", and had also to serve as larder and pantry for the family.(9)

A further argument against the factory system was the necessity of transporting milk. This would be an additional farm cost, and, in some instances, would involve the purchase of new equipment. Its impact would be different on different farms depending, for instance, on the distance from the factory, the number of labourers employed, and the number of horses kept. It would effect the small farmer most of all, since a man or boy would be required to transport the milk, while under the existing system it was the women - dairymaid, daughter, or wife - who handled the milk.

Most of the arguments against factories seem fairly trivial, but there is no doubt that such arguments were regarded as important in the early 1870s, or maybe it was simply scepticism that a farmers' committee could effectively run a factory business. Farmers risk their own capital, and are of necessity cautious and conservative. Illustrative of this scepticism is the name given to the site of the Holm's factory in the upper Dove Valley - 'Fools Corner'.

The advantages of the factory system seem so compelling that, with hindsight, it is difficult to understand any lack of enthusiasm. The people who stood to benefit most were those whose cheese-making skill was unexceptional or even inadequate. They were far more numerous than the exceptionally proficient like Mr. Milner. Since price and even saleability related to quality, great benefit would ensue from having cheese made by competent professionals, especially at a time when foreign imports already were influencing market prices of the poor quality goods. To the promoters of factories this appeared the simplest way of improving or, at least, maintaining farm incomes. As events were to prove, the increase in price for some farmers could be as much as thirty per cent. There were other factors to be considered. Since cheese-making was a summer activity, there was a period in the spring and again in the autumn
when only a small amount of milk was available on a farm. In the spring
this occurred when only a few cows were in milk, and in the autumn it was
repeated as yields steadily diminished. At such times the quantity of
milk on one day might be insufficient to make a whole cheese. Those that
were made were often poor in flavour and therefore sold cheaply. The
pooling of the resources of several farms immediately overcame this
difficulty, so that prices could remain much more uniform.

Another very important factor was greater labour efficiency. Although the
farmer's family was usually involved, many farmers hired labour for the
dairy work - usually a dairymaid. Such a person might not be fully
employed in cheese-making, leading to extra costs. In the factory, labour
could be used to maximum effect. This is amply demonstrated in the early
reports and accounts of the factories. The total overheads were usually
within a few pence of 4s per hundred weight, whereas on a 'typical' farm
with a herd of thirty cows the labour cost if a dairymaid was employed
would be at least 5s per hundred weight. The factory would, therefore, be
at least £6 per year cheaper in labour costs. Mr. Needham, a contributor
to the Holms Factory, told Morton that in diminished costs and increased
value he gained £80 per year from using the factory for his thirty cow
herd. (10)

The business efficiency of the factory could help the farmer to increase
his own efficiency. The daily delivery of each farmer was weighed so that
appropriate payments could be made, but this in turn emphasised to the
farmer exactly how much he was producing, and it would then be a smaller
step to develop his own system of records, so necessary for herd
improvement. Very importantly, the supplier could draw a weekly or
monthly sum for his milk, so that cash-flow problems, so inherent in the
old system, were eased. He no longer became indebted to the local cheese
factor, a feature which prior to 1870 must have had some considerable
influence on the price obtained for cheese. The much quoted comment of
Jenkins is particularly apt: "It is much better for the farmer to have a
factory for his bank than a factor for his banker". (11)

The most telling economic argument, and indeed, the reason for the
original proposal, was the improvement in quality which would ensue.
American competition was giving great cause for concern, and this is
clearly articulated in the discussion at the meetings of the Derbyshire
Agricultural Society in December 1869 and February 1870 at which the first moves were made to establish the new system. Much groundwork had already been done in establishing how American factories functioned, but the key point was the saleability of American cheese compared with its Derbyshire counterpart. A large retailer in Chesterfield was quoted as saying that he sold eighty tons of American to one ton of Derbyshire cheese. Another "Midland retailer" although purchasing Warwickshire and Leicestershire cheese refused to handle Derbyshire because of its variable quality, and American was sold in large quantities. It was pointed out that transhipment of American cheese cost at least 8s per hundred weight, so that given similar uniformity and quality from Derbyshire they need never fear overseas competition. In the 1860s the sparse agricultural references in the local paper show that concern about imports which was later to become an obsession. The solution was seen to lie in meeting the competition: thirty years later the same arguments were still being proposed, still largely unheeded.

The factory system was recognised in 1869 as heralding a massive social change. The farmer and his family were subject to long hours in cheese-making. Factories would relieve them of that drudgery, and their health would improve. It was apparently common for those engaged in the "arduous and wet occupation" of cheese-making to suffer from rheumatism at an early age. Health apart, the labour of the dairy is well illustrated by Morton who quoted a letter from Mrs. Bennett of Stone in Gloucestershire explaining her daily routine:

"During the cheese-making season I find it needful to be in the dairy be half past five." After initial preparations there is "an hour's release for breakfast", after which the cheese is made, by which time it is ten o'clock. "If I have a good servant, I can then leave the cheese to her to dry cloth it and again to salt it. With her assistance I have done with it until one o'clock." "If cheese be made twice a day, this has all to be repeated starting at four p.m." Mrs. Bennett went on to say that because her family had grown up and could share in the work she did not find it so burdensome and, of course, she prided herself on her skills. She remarked on the difficulty of obtaining a respectable servant willing to undertake such work. Where no servant was hired, the scale of the cheese-making operation must have dominated each day of their lives, even when they were
unwell. Mrs. Bennett was in no doubt that the factory system was advantageous. (13) This account also makes clear why, once the farm dairy had been superseded, it would be almost impossible to re-introduce such a system.

Despite the considerable advantages, the success of a factory movement would depend on its profitability. That profitability was challenged from its inception by the burgeoning liquid milk trade.
The Development of Factories

The success of the original experiment was crucial to the adoption of the system generally. Apart from the open house policy at the Derby site, there was a considerable amount of publicity in the form of reports in the local press, and the tireless Gilbert Murray even constructed a model of the factory containing scale miniatures of the equipment provided by G. Daykin who had equipped the factory. This model was displayed at the Derbyshire Agricultural Society's show held in September 1870, and is reported to have been one of the main attractions. (14)

The two experimental factories having established their profitability, they were quickly followed by four others. (15) Two of these were provided by landlords who were closely involved with the original scheme - J.G. Crompton at Windley and C.E. Newton at Mickleover. The other two, Alstonfield and Reapsmoor (the Holms Dairy), were of a different character, the latter being entirely a farmers co-operative effort. By 1875 others had appeared at Hartington, Grange Mill, Ellastone, Kedleston, West Hallam and Sutton on the Hill, all built by large landowners and notable county families such as the Duke of Devonshire, Lord Scarsdale, and the Drury-Lowes. At the same time other counties were becoming involved and by 1875 Morton was aware of nineteen factories located in five counties, and whilst the largest cluster was in Derbyshire, the idea had also taken root in neighbouring Staffordshire, and experiments were being tried in Gloucestershire, Somerset and Cheshire. Further factories were erected through the 1870s but by 1881 the early euphoria had evaporated. (16)

The size of the early factories shows a uniformity of scale. Coke considered that it was desirable to have no more than 400 cows contributing. (17) Beyond a certain size the scale of the operation would change, necessitating more equipment, more hands, and a bigger building. Within a radius of one mile from the factory the land area would be some 2000 acres; in a dairying region this might support up to 600 cows. Thus, had the factory system covered the region, factories would have been roughly two miles apart and no farm much more than one mile from its local co-operative. The largest of the early factories was Longford, dealing with the milk of 527 cows in 1874, roughly twice as much as the other
five. In 1874 a new factory was erected by the Mickleover group with a capacity of ultimately 800 cows. Most of the other new ones had 500 cow limits.

In 1874 the average prices obtained were exceedingly good, varying between 85s at Mickleover and 80s 9d per 120lbs at The Holms. These results must have encouraged those co-operatives which were to start the following year, and it was unfortunate that the general price of cheese eased in 1875 and never again reached the 1874 level. It is also true that the first factory managers were specialists. The Mickleover factory was run by Henry Harding, the son of an internationally known cheddar cheese maker from Marksbury near Bristol. Longford and Derby, as has been noted, called on American knowhow to become established. By 1875 J.P. Sheldon was commenting that there was a "dearth of factory managers, and the committees of intended factories ought to send young men to the Derbyshire factories to be trained so as to have a manager of their own at hand."(18) Lack of experience may well have been a contributory factor in the profitability of factories in the later 1870s, thereby influencing the rate of adoption of the system.

Apart from the economic considerations, the marketing of cheese met with some problems. The cheese factors who gained their livelihood between farmer and retailer were naturally uneasy about the new factories. "Having to dispose of such large stocks of cheese, with, at one time, well nigh every factor a foe, and every dealer determined to crush out a movement from which they anticipated nothing but evil, was an undertaking of great and serious responsibility." The factors were being squeezed out, and not only by the factories. John Coleman, Agent at Kedleston, was provided with capital by Lord Vernon and other landlords to start a cheese agency in 1875 and he subsequently sold £20,000 - £30,000 of cheese each year. The factors then had to negotiate with him rather than with the farmers. This move began when the Kedleston factory was established, run by Coleman for its first three years.(19)
Evidence to the Royal Commission on Agriculture in 1881 indicates that no more cheese factories were contemplated. They needed landlords to finance them and capital was not lightly invested, but, more importantly, the milk trade had sprung up with such vigour. Coke details the average prices obtained through the 1870s and the corresponding milk prices to the farmer.

Table 3

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Cheese Price (Longford)</th>
<th>Milk Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>per 120lbs (hundred weight)</td>
<td></td>
</tr>
<tr>
<td>1872</td>
<td>74s 9d</td>
<td>6d per gall</td>
</tr>
<tr>
<td>1873</td>
<td>82s 4d</td>
<td>7½d per gall</td>
</tr>
<tr>
<td>1874</td>
<td>82s 4d</td>
<td>7½d per gall</td>
</tr>
<tr>
<td>1875</td>
<td>74s 1d</td>
<td>6½d per gall</td>
</tr>
<tr>
<td>1876</td>
<td>71s 6d</td>
<td>6d per gall</td>
</tr>
<tr>
<td>1877</td>
<td>79s 9d</td>
<td>7d per gall</td>
</tr>
<tr>
<td>1878</td>
<td>64s 0d</td>
<td>5½d per gall</td>
</tr>
<tr>
<td>1879</td>
<td>66s 6d</td>
<td>5½d per gall</td>
</tr>
<tr>
<td>1880</td>
<td>78s 0d</td>
<td>7d per gall</td>
</tr>
</tbody>
</table>

Although these prices represented 10s per hundred weight more than private dairies obtained, the resultant price for milk was much lower than London milk prices. Direct comparisons are not possible, because of transport costs to London, and because the liquid milk trade involved producing through the winter period which was more expensive than summer milking for cheese making. Nevertheless the differential was sufficient for all the witnesses to the R.C. Agriculture to give this as the reason for the stunting of the growth of factories.

By 1881 some factories had failed, and all had experienced a chequered history. Assistant commissioner Druce reported to the R.C. Agriculture that some had failed and some were let to private cheesemakers who brought the milk locally. One which was built by an enterprising landlord (at Etwall) had "through bad management ceased to command the confidence of the tenants". It was let to a cheese-maker and farmers sold milk to him without the risk involved in a co-operative. More details of the Etwall Dairy emerge from the report of Mr. George
Gibbons who visited Derbyshire in connection with the 1881 Royal Show competitions. It was rented by Thomas Nuttall who farmed 350 acres at Beeby in Leicestershire, and also kept a shop in Newgate Street, London, where he marketed much of his produce. He specialised in Stilton cheese and had received many awards for his exhibits at shows, including the Dairy Show of the British Dairy Farmers Association in 1877 and 1881 and an international show held in New York in 1879. The work at Etwall was all done by his wife and son and two dairymaids. Thus the original idea of farmers acting together for mutual benefit was lost.

Druce claimed that there were twelve establishments in Derbyshire in 1881 which he described as milk and cheese factories. They varied in their organisation, some of them only producing cheese when milk prices were at their lowest, others concentrating on cheese production. This dual role meant that the distribution of factories did not relate directly to transport difficulties. The simple model of farmers within a few miles of railway stations supplying the London market, with the remoter areas developing factories and concentrating on cheese, never existed. The reasons for developing a factory depended firstly on there being an interested landlord willing to finance or supply a suitable building, or a group of farmers capable of working together, creating and investing in a company. The distribution shows the influence of landlords and enthusiasts, men such as Crompton at Windley, Coke at Longford and Newton at Mickleover and Etwall. In the Peak District, J.P. Sheldon lived at Sheen in a district which spawned a number of factories, mostly provided by the farmers themselves.

A second determinant was participation in the milk trade. As early as 1874 the Derby factory, which Morton visited during the Summer, was despatching all the milk of its eighteen contributors to London. Thus most factories were built after this more profitable dual role had become a reality. It is hardly surprising, therefore, that not all locations indicate remoteness. Those near to the railway were an efficient means of exploiting shortages in the liquid milk supply when prices were high. Wholesalers in London could easily contact a factory whereas communication with individual farmers was impossible.

A further stage, already evident in 1882, was the move by London milk
wholesalers to purchase conveniently situated factories so that they (the wholesalers) controlled the supply of milk, cheese-making becoming a secondary feature using surplus milk.(26) The Derbyshire Dairy Farmers Association tried for many years to develop their own factory so that they could act in a similar way and also influence milk prices, but, as has been noted, without success. Thus the cheese factory movement, in its original form, was very short-lived, lasting less than a decade, but factories of a different form were still being built in the 1880s. "Notes on South Derbyshire Farming" in the local press commented in 1888 that "new factories are springing up in every direction"(27) which was something of an overstatement since the maximum number according to evidence given in 1894 was twenty-seven,(28) many of which lay in North Staffordshire. Of these, three are recorded as butter factories. (See Map 5, p 89).

The butter factories were a decade later than the cheese factories. Although Derbyshire's main product had been cheese, butter was produced on farms and even in the early factories. By about 1877 concern was developing over the increasing quantities of continental butter which challenged home produce in local markets. Again it was Lord Vernon who moved to meet this competition, initially remodelling the dairy of his home farm to concentrate on butter production. As cheese prices fell relative to butter after 1880 Lord Vernon embarked on the development of a new dairy on his estate, adjacent to Sudbury station. Having no plan to follow, there were many details of the building and machinery lay-out that required modification and, although it was ready for the Spring of 1882, it was not until September that it was in good working order. In addition to the provision for butter there were also facilities for cheese-making which proved inadequate. Therefore Lord Vernon purchased the building in which was exhibited the working dairy at the Royal Show at York to provide ideal conditions for cheese-making. The equipment used in butter making suggests that his lordship was impressed by the demonstrations at the 1881 Royal Show at Derby and perhaps most especially by the new Danish cream separators.(29) These were steam powered centrifugal machines which provided instant separation of cream from "skimmed" milk instead of the day long process of allowing the cream to rise, necessary with traditional methods. These separated milk could thus be marketed fresh for human consumption providing a lucrative counterpoint to butter making. The
Location of factories: 1893

Sources: Morton J.C., Arthur J.
advantage of having an interested, enterprising, and affluent landlord is revealed by the accounts of the Sudbury factory for 1883. On a turnover of £14,717 the profit was £182: the benefit went to the farmers who received 7.17d/gall on average. The volume of milk handled - 400,700 gallons - was very large. This represents the milk of some 800-900 cows, about twice the size of most cheese factories.

The accounts also reveal the character of the enterprise.

<table>
<thead>
<tr>
<th>Product Sold</th>
<th>Receipts</th>
<th>Value per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butter</td>
<td>107,981 lbs</td>
<td>£7,642 1s 5d</td>
</tr>
<tr>
<td>Cream</td>
<td>2,785 qts</td>
<td>£391 2s 9½d</td>
</tr>
<tr>
<td>Separated Milk</td>
<td>267,335 galls</td>
<td>£3,435 3d</td>
</tr>
<tr>
<td>Whole Milk</td>
<td>51,606 galls</td>
<td>£2,222 10.3d</td>
</tr>
<tr>
<td>Cheese</td>
<td>85 cwts</td>
<td>£272 64s</td>
</tr>
</tbody>
</table>

The small amount of cheese made was partly due to the inadequate nature of the facilities, and capacity was much increased by the purchase of the working dairy from York. The enterprise was essentially a butter factory, but with the options of switching to cheese production and railway milk whenever it was financially advantageous so to do. The value of railway milk at 10.3d/gall suggests that this might be the most profitable venture, but all the sales were in the winter period when prices were high. Conversely, the production of butter was principally a summer activity, so that the average return of 8 d/gall for the 333,814 gallons run through the separators represented a very competitive price. By late 1883 Vernon stamped butter was becoming noted for its quality and averaging 1s 8d per lb, adding another 1d per gallon to the milk value.

The cheese producing side of the business expanded in 1884 and in the 'flush' milk month of May 1885 cheese-making consumed an equal amount of milk to butter making. The milk received - 97,000 gallons - represented nearly one quarter of the total amount handled in 1883. This expansion continued in the 1880s, and in 1894 the factory was described as the largest in the Kingdom.

In 1884 the factory also became a Dairy School providing three months
training for the sons and daughters of farmers. This was a pioneer project, later to be taken up in a more formal educational system.

Two other butter factories were established in Derbyshire in the 1880s: one at Kedleston was provided by Lord Scarsdale, and the other at Egginton was a co-operative farmers venture. The Egginton factory was favourably located at Egginton station, but Kedleston was relatively remote. Nevertheless it prospered in its early years and was well supported. At the annual dinner of the D.D.F.A. in 1888 in proposing the health of the chairman (Lord Scarsdale) reference was made to the factory. A voice from the room proclaimed "Lord Scarsdale's dairyman can make butter worth 4d per lb more than Lord Vernon's" followed by loud cheers.

The butter factories had a greater advantage over farmhouse production than did cheese factories. They produced the uniform quality which was in demand and could compete with Danish imports. In 1885 farmhouse butter had slumped "to the unprecedented low range of 6d - 1s 0d per lb whereas factory butter averaged 1s 2d to 1s 4d per lb. Moreover, the ordinary farmer was at a great disadvantage in not being able to avail himself of the use of a separator. The milk has to be set up for 24 to 48 hours at increased cost and inconvenience, and a marked deterioration in the quality of cream and butter. The only prospect was co-operation.

Perhaps more important than the deterioration in the butter quality was the fact that the skimmed milk was "old" after the manufacturing process, and disposal was a problem. The centrifugal separation solved this problem because it completed the separation in seconds rather than hours, and the skimmed milk could be marketed in London and other major cities for human consumption as "fresh skimmed milk". It sold at about 4d per gallon in the 1880s and was in demand especially among the poorer classes. Although it was very unpopular with producers of whole milk because of its cheapness and the possibility of mixing it with whole milk, it was, nevertheless, instrumental in introducing regular use of milk to a much wider public.

The final stage in the development of Derbyshire factories was marked by the acquisition by the the Henri Nestle Company of Vevey, Switzerland, of
a dairy at Hatton. Henri Nestle was a chemist who had evolved a new baby food comprising of milk, sugar and wheat flour. Condensed milk provided him with a means of making the product available far beyond Switzerland and his company was formed in 1873. By 1878 the company was also engaged in the condensed milk market. Before 1878 the milk had been provided by the Anglo-Swiss condensed Milk Company. The success of Nestle's baby food and condensed milk led to the establishment of new condensories near to major centres of consumption in Europe. In England, Chippenham (1873), Aylesbury (1873), and Middlewich (1874) were developed by the Anglo-Swiss Company and Staverton (Wiltshire), 1897, and Hatton, 1901, by Nestle's Company. The two firms amalgamated in 1905 and further factories were built at Salisbury and Ashbourne. Thus West Derbyshire received two important new outlets for its milk producers.

The Hatton dairy had been erected in 1898 by Messrs. Edwards and son of London. Nestle's took over the existing contracts, the produce of 2000 cows, so that a rapid start could be made. The factory was purchased 1900, and major extensions were completed in 1901. It immediately had "a vast influence on the Agriculture of the south-western district of the county". The works are "closely adjoining Tutbury railway station" (it is in fact a track side location) "and the supply of milk is divided equally between Staffordshire and Derbyshire. Among the contributing parishes are Marston-on-Dove, Sutton-on-the-Hill, Church Broughton, Sudbury, Boyleston, Longford, Hollington, Thurvaston, Alkmonton, Cubley, Somersall, Doveridge, Marston Montgomery, Yeaveley, Rodsley and Brailsford." Thus we see a completely new scale of operation. Bowles, in 1907, claimed that maximum daily quantities were 21,000 gallons in summer and 10,000 gallons in winter. This would give a capacity of some 5.6 million gallons. Bowles also put the number of cows at 7200. Assuming an average yield of 500 gallons per cow they would produce 3.6 million gallons, a plausible amount as his figures for daily consumption are maxima. Thus, accepting Bowles statement of 7200 cows, the Nestle's factory within six years was dominating the region. It embraced an area in which lay several cheese factories and some of these - for instance - Longford And Brailsford - became collection depots.

