THE DEVELOPMENT OF ENGLISH DAIRY FARMING, c. 1860 – 1930, with special reference to Wiltshire.

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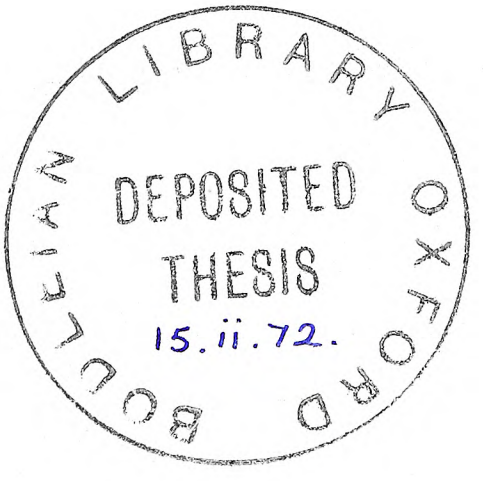

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Abstract

I

A notable change in diet in the past century has been the increased per capita consumption of milk. The dairy industry, therefore, considered from the point of view of either the producer or the consumer has been one of the most important parts of the agricultural sector. Nevertheless, dairy farming has been largely ignored by agricultural and economic historians. It is, therefore, the first purpose of this thesis to attempt to fill the gap by examining the development of the English dairy industry between the years 1860 and 1930. There is, however, a second purpose: namely to concentrate upon a particular area, Wiltshire, and to look at certain leading farmers, all of whom were engaged in the milk trade, with the intention of defining, as far as possible, the characteristics of such progressive farmers.

The statistical framework, based largely upon the evidence contained in the yearly Agricultural Statistics and the three censuses of agricultural production, is given in chapter two and shows the growth in the size and output of the national dairy herd. The number of cows and heifers increased from 1.4 million in the years 1866-70, to 2.4 million in 1926-30. During the same period net yields per cow and heifer in milk or in calf rose from some 350 gallons a year to 460. The overall effect was a doubling of the total output of the dairy industry in the course of sixty years. The value of this output is also estimated and, although the final figures vary from an earlier estimate made by Fletcher, the calculations leave little doubt as to the importance of the dairy industry. In the course of the period under review the percentage of gross agricultural

output from all milk rose from about 20 percent to 25 percent. More important than this overall figure is the fact that there was a marked change in the structure of the dairy industry. In rough figures butter and cheese manufacture accounted for some 70 percent of total output in the 1860s. By the turn of the century 70 percent of total output was in the form of liquid milk. In the post war years the position was that liquid milk accounted for 80 percent of available supplies, from the farm house cheese some 5 percent, and butter some 10 to 15 percent.

The analysis continues with a study of the various types of dairy farms and their varying fortunes. Thus one sees the rise of the suburban milk-selling farm, achieved at the expense of the urban cowhouse as well as the movement into milk production on mixed farms, and the conversion from traditional butter and cheese making on the dairy farms of the western counties of England. The economic forces behind these changes are examined in greater detail in the following chapter. The cost structure of the industry is defined and profitability assessed by comparing a feed/wage index with an index of wholesale prices for milk and cheese. The crisis of the 1870s emerges clearly from these figures, as does the overall profitability of the enterprise.

The general survey is completed with a chapter on technical change (which shows the limited nature of such change in the dairy industry and the comparitively late adoption of the milking machine) and a chapter on the marketing of dairy produce (which shows the rise of the large combines at the expense of the small men who had characterised the trade in the mid nineteenth century).

Taken overall the development of dairying, and the transformation

of the structure of English agriculture, can be seen in terms of the impact of two great forces: the internal pressure of demand and the external pressure of competition. The increasing volume of corn imports, reducing prices to levels at which the English producer could not compete, forced men to look to livestock husbandry. A similar increase in imports of butter and cheese, and later, meat, threw into sharp relief the benefits of the naturally protected market for liquid milk. The dairy farmer also stood to gain from changes in overall demand. Population was growing, the level of real wages was rising, and there was a greater awareness of the dietetic value of milk. Although there was an uneven distribution of the growing national wealth it is true, generally speaking, that a large percentage of the population were better off in 1900 than in 1860, and better off in 1930 than 1900. With more money to spend there was a tendency to spend a smaller percentage of overall income on food, but a greater proportion of that money devoted to food on proteins rather than on starches. In England there was a marked preference for proteins in the form of meat, but tastes did change thus adding to the rise in per capita milk consumption. Together these factors brought about the emergence of dairying as the most important single enterprise in English agriculture.

Against this background is placed the case study of Wiltshire. The general agricultural background for the county serves a dual purpose. First, it shows how one particular county responded to national trends. Second, it provides an introductory backcloth for a detailed investigation of the careers of certain leading farmers. Two types can be distinguished

from the evidence: the early adopter/innovater characterised by large farms and large incomes, a high level of education and a wide range of local and extra local contacts, and high socio-economic status; and the early majority adopter, characterised by average sized farms and a correspondingly lower gross income, a lower level of education and fewer extra local contacts, and medium socio-economic status. Both groups, however, are characterised by a strong psychological drive to succeed.

II

There are several major points that emerge from this thesis. The first is chiefly a point of historiography. The bias of the Royal Commissions has been commented upon before, but it is rarely mentioned that a later generation of agricultural historians also suffered from a similar mental block that gave rise to a monolithic view of agriculture, associating it almost exclusively with the growing of corn. Perhaps the best example of this attitude is afforded by Lord Ernle, who had less than a dozen references to dairy farming in the chapters covering the late nineteenth and early twentieth centuries. In view of the importance of dairying this omission is a striking one.

Second, the assessment of the profitability of dairying merits special attention, in that there are no other comparable figures for other branches of agriculture. All too often it is asserted that a particular enterprise was, or was not, profitable with little attempt made to show either the degree of profitability or the reasons behind the fortunes of the particular form of husbandry. In the case of dairying the figures suggest that the simple assertion of the profitability of milk selling is inadequate. This is not to say that milk did not pay better than cheese, beef, and mutton for much of the time, but it is important to note that the 1890s were years of real crisis when the milk seller fared worse than other livestock farmers. Equally one must stress that the relative success of the dairying in the inter war years was put into something of a false light by the intervention of the government at a time of crisis, which enabled the industry to sidestep the problem of overproduction.

Third, attention should be drawn to the section on certain leading

Wiltshire farmers. The questions associated with the diffusion of innovations has attracted considerable attention in America and, to a lesser extent, in Britain. Not surprisingly the work has been concerned with present day studies rather than with historical problems. The Wiltshire study attempts to approach the old problem of what provided the springs of action in a different light. One must beware of generalising from a limited basis, but the evidence from Wiltshire shows the importance of the early adopter/innovator and the early majority adopter in the process of change.

III

It would be misleading, however, to suggest that the present study is "complete". The thesis reveals certain weaknesses which apply more generally to modern agricultural history. The basic problem is one of the availability and reliability of evidence. The most serious problems arose when examining the factors influencing the demand for milk and milk products. For the forty years after 1860 there are hardly more than half a dozen estimates of per capita milk consumption, while even for the inter war years the data is not wholly satisfactory. Consequently it was necessary to fall back upon calculations based upon other material. For example, by dividing the total amount of milk offered for sale by the population of the country at various dates it was possible to get an indication of the probable position, but to suggest that these figures give anything more than an approximation would not be justified. To a lesser extent it was difficult to find reliable figures for milk yields. Many estimates from contemporary writers were obviously inaccurate, but there was no alternative but to use them as the basis of plausible calculations for the mid nineteenth century.

Similarly, there was a problem regarding prices. By collating figures from different parts of the country a general average was calculated for use in the assessment of gross output from milk. The degree of error was unlikely to have invalidated the conclusions on output. More serious was the almost total lack of figures relating to such by products as whey and whey butter. Overall the wage/feed index gives a good indication of the general fortune of the dairy farmer, but in many cases the income from by products meant the difference between financial success and failure. Lacking the necessary data the assessment of

profitability must necessarily be more tentative than one would wish it to be.

Likewise, there is a comparable crudity in the analysis of cheese manufacturing. Although the general outline is clear one would like to know more of the fortunes of individual cheeses and their makers. However, owing to the pressure of time, it was not possible to collect sufficient data to plot the fortunes of, say, Cheshire, Stilton, or Lancashire cheese. In the one case where an attempt was made to collect a set of figures (the case being that of Cheshire cheese) it was fourd that the local press did not contain sufficient information to give a comprehensive coverage of the period.

More generally, one must draw attention to the absence of comparably detailed figures for other branches of agriculture with which to compare the dairy farming data. Sheep and beef farming have not been studied in any detail by agricultural historians. Consequently it is difficult to make anything but the most general comparisons. This was most obvious when discussing profitability. To overcome this shortcoming the price of middling beef and mutton was compared with that of milk and with the wage/feed index constructed for the dairy industry. The comparisons, however, can only be tentative ones as no attempt was made to allow for the value of wool and it was not possible to take account of varying wage/feed indices for beef or mutton production.

Lastly, one must not overlook the limitations of the evidence from the interviews. As well as the normal problems associated with interviewing it must be remembered that only a small sample of men were considered. Although a large amount of material was collected in this

way it was the evidence of twenty men only, and in the absence of a control group one must beware of unwarranted generalisations.

Having dwelt at some length on the limitations of this thesis one must not lose sight of the main conclusions. First, the period 1860 to 1930 saw the rise of the liquid milk trade as the most important single enterprise in English agriculture. This rise was the result of a complex interaction of supply and demand factors that created a new situation within which the farmer had to work. On the demand side growing population, rising real wages, and changing tastes favoured the dairy farmer. On the supply side conditions were also to his benefit. Prices and costs fell in all spheres of agriculture, but the naturally protected market for liquid milk gave the dairyman a definite advantage over his fellow farmers. Although the potential growth was curbed by a combination of factors, such as rigidities in the structure of farming and ignorance on the part of consumers, the overall effect was to consolidate the position of the dairy farmer as the most important member of the agricultural community.

Second, looking particularly at the spread of dairying in Wiltshire, one can see the importance of the early adopter/innovator in introducing ideas, and the early majority adopter in popularising them. The process of change is a complex and interesting one. The present study is intended to throw some light upon it, but the firmest conclusion that emerges from this thesis is that there is an urgent need to carry out more work on this aspect of agricultural history.

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ABBREVIATIONS

Ag.Gaz.	Agricultural Gazette
Ag.H.R.	Agricultural History Review
Ag.Mkt.Rep.	Agricultural Market Report
Ag.Stats.	Agricultural Statistics
Ec.H.R.	Economic History Review
F.M.	Farmer's Magazine
J.B.D.F.A.	Journal of the British Dairy Farmers' Association
J.B.W.E.S.	Journal of the Bath and West of England Society
J.F.C.	Journal of the Farmer's Club
J.M.Ag.	Journal of the Board (later Ministry) of Agriculture
J.R.A.S.E.	Journal of the Royal Agricultural Society of England
J.R.S.S.	Journal of the Royal Statistical Society
J.Soc. of Arts	Journal of the Society of Arts
Manchester School	Manchester School of Economic and Social Studies
Parl.Papers	English Parliamentary Papers
R.C.Ag.	Royal Commission on Agriculture

Note: all costs and prices are given in old pence.

INTRODUCTION

I

It is the purpose of this thesis to examine the development of the English dairy industry between the years 1860 and 1930. The period is characterised by two major factors. The first and more general point is the attitude of successive governments. Between the repeal of the Corn Laws in 1846 and the advent of the first agricultural marketing act in 1931 every government followed a policy of non-interference in agricultural affairs. Thus, British agriculture was open to the full force of world trends for 85 years, during which time profound changes took place in its structure. The latter date, is therefore, determined by the end of laissez faire policies. The starting point relates to the second factor - namely the rise of the liquid milk trade. This trend, which emerges about the late 1850s, not only transformed the structure of the dairy industry but also provided a new cornerstone in British agriculture.

The importance of agriculture in the formative years of industrialisation has been stressed by economists for several years. Johnson and Mellor summarise the contribution in the following prepositions.[1] First, economic development is characterised by a substantial increase in the demand for agricultural products, and a failure to expand food supplies at the same rate as the growth in demand can seriously impede economic growth. Second, the expansion of food exports may be one of the best means of increasing income and foreign exchange earnings, especially in the early stages of development. Third, the labour force for manufacturing and

1. D.F. Johnson and J.W. Mellor in G.M. Meier, ed., Leading Issues in Development Economics, (Oxford, 1964), 291-7.

other expanding sectors of the economy must come in the main from agriculture. Fourth, agriculture as the dominant sector in an underdeveloped economy should and can make a net contribution to the capital required for overhead investment and for the expansion of secondary industry. Fifth, the rising net cash income of the farming population may be important as a stimulus to industrial expansion. Moreover, historians have been applying these ideas to the particular experience of England. In the introduction to Agriculture and Economic Growth in England, 1650-1815,[2] Jones deals with the matter under three main heads. The first deals with the supply of food and raw materials. As the results of improvements in technique and organisation English agriculture proved very responsive, and thus did not act as a barrier to economic growth. The second major concern is with the release of factors of production. The idea that agricultural change released labour, which was the basis of the new industrial force, has for long been accepted as the major contribution to economic growth made by the agricultural sector. In fact, as Professor Chambers pointed out as long ago as 1953, the newer systems of husbandry were more, rather than less, labour intensive. Although industry creamed off part of the surplus growth of rural population it must not be forgotten that the absolute number of people employed in agriculture increased until the mid-nineteenth century. Of greater importance was the contribution in the form of entrepreneurial skills and capital from agriculture to industry. The evidence is not wholly conclusive but 'the balance of probabilities is that agriculture did make a net contribution to the formation of

2. E.L. Jones, Agriculture and Economic Growth in England, 1650-1815, (1967).

industrial capital and did release entrepreneurs who played a significant role in industrialisation.'[3] Lastly, the importance of the income effects of agricultural change and the development of a market for industrial goods is considered. Little work has been done on this subject but it seems reasonable to argue that by keeping food prices low and thus releasing money to buy manufactured goods, and as a result of the increase in the total income received by the farming community agriculture played an important part in the expansion of the domestic market.

However, although the number of works on English agriculture has increased in the past few years there is still a lack of balance in the treatment of the subject; a lack of balance that reflects certain blind spots in our knowledge. There is particular ignorance of the detailed fluctuations and structural changes that took place after the initial phases of industrialisation. All too frequently one finds agriculture discussed as if it were synonymous with the growing of corn. Throughout the 85 years after the repeal of the Corn Laws when agriculture was left to face the buffets of world competition unaided the pre-occupation is with the arable farmer. Yet the wheat crop contributed only 15.4 percent of gross agricultural output in the United Kingdom in the years 1867-9, and a mere 4.1 percent in 1911-13.[4] Such an ill-balanced view of British agriculture throws into doubt the reliability of the "text book" view of these years. Lip service is paid to the improvements in stock that took

3. Jones, op.cit., 36.

4. calculated from E.M. Ojala, Agriculture and Economic Growth, (Oxford, 1952), 208.

place, but there is little advance beyond the "bigger and better" approach to the history of livestock husbandry. But if livestock farming generally is underwritten, dairy farming is scarcely mentioned.

No-where is this neglect more apparent than in the general economic histories of the period. The one book attempting to deal statistically with long term economic growth, Deane and Cole's British Economic Growth, 1688-1959,[5] has only two references both to the increasing imports of dairy produce, one in the late eighteenth century the other for 1879. Ashworth[6] runs to five references, three of which talk of the import of cheese and butter. The other two refer to the increased demand for meat and milk and their limited consumption by the poor. Similarly, Chambers has little to say about dairy farming after Repeal except that it 'was beginning to respond to the growth of knowledge of scientific feeding for milk production.'[7] Sayers, looking at the years 1880-1939, has a little more to say but beyond the mention of Scots in Essex, increased imports of dairy produce, and the growth of the rail-borne milk trade there is only the view - unsupported by figures - that 'only milk remained generally profitable.'[8] However, in the latest general economic history of Britain Mathias[9] fully acknowledges the importance of dairying but such is the state of knowledge that only the briefest coverage is given. This is true of the twentieth century as much as for the nineteenth. Pollard[10] has

5. P. Deane and W.A. Cole, British Economic Growth, 1688-1957, (Cambridge 1952) 32, 74.
6. W. Ashworth, An Economic History of England, 1870-1939, (1960).
7. J.D. Chambers, The Workshop of the World, (1968), 58.
8. R.S. Sayers, A History of Economic Change in England, 1880-1939, (1967), 110.
9. P. Mathias, The First Industrial Nation, (1961), 345-7.
10 S. Pollard, The Development of the British Economy, 1914-1950, (1962), 140.

only one reference to dairy farming. Concerned chiefly with the establishment and work of the Milk Marketing Board, he gives a very brief coverage of trends in the 1920s and fails to get below the surface of the subject - the implication of his argument being that conditions were satisfactory until the slump in world prices of butter and cheese; an interpretation that ignores the basic problem of oversupply of liquid milk that characterised the dairy industry throughout the decade.

More striking is the limited coverage to be found in agricultural histories. Lord Ernle's English Farming: Past and Present, for long the Bible of English agricultural historians, contains less than a dozen references to dairying in the nineteenth century and twentieth century. In the well known chapter XVII, High Farming: 1837-1874, the only reference declares that 'during the period from 1853 to 1874 little attention was in England paid to improvements in dairying.'[11] However, for the years 1890-1910 'the chief development....was concerned with milk, the demand for which was continuously increasing with the growing population and industrial prosperity.'[12] Mention is made of technical advances, improved breeds, and the enforcement of standards of hygiene but there is little attempt to assess their effects. Similarly, there is a general statement observing that 'the English dairy farmer could get a better return by selling milk and abandoning the butter market to their foreign and colonial competitors.'[13] The statement in itself cannot be queried

11. Lord Ernle, English Farming: Past and Present, (1961), 375.
12. ibid., 389.
13. ibid., 389.

but there is no indication of the relative prosperity of the various branches of dairying nor of the reasons for these changes in fortune nor of the type of person involved. Even for the 1920s when figures are more readily available, there is only a general comment - this time referring to the instability of the liquid milk market resulting from increased supply and stagnant demand - with none of the detail bestowed upon the arable farmer and his wheat prices.

The same criticism can be applied to a lesser extent to the other standard text, Orwin and Whetham's History of British Agriculture, 1846-1914. The coverage of dairy farming is more comprehensive but the treatment is essentially descriptive. The only attempt to evaluate the contribution from dairying is the reference to the 1908 Census of Production, but no attempt is made to link this with earlier estimates made by Morton[14] and Row.[15] Equally, the profitability of dairying is asserted rather than proved. This failing is all the more disappointed as Miss Whetham had previously written a useful article[16] on some aspects of the London milk trade. The most useful coverage is Cohen's History of Milk Prices, written in 1936.

14. J.C. Morton was a noted writer on agriculture in the middle decades of the nineteenth century. In his youth he attended David Low's agriculture classes at Edinburgh University where he also won first prize in mathematics competition. A member of the Royal Agricultural Society of England soon after its foundation he was best known as the editor of the Agricultural Gazette. During his lifetime he was responsible for several articles on dairying as well as for several books on the subject, one of which was written in conjunction with James Long, another prolific writer on agricultural subjects.

15. Henry Row first started writing on agriculture in the 1860s when Morton was reaching his peak. As a member of the Royal Statistical Society Row delivered several papers on the production and consumption of milk and milk products based on a wide range of individual research. He later joined the Board of Agriculture and was responsible for much of the detail in the yearly Agricultural Statistics.

16. E.H. Whetham, "The London Milk Trade, 1860-1900", Ec.H.R., 2nd.ser., xvii, (1961), 369-80.

The detail, showing returns for cheese as well as for milk, is a valuable contribution to any assessment of the dairy industry, but the study is concerned with prices and, therefore, only throws sidelights on the position of the farmer engaged in either cheese-making or milk-selling. The only attempt at evaluating the profitability of livestock farming in general and dairying in particular is Fletcher's article on Lancashire.[17] Following on his more general article[18] it spelt out in detail the advantages that the dairy farmer could exploit. Between the late 1860's and the end of the century the population of Lancashire rose by 50 percent while per capita milk consumption increased by 25 percent. Overall milk prices stayed remarkably stable, except during the depression of 1883-6 and the hard years of the early 1890s. On the input side the dairy farmer enjoyed certain advantages; the total wage bill fell some 15 percent while the cost of artificial feed fell even more dramatically by approximately 40 percent. In these two articles Fletcher went a long way towards redressing the balance that had been lost in earlier writings.

Lastly, one must mention the one book devoted entirely to the English dairy farmer, that by Fussell.[19] For wealth of detail, covering the 400 years from 1500, the book is unrivalled. But facts alone, for all their intrinsic fascination, are not sufficient without analysis. On this score Fussell's book is disappointing. A large body of material has been collected but its potential value has not been realised because of a lack

17. T.W. Fletcher, "Lancashire Livestock Farming during the Great Depression", Ag.H.R., ix, (1961), 17-42.
18. T.W. Fletcher, "The Great Depression of English Agriculture, 1873-96", Ec.H.R., 2nd. ser., xiii, (1961), 417-32.
19. G.E. Fussell, The English Dairy Farmer, 1500-1900,(1966).

of rigorous examination and evaluation of the evidence. Little attempt is made to distinguish between the types of dairy farming and less to differentiate between varying conditions over the country. The importance of local conditions needs to be stressed. There were, for example, several instances of strong local demand for a particular cheese. Lancashire cheese sold well in the industrial towns of the county - a point not stressed by Fletcher incidentally - Caerphilly was made in Somerset for the miners of South Wales while Wensleydale found a steady market in the North East of England. In each case the general downward trend in the quantity of cheese making was offset, to varying degrees, by local conditions. Similarly, local variations in the price of milk were common, particularly before 1914. It would be an exaggeration to argue that there was no such thing as a national market for milk by the late nineteenth century but the differences between one area and another could be considerable. In 1900 the average retail price of milk was 3d. a quart. However, prices could vary from 2½d. in such areas as Keighley, Colne, and Nelson, to 4d. a quart in Liverpool, Manchester, London and the surrounding counties of Surrey and Middlesex. All in all, Fussell's unsystematic approach and lack of a general background severely reduce the value of the work. A review of the book reflected the overall state of knowledge of the subject. 'It would be useful,' it observed, 'to command a convincing analysis of the economic and social incentives, constraints, and rigidities, which are likely to have determined progress'[20] in dairying.

Such a neglect is difficult to understand in view of the importance of dairy farming to producer and consumer alike in the years 1860-1930. In

20. E.J. Collins, Ag.H.R., xvi, (1968), 68.

1908 Sheldon felt justifiably proud in drawing attention to the 'exalted position which dairy farming fills today as compared with forty years ago.'[21] By 1938 Astor and Rowntree spoke of milk as 'the most important product of British agriculture....far more truly the cornerstone of our agriculture than wheat.'[22] Exact figures are not easy to find but clear indication of the increasing importance of the dairy industry can be obtained from the following table.

TABLE 1

Contributions to Gross Agricultural Product in U.K., 1867/9 - 1930/4. (as percentage of total at current prices)

	1867-9	70-6	77-85	86-93	94-1903	04-10	11-13	20-2	24-9	30-4
Wheat	15.4	11.2	8.8	6.2	4.2	4.3	4.1	4.2	3.8	1.9
Beef and Veal	15.2	18.1	19.7	20.2	21.8	21.6	21.3	19.0	18.0	16.6
Mutton and Lamb	11.3	12.1	12.5	12.8	12.7	11.9	11.3	8.8	10.1	10.4
Milk	14.7	15.6	17.3	19.3	20.2	24.4	23.8	27.6	25.4	26.6

Source: calculated from E.M. Ojala, Agriculture and Economic Progress, (Oxford, 1952), 208.

Ojala's work throws interesting light on the changing composition of gross agricultural produce, but the basis of several of his calculations are open to criticism. Fletcher in his article on Lancashire has amended some of the figures, but his attentions were not extended to a consideration of the value of milk, though he does admit that these estimates are probably open to correction. Two points deserve to be made. First, by considering the United Kingdom as a whole Ojala averages out considerable variations. Second, the average price assigned to milk requires careful consideration

21. J.P. Sheldon, British Dairying, (1908), 68.

22. Viscount Astor and B. Rowntree, British Agriculture, (1938), 251.

in view of the variations within England let alone the United Kingdom. Certainly the assessment of the total output from milk is not helped by the arbitrary manner in which the average yield of the dairy herd is arrived at - simply deducting two gallons a year from a base figure for 1908 fails to take into account the "Shorthorn craze" of the third quarter of the nineteenth century and the subsequent improvement in yields.

II

The failure of agricultural historians to recognise the importance of the dairy industry is more comprehensible if considered as an extension of contemporary prejudices at all levels. Despite the long tradition of dairy farming, it was not considered to be a legitimate branch of farming by many members of the agricultural community in the nineteenth century. At best it was a source of pin money, along with the hens, for wives and daughters, at worst it was "dirty boot farming", a low form of life on a par with pig-rearing, and as such to be avoided if at all possible. There were other, more concrete reasons for disliking dairying - it was hard work that continued throughout the year. The arable farmer, though hard pressed at harvest time, had a certain freedom of action, particularly in the dead months at the end of the year. The dairy farmer, however, was tied to his animals seven days a week, fifty-two weeks a year. Come what may the cows had to be milked and it was this unceasing routine that deterred many men from taking up dairying until all else failed. Nonetheless, there was still a definite sense of snobbery about the big sheep and corn barons of south Wiltshire who contemptuously referred to the dairymen as "teat-pullers", and this attitude was shared by many men who could envisage agriculture solely in terms of honest labour behind the plough, and fields of waving corn. This bias played an important role in hampering the change to, and development of, the dairy industry for it was not to be found merely among country farmers. Contributors to the various agricultural journals, the very people one would expect to be the leading thinkers of

the agricultural community, were as guilty of short-sightedness as the people to whom they preached. Despite Caird's prediction in 1849[23] scant attention was paid to livestock husbandry generally. Not until 1877 was there a journal devoted solely to dairy farming and even after that date the coverage given in the agricultural press at large was limited in comparison to the pages devoted to all aspects of arable farming.

Not surprisingly a similar attitude was to be found among the leaders of the agricultural community. This was most evident in the composition of the first Royal Commission on the Agricultural Interest, 1881. The aristocracy were well represented in the figures of the Dukes of Richmond and of Buccleuch, and Earls Spencer and Vernon. All owned large estates in the south and midlands, a not insignificant fact. The fact-finding missions were largely organised from London by the Central Chamber of Agriculture who decided to circularise local chambers and set up committees which would provide the assistant commissioners with the facts of the situation, which were in the opinion of the Agricultural Economist nothing more than 'evidence of fall in profit or fall in output or rise in cost of production'.[24] The witnesses called before the Commission were also far from representative, fourteen coming from the leading corn counties and five from the dairying areas. Moreover, greater emphasis was placed upon the testimony of the former in drawing up the final report. Gladstone once criticised Peel's praise of Cobden on the grounds that 'all that he

23. J. Caird, High Farming under liberal covenants...(1849), 6-7, 25-6.

24. Agricultural Economist, 1 December 1879. Quoted in Fletcher, Ec.H.R., op.cit., 250.

said was true but he did not say the whole truth, and therefore the effect of the whole as a whole was therefore untrue.'[25] The same applies to the first Royal Commission on agriculture. The evidence did show that wheat prices had fallen disasterously. What the evidence did not show, and indeed could not show in view of its nature, was that other prices had not fallen to the same extent, and that costs had also fallen appreciably. However, this was not made clear and the overall impression created was that there was widespread depression in agriculture.

By the time of the second Royal Commission on agriculture, 1894-7, there was a growing awareness of the diversities within agriculture. The growth of dairying was recognised but the full implications of the changes that were taking place were not realised. The bulk of the evidence still related to the undoubted trials of the arable farmer. Not surprisingly the evidence of the commissions led many historians onto the wrong track. The eloquence of these sources appeared to be supported by Sauerbeck's statistics published in the Journal of the Royal Statistical Society, but closer examination reveals a definite bias. The price of American and British wheat was used as part of the index. The emphasis was more on these sources than on animal products, of which milk was not included. Together these sources provide an impressive facade but a misleading one.