Here lies the success of the enterprise; the collection of milk from either farmgate or local depot. At last farmers were freed from the
dilemma of transporting milk to the station and dealing with a distant purchaser, or opting for cheese production either in the local factory, if available, or on the farm, both of which were unprofitable by 1900. Furthermore, Nestle's were prepared to receive varying amounts of milk; the contract was much more flexible. Not surprisingly the new factory was very popular and developed a different sort of relationship with its suppliers, for instance operating a systematic friendly inspection of farms to advise on clean milk production. Transport was initially by horse drawn vehicles, but at an early date self propelled vehicles were introduced, the earliest 'lorry' being a steam powered vehicle.

In 1913 a second condensery was opened at Ashbourne, and thus was dealt the final blow to local cheese production in south-west Derbyshire, ironically just at the time when prices had risen to 70s per hundred weight making such production again possible. In fact cheese-making did start at Earl Sterndale in the Peak and re-start at the old Brailsford factory, but only in conjunction with the Co-operative Wholesale Society, and only with the intention of using surplus production.

The co-operative factory system may be regarded as an intermediate stage in the change from farmhouse cheese to milk selling. It was regarded as having done "great and lasting good" to Derbyshire farmers: it broke the monopoly of the old cheese factors, and showed farmers the value of milk; and it released the farm from the daily treadmill of cheese making. Its decline was the result of falling prices in the 1880s, the result of further growth in imports. Competitiveness was not essential since there was the option of the growing milk trade, with its new demands on the management of the farm in order to produce winter milk. When the milk trade reached its nadir in the mid-1890s the original factories - most of them less than twenty years old - had changed their function, and many had disposed of the cheese-making equipment. Therefore a switch back to cheese-making was not possible. A few factories survived the difficult years and enjoyed a new prosperity in the twentieth century, but they were the exceptions. By 1905 W.J. Skertchly could proclaim that "the old Derbyshire plain cheese has become a thing of the past". (38) The production of condensed milk by Nestles opened up a new market: all the output of the Hatton plant was exported, mainly to the British colonies. Canned milk allowed the farmer to partially revert back to a summer milk
regime without creating a surplus, although the summer price was obviously lower.
In the late 1860s and the 1870s the leading proponents of the factory system worked tirelessly to ensure that Derbyshire farmers had a system of cheese production and marketing which would enable them to compete effectively with the low priced foreign cheese and butter which continued to gain popularity. The factory system replaced competition between farmers with a system in which they worked together to obtain the highest possible price for their produce. The key word was "co-operation", and it is clear that acceptance of such a concept posed a problem in a community in which competition in the market place was ingrained. In almost every discussion on the subject, the benefits of co-operation were illustrated by reference to the Danish System, a phrase which became synonymous with the best methods of production. It is appropriate, therefore, to review that system(40) in order to speculate on what could have developed in Derbyshire given different circumstances.

Denmark is a relatively small country which in the late nineteenth century had some 7 million cultivated acres, with rather more arable than grassland. In the 1870s and 1880s there were changes which indicated increasing emphasis on dairy products: rotation grasses increased as did mixed corn and root crops; cereals and fallow declined. Imports of bran and oil cake increased, the amount of bran rising from 1000 tons to 100,000 tons in the period 1878-88. The number of sheep fell by one third as cattle numbers rose from 1.2 million to 1.7 million. Such intensification of livestock was dependent on an expanding market. But Denmark's population was only just over the 2 million mark and nearly half depended on agriculture for their livelihood, a situation markedly different from England where the population was not only expanding rapidly but becoming increasingly urbanised and totally dependent on purchased foods.

Denmark's agricultural expansion could find an outlet only in exports. That the Danes should establish that market in England, when the problems of the cereal farmer were leading to increases in dairying, is remarkable. By the early 1890s some two thirds of Denmark's agricultural exports came to England, mainly in the form of butter, bacon, and eggs. Although bacon exports increased sharply after the establishment of co-operative bacon factories from 1887 onwards, it was butter which constituted the bulk of the trade. The scale of the operation and the rate at which it developed
may be gleaned from the following statistics:

**DENMARK EXPORTS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Butter Exported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1882-3</td>
<td>29,319,382 lbs</td>
</tr>
<tr>
<td>1892-3</td>
<td>78,956,086 lbs</td>
</tr>
</tbody>
</table>

These are net figures, and the true extent of the disaster for the British farmer is revealed by further examination of the 1892-3 figures.

- **Butter Imports to Denmark (principally Sweden & Russia)** 26,477,000 lbs
- **Butter Exports from Denmark**
  - of which England received 102,008,000 lbs
  - This represented the produce of at least 600,000 cows.

The typical Danish farm resembled the Derbyshire farm in being a small dairy unit. The Derbyshire farmer should have had a competitive advantage of nearness to market. The Danes succeeded by producing a uniform high quality, low priced product. The means of achieving this was promotion and assistance at the national scale, contrasting with the amateurish attempts to create order in a laissez faire economy in this country.

The Royal Danish Agricultural Society promoted the development of the dairy industry in the 1860s and encouraged investigations - backed by State aid - to establish rational principles for the various processes of dairying. In the 1870s new machinery became available, in particular the cream separator, and numerous exhibitions were held throughout the country which aroused the interest of farmers. The take-off point was probably the introduction of Government allowances to assist dairymen and women to learn the business in a thorough and practical way on working dairy farms.

Professor James Long was convinced that success related to that practical education for everyone in the industry. He found no expensive agricultural or dairy schools, no highly paid officials or instructors, and no large Government grants. The whole grant made to the Danish dairy industry was less than to "one important English county". Instruction was by working farmers, who allocated a portion of their herd to each student. Students kept detailed records of feeding and milking which could be compared with records of butter making. The farmer's reward was that he required no hired labour.
The state experimental station held numerous exhibitions, the general result of which was uniformity of production methods. Professor Long also commented on two other aspects of Danish production not common to the English dairy farmer. Butter was the end product, not cheese or liquid milk, and in order to sell it had to be top quality. Thus there was no divided interest. Butter was Denmark's main export and a large proportion of the population were dependent on it. He regarded the agricultural worker as superior to his English counterpart: there was little alternative employment to attract those of superior intellect or ambition away from the land.

Through the 1880s the organisation changed. The steam powered 'Danish' centrifugal cream separator was beyond the means of the small farmer, so that over a short period of time, the co-operative dairy or factory become the normal place of butter production. By 1893 there were more than a thousand such enterprises which soon expanded their operations to include marketing of produce and purchase of foodstuffs. They were built using a loan, co-operative members being guarantors according to the number of cows kept. The articles of association were almost identical to those of the Derbyshire factories. Butter making was the main object; some skimmed milk was made into cheese for local use, and suppliers were obliged to take back whey and separated milk. Milk prices depended on butter fat content. Milk quality was standardised by strict enforcement of cleanliness, all farms being regularly inspected, and fines or refusal to accept milk encouraged high standards. Members were required to feed their cattle in an approved way to ensure that butter flavour never varied. Cabbages and turnip tops were forbidden, and fodder such as turnips, rye, beans and vetches could be fed only with the dairyman's permission. Farmers failing to comply might be liable for damages if the price of butter from the dairy was affected.

In return, the farmer was assured of a market, and received a monthly payment plus annual distribution of profits. Very importantly, the dairy provided the churns and collected the milk, a feature not established in Derbyshire until the early twentieth century. The dairy arranged the purchase and delivery of seeds and feeding stuffs in bulk: apart from the cost-saving, this enabled them to demand that farmers purchase sufficient rape-cake to feed 1 lb per cow per day in Winter, a practice said to
improve the aroma of the butter.

It should be emphasised that Government exercised no control over the dairies or the dairy schools, but it did provide a great deal of back-up in the form of state dairy experts acting as consultants, research at the Experimental Laboratory for Rural Economics, credit institutions and agricultural land banks. Furthermore, the railway system was under state control and butter and milk were transported in passenger trains at good rates. This back-up appears to be the greatest difference between Denmark and England, where factory development was more dependent on benevolent landlords, and where there was the distraction of the liquid milk trade.

The third aspect of the industry, after improvements in production and efficient manufacture in co-operative dairies, was the development of a highly organised marketing system. Until about 1880 butter was delivered to local dealers who disposed of it through a broker to wholesale exporters. As the trade increased the exporters began to negotiate directly with the producers, arranging the transport themselves. Thus the middle man was gradually eliminated. A further stage was penetration of the English system, initially by-passing commission agents, then the wholesale butter merchants, to deal directly with retail dealers. By controlling the whole movement of butter, costs were reduced and adequate supplies ensured. Prices were fixed at a weekly meeting in Copenhagen of the exporters, who were all state appointed. The final logical step in the marketing process came in 1888 when an association of about one hundred dairies by-passed the butter exporters to deal directly with England. The injurious effect of this competition on the exporters was reflected in prices paid to dairies who were not in the scheme. The state was involved in the marketing of butter in one other respect. Two agents resided in England specifically to promote the reputation of the Danish product and to relay back reports on the English market. Their work included ensuring a good press image, always replying to criticisms which appeared from time to time, and also ensuring that miscreant firms or individuals who sold adulterated butter (butter mixed with margarine), which was a common and lucrative practice, were brought to book.
The "Danish system" may be seen to be not a static model, but a continuously evolving system of improvement to ensure that the main product of Danish agriculture had an assured outlet in the English marketplace.

It is not merely idle speculation to postulate what might have happened in Derbyshire given that spirit of co-operation which, in reality, never materialised. Factories would have been erected all over the district, at intervals of about two to three miles, financed by a loan (probably provided by landlords) which would have been repaid by a levy on production. Farmers contracts would have ensured milk quality and supply. Carriage to the factory would have been most efficiently organized by the factory itself. Then, given a merging of these separate companies into a working Derbyshire Dairy Farmers Company, further benefits would accrue. Factories remote from the railway would specialize in cheese production possibly sending their finished cheeses to warehouses adjoining railway stations; trackside factories would concentrate on maintaining a regular supply of liquid milk to London and provincial cities, and use the surplus mainly for butter production with skimmed milk again being exported by rail. A uniform price system for the whole county could have developed, with differentials between summer and winter to regulate supply and with bonuses for milk quality. Given standardised production methods and, therefore, quality control, marketing would have taken on a different character with the wholesaler and retailer approaching the Derbyshire company. Derbyshire controlled wholesaling companies could have been established in the major cities. A situation might have evolved through private enterprise which was very little different from the conditions created by the Milk Marketing Board half a century later. One must conclude that most of the financial problems of the late 19th century were self-inflicted. Derbyshire farmers sought to compete individually, whereas their foreign competitors gradually ousted them from the milk products market by improved efficiency brought about by co-operation.

2. Obituary, *Derby Mercury* . . . May 1883


5. Report of Derbyshire Agricultural Society Meeting of 18/2/1870 *Derby Mercury* 23 Feb 1870

6. Murray, G. pp.59-60

7. Coke, E.K. Minutes of Evidence, Royal Commission on Agriculture *BBP* C.3096 (1881) XVII Question 57,420


10. Morton, J.C. p.269

11. Jenkins, H.M. p.179 also in Morton, J.C. p.271

12. Reports of Derbyshire Agricultural Society Meetings *Derby Mercury* 24 Dec 1869 and 23 Feb 1870


17. Coke, E.K. Question 57,415

18. Morton, J.C. p.290

Derby cheese Co. rented a warehouse at Derby Midland Station. The company's guarantors were: the Duke of Devonshire, Lord Vernon, Lord Scarsdale, the Hon. Edward Coke, and Messrs. Crompton and Newton [local bankers]

20. Coleman, J. Minutes of Evidence, Royal Commission on Agriculture, BPP C.2778-I Vol XV 1881 Question 5784


22. Druce, S.B.L. Royal Commission on Agriculture BPP C.3375-II Vol XIX (1882) p.24

23. Gibbons, G. pp.540-542

24. Druce, S.B.L. p.24

25. Morton, J.C. p.294

26. Druce, S.B.L. p.24

27. 'Notes on South Derbyshire Farming,' *Derby Mercury* 18 July 1888

28. Murray, G. Minutes of Evidence, Royal Commission on Agriculture, BPP C.7400-I Vol XVI 1894 Question 5112
29. Reports of the Royal Show, Derby, 1881. Derby Mercury 13 July 1881 and 20 July 1881

30. Report on the Sudbury Factory, (reprinted from The Field) Derby Mercury 2 Jan 1884

31. Report, Derby Mercury, 22 July 1885

32. Murray, G. Question 5125

33. Reports Derby Mercury 26 Mar 1884 and 30 Jan 1889


35. Report. Derby Mercury 1 July 1885

36. Information provided by Nestless Co., Tutbury

37. Bowles, C.E.B. Victorian County History, Derbyshire Vol II 1907 p.319

38. Skertchly, W.J. 'Agriculture in Derbyshire,' J.R.A.S.E. Vol 66 (1905)

40. Elliott, T.H. Permanent Secretary to the Board of Agriculture. 'Denmark: Co-operative Dairies,' Royal Commission on Agriculture, BPP C.7400–III Vol XVI 1894

also Long, J. 'Agriculture on the Continent: How the Danes Make Farming Pay,' Derby Mercury 19 Jan 1898

Long, J. 'Agriculture on the Continent: A Typical Danish Farm,' Derby Mercury 26 Jan 1898

Long, J. 'Agriculture on the Continent: Why Danish Butter Occupies our Markets,' Derby Mercury 23 Feb 1898
CHAPTER 5

THE RELATIVE PRICES OF MILK, CHEESE AND BUTTER

Since all three products were subject to market prices which varied with quality, it is not possible to establish an absolute relationship regarding their profitability. However, there were longer term trends in prices which adversely affected the growth of factories and are usually interpreted as being instrumental in the rapid growth of the milk trade. It is useful, therefore, to attempt to express the value of butter and cheese in milk prices.

The initial problem is to establish the amount of milk required to produce butter and cheese. This depended on the fat content of the milk, a quantity which varied through the lactation, varied with different feedstuffs, and varied with different breeds of cattle. Gibbons(1) and Morton suggested 21 pints (2.625 imp. gallons) of milk were required to produce one pound of butter, but practical details from the Vernon factory at Sudbury show that in May 1885 the amount varied between 2.7 and 3.4 gallons. Professor Long(2) gave the "accepted" value as 3.0 gallons. The butterfat content was usually lower during the peak production months of May and June resulting in some factories paying for fat content. Three gallons per pound is taken as a rough and ready conversion figure. For cheese production there were similar variations, the detailed reports of the early cheese factories revealing that about twenty per cent more milk was required to produce cheese in May and June than in October. Gibbons gives an average figure of ten gallons producing nine pounds of cheese, and this is corroborated by Coke in his evidence to the Richmond Commission, using figures from the Longford factory.(3) The amounts vary more widely on farms. Despite this uncertainty a figure of one gallon of milk at 9/10 pound of cheese is seen as a reasonable approximation.

The crude conversion rates are:

Butter price per pound x 1/3 = milk price per gallon
Cheese price per pound x 9/10 = milk price per gallon

There is a further complication in that butter and cheese-making generated valuable by-products. Butter making left skimmed or separated milk, the quantity being approximately three quarters of the input. Cheese-making
left whey. Both could be used for feeding livestock, particularly pigs and calves. The value was conservatively estimated to be 1d per gallon. Separated milk could also be sold for human consumption at approximately 2.5d per gallon, after allowing for manufacturing loss and rail costs. This option was only open for fresh skimmed milk which had been separated mechanically and was produced near a railway station.

Manufacturing costs were estimated by Gibbons to be roughly equal to the cost of transporting milk daily to the railway, a task which involved almost the full use of one horse, plus wear of equipment and loss of churns. These costs being equal, they can be ignored when considering relative prices. The cost of transport of milk was 1d per gallon to London, whereas for butter and cheese it was insignificant. If the value of the by-products of butter and cheese, and the cost of transport of fresh milk are added to the equation, the following conversion factors may be used:

- Butter: price per pound × 1/3 + 1d
- Cheese: price per pound × 9/10 + 1d
- Milk: price per gallon - 1d

Milk prices

There are no official records of prices. The most complete set of figures were provided by Professor Sheldon of Sheen who had a relative who was a milk dealer. From this source Sheldon provided the Royal Commission with prices received for Derbyshire milk from 1870 to 1894. Other data referred to a particular year and usually appeared in a summary report on the state of agriculture in south Derbyshire published locally each January. Its value is that it was an impression of general price levels, rather than a particular experience. During the 1890s the D.D.F.A. published recommended prices but these have been treated with caution as they conflict with other evidence, and were an exhortation for future bargaining rather than a statement of reality. Figure 5 (p 107) is an amalgam based on Sheldon's evidence. It differs from most published estimates in that summer and winter prices are shown separately. Summer prices operated from 1st April until 30th September in most cases, and were usually about twopence lower than winter prices. The distinction is crucial to the comparison with manufactured product prices because the latter were mainly summer activities. The emerging structure of the dairy industry was largely based on this difference. Average prices over-
emphasise the relative profitability of milk, and mask the problem of the summer surplus and winter shortage that was inherent in a 'natural' dairying system.

Cheese Prices

There are numerous records of cheese prices in Derbyshire but prices varied so much according to quality that it is difficult to present a series of representative prices. Figures for 1874\(^{(7)}\) illustrate the problem:

- factories 80s - 84s per cwt
- large dairies 75s - 80s per cwt
- small dairies 68s - 75s per cwt

These relate to good quality cheeses, and large amounts of poorer quality must have been sold to factors at much lower prices. In 1898, when the national average price was 5d, a local Yeaveley farmer sold cheese to local retailers at 4d and a wagon load to Etches, the large Derby cheese factors, for only 3d per lb. Only exceptional private dairies matched the factories for price, and the average for farm cheese is probably more reasonably reflected by prices at the autumn Derby Cheese Fair, which were reported only spasmodically. From Murray's estimate of 1895 (see p.112) we have an indication of the proportion produced in factories. It amounted to 28%, leaving nearly three quarters still produced in farm dairies. Some of the farm produced cheese would be of the highest quality commanding prices similar to factory prices. However, even if Sheldon's view that there were ten indifferent or poor producers for every good producer (see p.112) is considered to be an overstatement, it is probable that less than half of all Derbyshire cheese sold well. Even the factories varied, much depending on the manager. It is clear that to establish an average price, were that possible, would mask the advantage obtained by quality producers, and the disadvantage of the sub-standard producers. The graph (Figure 6, p.108) attempts to show prices in three ways. The records of the Holms Factory\(^{(8)}\) at Sheen provide a complete record for the whole period 1874-94. They are averaged, largely into five year periods, so that general trends are evident. Also shown are the yearly prices for another co-operative factory in The Peak District,\(^{(9)}\) which indicates the fluctuations from year to year. Thirdly, the range of prices obtained at the October cheese fairs in Derby are superimposed where available, to show the relationship between factory prices and open market prices. The milk value of cheese has been calculated solely from
the Holms Factory record and is meant to show the highest receipts which a private producer might expect.

**Butter Prices**

Butter was not an important commodity in Derbyshire and local records began only in 1883 when the first butter factory was opened. Prices were published weekly and a complete record exists for 1883-1900. (See fig. 7, p 109). Factory butter was summer produced, and the winter prices indicate that farmers' wives continued to produce small amounts of butter for sale, perhaps as a housekeeping allowance. These might be sold in the local market, but it is known that there were many casual arrangements whereby wives sold butter in the street on market-day, often at a pre-arranged time to a small group of regular customers. It is ironic that the records for butter should be so complete when it was so insignificant in the Derbyshire dairying industry.

In Figure 8 (p.110) an attempt is made to show the relative prices of milk, cheese, and butter. Comparison is difficult because of the possible variables, and it should be particularly noted that (i) the cheese values relate to good quality cheese only (ii) no allowance has been made for the value of the by-products of cheese and butter making, worth perhaps 1d per gallon. With these points in mind, one can see that the specialist farm cheese makers would not be strongly attracted to the liquid milk trade, especially if they used the whey effectively. For the average producer, the lower cheese price and the value of the by-products would be roughly equal, and the graphs (Figure 8) are intended to represent a very crude comparison of values for such a producer.