25. J. Morley, Life of Gladstone, (1903), vol.1, 292. Gladstone to Lord Stanley in conversation 12 July 1846.

III

As a result of the neglect of the dairy industry by agricultural and economic historians the questions to be asked are often of a very basic nature. One would like to know with greater accuracy the dimensions of the industry and the size of its output. The task is not an easy one as before 1865 there are no official figures, and some of the estimates are of a highly suspicious nature. Even after 1865 problems persist for there is no accurate definition of the national dairy herd. "Cows and heifers in milk or in calf" is only an approximation as this category includes animals on rearing farms where the milk is not used for human consumption in any form. Further, the popularity of the dual-purpose Shorthorn renders impossible any clear cut division between dairy and beef cattle. Secondly, one needs greater detail on the structural changes that took place in the dairy industry. The switch from cheese and butter making to liquid milk production is well known but the chronology of change is a little vague, while the precise size of the various branches at various times through the period is not known. The geography of change is easier to ascertain but even here regional differences have been glossed over in the generalisations of historians.

The essential corollary to this question of supply is that of demand. Very little is known of the per capita consumption of dairy produce. In general terms there was a gradual change in the dietary pattern of the nation during the second half of the nineteenth century. The important point for present purposes is the increase in the consumption of liquid milk. However, having defined the change, the large problem remains.

namely explaining the interaction of factors leading to this change.

Looking more specifically at the dairy farmer other questions present themselves for consideration. It is commonly asserted that dairying, or more precisely milk selling, remained profitable throughout the depression period, but the veracity of this statement is open to doubt when examined in greater detail. The 1870s and 1880s were a period of large scale expansion but the outcome was a state of over-production which, coupled with the disasterous seasons of the 1890s, left some dairy farmers, especially those supplying milk on contract to London, in very dire straits; a point not fully appreciated by later observers. Overall, the reduction in the cost of feed and lower rents must have benefitted the dairy farmer, especially the new arrival, but it is important to look at the problems of labour scarcity, wholesalers' monopolies, and general price fluctuations before arriving at any general conclusions.

Although profitability is of paramount importance one must also look at the question of productivity in relation to the dairy industry. It is commonly held that dairying was the laggard sector in agriculture. In comparison with other branches of rural life, where machinery was ever encroaching, the dairy appeared backward in its use of traditional implements and utensils. Yet advances were made. Better feeding, better care and better breeding raised yields. The milking year was also extended though this necessitated more labour in the production of milk.

Consideration of technical change leads to the last major set of questions to be posed. They deal with the responsiveness of the dairy industry to the changing conditions, and with the type of person involved

in such adaptations. With the benefit of hindsight one might conclude that the striking feature of the years 1860-1930 was not the speed of development but the lack thereof. Favourable demand conditions at a time of heavy competition in certain branches of agriculture should have led to an earlier and more decisive adoption of dairying by the English farmer. In practice things were not as easy as theory might suggest. The problems of identifying and adapting to permanent change is always easier in retrospect. However, the barriers to change have to be defined before the fundamental question of who was responsible for the change can be tackled. A simple economic model can be constructed to show, that, in the conditions of the 1880s or the 1920s, and within the technological limits of those periods, certain branches of dairying were a paying proposition. That this was the case is shown by the changes that followed but one is no nearer distinguishing the successful farmer from his less fortunate bretheren. To attempt to solve this problem it is necessary to explore the psychological factors behind this simple model. No all-embracing answer is possible in the present state of knowledge, but by a detailed examination of some of the farmers in a certain area - in this case Wiltshire - it is possible to throw some light on the characteristics of the innovator and adaptor in farming.

Having posed certain questions one is left with the more difficult task of seeking answers. To a large extent the degree of success is determined by the quantity and quality of available material. Probably the most serious deficiency is the lack of hard figures on the size, composition, and output of the national dairy herd. The official figures provide a guide-line but there is no information on herd sizes or yields.

Instead one is thrown back upon the findings of such people as Morton and Rew, to supplement the yearly Agricultural Statistics. In fact there are many estimates of total numbers, yields, and usages scattered in the writings of the period, but the accuracy of these figures is open to question when, for example, one finds average yields quoted as 660 gallons in the 1870s, a figure that was not attained until after the second world war according to official records.

Similarly, there are problems in ascertaining the costs of, and returns to, dairying. Although price data for cheese and butter exists in the many and murky pages of the local press little attempt has been made to tap these sources. The Agricultural Gazette contains weekly quotations for the London market but this does not indicate the actual size of the returns to the farmer, and even the trend can be distorted by intermediate factors. Much local work needs to be done before the full range of local variations can be appreciated. Milk prices are more problematical. There were great variations throughout the country but, unlike corn prices, it is difficult to find figures relating to the various areas throughout the period. More detail is available for the London market but it would be foolish to generalise on this basis.

Contrary to popular opinion the keeping of records by farmers was quite common. Surviving material is gradually being collected and it is now possible to be more accurate in assessing the cost of enterprises. Unfortunately, many of the record books that have survived tend to be of a general nature, in certain cases acting as both diary and account book. There is little attempt to break down costs and apportion them to the different enterprises. It was the farming system as a whole that mattered,

rather than the profits or losses from component parts. It would appear from these observations that one can only counsel despair. This, however, would be to spurn a challenge that is far from insurmountable. In fact there is a wealth of material buried away in the writings of the period, but it is largely a question of bringing together scraps of material that have been culled from odd sources. Thus, among the lengthy chapters on the agriculture of various counties published in the Journal of the Royal Agricultural Society of England are brief paragraphs devoted to dairying, which when brought together with similar evidence from other agricultural journals yield a good descriptive picture of the change over the years. Similarly, by delving into the evidence given before the Royal Commissions or by collecting the single line references to milk prices in the Agricultural Gazette one can assemble a surprising amount of information to supplement the more obvious sources, such as the Journal of the British Dairy Farmers Association, the Dairyman's and Cowkeepers Journal, and the articles devoted to dairying in the Journal of the Bath and West of England Society.

Lastly, there is the evidence of a local nature coming from such sources as the local press and personal interviews. Ideally one would like to have such evidence from all the major dairying counties but time imposes severe limitations. However, the study of just one area throws interesting light on the overall picture. In the first place one can see in greater detail the variations from the general pattern, but more important one can come to terms with the area, its character, and its people. It is difficult to overestimate the importance of personal contact. A one hour

interview can be more illuminating than a week's reading. As well as collecting valuable insights into the mechanical side of farming it is possible to gain some understanding of the farmer himself, the considerations that moulded his judgement as well as the conditions within which he had to work. In conclusion, therefore, there is a surprising wealth of available material but there is more to be done. The local press has not as yet been fully utilised but, more important by far, there is a generation of farmers still living who can remember back to the first world war, and in some cases beyond. Here is a most valuable source of material, but one that will not last indefinitely. Already the rapid changes of the last twenty five years have obliterated much of the past but we still have a link with those days, a link that must not be lost.

CHAPTER 1

The Changing Economy, 1860-1930.

Before examining in detail the development of the dairy industry in England during these years it is necessary to sketch in the general economic background. Without an understanding of the changing forces to which the agricultural sector was subjected it is difficult to appreciate the full significance of the role played by the dairy farmer.

There is a tendency to talk of the "Industrial Revolution" as if it were a process that had reached completion, and thus had left England a full industrialised nation, by the middle of the nineteenth century. Such an interpretation, however, cannot be satisfactorily sustained. Economic development was a continual process and, although the most spectacular changes had taken place at an earlier date, important structural changes also took place in the economy during the second half of the nineteenth century, and the first decades of the twentieth, as the following table clearly proves.

TABLE II

The Structure of the British national product, 1851-1935. (as percentage of total national income).

	Agriculture, forestry, fishing.	Manufactures, mining, building.	Trade, transport, income from abroad.	Government domestic etc.	Housing
1851	20.3	34.3	20.7	18.4	8.1
1861	17.8	36.5	22.6	17.9	7.5
1871	14.2	38.1	26.3	13.9	7.6
1881	10.4	37.6	28.8	14.8	8.5
1891	8.6	38.4	29.8	15.1	8.1
1901	6.1	40.2	29.8	15.5	8.2
1924	4.2	40.0	35.0	14.4	6.4
1935	3.9	38.0	34.4	17.2	6.5

Source: P. Deane and W.A. Cole, British Economic Growth, 1688-1959, (Cambridge, 1967), 291.

The figures clearly show the relative decline in the contribution from agriculture, the limited increase in the manufactures-mining-building complex, and the steady rise of the transport and trade grouping. These trends are again apparent in the table depicting the changing employment distribution of the labour force.

TABLE III

The distribution of the British labour force, 1851-1931.

(in millions; percentage of labour force shown in brackets)

	Agriculture, forestry, fishing.	Manufacture, mining, industry.	Trade, and transport.	Domestic, and personal.	Public, professional, and all others.
1851	2.1 (21.7)	4.1 (42.9)	1.5 (15.8)	1.3 (13.0)	0.5 (6.7)
1861	2.0 (18.7)	4.7 (43.6)	1.8 (16.6)	1.5 (14.3)	0.6 (6.9)
1871	1.8 (15.1)	5.3 (43.1)	2.3 (19.6)	1.8 (15.3)	0.7 (6.8)
1881	1.7 (12.6)	5.7 (43.5)	2.8 (21.3)	2.0 (15.4)	0.8 (7.3)
1891	1.6 (10.5)	6.5 (43.9)	3.4 (22.6)	2.3 (15.8)	1.0 (7.1)
1901	1.5 (8.7)	7.7 (46.3)	3.6 (21.4)	2.3 (14.1)	1.3 (9.6)
1911	1.6 (8.3)	8.6 (46.4)	4.0 (21.5)	2.6 (13.9)	1.5 (9.9)
1921	1.4 (7.1)	9.2 (47.6)	4.0 (20.3)	1.3+(6.9)	2.1 (18.1)
1931	1.3 (6.0)	9.5 (45.3)	4.7 (22.7)	1.6+(7.7)	2.3 (18.3)

+ private domestic only

Source: Deane and Cole, op.cit., 142-3.

The most striking feature of this table is the decline, both relative and absolute, in the number of people employed in agriculture. In the second half of the nineteenth century the total number of people in agriculture fell by 0.6 million or approximately 25 percent. Between 1901 and 1931 the decrease was 0.2 million making a total fall of about one third from the peak figure of 1851. As a percentage of the total labour force the change was even more startling. In 1851 one person in five was employed in agriculture, by 1931 it was less than one in twenty.

In the years before 1914 the shake-out of labour from agriculture was directed towards lower productivity sectors, such as mining and transport, without breaking down the overwhelming hold of the old staple industries. However, some important trends began to emerge. Relatively speaking the numbers employed in the textiles and clothing industries were beginning to decline while there was growth in such sectors as metals, machinery and vehicles, and chemicals.

At the same time the late nineteenth century was a period of ever increasing competition in all sectors of the economy. That Britain's position in the world economy should decline as other countries' economies grew was inevitable. However, in judging the British performance it is important to draw the correct comparisons. Undoubtedly in some areas the position was worsened by a failure to come to grips with changing conditions, but it remains true that the economy was growing throughout the period, and flourished in the early twentieth century. This expansion was largely concentrated in the old staple industries where, though competition was greatest, demand increased, almost continuously, bringing about further expansion in the export of British staple goods. Not until the 1920s was there decline in demand for export staples, which revealed itself in heavy structural unemployment in the north of England, south Wales and Scotland.

The restocking boom of 1919-21 had reinforced the old, pre-war pattern. However, it would be wrong to consider the inter-war years simply in terms of unemployment, falling exports, and a declining world position.

Important changes were taking place. There was a significant shift in the pattern of investment towards new, high growth sectors of the economy. Production processes were improved and new techniques were introduced as part of the replacement programme. The development of the motor car industry was the most spectacular transformation, but other trades were not slow to adopt new techniques and better organisation. Even the coal industry raised its productivity by 18 percent, in the years 1924-30. More important were the developments in the electrical industries and the mass production techniques that were introducted in engineering and even machine-tool manufacture. None of these changes offset the very real social problems of high unemployment in cotton, coal, and shipbuilding but the structural changes and improved techniques were, in the long term, more important.

Although there is agreement as to the existance of important changes that took place between 1870 and 1939 there is considerable controversy as to the precise timing and causation of events. The myth or reality of depression in the late nineteenth century and the timing and basis of recovery in the 1930s have divided contemporary observers and later commentators. Despite the wealth of available data there is only limited harmony between the various indicators used to measure the growth of the economy.

TABLE IV

The Growth of the Economy: Annual average rates of growth of selected indices for the U.K., 1860/70 - 1920/9.

	Net Nat. Income	Real Income per head	Output manhour	Industrial incl.bldg.	Product. excl.bldg.	Exports	Consum. Expend.
1860-70	3.0	2.5	-	2.9	1.1	5.7	-
1870-80	1.9	0.8	0.9	2.4	1.2	2.8	1.3
1880-90	4.2	3.5	3.8	1.6	0.5	3.0	1.7
1890-1900	2.1	1.2	1.3	2.8	0.2	0.4	1.0
1900-13	1.1	0.4	0.6	1.6	0.2	4.2	0.1
1870-1913	2.3	1.3	1.5	2.1	0.6	2.7	1.1
1913-29	0.8	0.8	2.1	1.6	-	-1.3	0.6
1920-29	2.0	1.5	-	2.8	3.8	1.6	0.9

Source: D.H. Aldcroft and H.W. Richardson, The British Economy, 1870-1939, (1970), 4.

In comparison with the growth rates achieved earlier in the nineteenth century there was a slackening off of growth rates in the last years of the century, and particularly in the period 1900-1913 for all indicators except exports; a culmination of trends that started in the last quarter of the nineteenth century. However, this is not the same as saying that this was a decadent economy. In absolute terms the economy was growing, the change was a slowing down of this rate of growth, not stagnation or decline. After the war the rate of growth of the major indices improved considerably.

Comparison with foreign countries is usually made to the detriment of Britain. Thus, for example, in the period 1870/1 - 1913 the domestic output of the U.K. grew at a rate of 2.2 percent per annum whereas in America, Canada, Denmark, Sweden, Germany, and Belgium the growth rates were much higher. Similarly, in the years 1913-29 the growth in the U.K. domestic output was exceeded by the Netherlands, America, Switzerland, Norway,

Canada, Italy, and Denmark.[1] However, the unimposing impression given is largely superficial for the comparisons made are in one sense false ones. It was not simply a question of Britain's earlier industrialisation making the way easier for the rest. This was true but the point is that whereas Britain had passed through the first stage of industrialisation, a stage characterised by dramatic growth rates, her rivals were in the full flush of the initial stage of sustained economic growth. It is significant that during the 1930s when the major European and north American countries had passed into the later phases of industrialisation Britain's performance in the "international league" put her among the leaders.

Britain's slower rate of growth in the late nineteenth century has been attributed to many factors, many of which do not lend themselves easily to quantification, especially in view of the available data. The early start thesis though plausible has to be argued carefully. There is no *a priori* reason for believing that deceleration is inevitable, though it is reasonable to suggest that the pioneer must learn by experience in a way not facing later comers. Equally entrepreneurial inefficiency is an argument that can fall down on points of detail. However, one point can be made with safety: the export sector, for so long crucial to Britain's growth, experienced a period of lower rates of growth during the last decade of the nineteenth century *but* this was followed by a period of growth comparable with the halcyon days of the mid-century. This revival

1. D.H. Aldcroft and H.W. Richardson, The British Economy, 1870-1939, (1970), 7.

is important in understanding the apparent failure to respond to the major innovations - the internal combustion engine, the turbine, and electric chemicals for example - that provided the technical basis for growth in the twentieth century. But to say that the limited growth of new industries in Britain before the Great War proves the case for entrepreneurial inefficiency is merely to perpetrate a tautology.

The presence of increasing foreign competition did not pass unnoticed. On the contrary, British industrialists, pundits, and prophets of doom all saw threats overhanging the country. But in practice the threat was not so apparent in that demand continued to grow and exports correspondingly rose in absolute terms. With the benefits of hindsight it is easy to see the start of later trouble in the pre-war years but it distorts the picture of conditions in the late nineteenth century. The established expert industries as well as overseas investment offered better prospects than the new industries. (Although overseas investment was at its highest in the 1880s and the early twentieth century there is no evidence to suggest that there was a casual link with growth rates in the economy). Although the potential of the new industries could be seen in other countries there was still no good reason for changing. With exports rising and the huge capital outlay required if new industries were to be developed, with good returns offered by government and state borrowers in the British Dominions there was little incentive to see alternative outlets. There was also a relative abundance of labour which probably retarded the

rate of technical progress by reducing the incentive to invest in factor saving techniques - certainly this was the case in the coal industry. No doubt there was a certain psychological failure on the part of some businessmen - the supposed indifference to the considerations of prospective buyers, bred of success - but it is easy to exaggerate such an intangible factor. However, there were certain areas of neglect. The most striking was the lack of attention paid to science and technology. There was also a tendency to shy away from American and German competition and seek new markets in the Empire and among the primary producing countries. Moreover, the small firm, typical of British industry, tended to be a conservative force; one that was re-inforced in several cases by the English businessman's love for a landed estate. However, it would be wrong to suggest that such attitudes were common. There were far more solid reasons than conservatism and indifference to explain the course of British industry in the pre-war years, but the economy that emerged, re-inforced by the boom of 1919-21, after the Great War found that conditions brought responses that transformed the economy. Unemployment was one side of the coin. On the other side was a shift in resource allocation within the industrial sector and an increase in the rate of technical improvement in old industries that resulted in growth centred on, and carried forward by, an inter-related group of industries including the new industries, the construction trades, metal manufactures and non-ferrous metals.

Overall growth was not the only concern. Short term fluctuations, the trade cycle, were as important as long term developments. All sectors of the economy, including agriculture, were affected during the period, when

there was limited government aid. The identification of business, or trade, cycles is beset with difficulties, all the more so before 1939 when data is somewhat scanty. Further, different indicators can be used thus adding to the potential confusion. The following table shows Burns and Mitchell's reference dates - based on a number of key indicators - along with dates based on Feinstein's estimates of real national incomes and unemployment figures.

TABLE V

Periodicity of Business Cycles.

Troughs			Peaks		
Real Nat. Income	Unemploy.	B & M	Real Nat. Income	Unemploy.	B & M
1867	1868	1868	1866	1865	1866
1879	1879	1879	1875	1872	1873
1885	1886	1886	1883	1882	1883
1893	1893	1894	1890	1890	1890
1904	1904	1904	1900	1899	1900
1908	1908	1908	1907	1906	1907
1914	1914	1914	1913	1913	1913
1921	1922	1921	1920	1920	1920
1932	1932	1932	1930	1927	1929

Source: Aldcroft and Richardson, op.cit., 24.

The only discrepancy in the pattern is the depression of 1908 which spread from America, where a financial crisis had precipitated the trouble. With this exception the figures suggest that there was no major changes in the periodicity of the cycles during the period. But if the cycles were similar in length - all fall in the 6 to 12 year range, characteristic of the normal or Jugler cycle, except the special case of 1907/8 - there were

differences in amplitude, the annual rate of change in upswing varying from 1.9 percent in the period 1908-13 to 5.3 percent during the years 1885-90.

The similarity between the two halves of the period must not be allowed to obscure the fact that each cycle had its own particular characteristics. Thus, the boom of the early 1870s was characterised by heavy foreign investment with high levels of induced home investment. The slump down to 1879 was moderated by a housing boom. The early 1880s witnessed a minor boom dominated by new developments of a domestic nature, while the stronger upswing in the second half of the decade was based on expansion abroad. The mid 1890s boom was based on housing and its multiple demands while in the early twentieth century foreign investment and exports were the basis. Finally, the slump of 1929 was part of a world wide depression, the worst of which was not experienced in Britain as a result of her comparatively insulated position.

II

The overall performance of the economy greatly determined the possibilities of the agricultural sector, and, before looking in some detail at the course of British agriculture between 1860 and 1930, one must make more explicit the implications of the general economic changes for agriculture. Broadly speaking there were four major factors that must be considered. The period was characterised by increasing industrialisation and the absence of Protection. The first led to shrinkage, both relative and absolute, in the size of the agricultural sector, while the second led to

ever-increasing competition in most branches of agriculture. From the 1870s onwards the country was flooded with cheap corn, to be followed by dairy produce and meat in large quantities. However, it would be wrong to interpret the period as one of unrelieved gloom for the farmer. Competition was concentrated in certain areas, not widespread. Nor was shrinkage the same as decline. In other words for those who remained in agriculture there were certain trends that were of considerable advantage to the agricultural community. In the first place the population of the country increased steadily, but more particularly the urban population rose in total and as a percentage of the whole population. Table VI shows certain aspects of this growth in population.

TABLE VI

Population in selected English towns, 1861-1931. (000s)

	1861	1871	1881	1891	1901	1911	1921	1931
Birmingham	296	344	437	478	523	840*	922	1,003
Bristol	154	183	207	289	339	357	377	397
Liverpool	444	493	553	630	704	753	805	856
Manchester	339	351	462	505	645	714	736	766
Sheffield	185	240	285	324	409	465	512	518
Greater London	3,227	3,890	4,770	5,638	6,586	7,256	7,488	8,216
England	19,070	21,574	24,677	27,536	29,737	34,065	35,693	37,820

*boundary extended

Source: B.R. Mitchell and P. Deane, Abstract of British Historical Statistics, (Cambridge, 1962), 19,24-6.

This basic increase in demand was augmented by a growth in real incomes. The second half of the nineteenth century was a period of growth. Moreover, for many people the position was improved by the fact that prices fell more than wages. The effect of the rise in real wages was beneficial

to the agriculturalist in that the absolute level of money spent on food probably rose even though the percentage of family income spent on food fell under the influence of Engel's law. Associated with the growth of real incomes was a change in consumption patterns. With a rise in income there was a tendancy to spend more on the semi-luxuries of meat and dairy produce than on such staple foods as bread. However, there were important variations from the general trends. The rise in demand was checked by the fluctuations of the trade cycle, particularly in the early 1880s and 1890s. Similarly, there were variations according to the level of income, those in the lower level groups spending less on dairy produce. However, having made these reservations it remains true that for those staying in agriculture there were potentials to be exploited.

III

The general outline of agricultural progress in the seventy years after 1860 is well known. The simplification purveyed by disciples of Lord Ernle has been rejected for the more sophisticated interpretation that denies the monolithic nature of the agricultural sector, so often assumed by economic historians. Nonetheless, the Golden Age/Great Depression division still persists and, as a result, a false importance is given to the 1870s as a watershed. In one sense these years mark an important advance in that for the first time reliable statistics relating to agriculture become available. However, this is not the same as saying that these years are typical "base" years to be used as a measuring stick in assessing the trials and tribulations that characterised some of the ensuing period.

In the debate on the Corn Laws many arable farmers volubly expressed their fears that grain prices would slump as the result of an influx of cheap imports, which would bring disaster to the farming community. These views appeared ill-founded, not because they failed to take into account the many enterprises embraced by the term agriculture, but because grain prices held their own. High transport costs and upheavals in both America and Russia resulted in a period of prosperity, at least for the specialist corn grower. However, important changes were taking place that distinguished the 1860s from the early 1850s. Initially the justification for High Farming, or as it was more accurately termed by Pusey, High Feeding, was the extra dung used as fertiliser for corn, not the extra profit from the sale of meat.[2] In the early nineteenth century there had been a differential of 1d. per pound between spring and autumn meat. This differential was erased by the rise in the number of stall fed cattle, and consequently by the middle of the century fatstock prices were not sufficient to cover the costs of store animals and oil-cake and leave a profit. It was, therefore, necessary to charge the grain enterprise for the dung. This appears to have been the case for both stall-fed cattle and cake-fed sheep.[3] Thus as long as Protection was maintained, or exogenous factors kept up grain prices the losses from meat produced by stall-feeding could be offset. The collapse of wheat prices in 1851-2 and 1858 caused much harship but by the end of the decade

2. P. Pusey, 'On the Progress of Agricultural Knowledge during the last Four Years', J.R.A.S.E., iii, (1842), 161-217.

3. see E.L. Jones, "The Changing Basis of Agricultural Prosperity, 1853-73', Ag.H.R., x, (1962), 102-19, for examples culled from many parts of the country.

a change in emphasis, reflecting a change in the roots of agricultural prosperity, can be detected. The manure from stall-feeding was now considered as fertiliser for root crops which were used as further feed for cattle. Thus, there was a change in emphasis within the framework of mixed farming; a change that reflected the new balance of market forces that were operating in the decades after Repeal. Long term changes in prices are shown in Table VIII, from which it can be seen that during the so-called Golden Age the basis of prosperity was livestock rather than arable enterprises.

The growth of population, accompanied by rising real incomes, favoured an extension of livestock production. Moreover, it was the arable farm that was in the best position, and the arable farm that showed the greatest increase in livestock production. In contrast the acreage under wheat declined. Lawes and Gilbert came to the conculsion in 1868 '...that the area under wheat has diminished during the last 15 or 20 years...'[4] Further, the number of sheep rose. However, at first sight the overall increase in livestock numbers is surprisingly low but becomes more comprehensible on consideration of the severe losses among breeding ewes in the bitter weather of early 1860, the losses and liquidations in the droughts of 1864 and 1868, and the impact of rinderpest in 1865-6. Thus, with changes within mixed farming pre-figuring later structural changes taking place, a new perspective emerges. The early 1870s, far from being typical, were exceptional in that they saw an expansion of the wheat acreage under the influence of short-term price changes. Further, the very

4. J.B. Lawes and J.H. Gilbert, 'On the Home Produce...of Wheat', J.R.A.S.E., 2nd. ser., iv, (1868), 365, 390.

fact that change was already taking place helps to explain the failure of many farmers to come to terms with the sudden changes of the 1870s. In other words, those who could adapt by expanding livestock enterprises had already done so, while the remainder were left with a high-cost system that, wrongly equating technical efficiency with economic efficiency, left them extremely vulnerable to a major change in prices. Once committed to a predominantly arable system the costs of change were considerable, while psychological barriers were often more important than economic ones in limiting adaptation and change.

The collapse of grain prices in the 1870s destroyed the balance of the mixed farming system of the previous decades. This system, beautiful in conception, worked admirably so long as price changes were relatively small. The weakness of the system, and the limitations of adaptation in the mid-nineteenth century, were revealed in the second half of the 1870s. As table VII shows this was the time when foreign grain began to flood into the country from several foreign countries.

TABLE VII

The Export of Wheat from selected countries, 1851-99
(M.bushels - annual averages)

	U.S.A.	Canada	Russia	India	Australia
1851-60	5	-	41	-	-
1861-70	22	-	75	-	-
1870-74	59	1	55	1	-
1875-79	107	3	71	6	-
1880-84	136	4	65	29	-
1885-89	110	3	95	36	-
1890-94	170	9	104	30	8
1895-99	184	16	107	15	3

Source: M. Tracy, Agriculture in Western Europe, (1964), 23.

The price of American wheat from Atlantic ports c.i.f. at Liverpool fell from 52/1d. per quarter in the years 1870-4 to 28/- in the period 1895-9.[5] Of this fall a large part was the result of lower transport costs. The cost of carrying a quarter of wheat from Chicago to Liverpool in 1868-79 averaged 11s., by 1892 it was 4/3d., and by 1902 had reached 2/10½d.[6] Bumper harvests in America brought gloom in parts of England where a run of bad seasons compounded troubles and confused the issue for many.