Some further details may assist in understanding farmers' decisions to change from one method of production to another. In the 1870s the volume of railway milk was expanding rapidly. The demand in London was such that it was possible to lure farmers into the trade by offering prices which were far above anything that could be obtained by cheese production, even from factories. The very best factory product, plus the value of the whey by-product could just about equal the summer value of railway milk. In winter the discrepancy in price was much greater, since cheese prices
Derbyshire milk prices

Figure 5

Sources: Coleman, J. R.C.A.I
Murray, G. Sheldon, J.P. & Finney, R. R.C.A.II
Derbyshire Dairy Farmers Association reports
Agricultural Gazette
Private diaries and accounts
Derbyshire cheese prices

Sources: Records of the Holms factory (Murray)
Records of a Peak District factory (Murray)
Derby Cheese Fair price range (Derby Mercury)

Derbyshire cheese prices: Milk value
Derbyshire butter prices

![Graph showing butter prices from 1870 to 1900.](image)

Source: Derby Mercury - prices from Derby poultry, fruit and vegetable market.

Derbyshire butter prices: Milk value

![Graph showing milk prices from 1870 to 1900.](image)
Derbyshire: Summer prices

Figure 8

Derbyshire: Winter prices
varied very little seasonally. Coleman claimed that prices as high as 12d had been obtained, although that appears exceptional, probably involving contracts made directly with retailers rather than with wholesalers.(10) But cheese prices were also at exceptionally high levels, all of the factories usually averaging 7d per lb and, in the best year of 1874, even 8d. Of course there were then only a few factories, all of them being run by enthusiasts employing the very best professional managers. Butter making was unimportant, probably because the method was so laborious and large amounts were not easily handled.

In the 1880s there were fluctuations in the fortunes of the three commodities. Gilbert Murray was quite precise about the causes and the timing of the changes. From 1874 to 1885 there had been a period of greater prosperity than was ever before experienced, because the urban milk trade could take all the milk that could be obtained; large retail companies were paying up to 12% return on capital to shareholders [in an age when 3-4% was the norm]; land was being improved because of the beneficial effects of first class foods that were increasingly being purchased to maintain winter production. The first disturbing element was the introduction of the mechanical separator, first exhibited at the Royal Show at Kilburn in 1879. Although the prime function of the separator was butter making, it was the by-product, separated milk, which upset the milk trade, as it kept sweet for at least 24 hours, allowing it to be sold for human consumption. "The introduction of this in the market, at half the price of new milk, was readily taken up by the working classes". There followed a fall of 2d or even more per gallon in the price of new milk. "Many farmers decline to make winter milk at the price; they prefer to return to the old system for a time or rear a few calves during the winter"(11) [1887]. Thus cheese production, and butter making in the three new factories, became equally attractive for a few years. But increasing importation of American cheese and Danish butter put further pressure on home prices and the greatest decline was in the 1880s. Thus, separated milk and foreign imports both took their toll. It is also clear that, when milk was reaching the cities in plentiful supply, its price became much more closely related to the price of the manufactured products, so that foreign manufacturers then had their influence on the liquid milk market. The graph illustrates this close connection from the late 1880s. Prices reached their lowest levels in the 1890s. In 1889
Stirton noted that the summer price of milk had dropped to 5d or 5½d. Factories were paying 5d per gallon, which farmers regarded as unprofitable. Stirton wondered how the factories survived when their cheese was selling for only 5 d per lb. There was a slight recovery in the early 1890s, but further falls meant that in the last few years of the century the lowest prices for all dairy products were experienced.

Generally, the graphs distort against the advantage of milk because they assume good quality manufactured products. Sheldon claimed that for every farmhouse that made good quality cheese there were ten others with an inferior product. In May 1894 he saw butter being sold on Ashbourne market for 6d per lb, a milk value of 2d. That sort of price would not pay the rent, never mind feeding the animals or hoping for a profit. Butter and cheese profitability also depended on the milk quality. The higher the fat and other solids content the greater the profitability. The railway milk trade had no such problems: the price was guaranteed by contract, and volume rather than quality was the main objective. Little wonder, therefore, that the milk trade gradually edged out other forms of production, which survived only in inaccessible parts of the region, and survived only with effective use of the whey and skimmed milk. This involved piggeries or calf rearing linked to the manufacturing, or, in the case of the butter factories, sale of skimmed milk for human consumption.

By 1893 the disposal of milk was as follows:

- factories 4 million gallons per annum
- farm cheese and butter 10 million gallons per annum
- fresh milk 15 million gallons per annum
- stock rearing 3 million gallons per annum

Further inroads were made in the traditional pattern in the later 1890s and by 1900 it was reported that there was "scarcely any cheese" at Derby cheese fair, which thirty years previously, had been a major venue for the disposal of the region's produce. One may conclude that throughout the three decades 1870-1900, railway milk had a price advantage which gradually changed the economy of the region.

2. Extract from the Agricultural Gazette. *Derby Mercury* 27 July 1885 (Professor Long was formerly Professor of Dairy Farming at the Royal Agricultural College).

3. Coke, E.K. Minutes of Evidence, Royal Commission on Agriculture *BPP C.3096 XVII pt.II (1881)* Question 57,413


5. Sheldon, J.P. Minutes of Evidence, Royal Commission on Agriculture, *BPP C.7400-II XVI pt.II (1894)* Question 21,548 (Sheldon was formerly Professor of Agriculture at the Royal Agricultural College)


7. *Derby Mercury* 30th Sept 1874

8. Murray, G. 'Dairying in Derbyshire,' *Journal of the Board of Agriculture III (1896)* pp.60-61

9. Murray, G. Final Report, Royal Commission on Agriculture, *BPP C8541 XV Appendix G*

10. Coleman, J. Minutes of Evidence, Royal Commission on Agriculture, *BPP C.2778, XV (1881)* Question 5786

11. Murray, G. 'Agriculture in south Derbyshire,' *Derby Mercury* 12th Jan 1887


14. Ibid, Question 21,545

15. Murray, G. Derby Mercury 2nd Feb 1895

16. Derby Mercury 4th April 1900
The change to winter milk production brought about radical changes in farm management. It became necessary to do more than maintain the livestock in a reasonably healthy condition through the difficult winter months. Now, those cattle in full milk had to be maintained in prime condition so that the continuous drain on the system caused by regular milking did not lead to sickness to which they were more susceptible than dry cows. Housing became more important, with each animal having adequate breathing space, a figure of 600 cu.ft. being recommended. Good draught free ventilation was also required so that the air was regularly changed without exposing any animal to chills. An unfailing supply of water became essential to provide the eight or more gallons required daily by each animal in addition to that required for cleaning purposes. (1) Some estate farms already had the cow sheds of the necessary standard, but there were many farms where conditions were not ideal as was revealed when inspection of milking premises became commonplace later in the century. The ultimate effect of inferior premises was increased work for the farmer and average yields lower than might have been obtained. The milk trade, therefore, necessitated or at least encouraged the erection of new sheds. This is revealed by the judges in the farm-prize competition for 1881. (2) On Mr. Hellaby's farm at Twyford the buildings were "good and substantial, the more modern and convenient ones having been built by the present tenant" since he first rented the farm in 1868. Similarly Mr. Woodward, at Trusley, had built several cowsheds, although in his case the sheds "would have been much better if more room had been left for the cows".

In the years prior to 1870 when cheese making prevailed it was a summer activity so that cows produced milk off the rich summer grazing. Calving was timed to occur between the end of March and the first week of May. The use of artificial foods was rare, grass in summer and hay in winter being the mainstays of the diet. From the mid-1850s the feeding of bean-meal as an auxiliary food gained in popularity in the great cheesemaking counties, having first been adopted in Ayrshire. Its more general usage is attributed to Mr. Harding, a celebrated Cheddar cheese maker who, having noted its usage in Scotland, recommended it on his lecture.
Bean-meal was said to improve milk quality as well as increase yield. Even on cheese-producing farms cattle needed food other than hay and straw in winter, and some roots were used, but usually this was often to make inferior crops of hay and straw more palatable. In the vicinity of Derby and especially Burton, brewers grains were fed with chopped straw or hay, and the practice became more widespread as railway building placed more farmers within reach of this commodity. But, in general, concentrates were not commonly used on dairy farms, and milk quality, especially the amount of butterfat, was poor.

This grassland system of dairying had to change when winter milking was introduced. The stock had to be maintained in much better condition throughout the winter season. There is ample evidence for Derbyshire from the Richmond enquiry that this change took place in the 1870s, not only on milk farms but also on some cheese farms. The Longford area in 1881, entirely cheese-producing, still maintained a feeding regime of grass in summer and "chiefly chopped straw and grains in addition to hay in winter". In that area arable land was regarded as being of less value than permanent grass and "any extent of arable interferes with the letting of the farm altogether." The proportion of grass to arable was stated as being 3:1, rather more than had been the case ten years earlier.(4) But not all farmers relied solely on traditional feeding patterns, and, as is noted later, much discussion centred on the best way of improving milk quality in order to increase cheese output without increasing yields.

In parishes fortunate enough to be able to participate in the milk trade there had been much greater changes. John Coleman, Lord Scarsdale's agent, summarized the mode of feeding as summer grass and in winter chopped straw and Burton grains mixed with "meal, cake, and other feeding stuffs"(5) He illustrated the financial benefit of winter feeding for milk production by describing a farm on which a tenant had 200 acres, all but five acres under grass. He kept a milking herd of between forty and fifty cows and the gross returns from milk sales were as much as £1,100 per year.(6) This is likely to be a ceiling figure which could be obtained if one assumes 50 cows each producing 500 gallons of milk, all of it being sold at an average price of 10½d per gallon. This sort of revenue was possible only for a very short period in the 1870s and early 1880s. To achieve this figure, the farmer had to invest in a large amount
of purchased concentrates. "Where he used £20 on artificial food in cheesemaking, he now uses £200". Coleman also noted the benefit of combining milk selling with beef production, with beef at the relatively high price of 9d per pound. The improved winter feeding of cattle enabled them to command a price of £17-£20 when sold for meat, and, of course, the dairy shorthorn was regarded as the best dual purpose animal in this respect. The amount of purchased foods increased through the decade of the 1880s. Where Coleman's tenant was spending £1 per acre in 1881 there is evidence that it was common for farmers to spend almost double this amount by the early 1890s. Samuel Osborne of Quarndon was spending more on cake, corn, and manures than he spent in rent (rent 37s 6d in 1894), and Richard Finney explained that a farm with one third arable would be roughly self-sufficient, in that sales of surplus arable produce would be equal to the cost of cakes, etc. Where the ratio of grass to arable was higher, then purchases of food would increase. (7) Gilbert Murray's evidence supports this: "Twenty-six years ago (i.e. 1867) there was not £20 spent on the whole property (the Elvaston estate of some 6000 acres) in the purchase of manures and feeding stuffs." Tenants in 1893 were spending "a sum equal to the rent of the land", which approximated to 35s per acre. (8)

Possibly the most extreme example is the instance of Mr. George Bryer of Markeaton Park near Derby, who won the Royal Agricultural Society's prize-farm competition when the Royal Show visited Derby in 1881. He farmed 250 acres of which only 35 were arable. His main business was supplying milk to the inhabitants of Derby, less than two miles distant, and for this purpose he kept a milking herd of some sixty cows. To maintain a constant supply of milk he bought in some twenty animals each year, so that there would usually be a very small proportion of dry cows in his herd. This helps to explain the very high output of 45,416 gallons in 1880, an average over 750 gallons per cow. Nevertheless the sum paid for purchased food was exceptional, £817 in total or 63s 5d per acre.

A similar sort of expenditure was incurred by the second prize winner, Mr. Hellaby, on his Twyford farm. There, on 173 acres, 53 acres were arable, yet the cost of purchased foods in 1880 was more than £3 per acre. This high figure is partly explained by the amount of concentrates fed in summer as well as in winter. Whilst these two examples (9) probably
represent the maximum amounts in the new style of feeding, they are indicative of a quiet revolution that was taking place in the quest for a more profitable dairy animal.

Much of the concentrated food could be grown on the farm, but considerable amounts were 'artificial' foods that were imported, like maize, or were by-products such as linseed cake. Much has been made of the lower price of grain in promoting the dairy industry, but this is only part of the story as farmers in Derbyshire were experimenting with many exotic foods which certainly did not come from the grain counties.

It is hardly possible to generalise about the new system of feeding as each farm had its own unique pattern of profitability and each farmer no doubt had his own ideas on the most economical balance of feeding. Gilbert Murray, familiar with Derbyshire methods, presented an important paper on the subject(10) in which he sought to establish the "feeding value" of different foods. Taking his standard as best quality meadow hay, he gives us the following table:

<table>
<thead>
<tr>
<th>1 lb hay</th>
<th>4 lb green clover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3½ lb mangolds</td>
</tr>
<tr>
<td></td>
<td>1½ lb oat straw</td>
</tr>
<tr>
<td></td>
<td>1 lb bran</td>
</tr>
<tr>
<td></td>
<td>0.5 lb linseed</td>
</tr>
<tr>
<td></td>
<td>0.4 lb mixed meal</td>
</tr>
</tbody>
</table>

Whilst acknowledging that the herdsman's skill lay in knowing his herd, each one of which required its own rations, he suggested that an average daily ration might be:

- hay: 5 lbs
- chopped hay and straw: 20 lbs
- roots: 25 lbs
- bean meal: 2 lbs
- mixed wheat & barley meal: 2 lbs
- bran: 2 lbs
- ground oats: 2 lbs
- linseed: 2 lbs
- total: 60 lbs
It should be noted that all of the ration, with the exception of linseed, could be grown on the farm. Some of the products had to be home produced because of their bulkiness or unavailability elsewhere. Thus hay and roots would form the major part of the farm production of winter fodder. The chopped straw was usually oats rather than wheat or barley. Straw, being difficult to transport in those pre-baler days, needed to be part of the farm system. Thus dairy farms needed some arable land even when the price of cereals and linseed made concentrates cheaper to purchase than produce. The extent to which a farmer changed to grassland instead of arable might be taken as a sign of intensification, of a switch to improved winter feeding, perhaps of a switch to the milk trade. Unfortunately, it is not possible to distinguish this from increased grassland as a cost cutting exercise; a change to a less labour intensive system. The following section examines the changes which took place in land-use, but the reasons for those changes, in any one parish or on a particular farm, cannot be clearly identified.

II. Land Use and Livestock Change

An analysis of the change in cropping patterns, using data from the parish summaries of the Agricultural Returns selected at five-year intervals, has made possible some generalizations about the changes which occurred in agriculture in south west Derbyshire between 1870 and 1900. The use of data spaced at five year intervals was necessary to identify when the greatest changes in land-use and livestock numbers occurred. Inclusion of intermediate years would have picked out minor variations within the five year intervals and also have reinforced the credibility of the data which have been used. However, since the character of the changes was revealed to be slow and consistent, further information was deemed to be only marginally beneficial and therefore unnecessary in the context of this investigation. The problem of accuracy of the Agricultural Returns has already been alluded to in the Introduction (p 6) and is treated at length by Coppock. The voluntary nature of the Returns is sometimes used as a criticism of their worth in historical land-use studies: the earlier returns (i.e. immediately after their introduction in 1866) must be treated with caution. For the purpose of this study a check was made on the total acreage throughout the period. This reveals a remarkable
consistency, but with the usual tendency for the acreage to increase with the passage of time as farmers became more confident that there were no sinister motives behind the annual survey.

Table 4  Acreage of Study Area (from Agricultural Returns)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Acreage of Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>105,000</td>
</tr>
<tr>
<td>1875</td>
<td>107,000</td>
</tr>
<tr>
<td>1880</td>
<td>107,000</td>
</tr>
<tr>
<td>1885</td>
<td>110,000</td>
</tr>
<tr>
<td>1890</td>
<td>109,000</td>
</tr>
<tr>
<td>1895</td>
<td>112,000</td>
</tr>
<tr>
<td>1900</td>
<td>111,000</td>
</tr>
</tbody>
</table>

The inaccuracies presented by slight variations in the acreage of parishes as shown in the Returns, and the problems of real changes in parish boundaries, have been minimised by expressing all land-use figures as percentages of total land-use. Similarly livestock figures are all expressed in numbers per hundred acres. This gives an added benefit of being able to relate livestock to land-use as the hundred acre unit becomes common to crops and livestock.

The main purpose of the analysis of the Agricultural Returns is to review the changes that occurred during the Great Depression 1873-1896. For simplicity of presentation, the fluctuations which occurred within that period have been ignored, and the maps focus on the situation in 1870 and again in 1895 after the changes had taken place. The timing of the changes was considered to be important, and simple computer graphs were produced illustrating trends in land-use and stocking ratios for each parish from 1870 to 1900. Details of particular arable crops were omitted in the quest for a simple parish 'profile' so that comparisons could be made by inspection. From the seventy parishes, three have been selected as having representative profiles which illustrate the subregional variations.(12) (See pp 135-138).

Before examining the temporal and spatial changes which are revealed by the Agricultural Returns it is helpful to indicate what size farms existed
in the district. Map 6, (p 126) shows that a unit of about 100 acres was
typical of the district. Distinction can be made between parishes to the
north and to the south of the Trent Valley. In the north many parishes
had an average farm size of below 100 acres: the principal exceptions
being on the alluvial grazing lands of the Dove Valley in parishes such as
Doveridge and Sudbury; on the sandy soils around Mercaston and Bradley;
and in estate parishes such as Barton Blount. In the Trent Valley and the
area to the south much larger farms were to be found, with the most
extreme example being Foremark where three farms occupied an area of 1153
acres. Only two southern parishes fall below the 100 acres average. One
of them, Melbourne, is exceptional because it had already developed a
substantial interest in "spade cultivation". The light and friable
Millstone Grit soils around the town, the relatively low rainfall (650mm),
and the advantageous position perched above the Trent Valley reducing the
risk of frosts and fog, all combined to give conditions which encouraged
market gardening.(13) Consequently, the average farm size is low although
the parish had seven farms of over 100 acres.

Map 7 (p 126) confirms that the areas with the greatest proportion of
small farmers were: in the area immediately south of Ashbourne on heavy
clay land with high rainfall; in the vicinity of Derby; and in Melbourne
parish. (See Appendix I for details of map compilation).

Farm Systems in 1870

The proportion of grassland to arable was high throughout the region, no
parish having less than 60% grassland. The amount of rotation grass was
relatively small, usually well under 10% of the total grassland, and
related to particular rotations. The situation in 1870 (see Map 8, p 127)
clearly highlights the differences between land north and south of the
River Trent. The north west of the region near Ashbourne, and the Dove
Valley especially near Uttoxeter, had exceptionally large percentages of
grassland, most of it permanent. The former is coincident with heavy clay
land, and the latter with feeding meadow liable to flooding. A third zone
largely grassed lay immediately to the north west of Derby in the parishes
of Mackworth, Markeaton, and Kirk Langley where the reasons for the
emphasis are less clear. Derby itself was surrounded by an aureole of
permanent grass, widest on the east side in the valley of the River
Derwent. On these pastures were fed the cows which supplied much of Derby's fresh milk as well as livestock awaiting the attention of local butchers. The south east of the region was different, most of the parishes having only two thirds grassland including the rotation seeds.

The distribution of cereals Map 12 (p 129) is inversely proportional to grassland, so again there is a clear distinction between the south east and the rest of the region. The south east, by Derbyshire standards, could be described as corn country. It was not only the acreage of cereals, but the types of cereals that was different. Barley was an important crop, whereas further north the emphasis was on oats and wheat. The figures for Ticknall illustrate the point. The total acreage under cereals was 25.8% compared to the average for the whole region of 15.7%, and the barley acreage was 14.4% against an average of 4.6%. Dairying, of course, was still the dominant aspect, but not to the exclusion of other enterprises. Mixed farming is the best description of the local economy.

Given these variations in land-use, the density and type of livestock is predictable. Those areas where permanent grass predominated and farms were usually small were almost totally dependent on dairy cattle, densities being roughly twenty to every 100 acres. In the south east, densities were about half that figure (Map 14 p 130). Conversely, if we assume that livestock recorded as "other cattle over two years of age" were beef cattle, the greatest number were in those parishes producing most cereals or having substantial areas of river land. Stocking rates averaged 4 per 100 acres in 1870, but varied across the region from figures as low as 1 per 100 acres in Rodsley, Alkmonton, and Cubley in the north, to as high as 10 per 100 acres in Calke and Newton Solney in the south. Water meadows of the Dove and the Trent provided excellent feeding land for beef cattle, so parishes such as Doveridge (6 per 100 acres) show higher than average figures. Most farms supported at least a small flock of sheep. The distribution was less clearly defined than for other livestock, but a majority of southern parishes had high densities and most of the parishes with small numbers of sheep were in the north. (See Map 16, p 131) The lighter soils areas were the most favourable, although that was only one factor. The extreme example was Foremark where, on the light land of the Bunter sandstone, densities were three times the average for the whole region.
Thus the general picture of farming in south west Derbyshire in 1870 is of a region where dairying - in the form of cheese-making - was the dominant aspect, but a region with important variations. The north west was almost totally committed to dairying, and farm size seems to have been geared to the family unit where it was probably the farmer's wife who made the cheese and the farmer himself was manager and labourer. On such a farm the amount of hired labour would be small (see Chap 7) and the labourer most likely lived in the farmhouse. The south east had many relatively large farms - over 250 acres - and here farming practice was much more akin to eastern England. Less permanent grassland and dairying; more cereals, beef, and sheep, and more hired labour living in tied cottages, being the main difference from the system in the north west.

Changes 1870–1895

The more important aspect of this analysis is to examine the changes which occurred in the quarter century after 1870 which, one must assume, were either responses to the depression or resulted from the switch to liquid milk production. The two were obviously linked, but we know very little about the sub-regional rates of adoption of liquid milk except that those farms within three miles of railways were favourably placed to embrace the new system. Consequently, while we may discover the changes, the reasons for change cannot be accurately pinpointed.

Over most of the region there was an increase in permanent grass. (See Map 9, p 127). Those areas already fully committed to dairying had limited scope for an increase in pasture land and in such cases the change was less than the average (average increase 10.8% of total land area), but a greater uniformity emerged in the area north of the River Trent. Two parishes - Egginton and Sinfin - actually decreased their proportion for reasons that are obscure. In the southern part of the region there was much more scope for change. Surprisingly, very few parishes did grass-down in the way one might have predicted. Newton Solney, Bretby, Hartshorne, and Foremark do show larger than average increases, but many others showed little change despite having the smallest amounts of grassland in 1870. Barrow on Trent, Swarkestone, Stanton by Bridge, Calke, and Smisby provide good examples. Melbourne, where there was a big increase in market gardening, had a substantial decrease in its grassland
area. The amount of hay produced increased in most parts of the region. The increase for the region was 31%, all of it derived from permanent grassland. The amount of rotational grass, only 7.3% of the area in 1870, had fallen to 3.7% by 1895. The southern parishes, again surprisingly, did not increase their hay acreage substantially (see Maps 10 and 11, p 128). Five of them recorded decreases. The certainty is that they had less winter fodder; the inference is that they were concentrating more on summer grazing, probably sheep and beef cattle, rather than turning to more dairying. Had dairying been on the increase, then one would expect to see more rather than less winter fodder.

Cereals production declined in every parish. Map 13 (p 129) shows the decrease, which, overall, was 40%. Two features of interest are revealed by the map: Radbourne parish more or less abandoned cereal production, although neighbouring parishes only reduced their acreage by about half; secondly, parishes in the "corn belt" of the south east reduced their production by less than the average. In the Radbourne example further investigation would be required to establish the reasons more fully. The change was coincident with a large increase in beef animals, and farms may have been in hand rather than let to tenants. The overall reduction in cereal acreage is only part of the story. The balance of cereals also changed. Fig 9 (p 132) shows the changes in four parishes selected as representative examples of the southern area (Ticknall and Swarkestone) and the northern area (Cubley and Barton Blount). The salient points which are illustrated may be summarized thus:

<table>
<thead>
<tr>
<th>Northern Parishes</th>
<th>Southern Parishes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Small cereal acreage</strong></td>
<td><strong>1. Relatively large cereals acreage</strong></td>
</tr>
<tr>
<td><strong>2. Barley unimportant, declining almost to zero</strong></td>
<td><strong>2. Barley an important crop in 1870, declining 1870-1895</strong></td>
</tr>
<tr>
<td><strong>3. Wheat, the most important crop in 1870, declined more than any other crop.</strong></td>
<td><strong>3. Wheat production, important in 1870, was cut by half.</strong></td>
</tr>
<tr>
<td><strong>4. Oats acreage remained constant, and became the main cereal by 1895.</strong></td>
<td><strong>4. Oats acreage increased, and became the main cereal by 1895.</strong></td>
</tr>
</tbody>
</table>
Oats was the most useful crop for dairying because of the value of the straw which was fed to cattle in a mixture of chopped straw, grains, and pulped turnips. The value of oats was roughly the same as wheat. It would appear that cereal production continued in excess of local demand in the south throughout the depression. The change of emphasis to oats may have been a response to increased demand for that cereal in the northern parishes. In those northern parts the locally produced cereals could not have met local needs. More purchases were required even without a change in feeding patterns or increase in numbers of livestock. This is in line with the view that the reduced price of cereals was an advantage to the dairy farmer. However, only Radbourne parish took this to the extreme by grassing down almost completely. There must have been an advantage in growing oats on the farm, and the reason was probably the value of the straw, which was bulky and difficult to transport.

Livestock products provided most of the farmers' income. Changes in the number of livestock should provide an accurate guide to the degree of intensification that took place 1870-1895. More grassland should support more livestock if the concentrated cereal foodstuffs were purchased. The reality was that only minor changes in numbers took place. For the whole region the increase in milk cows was from 17 to 18 per 100 acres; beef cattle did not increase their numbers at all (see Table 5, p 134). So there was a 5% increase in the number of mature cattle, and the increase in young stock was about 13%. Map 15 (p 130) shows that a majority of parishes recorded little or no change. Even in the north west some parishes recorded decreases, for instance Church Broughton. The south east, which had the greatest opportunity to change to a livestock economy, had little change in numbers, and Barrow on Trent showed quite startling decreases.

The greatest change in livestock numbers was the sheep population. The size of breeding flocks is difficult to quantify because all sheep over one year old were placed in the same category, which included ewes and lambs over one year old. Nevertheless Map 17 (p 131) shows that the great majority of parishes reduced their sheep populations. The greatest decreases were generally in the south east, and in that zone only one parish, Bretby, did not experience a decline. Foremark, where large
Map 8
Grassland 1870
Permanent and rotation
Percentage of farmed land

Map 9
Grassland 1870-1895
Permanent and rotation
Change as a percentage of farmed land
Hay: 1870

Percentage change in crop area

INCREASE

DECREASE

Hay: 1870 - 1895
Milk Cows: 1870
Number per 100 acres
- >25
- 22-25
- 18-21
- 14-17
- 10-13
- 6-9

Milk Cows: 1870-1895
Change in number per 100 acres
- 9-11
- 6-8
- 3-5
- INCREASE 0-2
- DECREASE 0-2
- 3-5
- 6-8
Map 16
Ashbourne

Map 17
Ashbourne

Sheep: 1870
Number per 100 acres
- Value indicated on map
- 62.5
- 50
- 37.5
- 25
- 12.5

Sheep: 1870 - 1895
Change in number per 100 acres
- INCREASE
- 25
- 12.5
- DECREASE
- 25
- 12.5
- 25
- 37.5
- 50
Balance of cereal production: Selected parishes

**SOUTHERN PARISHES**

- **Ticknall**
  - Oats
  - Wheat
  - Barley
  
  - 1870
  - 1895

**Swarkestone**

- Oats
- Wheat
- Barley

**NORTHERN PARISHES**

- **Cubley**
  - Oats
  - Wheat
  - Barley
  
  - 1870
  - 1895

- **Barton Blount**
  - Oats
  - Wheat
  - Barley
  
  - 1870
  - 1895

Percentage of total land use

*Figure 9*
numbers had been pastured in 1870, reduced its sheep population by over 40%.

There remains the question of the timing of the changes that occurred between 1870 and 1895. An overview can be ascertained from inspection of Table 5 (p.134). This shows that cattle numbers hardly changed at all. This is especially true if the 1880 figures are treated as possibly anomalous because of the fodder and grazing shortages of 1879. The variations are no more than one would expect given variations in weather conditions from year to year. An increase in dairy cattle of slightly above one beast per hundred acres is discernable, the increase occurring gradually over the period. Taking the milking herd and two-years-old cattle together, no change occurs. As for calf rearing, very little variation occurs, although by testing the figures using ten year running means (i.e. averaging sets of three adjacent figures) the numbers were slightly lower in the 1870s, but constant thereafter. There was a fall in the number of pigs and this occurred between 1875 and 1880. Since pig keeping was an integral part of the system on a cheese producing farm, this decline points to the decline of cheese-making and, by implication the growth of the milk trade in the late 1870s. The greatest change in livestock numbers was in the sheep population. There was a decline of 40% between 1870 and 1895 and the bulk of this decrease was coincident with very wet seasons and an epidemic of fluke rot between 1875 and 1880(14) and not with the fall in mutton prices which came five years later.

The decline in cereal acreage has been discussed (p.124). From Table 5 (p.134) it can be seen that oats acreage hardly changed; barley declined slowly throughout the whole period; and wheat suffered its sharpest fall between 1875 and 1880. The changes in acreage of green-crops were minimal. The practice of bare - fallowing diminished, with 1880-1885 registering the most significant decrease. Fallowing related to the cereal crops, so that any substantial decrease in the latter affected the amount of fallow too.
Table 5  Agricultural Statistics for South West Derbyshire: 1870-1900

Crops in Percentages

<table>
<thead>
<tr>
<th></th>
<th>1870</th>
<th>1875</th>
<th>1880</th>
<th>1885</th>
<th>1890</th>
<th>1895</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>6.5</td>
<td>6.7</td>
<td>4.2</td>
<td>3.6</td>
<td>3.6</td>
<td>2.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Barley</td>
<td>4.6</td>
<td>3.7</td>
<td>3.4</td>
<td>2.2</td>
<td>2.0</td>
<td>1.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Oats</td>
<td>4.2</td>
<td>3.6</td>
<td>4.2</td>
<td>5.3</td>
<td>4.1</td>
<td>5.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Rye</td>
<td>0.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.5</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>Peas &amp; Beans</td>
<td>1.3</td>
<td>1.2</td>
<td>0.5</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Potatoes</td>
<td>0.8</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Roots</td>
<td>2.3</td>
<td>2.0</td>
<td>2.1</td>
<td>2.4</td>
<td>2.6</td>
<td>2.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Cabbage</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
<td>1.0</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Rape</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
<td>0.1</td>
<td>0.6</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Fallow</td>
<td>1.8</td>
<td>2.4</td>
<td>2.1</td>
<td>1.1</td>
<td>1.0</td>
<td>0.7</td>
<td>0.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1870</th>
<th>1875</th>
<th>1880</th>
<th>1885</th>
<th>1890</th>
<th>1895</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation Grass (no hay)</td>
<td>2.4</td>
<td>1.8</td>
<td>0.7</td>
<td>1.0</td>
<td>1.0</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Rotation Grass (hay)</td>
<td>3.9</td>
<td>2.7</td>
<td>4.4</td>
<td>3.0</td>
<td>2.8</td>
<td>3.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Permanent Grass (no hay)</td>
<td>54.2</td>
<td>56.7</td>
<td>76.2</td>
<td>57.5</td>
<td>57.2</td>
<td>56.9</td>
<td>59.3</td>
</tr>
<tr>
<td>Permanent Grass (hay)</td>
<td>16.9</td>
<td>17.0</td>
<td>20.3</td>
<td>22.5</td>
<td>24.0</td>
<td>23.0</td>
<td></td>
</tr>
</tbody>
</table>

Livestock per 100 acres

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk cows</td>
<td>17</td>
<td>18</td>
<td>16</td>
<td>18</td>
<td>19</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Cattle 2 years</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Cattle 2 years</td>
<td>8</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>11</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Sheep (over 1 year)</td>
<td>25</td>
<td>28</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Lambs</td>
<td>14</td>
<td>15</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Pigs (all ages)</td>
<td>10</td>
<td>11</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

In view of the quite distinct differences across the region it was deemed necessary to examine the Agricultural Returns for each parish to establish whether there were variations between parishes, both in the degree of change and in the timing of any change. To this end very simple graphs were constructed to show land use in three categories - grassland, hay, and cereals; and livestock in four categories - milk cows, cattle over 2 years, cattle under 2 years, and sheep. (see Figures 10-12 pp.135-138)
By restricting the detail on these graphs or 'profiles' it was possible to compare parishes by inspection. From the seventy parishes, three have been selected as representative of the main types within the region.

Boylestone (see Figure 10) is typical of the north western parishes lying immediately south of Ashbourne.

![Graph of Boylestone (North-West)](image)

Already a specialist dairying parish with 75% of its land under grass in 1870, there was a small and gradual increase in grassland to 83% of the land area by 1900. The hay crop increased only marginally. As the grassland increased, so the cereal acreage, already small, decreased to some 10% of the total area by 1900. The process of land use change was slow, small, and steady. It did not correlate immediately with the change in cereal prices. In Boylestone, milk cows were the most numerous livestock. There was a small increase 1870-75, after which the wet years saw numbers decline slightly (1875-80). No discernable change occurred thereafter. Beef cattle were almost non-existent throughout the period,
but young stock numbers increased appreciably – apart from the wet years – between 1870 and 1900, possibly signifying calf-rearing as a profitable side-line. The greatest fluctuations occurred in sheep numbers. 1875-1880 saw the flocks decimated in the wet years, followed by steady recovery until similar numbers were recorded in 1890. This pattern does not reflect the changes in prices. The market price fell most steeply 1883-5 when Boylestone was recording increases.

Apart from the decline of the sheep population, Boylestone parish witnessed no great change in livestock farming. The village was four miles from the nearest station, just about within the range of the early milk trade. Certainly there was more grass and less arable by 1900 but even that change was modest. The effects of the milk trade and the depression appear to have had less effect on farming systems than did adverse weather conditions.

Doveridge parish (see Figure 11, p 137) lies partly in the valley of the River Dove and partly on the Red Marl. It was already largely under grass (over 85%) in 1870. No changes occurred before 1875 after which there was some increase in grassland. From 1880 the increase became almost imperceptible but quickened slightly after 1890 pushing the amount of grass to over 90% of the total area. The hay crop increased on a more rapid scale between 1875 and 1890 with a 50% increase in crop area. The amount decreased slightly through the 1890s. Cereal acreage fell from a low level to an insignificant one (3.7% of total area by 1900). The greatest decline was 1875-1880. Livestock numbers show that, on the Dove meadows and adjacent land, there was a balance between dairying, beef and sheep in 1870. In the wet years, 1875-80, sheep numbers were almost halved, but beef cattle increased in quantity. Between 1880 and 1885 a further change took place, dairying advancing quite rapidly at the expense of beef cattle, overall numbers remaining constant. Doveridge appears to have adjusted to prevailing price opportunities. Beef cattle numbers declined when the price fell (see Figure 13, p.148) and were replaced with dairy cows. The parish lay close to Uttoxeter station and it is probable that railway milk was the attraction. In the 1890s the price of milk reached its low point, and the partial return to beef production may reflect the labour economies of such a move as well as the changing balance of prices. The sheep population never recovered from the decline of 1875-80. Taking Doveridge as typical of the valley lands, it does
appear that there was some flexibility between milk production and grass-fed beef. Changes in livestock could occur over a shorter period than changes in land-use as long as the total stocking ratio remained fairly constant.

The third parish, Ticknall, has been selected as typical of the agriculture in the south-east, south of the River Trent. Ticknall's land use (see Figure 12 p 138) showed a relatively high proportion of arable in 1870 (over 25% cereals). This began to decline in the 1870s, and fell more rapidly in the 1880s. Unlike the northern parishes, partial recovery of the cereal acreage occurred in the 1890s. Grassland acreage obviously shows the reverse pattern, increasing to 76% by 1890, then falling back to 72% by the end of the century. The remarkable feature of the graph is the consistency of livestock numbers. Apart from sheep, which, as elsewhere in the region, reduced in numbers 1875-80 never to recover, there were only very minor changes. Beef cattle, small in number for this south eastern part, never varied at all. Dairy cattle increased from 13 to 15
per 100 acres, just about consistent with the change in grassland acreage, though the density was low. Ticknall is typical of the south east of the region in that cereal acreage held up and livestock numbers changed only marginally. Thus the farmers who apparently had the greatest scope to respond to changing patterns of profitability showed little inclination to do so.

The study of land-use and livestock densities for the period 1870-1900 is illuminating. Given the fact that livestock farming, particularly milk production, was the most rewarding, one might expect to see a general move in that direction over the years. The reality was that changes were only marginal. Dairy farmers of the northwest increased their herds by perhaps one milk cow and perhaps reared a few more calves. They reduced their cereal acreage and benefitted by purchasing cereals instead, but this process was never taken to the extreme. There was very little intensification. The mixed farmers in the south-east increased their
dairy herds by one or two cows and the grassland went up accordingly. However, they did not abandon cereal production: the wheat acreage fell away markedly, but was largely replaced by oats. Certainly, one cannot speak of any major change in crops or livestock. Yet there had been major changes in the balance of prices.

One must conclude that there are important factors in the running of a farm which prevent the farmer from changing his methods to meet changing prices. These factors include: the physical environment, especially soil character and rainfall; the size of the farm and the character of the related buildings; the attitude of the landlord towards changes on his land, and his willingness to invest in permanent improvements such as new buildings; the farmer's available capital necessary for change (e.g. purchase of livestock). Further factors would probably embrace the farmer's lack of experience of different farming systems, and his reluctance to invest capital at a time of great uncertainty in agriculture. Thus, while agricultural prices may vary in relatively short cycles, changes in farming practices lag behind the price changes, and when adopted, are likely to be of much longer duration. One is left with the impression that farmers of south-west Derbyshire trod cautiously in the late nineteenth century. Despite the apparent opportunities of the milk trade, falling profits appear to have been met by economies, possibly in labour, rather than by capital investment and increased output.


5. Coleman, J. Minutes of Evidence Royal Commission on Agriculture BPP C.2778 (1881) Vol XV Question 5996

6. Ibid. Questions 5883-5893


12. Data for all maps, diagrams, and tables in this chapter are extracted from the Derbyshire Parish Summaries of the Agricultural Returns, Public Records Office, Kew, as follows:

1870  P.R.O. - M.A.F. 68/122
1875  P.R.O. - M.A.F. 68/407
1880  P.R.O. - M.A.F. 68/692
1885  P.R.O. - M.A.F. 68/977
1890  P.R.O. - M.A.F. 68/1262
1895  P.R.O. - M.A.F. 68/1547
1900  P.R.O. - M.A.F. 68/1832

13. Reeve, M.J.  Soils in Derbyshire II SK 32E/42W Soil Survey Record No.27 p.123 and 131

14. 'Report of the Judges on the Derby Prize-Farm Competition 1881'.
CHAPTER 7

THE INCIDENCE OF DEPRESSION IN DERBYSHIRE

The Ernle model of British farming during the depression years, 1873-1896, includes Derbyshire as one of the grassland counties of the north and west affected but little by the overall fall in prices: the change to milk production enabled Derbyshire men to participate in the only trade with natural protection from imports, and the lowering of prices was offset by the greater reduction in purchased feed prices.

The purpose of this chapter is to examine the local evidence to establish whether Derbyshire did fit into this pattern, and, also, to see if the Derbyshire farmer perceived this to be the case. For convenience, the whole period is subdivided into the three decades, 1870s, 1880s, 1890s.

1870-79

There is no doubt that, overall, agriculture in Derbyshire flourished throughout the 1870s. This was the period in which the milk trade became established and other livestock products remained at relatively high price levels. The major step of switching to liquid milk sales represented an increase in profits as high prices were offered to induce farmers to produce for the urban markets. It must also have represented increased output from the farm. A detailed fragment of farm accounts for a farm of 145 acres in Bradley parish reveals that in May 1873 a spring cart was purchased, possibly signifying that the switch to railway milk had just been made. During the next three years the amount of purchased winter
Feedstuffs increased substantially:

<table>
<thead>
<tr>
<th></th>
<th>1873</th>
<th>1876</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burton grains</td>
<td>£18-5-0</td>
<td>£26-9-3</td>
</tr>
<tr>
<td>Concentrates</td>
<td>£27-3-0</td>
<td>£58-17-10</td>
</tr>
</tbody>
</table>

The concentrates were chiefly linseed cake and Indian corn meal, but included bran and sharps, Indian beans, cotton cake and rice meal. Rice meal was apparently fed in the summer months. The varied pattern of purchases for the two years suggests that some experimentation with feeds was taking place.\(^1\)

The majority of farmers stayed with the old system of cheese-making, but in the 1870s some of them had the advantage of the local factory to enhance their income, and even the farmhouse producers enjoyed a period of considerable prosperity, tempered by lower prices only in 1878 and 1879.