However, as Fletcher[7] pointed out, the troubles besetting arable farmers did not signal the collapse of English agriculture as a whole. On the contrary, conditions positively favoured livestock farmers who could utilise the misfortunes of others by feeding corn to stock, thus reducing the outlay on expensive artificial feed. More generally, as long as trade prospered the demand for meat and dairy produce remained buoyant and the price of these items fell less than that of wheat. The contrast between the two types of farming was at its greatest during the 1870s and 1880s. On the one hand were the arable farmers vociferously complaining to, and being sympathetically heard by, that unrepresentative body, the Richmond Commission. On the other hand were the livestock farmers, relatively prosperous and largely overlooked by commissioners and politicians. For meat and milk producers the 1870s and early 1880s were a "Golden Age" the like of which had not before been experienced. However, the position changed as a second wave of competition - this time

5. M. Tracy, Agriculture in Western Europe: Crisis and Adaptation since 1880, (1964), 22.
6. P.S. Bagwell and G.E. Mingay, Britain and America: A study of economic change, 1850-1939, (1970), 75.
7. Fletcher, Ec.H.R., op.cit.

in the form of imported meat and cheese - hit the English farming community. Although input costs, and in particular feed costs, were falling the decline in livestock prices was severe in several cases. The profitability of sheep farming was curtailed by the collapse of wool prices while the other mainstay, milk production, suffered more than is usually realised. The milk trade had expanded considerably in the 1870s and 1880s as demand rose and competition from imported cheese increased thus driving away many dairy farmers into the new trade. The outcome was an oversupply crisis that greatly reduced the contract price of milk. The position was most serious for the dairy farmers supplying London but the same was true of other large towns. Not until the early twentieth century did prices revive. Table VIII shows the movement of prices for selected products.

TABLE VIII

Price movements for selected products, 1851-1913. (1861-70 = 100)

	Wheat	Beef	Mutton	Wool	Milk	Cheese
1851-55	109.8	85.7	88.3	66.5	77.6	85.1
1856-60	104.6	94.3	94.7	85.4	88.8	98.7
1861-65	93.1	95.7	99.6	109.4	95.3	96.6
1866-70	107.2	104.1	100.3	89.2	104.7	103.5
1871-75	107.2	121.3	118.4	100.0	107.5	96.0
1876-80	93.1	116.2	120.1	71.7	116.8	90.2
1881-85	78.4	112.3	118.4	50.8	100.9	90.6
1886-90	61.8	91.6	104.2	50.0	90.7	81.1
1891-95	54.9	92.4	96.5	47.6	89.7	71.3
1896-1900	55.9	93.2	96.8	43.4	75.7	64.9
1901-05	54.9	96.3	101.0	40.1	80.4	71.0
1906-10	62.7	99.4	102.1	50.0	80.4	-
1911-13	64.0	105.1	104.1	31.1	88.8	-

Percentage Change	1851-5/ 1876-80	1876-80/ 1911-13	1876-80/ 1896-1900	1896-1900/ 1911-13	1851-5/ 1911-13
Wheat	-15.2	-31.2	-39.6	+14.8	-41.7
Beef	+35.6	- 9.6	-19.9	+12.8	+22.6
Mutton	+36.1	-13.4	-19.5	+ 7.5	+17.9
Wool	+ 7.6	-56.6	-39.5	-28.3	-53.2
Milk	+50.6	-24.0	-35.2	+17.2	+14.5
Cheese	+30.5	- 2.3	-22.9	-	-

Source: Report on Wholesale and Retail Prices, Parl. Papers, 1903, lxviii, 136-7, 150, R. Cohen, The History of Milk Prices, (Oxford, 1936), 18, J.R.S.S. xlix (1886), 637, 640, lvi, (1893), 241-2, 245, lxiii, (1900), 101-2, 105, lxxvii, (1913), 565-6, 569.

(321)

Once again bad weather added to the problems facing the farmer. The four years 1892-6 were all characterised by drought, the only difference being in the severity of the conditions. However, the turning point had been reached and prices improved in the years before 1914.

The years after 1860 saw English farming under many and various pressures, and though changes were often painfully slow important structural changes had taken place. Although official statistics were not collected until 1866 there is sufficient evidence to describe the major trends. The most obvious change was in the acreage of land devoted to arable farming. As the shift towards dairying and beef production gathered momentum so the acreage devoted to wheat in particular declined, while the area of permanent pasture rose. Second, the number of cattle rose throughout, with the exception of the last decade of the nineteenth century; but the number of sheep fluctuated, declining to a low in 1881-5, recovering over the next decade before finally falling to below the level of 1866-70. Table IX summarises the position.

TABLE IX

Land Use and Animal Population, 1866-1915. (1866-75 = 100)

	Arable	Wheat	Permanent Grass	Sheep	Total Cattle
1866-70	99.1	99.9	96.7	99.3	94.3
1871-75	101-0	100.2	103.3	100.7	105.7
1876-80	98.2	87.0	112.0	97.4	106.2
1881-85	94.1	77.9	121.2	85.8	112.7
1886-90	90.6	68.9	127.5	88.7	118.0
1891-95	86.8	56.1	132.4	92.5	122.6
1896-1900	84.6	54.7	133.5	89.6	122.4
1901-05	81.5	46.9	136.1	86.0	125.1
1906-10	78.3	49.4	139.2	90.5	130.8
1911-15	76.2	55.3	140.2	83.2	132.7

Source: A Century of Agricultural Statistics, Great Britain 1866-1966, H.M.S.O., 1968), 94, 96, 98, 123, 125.

The changing composition of the agricultural sector is reflected in the changing composition of gross agricultural output. The most comprehensive attempt at calculating gross agricultural output has been carried out by Ojala, but some of his basic material is open to criticism for its reliance upon import prices used by Sauerbeck. Fletcher in an appendix to one of his articles suggests 'crude alterations' that give the following figures:

TABLE X

The Gross Agricultural Output of the U.K. and England. (£M)

	U.K.			England	
	1867-9	1870-6	1894-1903	1867-71	1894-8
Wheat	35.38	27.56	7.72	28.44	7.64
Barley	16.78	17.56	9.43	12.62	7.54
Oats	10.54	9.07	8.07	4.28	4.23
Potatoes	14.02	13.82	11.34	3.00	3.00
Hay, Straw, Fruit, Veg.	20.11	19.40	21.75	14.00	17.00
Other crops	7.34	7.58	3.64	3.09	2.06
ARABLE	104.17	94.99	61.95	65.43	41.47
Beef	34.90	45.67	42.05	14.59	16.02
Mutton	25.92	30.51	25.20	14.60	12.59
Pigmeat	18.60	22.95	19.13	9.59	10.52
Horses	1.50	2.00	3.00	1.00	2.00
Milk	33.78	38.51	43.56	15.40	20.29
Wool	7.49	8.27	3.24	5.62	2.36
Poultry and Eggs	4.57	6.96	10.00	3.50	7.00
LIVESTOCK	126.76	154.87	146.18	64.30	70.78
TOTAL	230.93	249.86	208.13	129.73	112.25
Index	100	108	90	100	87

Source: T.W. Fletcher, 'The Great Depression of English Agriculture, 1873-96' Ec.H.R. 2nd.ser., xiii, (1961), 432.

Looking at the figures for England alone the contribution to gross output from wheat declined from 21.9 percent to 6.8 percent during the years covered by the table. In contrast that from beef rose from 11.3 percent to 14.3 percent and that from milk from 11.9 percent to 18.1 percent.

Yet though there had been change, often of a spectacular nature as in the case of the Scots in Essex, it was of a limited nature especially when compared with the experience of the Danes. Through to the mid nineteenth century Denmark was primarily a grain exporting country, but the flood of imported grain in the late 1870s, coming on top of political upheavals that had reduced markets, forced a radical re-orientation of the direction of agricultural output. By the 1880s the export of dairy produce, and to a lesser extent of meat and livestock, had been firmly established.

TABLE XI

Selected aspects of Danish Agriculture, 1861-1914.

	Dairy Cows (000s)	Other Cattle (000s)	Pigs (000s)	Butter (000 tons)	Milk (000 tons)	Pork & Bacon (000 tons)	Beef (000 tons)
1861	737	364	304	-	-	-	-
1871	808	431	462	36	1082	39	-
1881	899	571	527	49	1391	46	59
1891	1011	695	829	75	1945	72	68
1903	1089	751	1457	107	2613	127	92
1914	1310	1153	2497	143	3574	217	123

Source: Tracy, op.cit., 110.

Conditions between the two countries were not strictly comparable: large farms in Britain did not readily lend themselves to dairy farming, while there was a general reluctance on the part of landlords and the government (as well as many farmers) to accept change as permanent and act accordingly. Nonetheless, the success of the Danes gives some indication of the possibilities of the situation that faced Dane and Englishman alike.

The importance of the factors limiting change in agriculture can hardly be overstated, and they must clearly be stated if the developments -

or lack of - in the late nineteenth century are to be properly understood. Broadly speaking these factors can be grouped under three heads - economic, psychological, and technical - though all three were intertwined and self-reinforcing. The technical limits to an extensive conversion to grassland farming were a lack of knowledge and ability to sow down good grass in the drier areas of the south and east of England. Moreover, the attractions of ley farming were more theoretical than practical as the productivity of new leys was generally considered to be half that of old pastures. Psychologically, the greatest weakness was the refusal to accept change as permanent, until too late. The run of bad seasons, though compounding troubles, was too readily seized upon as the root cause, although it was essentially transient. This attitude was to be found at all levels. Landlords were often extremely reluctant to grant rent reductions confirmed in the belief that conditions were about to improve. Similarly, the government, though granting two Royal Commissions, was never sufficiently impressed by the cries of certain elements of the agricultural interest to intervene and re-introduce Protection. Free Trade was a powerful gospel and one that allowed the majority to stand back while a minority was steadily reduced to a position which left the agricultural sector in danger of collapse as confidence slumped. Not until a state of national emergency pertained did the government of the day intervene.

However, farmers were not free from criticism. The self-contained beauty of the four course rotation appeared to hypnotise the farming community which persisted in equating technical and economic efficiency.

Further, there was a marked reluctance to move into dairy farming or market gardening as the majority of arable farmers felt that such activities were not a part of proper farming, and, as such, fell below their dignity. It would be wrong, however, to reduce the problem to a huge mental block. There were some very solid reasons for the slow nature of change. Land tenure in England - or to be more precise, in those areas where depression was a reality, namely the south and east - was geared to the needs of arable farming. In contrast to much of Europe, England had large farms which were admirably suited to the growing of wheat. Grassland farming, however, required smaller labour intensive units. Thus adaptation would have involved not simply the division of holdings, but all the expenses attendant on building and equipping a new farm. With landlords reluctant, and increasingly unable, to act it was difficult to get new barns let alone a complete set of farm buildings. The investments of the mid nineteenth century in drainage had been expensive, and misguided, consequently a further major outlay of capital, as was required in the late 1870s, was extremely difficult to make. Moreover, as the years passed and improvement did not come landlords found themselves unable to do little more than offer low rents with few, if any, restrictions. For the tenant the position was little better. In the first place there was the expense of switching enterprises <u>after</u> one had failed. Second, there was no incentive to change in view of the weakness of his position as a tenant, and attitude confirmed by the reluctance of landlords to relax on tenancy conditions, let alone to spend money on the re-equipping of the farm for a new set of enterprises.

In combination these factors were a powerful force curbing change among a large number of farmers, but there were exceptions, and, more significantly, by the end of the century, after much suffering in certain areas, a distinct change in the character and structure of agriculture had taken place. There were also other compensatory factors to be offset against the well known tale of gloom. The gross output of the agricultural sector had declined but so also had the percentage of the national labour force therein employed. The outcome of these two trends was a rise in the output per worker employed in agriculture; a rise greater than that found in some sectors of the economy.

TABLE XII

Productivity of Agriculture, U.K., 1867-1929. (1867-9 = 100)

	Value added by agricultural labour	Persons employed in agriculture	Output per worker (i)agriculture	(ii)manufacturing and mining.
1867-9	100	100	100	100
1870-6	101	95	106	109
1877-85	95	88	108	119
1886-93	99	86	115	123
1893-1903	95	80	119	125
1904-10	98	78	126	133
1911-13	97	78	124	132
1920-2	93	80	116	146
1924-9	69	55	125	159

Source: Ojala, op.cit., 153.

The outbreak of war in 1914 brought no dramatic reversal of these trends. The cry of "Business as Usual" applied as much to the farm as the firm, yet in the first few months problems were beginning to appear in certain areas. Livestock farmers were hampered by the high cost of imported feed, which gave a boost to the grassland areas, while dairying was affected by the loss of labour, which necessitated the use of women,

children and old men as milkers. Overall, however, little attention was paid to the question of food supplies, until late in 1916. The German submarine threat made obvious once again that Britain was an island, and an island that had to supply herself with food in time of general hostilities. Action was taken: each county war agricultural committee (established in 1915 to organise the supply of labour, fertiliser, feed and machinery) had to set up executive committees to which were conferred extensive powers. In particular they could order farmers to plough up grassland and could take over the management of uncultivated or badly cultivated land - both of which they did.

The "plough policy" had little effect on the harvest of 1917 but by the following year there were over 3 million more acres of tillage than in 1916, while in comparison with the years 1904-13 the wheat crop in the United Kingdom had been increased from 7.1 million quarters to 11.6 million and the potato crop from 7 million tons to 9.2 million.[8] Against this must be set the loss of 100 million gallons of milk and 10,000 tons of meat[9] but in terms of calories the food supply in 1918 had been increased by 24 percent over the average for the pre-war decade. A marked rise at the time when men, machines, and materials were in short supply and only critics of the policy abounded.

The pressures of a national emergency were great but the "plough policy" needed a firm underpinning. This was provided by the 1917 Corn Production Act which guaranteed certain minimum prices.[10] The ending of hostilities saw no change in this policy which received confirmation in

8. G.P. Jones and A.G. Pool, A Hundred Years of Economic Development, (1966), 326
9. T.H. Middleton, Food Production in War, (1923), 321.
10. The guaranteed prices were: wheat, 60/- per quarter in 1917, 55/- in 1918-19, 45/- in 1920-22; oats 38/6 in 1917, 32/- in 1918-19, and 24/- for 1920-22.

the Agricultural Act of 1920. This continued the guaranteed minimum prices, and was hailed as the start of a new era in which government and farmers worked together to avoid the troubles of the recent past. The contrast with the policy of the nineteenth century was marked but the new Golden Age was little more than a mirage. In 1920 the price of wheat rose high at 86/4d. a quarter. Within a year it had slumped to 49/-, and reached a low of 40/9d. in 1922. Under the provisions of the 1920 act the government was faced with a bill of some £20 million, an astronomical sum for those days and one that the government refused to meet. The 1920 act was repealed. Guaranteed prices disappeared along with guaranteed agricultural wage levels: thus was achieved the great betrayal that caused the bitterest of hostility at the time and has lost the Conservative party the support of may farmers to this day. The honeymoon, if ever it existed, was over and the old trends dating back into the nineteenth century reappeared. So did the old responses. The production of meat, dairy produce, fruit and vegetables increased but there were other changes. Imported meat, butter and cheese reached the country in increasing quantities at a time when the demand for liquid milk was all but static. Unemployment, the relative expense of retail milk, prices and the presence of cheap substitutes combined to depress demand. Moreover, as competition from cheap imported cheese intensified in the late 1920s there was a switch to liquid milk production which produced a glut of milk and falling prices. A crisis, as serious as that of the 1890s, faced dairying but this time the government intervened. A first step had been taken in 1925 when the Sugar Beet Subsidy Act had been passed.

This was an expensive success that did not reach the roots of the problems facing agriculture. However, it did mark a new outlook in government policy. In the early 1930s the traditional policy, handed down since the days of Cobden, was dramatically reversed. The Wheat Act of 1932 and the establishment of the Milk Marketing Board in 1933 represent the start of a new era.

Before assessing the impact of laissez faire policies and attitudes on agriculture one must look at the changing structure of gross agricultural product in the early twentieth century as shown in table XIII.

TABLE XIII

The Gross Agricultural Product of England and Wales, 1908, 1925, and 1930/1. (£M. at current prices)

	1908	%	1925	%	1930/1	%
Live Stock	50.80	39.9	78.97	35.1	64.96	32.0
Dairy Produce	25.50	20.0	57.60	25.6	54.97	27.1
Poultry and eggs	4.35	3.4	15.08	6.7	21.01	10.4
Wool	2.10	1.7	3.00	1.3	1.31	0.6
Farm crops and veg.	40.20	31.6	54.65	24.8	45.49	22.5
Total	127.15		225.33		202.66	

Source: The Agricultural Output of England and Wales, 1925, Parl. Papers, 1927, xxv, 76-77, (C.2815), The Agricultural Output of England and Wales, 1930/1, Parl. Papers, 1933/4, xxvi, 39. (C.4605),

Several points stand out: the relative importance of corn continued to decline but during the 1920s beef was no longer so profitable as in the pre-war days. In contrast dairy produce consolidated its central role while the comparatively unfashionable poultry sector assumed a minor but increasing importance. The change of balance can be seen in the price

trends for the period.

TABLE XIV

Price changes in selected items, 1906-1930. (1911-13 = 100)

	1906-10	1911-13	1914-20	1921-25	1926-30	
Wheat	97.6	100.0	196.1	161.4	136.6	Gazette average
Barley	87.8	100.0	204.7	151.4	128.6	" "
Fat Cattle	93.4	100.0	187.3	169.0	134.4	Second quality
Fat Sheep	97.4	100.0	189.1	194.8	158.2	" "
Milk	93.4	100.0	203.1	191.2	164.2	
Butter	95.2	100.0	177.1	173.2	144.8	2nd. quality British
Cheese	93.0	100.0	188.9	162.0	152.8	" " Cheddar
Overall	92.4	100.0	195.9	173.0	144.0	

Source: Agricultural Statistics.[11]

In one respect the relative stability of liquid milk prices was no more than a contrivance. Demand was far from buoyant but prices were propped up by means of the Permanent Joint Milk Committee, which was established after the severe post-war decline - when the index of milk prices fell from 303 to 263 to 179 in the years 1920-22 - in an attempt to save the position of wholesalers as much as producers. Initially the scheme succeeded but lacking the monopoly position later to be given to the Milk Marketing Board it was impossible to prevent cheese makers from turning to the liquid milk market in the late 1920s and early 1930s; consequently milk prices fell to a level that threatened to bring ruin to the mainstay of British agriculture.

The 1920s were also years of limited progress in terms of labour productivity. More accurately the position by the end of the decade was only the same as that of the pre-war years, having dropped 6 percent between

11. Several of the tables in this thesis are based on information from the yearly Agricultural Statistics. In these cases detailed references have not been given as this would involve excessive footnoting. The data can be checked in the appropriate volume of the statistics.

1911-13 and 1920-2.[12] Yet British agriculture in the 1920s presented a marked contrast with the conditions that prevailed in the 1860s. The size of the agricultural sector had declined dramatically while its composition had altered equally radically. Neither of these facts in themselves should be considered surprising. In a developing industrial economy a shift of capital and labour from agriculture to secondary and tertiary sectors is not simply to be expected but positively desirable. Similarly, one would more than expect a switch to take place within the agricultural sector itself. In an industrial society, concentrating on the manufacture and export of industrial goods and importing a large quantity of essential food-stuffs, agricultural production would be forced to adapt by producing proteins rather than starches as well as semi-luxury commodities such as fruit, vegetables, and dairy produce that enjoyed varying degrees of natural protection.

The question, therefore, becomes one of degree: should market forces have been allowed full freedom or was there a case for some form of protection or aid for British agriculture? The argument used in favour of free trade was, roughly speaking, that Britain was an industrial nation and that to shore up agriculture would be detrimental to her position by causing less than optimum use of resources. This in turn would have wider repercussions as world trade would be hindered by artificial barriers. The gospel of free trade had wider, more emotive, connotations for many of its supporters. Thus, for Cobden it was not simply a question of attaining the most efficient use of resources, nor

12. R.H. Ojala, Agriculture and Economic Progress, (Oxford, 1952), 153.

even a means of removing unscrupulous profiteers, but a means of establishing world peace via a huge trading brotherhood of mankind. More significantly, the tenets of free trade soon became established as gospel. It was firmly held that Britain's achievement, the position she had reached in the nineteenth century were the direct outcome of this policy. In fact there was some truth in this argument, but Britain's overwhelming position in the early and mid nineteenth century was such that a free trade policy merely enabled her to extend her position until rivals appeared on the scene. Had the prophets of doom been proved correct soon after Repeal, if British agriculture had collapsed in the 1850s, then, perhaps, some form of government aid would have been forthcoming or at least accepted in principle. As it was no such collapse materialised and the political feasibility of protection rapidly declined. By the end of the century it was impossible to use the term protection without bringing about wholesale condemnation. Therefore, its supporters had to become "Fair Traders" but their chances of success were very slim. The cheap loaf, the dear breakfast table were powerful arguments, and the failure of Joseph Chamberlain in the early twentieth century bears eloquent witness to the political impossibility of gaining government aid on a realistic scale for agriculture.

However, what is is not necessarily right. There were arguments to be made in favour of some form of government subsidy. First, there was the strategic argument of self-sufficiency in times of war. This view, that by running down the agricultural sector and relying heavily

upon imports of food the country was exposing itself to the dangers of starvation in war, was strengthened by the submarine scare of 1916. In these circumstances the government did act but the success of such action as a long term policy depended upon proximity to danger. As the memory of 1916 faded so did support. Equally, the very success of British agriculture in rising to the crisis during the war years tended to undermine the argument. Second, the question was approached from the social angle. The run down of agriculture, however necessary, involved considerable hardship and it was argued that it was the responsibility of the government to protect, or at least ease the lot of, these people. Again the strength of the argument depended to a large extent on the presence of suffering, and it was not until the appearance and awareness of more widespread hardship and unemployment in the inter-war years that such an approach gained support. Lastly, there was the economic argument. Basically the danger was that the shrinkage of agriculture took place so rapidly and to such an extent that there was generated a vicious spiral of agricultural depression leading to lack of investment which caused further depression, and so on, until land, not wanted for industrial use, fell into disuse. In other words there was a wastage of a valuable resource, namely land. This appears to have been the case in the late nineteenth century and the depression of agriculture in the inter-war years was the aftermath of the lack of pre-war aid. Resources were not fully utilised and social suffering unnecessarily increased. The benefits of free trade, often more apparent than real, had to be bought at a price, and the bulk of the nation allowed that price to be paid by some parts of the farming community.

CHAPTER 2

The National Dairy Herd: Size, Composition, and Output.

I

The systematic collection of agricultural statistics in Great Britain was not started until 1866 - a late date in comparison with Ireland and certain other European countries. Prior to this no reliable evidence relating to the size of the national dairy herd, or even to the national herd as a whole, exists. Caird, having quoted one astronomical figure purporting to be the number of cattle in the United Kingdom - 15.4 million in 1836! - tartly concluded that 'in number and value that great branch of our national prosperity, the live stock, seems thus to have been estimated at 100 per cent more than really existed.'[1] Not all estimates were so outlandish. McCulloch, in 1852, thought that there was some 5.1 million cattle in Great Britain,[2] but even this would appear to be too high as the official figure for 1870 was only 5.4 million and there is nothing in the writings of the period to suggest that numbers were almost stagnant in the interval; on the contrary the evidence suggests that there was a definite increase, curbed only by the threat of disease. One is, therefore, left with no alternative but to await the availability of official statistics before making any assertions on the size and composition of the national herd.

1. J. Caird, Our Daily Food, Its Price and Source of Supply, (1868), 9.
2. J.R. McCulloch, Commercial Dictionary, (1852), 273.

The position between 1866 and 1930 is shown in Table XV.

TABLE XV

The Changing Structure of the English National Herd, 1866-1930.

(Numbers in 000s: Index 1896-1900 = 100)

	Total Cattle		Cows & Heifers		Two Year Olds		Other Cattle	
	No.	Index	No.	Index	No.	Index	No.	Index
1866-70	3,678	78.3	1,446	75.6	966	95.5	1,265	69.4
1871-75	4,054	86.2	1,555	83.2	1,071	106.1	1,429	78.2
1876-80	4,076	86.8	1,579	84.4	1,083	107.3	1,413	77.5
1881-85	4,325	92.0	1,687	90.2	1,050	104.0	1,588	87.2
1886-90	4,543	96.6	1,806	96.6	1,108	109.7	1,629	89.4
1891-95	4,701	100.0	1,844	98.6	1,140	112.9	1,818	99.8
1896-1900	4,701	100.0	1,870	100.0	1,009	100.0	1,822	100.0
1901-05	4,818	102.4	1,916	102.4	1,040	103.0	1,862	102.0
1906-10	5,055	107.4	2,045	109.2	1,033	102.3	1,976	108.3
1911-15	5,113	108.7	2,105	112.5	981	97.3	2,026	111.1
1916-20	5,272	114.7	2,150	114.9	1,010	100.1	2,111	115.8
1921-25	5,047	107.3	2,280	121.8	902	89.4	1,865	102.3
1926-30	5,264	111.9	2,394	127.9	923	91.5	1,847	101.3

Source: Agricultural Statistics.

The striking feature of this table is the steady increase in the dairy herd throughout the period.[3] The figures for the dairy herd, i.e. cows and heifers in milk or in calf, show an upward trend throughout the 1870s and 1880s. During the period 1880-88 the rise was particularly marked. The following decade was a period of stagnation, the response to overproduction and bad seasons, and even one of decline in the years 1889-92. However, from 1898 to 1930 the trend was steadily upwards, suffering but a small reversal in 1916.

3. Strictly speaking the categories into which the national herd is divided in Agricultural Statistics are only approximations. Thus cows and heifers in milk or in calf is effectively the national dairy herd but it does include cows that are kept solely for breeding. Similarly, the category "other cattle" is something of a catch-all. However, it would be wrong to suggest that this group is a mere extension of the beef herd (i.e. baby beef) as it includes a certain number of young animals who are not part of either the beef or the dairy herd at the time of collection.

In contrast the national beef herd, as represented by two year olds and above, showed greater fluctuation. Numbers, having risen to a peak in 1891-5, fell off to such an extent that by the end of the period there had been an overall decline of 4.4. percent. From 1880 to 1887 the number of two year olds and above showed no tendency to rise but for a brief period of four years, 1887-91, the trend turned slightly upwards; thereafter falling back to its previous level. A further decline can be detected in the years 1909-16, and not until the second half of the 1920s was there a discernible rise in numbers.

In part the decline of the beef herd was offset by the rise of baby beef production. The exact proportions of this rise are difficult to determine owing to the fact that the distinction between cattle over and under one years was not made from the outset. Nonetheless, even when allowance for this development has been made, the rising importance of the dairy herd, in terms of numbers alone, cannot be denied.

A further point of importance is the timing of the growth of the dairy herd. From the figures in Table XVI it can be seen that the periods of maximum growth in the dairy herd were the decades 1876/80 - 1886/90 and 1916/20 - 1926/30. During the first decade the growth of the dairy herd contrasted with the sluggish growth of the beef herd. Contrasts, however, were sharper in the second decade mentioned when all other categories showed a decline.

TABLE XVI

Percentage Growth in the National Herd by decades, 1866-1930.

	Total Cattle	Cows & Heifers	Two Year Olds and Above	Other Cattle
1866/70 - 1876/80	8.6	9.1	12.1	11.7
1871/75 - 1881/85	6.8	8.5	-2.0	11.1
1876/80 - 1886/90	14.0	14.4	2.3	15.3
1881/85 - 1891/95	8.6	9.2	8.6	14.5
1886/90 - 1896/1900	3.5	3.5	-8.9	11.9
1891/95 - 1901/05	2.4	3.9	-8.2	2.4
1896/1900-1906/10	7.5	9.3	2.4	8.4
1901/05 - 1911/15	6.1	9.8	-5.6	8.8
1906/10 - 1916/20	4.3	5.2	-2.2	6.9
1911/15 - 1921/25	-1.3	8.3	-8.1	-8.0
1916/20 - 1926/30	-0.2	11.4	-8.6	-12.5

Source: calculated from Agricultural Statistics.