The depression, however, was not only about prices. There was also the unprecedented series of poor summers in the 1870s, and Derbyshire certainly did not escape. Although the effects were perhaps less severe than in the arable eastern counties, grassland suffered in that the lower summer temperatures - as much as 4°C below the mean - reduced the amount of grass produced, and the constant wet weather affected the quality of the pastures. Druce\(^2\) in 1881 commented on the damage done on the clays of South Derbyshire in contrast to the Peak District where the porous gritstone and permeable limestone regions suffered little damage. The Hon. Edward Coke\(^3\) of Longford described how, on recently drained land, a "sort of water grass" destroyed the better grasses to such an extent that by 1881, during a summer that was "as near perfection as could be", the pastures were only just recovering. It was for this reason that farmers in his locality had all lost money and many were in straitened circumstances. Land agent John Coleman of Quarndon,\(^4\) administering upwards of 40,000 acres, also spoke of dairy farmers suffering resulting in his allowing rent remissions, but only "on account of the seasons and not on account of the price".

In addition to the smaller amount of summer grass produced and the difficulty of making good hay, the milk yield of cows was affected. The
average yield on Coke's own farms, where detailed records were kept, illustrates this fact:

<table>
<thead>
<tr>
<th>Year</th>
<th>Gallons per Cow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1872</td>
<td>529</td>
</tr>
<tr>
<td>1873</td>
<td>538</td>
</tr>
<tr>
<td>1874</td>
<td>539</td>
</tr>
<tr>
<td>1875</td>
<td>584</td>
</tr>
<tr>
<td>1876</td>
<td>574</td>
</tr>
<tr>
<td>1877</td>
<td>504</td>
</tr>
<tr>
<td>1878</td>
<td>487</td>
</tr>
<tr>
<td>1879</td>
<td>402</td>
</tr>
<tr>
<td>1880</td>
<td>432</td>
</tr>
</tbody>
</table>

This sort of reduction would inevitably result in a low profit margin or even a trading loss. Land agents agreed that a tenant farmer needed £8 per acre capital, and their general calculation of income was 5% interest on capital plus another 5% for supervising the farm. Thus a farmer operating efficiently on 100 acres might expect a profit of about £80 per year. Such a farm would support a milking herd of about 20 cows and if the milk yield fell by 100 gallons per cow the profit margin would approach zero, valueing milk at 7d per gallon. In the days before foreign foods were imported, the price would have risen in the market place. This did not happen in the late 1870s, and indeed one may speculate that the adverse weather merely advanced the flow of imports, allowing wholesalers and retailers to establish a rapport with foreign suppliers which remained after home milk yields had recovered.

So Derbyshire was affected, but only by the unavoidable circumstances of atrocious weather conditions. There was very little reference to price depression in the local press, and twenty years later the 1870s were recalled as the good times. Weather had created a temporary set-back, and there was not great cause for concern. Far more concern was expressed about the problems of dealing with distant milk wholesalers, loss of churns, loss of milk in transit, and non-payments. Meat prices remained at a satisfactory level, so that there were alternative ways of supplementing incomes.

1880-1889
This was the decade which saw Derbyshire drawn into the web of subsiding prices. The period up to 1885 was really a continuation of the prosperity of the 1870s. As far as one can tell the prosperity of the milk producers continued almost unabated, certainly until 1883 and remained satisfactory for another two years after that. A farm milk ledger for a holding at Over Haddon near Bakewell(6) shows that in 1883 milk was sold to Mr. William Holmes, a Manchester retailer, for 10d per gallon in winter and 8d in summer, similar prices to those claimed for the 1870s. There was no change until 1885 when a fall of 2/3d was experienced, and on March 1st 1886 the price fell by a full 2d per gallon. After that month there are no further entries, so one cannot establish whether the summer price was applied early or whether there was a substantial decrease. A complete diary for the same holding in 1888 shows the price to be 8d in winter and 6d in summer. The annual production in 1883-1885 was around 12,000 gallons, so the fall in revenue on this total represents £100. By 1888 output had been greatly increased, and a second farm was incorporated. An entry for January 30th 1888 reveals

"Balancing my accounts. Found out that I was the wrong side this year by nearly £200."

The whole issue is blurred by the fact that a farm was being purchased - on a mortgage - at Yeaveley, to the south of Ashbourne. The mortgage payment is not revealed, so the trading loss may have been small, or even profit made.

One other example from the Peak District does show the decline in profits which were claimed in the local press. A small farm of 90 acres in the White Peak at Pike Hall(7) supplies us with detailed accounts for part of the 1880s.

<table>
<thead>
<tr>
<th>Year</th>
<th>Receipts</th>
<th>Payments</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td>£276-9-3</td>
<td>£191-9-8</td>
<td>£84-19-7</td>
</tr>
<tr>
<td>1887</td>
<td>No data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1888</td>
<td>£247-12-7</td>
<td>£207-15-1</td>
<td>£39-17-6</td>
</tr>
<tr>
<td>1889</td>
<td>£236-2-9</td>
<td>£212-0-0</td>
<td>£24-2-9</td>
</tr>
</tbody>
</table>

(payments include rent at £80 per annum)

The receipts in 1886 included £104-0-0 for the sale of milk to the factory at Grange Mill, the rest coming from the sale of sheep and cattle. The
figures for 1886 are almost identical to 1874 when the farmer was making farmhouse cheese.

It appears that a distinction must be made between milk contracts made direct with retailers and those made with wholesalers. Greater discrepancies seem to have occurred in milk prices in the early 1880s than at any other time. While the Over Haddon farmer was enjoying consistently high prices until 1885, others were experiencing difficulty at an earlier date. The first indication of this relates to 1882 of which it was reported that there were many instances of 6d per gallon being the maximum that could be realized, hence a movement back to cheese-making, although butter making at the time was considered the most profitable way of dealing with milk.\(^8\)

By the end of 1885 the tone of the annual report of the local dairy farmers association was more despondent, stating that it was impossible in many cases to produce and deliver milk at a profit. A consequence was a great depreciation in the value of livestock, especially milking cows. "The loss sustained to dairy farmers cannot be less than 25% of their capital". The blame was placed on the Richmond Commission 1879-81 which had pointed to the profitability of dairying, so encouraging a switch from cereals, the consequence of which was over production, at least in the summer.\(^9\)

Although milk cows were cheaper, the general response was to return to greater self-sufficiency. Instead of relying on the purchase of cattle as had been the case when milk profits were high, farmers now preferred to rear their own calves. Such animals were also thought to thrive better than purchased stock, and the risk of importing disease onto the farm was minimised. For those farmers involved with factories or manufacturing themselves, skimmed milk could be used for calf-rearing. Gilbert Murray, writing in the Livestock Journal saw this change as occurring from 1883 onwards.\(^10\)
Contemporary with these changes there was also a slump in the price of beef and mutton, so that the opportunities for switching emphasis of farm sales were reduced (see Figures 13 and 14, p 148). Not only did milk production remain popular, but, as a result of the rapid fall in butter and cheese prices, more and more farms and factories looked to the liquid milk market, exerting even more pressure on prices. This situation continued for the rest of the decade.

Thus the 1880s falls into two distinct parts. The first half was a period of prosperity which gradually diminished until, by 1885-86 as profits were squeezed and alternatives eliminated, there was no longer any easy way of making money from farming, and realization dawned that this was no temporary set-back. The second half of the 1880s merely confirmed the new circumstances, and solutions were beginning to be sought in other directions, most notably in the call for co-operation, a plaintive cry which continued unheeded until the end of the century. It is interesting to note that the number of farming reports and letters in the prosperous seventies and early eighties were very few in number, but they increased significantly in the late 1880s and became almost a flood in the 1890s. The extent to which farmers were educated to believe that they were being unfairly treated is open to speculation, but the fragmentary evidence of farm accounts suggests that the concern expressed was based on hard fact.
Beef prices (wholesale) at Derby Market

- **Top price**
- **Median**
- **Bottom price**

Source: Derby Mercury

Figure 13

Mutton prices (wholesale) at Derby Market

- **Top price**
- **Median**
- **Bottom price**

Source: Derby Mercury

Figure 14
For Derbyshire, during the 1890s the county was seen to be in the grip of depression. In view of the continuing decline in prices nationally, statements need to be treated with caution. It is proposed to view the local events of the decade from three standpoints: perceptions, realities, and responses.

1890s - Perceptions

A survey of members of the Derbyshire Dairy Farmers Association was conducted in 1893 with a view to collecting factual evidence with which to arm their representative Richard Finney when he appeared before the Royal Commission on Agriculture. One hundred and fifty five members - about 30 per cent - responded to questions which asked for a comparison of prices in 1883 and 1893. Respondents were also asked to list the causes of "injury" and to suggest remedies. The survey is a useful barometer because it covers the decade of greatest decline in prices: it is disappointing in that the returns came from men farming an average of 167 acres, far larger than the average for the region.(11)

The hard facts of the survey show the following price changes:

<table>
<thead>
<tr>
<th></th>
<th>1883</th>
<th>1893</th>
<th>% decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese</td>
<td>6.85d</td>
<td>5.75d</td>
<td>16</td>
</tr>
<tr>
<td>Butter</td>
<td>15.50d</td>
<td>13.75d</td>
<td>11</td>
</tr>
<tr>
<td>Milk</td>
<td>8.5d</td>
<td>6.75d</td>
<td>20</td>
</tr>
<tr>
<td>Beef</td>
<td>7.67d</td>
<td>6.00d</td>
<td>22</td>
</tr>
<tr>
<td>Mutton</td>
<td>8.25d</td>
<td>6.50d</td>
<td>21</td>
</tr>
<tr>
<td>Wool</td>
<td>12.75d</td>
<td>9.25d</td>
<td>27</td>
</tr>
<tr>
<td>Rent reductions: 10% to 15%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour Wages: 2s higher in 1893</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The cause of injury can be ranked according to the proportion of farmers mentioning them.
Farmers view of causes of depression

86% mentioned free foreign competition and low prices
26% mentioned unfair basis of local taxation
25% mentioned high rents
19% mentioned bad seasons

Smaller numbers mentioned unchecked adulteration, restrictions on cropping and sales, and depreciation in the value of stock.

The main remedies suggested were:

63% reductions in rent and revaluation of farms
49% reductions in rates and taxes
50% protection, or taxation of foreign produce.

Other suggestions included: abolition of land tax and tithe; regulations on the sale of separated milk; greater co-operation by farmers; farmers' representatives in Parliament; and change of Government.

There was a strong feeling of injustice at the whole situation. All the features mentioned in the survey were important on their own account, but collectively they added up to something approaching conspiracy against the farming interest. Such a conclusion emphasised the rural-urban schism, gave a sense of grievance, and added a despondency which reflected more than financial hardship. It is apparent from the survey that it was difficult to identify clearly what was wrong, or what remedial measures were required. Farmers knew that prices were too low, and that prices related to foreign competition, yet they prided themselves on their competitiveness. They knew that they had the advantage of nearness to market; they should have been able to meet any competition. Any obstacles placed before them, therefore, were regarded as unfair, and, perhaps, assumed greater prominence than the actual financial burden warranted.

The issue of local burdens on the land, although not new, featured prominently. A letter to the local press summarized this viewpoint:

"The seed is sown, the crop harvested and marketed; but before proceeds can be divided (to landlord and tenant) a host of claimants
appear who have contributed nothing to the cost of production. First comes the tithe owner, who claims a tenth of the crop. In various forms of taxation the state cannot take less than another tenth. Out of the remaining four fifths the farmer must provide for the cost of production and interest on capital employed. Except on land of great fertility this cannot be done”.

"Treat any other industry as that of agriculture is now treated and it would certainly perish”.

"No industry can thrive under a system which protects the foreigner by taxing the home producer, and thus handicaps him out of the race”.

The taxes were tithes, land tax, and local rates. Tithes were an anachronism in that tithe owners were usually remote from the local community, and even though their impact was small in Derbyshire, the principle offended. Land Tax dated back two hundred years to 1692 when the rate had been fixed annually and had also included personal property. After 1833 it had applied only to real estate and the amount was fixed, regardless of profitability. Local rates were seen as the most injurious. The main beneficiaries were not farmers. Rates provided for maintenance of the poor, the police, improvement of roads, and in some cases sanitation, lighting, public baths, libraries, recreation grounds and education. Education was a particular irritant because new schools educated the more intelligent youngsters away from the land. Agriculture was seen to be paying for a system which impoverished its own workforce. Other public amenities were seen to be for the benefit of the urban dweller, thus the rural areas were subsidising the towns. Furthermore, the urban population was growing rapidly with the consequence that local rates were rising and could only continue to do so. The creation of county councils in 1888 had led to increases in local spending. The rates which a farmer paid related to his rent, and this led to a further injustice. Temporary rent remissions were obviously helpful, but did not qualify for any rate reduction, whereas permanent rent reductions also eased the rate burden. Thus, in a number of ways the farmer felt that he was treated unfairly. He looked for a new rating system which would relate to an individual’s ability to pay, and would involve the urban dweller just as much as the farmer. Also, given that local taxation was a
necessity, there was a need to consider its effect in relation to competition with overseas farmers. If their taxes were lower — as was generally the case — then some form of protection was needed. Perhaps surprisingly farmers were not agreed on the need for Protection, and even its proponents favoured only minimum tariffs which would remove the foreign advantage without harming "the masses".

The main debates centred on prices. In the 1890s there were a number of practices which were regarded as injurious. Obviously prices of imports regulated the prices of home produced goods, but there were additional factors which caused resentment. For instance, whilst progressive legislation from 1866 had gradually reduced the incidence of the main contagious cattle diseases, the principle of unrestricted importation of live animals still existed and port inspection facilities were not trusted. It was felt strongly that all stock should be slaughtered at the port of entry. With regard to imported dairy products there was a greater grievance. Margarine was cheaper than butter, and if a proportion of margarine was added to butter, the product could be sold profitably at a lower price. R.H. Rew claimed that he gathered evidence on a visit to Normandy and Brittany that their exports to England were adulterated in this way "to a large extent". Margarine manufacturers were also criticized for packaging their product in casks, baskets, and boxes that were replicas of the containers used by foreign butter suppliers. Retailers paid a higher price for margarine so packaged; the only motive was fraud. The colouring added to margarine was questioned. The use of yellow was done with the object of making margarine look like butter. Another irritation was the addition of skimmed milk to whole milk by wholesalers and retailers. There was existing legislation to outlaw all of these practices, but it was poorly administered.

Taking all of these grievances together, one can understand that farmers felt that they were neglected by Government to an extent that gave importers an advantage over home producers.

"The obstacles to the British farmer are all the creation of the law, or the result of its administration. Therefore, they are in reality violations of the principle of Free Trade."

"It is an obligation laid upon a country which adopts Free Trade to
see that its own producers obtain at least a fair field. More than this they cannot demand; less than this they cannot tolerate." (15)

The result of such hindrances was prices of foreign produce which could not profitably be matched. Only liquid milk sales were protected and by the 1890s competition among British farmers had caused profits in that direction to touch rock bottom. Although the fraud so prevalent in the 1870s had largely been eradicated, there was still a feeling of injustice at the difference between wholesale and retail prices. Retail prices were usually 4d per quart - exactly twice the winter wholesale price and nearly three times the summer wholesale price. (16) At a time when farming profits were low, large retail companies were declaring dividends of over 10%. (17) Herein lies the reason for so much discussion on the need for co-operation to effectively challenge the "middle men".
It is not disputed that agriculture was experiencing increasing problems as the century drew to its close. What may be questioned is whether the relative price changes were greater in agriculture than in other industries; whether the depression was real or resulted from a failure to appreciate an overall deflation of prices; and whether dairying escaped the worst effects because of its unique position and opportunities. [See Figures 15, 16, 17, 18, pp 178, 179].

Circumstantial evidence points to the fact that some dairy farmers were defeated in the 1890s. Professor Sheldon of Sheen recorded that "some of them are losing money, a few have gone to the wall, others have given up."(18) Perry, in his study of agricultural bankruptcies, shows that Derbyshire, in common with many other grassland counties, suffered far less than the average, although the numbers increased substantially in the 1890s.(19) But bankruptcy represents the extreme form of distress, and better indicator would be the number giving up farming before they became insolvent. While this has not been quantified, the advertisements of Cumberlands, the local auctioneers, reveal increasing numbers of farming stock sales through the 1890s with the largest number in 1896. A new phrase was coined to describe many of the sales "held on behalf of Mr... who is declining farming."(20) Although lack of financial success usually is not proclaimed publicly, at a meeting to discuss "the present unprecedented condition of agriculture" in 1892 Mr. Evans of Ashbourne did just that.(21) In a moving speech he explained that he was a working farmer, rising at 4 a.m. in summer and 5 a.m. in winter. He finished work at 10 or 11 p.m. at night. For thirteen years he had worked his farm at a loss; he was "working his way to the workhouse." Supporting speeches revealed that others were in a similar plight; often they received no rent remission because small landlords were themselves not in a financial position to help. Exceptional cases reached the local press revealing the possible scale of financial loss. Frank Newham of Sutton on the Hill was made bankrupt in 1894. In the previous two years he had lost £500. He suffered a further penalty for giving incorrect answers regarding the sale of £140 worth of stock at his bankruptcy hearing. Charged with fraud, he received six months imprisonment with hard labour.(22) The inquest of a Cauldwell (near Burton on Trent) farmer revealed that he had told a
friend, shortly before taking his own life, that he had lost £2,000 through staying on in farming. The verdict was suicide while temporarily insane, a conclusion which hardly reflected the mental turmoil which he must have suffered. (23)

There is also evidence of farmers trading down onto smaller holdings as their capital dwindled. Farms near railway stations were always in demand; large farms which landlords had equipped with improved buildings became difficult to let, whereas holdings of 50-150 acres let more readily. Permanent improvements could be a burden on the property as the rent would be raised. (24) So it appears that there was more movement than had previously been the case, especially in the last five or six years of the century. A report in 1898 noted that there were more dairy farms to let in Derbyshire than previously within living memory and commented that "this cheap milk enables adventurers to start business in a district where they have previously had no footing". (25) That land agents should be reporting these events indicates that the trend was new and worthy of comment.

Notwithstanding these extreme examples, it is true that most farmers continued their family businesses throughout the 1890s. From the evidence of the Agricultural Returns and from known yields and prices, it is possible to develop a model of profitability in the 1890s. The assumption is made that the farm is north of the River Trent and its chief product, milk, is sold to London.
**Farm size:** 100 acres  
**Rent:** 35s/acre (£175 per annum)

**Land Use:**  
- 85 acres grassland  
- 12 acres cereals  
- 3 acres greencrop (roots & cabbage)

**Livestock:**  
- 20 milk cows  
- 4 other cattle over 2 years old  
- 10 cattle under 2 years  
- 4 horses  
- 10 breeding ewes  
- 10 pigs  
- sundry poultry

*Figures are parish averages from Agricultural Returns 1895*

**Revenue**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk: 20 cows @ 500 galls @ 6 d</td>
<td>£281</td>
</tr>
<tr>
<td>Stock Sales: 4 cows @ £15</td>
<td>60</td>
</tr>
<tr>
<td>12 lambs</td>
<td>21</td>
</tr>
<tr>
<td>pigs</td>
<td>23</td>
</tr>
<tr>
<td>14 calves @ 30s</td>
<td>21</td>
</tr>
<tr>
<td>Rent Rebate: 17½%</td>
<td>30</td>
</tr>
</tbody>
</table>

**Costs**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent: 100 acres @ 35s</td>
<td>£175</td>
</tr>
<tr>
<td>Rates: on £175 @ 2s3d</td>
<td>20</td>
</tr>
<tr>
<td>Rail costs: 10,000 galls @ 0.94d</td>
<td>39</td>
</tr>
<tr>
<td>Labour: 2 men &quot;living in&quot;</td>
<td>52</td>
</tr>
<tr>
<td>*Feedstuffs: 20 tons cereals/linseed/grains</td>
<td>100</td>
</tr>
<tr>
<td>Miscellaneous: tradesman's bills/insurance/depreciation on machinery AND farmers living costs.</td>
<td>50</td>
</tr>
</tbody>
</table>

*See Appendix II*
A casual inspection of farm prices compared with all other wholesale prices would suggest that farming compared quite favourably in the 1890s. The qualitative distress signals emanating from farmers meetings and letters to the press suggest a different story. Only by an examination of the relative importance of all farm costs and revenues can a clearer picture emerge.

Rents

The value of land in S.W. Derbyshire was between 30s and 40s per acre in 1881 and this had not changed by the 1890s. The significant difference was that rent reductions were given, and these were usually of the order of 10-25%. Some of these reductions were permanent, which qualified the farmer for a proportional rate reduction. The survey of 1893 revealed that the average rent was then "above 30s per acre" after the reduction, giving a rent of about £150 for a 100 acre farm. Rents had fallen by less than the average fall in prices, and the rent was usually the chief item of expenditure. On small farms the rent tended to be higher than on larger farms; the sale of a tenanted farm in Osliston and Thurvaston parish revealed that its 40 acres yielded £110 annual rent, a value of 55s per acre. The larger land-owners were able and ready to assist their tenants with rent reductions, but this was not always the case with small land-owners, so that a tenant might be burdened with a rent which related to the beginning of his tenancy in more prosperous times. The model cost/revenue account reveals that the rent reduction was a crucial element in the profitability of the farm.

Rates and Taxes

The various taxes on the land came in a number of forms and varied from parish to parish. There were items such as school board, poor rate, highway rate, and sanitary rate, which in the 1893 survey collectively were estimated at 2s 6d in the £1. Additionally there was Land Tax where it had not been redeemed by lump sum payment. Nationally, this was usually paid by the landlord, but in Derbyshire it usually fell on the tenant and amounted to approximately 1s per acre. Thus the burden on the land amounted to 15-17% of the rental. The demands for local spending were increasing, and a change of government from Liberal to Tory in 1895
led to the introduction of legislation which gradually switched the burden away from the land. The Agricultural Land Rating Bill of 1896 was strongly opposed by the Liberals. In debate, Lloyd-George claimed that "the landlords have been bleeding the farmers, and now they want to bleed the tax payers". (31) The whole question of taxation highlighted the changing power balance between urban and rural based interests.

Labour

Derbyshire had more than one third of its agricultural labourers "living in" in the late nineteenth century, whereas in Eastern and Southern England not one in a hundred would lodge on the farm. (32) For this reason, there was a stronger rapport between farmers and workers than in many other regions. Derbyshire was a high wage county, most especially those parts where there was alternative industrial employment. East Derbyshire had its mining and iron industries, and the south west Region, lying close to Derby and Burton, had the Midland Railway and breweries providing increasing opportunities for alternative employment. Since industrial wages were generally much higher than the average in agriculture, Derbyshire farmers were forced to pay high rates to keep their skilled men. Because of the nature of the agriculture, Derbyshire had never employed large numbers of women and children in the traditional gang systems, and by the late 1860s it was rare for boys under thirteen years of age to be employed. (33) The wages of men hired for the year was about 14s per week, varying between 16s at harvest time and 12s in winter. Those living in received 5s to 7s. There was less work in winter and some had to find work in Derby or Burton. The breweries paid 13s per week and three pints of beer per day. The free beer was regarded by farmers as the ruination of many labourers. (34) By the 1890s farm work in the district was more evenly distributed through the year with winter milking. Perhaps the lack of variety, and certainly the daily journey to the railway station for much of the year in the hours before sunrise and after sunset, was not appreciated by many labourers. (35) Farmers thought that labour was less efficient than formerly, and the quality of labour was a constant complaint. Few men stayed on the land all their working lives. Wages had risen by 2s to 3s per week on average, but there were instances of good cowmen earning 25s per week. Harvest labour was supplemented cheaply by the ubiquitous Irish. Despite these increases, agriculture had problems
maintaining an adequate skilled work force.\(^{(36)}\)

In the context of farm profits, labour was the one major cost that rose. The wage bill for a farm depended on whether men lived in or not, and also depended on the farmer's family. There is little doubt that many farmers remained solvent because they used unpaid family labour. The general farm size made this possible.

**Railway Costs**

Transport of milk to London received a special cheap rate from Derbyshire of 2d per barn gallon of 17 pints, equivalent to 0.94d per gallon. Those entering the milk trade could not escape this cost which did not vary from 1870 to 1900. On an annual output of ten thousand gallons this amounted to nearly £40, and a similar amount sent to Manchester would have cost £30.\(^{(37)}\) Railway rates aroused much feeling, especially as the railway companies were seen to favour importers because they offered special rates for bulk transport from the ports. In the early 1890s hostility increased as the companies proposed changes which would have increased charges by as much as 33%. The changes were scheduled to operate from 1st January 1893, but, following representations from the Derbyshire Dairy Farmers Association to the Midland Railway,\(^{(38)}\) and nationally by the British Dairy Farmers Association to the Board of Trade, the increases were first postponed and then quietly dropped.\(^{(39)}\) There were other hidden costs in rail transport because milk was carried at owners' risk so that the railway companies were not accountable for any losses. Loss of milk and loss of churns was a constant and expensive problem.

**Feedstuffs**

It has been shown that winter milk production involved the use of much greater quantities of cereals and artificial concentrates such as linseed cake. Theoretically, farmers could have opted for grassland only, purchasing all their concentrate requirements and thereby increasing the throughput of the farm. This would have had disadvantages as chopped straw - oat straw in particular - became a standard part of feeding, and it was much more convenient to have that produced on the farm and available as required. Certainly the grass acreage increased, but few
farmers took this to the extreme. Purchase of feeds, therefore, was a topping up process. Those farms with about one third arable were self sufficient; as the ratio of grass to arable increased, so the amount of purchased feeds increased. The price of cereals fell sharply during the depression, thus giving an increasing advantage to the dairy farmer. The extent of the fall depends on where the starting point is fixed. Cereal prices were high when milk prices were high and fell roughly in parallel. Taking 1871-5 as the high point in cereal prices, the main changes are summarized in Table 6.

Table 6  Price of Cereals per cwt and Percentage Values(40)  
[1871-75 = 100]

<table>
<thead>
<tr>
<th></th>
<th>Oats</th>
<th>Wheat</th>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td>1871 - 75</td>
<td>9s 5d</td>
<td>12s 9d</td>
<td>11s 1d</td>
</tr>
<tr>
<td>1876 - 80</td>
<td>8s 9d</td>
<td>11s 1d</td>
<td>10s 2d</td>
</tr>
<tr>
<td>1881 - 85</td>
<td>7s 7d</td>
<td>9s 4d</td>
<td>8s 9d</td>
</tr>
<tr>
<td>1886 - 90</td>
<td>6s 4d</td>
<td>7s 4d</td>
<td>7s 6d</td>
</tr>
<tr>
<td>1891 - 95</td>
<td>6s 5d</td>
<td>6s 6d</td>
<td>7s 1d</td>
</tr>
<tr>
<td>1896 - 1900</td>
<td>6s 1d</td>
<td>6s 8d</td>
<td>6s 11d</td>
</tr>
</tbody>
</table>

Oats and wheat were the two main feeding cereals, and the fall in price was approximately 40%. A comparison of the 1890s with 1876 - 80 is more relevant since that was the period when large numbers switched to the milk trade and extra winter feeding. The fall in price was then about 33%, depending on the balance of oats and wheat. More exotic feeds fell by similar amounts; for instance, the price of linseed had reduced by exactly one third between 1870 and 1890. Percentage changes can mislead, and it is worth noting that the price of wheat was always higher than oats although it experienced the greatest price reduction. Inclusion of wheat in the equation tends to exaggerate the advantage to the dairy farmer. Overall, then, dairying obtained an advantage in the price of its purchased feeds of about one third between 1880 and 1890, prices thereafter fluctuating only slightly. This advantage was acknowledged in evidence to the Royal Commission on Agriculture in 1894, but the assertion was also made that the lower price of feeds had much less effect than the lower price of dairy produce.(41)
Revenue

The main source of income was the sale of milk. In the 1870s the average price was probably over 9d per gallon. By 1883 this had already dropped to 8.5d and for much of the 1890s the price was consistent at 6½d, being divided into 5½d in summer and 8d in winter. The income from milk obviously depended on the yield of the milking herd. Rew estimated the national average yield in 1892 to be 420 gallons per year.(42) Yields in dairying counties were thought to be higher. Hall showed that leading dairy farmers expressed opinions which varied from 550 gallons to over 600 gallons.(43) Some of this amount would be fed to the calf, so that an estimate of 500 gallons sold for a good quality beast is the best approximation that we have. An animal yielding less than 500 gallons was not held to be profitable. Progressive farmers who selected for improved yields, possibly keeping records, could obviously exceed this figure. There was a strong divergence of opinion between the advocates of pedigree animals which conformed to the classic characteristics of the shorthorn, and the working dairy farmers who bred for milk production. The variations in income which would result from variations in yield are summarized in Table 7.

Table 7 Revenue from a herd of 20 cows

<table>
<thead>
<tr>
<th>Yield per cow</th>
<th>1883</th>
<th>1893</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>420 gallons</td>
<td>£298</td>
<td>£236</td>
<td>£62</td>
</tr>
<tr>
<td>500 gallons</td>
<td>£354</td>
<td>£281</td>
<td>£73</td>
</tr>
<tr>
<td>600 gallons</td>
<td>£425</td>
<td>£338</td>
<td>£87</td>
</tr>
</tbody>
</table>

Thus income could be increased by improving the quality of the herd, and perhaps feeding a small amount extra in concentrates. Herd improvement necessitated culling poor yielding stock and replacing them, probably with home reared animals. Therefore there were sales of stock, either culled or barren animals. The shorthorn was highly regarded because of its dual purpose qualities, providing good quality beef as well as milk, but the value of beef fell in the period under consideration by over 20%. Many farmers also kept a few sheep and perhaps a couple of sows. There again the fall 1883 - 1893 was over 20%, less so in the case of pigs.
Taking the hypothetical 100 acre dairy farm it is possible to compare 1893 with 1883 assuming no changes in land use or numbers of stock.

100 acre Dairy Farm (refer back to p 156)

<table>
<thead>
<tr>
<th>Revenue</th>
<th>1883</th>
<th>1893</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>£354</td>
<td>£281</td>
<td>- £73</td>
</tr>
<tr>
<td>Stock Sales</td>
<td>£156</td>
<td>£125</td>
<td>- £31</td>
</tr>
<tr>
<td>Total</td>
<td>£510</td>
<td>£406</td>
<td>- £104</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>1883</th>
<th>1893</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>175</td>
<td>145</td>
<td>- 30</td>
</tr>
<tr>
<td>Rates (est)</td>
<td>15</td>
<td>20</td>
<td>+ 5</td>
</tr>
<tr>
<td>Rail Costs</td>
<td>39</td>
<td>39</td>
<td>-</td>
</tr>
<tr>
<td>Labour</td>
<td>40</td>
<td>52</td>
<td>+ 12</td>
</tr>
<tr>
<td>Feedstuffs</td>
<td>150</td>
<td>100</td>
<td>- 50</td>
</tr>
<tr>
<td>Miscell &amp; Profit</td>
<td>91</td>
<td>50</td>
<td>- 41</td>
</tr>
<tr>
<td>Total</td>
<td>510</td>
<td>406</td>
<td>-104</td>
</tr>
</tbody>
</table>

The points which are worthy of emphasis are, firstly, that the decline in the price of feedstuffs, although falling by a larger percentage than farm sales, was less than half the fall in income on this 'average' farm. Secondly, the rent reduction appears to be a crucial aspect of cost saving. It must often have been essential if the farmer were to remain in business and indeed, it is unlikely that landlords allowed any rent reductions that were not essential.

The above model was developed to assess changing costs and revenues in dairying. The exercise was, therefore, limited to parishes on the Red Marl. To assess the changes in the area south of the River Trent, where dairying was rather less dominant, a similar exercise was completed. In this case a 150 acre unit was deemed to be more realistic.
150 acre farm south of River Trent
(data from Agricultural Returns, 1895, for all parishes except Melbourne)

<table>
<thead>
<tr>
<th>Land Use</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>115 acres grassland</td>
<td></td>
</tr>
<tr>
<td>25 acres cereals</td>
<td></td>
</tr>
<tr>
<td>9 acres greencrop</td>
<td></td>
</tr>
<tr>
<td>1 acre others (orchards etc.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Livestock</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20 milk cows</td>
<td></td>
</tr>
<tr>
<td>8 other cattle over 2 years old</td>
<td></td>
</tr>
<tr>
<td>13 cattle under 2 years old</td>
<td></td>
</tr>
<tr>
<td>8 horses</td>
<td></td>
</tr>
<tr>
<td>24 breeding ewes</td>
<td></td>
</tr>
<tr>
<td>10 pigs</td>
<td></td>
</tr>
</tbody>
</table>

A comparison with the 100 acre farm of the north is most easily effected by simply examining the additional crops and livestock on the extra 50 acres.

<table>
<thead>
<tr>
<th>Additional 50 acres land use:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30 acres grassland</td>
<td></td>
</tr>
<tr>
<td>13 acres cereals</td>
<td></td>
</tr>
<tr>
<td>6 acres green crops</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional livestock:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 milk cows</td>
<td></td>
</tr>
<tr>
<td>4 cattle over 2 years old</td>
<td></td>
</tr>
<tr>
<td>3 cattle under 2 years old</td>
<td></td>
</tr>
<tr>
<td>4 horses</td>
<td></td>
</tr>
<tr>
<td>14 breeding ewes</td>
<td></td>
</tr>
<tr>
<td>0 pigs</td>
<td></td>
</tr>
</tbody>
</table>

The milking herd size and the number of pigs were identical to 100 acre farms in the north, clearly indicating the more mixed nature of this southern area. It is assumed that the produce of the grassland and root crops would be consumed on the farm, the latter being mainly winter sheep fodder. Attempting any form of costing is difficult because throughput is not known. The following calculations assume that rearing and fattening is the norm, rather than purchase of stock for fattening off.
Revenue

Stock sales:
- 4 cattle @ £15
- 18 lambs @ £1 15s
- 3 calves @ £1 15s
- 13 acres @ 0.8 tons/acre and £5 per ton

Cereals:
- 13 acres @ £5 per ton

Rent Rebate:
- £15

£60 00s
31 10s
4 10s
52 00s
15 00s
£163 00s

Costs

Rent:
- 50 acres @ 1.75
£87 10s

Rates
- 10 00s

Labour:
- 1 man @ £1 per week
- 52 00s

Miscellaneous & Profit
- 13 10s

£163 00s

Items have been omitted from both sides of the account in order to make simple comparison with the 100 acre model. These include the sale of straw, worth at least £2 10s per acre or £32 10s in total; the purchase of seed for cereal crops; the sale of wool and the cost of cereals fed to sheep in winter; and the cost of cereals fed to four cattle and four horses. The sum total of all of these is assumed to be zero. The comparison of 1893 with 1883 shows the following changes:

<table>
<thead>
<tr>
<th>Revenue</th>
<th>1883</th>
<th>1893</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock sales</td>
<td>£120</td>
<td>£96</td>
<td>- £24</td>
</tr>
<tr>
<td>Cereals sales</td>
<td>67</td>
<td>52</td>
<td>- 15</td>
</tr>
<tr>
<td></td>
<td>187</td>
<td>148</td>
<td>- 39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>1883</th>
<th>1893</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>£87½</td>
<td>£72½</td>
<td>- £15</td>
</tr>
<tr>
<td>Rates</td>
<td>7½</td>
<td>10</td>
<td>+ 2½</td>
</tr>
<tr>
<td>Labour</td>
<td>40</td>
<td>52</td>
<td>+ 12</td>
</tr>
<tr>
<td>Miscell &amp; Profit</td>
<td>52</td>
<td>13½</td>
<td>- 38½</td>
</tr>
<tr>
<td></td>
<td>187</td>
<td>148</td>
<td>- 39</td>
</tr>
</tbody>
</table>

There are serious doubts about the way in which the grassland and livestock were managed, but the data points to low stocking densities, and the model suggests some difficulty in achieving acceptable profit margins.
in the 1890s. The technique of using average data for a 150 acres farm masks the fact that the region would comprise of specialist dairy farms which would be equally profitable with their northern counterparts, and larger mixed farms on which tenants were experiencing greater difficulties in balancing the books.

Rent reductions have been assumed in both models and are seen to be important in the balance sheet of the 1890s. Assuming that rent is related to potential profitability, it should provide a valuable indicator of prosperity in S.W. Derbyshire relative to other parts of the country. Furthermore, changing rentals should indicate changing profits over time. Some exemplification is necessary to reinforce the argument.

Derbyshire Rentals

An overview may be obtained from an indirect source. Schedule A of the Income Tax was divided into three categories, one of which was "Lands". The assessment of "Lands" was based on the gross annual value, and therefore gives an approximation to rental value. The problems of using such data have been explored by Grigg (44) and the limitations of the source - especially the fact that comparisons can only be made between counties - is acknowledged. Data for the whole of England and Wales was provided for the Royal Commission on Agriculture by the Inland Revenue Commissioners for the years ending April 1880 and 1895. These show that Derbyshire had a reduction in gross annual value of 15.9% over the fifteen years, compared with the national average of 23.4%. The counties with smaller reductions were all in the west, including all of Wales, Cumberland and Westmoreland, Lancashire and Cheshire, Devon and Cornwall. Conversely, the largest reductions were in Eastern England with Suffolk (39.9%) and Essex (39.7%) having the highest values.(45)

The Royal Commission also took evidence of rents of individual farms, included in sample farm accounts.(46) Unfortunately only one example was provided for Derbyshire, and that from the largest landowner in the county, The Duke of Devonshire. Most examples related to Eastern England and the level of rents, mostly averaged for 1889-1893, may be illustrated by summarising the details for three counties, Essex, Bedfordshire and Lincolnshire.
<table>
<thead>
<tr>
<th>County</th>
<th>Number of Accounts</th>
<th>Total Acreage</th>
<th>Total Rent</th>
<th>Rent per Acre</th>
<th>Reduction in Lands 1880-95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essex</td>
<td>9</td>
<td>6824</td>
<td>6460</td>
<td>25s 6d</td>
<td>39.7%</td>
</tr>
<tr>
<td>Beds.</td>
<td>9</td>
<td>4750</td>
<td>4658</td>
<td>29s 4d</td>
<td>26.7%</td>
</tr>
<tr>
<td>Lincs</td>
<td>7</td>
<td>4929</td>
<td>5577</td>
<td>30s 3d</td>
<td>29.7%</td>
</tr>
</tbody>
</table>

For Derbyshire, we must rely on the evidence from part of the Devonshire Estates, none of which lay in the south of the county. The accounts show that, for farms of size 50-300 acres, the following average rentals applied:

- Staveley & Chesterfield Estate (6124 acres) 19s 6d per acre
- Hardwick Estate (5446 acres) 22s per acre
- Shottle & Pentrich Estate (4944 acres) 20s 9d per acre

Thus these estates in East and North East Derbyshire had very similar rentals to the Eastern Counties. The average rent reduction was stated to be 9.73%.(47)

To obtain data for South West Derbyshire it is necessary to examine the records of individual estates to verify the assertion by the Derbyshire Dairy Farmers Association that rentals were "above 30s per acre" after reductions of 10% to 15%. The rental books of two major estates in the area, Calke and Radbourne, have been used for this purpose. The largest estate in the study area belonged to the Harpur-Crewe family. It stretched from Alvaston and Boulton in the north to Smisby in the south. It was not a single block of land, but comprised of holdings in fifteen parishes with the largest tracts lying in the parishes of Swarkestone, Stanton by Bridge, Ticknall, Smisby and Calke. In the 1880s the total area was 9,500 acres of which about half lay to the south of the River Trent.(48) The rental records for the 1880s and 1890s allow estimates to be made of the rent per acre for the whole estate and for individual parishes. Although farm sizes are not recorded, the payments made by individual farmers make possible an assessment of trends in rent payments. The average rent for the whole estate in the first half of the 1880s was 34s per acre. There were substantial variations between parishes, with much of the Trent Valley land approaching 40s per acre. In 1885-86 a 7½% reduction was applied to every property on the estate regardless of size, and the following year the reduction was 10%. These were temporary
reductions, but in 1887-88 rentals were re-assessed and the value of property reduced by approximately 10% (varying between 8.5% and 11%). This permanent reduction would qualify tenants for reductions in local rates. No further changes took place before the end of the century. A feature of the rental records is the extent to which debts were struck out or written off. In 1886 the estate changed hands and the rent arrears (£1444) were removed from the estate records. Thus at Michaelmas, 1886, there were no arrears of rent. In the next fourteen years to 1900 there was not a single year in which the full rent charges were met. The accumulated arrears had reached a massive £6323 by 1897, falling to £4086 by 1900 largely as a result of debts being written off. In addition to the arrears, large sums were written off especially in the later 1890s, the overall total being £5272. Taking the accumulated arrears (£4086) and the amount written off (£5272) we find that (£9358) or 4.75% of the total rental of £195,000 was not paid.(49)

These figures are open to many interpretations. The facts show that rent arrears were small before 1886, and in that year Sir Vauncey Harpur-Crewe inherited the estate. Thereafter the arrears grew inexorably despite his rent reductions. One may speculate whether the tenants exploited the generosity of their landlord, or whether he was happy to keep long-standing tenants, knowing that they really were in financial difficulty. The figures suggest that a 10% reduction was inadequate, and that a further 5% would have solved the problem. However, the majority of farmers were able to pay their rent, whilst a few incurred considerable debts. From the estate's point of view, further reductions would have reduced income and the less efficient tenants would still have posed a problem.