The official statistics provide a solid basis for the study of the development of the national dairy herd, but certain problems remain. The lack of data relating to the years before 1866 has already been mentioned. (On assumption that the rate of increases during the early 1860s and early 1870s the average yearly figure for the period would be 1,429,000, giving a growth rate of 8.8 percent for the decade 1861/65 - 1871/75). A further doubt, however, emerges over the accuracy of the early returns. The introduction of such a new idea was bound to bring problems, and not surprisingly the early returns were not perfect. Certain tenants, whose rents were determined by their stocking densities, were somewhat loath to divulge information, while some returns were not completed simply because of human failings. The effects of these commissions cannot be assessed but by the 1870s the system was working well with a coverage of over 90 percent of all landowners. More specifically, the early cattle returns are misleading. The 1866 figures were collected in March from occupiers of land

over five acres. Further, widespread cattle-plague in every county during 1865-1866 made its effects felt for several years. Lastly, there is no clear cut definition of the dairy herd. The popularity of dual-purpose animals blurred the distinction between milk and meat animals. Equally, the number of cows and heifers in milk or in calf is somewhat misleading as it includes cows for rearing only. However, the approximation is the best available and will be used here.

The figures for the country at large conceal several striking variations. (See Appendix A for details of individual counties). Taking the period as a whole the first point that emerges from the detailed figures is that the greatest growth in numbers took place in three southern counties: Essex, Hampshire, and Sussex. Moreover, they are followed by four more - Berkshire, Hertfordshire, Kent and Wiltshire. Only Shropshire breaks the pattern. Equally striking is the fact that the leading dairy counties - Cheshire, Leicestershire, Staffordshire, and Somerset - show no more than average rates of increase, while Derbyshire, the West Riding of Yorkshire, and Lancashire were well below average.

Dividing the period at 1900 reveals further differences. Before this date the most spectacular growth rate was in Essex (the classic story of emigrant Scots), but the above average increases in Cambridgeshire, Lincolnshire, and, to a lesser extent, Hertfordshire, reflect the spread of dairying in the arable lands of eastern England. Two exceptions stand out from the overall picture of growth. First, the number of cattle housed in London and Middlesex fell off from a peak in the late 1870s. This was the result of several factors: less land available, tighter hygiene

regulations, and greater competition from county suppliers. Second, the number of dairy cattle in Gloucestershire scarcely rose overall. The 1890s were years of decline but more surprisingly so were the late 1870s. The reasons are not clear, but the most likely explanation is that dairying in the south western counties of Wiltshire, Somerset, and Gloucestershire had been over-expanded in the early 1870s. By the end of the decade the London market was temporarily glutted and falling cash incomes probably resulted in a reduction in the number of dairy cows kept in these counties.[4] During the first three decades of the twentieth century the position in Gloucestershire changed markedly, but this was not the only difference between the two periods. Dairying in the east of England, with the exception of Kent, was less prominent. The most striking change was the rise of new dairying areas, mainly on chalk and light lands in such counties as Wiltshire, Berkshire, Hampshire, and Sussex. There was also a belated switch to the liquid milk trade in Shropshire which led to an above average increase in numbers of dairy cattle in the county.

To talk simply in terms of increased numbers is misleading. Essex, for example, despite the dramatic changes of the late nineteenth century, was never a serious rival to the old-established dairying districts of the north and south-west. In terms of overall numbers the big five - Lancashire, Somerset, the West Riding, Cheshire, and Devon - were scarcely challenged. To put the picture in proper perspective one must look at the stocking densities of the different counties. (See Appendix B for details of individual counties).

4. see Chapter 3, page 119.

TABLE XVII

Leading Counties by density of Cow Population, 1870, 1900, & 1930.

	1870	1900	1930
1.	Cheshire	Cheshire	Cheshire
2.	Lancashire	Lancashire	Lancashire
3.	Derbyshire	Derbyshire	Staffordshire
4.	Somerset	Staffordshire	Derbyshire
5.	Staffordshire	Somerset	Somerset
6.	Dorset	Cornwall	Dorset
7.	Westmorland	Dorset	Wiltshire
8.	Cornwall	West Riding	Cornwall
9.	West Riding	Westmorland	Shropshire
10.	Shropshire	Shropshire	Westmorland
11.	Cumberland	Wiltshire	Sussex
12.	Devon	Leicestershire	West Riding
13.	Leicestershire	Cumberland	Surrey
14.	Wiltshire	Devon	Hampshire
15.	Monmouth	Buckinghamshire	Cumberland

Source: calculated from Agricultural Statistics.

Only Wiltshire - the north of which was a long established dairying area - rose to challenge the big five, though at a lower level there were significant increases in Sussex and Hampshire. In terms of increased stocking densities the traditional dairying counties have a good record. In both halves of the period Cheshire, the West Riding, Staffordshire, Leicestershire, Derbyshire, and Wiltshire all experienced above average increases, while in the second half of the period they were joined by Dorset, Gloucestershire, Somerset, Berkshire, Hampshire, Shropshire, Surrey, and Sussex. The only area to show a consistent decline was Middlesex for the reasons mentioned above. More surprisingly, the stocking density in Gloucestershire actually fell between 1870 and 1900, although there was a marked recovery in the following thirty years. In these same years, 1900-30, there was a decline in stocking density in Cambridgeshire and very limited increase in Bedfordshire, Lincolnshire, Rutland, and Huntingdonshire - all

in the east of the country.

Lastly, one must look at the increase in the cattle population in relation to the growth in human population during the period. Quite simply, the number of cows and heifers per 1,000 of population declined from about 70 in 1871 to about 58 in 1901 at which level it stayed roughly constant throughout the remainder of the period. However, it would be wrong to interpret this as a deterioration in the supply of dairy produce. On the contrary the position improved as the increasing imports of cheese and butter more than offset the relative decline of the cow population. Moreover, this supply of cheap manufactured dairy products, by reducing the demand for domestic cheese and butter, enabled the liquid milk to expand without the hinderance of rising prices checking demand.

To give these figures greater meaning it is necessary to compare conditions at home and abroad. Unfortunately, there is no readily available source on dairying on the continent. By collecting together figures from Agricultural Statistics and other scattered sources it is possible to draw up the following table.

Table XVIII over....

TABLE XVIII [5]

Cattle in selected European countries, 1864-1906. (M).

	Austria			Denmark			France		
	Total Cattle	Cows	Cows as % of cattle	Total Cattle	Cows	Cows as % of Cattle	Total Cattle	Cows	Cows as % of cattle
1864	9.2	6.1	66.3	1.2	0.8	66.7	14.2	5.6	39.4
1872	7.4	3.8	51.4	1.2	0.8	66.7	11.3	6.0	53.1
1881	8.6	4.1	47.7	1.5	0.9	60.0	11.6	7.3	62.9
1890	8.6	4.3	50.0	1.5	1.0	66.7	13.6	6.5	47.8
1898	9.5	4.7	49.5	1.7	1.1	64.7	13.4	6.5	48.5
1906	-	-	-	1.8	1.1	61.1	14.0	7.4	52.9

	Germany			Sweden			England		
	Total Cattle	Cows	Cows as % of Cattle	Total Cattle	Cows	Cows as % of Cattle	Total Cattle	Cows	Cows as % of Cattle
1864	-	-	-	1.9	1.2	63.2	3.3	1.3	39.4
1872	15.8	9.0	57.0	2.2	1.3	59.1	3.9	1.5	38.5
1881	15.8	9.1	57.8	2.3	1.5	65.2	4.2	1.6	38.1
1890	17.5	9.9	56.6	2.4	1.6	66.7	4.6	1.8	39.1
1898	-	-	-	2.5	1.7	68.0	4.7	1.9	40.4
1906	19.3	10.5	54.4	2.6	1.8	69.2	5.1	2.0	39.2

Source: Agricultural Statistics, J.A. Clarke, 'Practical Agriculture', J.R.A.S.E., 2nd.ser., xiv, (1878), 467. J. Mackintosh, 'The Increase and Improvement of Dairy Livestock', J.B.D.F.A., xxxi, (1917), 14. R. Bannister, 'Our Milk, Butter, and Cheese Supply', Journal of the Society of Arts, xxxvi, (1888), 967. J. Mackintosh, 'The New Agricultural Policy and the Dairy Farming Industry', J.R.A.S.E., lxxviii, (1917), 22.

Looking simply at the numerical increase in each of the six selected countries England's performance is good. However, if one looks at the number of cows as a percentage of total cattle a distinct difference emerges. Only once does the figure for England rise above the 40 percent mark, whereas at no time does the level fall below 45 percent for any of the other five countries (with the exception of the first figures for France which

5. The lack of a good series of figures throws some doubt on the validity of the table. The early returns for France, in particular, appears to be too high. The outline, however, is clear despite the weakness in detail. Ideally, one would like to compare stocking densities per 1,000 acres of cultivated land. There are few available figures and one cannot base any firm conclusions on them.

Cattle and Cows per 1,000 acres cultivated land.

	Austria	Denmark	France	Germany	Sweden
Cattle 1878	-	210	-	205*	181
Cows 1914	108	185	86	127	152

*Prussia

is open to some doubt because of the very high estimate of total cattle). In part these figures do no more than reflect the fortunate position England enjoyed with regard to meat production, but the different emphasis upon meat and milk also reflected marked differences in taste, which in turn affected the degree of significance accorded to the various branches of livestock husbandry.

There was also a marked contrast in the ratio of cows to human population, as the following table reveals. The explanation is two-fold. First, the dairy herd was a smaller percentage of the total herd in England. Second, and more important, England was an advanced industrial nation, buying large amounts of her foodstuffs from abroad, and her agricultural sector was allowed to contract under the forces of free competition in the world market.

TABLE XIX

Cows per 1,000 of population, 1865, 1888, & 1905.

	1865	1888	1905
Austria	261	110	176
Denmark	448	500	440
France	150	170	191
Germany	-	212	174
Sweden	321	-	338
England	68	63	58
Great Britain	85	78	68
Ireland	248	209	338

Source: as for Table XVIII

Numerical increase was but one aspect of the development of English dairy farming. Equally significant was the structure of the national herd. Unfortunately, it was not until 1908 that the first cattle census was taken. The figures revealed an overwhelming predominance of Shorthorns.

TABLE XX

The Composition of the National Herd, 1908.

Breed	Number	%	Breed	Number	%
Shorthorn	4,413,040	64.0	Highland	99,804	1.4
Devon	454,694	6.5	South Devon	96,991	1.4
Ayrshire	440,000	6.3	Channel Island	101,233	1.4
Hereford	384,877	5.5	Galloway	31,265	0.4
Welsh	248,401	3.5	Red Poll	27,232	0.4
Aberdeen Angus	193,960	2.8	Sussex	19,660	0.3
Irish	168,790	2.4	Others	37,164	0.5
Lincoln Red	188,023	2.7	Total	6,905,134	99.5

Source: Census of Production, 1908, (6.6277), Parl.Papers 1912-13, x, 585.

The large number of Shorthorns reflected the strength of opinion which, for much of the nineteenth century, had favoured the dual purpose animal in preference to the specialist beast. The specialist dairy breeds were numerically insignificant. The Ayrshire was the most important but was largely confined to Scotland, though some had been brought into England, notably to Essex where to Scots farmers had migrated with their cows. Jerseys and Guernseys formed an even small percentage of the national herd, and it is difficult to see that their undoubted dairying qualities could have had anything but a limited, local importance. The Friesian, today the most popular dairy cow,[6] did not warrant a separate category even though they

6. The Milk Marketing Board Census for 1955 showed that of 2.5 million cattle in England and Wales 40.5 percent were Friesians, 25.3 percent Shorthorns, 18.3 percent Ayrshires, 7.9 percent Jerseys and Guernseys.

were to be found in England from the 1860s onwards.

The picture at the turn of the twentieth century contrasts markedly with that of a hundred years earlier. From the surveys of the late eighteenth and early nineteenth centuries, it is evident that the local breed of cow (and of sheep) was more important, although there were signs that some dairy farmers were prepared to buy replacements from any part of the country. Cheshire dairy farmers at the turn of the century (1800) bought Longhorns from Lancashire, as well as Irish, Scotch, and New Leicester cattle.[7] There was a preference for the Longhorn in the adjoining counties of Lancashire and Staffordshire, and also in other parts of the north-west midlands, as far south as Leicestershire and Northamptonshire.[8] In the south-west of England the local breed was firmly entrenched. The Devon Red and the South Devon were to be found not merely in their native county but in Cornwall, and parts of Dorset and Somerset where they mixed with both Long and Shorthorns. The old Red Gloucester was still to be found in Gloucestershire and Wiltshire, but the Longhorn had become popular here in the late eighteenth century, much to the dismay of William Marshall.[9] Further east in the Vale of Aylesbury the Shorthorn was the favourite dairy animal. A similar preference was to be found in much of eastern England. The most notable exceptions were in the two East Anglian counties where the Suffolk Dun and the Norfolk Red Poll were still to be found in large numbers.[10] Kent had a long tradition of importing Dutch cows, (but one must not exaggerate their number), while the proximity of Hampshire to the Channel Islands led to a certain number of these cows being included in the

7. H. Holland, General View, of.....Cheshire, (1801), 249-51.
8. W. Marshall, Rural Economy of the Midland Counties, (1796), VM I, 315
9. W. Marshall, Rural Economy of Gloucestershire, (1796), VMI, 212, VMII, 75, 96.
10. W. Marshall, Rural Economy of Norfolk, (1788), VMI, 323, and A. Young, General View of....Norfolk, (1797), 445.

local dairies. However, more indicative of the change to come, the London cow-houses were gradually becoming dominated by Shorthorns at the expense of Longhorns.

In 1887 Coleman[11] referred to the Shorthorn as "the universal intruder", a most apt title, but he gave no indication of the date at which it achieved this position. That the Shorthorn was the leading dairy breed by the 1880s cannot be seriously doubted. Long and Morton, two of the most experienced observers and prolific writers on the subject, were confident of the matter.[12] Only in exceptional cases, such as Shropshire,[13] was the old Longhorn still predominant while the local breed was of significance only in the more outlying areas of the south-west and, to a lesser extent, East Anglia. Nonetheless, traces of the old local breeds could be found in the hotch-potch of mixed animals that persisted throughout the nineteenth century.[14]

In his General Treatise on Cattle, published in 1809, Lawrence observed 'that of late years, the shorthorned cattle have supplanted the long, in many considerable dairies, the superior quality of milk making amends for the reduced quantity of butter.'[15] This was undoubtedly true, and represented an extension of the trend noticed by Marshall, Young, and others but this was a novelty, and, as such, caught the eye of the observer. However, this is not to say that there was a wholesale switch to the

11. J. Coleman, The Cattle, Sheep, and Pigs of Great Britain, (1887), 111.
12. J. Long and J.C. Morton, The Dairy of the Farm, (1885), 35.
13. J.C. Loudon, Encyclopedia of Agriculture, (1883), 1148.
14. e.g. H. Evershed, 'The Farming of Warwickshire', J.R.A.S.E., 1st.ser., xvii, (1856), H. Tanner, 'The Farming of Shropshire', J.R.A.S.E., 1st. ser., xix, (1859), W. Bearne, 'The Farming of Northamptonshire' J.R.A.S.E 1st. ser., xiii, (1852-3).
15. J. Lawrence, A General Treatise on Cattle, (1809), 115.

Shorthorn. The writers of the time were not over-concerned with the ordinary happenings which tended to be overlooked in the keenness to record any novelty. Moreover, such changes did not take place overnight. A cow was kept for at least four years, if all went well, and though some replacements were purchased annually the process of hearing of, trying out and, finally, switching to a new breed of cow took several years. On top of this one must make allowance for the greater time taken for ideas to spread in pre-mass media days, as well as the innate conservatism of the bulk of the farming community. Writing some fifty years later, H.H. Dixon, better known as "The Druid", pointed out that 'even at the Ketton sale in 1810 the taste for Shorthorns was confined within a narrow compass, as Durham, Yorkshire, Lincolnshire, Northumberland, and Westmorland were the only counties which purchased.'[16] It would appear that the first decade of the nineteenth century was still very much a part of the experimental stage during which the Shorthorns were gradually spreading from their home area to other parts of the country. The process was one of infiltration rather than of dramatic takeover.

By the mid-century the balance seems to have shifted in favour of the intruder. Although Milburn,[17] in 1851, could still classify the Shorthorn as a fat animal other evidence suggests that this was not altogether the case in practice. In the Vale of Berkely, the dairying areas of Warwickshire and Northamptonshire the Shorthorn had ousted the local breed.[18] By the end of the decade it was held that the Shorthorn was 'peculiarly the milk producing breed of the country.'[19] Dixon summed up the position when he wrote

16. H.H. Dixon 'The Rise and Progress of Shorthorns', J.R.A.S.E., 2nd.ser., 1 (1865), 320.
17. M.M. Milburn, The Cow: Dairy Husbandry and Cattle Breeding, (1851), 35-9.
18. Bearne, op.cit., Evershed, op.cit., J. Bravender, 'The Farming of Gloucestershire', J.R.A.S.E., 1st.ser., xi, (1850-1).
19. J. Gamgee, Dairy Stock, (1861), 9.

that 'they are gradually encroaching on the county limits of the Sussex and on the "blood-red" dairies of Essex, Norfolk, and Suffolk; in the cheese districts of Cheshire, Gloucestershire, and Wiltshire, scarcely any other breed is used.'[20] The universal intruder had come to stay.

It is generally held that the late eighteenth and early nineteenth centuries saw the improvement of the Shorthorn breed. No one would argue that the quality of the animal as a meat producing beast was raised, but the Shorthorn was a dual purpose animal to be found on milk producing as well as meat producing farms. Unfortunately less attention was paid to the milk producing qualities of the breed. Thus the spread of the Shorthorn was not an unqualified blessing for the English dairy farmer. Low bemoaned the fact that the new Shorthorn was inferior to the old in its milk yielding ability.[21] Like Bakewell and his Longhorns the early improvers sacrificed milk to meat. To a certain extent the work of Thomas Bates offset this tendency but even he succumbed to the show mania which seriously limited the potential development of the English dairy industry. As one distinguished writer on agricultural topics observed 'it is a common saying among dairy farmers that "So-and-So has pedigreed his milk away"....'[22] Yet the Shorthorn was to maintain its popularity well into the twentieth century. In part this was the result of improved yields achieved by the 1890s but largely because of the attractions attributed to dual purpose animals. This frame of mind led to other changes that further hindered the dairy industry. The Suffolk Dun, noted for its value in the butter

20. Dixon, op.cit., 324.
21. D. Low, On the Domesticated Animals of the British Isles, (1845).
22. J.R.A.S.E., 3rd. ser., xvii, (1885-6), 122, C.S. Read.

dairy, fell foul of the preference for dual purpose animals and was gradually converted into the Red Poll. Again milk was sacrificed to meat. The fate of the old Suffolk cow contrasts with that of the Ayshire. The latter was developed as a specialist dairy animal as the result of the demand for dairy produce from Glasgow and Paisley; the former, equally well suited, lived too far distant from London to survive in its specialist form.

The railway era came too late for the English dairy farmer to have a specialist animal, but on a very limited scale the gap left by the Suffolk Dun was filled by Alderney cattle. In the early nineteenth century some 400 had been imported annually. Some had found their wgy to London, others stayed in the southern counties. The most famous herd was founded in 1825 by Philip Dauncey at Horwood, in Buckinghamshire. He set about developing high yielding cows by a policy of careful breeding. By 1879, when the herd was sold, he had won for himself a considerable reputation. However, the overall impact of those animals must not be exaggerated.[23] Of the two animals the Guernsey was probably the more popular. Coleman observed that in the ten years between the first and second editions of his book (the latter appearing in 1887) 'the Guernsey cattle have advanced in favour more rapidly perhaps, than any other breed.'[24] The Express Dairy's herd helped to popularise their image as a general utility milk producer but for most dairy farmers the Guernsey was primarily the "amateur's cow". As Low pointed out forty years before 'they are generally in demand by the more opulent classes for the domestic dairy.'[25] The situation had

23. for a detailed treatment of this subject see E.J. Boston, Jersey Cattle, (1954).

24. Coleman, op.cit., 233.
25. Low, op.cit., 333.

changed but little in the intervening years. In fact the tendency was confirmed in the later years of the century as "Villa Dairying" became more fashionable. The demand here was for a pretty cow to display on the lawn rather than for the more ungainly, but more productive, lady of the working dairy. Nonetheless, some dairy farmers realised the value of the breed and Jerseys and Guernseys could be found in the butter-making dairies of Hampshire and Dorset.

Awareness of the importance of milking qualities can be detected among the owners of all breeds by the late nineteenth century. The development of improved milking stock was predominantly the work of numerous practical men working in relative obscurity, not the outcome of pedigree breeding. On the contrary pedigree breeding had proved disasterous. The Dairy Shorthorn can be traced back to the animals bred by Thomas Bates but the links were often tenuous, and, in practical terms, any progress achieved by Bates had been cancelled out by the show mania of the mid-century. The situation was summed up by an otherwise unknown Cheshire dairyman, by the name of Riley, in conversation with J.D. Dent, who was reporting on the cattle at the 1864 Royal Show. Dent reported Riley as saying that 'if he wanted milk he would rather have his stock related to the Cheshire cows of 1800, to the Ayrshire, or even the Welsh cow...than to Royal Dukes and Duchesses, and would prefer their being matched to the son of his neighbours' best milking cow that to a bull of Bates's or Booth's.'[26]

However, there were those who were rebuilding the milking reputation of the pedigree stock. The success of the Stratton family illustrates the point. In 1837 Richard Stratton bred Moss Rose from a dam that had been

26. cited in R. Trow Smith, op.cit., 241.

described simply as "a Shorthorn dairy cow of good character and an excellent milker." The sire, Phoenix, had been purchased locally. Moss Rose and her descendants provided the basis of the family reputation which was developed by Richard Stratton's sons. Their record at Smithfield was impressive. Between 1872 and 1886 they won eleven gold medals and breed championship cups, and three championships of the whole show. Nationally, they won prizes to the value of £5,000. Of greater significance was the fact that these prizes included several from dairy shows.[27] The Strattons were important people behind the revival of the Dairy Shorthorn, but it is an indication of the delay that attended these improvements that the Dairy Shorthorn Association was not founded until 1905. When one looks at the major herds of Shorthorns it is striking that the majority were founded late in the nineteenth century.[28]

The neglect of the dairying qualities of the Shorthorn is important because of the predominance of this animal in the national herd, but similar faults were to be found among other breeds and their breeders. The Devon, for long noted for its high quality milk, suffered under the show mania of the mid-nineteenth century and it was not until the 1890s that that attention was again paid to its milking properties.[29] The folly of the show breeders was not found at the lower levels - the Devon maintained its position in its native county and was to be found elsewhere, in Norfolk,

27. for greater detail see E.J. Burrows, A History of Dairy Shorthorn, (1950)
28. e.g. George Taylor at Cranford, Middlesex, 1891-1912, Lord Rothschild's herd at Tring, 1897-1913, R.W. Hobbs, Lechlade, Gloucestershire, from 1878, and C.R.W. Adeane at Brabraham, Cambridgeshire from 1896. For further details of these herds see Burrows, op.cit.,
29. J. Sinclair, A History of the Devon Breed of Cattle, (1893), A.C. Skinner 'The Devon Cow for Dairy Purposes', J.B.D.F.A., ix, (1894),89-96.

Essex, and Dorset where butter making was the chief concern - but the repercussions could not altogether be avoided.

In an age when the emphasis was upon dual purpose animals it is not surprising that specialist breeds should find limited support. The Jersey was a case in point. With butter making of declining importance on many dairy farms, the relatively delicate nature of the animal, coupled with its limited yield, limited the demand for the breed. The Friesian, however, had greater attractions in that its yield was much higher than that of the Shorthorn and its fattening properties were scarcely any worse. Nonetheless, there was considerable opposition to the breed from its introduction into this country until the 1940s, - opposition that was strengthened by the higher cost of the animal. The origins of the breed in England are obscure, but there are references to the importing of Dutch cattle from the late seventeenth century - indeed, the improved Shorthorn probably owes part of its character to the Dutch cow - but this appears to have fallen off by the early nineteenth century. There was, however, a demand for them from the London cow-keepers who appreciated their high yields. According to Stanford, in his history of the breed, imports recovered from the 1860s onwards until 1887 when the import of live cattle was stopped because of cattle plague. The trade was resumed again in 1890 but halted two years later, again to prevent the importing of disease. However, this short space of time was sufficient to allow in enough Friesians to form the basis of the British Friesian Cattle Society.[30]

Their reception in England was varied, though largely adverse. The

30. J.K. Standford, British Friesians, (1956), 39.

Live Stock Journal in 1885 commented on the fact that 'the Shorthorns.... have been so persistently bred for beef alone that they have lost their prestige as milkers', continuing it suggested that 'of late the Holsteins and the Jerseys have excelled them.'[31] In practice such merit was largely ignored. Stanford claims that there were some thirty to forty Friesian herds scattered over the country[32] but, assuming that this is correct, they still comprised no more than a small percentage of the cows in England. Moreover, opinion tended to be hostile. High yields, or so it was argued, weakened the animals and such qualities could never be handed down to their offspring. It took a long time for prejudice to be overcome. Well into the twentieth century the Friesian was dismissed as a "mere water cart". The low butter fat content of the milk could not be denied but the charges were often exaggerated. Practical performances seemed to carry little weight. As Stanford points out 'by 1929 they (Friesians) had won the Silcock cup seven times out of nine, a cup for which points were awarded not only for milk, but for individuality, breeding, appearance, the young stock, the bulls, and the butter-fat percentage.'[33] Although outnumbered ten to one by other dairy breeds there were by 1925 six 3,000 gallon Friesians and over 160 2,000 gallon yielders. Against this number all other breeds could only muster sixteen. It took the harsh years of the inter-war years, when emphasis was placed on high yielding animals, to achieve wider acceptance of the Friesian as a respectable dairy animal.

31. ibid., 45. The original reference was to America but was quoted to illustrate the position in Britain.
32. ibid., 39.
33. ibid., 111.

The structure of the national dairy herd reflected the different needs as seen by the dairying community. Butter making was of limited importance even in the mid-nineteenth century and had declined considerably by 1900. Consequently there was little demand for a cow that had produced milk with a high butter-fat content. (All the more so as liquid milk was not graded). The Devon, therefore, was restricted to its home county and the butter areas of Dorset, Hampshire, and East Anglia. Similarly, the Jersey and Guernsey were not widespread, though some were found in milk producing dairies to ensure that the milk was above the legal minimum standard. For the cheese maker or milk seller the quality of the milk was of less consequence. Although the improved Shorthorn was reputedly less fecund than its ancestor it was generally superior to the local breeds that it gradually replaced. Moreover, its fattening qualities appealed to farmers who firmly believed in the virtues of the dual purpose animal.

In other respects the national herd was far from ideal. Generally speaking, the standard was low despite the improvements of the late nineteenth century. Complaints of poor quality came from all parts of the country and it was commonly held that the general level could be raised considerably. The proud boasts of the Royal Show winners revealed not so much the advances that had been made as the gap between good and bad, and the distance that the majority had to make up. Basically, the trouble was the large number of third rate bulls from which the dairy herd was bred. Attention was drawn to the desirability of breeding from deep milkers, but all too often the advantages to be gained in this way were squandered by the use of a scrub bull, whose lineage showed little milking ability. The

situation was made no better by the increasing habit of maintaining "flying herds". The result was to slaughter the best milkers instead of using them for breeding purposes.

Throughout the period breeding was done on an empirical basis. However, this had its limitations, particularly as the Shorthorn was not a reliable line breeder. By the inter-war years the position had been improved somewhat by the breakthrough in knowledge of genetics but it would be wrong to exaggerate the impact of these developments before 1930. Similarly, milk recording schemes had no far reaching influence during the period. What progress that was made was the result of quiet unspectacular work carried out by small farmers throughout the country - but the rate of progress was steady and slow.

If the genetic revolution came in the early twentieth century and made its impact felt several decades later, the late nineteenth century was characterised by a breakthrough in nutritional science. This new knowledge, developed during the second half of the nineteenth century, was increasingly popularised, particularly in the inter-war years when James Mackintosh and Robert Boutflour were active in bringing information to all levels of the farming community.

Practical men had been aware of the importance of a properly balanced diet for many years. Thus, Thomas Horsfall of Burley, in Yorkshire, having first analysed the composition of milk worked out a ration to cover both maintenance and production of milk. This was expressed initially in terms of hay but as the quantity of feed required was so great he turned to artificial feeds, such as rapecake, and green foods, such as cabbage, kohl-rabi, and mangolds. The cows and their yields were weighed regularly

to ensure that the diet was suitable. Such practice was exceptional, especially in the mid-nineteenth century, but if the ordinary dairy farmer was less thorough he had, by the end of the century, a wider range of foodstuffs which enabled him to feed his cattle more richly and more cheaply than before. Cabbage, kohl rabi, turnips, swedes, mangolds were all used as feed while ensilage became increasingly common in the last quarter of the century. All in all improved feeding was probably as important as improved breeding in raising the standard of the national dairy herd.

III

Writing in 1892, Rew informed readers of the Journal of the Royal Agricultural Society of England that 'in no branch of agricultural statistics has there been more uncertainty than in that which relates to the production of milk.'[34] A masterpiece of understatement the observation applies to the whole period, but particularly to the years before 1900. However, it is necessary to determine the changing level of milk yields during the period. At first sight the position appears quite hopeful as the agricultural journals contain numerous references to yields from herds scattered throughout the country. On top of this there are several calculations from the pundits writing on the subject of dairy farming. However, it would be a rash man who placed any great reliance upon these figures. In themselves they give some indication of the possibilities open to the progressive farmer, but all too often the figures reflect what could have been the case rather than what was the case in practice.

The standard authority, Trow-Smith's History of British Livestock Husbandry, 1700-1900, summarises the position as follows. The maximum yield possible in the eighteenth century would be found in the town dairies, where the cows were fed on a comparatively high plane of nutrition. An example is quoted: Thomas Wakefield, a leading Liverpool cow-keeper, achieved an average yield of 678 gallons a year from his well-bred Shorthorns. Against this Trow-Smith points out that Cheshire farmers got no more than 300 gallons from mixed herds (which most would be) including bad milkers and slinkers.[35] A final average of 400 gallons a year from well managed

34. R.H. Rew, 'The Production and Consumption of Milk', J.R.A.S.E., 3rd.ser., iii, (1892), 421.
35. Trow-Smith, op.cit., 184.

herds accords with the computation of William Jacques of Ampthill, who, basing his assessment on a large cross-section of cows decided upon a figure of 389 gallons a year.[36] Looking forward to the late nineteenth century Trow-Smith could find no evidence to suggest a marked overall increase in yields. 'The Harley average of about 550 gallons' he concluded, 'was a common one for well managed herds in the third quarter of the nineteenth century, and was no improvement on, and probably a regression from the yields of a century earlier.'[37]

This general background provides a useful first approximation against which to assess the myriad estimates quoted by nineteenth century writers. However, it is not possible to use these references in deciding when, and to what extent, yields varied. Certain claims can be dismissed at once. In his work On the Domesticated Animals of the British Islands, Low claimed that 'healthy cows on good pastures will give from 800 to 900 gallons a year, although taking into account the younger and less productive stock, 600 gallons may be regarded as a fair average for the low country, and somewhat less for dairy stock in the higher.'[38] Low gave no indication of how he reached this figure, and, although a figure of 600, or even 900, gallons a year would not have been impossible at this time - 1843 - it does seem unlikely that the 'general average could have been in the region of 600 gallons a year - particularly when one remembers that the average gross yield of all cows was only 598 gallons per annum in 1954/5.[39]

36. Annals of Agriculture, xxxii, 142ff. Cited in Trow Smith, op.cit., 185.
37. Trow Smith, op.cit., 306.
38. Low, op.cit., 343.
39. Ministry of Agriculture, A Century of Statistics, (1968), 58.

In the same way the estimates of Milburn[40] (600-800 gallons) and Youatt[41] (500-600 gallons) cannot be taken as typical of the national dairy herd, and are generous even for a good dairy herd at that time.

However, certain farmers did achieve such figures. W.H. Heywood, of Dunham Massey, near Altrincham in Cheshire had a herd of 50 cows from which he received an average of some 580 gallons per animal per year.[42] Similarly, R.H. Paget reported that in the years 1886-88 his herd of 45 cows, aged two years and above, gave an average of 605, 532, and 578 gallons.[43] But to produce such results a good herd was needed in the first place, and good management in the second. Yet, with the growing demand for liquid milk from the urban market, which necessitated a longer milking season, a growing number of milk producers were able to raise the yearly yields of their cows. Individual examples, however illuminating in themselves, give no indication of the overall standard. One has to look elsewhere for more general information. J.C. Morton, in an article published in 1868, discussed the means of supplying large towns with milk. In the course of this discussion he referred to the increasing number of "district farmers" supplying milk to London from herds that averaged 500-550 gallons a year. Ten years later Morton set about calculating the average yield of the national dairy herd. In all, he reckoned, there were some 2.25 million cows and heifers in milk or in calf in Great Britain,

40. Milburn, op.cit., 20.
41. W. Youatt, The Complete Grazier, (1864), 190.
42. W.E. Heywood, 'The Comparative Profit from Making Cheese or Butter, Selling Milk or Grazing', J.R.A.S.E., 2nd. ser., 1, (1865), 338-43.
43. R.H. Paget, 'The Milk Record at Cranmore Hall (Home Farm)', J.R.W.E.S., 3rd. ser., xx, (1888-9), 184-6.

producing a grand total of 1,000 million gallons of milk in a year, or an average gross yield of 444 gallons. He calculated that of this total approximately 1/16th was fed to calves, giving a net average yield of 370 gallons per annum.[44] Morton was an assiduous collector of statistics relating to agriculture and his figures are a more reliable guide than the standard farming textbooks, which relate to what should, rather than what did, happen. Equally persevering in his quest for reliable information was James Long. In 1885 the two brought out a book, The Dairy of the Farm, which contained several facts that modified Morton's earlier estimates. The section headed "Dairy Statistics" they open with a fairly ordinary statement: the average yields of a well managed cow should be in the region of 480-600 gallons a year, according to breed and size, and could be raised by rich feeding and good management. The difference between theory and practice emerges when they looked at the prevailing conditions: 3.75 million cows and heifers in Great Britain produced 1,200 million gallons a year, or an average of 320 gallons, available for human consumption.[45] At first sight the figure appears low, but when one considers the overall standard of the national herd, the prevalence of disease, the scarcity of good milking bulls, and the general neglect of dairying in the mid-nineteenth century, it does not appear unreasonable. (The figure for England, probably, would be higher than for the rest of Great Britain owing to the greater concern with the liquid milk trade and, possibly, to a higher standard of care than in certain parts of Scotland and Wales).

44. J.C.Morton, 'Town Milk, J.R.A.S.E., 2nd.ser., iv, (1868), 69-98, and 'Dairy Farming', J.R.A.S.E., 2nd.ser., xiv, (1878), 645-701.

45. Long and Morton, op.cit., 14.

Marked improvements in the standard of the national dairy herd did not come until the late nineteenth century, when the farming community finally accepted that arable farming was no longer supreme, and that dairy farming was the most important branch of farming. However, improvements had taken place, but it is not to the great shows that one must turn for evidence of change. On the contrary show mania was tantamount to retrogression for the dairy cow. It was the smaller farmer, unsung by so-called pundits, who slowly but steadily improved the milking qualities of their animals. As individuals their achievements were small but in total their contribution was considerable. The 1880s were a turning point in the acceptance of dairy farming as a legitimate and valuable part of farming and from that date improvements in output proceeded apace, making good the losses of the earlier decades.[46]

Contemporary evidence appears to support this assertion. The English editors of Fleischmann's The Book of the Dairy, which appeared in 1896, calculated the average gross yield to be 450 gallons, and the net yield to be 390 gallons[47] a year, while Sheldon, writing seven years earlier, arrived at an average net yield for the cows and heifers of Great Britain of 400 gallons a year.[48] However, the most extensive survey was carried out by Row for the year 1890. His findings deserve detailed attention. Questionnaires were sent to all counties of Great Britain and the seventy three returns received gave, on average, a gross yield of 529 gallons, a net yield of 435 gallons a year. For England alone there were thirty two returns which gave an average net yield of 451 gallons. In contrast,

46. R.H. Row, 'An Inquiry into the Statistics of the Production and Consumption of Milk and Milk Products in Great Britain', J.R.S.S., lv, (1892), 244-86.
47. W. Fleischmann, The Book of the Dairy, (1896), xviii.
48. J.P. Sheldon, The Farm and the Dairy, (1899), 164.

in the dairying areas of Great Britain the average net yield was 471 gallons, while a figure of 666 gallons was achieved in seven well managed dairies. Having made allowance for the upward bias of the returns Rew concluded that the overall average net yield for the United Kingdom was approximately 400 gallons a year.[49]

The near unanimity of these writers gives an added conviction to their estimates, that is not warranted by the nature of their material. The returns used by Rew cover only a very small proportion of the dairy farmers of Britain. Moreover, by their very nature they are likely to have given a marked upward twist to the overall figure. As estimates for the United Kingdom they are open to criticism for as late as 1926 the net yield in Eire was only 406 gallons.[50] Unfortunately, the first official survey of yields was not carried out until 1908. It concluded that the average annual yield for cows in milk in Great Britain was 550 gallons, while the average for all cows and heifers was 437 gallons.[51] This conclusion, however, hid some interesting variations. For example, the average yield per cow in milk in England was 18 percent above that in Scotland, and 37 percent above that in Wales. Within the regions of England alone the figure ranged from 508 gallons in the South West to 633 in the Northern district.

Although an advance on the material available to Rew, the first Census of Production did not give a comprehensive survey, and, consequently, some of its figures were amended by the later surveys of 1925 and 1930/1. According to the Agricultural Output of England and Wales, 1925,[52] the average annual yield per cow and heifer was 468 gallons on milk producing

49. Rew, J.R.S.S., op.cit.
50. E.M. Ojala, Agriculture and Economic Growth, (Oxford, 1952), 204.
51. Census of Production, 1908, P.P. 1912-13, x, 584.
52. Agricultural Output of England & Wales, 1925./Parl. Papers 1927, xv, 61. 255 (C.2815)

farms and 356 gallons on mixed dairy farms. The returns showed a 73:27 ratio of milk to produce dairy farms, giving a weighted average of 438 gallons, a figure that accords with the 1908 figure. However, this figure was further revised on the basis of details of the disposal of milk, plus an adjustment to allow for the bias in favour of milk producers, for whom the filling in of forms was easier than for those making butter or cheese. The new ratio used was 56:44, giving an average net production of 416 gallons a year. On this basis the 1908 figure would need to be reduced to approximately 400 gallons. The 1930/1 Agricultural Output[53] saw no reason to correct the 1925 estimates but concluded that in the six years since the last survey the average yield had risen to 462 gallons per cow and heifer per annum. However, in comparison with the 1925 survey the returns for 1930/1 covered 40 percent of the total dairy herd, an improvement on the 29 percent coverage of the earlier survey.

One fact emerges clearly from this survey of the data relating to milk yields in Britain: there is little reliable evidence until after the Great War. However, by combining what hard facts there are with the literary evidence for the period one may offer the following estimates.

TABLE XXI[54]

Estimated Average Net Yields per Cow and Heifer in milk or in calf in England, 1660-1930.

1860-1880	350	1914-1920	400-410
1881-1895	380	1921-1925	420
1896-1910	400	1926-1930	460
1911-1913	420		

53. The Agricultural Output in England and Wales, 1930/1, (C.4605). Parl. Papers, 1933-4, xxvi, 21.

54. The following figures for the United Kingdom are given by Ojala, op.cit., 205.

1867-9	326	1886-93	369	1911-13	414
1870-6	336	1894-1903	387	1920-2	414
1877-85	352	1904-10	404	1924-9	424

The period 1914-1920 is an exceptional one. Owing to the scarcity of imported feed and other demands on resources yields fell, but the damage had been largely repaired by the mid 1920s.

So far in the discussion an important distinction has been made between gross and net yields (the latter being the gross figure minus all milk fed to calves). Similarly a distinction has been drawn between the average yield per cow and heifer in milk or in calf and the average yield per cow in milk. It is now time to look more closely at the annual yield figure. It can be broken down into two components, (i) length of milking season, and (ii) average daily yield. The gross yield (T) equals the average daily yield (Y) multiplied by the length of the season (S). The figures to be used and the equations derived from them are given below.

TABLE XXII

Components of Gross Milk Yield, England 1860 & 1910.

	1860	1910
Average gross annual yield per cow and heifer (gals)	350	450
Average gross daily yield (gals)	1.43	1.61
Length of milking season (days)	245	280

(i)	Sii.Yii - Si.Yi	=	450 - 350	=	100	actual change
(ii)	Si.Yii - Si.Yi	=	394½ - 350	=	44½	season constant at 1860 level
(iii)	Sii.Yi - Si.Yi	=	400½ - 350	=	50½	yield constant at 1860 level
(iv)	Sii.Yii - Sii.Yi	=	450 - 400½	=	49½	season constant at 1910 level
(v)	Sii.Yii - Si.Yii	=	450 - 394½	=	55½	yield constant at 1910 level

Certain points need elaboration. The gross yield per annum is reckoned as the net yield plus 10-12 percent, a common figure quoted by writers of the period. These figures are open to all the qualifications discussed above. The length of the milking season is also somewhat problematical. For 1860

it was assumed that the majority of dairy farmers were producing cheese or butter. In other words production would be concentrated in the summer months. Taking the normal season to be from April to November, the figure of 34 weeks was rounded up to 35 to make some allowance for milk producers who carried on through the winter. By the end of the century there had been a marked expansion of the liquid milk market and production was necessary throughout the year. Some milk producers were in the habit of milking their cows to within one month of calving, thus giving a milking season of over 300 days. However, a more normal figure was a milking season of 44 to 46 weeks.[55] But not all dairy farmers were milk sellers and a weighted average of 40 weeks was arrived at by using the 1908 milk utilisation figures.[56] From these figures one obtains the daily gross averages of 1.43 and 1.61 gallons. Owing to the lack of reliable data for the mid-nineteenth century it is not possible to check the first figure. However, by the end of the century more detailed and more reliable evidence is available. High yielding herds could average over two gallons a day throughout the year but an average figure of two gallons a day in summer and one to one-and-a-half in winter was generally accepted.[57]

From the equations it can be seen that the overall improvement in yields was as much the result of better yields (i.e. the result of improved breeding, feeding and general attention) as of a simple extension of the milking season - by 1910 the milking season was 14 percent longer while yields were 13 percent higher.

55. Agricultural Gazette, xxv, (1887), 457, J. Long, The Dairy Farm, (1889), 50, J. Oliver, Milk, Butter and Cheese, (1894), 52.

56. Figures of 44 weeks for milk producers and 34 weeks for cheese/butter makers were weighted in the ratio of 80:15 on the basis of the returns for the disposal of milk in 1908. As this probably exaggerated the importance of milk producers the answer, 42, was rounded down to 40.

57. W. Buckles, Farm Records and the Production of Clean Milk at Mourdsmere, (1917), 29, Agricultural Gazette, xxiv, (1886), 34, and li, (1900), 164.

IV

Owing to the limitations of the material relating to average yields the calculation of the total product of the English dairy industry is fraught with some danger. Using the figures arrived at earlier the following totals are obtained.

TABLE XXIII

Total Output of Dairy Industry, England, and England & Wales. (Yearly averages, M.gals.)

	England	England & Wales
1865-70	506.4	592.9
1871-75	544.3	634.3
1876-80	552.7	643.1
1881-85	641.0	742.0
1886-90	686.3	792.5
1891-95	700.6	808.1
1896-1900	748.0	859.6
1901-05	766.4	875.6
1906-10	818.0	932.0
1911-15	883.9	1,002.0
1916-20		
1921-25	957.4	1,093.3
1926-30	1,101.0	1,255.8

It is interesting to note that the calculation for England and Wales in the period 1926-30 is roughly two percent lower than the Ministry of Agriculture's figure. The discrepancy is due to the fact that the official yield figure used was 463 gallons while a figure of 460 was used in the table. However, if one looks at one of the more reliable nineteenth century estimates, Morton's of 1875, which gives the total output of the dairy industry of England and Wales as 650 million gallons, there is a considerably smaller gap between the two figures than one might expect.

Total output figures only show the overall changes that took place. Of equal importance are the internal changes within the dairy industry. The agricultural censuses of the twentieth century contain sufficient information for one to be reasonably confident of the structure of the industry. Prior to 1900, however, there are virtually no figures to work upon. All the contemporary writers openly admitted that their figures were estimates based more on inspired guesswork than on hard facts. To give some idea of the position some of the more reliable estimates are shown below.

TABLE XXIV

The Formation of the Dairy Industry. (as % of total milk production)

	England and Wales			Great Britain			United Kingdom		
	Milk	Butter	Cheese	Milk	Butter	Cheese	Milk	Butter	Cheese
1875	29.8	23.1	47.6	-	-	-	-	-	-
1878	-	-	-	36.5	15.6	31.2	-	-	-
1885	-	-	-	-	-	-	41.7	50.0	
1890	-	-	-	-	-	-	40.2	43.5	15.8
1908	71.1	12.3	4.2	70.9	11.7	4.6	-	-	-
1907-8	-	-	-	68.9	16.5	7.3	-	-	-
1924-5	80.8	14.9	5.0	69.8	13.8	7.5	-	-	-
1930-1	80.2	14.8	4.9	68.8	14.2	7.8	-	-	-

Source: F.A. Barnes, 'The Evolution of the Salient Patterns of Milk Production and Distribution in England and Wales', Institute of British Geographers, xxv, (1958), 167-95. J.C. Morton, 'Dairy Farming', J.R.A.S.E., 2nd.ser., xiv, (1878), 643-718. J. Long & J.C. Morton, The Dairy of the Farm, (1885), 10. R.H. Rew, 'Production and Consumption of Milk', J.R.A.S.E., 3rd. ser., iii, (1892), 421-7. 1908 Census of Production, Parl. Papers, 1912-13, x, 584. Report of the Reorganisation Committee for Milk, Min. of Ag., Econ.Ser., 38 (1933), 200. The Agricultural Output of England and Wales, 1925, (C.2815), Parl.Papers, 1927, xxv, 65. The Agricultural Output of England and Wales, 1930-31, (C.4605), Parl.Papers, 1933-4, xxvi, 24.

Conditions were not uniform throughout the four Home Counties. More butter was made in Ireland, and, to a lesser extent, in Wales than in England. The latter, at the start of the period under review produced substantial amounts of cheese but stitched more completely to the liquid milk trade than any of the other three countries. Although it is impossible to give precise figures it would seem reasonable to suggest that the distribution in England was as follows:

c.1860 milk 30%, butter 30%, cheese 40%.

c.1900 milk 70%, butter 15%, cheese 10%.

c.1930 milk 80%, butter 15%, cheese 5%.

These figures are essentially conjectural and only give an approximate idea of the situation. Nevertheless, they probably reflect the overall trends with a reasonable degree of accuracy.

V

The last stage in assessing the overall importance of the dairy industry in England is to calculate the gross output it generated. The position is shown in Table XXV.

TABLE XXV.

The Gross Output of the English Dairy Industry +

	Production (M.gals.)	Value (d/gal.)	Gross Output (£M.)	Gross Output (£M. 1906-10 prices)
1866-70	506.4	6.5	13.72	16.25
1871-75	544.3	6.9	15.64	17.46
1876-80	552.7	7.5	17.27	17.73
1881-85	641.0	7.7	20.57	20.57
1886-90	686.3	6.6	18.87	22.02
1891-95	700.6	6.3	18.40	22.48
1896-1900	748.0	6.0	18.70	24.00
1901-05	766.4	6.7	21.39	24.59
1906-10	818.0	7.7	26.25	26.25
1911-15	883.9	9.0	33.14	28.23
1916-20				
1921-25	957.4	11.8	47.08	30.73
1926-30	1,101.0	10.5	48.17	35.33

+ excluding milk fed animals.

For the last four decades of the nineteenth century the figures are far more definite. Great variations existed between different parts of the country, and the coverage of existing statistics is patchy. The most complete series of figures relate to milk supplied under contract to certain London hospitals. As indicators of the overall trend in prices these figures are valuable, but as indicators of the actual level of prices they are of limited use. This applies particularly to the milk prices in the years 1866-80. During this period the average contract price ranged from 50 to 100 percent above milk prices both for London and

other parts of the country. Thereafter the figures are not so misleading though they are consistently above average. The position is further complicated by the different means of disposal open to the milk seller. I.N. Edwards of St. Albans grossed 1/6d. a gallon during the late 1880s by selling locally, rather than sending to London, where the average price was almost half the figure he was making.[58] In contrast some Somerset milk sellers were forced to make contracts at 4d. a gallon.

Cheese prices present less of a problem in that there is a large amount of scattered material relating to prices. The difficulty is to decide the amount of cheese that fetched top prices and that which brought in lower returns. There is no way in which this can be satisfactorily achieved, but by careful use of contemporary estimates it is possible to arrive at a reasonable figure. On the other hand, butter prices were more conjectural. Price data exists, but the bulk of home produced butter was sold at the local market, at comparitively low prices which bore limited relation to the figures quoted at the big fairs and markets. The validity of the figures above, therefore, is open to question, but in the existing state of knowledge there is little more that can be done to improve upon them short of a nation wide survey of local conditions: a task that is liable to consume time out of all proportion to the value of the results obtained.

The same problems exist for the later period but the availability and validity of data improves with the passage of time. Certain imponderables remain. The amount of milk sold under contract compared

58. I.N. Edwards, 'Winter Dairying', J.B.D.F.A., iv, (1887), 136.

to that sold as accommodation milk cannot be judged, for example. Nevertheless, it is possible to calculate an average figure that is sufficiently accurate for the present purpose of calculating the gross output of the dairy industry in England.[59]

With output rising steadily throughout the period the gross output at constant, 1906-10, prices increased despite the general decline in certain other sectors of agriculture. At current prices the picture is somewhat different. In the years from 1866 to 1889 the returns to cheese and milk rose, the latter markedly. At the same time a growing proportion of total milk production was being diverted into the liquid milk trade. As a result gross output values burgeoned. During the 1880s the pattern altered. First, the returns to cheese declined; followed later by those to milk. The fall in price, which continued until the end of the century, was sufficient to offset the effect of rising output on the value of gross production. By the late 1890s there were signs of change and though output was rising comparatively slowly, especially in the first decade of the twentieth century, the value of gross output recovered as milk and cheese prices revived. After

59. The figures used for the calculations of gross output are as follows:

	Estimated Average Price d/imp.gal.				Estimated Disposal %		
	Milk	Butter	Cheese	Average	Milk	Butter	Cheese
1866-70	7	6	6.5	6.5	30	30	40
1871-75	8	6	6.5	6.9	35	25	40
1876-80	9	6	6.5	7.5	45	20	35
1881-85	9	6	6	7.7	55	15	30
1886-90	7	5	6	6.6	65	10	25
1891-95	6.75	5	5.5	6.3	70	10	15(+5)
1896-1900	6.5	4	5	6.0	70	10	10(+10)
1901-05	7	4.5	6.5	6.7	70	10	5(+15)
1906-10	8	4.9	7.4	7.7	75	8	5(+12)
1911-15	9	5.4	10.7	9.0	75	8	5(+12)

for the 1920s the Ministry of Agriculture figures were used as the basis of the calculations. The figures used were 1921-5 11.8d. per gallon and 1926-30 10.5d. per gallon.

the Great War the situation was complicated by the actions of the Permanent Joint Milk Committee, whose agreements propped up liquid milk prices, at a time when the large-scale import of cheap butter and cheese and the resulting unprofitability of home production, and the subsequent switch to liquid milk production threatened the well being of the dairy farmer.[60]

Unfortunately, there are no available figures for the performance of other branches of the agricultural sector with which to make comparisons. The figures calculated by Ojala relate to the United Kingdom as a whole and are of limited value owing to the great variations between the various countries. The only figures for England are those of Fletcher, amending some calculations by Ojala for the period 1867-71 and 1894-8.[61] The comparison shows that at current prices output generated by beef rose by 9.8 percent, while that from milk products increased by 13.3 percent. However, the figures in Table XXV show a rise of approximately 35 percent between 1867/70 and 1896/1900, (but it should be noted that the figures in Table XXV are lower than the figures calculated by Fletcher). In contrast the gross output from mutton had declined 13.8 percent, and that from wool by the huge margin of 58 percent in the years in question. Only pigmeat showed an increase - of 9.8 percent.

The importance of the dairy industry can be clearly seen. The comparisons made above understate this importance for the late 1890s were the years of lowest prices in the dairy trade. Nonetheless, in terms of

60. see Chapter 3 pages 126-30

61. see Chapter 1 page 46. Recalculating the figures used in this chapter one gets the following results. Value of output of milk:
1867-71 £13.87M i.e. 10 percent lower than Fletcher's estimates.
1894-8 £18.82M

output generated dairying had emerged, by the end of the century, as the most important single enterprise in English agriculture. Further, this change was largely the result of a major structural change in response to the changing pattern of supply and demand in the last forty years of the nineteenth century. The importance of liquid milk, confirmed and recognised in the inter-war years, stemmed from these earlier changes.

Appendix A The Growth of the English Dairy Industry, by counties.

No. in 000s. Index 1896-1900 = 100.