A second example is provided by the Radbourne estate. It lies to the north of the Trent Valley in the "Red Marl" country, and the total area was about 6000 acres in the 1880s and 1890s. The overall rental income was fractionally over 30s per acre in 1883. There was a general uniformity in rents, as may be seen from the following examples:
<table>
<thead>
<tr>
<th>Farm</th>
<th>Acreage</th>
<th>Rent</th>
<th>Rent per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potlocks</td>
<td>179</td>
<td>£244 16s</td>
<td>27s 4d</td>
</tr>
<tr>
<td>Tyrrel Hayes</td>
<td>185</td>
<td>£277</td>
<td>30s</td>
</tr>
<tr>
<td>Old Park Farm</td>
<td>210</td>
<td>£338</td>
<td>32s 2d</td>
</tr>
<tr>
<td>Dalbury Woodhouse</td>
<td>263</td>
<td>£400</td>
<td>30s 5d</td>
</tr>
<tr>
<td>Wild Park</td>
<td>137</td>
<td>£223 10s</td>
<td>32s 7d</td>
</tr>
<tr>
<td>Middle Wild Park</td>
<td>149</td>
<td>£240</td>
<td>32s 3d</td>
</tr>
</tbody>
</table>

Smaller farms commanded rather higher rents, for instance, Lees Corner Farm: 80 acres; rent £159, £2 per acre.

The rent of most farms on the estate remained constant throughout the years 1883–1900. A minority of farmers did obtain a small reduction in rent. Thomas Archer of The Pastures, Kirk Langley, had his rent reduced by £20 to £266 15s in 1890 (7%) and likewise John Daykin of Petty Close, Kirk Langley, achieved a 5½% reduction from £116 8s to £110 in 1893, but such cases were exceptional. Despite this lack of rent reductions, the Radbourne estate had very few instances of rent arrears, and certainly there was no policy of writing off old debts.

The examples of the Calke and Radbourne estates illustrate the difficulty of making generalisations. Why should two estates only a few miles apart exhibit such different characteristics? One is tempted to conclude that the Calke estate with its larger mixed farms was feeling the effects of the decline in prices, whereas Radbourne, milk producing country, remained prosperous. There are other possible explanations. The attitude of estate owners must have been important. Radbourne appears to have been run very efficiently; the rents at Calke were very often paid late and often only partially paid. Necessity can be an excellent motivator. Radbourne was close to a railway station, and its farms geared to milk production. Presumably, the demand for such farms hardly slackened; tenants therefore had to meet their obligations. We may assume that the larger farms of the Calke estate were less easily let. Furthermore, the landlord was noted for his generosity. The necessity to make full payment on rent day perhaps was less pressing here. Another factor to be considered is that after the reductions on the Calke estate, the rents on the two estates were almost identical. There was less need
for reductions at Radbourne because its rents started at a lower level.

Whatever conclusions are reached, the fact remains that South West Derbyshire was a high rent area. Whether the rents were above an economic level is open to speculation. The true value could be tested by looking at the price of land. An example survives from the diary of Major-General John Talbot Coke who owned an estate at Trusley, neighbouring Radbourne. When three farms were purchased (29th September, 1892) the rentals were established so that the annual return on the investment was 3.33%. They therefore reflect the valuation exactly

<table>
<thead>
<tr>
<th>Farm</th>
<th>Area</th>
<th>Price</th>
<th>Rent</th>
<th>Rent/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad Close</td>
<td>45 acres</td>
<td>£1950</td>
<td>£65</td>
<td>28s 6d</td>
</tr>
<tr>
<td>Rook Hills</td>
<td>109 acres</td>
<td>£5070</td>
<td>£169</td>
<td>31s</td>
</tr>
<tr>
<td>Trusley Brook</td>
<td>98 acres</td>
<td>£3360</td>
<td>£112</td>
<td>22s 6d</td>
</tr>
</tbody>
</table>

Although the state of the farms is not known, this example suggests that the true value of farms was rather less than 30s per acre, even for smallish farms. (51)

The Derbyshire examples alluded to above do not constitute a sample large enough to make any firm statements regarding rent trends. However, the five estates covered 32,000 acres, and belonged to three landowners who were better placed than most to make rent reductions. We have seen that the greatest reduction was 10%. Farmers claimed that smaller landowners could not match the reductions of the great landowners (52) which would lead to an average figure of less than 10%. This does not fit the evidence given by the Inland Revenue, but it is in accord with the conclusions of the ten commissioners in their Supplementary Report of the Royal Commission on Agriculture that "besides the fall in prices, the chief cause of agricultural depression has been the excessive rent put upon agricultural land". (53) It also explains why, in the survey of 1893 (see p.150) rent reductions featured as the most popular remedy for agricultural depression. Rent was usually the major farm cost: farmers would have wanted to see a fall in rent of about 20% to keep in line with the changing price of produce.
If profit margins were lowered and rent reductions were not substantial, income could only be maintained by increasing output. It has been shown in Chapter 6 that livestock numbers did not increase. Increased output could result only from improvements in crop yields or output from livestock. Average crop yields did not increase, and it is a fair assumption that, in such a short period of time, only marginal improvements occurred in the meat-yielding qualities of livestock. The unknown factor is the average milk yield per cow. In 1875 Morton(54) had estimated 420 gallons per lactation and in 1892 Rew(55) reached a similar conclusion. Other evidence is more optimistic. Coleman(56) (1890) thought that Derbyshire cattle might achieve 600 gallons, and Hall partially corroborates this with the view that "we cannot be far wrong if we say that a good dairy cow ought to yield not less than 600 gallons". (57) The proportion of "good" dairy cows is, of course, unknown. Thus we are left to speculate. In Derbyshire the conversion to home-bred shorthorns must have been complete by 1880 (see Chapter 2) but falling milk prices would have been a stimulus to breed selection for milking qualities. The figure of 500 gallons has been used in the models. If an increase from 500 to 600 gallons (20%) is considered, the gross revenue from a herd of 20 cows increases by £57 (see Table 7 p.161) In such a case the 100 acre farmer would enjoy a £16 rise in income instead of a £41 fall. Alternatively, one might calculate the yield increase necessary to maintain income between 1883 and 1893. The necessary increase is from 500 to 573 gallons (14.5%). This may have been possible for some breeders, but seems a very high figure as the average for the region. However, it is almost certain that some improvement took place, so the model must undervalue profits. This sort of speculation brings the findings for Derbyshire into line with Fletcher's conclusions about the industry in Lancashire during the same period. Fletcher assumed a 20% increase in yield, and using that basis, the Derbyshire dairy farmer enjoyed an improved living standard in the depth of the "depression". Clearly, the issue of milk yields is central to the whole discussion, but unfortunately the evidence tends to be impressionistic. The argument against this view of a prosperous dairying industry is also impressionistic: it is based on the fact that farmers increasingly attended meetings and wrote to the press to explain that they were in financial difficulty.
Perhaps the truth lies in other circumstances, because the early 1890s produced three abnormal seasons. 1891 was dull and wet, and 1892 was similar but more extreme: in both years crops were difficult to harvest, most especially hay.(58) 1893 was a drought year which again affected crops. The yield of hay was less than half the average of the previous five years. Fodder prices rose, farmers tried to shed some livestock, but prices fell in response. Fatstock were slaughtered before they were ready. The dry summer of 1893 caused milk yields to fall by as much as 30%.(59) This was, perhaps, the lowest point for farmers who had already lost capital and were not in a position to view the effects of the weather philosophically. Responses were bound to be cost-cutting exercises. Perhaps a reduction in labour, cutting purchases of feeds to the minimum even at the expense of yields, selling a few stock, and making maximum use of any other farm enterprise such as the orchard. The Agricultural Returns record a marked increase in orchards at this time, and S.W. Derbyshire produced damsons in abundance. Lance Waud, describing the similar problems of 1930 and 1931 puts the response most aptly:

"The Derbyshire livestock farmer did as his forbears had done in similar circumstances. He tightened his belt, spent nothing if it could be avoided, lived largely off the farm and weathered the storm."(60)

The seasons, of course, improved. Prices did not. It would be another ten years before farming prospects could be viewed with equanimity. The depression did not end in 1896; rather, the last four years of the century saw the lowest prices ever received for summer milk. Factories fared even worse. At a meeting in Uttoxeter between farmers and a representative of the Co-operative Wholesale Society the possibility of a new creamery, was discussed, but the price offered for milk was so low that the farmers rejected the proposal out of hand.(61)

As other sectors of the economy came out of their price depression, agriculture was affected by more expensive purchases of, for instance, implements and equipment. Some items were said to have risen by as much as 45%.
1890s Responses

During the 1890s there was more support for collective action to improve conditions, both through participation in a national campaign to influence Government decisions and by local initiatives. There were meetings, usually organized by the Derbyshire Dairy Farmers Association though not restricted to its members, to discuss problems and formulate policies. Resolutions were drafted and copies sent to local M.P.s, the Minister of Agriculture, and the Prime Minister. The instance of railway charges was one area where farming pressure groups had complete success in resisting the demands of railway companies. There were few other successes. Lord Winchelsea tried to form a national union of all the agricultural interests, embracing landlords, farmers, and agricultural workers. Derbyshire delegates attended a congress convened by this new National Agricultural Union in 1893 but there was little confidence locally that it would bring about improvements. Even in that year the annual general meeting of the D.D.F.A. was recording that "Lord Winchelsea's new union if successful could not alter the price problem". Lord Winchelsea attended a meeting at Burton-on-Trent in 1894 and spoke of the need for some degree of Protection for British agriculture in order to safeguard the nation's food supply. His approach was that Government was responsible for the situation, and only Government could alter it. One of the few references to the significance of the money supply occurred at the meeting, Lord Winchelsea proclaiming that "all interested in agriculture ought to study and master the question of Bimetallism, for that was a subject which affected them deeply." He appealed to all landlords, tenants, and labourers to join his union in order to exert pressure on Government. It is strange that the response was so lukewarm and sceptical, especially as the common theme running through all the farmers' meetings was the need for unity. Even the committee of the D.D.F.A. refused to recommend a block subscription to the new union. Maybe it was uncertainty as to what action would be most effective which created the apparent lethargy. The building of factories had ground to a halt, and some, such as Kedleston, were already closing, but the early innovators still saw factories as the most effective solution. Mr. J.G. Crompton expressed this view at the 1893 general meeting: "Protection will not come, therefore the only solution is the adoption of the factory system on a universal scale". The problem with this approach was that the
desired end was unobtainable. It was pointed out to Mr. Crompton that out of 6000 Derbyshire farmers, they only had 500 members. It has been shown in Chap 4 that money could not be raised for an association factory in Derby. The importance of factories would have been the long term solution of the summer milk surplus. Whilst that problem remained, milk dealers had the advantage in negotiating contracts. Therefore, more factories were required before a recommended price for milk could be forced on the wholesalers. But building more factories required investment in enterprises similar to existing ones which were experiencing financial difficulties.

Some improvements did occur where practical action was taken. For instance, Samuel Osborne acting as agent for the sale of milk (see Chap. 3) improved a few farmers' contracts, and the employment of a full-time London agent expanded this scheme. But the effects on the local economy must have been very small. For those who still depended on cheese-making, income could be increased by improving quality. For many years Gilbert Murray had advocated practical instruction to achieve this. Again the problem was one of organization, and here there was help from central government.

From 1889 Treasury grants became available for agricultural and dairy instruction, administered by the new Board of Agriculture. The new county councils established technical education committees with funds available to improve skills in numerous industries. In Derbyshire a travelling dairy school was established in 1891 and proved very popular, some 350 pupils enrolling for the classes in 1893, nearly all of them being awarded proficiency certificates. A survey of former pupils in 1893 (45 replies) revealed that all of them had been able to sell their butter more easily and 20 claimed that they obtained at least 1d per lb more as a result of the instruction. Another innovation was instruction in elementary agriculture; fundamental scientific facts relating to soils, manures, plants and animals were taught at over 20 centres throughout the county. In 1892 there was a total of 460 students enrolled, 59 of these attending the Etwall classes. (65)
In 1894 a decision was taken by Derbyshire in conjunction with Nottinghamshire, Leicestershire and Rutland to create a permanent centre for instruction, and in September 1895 the Midland Dairy Institute was duly opened by the Duke of Devonshire. Located at Kingston-on-Soar and comprising 160 acres, its purpose was to provide practical instruction in butter and cheese making, care of the milking herd, and grassland and arable management. Six week courses were provided for farmers and their wives as well as for younger students. (66) Thus was the necessary educational support provided, although some local writers would have preferred such instruction to have been part of the school curriculum so that all youngsters received the benefit.

Lack of adequate transport continued to handicap farmers who were some distance from existing railway lines. This undoubtedly was the reason for the slow decline in farmhouse cheese manufacture, although the inference may be drawn that three miles was no longer the limit for transporting milk to the station. Additions to the railway network would have been beneficial particularly to the area lying immediately to the north and west of Derby, and there were proposals for two new lines, one providing a direct link between Derby and Ashbourne and the other joining Ashbourne with the Derby-Burton line at Egginton Junction. The former proposal reached an advanced stage of planning, but the latter was never more than an expression of hope from the Longford district. (See Map 18, p 175).

The Derby-Ashbourne Light Railway proposal was revealed to interested members of the public in August 1895, a year before the Light Railway Act enabled such lines to be constructed on existing public highways. A detailed scheme had been prepared in conjunction with Dickenson & Co. of Birmingham for the construction of a tramway powered by overhead electric cable, and extending from the bridge in Compton Street, Ashbourne, to the terminus of the Derby tramway [at the junction of Ashbourne Road and Windmill Hill Lane]. The total cost was put at £62,000, including all construction, rolling stock, and the generating station at the Brailsford brook roughly at the mid-point of the line. Innovation included the use of railway drays which farmers could hire to carry goods to and from the railway and which could be loaded at any
Railways of South Derbyshire

- London and North-Western Railway (1899)
- North Staffordshire Railway (1848)
- Proposed Light Railway (1878)
- Great Northern Railway (1878)
- Midland Railway
- Friargate
- Mickleover
- Derby
- Peartree
- Swarkestone
- Worthington
- Tonge
- Melbourne
- West

- Railway
- Proposed railway
- Station or halt
- Selected village
- Distance in miles from nearest railway station
  (Study area only)
halt straight on to the rail cars. Although the line would provide passenger transport, the initial meeting reflected the strong farming interest and the committee appointed included such well-known figures as Messrs. C.E. Newton, R. Finney and G. Murray, all of whom were closely connected with the factory movement and the Derbyshire Dairy Farmers Association. A second phase envisaged an extension of five miles to Dovedale.

For the following five years there were various enquiries by the Board of Trade into objections, principally from Derby Corporation which was concerned about the effect on urban trams and the visual impact on Friargate, Derby's most important Georgian street. There were numerous changes made to the original proposals: by November 1900 the idea was to construct a standard gauge double track terminating at the Friargate station of the Great Northern Railway where warehousing facilities would be available. The cost had risen to £120,000 and objections had by then turned to the danger of the track sunk into the roadway. Thus the great advantages of such a line in improving accessibility for a large rural area between Derby and Ashbourne were largely over-ridden by the problems of the final mile within the Borough of Derby. The line had met with no objections from local landowners, unlike a proposal for a standard railway fifteen years earlier when the hunting interest had expressed displeasure at having their territory divided. (67)

The Longford railway never progressed beyond a public meeting at Longford school in 1897 attended by a large number of tenant farmers, representatives of local estates and traders. At the time the London and North-Western Railway Company was constructing the Buxton to Ashbourne link and the Longford hope was that this line could be extended further southwards to Egginton or Marston-on-Dove. The local M.P. - Mr. Victor Cavendish - himself a railway director, suggested that the method to adopt was to petition the company with the advantages of such a line, and a deputation was duly organized. The mutual advantages were seen to be the large local agricultural trade: milk and agricultural produce off the farms, and feedstuffs, brewers' grains, coal and other supplies brought into the district. For the L.N.W. Railway there was further potential trade from industries such as brickmaking. The construction problems would be minimal as there would be no opposition from landowners and the
engineering problems were relatively small. Such a line would connect Manchester and Burton by a direct route and result in a great extension of through traffic.(68) No further report was printed so presumably the directors of the L & N.W. Co. viewed the scheme with less optimism than did local residents.

At the time that these two proposals were being aired there was also rumour that a large milk condensery was to be built in the district,(69) and within a short time the Nestle factory at Hatton was collecting from the district through which both of these lines would have run. The inaccessibility of the district was diminishing through the development of road rather than rail transport. Nevertheless, the long haul by cart and wagon for goods such as coal and grains from Etwall and Mickleover stations continued for at least another quarter of a century.
Index of wholesale prices (1900 = 100)  
[Coal and metals; Textiles; Food, drink and tobacco; Miscellaneous]  

Figure 15

Butter and margarine: Average wholesale price (1900 = 100)  

Figure 16
Imported Cheese: Average wholesale price \(1900=100\)

![Graph of Imported Cheese: Average wholesale price](image)

Board of Trade statistics
PP 1914 16 Cd 7733 LXI 410 & 411

Milk: Average wholesale price \(1900=100\)

![Graph of Milk: Average wholesale price](image)

Board of Trade Statistics
PP 1914 16 Cd 7733 LXI 410 & 411
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2. Druce, S.B.L. Minutes of Evidence, Royal Commission on Agriculture, Bpp C.3096-II, XVII, 1881 Question 30,532

3. Ibid, Coke, E.K., Question 57,497

4. Coleman, J. Minutes of Evidence, Royal Commission on Agriculture, BPP C.2778-I, XV (1881) Question 5831

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6. Ledger compiled by S.S. Potter, Manor Farm, Over Haddon (nr. Bakewell) in the possession of Mr. R.W. Potter, Yeaveley.

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31. Report Derby Mercury, 6 May 1896


34. Evidence of Mr. F. Bradshaw, landowner (Barton Blount), Mr. T.S. Radford (Church Broughton), Mr. S. Faulkner (Scropton) and Mr. G. Lucas (Hilton, schoolmaster), Second Report on the Employment of Women and Children in Agriculture BPP 4202-I, XIII (1968-9) pp.424-428


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45. Royal Commission on Agriculture, C8300, Vol XV (1897) Statement

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49. Harpur-Crewe Papers, Derbyshire Records Office. D2375M/274/4 to D2375M/275/17 and D2375M/269/1 and 2

50. Radbourne Estate Office, Rental Book 1883-1904, by kind permission of Mr. H.K. Marshall

51. Diary of Major-General John Talbot Coke, by kind permission of Mr. D. Coke-Steel.

52. Guildhall meeting, Derby Mercury, 2 Nov 1892

53. Royal Commission on Agriculture, C8540, XV (1897) ptV, Ch XVIII Supplementary Report


57. Hall, J.F. 'How to Increase the Profit of Dairying', J.B.D.F.A., VII, 1893, p.113


61. D.D.F.A., Uttoxeter Branch Meeting, Derby Mercury, 19 May 1897


63. Report of Meeting of Farmers at Burton on Trent, Derby Mercury, 17 Oct 1894

64. Report, Derby Mercury, 31 Jan 1894

65. Reports, Derby Mercury, 10 Feb 1892, 1 Jan 1893 and 2 Jan 1895

66. Reports, Derby Mercury, 26 June and 25 Sept 1895

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68. Report, Derby Mercury, 6 Oct 1897

69. D.D.F.A. Meeting, Derby Mercury 8 Sept 1897
CHAPTER 8

CONCLUSION

The object of this study was to determine the major changes which took place in the agriculture of south west Derbyshire in the late nineteenth century. The area was selected because it was known to be a dairying region: the period was chosen because it embraced the Great Depression of English agriculture 1873-1896. Thus it was intended to use the study area as an example to illustrate more general considerations of dairying in the years when agriculture in general was at a low ebb, and to test the validity of the argument that specialist dairying regions prospered in the late nineteenth century. The methods and sources were selected in an attempt to present both a quantitative interpretation of change in farming systems and a qualitative assessment of the farmers' perception of their circumstances. The statistics from the Agricultural Returns and various price series allow interpretations based on response to economic forces; the study of local press reports and letters is more useful in determining the reasons for change, as actions taken in the midst of events may well appear illogical when the events have run their course.