1866-70	Beds.	Berks.	Bucks.	Camb.	Chester	Cornwall	Cumberland
No.	8,702	14,071	25,125	10,970	77,433	46,066	38,540
Index	73.7	68.0	81.2	64.8	73.5	65.9	81.4
1871-75							
No.	9,835	15,250	26,346	13,648	94,083	48,229	40,424
Index	83. 3	73.7	85.1	80.6	89.3	69.0	85.4
1876-80							
No.	9,985	16,241	26,602	13,948	93,878	52,525	40,755
Index	84.5	78.5	85.9	82.4	89.1	75.1	86.1
1881-85							
No.	11,162	17,700	29,485	13,952	95,241	58,063	43,468
Index	94.5	85.6	95.2	82.4	90.4	83.0	91.8
1886-90							
No.	11,990	20,209	30.971	15,816	95,942	65,915	44,623
Index	101.5	97.7	100,0	93,4	91.0	94.3	94.2
1891-95							
No.	12,090	20,296	30,384	17,001	104,055	66,885	46,012
Index	102.3	98.1	98.1	100.3	98.8	95.7	97.2
1896-1900							
No.	11,810	20,692	30,958	16,943	105,394	69,927	47,359
Index	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901-05							
No.	11,374	21,163	31,384	17,060	107,152	72,299	49,292
Index	96.3	102.3	101.4	100.7	101.7	103.4	104.1
1906-10							
No.	12,578	24,356	34,278	17,636	114,713	77,283	51,020
Index	106.5	117.7	110.7	104.1	108.8	110.5	107.7
1911-15							
No.	12,249	25,754	34,039	17,466	116,130	79,176	53,567
Index	103.7	124.5	109.9	103.1	110.2	113.2	113.2
1916-20							
No.	12,513	25,712	32,976	17,308	120,538	79,043	54,796
Index	105.9	124.3	106.5	102.2	114.4	113.0	115.7
1921-25							
No.	13,979	28,410	36,963	17,617	121,295	84,524	57,153
Index	118.4	137.3	119.3	104.0	115.1	120.9	120.7
1926-30							
No.	14,414	31,486	37,647	17,461	131,032	89,694	59,141
Index	122.0	152.2	121.6	121.6	124.3	128.2	124.8

	Derby	Devon	Dorset	Durham	Essex	Glam.	Hants.
1866-70							
No.	61,603	70,257	44,212	18,629	20,129	38,000	28,746
Index	87.8	72.2	83.1	67.4	59.3	98.1	61.1
1871-75							
No.	63,577	72,888	47,329	19,893	21,927	38,314	31,556
Index	90.6	74.9	89.0	71.9	64.6	98.9	67.0
1876-80							
No.	64,793	77,770	48,660	20,242	22,639	35,914	34,402
Index	92.3	79.9	91.5	73.2	66.7	92.7	73.1
1881-85							
No.	67,718	85,821	51,090	22,400	25,798	39,595	38,504
Index	96.4	88.2	96.1	81.0	76.0	102.2	81.8
1886-90							
No.	69,941	92,346	54,669	24,226	29,171	41,549	43,113
Index	99.7	94.9	102.8	87.6	85.9	107.3	91.5
1891-95							
No.	71,594	95,407	53,768	26,450	31,706	40,166	45,112
Index	102.1	98.0	101.1	95.6	93.4	103.7	95.8
1896-1900							
No.	70,172	97,277	53,187	27,656	33,958	38,757	47,103
Index	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901-05							
No.	71,028	102,485	53,863	28,086	35,896	39,973	48,000
Index	101.3	105.3	101.3	101.4	105.7	103.1	101.9
1906-10							
No.	75,453	109,042	58,203	29,170	44,217	44,575	54,239
Index	107.5	112.0	109.4	105.4	130.2	115.1	115.2
1911-15							
No.	81,168	111,144	61,361	29,530	44,331	47,090	55,796
Index	115.7	114.2	115.3	106.8	130.5	121.5	118.5
1916-20							
No.	81,296	112,315	64,494	30,436	43,054	52,964	57,494
Index	115.9	115.4	121.3	110.1	126.8	136.8	122.1
1921-25							
No.	82,877	115,204	68,326	31,363	46,494	60,881	63,292
Index	118.1	118.4	128.4	113.3	136.9	157.1	157.5
1926-30							
No.	84,851	121,336	71,841	34,090	52,103	65,060	71,185
Index	121.0	124.7	144.1	123.2	153.4	167.9	151.1

	Hereford	Herts.	Hunts.	Kent	Lancs.	Leic.	Lincs.
1866-70							
no.	23,513	9,969	5,480	24,689	112,[illegible]68	51,827	44,027
Index	75.0	69.8	72.3	75.0	89.0	79.7	64.0
1871-5							
no.	24,922	11,230	7,012	26,390	121,148	53,392	50,452
Index	79.5	78.6	92.5	80.2	89.1	83.6	73.3
1876-80							
no.	25,076	11,682	7,489	27,045	122,203	55,081	52,766
Index	80.0	81.8	98.7	82.2	89.9	82.8	76.7
1881-85							
no.	28,682	12,489	7,118	29,750	125,339	57,411	58,781
Index	91.5	87.5	93.9	90.4	90.7	93.7	85.4
1886-90							
no.	30,403	13,185	7,930	31,545	131,769	60,074	60,972
Index	97.0	92.3	104.6	95.9	97.0	100.3	88.6
1891-95							
no.	31,220	13,776	7,787	32,519	134,214	59,863	64,376
Index	99.6	96.5	102.7	98.9	98.7	99.8	93.5
1896-1900							
no.	31,361	14,278	7,583	32,901	135,918	59,940	68,851
Index	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901-05							
no.	31,842	14,692	7,029	34,602	138,148	60,389	70,353
Index	101.6	104.7	92.7	105.2	101.6	101.1	102.2
1906-10							
no.	32,818	17,590	6,927	38,345	142,363	63,641	71,687
Index	104.7	123.1	91.3	116.6	104.8	109.2	104.1
1911-15							
no.	35,149	19,000	6,708	39,174	140,532	65,623	72,245
Index	112.1	133.0	88.5	119.1	103.4	114.2	104.9
1915-1920							
no.	36,276	18,343	7,572	39,744	141,236	69,060	74,866
Index	115.7	128.4	99.8	120.8	103.9	122.8	108.7
1921-25							
no.	36,871	20,413	7,936	44,738	140,044	54,152	75,328
Index	117.6	142.9	104.7	136.0	103.0	135.6	109.4
1926-30							
no.	38,484	21,861	8,076	49,317	141,308	53,065	80,162
Index	122.8	153.1	106.5	149.9	104.0	132.9	116.4

	Middx.	Monmouth	Norfolk	Northants.	N'umber.	Notts.	Oxon.
1866-70							
No.	13,098	15,147	26,803	20,849	18,925	21,325	16,122
Index	89.3	84.8	77.0	69.6	72.9	76.2	79.5
1871-75							
No.	16,222	15,498	27,633	23,462	19,800	22,473	17,064
Index	104.5	86.8	79.4	78.2	76.3	80.3	84.1
1876-80							
No.	16,807	15,346	27,062	23,836	19,570	23,244	16,943
Index	115.4	85.9	77.8	79.5	75.3	83.0	83.6
1881-85							
No.	15,579	17,012	29,917	26,533	22,205	25,488	17,912
Index	106.9	95.2	86.0	88.5	85.5	91.0	88.4
1886-90							
No.	14,650	18,468	32,259	29,119	23,810	27,492	20.000
Index	100.6	103.4	92.7	97.1	91.7	98.2	98.7
1891-95							
No.	14,472	18,815	33,359	28,273	25,878	27,881	20,298
Index	99.4	105.4	95.9	94.3	99.7	99.6	100.1
1896-1900							
No.	14,566	17,860	34,792	29,979	25,966	27,987	20.269
Index	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901-05							
No.	12,881	18,345	34.158	30,205	27,015	27,952	20.523
Index	88.4	102.8	98.2	100.7	104.2	99.9	101.3
1906-10							
No.	11,606	18,744	35,166	31,703	27.374	29.565	22,974
Index	79.7	104.9	101.1	105.7	105.4	105.6	113.3
1911.15							
No.	10,178	18,961	36,718	32,389	28,127	29,926	23,111
Index	69.9	106.2	105.5	110.3	108.3	106.9	114.0
1916-20							
No.	9,502	19.969	40,454	34,136	29,162	31,282	23,240
Index	65.2	111.8.	116.2	116.2	112.3	111.8	114.7
1921-25							
No.	8,808	20.450	44,091	37,881	30,370	33,665	27,218
Index	60.5	114.5	126.8	129.0	116.9	120.3	134.3
1926-30							
No.	7,563	21,466	47,503	39,577	34,137	34,819	29,023
Index	51.9	120.1	136.6	134.8	131.4	124.5	143.2

	Rutland	Salop.	Somerset	Staffs.	Suffolk	Surrey	Sussex
1866-70							
no.	2,722	49,486	92,608	64,603	18,886	18,108	30,550
Index	76.9	80.5	87.8	83.6	71.1	83.4	64.3
1871-75							
no.	2,942	52,785	97,036	66,822	19,475	20,200	33,650
Index	83.1	85.8	92.0	86.5	79.5	93.0	70.8
1876-80							
no.	3,167	51,440	96,921	63,936	19,136	21,936	34,878
Index	89.5	83.7	91.9	82.8	78.1	101.0	73.4
1881-85							
no.	3,795	55,207	102,861	68,419	20,773	23,394	37,118
Index	107.2	89.8	97.5	88.6	84.8	107.6	78.1
1886-90							
no.	3,982	59,382	107,690	72,958	22,923	23,899	41,537
Index	112.5	96.6	102.1	94.5	93.5	110.0	87.4
1891-95							
no.	3,602	61,608	106,068	76,049	23,521	24,242	43,787
Index	101.7	100.2	100.6	98.5	96.0	111.5	92.2
1896-1900							
no.	3,540	61,480	105,462	77,243	24,501	21,719	47,520
Index	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901-05							
no.	3,467	64,751	108,350	79,519	24,766	20,876	49,489
Index	98.0	105.3	102.8	103.0	101.1	96.1	104.1
1906-10							
no.	3,689	71,625	119,152	85,281	26,629	23,457	55,673
Index	104.2	116.5	113.0	110.4	108.6	108.0	117.1
1911-15							
no.	3,763	78,373	125,559	89,140	27,440	23,401	58,892
Index	106.3	127.5	119.1	115.4	112.0	107.7	124.0
1916-20							
no.	3,849	85,888	131,926	95,795	29,335	23,313	60,464
Index	108.7	139.7	125.0	124.1	119.8	107.4	127.2
1921-25							
no.	4,057	92,180	135,227	100,890	31,845	24,445	68,556
Index	114.7	149.9	128.1	130.6	130.0	112.6	144.3
1926-30							
no	4,527	99,257	138,661	106,589	35,009	25,199	73,953
Index	127.8	161.4	131.5	138.0	142.9	116.0	155.6

	Warw.	W'morland	Wilts.	Worc.	York.E.R.	N.R.	W.R.
1866-70							
No.	28,755	21,266	48,952	22,422	21,607	46.288	94,741
Index	81.8	88.6	77.5	87.1	81.8	85.1	74.0
1871-75							
No.	29.898	22,479	50,199	23,827	24,031	48,853	103,213
Index	85.0	93.7	79.5	92.5	90.9	89.8	80.6
1876-80							
No.	30.032	23,111	48,853	23,861	24,251	49,584	108.652
Index	85.4	96.3	77.4	92.6	91.8	91.1	84.9
1881-85							
No.	33,823	23,530	51,677	25,975	25,111	51,438	113,583
Index	96.2	98.1	81.9	100.9	95.1	94.6	88.7
1886-90							
No.	35,773	25,897	59,052	26,771	25,617	53,027	119,600
Index	101.7	107.9	93.6	103.7	97.0	97.5	93.4
1891-95							
No.	34,570	24,119	60,269	26,512	26,197	54,413	123,054
Index	98.3	100.6	95.5	102.9	99.2	100.0	96.1
18896-1900							
No.	35,170	23,985	63,126	25,762	26,419	54,400	128,050
Index	100.0	100.0	100.0	100.0	100.0	100.0	100.0
18901-05							
No.	34,613	24,522	66,853	26,563	25,935	53,388	128,358
Index	98.4	102.2	105.9	103.1	98.2	98.1	102.4
1906-10							
No.	39,197	25,291	76.247	28,179	28,061	55,458	130.889
Index	111.4	105.4	120.8	109.4	106.2	102.0	109.2
1911-15							
No.	40.814	26,813	81,402	26,186	27,862	57,134	130,708
Index	116.1	111.8	128.9	101.6	105.4	105.0	112.5
1916-20							
No.	44,400	27,472	84.690	29.123	29,231	59.658	134.528
Index	126.3	114.5	134.2	113.1	110.6	109.6	114.9
1921-25							
No.	48,396	29.390	91,680	30.681	29.766	62,177	134.391
Index	137.6	122.5	145.2	119.1	112.7	114.3	121.8
1926-30							
No.	49,186	29,815	100.713	32,082	30,993	64,149	137,489
Index	139.8	124.3	159.5	124.6	117.3	118.0	127.9

Appendix B.

Stocking Density of Cows and Heifers per 1,000 acres of Crops and Grass

	1870	1900	1930	Increase 1870-1900	1900-30	1870-1930
Beds	35.1	46.2	53.2	11.1	+ 7.0	18.1
Berks	38.9	58.6	92.7	19.7	+ 34.1	53.8
Bucks	66.7	78.2	95.2	11.5	+ 17.0	28.5
Camb	23.8	36.4	35.1	12.6	- 1.3	11.3
Cheshire	166.3	200.3	261.6	34.0	+ 61.3	95.3
Cornwall	98.3	114.7	149.7	16.4	+ 35.0	51.4
Cumberland	74.6	83.1	114.4	8.5	+ 31.3	39.8
Derby	127.4	143.0	184.5	15.6	+ 41.5	57.1
Devon	73.5	80.9	108.8	7.4	+ 27.9	35.3
Dorset	99.9	111.4	166.3	11.5	+ 54.9	66.4
Durham	60.5	65.7	88.1	5.2	+ 22.4	27.6
Essex	26.9	44.5	70.1	17.6	+ 25.6	43.2
Gloucester	63.0	54.5	99.0	-8.5	+ 44.5	36.0
Hants	45.5	67.9	116.5	22.4	+ 48.6	71.0
Hereford	58.3	72.2	77.3	13.9	+ 5.1	19.0
Herts	32.7	44.2	70.9	11.5	+ 26.7	38.2
Hunts	29.9	76.9	103.4	11.6	+ 26.5	38.1
Kent	35.6	45.4	68.9	9.8	+ 23.5	33.3
Lancs	160.6	167.3	194.0	6.7	+ 26.7	33.4
Leic	72.4	85.6	110.7	13.2	+ 25.1	38.3
Lincs	32.5	46.6	48.6	14.1	+ 2.0	16.1
Middx	13.4	12.6	11.8	-0.8	- 0.8	-1.6
Monmouth	69.2	74.3	97.6	5.1	+ 23.3	28.4
Norfolk	26.7	33.4	44.0	6.7	+ 6.6	13.3
Northants	42.1	53.2	67.9	11.1	+ 14.7	25.8
N'umberland	28.3	37.4	54.9	9.1	+ 17.5	26.6
Notts	49.6	63.5	76.5	13.9	+ 13.0	26.9
Oxon	43.1	50.2	70.2	6.9	+ 20.0	26.9
Rutland	33.8	40.0	44.3	6.2	+ 4.3	10.5
Salop	78.9	88.5	143.9	9.6	+ 55.4	65.0
Somerset	123.8	124.3	169.5	0.5	+ 45.2	45.7
Staffs	116.8	132.7	188.4	15.9	+ 55.7	71.6
Suffolk	24.6	33.6	47.9	9.0	+ 14.3	23.3
Surrey	68.8	77.7	123.3	8.9	+ 45.6	54.5
Sussex	51.4	74.4	127.8	23.0	+ 53.4	76.4
Warwick	64.6	72.6	98.1	8.0	+ 25.5	33.5
W'morland	98.5	97.1	129.5	-1.4	+ 32.4	31.0
Wilts	72.2	87.7	161.0	15.5	+ 73.3	88.8
Worcester	63.5	66.1	78.6	2.6	+ 12.5	15.1
York E.R.	35.3	39.2	45.7	3.9	+ 6.5	10.4
N.R.	59.7	62.0	77.8	2.3	+ 15.8	18.1
W.R.	87.1	106.2	124.3	19.1	+ 18.1	37.2
England	65.3	76.9	103.4	11.6	+ 26.5	38.1



Cows and Heifers per 1,000 Acres of Crops + Grass

0-24.9 25-49.9 50-74.9 75-99.9 100-124.9 125-149.9 150-174.9 175-199.9 200+

1870

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Do
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Cows and Heifers per 1,000 Acres of Crops + Grass
0-24·9
25-49·9
50-74·9
75-99·9
100-124·9
125-149·9
150-174·9
175-199·9
200+

1900



Cows + Heifers per 1,000 Acres of Crops + Grass

1930

0-24·9 25-49·9 50-74·9 75-99·9 100-124·9 125-149·9 150-174·9 175-199·9 200+

99c

CHAPTER 3

The Dairy Industry: Structure and Location

(i) The Liquid Milk Trade

I

If the Shorthorn was "the universal intruder", dairy farming itself was scarcely less ubiquitous. It is no exaggeration to say that a dairy cow was to be found on at least 99 percent of the farms in England. Moreover, in every county there were to be found specialist dairy farmers producing for the market, either local or national. Nonetheless, there were certain areas in which there was a greater concentration of dairying. Broadly speaking these areas tended to be in the west of the country. The most important amassment was in the north west, comprising the counties of Cheshire, Lancashire, Derbyshire and Staffordshire. Secondly, there was the south western grouping centred on Somerset, Gloucestershire, Dorset, and Wiltshire. In contrast to the pasture lands of the western counties of England, the east, an area predominantly arable, had fewer dairy cows and fewer dairying specialist centres. There was some extension of arable dairying, especially during the last decades of the nineteenth century, but it never reached proportions comparable with conditions in Denmark. However, the simple east/west division conceals certain variations. The most important factor distorting the pattern was the presence of, or accessibility to, a large urban centre. Throughout the period under review the ever rising urban population was to be of crucial importance in the changing structure and shifting location of the dairy industry.

Traditionally, dairying was associated with the manufacture of cheese and butter. Production for the liquid milk market, even in the early nineteenth century, was limited. Very little milk was actually drunk. Louis Simond, writing in 1810, felt it necessary to explain that in England 'milk is not...food or drink, but a tincture -- an elixir exhibited in drops, five or six at most, in a cup of tea, morning and evening.'[1] For the most part liquid milk served two purposes. First, it was an ideal food for children under the age of five, and, second, it was a suitable medium in which to cook. Yet by the end of the century the liquid milk trade had reached large proportions and the habit of drinking milk, with tea, coffee, and cocoa, or in the raw state was becoming increasingly common.

1. L. Simond, Journal of a Tour in Great Britain. (1810), quoted in H. & P. Massingham, eds., The London Anthology, (1950), 183.

II

(a) Prior to the Great War.

The sale of liquid milk as a large scale commercial proposition was largely associated with, and dependant upon, an expanding urban market. In rural areas, where access to milk was usually easier there was little incentive to produce beyond immediate personal needs. Even when milk was given to labourers as part of their wage it was not considered more than a minor intrusion upon the principal usage to which the milk was put. However, as urbanisation proceeded apace the number of people divorced from an immediate supply of milk increased. Thus, the potential market for liquid milk increased in two ways, irrespective of changes in consumption habits. First, the population of England grew by some 98 percent between 1861 and 1931. Second, the percentage of that population living in towns and cities also rose from, roughly, 50 percent in 1860 to 75 percent in 1900, and topping the 80 percent level by 1930. On top of this there was an increase in the per capita consumption of milk during the period.[2]

For much of the early nineteenth century the urban demand for milk could be satisfied by cowkeepers within the towns, and suppliers living on the fringes of large centres of population. Such sources of supply, providing milk warmfrom the cow, were only satisfactory in comparatively small towns. As towns and trade expanded the demand for land intensified. As cost became increasingly prohibitive the urban cowkeeper could not

2. see chapter 9 for details.

easily expand his business. Moreover, as city boundaries pushed further into the countryside the distance from which feed had to be brought and refuse sent rose, and with it costs. Similarly, the suburban farmer found himself increasingly separated from his customer. The advent of the railway, reducing costs on both the inward and outward journey, brought a temporary breathing space, but the very means of this stay of execution was to prove the final and decisive blow. The expansion of the railway network opened up the possibility of new, external, sources of supply for the increasing number of town and city dwellers. An anonymous contributor to the Farmer's Magazine commented in 1855 that 'dairymen at the centre, from the greater expense, cannot manufacture milk so cheap or good in quality as farmers in the country who supply retail customers; hence milk-walks are fast falling into the hands of the latter, and have been doing so since the opening of the numerous railways and country supply of milk through their instrumentality.'[3] London provided the first and most striking example but the capital was not unique in this respect. The town based cowshed did not disappear immediately - most had ceased to exist by the 1920s, but in Liverpool there were still 43 registered cow keepers in 1954[4] - but their importance as a source of supply diminished considerably.

As a result of the heavy concentration of people in the capital it is in London that one finds the earliest and most marked move away from internal supplies of food. Since the late sixteenth century London had

3. F.M. 2nd. ser., vii, (1855), 309.

4. H. Hill, 'Liverpool - last Stronghold of Town Cowkeepers', Dairy Engineering, lxxiii, (1956), 107-110.

not been self sufficient, but 250 years later there was one exception to the rule - milk. Its perishability was such that it set a narrow physical limit to the area from which it could be transported without serious deterioration. In an age of horse drawn traffic and rudimentary cooling devices this limit was at most five miles. The added speed of rail transport, and more particularly improvements in methods of cooling considerably extended this boundary. The potential was soon realised and in 1857, Dodd was able to write that 'every year the railways are bringing more and more milk to London, and it is evident that the trade is a profitable one.'[5] The date of this observation is significant in that the development of rail borne milk to London is generally claimed to have taken place after the cattle plague of 1865-6.

The outbreak of murrain on the 19th June 1865, and its subsequent rapid spread through both the cattle houses of London and every county of England, aroused much interest and greater fear. The flurry of events, the flood of contemporary literature on the subject, and the failure to treat the episode in its proper perspective have led to a seriously distorted view being propounded by later observers. The orthodox view is that the cattle plague and its effects were a crucial turning point in the development of English dairying, marking the change from an internal to an external supply of milk for London, which stimulated change particularly in the south western counties of England. For example, Carrier writes that 'the great expansion of our dairy industry dates from the rinderpest havoc of 1865.'[6] Broadly speaking this interpretation

5. G. Dodd, 'The Food of London', Journal of Agriculture, (1855), 364-78

6. E.H. Carrier, The Pastoral Heritage of Great Britain, (1936), 194.

has been followed by later writers, notwithstanding the unresolved problems and contradictions it contains. Fussell concentrates his attention on the period after 1865, giving no figures for the earlier period despite observing that 'the supply of country milk was already reducing the number of town cowkeepers.'[7] Similarly, Whetham[8] talks of the increase in rail borne milk after the outbreak of cattle plague, but offers no convincing explanation of the fact that she herself mentions, namely, that even before 1865 demand for milk in London was greater than the available supply from urban parlours and suburban farmers.

It is, therefore, necessary to give some indication of the manner in which London was supplied with milk in the mid nineteenth century. Demand was met by urban cowkeepers, suburban farmers, that is those within five to ten miles of the metropolis, the grazing districts such as Hendon, Dulwich, Highgate, and Norwood, and, lastly, external, county suppliers. Contemporaries estimated the number of cows in and about London, supplying the inhabitants with milk, to be in the order of 24,000. Of the number of cowkeepers less is known of their total number than of their general nature. In 1851 there were some 4,450 cowkeepers and milksellers of both sexes. At the one extreme were the holdings, like that of Mr. Rhodes of Islington, with an average of 400 cows in milk; but this was exceptional. More common was the cowkeepers with 50 to 80 beasts and a small farm near town; the most common type of holding, however, had no more than ten or a dozen cows. In a paper delivered to the Society of Arts, Morton, defending

7. G.E. Fussell, op.cit., 194.

8. E.H. Whetham, op.cit.

the small cowkeeper against the bitter and exaggerated charges of being sinks of filth and disease that had been vociferously hurled at them in 1865-6, described the normal London cowhouse as

> 'a piece of ill-conditioned, rather ricketty old stabling, with a sort of brick built manger on the floor, the length divided by short and scanty stall divisions 7 feet or 7½ feet apart, furnished with ropes, or straps, or chains with running rings so as to tie up two cows between each pair. This floor is roughly causewayed and there is a gutter, lengthwise down it, parallel with the manger, and a little more than a cow's length from it. The house may only be wide enough for a single row of cows, or there may be one on either side, with the gutter between them for the drainage of both. I am now referring to the average style of the smaller and inferior cowhouses of the City, and the poorer districts of the Metropolis. You come upon one from some street of third rate houses, which leads you into a small back yard, half filled with this poor shedding. There may be a small pit for dung, a store of some sort for the grain; and a small quantity of hay and roots which are kept on handware stowed away in any convenient corner - for a full cowhouse, even of this small class in London is a very rare exception. The roof is either low, with plenty of ventilation through its loosely lying tiles or if higher, there is a "tallet" or floor overhead where hay and other food is placed, and in which spaces are left next to the walls and over the heads of the cattle, and then the space of this upper room is measured with the 1,000 cubic feet per cow, which is the rule that must be observed (for instance in St. Pancras) if the cowkeeper wishes to avoid being opposed for the renewal of his licence. There are windows perhaps, which at this season of the year are closed, perhaps with a bit of sacking nailed over them. This is the ordinary style of a cowhouse - such as the majority of them are.[9]

In 1865 Morton calculated that there were some 12,000 cows in the Metropolis,[10] scattered throughout the area in parlours ranging from large to small, and from model cleanliness to appalling squalour. Any attempt to calculate the total yield from these animals is fraught with danger.

9. J.C. Morton, 'On London Milk', Journal of the Society of Arts, xiv, (1865-6), 65-78

10. J.C. Morton, 'Town Milk', J.R.A.S.E., 2nd serv., iv, (1868), 69-98.

However, among the highly fed cattle of the London cowhouses an average yield of 750 gallons per annum would probably err on the generous side; for the remaining 12,000 cows in the surrounding districts the figure is unlikely to have been more than 500 gallons per annum.[11] The total gallonage, would, therefore, be in the order of 15 million gallons in any year. At the same time the population of London was about three million, and per capita milk consumption a mere 1/5th. of a pint a day, or nine gallons a year.[12] Thus, the total demand, at 27 million gallons a year, was far in excess of internal supply. In other words some 36,500 cows would have been needed to meet the demand of the capital. Even if one makes allowance for the watering down of supplies - a figure of 20 percent was frequently quoted by contemporary observers - the number of cows required would still be in the region of 30,000. Therefore, unless these figures for yields and consumption are wildly inaccurate, which is unlikely in view of the consensus of both contemporary and later observers on these points, external supplies of rail borne milk must already have been quite considerable - that is in the order of five to ten million gallons a year.

The generally held view, however, has minimised the importance of rail borne milk in supplying the inhabitants of London during the years before 1865. By concentrating on the last decades of the century a false impression of the changing source is given. Barnes, for example, produces a table that shows the volume of rail borne milk to London rising dramatically from one million gallons in 1861 to 30 millions in 1884.[13]

11. ibid.
12. ibid.
13. P.A. Barnes, 'The Evolution of the Salient Pattern of Milk Production and Distribution in England and Wales', Transactions of the Institute of British Geographers, xxv, (1958), 167-95.

Unfortunately, truly precise figures as implied by this table do not exist. In fact there is a marked absence of detail on the subject for the years around 1865. The records of the major railway companies do not contain details of milk carried in these early years. The only available figures are those collected by Morton from the heads of some of the railway companies. From five, but five only, railways came some one and a half million gallons.[14] With no other figures against which to check this estimate it is necessary to look elsewhere for an answer. On a priori grounds the cataclysmic view of a sudden upsurge in rail bourne milk is unconvincing. If so little milk were carried in the early 1860s it is unlikely that the huge expansion implicit in this argument could have taken place. The logistical problems of bringing in something like ten times as much milk, albeit for a short time only, would have been so great that one must be very suspicious that an increase of such magnitude really took place. As demand exceeded supply before 1865 it is reasonable to argue that milk was brought to London by rail before the effects of the rinderpest could have been felt. Scattered evidence exists to support this view. Milburn wrote in 1851 of 'the new mode of supplying our large towns with milk'[15] which had resulted from the development of the railway system. Dodd's reference to the ever increasing supply of railway milk to London was forcefully supported by Gamgee, who fulminated that 'as a means of supplying London with milk the cowsheds within it are next to valueless, by far the greater proportion of that commodity being brought in by rail from the surrounding country.'[16] Some of this was from the Home Counties. Evershed, writing in the Journal of the Royal Agricultural Society for

14. Morton, 'On London Milk', op.cit., 73.
15. M.M. Milburn, The Cow in Dairy Farming and Cattle Breeding, (1851), 70
16. J.S. Gamgee, The Cattle Plague, (1857), 34-5. Italics supplied.

1853 noted that 'a new trade has been opened in this district [Surrey] since the completion of the South-Western railway, from the convenience thus afforded of sending milk and vegetables to London...several dairies of 20 to 30 cows are kept, and the milk sent to the various stations of the South-Western Railway, and conveyed to the Waterloo terminus for the supply of the London market.'[17] The same was true of Middlesex,[18] although the supply of milk to the capital from there had a longer tradition. Even in Hertfordshire, not a county noted for its dairies, the areas near the railway, particularly in the Hertford region, sent milk by rail to London. But it was not simply a question of short distance rail supply. An anonymous writer in the Farmer's Magazine of 1859 stated that 'the great proportion of the London supply now comes up by railway from the country from considerable distances, and the country milk trade is daily increasing. Scarcely one-fifth of the London supply is furnished by the cows kept in the metropolitan hay-stalls....'[19] The claim is exaggerated in detail but correct in essence. The distance from which milk was brought could be surprisingly high. Goodwin told his readers that 'for fifty miles around this great city the cows can be milked at early morn, the milk brought by swift trains to town, and delivered at our doors in time for breakfast.'[20] Wynter, writing five years earlier in 1854, confirmed the inadequacy of

17. H. Evershed, 'The Farming of Surrey,' J.R.A.S.E., 1st. ser., xiv, (1853) 402-3.
18. J.C. Clutterbuck, 'The Farming of Middlesex,' J.R.A.S.E., 2nd.ser., v, (1869), 20.
19. Anon, 'The Supply of Milk - Natural and Artificial', F.M., 3rd. ser., xvi (1859), 500.
20. G. Goodwin, Town Swamps and Social Bridges, (1859), 14.

of the supply from the cowsheds and suburban dairies and observed that 'the railway, which in some cases brings milk from as far as eighty miles, makes up the deficiency....'[21] These claims are substantiated by such writers as Bravender who, writing in 1851 of the agriculture of Gloucestershire, referred to the 'railways [which] have afforded great facilities for the transport of corn, butter, cheese, milk, and fat stock to London for sale....'[22] The 1855 Post Office Directory of Wiltshire speaks of the railways opening up the markets of several towns and cities, not least of which was London. Moreover, it was well known that the dairy farms straddling the Great Western Railway between Swindon and Melksham were among the first to switch to liquid milk production.[23] It would, therefore, appear reasonable to suggest that the switch to liquid milk production for the London market pre-dated the cattle plague of 1865 in those areas favourably situated near the railway.

Piecing together these fragments one is led to the conclusion that the figures quoted by Barnes are unacceptably low. Yet, one cannot dismiss the events of 1865 as unimportant. On the contrary, it was a vital stimulus, but to trends that were already under way. The extent of the outbreak must not be forgotten. By the 30th. December 1865 outbreaks of the disease were reported on 9,954 farms in Great Britain. In all some 76,000 cows were attacked of whom 14,000 were killed, 44,000 died and only 7,000 recovered. (The rest were officially returned as "unaccounted for"). By March 1867 of 12,460 cattle in the Metropolitan area 7,474 had been attacked

21. Quarterly Review, xcv, (1854), 292-3.
22. J. Bravender, 'The Farming of Gloucestershire', J.R.A.S.E., 1st. ser., xi, (1850), 173-4.
23. R.C. Agriculture, Parl. Papers, 1881, xvi, 440.

and only 315 had recovered, with a further 602 unaccounted for.[24] The need to find alternative sources of supply led to demands being made on areas as far away as Macclesfield, almost 200 miles from London. The Express Dairy Company made its reputation by bringing milk from the Midland areas of Derbyshire, Staffordshire, and Nottinghamshire. Equally, new sources were tapped in Wiltshire, Somerset and Gloucestershire. The amount of milk carried by the Great Western Railway increased markedly in the short run, but, without figures for the years before 1865 nor for some years after, it is not possible to put into precise perspective the undoubted expansion that took place in these and subsequent years.

Against this background the events of 1865-6 may be seen in a new light. As Sheldon observed 'this new order of things [milk brought by long distance rail] had begun to recommend itself to the milk salesman some time Before the cattle plague, or rinderpest had wiped out so many town dairies....'[25] The plague, by wiping out half of the cows in London, and by causing a widespread revulsion against the squalor, real or imaginary, of many cowsheds, sounded their death knell. At the same time it gave a tremendous boost to the country supplier, especially in the more distant parts of England. The very fact that it was possible to expand supply so extensively and so rapidly suggests that an embryonic supply and transportation structure was in being before the emergency conditions of the mid 1860s. In many ways the large scale outbreak of

24. for details of the progress of the cattle plague throughout Great Britain see Parl. Papers, 1866, xxii, 1866, lix, 1867-8, xviii.

25. J.P. Sheldon, Dairying, (1912), 264. Italics supplied.

disease in 1865-6 made irreversible the trend towards country milk production for the London market; but neither London nor the cattle plague must be considered in isolation. Notwithstanding the size and importance of the capital, nor the spectacular upheavals of the years concerned, one must not let short term considerations cloud the long term perspective. Without the rinderpest outbreak the shift to liquid milk production would have been slower, but it is difficult to envisage the existing expansion failing to continue. 1865 was an important step but not a beginning.

By the late nineteenth century the London milk trade had reached considerable proportions. The greatest gallonage was carried by the Great Western Railway network, but the Midland and the London and North Western railways were not far behind. In all some 40 million gallons a year were brought into the capital by rail. The cowsheds, on the other hand, produced no more than five million gallons.

TABLE XXVI

London's Railway Milk, 1890
(M/gals.)

Great Western Railway	9.8	Great Northern Railway	4.4
Midland Railway	7.0	South Eastern Railway	1.3
London & North Western	7.0	London & Brighton	0.7
London & South Western	5.7	London, Chatham, Dover	0.01
Great Eastern Railway	4.5	TOTAL...	40.4

Source: H. Rew, 'An inquiry into the Statistics of the Production and Consumption of Milk and Milk Products in Great Britain,' J.R.S.S., lv, (1892), 24-86.

The great rise in the volume of rail borne milk to the capital affected many parts of the country which previously had been devoted to either cheese making or other branches of agriculture. 1865 was not

the only stimulus to expansion. The collapse of cheese prices in 1879 hastened the switch to liquid milk production, and when the first Royal Commission came to collect evidence there were to be found several examples of a recent increase in milk selling. The Commissioners were told that in Gloucestershire 'as many dairy farmers as possible are selling their milk in large towns...sending their milk all the way to London rather than make cheese.....'[26] Similarly in Dorset it was reported that 'of late years... in those districts which lie within easy reach of a railway station and main line to London the sale of milk has been very largely developed.'[27] In the Midlands the pattern was almost identical. From the tentative start of the early 1860s in Derbyshire there had been a steady growth in the milk trade with London throughout the 1870s. Increasing demand and good prices were a sufficient attraction but the relative merits of milk selling became more apparent in 1879 when the flood of cheap American cheese brought ruinous prices for English manufacturers. As a result there was a further transfer from cheese making to milk selling. Druce, reporting on conditions in the county, had no doubt that 'this comparatively happy state of things was caused to a great extent by the milk trade to London and other large towns.'[28] The effect of this trade was obvious to any observer. It was held that three quarters of the milk sold in Derbyshire went to London, and the area devoted to milk production was steadily increasing. In the central, western and northern districts of the county arable land was being converted to grass, while in the east, though it was unprofitable to switch to grass, arable farmers were turning

26. R.C.Ag., Parl. Papers, 1881, xvii, Q.34168, p.181.

27. ibid., Parl. Papers, 1881, xv, p.36.

28. ibid., Parl. Papers, 1881, xv, p.275.

to the production of winter milk.[29] The same story applied to Staffordshire. The trend was in favour of liquid milk production at the expense of cheese making.[30] Even in Cheshire the milk trade was gaining ground at the expense of the traditional cheese dairying.[31]

These trends were confirmed in the following decade. The importance of milk selling in the areas previously mentioned increased, but they were no longer the only areas supplying the London market. The second Royal Commission, more alive to the significance of dairying, bore witness to this development. For example, Fream commented on the sale of milk in the Andover district of Hampshire,[32] while Spencer noted that the manufacture of butter in the Vale of Aylesbury had been abandoned to a large extent and its place taken by milk selling.[33] By the end of the century the picture was clear. London relied principally upon two areas for its supply of milk. First, the south western counties - Wiltshire, Hampshire, Gloucestershire, Somerset, Dorset, Berkshire, and Oxfordshire. Of these Wiltshire, and in particular the Vale of Pewsey, had emerged as the most important single source area. Swindon was the focal point for the whole area served by the Great Western Railway. Scarcely any cheese or butter was made. Even in the cheese areas of Somerset change had finally come to stay. Tradition was no safeguard against changing circumstances. Falling incomes had 'turned many a cheese tub on its side and brought to the door the milk churn with its fortnightly remittance.'[34] The second area was that of the

29. ibid., Parl.Papers, 1881, xv, QQ.6021-2, p.209.
30. ibid., Parl.Papers, 1881, xvii, Q.34,465, p.192.
31. T. Young, 'Dairy Husbandry in Lancashire and Cheshire', J.R.S.E., lxxvi, (1915), 97-110. For the personal experience of one family see W.B.Mercer, 'Two Centuries of Cheshire Cheese Farming', J.R.A.S.E., xcvii, (1937), 61-89.
32. R.C.Ag., Parl. Papers, 1894, xvi, pt.i, 482.
33. ibid., Parl. Papers, 1896, xvii, QQ.46,580-1, p.15.
34. E.G.F. Waller, 'The Dairy Industry of Somerset', J.B.D.F.A., xx, (1906), 26.

Midland counties of Derby, Stafford, and Nottingham. Under the guiding genius of George Barham the milk trade in this area had been extended to the benefit of all. As with the south west traditional dairying suffered. Cheese making, both farmhouse and factory, was seriously limited while the manufacture of butter was restricted to areas too isolated to take advantage of the milk trade.

As well as these two major supply areas London also drew upon the resources of more distant places. Milk was sent from Cheshire and Westmorland as well as from Devon and Cornwall, albeit on a small scale. The normal range of supply was between 50 and 150 miles but in winter it was necessary to transport milk 320 miles from St. Erith in Cornwall to London.

One county has been excluded from the foregoing discussion - the oft quoted example of Essex. As a supply area this county was not the most important by any means. However, the dramatic nature of the change that took place has given it a special significance. The outline of the story is straightforward. The clay soils had been devoted to corn growing, and a prosperous farming community developed on the prices of the mid nineteenth century. With the onset of depressed prices Essex farmers suffered more than most. The high costs of working the heavy soil proved ruinous in a period of declining returns. The situation was intensified by high social expenditure, inability to reduce costs, and a refusal to come to terms with changing conditions. The result was a large number of bankruptcies - though the actual number was probably less than the tales of gloom would have one to believe - and a rapid decline in the state of agriculture, land being allowed to "tumble down to grass". Into this situation came a new group

of men. Faced with intense competition for land at home and the prospect of cheap tenancies in England, a large number of Scots migrated from the south west of Scotland to the south of England. To Essex they brought a new way of life. Instead of following the plough they ranched cattle on the grasslands and sold the milk to London. Already dairy farmers they had none of the prejudices against milk selling that characterised many English farmers, not merely those in Essex. For them milk selling was an easier way of life than butter or cheese making. Further, they did not share the high life of their predecessors, but were able to adapt themselves to the conditions of the time simply by continuing their standard of living at a level which was appreciably lower than that of the old Essex grain growers.

The heroic qualities of the drama - the triumph of yeoman sturdiness over the corrupting influence of society - can obscure certain fundamental points. Thus, it was not simply that the Essex farmers did not want to buy cows! This was one strand in the story but not the only one. Basically, they could not afford to change their system of farming in a wholesale fashion because they had lost so much money in the 1870s and 1880s when the permanence of change was not appreciated by farmer or landlord. The refusal to reduce rents until too late in the day (for the Essex farmers, that is, for the Scots were able to dictate terms to landlords) and the reluctance of landlords to invest money in new buildings was as important a factor as the more commonly quoted stubbornness and extravagance of the Essex farmer. But had the money been available there was no guarantee that success would have followed. The grain growers, not unnaturally, were

inexperienced in the management of cattle. Technically, as for example in their knowledge of long leys, the Scots were far superior. Good management was crucial. It is often implied that every Scot who came to Essex as a dairy farmer succeeded. This was not the case. The more able undoubtedly succeeded but the failure rate among the rest was no different from that of other groups. The family farmer, employing no hired labour, and spending little time and money on elegant living, had a head start but if he lacked managerial ability he could not hope to survive long in farming. The implications of this episode will be discussed later; for present purposes the existence of Essex as a supply for London is all that needs to be noted.

The sheer size of the capital put it into a class of its own. No other city, with the exception of Newcastle, had to draw upon such distant sources. However, on a smaller scale the trends noted above were to be found in relation to the other towns and cities of England. The growth of urban centres stimulated the development of liquid milk production in their immediate vicinity. The presence of a well developed railway network facilitated the change. Outside London the two largest urban concentrations in England were those centred on Birmingham and Manchester. Predictably the demand for milk influenced the surrounding areas. Dairying in Warwickshire had begun to revive in the mid nineteenth century and by the late 1860s milk was being sent to London.[35] However, the more immediate demand from Birmingham and Coventry led to a change in the direction, and an increase in the volume of milk produced and sold off farms in the county.[36] Lancashire farmers had also been steadily adapting to the new conditions. As early as 1847 the railways were playing an important role.

35. F.M. 3rd.ser., xxxix, (1871), 189.
36. R.C.Ag., Parl.Papers, 1881, xvii, Q.Q.32,315-20, p.108.

Beesley commented that 'large quantities of milk are forwarded daily by the railways, to Liverpool, Manchester, and Bolton - in some instances a distance of 40 miles, but ordinarily from 15 to 20.'[37] Cowhouses persisted in Liverpool to a greater degree than anywhere else, but Manchester was soon dependant on outside supplies. During the 1870s the change in Lancashire dairying was most marked. It was held that 'cheese-making has decreased in Lancashire in greater proportion to any other dairy counties, from the fact that it includes a larger town population (always increasing in number and demanding more milk) than any other county in England save the Metropolitan ones.'[38] Cheese making persisted in the north of the county until the 1890s, when the completion of the railway from Preston to Stockport opened up new possibilities, but even before this time Manchester was drawing milk from Derbyshire, Staffordshire, and the east of Cheshire.

Throughout the country a similar pattern unfolded. Around every town and city were to be found milk sellers. Further afield, as long as a railway link was available, land was laid down to grass and milk sold. In the old established dairying areas the milk churn also became an increasingly common sight. Competition in other enterprises threw into sharp relief the benefits of the protected domestic market for liquid milk. In 1879, 1886, and 1895-6 cheese prices collapsed, thus adding further stimulus to the structural change that was transforming the dairy industry in England. In the east of England, as well as the west, the number of dairy cattle rose. The Great Eastern Railway opened the way to the London

37. G. Beesley, Agriculture in Lancashire, (1847), 8.
38. Anon, 'Lancashire Dairy Farming', J.B.D.F.A., 1, pt.ii, (1878), 33.

market, while the growth of seaside resorts presented another outlet. Pratt, writing in 1906, pointed out that 'during the summer season a considerable quantity of milk is also conveyed to seaside resorts such as Cromer, Yarmouth, Southend-on-Sea etc., both from the Great Eastern stations and over the Great Eastern system from stations in Derbyshire, Staffordshire, and elsewhere.'[39] In a similar manner the rise of Margate, Broadstairs, Folkestone, Dover, and Tunbridge Wells as resorts stimulated the development of dairying in the area between Gravesend and Bromley.[40] Examples, from Blackpool to Brighton, can be found with ease.

Buoyant demand was the key to success of the liquid milk trade. However, there was a point beyond which it was not safe to go. The market could only absorb a certain amount, and beyond that point returns would fall. This position was reached, briefly in the late 1870s, more persistently in the late 1880s and 1890s. The evidence for the late 1870s is scanty, but Wrightson looking back on the development of the milk trade from the vantage point of 1890 claimed that in the late 1870s 'the new milk trade was congested',[41] an assertion that is borne out by Richard Jefferies' reference to the problem of a milk surplus in Wiltshire in 1878.[42] Whatever the precise position the situation changed radically in the next few years. 1879 was a calamitous year for cheese makers, and many men, not only in Wiltshire, turned to the milk trade with its quicker and more reliable turnover. However, the sudden influx of a large number of new

39. E.A. Pratt, The Transistion in Agriculture, (1906), 15.
40. W. Lawson, 'Dairying in Kent, Surrey and Sussex', J.B.D.F.A., xlv, (1953) 47-53.
41. J. Wrightson, 'The Agricultural Lessons of "The Eighties"', J.R.A.S.E., 3rd.ser., 1, (1890), 276.
42. Richard Jefferies, Hodge and His Masters, Fitzroy edition (1966), vol.i, 82. The articles were originally published in The Standard during 1878.

producers led to a glut of the liquid milk market. Supply exceeded demand and prices slumped. In 1885 the Agricultural Gazette commented as follows; 'now farmers are all rushing into the new milk business, the market is altogether overdone. Milk at the stations can hardly be given away, and dealers are cutting the price lower and lower; in fact, prices are far below the cost of production.'[43] Evidence from all parts of the country appeared in the succeeding volumes. In south Derbyshire 'the milk trade is still in a depressed state and prices are difficult to maintain.'[44] In Essex it was reported that 'the London milk trade appears to be now rather overdone. The dealers keep sending word to limit the production, as they are overstocked.'[45] The situation was neatly summed up by the correspondent from Staffordshire. More in sadness than in anger he wrote that 'there has been a concentrated rush upon dairy farming, because it was considered the best thing going amongst the whole list of farm practices. In consequence the supply has outstripped the demand. The condition of the trade all along the line is exceedingly depressed. Under the item of fresh milk the collapse is most severely felt...Never was a thing more completely overdone...'[46] Prices reached an all time low of 4d. a gallon in Somerset and Staffordshire,[47] and was little higher elsewhere. Paradoxically the position could have been ameliorated by a more rational distribution of supplies. Instead all eyes looked to the big cities. In rural areas small quantities of milk were almost impossible to come by and even small towns were not adequately supplied. A contributor to the

43. Ag.Gaz., xxi, (1885), 270.
44. ibid., 623.
45. ibid., 685.
46. ibid., 719.
47. Ag.Gaz., xxiii, (1886), 296, 345.

Agricultural Gazette summed up the position in 1885.

'For several years past,' he wrote, 'farmers have been dazzled by the reports of the prices said to be paid in large towns, and they have all rushed to find their market there, at the same time neglecting markets nearer home, and...the latter would be the better paying markets. Thus,....whilst the large towns are deluged with milk, and the prices paid to the producer are low, the smaller towns and villages are neglected...What has been done here (Ulverston) can be repeated in other small towns, expenses of long railway transit saved, bad debts avoided, better prices received, and the glut in the cities obviated...'[48]

From the mid 1880s to the mid 1890s much of the milk trade was in the doldrums. When the second Royal Commission on agriculture sought information in the early 1890s witness bore testimony that liquid milk production had been overdone. In the West Riding, Leicestershire, and Essex the limit had been reached. Even in such counties as Lincolnshire, Northamptonshire, and the Isle of Ely, areas not noted for the size of their dairy industry, the story was the same - overproduction.[49] It would be invaluable to have good series of milk prices for several parts of the country. Unfortunately, the evidence is mainly of a scattered and fragmentary nature. The exception is London. Data relating to the contract prices paid by two London hospitals, St. Thomas's and Bethlem Royal, is available for the years after 1850. This material clearly shows the fluctuations in prices. (It should be stressed that the general price level between 1873 and 1896 fell by some 40 percent while between 1896 and 1914 there was a small rise in the level.)

TABLE XXVII

London Contract Milk Prices, 1861-1913. (1861-70 = 100)

1861-65	95.3	1881-85	100.9	1901-05	80.4
1866-70	104.7	1886-90	90.7	1906-10	80.4
1871-75	107.5	1891-95	89.7	1911-13	88.8
1876-80	116.8	1896-1900	75.7		

Source: Report on Wholesale and Retail Prices, Parl.Papers, 1903, lxviii, (321) 136-7, Cohen, op.cit., 18.

48. Ag.Gaz., xxi, (1885), 333.

49. R.C.Ag., Parl.Papers, 1894, xvi, pt.i., p.99, pt.ii, Q.17,808,p.128.

The trend rose sharply until 1875. This peak level was maintained for a few years whereafter prices slumped, reaching a final low in 1899. Prices recovered in the early years of the twentieth century and rose steadily, except for the years 1905-6 when overproduction again brought a slump.

The question of oversupply raised a further problem. The milk trade, as it existed in the second half of the nineteenth century, had developed in a somewhat haphazard manner which led to a fundamental weakness - a lackof organisation that failed to come to grips with the problem of balancing supply and demand. Day to day fluctuations in demand presented serious problems, and the solution that evolved was far from satisfactory from the producers point of view. To meet daily variations, and fluctuations between one region and another of any town, there was a flourishing trade in milk on the platforms of the major terminii of the railway companies. The milk sold in this manner was not governed by contract prices. In times of temporary shortage, a sudden cold spell for example, the price of platform milk, or accommodation milk as it was known, could rise well above the prevailing contract price. Further, there was the, theoretical, advantage that the producer could sell small quantities of milk as and when he liked to or needed to. However, there was a reverse side of the coin. In times of low prices the farmer had little choice but to take whatever price was going even thought it was below the cost of production. Unable to store his milk, in many cases unable to convert the surplus into cheese or butter, the producer bore all the risk of excess supply.

The position was improved in part by the building of cooling stations and factories in which surplus milk could be converted into manufactured products. However, very little is known of the extent and effectiveness of these depots. In 1879 the North Wiltshire dairy built a depot at Stratton, just outside Swindon, and the Surrey Farm Dairy Company, and the Amalgamated Dairies had depots at Tisbury and Derby respectively. Also there were milk depots at railway terminii - in London the London and South Western, the Great Western, the Midland, and the London and North Western had depots at, respectively, Vauxhall, Wood Lane, Cricklewood, and Kilburn. However, the scale of platform sales in London in the quarter century or so before the Great War suggests that cooling depots and factories had not solved the problem. Further, it is striking that the decline in the volume of accommodation milk after World War 1 was accompanied by the adoption of a new principle, which, by limiting the amount of milk to be sold by any producer at liquid milk prices, supposedly reducing severe under-cutting of prices, still kept the responsibility and risk for surplus production firmly on the shoulders of the producer.

Looking at the period 1860 to 1914 as a whole, the rise of the liquid milk trade is most striking. In the 1860s its share of total production was no more than 25-30 percent of the dairy industry whereas by the outbreak of the Great War this had been increased to over 70 percent. In more concrete terms this represented an increase of 400 percent from 150 million gallons to over 600 millions. Partly this was nothing more than the result of an increase in population, but equally important was the change

in consumption patterns, resulting from higher standards of eating, greater accessibility to milk and a purer supply. From the consumers' point of view this was a great step forward in standards of health while for the farmer the new liquid milk trade was a life saver.

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(b) 1914 to 1930

The twenty years prior to the advent of the Milk Marketing Board saw considerable changes but, with the exception of the upheavals of the world war, they were essentially a continuation of trends that had developed during the late nineteenth century. The outbreak of war in August 1914 did not affect the farming community of England immediately. The harvest was brought in and "business as usual" was as much the order of the day in the country as in the town. For the dairy farmer, however, the lull was a short one. For some years there had been a shortage of milkers in certain parts of the country but the demands of war time increased this problem caused serious problems in some of the leading dairy counties.[50] Moreover, the situation was soon intensified by the growing scarcity, and, therefore, the rising cost of artificial feed. The heavy reliance upon imports was felt most in the eastern counties though during 1916 in particular the number of dairy cattle fell in many parts of the country. Taking the war years as a whole, however, overall numbers were maintained. Yields on the other hand were reduced - the fall was in the region of 20 percent - by the limitations of feed and labour.

These problems were soon apparent but it would be misleading to suggest that this was the only effect of the war years on the dairy industry. On the credit side was a new awareness of the nutritional value of milk. The failure of large numbers of men to pass the fitness test required by the army had created something of a scandal. As a result more attention was paid to the diet of the nation and to the contribution of various

50/ T.H. Middleton, Food Production in the War, (Oxford, 1923), 108.

foodstuffs. The impact of government thinking was somewhat contradictory. On the one hand, the value of milk as a foodstuff was realised in full. On the other, the plough policy necessitated the destruction of old pasture land, much of which had been devoted to dairying. The contradiction, however, is more apparent than real. Price fixing was used to encourage milk production and positively discourage the manufacture of butter and cheese. Thus it was possible to plough up pastures in areas where the emphasis was upon manufacturing milk. Nonetheless, the new importance accorded to liquid milk was partially offset by the effects of plough policy and price fixing.

However, the rise in consumption that resulted from the propaganda of the war years took place very slowly indeed. In contrast the switch into milk production after the war was rapid. The high price of milk was an obvious attraction. The Ministry of Agriculture's Index Number of Prices of Agricultural Produce showed that milk prices had risen from 103 in 1914 to 300 in 1919. It was not simply a question of restocking, or increasing the stocking density, on the old pasture lands. Added to this came new areas, such as the chalk uplands of south Wiltshire and Hampshire, developed with an eye to the liquid milk trade. The effect was to flood the milk market. Prices dropped dramatically - between 1921 and 1922 the general agricultural price index fell by 23 percent whereas that of milk fell by 32 percent - and would have fallen further had it not been for the Permanent Joint Milk Committee. Set up in the summer of 1922, it was composed of representatives of the National Farmers Union, the National Federation of Dairymen's Associations, the Amalgamated Master Dairymen Ltd.,

and the National Association of Creamery Proprietors and Wholesale Dairymen (Incorporated). In 1929 they were joined by representatives of the Milk Committee of the Co-operative Union. The idea of new agreements, if not new in theory, was in practice a sharp break with the past. The immediate occasion of this departure was the dramatic price fall in summer milk in 1921 and especially in 1922. The milk price index for May and June of 1922 was 27 and 28 percent above pre-war levels. In contrast the general index was 69 and 64 percent higher for the same months. The official view of the situation was as follows:

> 'This sudden rupturing of the relationship between costs and receipts revealed the weakness of individual producers when attempting to bargain on a falling market with relatively large scale buyers who were in a position to set the price on their estimate of the market without reference to the producers' outlook...The actual scheme, however, was much more than an attempt by the farmers' organisation to strengthen weak bargainers; it was a considered effort to deal with certain general difficulties in milk production, of which variations in output between summer and winter periods and the presence of milk supplies in excess of actual fluid milk requirements, were the chief. The unfortunate effect of these factors upon prices had been recognised but no systematic effort to control their effects had previously been made in this country.' 51

The Ministry of Agriculture's interpretation contains much that is true. In the traumatic conditions of the summer of 1922, when producer and distributor were both faced with ruin, there was a degree of unity that transcended sectional interests. The immediate problems facing the milk trade were faced, and an answer hammered out. But beneath the surface there were fundamental differences that were not so easily resolved. Despite the agreement reached in 1922 the position of the producer was still weak. Moreover, the risk associated with the surplus production problem was once again placed squarely on the shoulders of the producer.

51. Ministry of Agriculture, Economic Series 16, (1927), 62.

The principle adopted, which removed risk from the distributor, was that each producer was to receive liquid milk values for a certain basic quantity of his supply, and manufacturing values for the remainder. The problem was clear: if too much milk was produced for the liquid milk market prices would fall, but there was an obvious incentive to produce for this market because world competition in butter and cheese had reduced returns to an unprofitable level. The distributors, by contracting to take some but not all milk based on a period - originally November to February, but later standardised to October to December - when milk production was not normally at its peak, carefully avoided the responsibility of dealing with any surplus that might be produced. Further, by putting a premium on what was termed the "accounting period", that is October to December, the effect of the scheme was to induce many dairy farmers to produce as much as possible during these months which merely extended the period of potential oversupply from the summer months into the autumn. The dairy farmer, therefore, was forced to suffer the consequences of government exhortations and inflated war time prices, which had drawn new men into the trade, and of world competition in manufactured milk products, without any aid from the government. With the benefit of hindsight one can argue that a reduction in the number of milk producers was the only answer, and that to achieve this competition was the only alternative. To the producer the position was less clear cut. Having been called upon to respond to a national crisis he found himself abandonded, overstretched and exposed, by a government that no longer

appeared to have any time for the agricultural community as a whole. Belated aid, in the form of the Milk Marketing Board, did little to lessen the animosity felt for both the large distributors and the Conservative party.

The 1922 scheme needs to be examined in more detail. The system was that for each producer a standard quantity, based on average weekly deliveries for the period November 1922 to February 1923, was calculated. Liquid milk prices were payable to all milk produced for sale in this period. In October and March liquid milk prices were to be paid on 100 percent of the standard quantity, and on 110 percent of the standard quantity in the months April to September. Production in excess of these quantities was defined as manufacturing milk, for which a lower rate was paid. Milk supplied to creameries was to receive the liquid milk rate minus two deductions. The first, a sum equal to the actual railway carriage, the second a charge to cover expenses of 1d. a gallon in the six summer months and 2d. a gallon during the rest of the year.

/Table XXVIII over...