Agricultural production in south west Derbyshire in 1870 was more specialised than it had formerly been. There had developed an emphasis on cheese production in the eighteenth century and that emphasis had intensified in the nineteenth century. Cheese was eminently transportable, being easy to handle and having a high value to weight ratio. The cheese produced on a 100 acre farm would weigh only about 3½ tons. The market area could be - and was - large, with Derbyshire cheeses finding their way to the continent as well as to London. The canals and later the railways had improved access to these distant markets, and in 1870 there was little difficulty in disposing of reasonable quality cheese. The greatest deficiency was lack of organization in marketing, so that intermediaries or factors were able to exploit the situation while admittedly providing a necessary service.

The dairy farm production of cheese influenced the size of the milking herd. Beyond a certain size there would need to be investment in new equipment and extra labour. For many farmers that size centred on the
family unit, with the women of the household charged with the responsibility of converting milk into saleable cheese. Expansion of production would mean employing a dairy maid and extra hands for milking who could not be used effectively elsewhere on the farm. This raises the question of whether there was an optimum farm size for cheese-making. In a region where well over 80% of the land was tenanted, much of it on medium or large estates on which land could be re-apportioned into effective units, it is interesting that the areas with the smallest average farm size should be most committed to dairying. Those areas also had the highest rainfall and heaviest soils making them more suited to a grassland economy. The evolution of farms is beyond the scope of this study, but the question of the relationship between physical environment, farm size and farming economy, is seen to be of some significance in an analysis of agricultural change. The Agricultural Returns revealed a quite distinct difference between the mixed farming economy on the larger farms of the lighter soils in the south east of the region compared with the specialist dairying on the smaller farms of the Red Marls in the north west.

The development of free trade in agricultural produce after 1846 soon had its effect on the farmers of south west Derbyshire. In competition with American cheese imports they suffered from two serious weaknesses in their methods. Farmhouse cheese varied enormously in quality, Professor Sheldon, in evidence to the Royal Commission, claiming that for every good cheesemaker there were ten indifferent or poor producers. The second weakness was in the system of marketing which was totally disorganized in the sense that no farmers' organization was involved in linking producer with retailer. The Americans had overcome both problems by developing a factory system of production which ensured uniformity of quality, and a streamlined system of exporting to England which, while it did not match the efficiency of the slightly later Danish system of butter exports, was sufficiently well organized to ensure that American cheese could be sold at prices that English farmers found difficult to match. So American cheese was in demand on account of both quality and price. The obvious solution was to develop cheese factories in Derbyshire. Purpose-built factories required capital investment either by landlords or by farmers forming co-operatives. The long term future of factories was thought to be more secure if farmers had a financial stake in their development,
ensuring that they were fully supported. But the early factories were experimental, their potential profitability unknown, and needed risk capital provided by landlords. The district was not short of such people. In Lord Vernon of Sudbury and the Hon. Edward Coke of Longford (second son of Coke of Norfolk) they had two of the most progressive landlords in the country anxious to develop the factory system. There were other enthusiasts, most notably John Coleman and Gilbert Murray agents respectively to Lord Scarsdale and the Earl of Harrington. With that sort of financial backing and administrative expertise the initial developments posed no problem. If the whole district could have converted to factory production the quality problem would have been solved and the marketing system organized to the benefit of the producer. There would then have been an advantage over imported cheese because Derbyshire lay so much nearer to the market. How unfortunate it was that in the crucial early years of factory development from 1870 the London milk trade reached out to the North Midlands.

Railway milk in the early years of the trade provided rich rewards. London was short of milk and prices reached levels that the cheese trade could not match. It also carried no penalty for inferior milk with a low fat content, unlike cheese and butter making. It probably assisted the change to Shorthorns from the quality producing Longhorns. But there was a price to pay for those who took this seemingly easy option: dealers required a level supply throughout the year. Thus the milk contract necessitated quite major changes in the farming year. Instead of concentrating on maximum output on summer grass, it became necessary to produce milk throughout the winter. Winter milk production demanded different methods of feeding using much greater quantities of cereals and purchased "artificial" foods such as linseed cake. It also demanded an unattractive work regime with much of the morning and evening milking done in the hours of darkness, and the journey to the station also undertaken in darkness. In the early years before milk cooling methods had been improved that journey was undertaken twice a day. It is not surprising that farm labourers found the system unattractive, as did many farmers who were close enough to the railway to participate.

The most damaging aspect of the milk trade was that it divided interests. Without it, the cheese factory movement would almost certainly have
prospered, would have been able to compete effectively with foreign competition, and would have provided a reasonable living standard for farmers even in the depths of depression in the 1890s. The milk trade prevented that happening. Instead it provided rich pickings for the early adopters, but had itself run into trouble by the mid 1880s. By then, so many farmers throughout England had turned to milk, as cereal prices slumped, that there was surplus summer production. That surplus could not be channelled into cheese and butter production because imports were so competitively priced. In effect, the development of the milk trade meant that the cheese and butter trade was virtually abandoned to the foreign producer. Yet the two would have run most effectively together allowing surplus milk to be manufactured, as in fact did happen at some of the factories. The lack of co-ordination depressed milk and cheese prices and contributed to the difficulties experienced in the 1890s.

The depression in agriculture did not affect the Derbyshire producer - apart from the adverse weather of the late 1870s - until about 1885. From that time onwards concern began to be expressed at farmers meetings and in local newspapers. That concern was partially about the falling price of cheese, beef, and mutton, but principally it was about the price of milk. Publicity about milk prices was partially due to the formation of a producers' organization - the Derbyshire Dairy Farmers Association. That body involved itself initially with solving problems associated with distant and sometimes unscrupulous dealers, but in the 1890s it became much more concerned with a form of price fixing by recommending minimum prices. If all producers had been members it would have attempted to force its recommended price on London dealers by withholding supplies, effectively a milk strike. Its membership was never more than a small proportion of milk producers, and it has been shown that many of those members lived on the larger farms particularly in the south-east of the region. It never really represented the small family dairy farmer and it was never a very effective organization in influencing prices, although it did much good work, for instance, in preventing railway companies from exploiting their monopoly carriage situation. If the Derbyshire Dairy Farmers Association was more representative of the larger farmer, what credence can we place in its assertains that dairy farming in Derbyshire was depressed in the last fifteen years of the century? This question is relevant to the more generally held view that dairying profited at that
time because the cost of purchased cereals fell sharply, because the price of milk fell less than the average rate of deflation, and because the market for the product expanded. Examination of all the major costs and revenues of a typical 100 acre farm, using average figures for the district, has revealed that major savings were made because of the lower price of purchased foods. However, the fall in revenue caused by lower prices for milk and livestock far outweighed the savings on feedstuffs, and rent reductions were apparently obtained to offset the fall in revenue. These were of the order of 10-15% according to a survey conducted in 1893, which was rather less than the average for the county claimed by the Inland Revenue Commissioners. Evidence from estate records points to an even lower figure, even though that evidence relates to the estates of large landowners who were in a position to grant rent remissions. Thus, the evidence available suggests that South Derbyshire agriculture was experiencing financial difficulties, especially in the 1890s. This is contrary to Fletcher's findings for Lancashire where there was a similar emphasis on dairying. In Lancashire there was little evidence for rent reductions, prices were similar to Derbyshire, and the only significant difference was a major reduction in railway rates, an advantage not enjoyed in Derbyshire. Fletcher confidently asserts that "no great depression of agriculture existed in Lancashire during the last quarter of the nineteenth century". It would be difficult to make such a judgement about south west Derbyshire even allowing for the hyperbole of the Derbyshire Dairy Farmers Association. It is not claimed that conditions were anything like as bad as those experienced by the cereal farmers of Eastern England, but that prices deteriorated in the late 1880s to a point where only the most efficient farmers made reasonable profits. However, a major question is left unanswered. It is fairly certain that, in the production of cereals, beef, and mutton, farmers became financially worse off. But dairy farmers had an opportunity to maintain or improve their income by improving the milk yield of their herd. Fletcher assumed an increase of 20% in his Lancashire study, and it has been shown that a similar increase in Derbyshire would have more than offset any price reductions. Thus it is possible to assert that conditions in Derbyshire were almost identical to Lancashire. Prices deteriorated, but dairying, almost alone of the various farming systems in England, provided the opportunity for financial advancement by herd improvement. Progressive farmers undoubtedly took that opportunity, but whether average milk yields
for the whole district increased substantially is open to question. If they did then the campaign to improve prices was completely false.

In Chapter 1 it was shown that the late nineteenth century was a period when prices in general fell. This fact has been ignored in ensuing discussion, but obviously it is relevant to income levels. Precise cost-of-living figures are difficult to determine, but it may be said that a man farming 100 acres enjoying an income of £80 to £90 in the 1870s would be equally as well off in the 1890s if his net income dropped to £60 to £70. However, there are other factors which should be considered. In the same period labourers wages were rising, and a skilled stockman would earn between £50 and £60 by the 1890s. Additionally, tenant farmers had capital invested in the farm of the order of at least £8 per acre. On the 100 acre farm this represented £800, which would yield £40 at 5% interest. Thus it might be argued that allowing for his own labour, management skills, and capital investment, the farmer should expect an income approaching £100 per year.

One of the most interesting results of the analysis of the Agricultural Returns is the clear evidence that the larger farms of the Trent Valley and parishes to the south did not switch to milk production in any substantial way. They had their milking herd, but beef, mutton, and cereals remained important despite the much greater fall in prices of those products. One can only speculate on the reasons for such apparent rigidity. Uncertainty about future prices is one factor, but that would not last for a decade. One suspects that farm size is an important element. Dairying is labour intensive, and a switch in that direction might upset the balance of work on the farm. It is also possible that the farmers wished to keep options open rather than become tied to dairying. Farm buildings might also be inadequate for intensive dairying.

One is also struck by the lack of intensification in the late 1880s and the 1890s. Lower profit margins were not met by increased stocking rates, and, again, there was a contrast between the north west of the region where dairy animals increased by some 10%, and the south east where, at least in some parishes, there was a decline in production. The solution in the south east, which, by analogy may be compared with eastern England, was to economise by reducing expenditure. Further study into the
employment of labourers might be revealing in this context. In the north west, the addition of two or three cows to the milking herd would have little impact on labour requirements.

The results of this investigation reveal scope for further study. It has not been possible to establish whether distance from railway stations led to a distinction between milk producing areas and more remote cheese producing areas in the period before milk collection became more commonplace. The Agricultural Returns, using the parish as the base area, are too generalised to establish how individual farmers reacted to changing economic conditions. Throughout the study, farm sizes in the northern part of the region are taken to be smaller than in the south, but this is a broad generalisation. It would be interesting to see how the many large farms in the north fared during the 1890s.

In completing the study there were many problems relating to availability or existence of data. The prices of produce which appeared regularly in Derby markets - beef, mutton, butter, eggs, fruit, etc - posed no problems as they were recorded in the local press every week, but the main commodities under study - cheese and milk - were marketed in a different way. Some cheese was sold through factors and such sales were private agreements; some was sold at cheese fairs which provided a guide to prices, although local reporting was inconsistent; and some was sold direct to retail outlets. Apart from the cheese fair reports the main evidence comes from the factories and factors records. Since prices varied by as much as 25% depending on quality, it is exceedingly difficult to establish an average price. Data for milk sales is just as elusive, the contract being a private bargain. It is unlikely that contract prices varied as much as cheese prices because quality was less important, but reliance has had to be placed on a very limited number of sources, principally evidence to the two Royal Commissions on Agriculture, Summary press notes relating to local agriculture, and reports of the Derbyshire Dairy Farmers Association. Individual farm diaries have been corroborative, but were very limited in number.

Information on rents is not readily available. Estate papers may have full documentation of the rents paid by named individuals, but the address and acreage of the farm is not usually recorded, and it is necessary to
establish those details by reference to tenancy agreements. In this study the results which were obtained suggest that the use of Inland Revenue data is more appropriate to national variations than to a localised study. The issue of farm rentals is of significance in agricultural history, but the collection of precise data, and the interpretation of the data, bearing in mind the variations relating to farm size and landlord's capital investment as well as regional variations, is complex.

The use of a model 100 acre farm to illustrate profitability by bringing together details from the Agricultural Returns and contemporary prices was seen to be useful in appreciating the balance of farm costs and revenues. The very simple format used is effective only if the Agricultural Returns fairly reflect the farming year. Thus for arable crops or for a dairy herd it may be used with confidence. It is less useful where the farming system employs a short cycle of purchase and sales, for instance where livestock are being fattened for market. The model could be developed further to establish more precisely the more incidental expenses of the farm.

In attempting to assess the well being of agriculture in south west Derbyshire the greatest frustration lay in the lack of evidence on milk yields. While it could be shown that farmers who remained static suffered a severe depression in their incomes, it is unlikely that they did not respond to the challenge of improving output. The extent of that improvement is crucial to any conclusion that is reached, but no information other than general estimates was available.

The results which have been obtained, and the inadequacies which have been exposed, all point in one direction. To achieve a more comprehensive view of the state of agriculture in the late nineteenth century it would be necessary to investigate at the level of the individual farm, by examination of farm accounts and diaries on a much broader basis than has been possible here. Such sources would yield far more information about the processes of agricultural change than could even be elicited from the interpretation of Agricultural Returns and price series.
APPENDIX 1

Farm Size (Map 6) (see page 126)

The Agricultural Returns recorded farm size in broad categories only in the year 1870. Therefore no comparison with later years is possible. A distribution map is included, but it is accepted that it is only a generalization as no allowance could be made for farms lying across parish boundaries, and the varying size of parishes is also unhelpful; the smaller the parish, the less reliable is the result.

The method of working is best described by reference to one parish, Cubley.

<table>
<thead>
<tr>
<th>No. of Farmers</th>
<th>Farm Size in Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td>Cubley 1870</td>
<td>48</td>
</tr>
<tr>
<td>Total parish area (calculated from the crop returns): 2351 acres</td>
<td></td>
</tr>
</tbody>
</table>

The assumption was made that farms of less than 20 acres were part-time holdings, and these were removed by assigning an average size to them as follows:-

17 farms of 0-5 acres : $17 \times 2\frac{1}{2} = 42\frac{1}{2}$ acres

13 farms of 5-20 acres : $13 \times 12\frac{1}{2} = 162\frac{1}{2}$ acres

Area occupied by farms of less than 20 acres = 205 acres

Parish area occupied by farms of more than 20 acres = 2351-205 acres

The average farm size is $\frac{2351-205}{3+6+9} = 119$ acres

This method presents a more realistic assessment than the alternative of including all the small-holdings. When that is done the average farm size is 48 acres.

The second map (Map 7) is a simple expression of the number of farms larger than 100 acres. Cubley had eighteen farms of more than 20 acres, nine of which (50%) were over 100 acres. A simple classification has been used to highlight parishes of large farms and parishes of small farms.
Grassland 1870 (Map 8)

Permanent and rotational grassland are not differentiated on the maps. Although "seeds" or rotation grass crops are important in the cycle of arable crops, in terms of grazing land and hay production the distinction is less significant. Furthermore, as the general tendency was for the amount of permanent grass to increase, the distinction between perennial seeds and permanent grass is a fine point, and largely irrelevant to this study.

Grassland is expressed as a percentage of the total area, and classification selected by inspection of a dispersion diagram in order to give a "best fit" map.

Grassland: 1870-95 (Map 9). Here the change is depicted as a percentage of the total land area. This enables one to assess the increase or decrease per 100 acres: inversely it shows the changing acreage of the arable land.

Hay: 1870 (Map 10)

Again, seeds and meadow are indifferentiated. The purpose of the map is to illustrate the proportion of land from which a hay crop was taken and to illustrate the variations in this proportion across the study area to establish where most winter fodder was produced.

Hay: 1870-95 (Map 11)

Here, the percentage change in hay crop area is shown. This gives much higher figures than expressing change as a percentage of total land area. The purpose is to establish what increases (decreases in a few parishes) took place in the production of hay. This may be a pointer towards establishing the number of livestock wintered on farms.

Cereals: 1870 (Map 12)

The acreage of the four cereals, wheat, oats, barley, and rye, is expressed as a percentage of the total farmed area.
Cereals: 1870-95 (Map 13)

This map is presented in a similar way to Map 11. It attempts to show the decrease in the production of cereals by expressing change as a percentage of the 1870 figure. Since most of the cereal output was fed to livestock on the farm, this map gives some indication of the decrease in concentrates produced locally.

Milk Cows: 1870 (Map 14)

In order that a density map could be produced it was necessary to standardise the data by relating the total number for each parish to the area. The unit area chosen is 100 acres so that there is an immediate relationship with the crop maps.

Milk Cows: 1870-95 (Map 15)

The change in the number of milk cows might have been expressed as a percentage value, but it was considered more useful to show the actual change in numbers per 100 acres.

The greatest difficulty with these two maps is in the interpretation of the data. Cattle were recorded under three headings: cows and heifers in milk or in calf; cattle over two years; and cattle under two years. The assumption is usually made that the second category were not destined for the milking herd, but were being reared for beef. Unfortunately, this distinction is likely to be erroneous, and some cattle aged over two years might be 'followers' or future milkers. This is not important in the context of the size of the milking herd, but it does make any distinction between dairying animals and fattening cattle no more than a generalization.

Sheep: 1870 (Map 16) and Sheep: 1870-1895 (Map 17)

These two maps have been compiled using the same method as Maps 14 and 15.
APPENDIX II (see page 156)

Feeding Requirements

Taking the recommendations of Gilbert Murray* for efficient production of milk, the daily rations for the milking herd are:

**Winter Feeding (200 days)**
- 20 - 26 lbs chopped hay and straw
- 16 - 20 lbs roots
- 8 - 12 lbs steamed cereals, brewers grains, and linseed cake.

**Summer Feeding (165 days)**
- Fresh grass
- 3 - 4 lbs cereals and brewers grains

The requirements of one cow are:
- 4600 lbs hay and straw
- 3600 lbs roots
- 2577 lbs concentrated foods

Additionally, the farm supports other livestock which are fed less intensively. For the purpose of calculation the total requirement of all the other livestock is taken as equivalent to 5 cows for the concentrated foods and roots, the rest of the food being home produced.

**Total requirement**

Hay and straw: assume that all is home produced
- roots: \(3600 \times 25 = 90,000\) lbs = 40 tons
- Concentrates: \(2577 \times 25 = 64,425\) lbs = 28.75 tons.

*Murray, G. J.B.D.F.A. Vol X Pt.II (1895) pp.16-40
The produce of the farm

National average yields and prices* were

<table>
<thead>
<tr>
<th>Crop</th>
<th>Yield</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>16 cwts/acre</td>
<td>6s 6d</td>
</tr>
<tr>
<td>Barley</td>
<td>16 cwts/acre</td>
<td>7s 0d</td>
</tr>
<tr>
<td>Oats</td>
<td>14 cwts/acre</td>
<td>6s 3d</td>
</tr>
<tr>
<td>Roots</td>
<td>13 tons/acre</td>
<td>-</td>
</tr>
</tbody>
</table>

3 acres of roots yields 39 tons.
12 acres cereals yields 9 tons.

Total requirement | Home production | Self Sufficient
Roots 40 tons  | 39 tons         | 20 tons purchased
Cereals 28.75 tons | 9 tons         |

The value of the purchases was lower in the 1890s than at any other time. Linseed cake fell to £5 per ton and brewers grains could be purchased even more cheaply; especially in the summer. The total value of 20 tons therefore, is placed at £100. This is in line with Finney’s evidence to the R.C.A. that a farm with one third arable would be self-sufficient.

*Min. of Ag., Fisheries, & Food A Century of Agricultural Statistics, 1866–1966
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