TABLE XXVIII

Permanent Joint Milk Committee Contract Milk Prices (d/gal. buyer's station)

	Average Milk Price October–March	Average Milk Price April–September	Average Milk Price Annual	Average Manufacturing Price
1922-3	20	12	16	9
1923-4	18½	12	15½	8½
1924-5	18½	12	15½	8½
1925-6	17	13½	15	9
1926-7	16½	12	14½	7½
1927-8	16½	12	14½	8½
1928-9	16⅔	13⅓	15	8⅓
1929-30				
Class 1 10%	16⅔	12⅔	14⅔	
Class 11 20%	16⅔	12⅔	14½	£
Class 111 50%	16	12½	14	
1930-31				
Class 1 10%	16½	12	14½	
Class 11 25%	16 5/6	11½	13 5/6	5
Class 11b+	16⅓	12	14 5/6	
1931-2				
Class 1 10%	14⅓	12½	13 5/12	
Class 11 25%	14	12	13	4½
Class 11b+	14½	12½	13 5/12	
1932-3				
Class 1 10%	15 5/6	12 5/6	14	
Class 11 25%	15⅔	11½	13 7/12	5 £
Class 11b+	15 5/6	12 5/6	14	

+liquid milk price payable only on a negotiated percentage of total supplies; remainder payable at manufacturing rates.

£ manufacturing price linked to liquid price for this year; if cheese price basis operative figure would have been 7½d.

£ minimum price of 5d. guaranteed; cheese basis price 4½ - 4⅝d. hence guarantee.

Source: Ministry of Agriculture and Fisheries, Economic Series, 38 (1933), Reorganisation Commission for Milk, 16.

The manufacturing rate was calculated from the average price per pound of New Zealand and Canadian cheese minus 2d. per pound - a figure supposed to represent the cost of manufacture.

This was the basic structure that lasted, with only minor alterations, for seven years. Initially theschemewas a success in that it removed the

winter shortages that had characterised many pre-war years. However, the premium upon winter production resulted in further instability, which was compounded by the declining trend of world cheese prices that led many cheese makers to abandon their trade and sell their milk on the liquid market. The outcome was a state of chronic oversupply and resultant instability. In 1929-30 a new scheme, based on the idea of a declared quantity, was introduced. A producer contracting to sell in Class 1 would receive the full rate as long as his supply did not vary by more than 10 percent from the declared quantity. Selling in class 11 the producer had a wider margin for variation, 25 percent, but the price per gallon was lower. After 1929-30 class 111 was replaced by class 11b. In this category there was no limit as in the other two classes but instead the price per gallon was paid for a negotiated percentage of his output. This class was particularly unpopular as the negotiating power of the individual producer was so weak. However, the other categories were hardly popular as their effect to the producer was to place the risk of oversupply on his shoulders throughout the year, rather than merely for a part of it. This weakness was recognised by the Grigg Commission of 1933 which say that

> 'In the agreements of 1930-1, the sellers had the right to declare in which class they would sell, though in practice they were usually compelled to sell in the class which buyers chose; in the following year they found themselves under the necessity of conceding to buyers the right to declare in which class they (the buyers) would buy. The worsening of the producers' position in 1930-1 is reflected not only in the lower liquid milk prices but also in the fact that the average percentage payable at manufacturing rates was raised from 20 to 25 per cent.'[52]

This was no more than open admission of a fact that had been true throughout the existence of the P.J.M.C., namely, that the producers were

52. Ministry of Agriculture, Economic Series, 38, (1933), 15.

left to deal with the major problem of the milk trade with no help from the distributors, who had secured their position through their semi-monopolistic hold on the wholesale and retail trade.

Although the producer was in a relatively weak position he did benefit from the price fixing schemes of the 1920s. In 1913 the difference between producers' liquid milk price and manufacturers' return on cheese price basis was 3.95d. per gallon. By 1922-3 it had risen to 5.99d. and reached 7.37d. per gallon in 1931-2.[53] The incentive to change from the manufacturing branches of the dairy industry to the liquid milk production was an increasing one but, with more people selling milk, the stability of the milk market was further reduced. By the early 1930s there was a very real threat of total collapse. Negotiations between producers and distributors were deadlocked, a national milk strike was only just avoided by means of a last minute compromise, and finally the government, in the face of increasing pressures and problems, stepped in to aid the farmer.

The history of the Milk Marketing Board is outside the scope of this thesis, but it is important to consider the conditions from which it arose. In some respects the crisis of the post war years was similar to the over-production of the late nineteenth century. However, the latter period was more restricted, and the crisis more intense, because of two factors. First, the rate of increase in the consumption of milk was decreasing - in fact, total per capita consumption may well have been stagnant by the end of the 1920s - as a result of increasing unemployment, and the rising relative cost of milk to the consumer. Second, there was little possibility

53. ibid., 43.

of any relief via the manufacture of cheese or butter as world trends, over which the English farmer had no control, were firmly against traditional dairying. In fact as cheese prices spiralled downwards the only alternative to abandoning dairy farming was to change to the liquid milk trade. But this was no more than a short term solution. Fortunately government action saved many English dairy farmers from being squeesed out.

The attention given to the P.J.M.C. and the lack of detail relating to other milk contracts has led to a false importance being placed upon the P.J.M.C. contract prices. To imply that they were in any way universally accepted would be most misleading. At best they served as a figure about which settlements were made. In those areas within the orbit of London P.J.M.C. prices were most closely adhered to. In Birmingham and the Midlands the tendency was for contract prices to follow the trend of London prices, without necessarily coinciding with the actual level, but in the north west a more independant line was adopted, which resulted in higher prices for the producer. However, in all areas there was considerable variation. For example in the Birmingham area in the summer of 1924 some contracts were agreed at 10d. to 10½d. a gallon, which was 2d. below the P.J.M.C. level.[54] It was held that the official contract prices were in the region of ½d. to 1d. a gallon higher than other contracts - though it should be noted that the restrictions on the quantity of milk to be supplied were usually tighter on the latter.[55] This was, in the last analysis, the major flaw in the position of the P.J.M.C. Its position was semi-monopolistic, which meant that there was scope for undercutting. This scope was ruthlessly

54. Ag.Mkt.Rep., xxi, 1924, 4th April, p.9.
55. Ag.Mkt.Rep., xxi, 1924, 3rd.Oct., p.12.

exploited in the late 1920s and early 1930s with the result that only government intervention saved the milk market from total collapse.

Despite the problems facing the dairy farmer during these years his position was not so dire as that of some of his fellow farmers. In fact, taking the period as a whole, he suffered less than most from the general farming depression. Table XXIX, showing price indices for certain agricultural products, gives some idea of the position.

TABLE XXIX

Index Numbers of Prices of Selected Agricultural Products (1911-13=100)

	Wheat	Barley	Fat Cattle	Fat Sheep	Milk	General Index
1920	247	315	263	287	303	292
1921	219	184	227	217	263	219
1922	146	141	163	200	179	169
1923	130	119	151	187	174	157
1924	152	165	153	187	170	161
1925	160	148	151	183	170	159
1926	164	131	141	157	170	151
1927	152	148	127	150	160	144
1928	132	139	138	167	161	147
1929	130	125	133	157	169	144
1930	105	100	133	160	161	134
1931	76	100	122	133	147	120
1932	78	96	115	97	144	112
1933	70	100	101	110	150	107

Source: Agricultural Statistics.

Two surveys of the depression in agriculture in the late 1920s and early 1930s bear out this assertion. Skilbeck and Messer, in 1929, saw dairy farming as the most stable farming enterprise, despite the problem of over-production. Looking at the situation two years, later Messer produced evidence from all parts of the country showing that the dairy farmer was

still better off than most of his fellows. Summing up he wrote

> 'Two features most consistently mentioned in the present circumstances of agriculture are the stability of dairy farming generally and the extension of this type of farming wherever it is possible. There is no record of any serious difficulty among dairy farmers, except, perhaps, in Dorset. In this part a large proportion of the milk produced is manufactured. Not only have cheese prices fallen, but more of the milk which normally would have been made into cheese on the farm has been put on the market. There are no signs of hardship where milk is sold for liquid consumption, and even where a considerable proportion of the milk is manufactured, as in Wiltshire and Somerset, there is a very ready demand for farms. Every town has its fringe of producer-retailers, and though sometimes cases are mentioned of industrial depression being reflected in a smaller demand for milk, or in difficulty in "getting in money", there is no question of such farmers being in serious trouble. The newer milking grounds are growing up on districts hitherto regarded as arable districts and are proving serious competitors with some of the old 'exporting' districts not so conveniently situated to the consuming market.'[56]

The rise of new milk producing areas was one of the most striking features of the 1920s. In certain cases - for example, in Cheshire, Leicestershire, Shropshire and the Severn valley - there was a continuation of pre-war trends, from cheese making to milk selling, but in the Cotswolds and the downlands of Wiltshire and Hampshire land previously devoted to arable or sheep farming was turned over to dairying. The development of the milking bail by A.J. Hosier made possible the successful farming of these areas in the new conditions of the 1920s.[57]

There were also significant changes in the means of supply. The railway, though still important, found its position challenged by road transport. The quantity of milk carried by rail declined by 18.4 percent

56. M. Messer, The Agricultural Depression of 1931, (Oxford, 1937), 13.

57. for details see chapter 11.

between 1921 and 1931. This represented a fall from 256 million gallons to 209 million.[58] The only railway company to increase the amount of milk it transported was the Great Western, which tapped the new milk producing areas of Wiltshire and Hampshire as well as the traditional dairying areas of Dorset, Somerset and Gloucestershire. London remained the focus for long distance milk. In 1925 the quantity of milk carried by rail into the capital was 90.5 million gallons. Of this total the Great Western Railway carried 47.6 million gallons, the Southern Railway 16.9 million, the London and North Eastern Railway 15.5 million, and the London, Midland and Scottish 11.5 million.[59] Outside London only Newcastle drew the bulk of its milk supply from over 50 miles. Yet for the capital a greater part of its milk supply was carried over 75 miles. For the railway companies this meant considerable work. The Great Western Railway ran over 200 trains a week exclusively for the carriage of milk. A further 100 carried milk, while 200 other trains were used for the return of empty churns. The London and North Eastern Railway ran over 120 milk specials each week, trains that left in the early hours of the morning to arrive in time for the morning round, others that arrived around midday for the second and third deliveries.

However, some 30-40 percent of all milk carried by rail only travelled up to 50 miles. At this distance competition from road transport was felt by the railways companies. The extent of this competition, however, should not be exaggerated. Towns like Sheffield relied heavily upon road transport but the relationship between the two means of supply was more often complementary than competitive. The history of lorry borne milk can be traced from the last years of the Great War, when the scarcity of milk

58. Ag.Mkt.Rep., xx, 1923, 27th April, p.2, xxviii, 1931, 10th April, p.2.

59. Ministry of Agriculture, Economic Series, 16, (1927), 26.

forced dairymen to seek new sources of supply. Since then several factors had added to the popularity and potential of this means of transport. Technical improvements in the motor vehicle itself - solid tyres were ruinous when transporting milk over anything but a short journey - were the most important, but troubles on the railways, in particular the General Strike, showed the value of road transport, and led to a greater use of lorries. The flexibility of road transport was a further consideration. Many farms too distant from the railway to participate in the liquid milk trade could be reached by road. Moreover, the use of lorries reduced certain handling operations at terminal points for consignors and consignees alike. Lastly, the introduction of milk tankers greatly increased the popularity of road transport. The milk tanker, first used by Rees of Liverpool, had certain disadvantages. The initial capital outlay was high, and it was not suited to off-farm collection, but there were obvious advantages as well. The use of churns was eliminated, which added to the saving of time and labour. There was less surface contact than with churns and the space required for a given quantity of milk was less. The milk also kept better, largely because there was a smaller range of temperature change in transit using tankers than with any other means of transport. Initially the use of tanker lorries was limited to parts of the West country and the south of Cheshire. However, the potential advantage can be seen from the example of a firm in Frome, which used two tankers to transport its milk to London. The journey of 110 miles took ten hours when loaded and nine hours empty. The tankers ran seven

days a week, carrying some 2,620 gallons, or about 12 tons net weight. According to the firm concerned there was a great reduction in handling charges - some 500 to 600 seventeen gallon churns would have been required otherwise - and a reduction in overall transport costs of some 50 percent was effected. The average cost of transport per gallon was a mere 0.84d.. Lastly, even on a warm day the temperature of the milk varied by just one degree farhenreit, thereby lengthening the keeping period of the milk by 24 hours. However, such examples were exceptional, although it is not insignificant that the first rail tanker carrying milk left Wootton Bassett on the 23rd. October 1927. By the early 1930s and the arrival of the pneumatic tyre on a wider scale, competition was being felt by the railway companies who lacked the short distance mobility of the lorry.[60]

60. Ibid. 25.

IV

By 1930 liquid milk production was easily the most important branch of the dairy industry in England. Something like 75 percent of all milk sold off farms in the country was sold on the liquid milk market, which was dominated by the demand from the large urban centres. Tyneside drew heavily on all parts of the north of England, as well as upon the south west of Scotland. The north western industrial area on the Manchester-Liverpool axis was supplied by dairy farmers in Lancashire, Cheshire, north Staffordshire and north Derbyshire as well as the Welsh counties of Flint and Denbigh. The West Riding centres of Leeds, Bradford and Sheffield drew on local supplies but had to tap the adjoining county of Derbyshire. Similarly, the industrial complex centred upon Birmingham received its milk from Warwickshire, Shropshire, Worcestershire, Gloucestershire, Staffordshire, and Derbyshire. Lastly, the capital drew most heavily upon the south western counties of Wiltshire, Somerset, and Dorset, the midland counties of Staffordshire, Derbyshire, and Leicestershire, as well as upon the more local supplies from Sussex and Surrey.

The years from 1860 to 1930 witnessed considerable structural change in the dairy industry. At the first date the liquid milk trade was of limited importance, but by the latter it was not simply the predominant sector of the dairy industry but the backbone of English agriculture.

CHAPTER 4

The Dairy Industry: Structure and Location

(ii) Cheese and Butter Manufacture

I

Traditionally, dairy farming was synonymous with the manufacture of butter and cheese in the farmhouse. In England the association was primarily with the making of cheese. Butter making, though widespread, was of limited importance beyond the local level, having been driven from the London market by foreign competitors, who extended their position every year. The cheese and butter room were seen as symbols of a virtuous, hard working way of life for both the farmer and his wife. However, despite the lengthy defences of this way of life, by such writers as Professor Long, the dominant feature of English dairying in the second half of the nineteenth century was the rise of the liquid milk trade from a position of obscurity to one of crucial importance to the country at large. The percentage of milk sold for the liquid milk trade was much higher than in other European countries. In fact, in such countries as Denmark and Sweden, the position was reversed with over three quarters of the total milk for human consumption being manufactured. Elsewhere the percentage was not so high, but there was still a marked absence of a liquid milk trade of the size of that in England. Buoyant demand was the key. In part this was no more than a reflection of the steady increase in population that continued through the period. But more than this it reflected a change in the dietary pattern of the country. Rising real wages opened up new possibilities for more people, and over the course of the fifty years after

1860 there was a distinct change in attitudes towards milk. Per capita consumption rose as people became more aware of the value of milk as a food, and as the supply itself became safer under the influence of health acts and increasing vigilance, both public and private. Technical advances in refrigeration and transportation opened up the huge, and increasing, urban market, but the whole process was greatly facilitated by the flood of cheap imported butters and cheeses that reached England in huge quantities from the 1860s onwards. Demand for these items could be met only by bringing in foreign goods. However, by reducing the competition for English manufactured milk products, structural changes in the dairy industry were able to take place without any prohibitive price rise, which could have reduced the demand for liquid milk. The decline of farmhouse cheese making, much lamented by certain writers, was no great economic loss to the country as a whole. Moreover, as their standard of living was improved, the dairy farmer had a profitable alternative that relieved him and his wife from much tedious labour.

II

(a) Cheese

Looking at the dairy industry in 1850 or 1860 it would be true to say that cheese was made in farms throughout England, though predominantly in the western part of the country. By the end of the century this was no longer the case. The cheese making areas were restricted to the parts of the north and south-west, with scattered areas of limited importance in the midlands. In many respects this chapter is the reverse of the previous one. Milk selling had replaced cheese making in many areas throughout the country. To tell of the gains of one is to relate the losses of the other.

The most important dairying area in England was the north west, concentrated on Cheshire with its great density of cattle population. In the mid nineteenth century cheese was made in Lancashire, Cheshire, Derbyshire, Staffordshire, north Shropshire, as well as in the west riding of Yorkshire. By the end of the century farmhouse cheeses were made in the south of Cheshire and the north of Lancashire. North Shropshire was still unaffected by the milk trade, but both Derbyshire and Staffordshire were predominantly milk selling counties. Cheese making survived in the more remote farms, and in a few factories, but is importance had been greatly reduced. A similar story applies to the south western counties. At the time of Caird's famous tour, cheese making was all important in Somerset, Gloucestershire, north Wiltshire, west Berkshire, Dorset, and also in parts of Hamoshire and Oxfordshire. Fifty years later the milk trade was in command of most of North Wiltshire, and large parts of the

surrounding counties. Certain areas, such as the vale of Blackmore, the vale of Berkeley, and south of the Mendips, remained wedded to the old traditions of cheese making, but every year saw the milk trade "overturning a few more cheese tubs." In the midlands cheese making had never been so important as in Cheshire or Somerset. However, there had been local cheeses made in Worcestershire and Warwickshire, but the best known was the Stilton cheese, made around Melton Mowbray, and in parts of Rutland and Huntingdonshire. As the local cheeses died out only Stilton remained. Never manufactured on a large scale, it supplied a small but steady demand throughout. Elsewhere in the country the story was straightforward: cheese had never been of great importance, and what standing it had once enjoyed was quickly eroded by the inroads of the milk trade.

In talking of the manufacture of cheese so far no distinction has been made between the different types.[1] First, there were cream cheeses: Stilton, its Yorkshire equivalent, Cotherstone, and cream Cheddar. Second, whole milk cheeses: best Cheshire, some Cheddar, good Double Gloucester and Wiltshire. Last, skimmed milk cheeses: ordinary Cheshire, Cheddar, Gloucester, and Wiltshire, as well as the local cheeses of Shropshire, Warwickshire, and Leicestershire. Although the Cheddar type cheese was common, each county had its own particular variety of cheese. The Blue Dorset, the North Wiltshire Loaf, and the Derbyshire cheese did not survive the century. They had always been essentially local cheeses, and proved unable to compete with the cheap, uniform American cheese that flooded the English market from the 1860s. The greater the similarity with Cheddar, the greater the threat from foreign competition. However, some local

1. Fussell, op.cit., (Chapter V), gives details of some, but not all, cheeses, and their manufacture.

cheese did manage to survive, and even flourish. The soft Lancashire cheese was extremely popular locally. It did not suffer from direct foreign competition and, after the initial shake out from cheese to milk selling, this proved a profitable line for the remaining makers. Similarly, Stilton clung to a small, but steady market. More interesting was the case of Wensleydale cheese makers. Sited in the Yorkshire dales, the greatest problem was to sell the cheese. The time honoured practice, which persisted throughout the century, was to barter the cheese for provender and flour from the nearest grocer or corn merchant. The cheese was collected twice a year, autumn and early winter, and sold by the corn merchants to the grocers and dealers from Tees and Tyneside, who came to the October and November fairs. This local Christmas trade flourished throughout the pre-war years.[2] Local taste was also important in Somerset. Again a soft cheese, this time Caerphilly, was in demand from the nearby coal mines of South Wales. Unlike the trade with Tyneside, the venture proved less stable, and had petered out by the early twentieth century. Nonetheless, the importance of changes in taste cannot be denied.[3] More generally it was a problem facing all manufacturers, for over the course of the nineteenth century there was a definite swing away from the old type of long matured, strong cheese. A milder cheese was demanded, and this involved changes in technique that presented problems, particularly to the makers of Cheshire cheese. However, the change was effected, and though by 1900 Cheshire cheese was no longer made in

2. A. Simon, Cheeses of the World, (1956), 31.

3. see Chapter 9.

Derbyshire and Staffordshire, it was still the second most important cheese made in England. It was only exceeded by Cheddar. Although the overall make of cheese declined, the percentage of Cheddar in that make increased. From the heart lands of Somerset the techniques of Cheddar cheese making spread. In Gloucestershire and Wiltshire local cheese was abandoned in favour of the more regular system that had been developed and popularised by Joseph Harding.

Having outlined the geographical changes in the cheese producing areas of England, the next step is to define more closely the production from this sector of the dairy industry. For the pre-war years only the roughest estimates can be made. No official statistics were collected before 1908, and the few prior estimates that were made, were little better than inspired guesses based on limited knowledge. Consequently, all calculations are of a general nature, claiming only an approximate degree of accuracy, and open to obvious reservations.

According to the Census of Production for 1908, the amount of cheese sold from all classes of holdings in England was 362,000 hundredweights,[4] which was equivalent to approximately 45 million gallons of milk, or 5 percent of total farm sales of milk in liquid and manufactured form. On top of this one must make allowance for factory cheese - 53,000 hundredweights from factories in England and Wales[5] - and cheese consumed on the farm, say 5 percent of off-farm consumption. In total output was unlikely to have exceeded half a million hundredweights. Lacking precise details for the mid nineteenth century makes comparison difficult. However, at this time,

4. Census of Agricultural Production, 1908, C.6277, Parl. Papers, 1912-3, x, p.584.
5. First Census of Production, C.6320, 1907, Parl.Papers, 1912-3, cix, p.509.

cheese making probably consumed 40 percent of total available output.[6] This would have represented some 200 million gallons of milk, or 1½ to 1¾ million hundredweights of cheese. In other words, over the course of fifty years the total output of cheese in England declined by two-thirds. The timing of this decline can only be plotted from descriptive evidence. The period of greatest decline appears to have been the twenty years from 187- to 1890. In the case of Lancashire the change was concentrated in the earlier years, but in Derbyshire[7] and Wiltshire there appears to have been a fairly even spread over the years. In Somerset, the later years of the century were crucial,[8] but generally speaking the process was under way by 1870, and had achieved large proportions by 1890. The collapse of cheese prices in 1879 and 1885 gave sharp impetus to the move out of cheese making, the years 1895-6 provided a final sting in the tail, as prices slumped again.

During the 1920s the percentage of milk used in cheese making hovered about the 5 percent mark, but this is not suggestive that there was any revival. On the contrary, the late 1920s and early 1930s saw the finaly collapse of farmhouse cheese making in England, as a further flood of imports swamped the market and dragged prices down to ruinous levels. In 1933/4 there were only 1,324 farmhouse cheese makers holding a licence from the Milk Marketing Board, using a mere 18.8 million gallons of milk.[9]

6. No precise figures exist for these years, but from estimates of such people as Morton it would appear that cheese making accounted for nearly half of the milk available for human consumption. See Chapter 2, Table XXIV.
7. J.R. Bond, 'Derbyshire Farming, Past and Present', J.R.A.S.E., xcii, (1932) 171.
8. E.G.F. Waller, 'The Dairy Industry of Somerset', J.B.D.F.A., xx, (1906), 23-34.
9. Milk Marketing Board: Five Year Review, 1933-38, (1939), 37.

If the data relating to overall cheese production is scanty, information on the make of different types of cheese is virtually non-existent. Strictly speaking, it might be possible to arrive at a figure, by collecting data from local market reports, but there is little way of telling how much cheese was sold without reaching a cheese fair or local market. Not until the advent of the Milk Marketing Board is such detail available. During the first five years of its existance, of all the farmhouse cheese made, 52 percent was Cheddar, and 29.6 percent Cheshire. The only other cheese made on any scale was Lancashire, which accounted for 14.2 percent. Of this Wensleydale accounted for 2 percent, Caerphilly 0.8 percent, Stilton 0.4, and all others 1.0 percent.[10] With the exception of Caerphily, which was made on a larger scale before the war, this probably gives an accurate impression of the importance of the various types of cheese at the end of the nineteenth century.

The marked decline in cheese production was the result of changing circumstances that turned the profitable days of the 1860s into the gloom of the 1880s and 1890s. For the historian of the dairy industry there is no data available that is comparable with that relating to corn prices. However, it is possible to give some indication of the course taken by cheese prices, during, it must be stressed, a period when the general price level fell by some 40 percent. From the early 1870s the trend was steadily downwards. In 1879, 1886, and 1895-6 prices slumped disasterously. Looking at the figures for English cheese sold on contract at two London hospitals prices fell from over 70/- per hundredweight in the 1860s to below 50/-

10. ibid., 38.

by the late 1890s. Short term fluctuations were even more severe. In 1879 the price fell from 65/- to 56/6d, while in 1896 the level reached a low of 40/-.[11] Although there were variations from area to area, and from cheese to cheese these figures probably represent the experiences of the bulk of English cheese makers during these years. The figures for the Chippenham cheese market, for example, show little difference. The slump was delayed a few years, and was sharper when it came, but the basic pattern is the same. Similar, Cheshire cheese prices followed the same general trend.

In the shorter run, it is possible to give a wider coverage of the conditions facing the cheese maker. In Somerset the price of best quality cheese fell from a peak of 80/- a hundredweight to 60/- in 1881, while thirteen years later the price had fallen still further, to 56/-.[12]

TABLE XXX

Cheese Prices in Wiltshire and Derbyshire, 1872-94 (s/cwt.)

	Wiltshire: Average Price		Derbyshire: Fine Quality
1874-75	73.5	1872-75	70.0
1876-80	68.0	1876-80	66.4
1881-85	49.4	1881-85	64.0
1886-90	46.6	1886-90	59.4
1891-93	47.0	1891-94	61.4

Source: R.C.Ag., Parl. Papers, 1895, xvi, p.34, 1896, xvii, p.601.

The figures in Table XXX reflect the differences between the best cheese and ordinary makes. The Wiltshire figures refer to the average price for all cheeses, whereas the Derbyshire ones apply only to best

11. Report on Wholesale and Retail Prices, Parl.Papers, 1903, lxviii, p.150. (321)

12. R.C.Ag., Parl.Papers, 1881, xv, Qq. 1836, 1838, p.59. 1894, xvi, pt.iii, Q.42,271 p.295. It should be noted that the price of inferior cheeses fell by 50 percent.

quality cheese. It was at the second, and third, quality level that prices fell most, because here competition was most keenly felt. Of this competition there can be no doubt. Until 1870 the price of imported cheese tended to rise. However, with the massive imports of the next three decades prices fell from 60/- a hundredweight to under 40/-, by the end of the century.[13] The percentage fall in price was not exceptional, but the level from which the fall started made the competition so fierce. First class cheeses[14] avoided the worst fall, but other makes were dragged down by cheap American, and later New Zealand, cheese which flooded in. The collapse, as much as 50 percent in some cases, but averaging about 30 percent, was not offset by a comparable fall in production costs. By the 1880s and 1890s the returns to cheese, except first quality, were not sufficient to cover the cost of production. Not until the early twentieth century was there a revival in cheese prices. In some parts of the country, notably east Lancashire, and parts of Cheshire, there was a return to cheese making among those farmers who had not completely abandoned the old ways for milk selling. The impact of the revival, however, must not be exaggerated. By the 1900s cheese making was of little significance in comparison with the milk selling side of the dairy industry. Moreover, the upheavals of the war years led to a confirmation of earlier trends. To encourage milk production, cheese prices were fixed at an uneconomic level. The need to find new sources of supply, and the possibilities opened up by the use of the lorry, added further strength to the trend away from farmhouse cheese making.

13. Agricultural Statistics.

14. R.C.Ag., Parl. Papers, 1881, xvii, Q.56,800, p.918 states that of the annual make 50 percent was second quality, and 25 percent first quality.

After the war the same basic pattern continued. Foreign competition was even greater in volume. By the end of the 1920s there was the real threat of world wide overproduction. For the English dairy farmer the position became dire. Prices dropped dramatically,[15] and in the rush from cheese making the whole structure of the dairy industry was threatened. Against this background was planned the birth of the Milk Marketing Board.[16]

TABLE XXXI

Cheese Imports into the United Kingdom, 1860-1930 (000 cwt.)

1861-65	770.9	1886-90	1,908.3	1911-15	2,423.1
1866-70	934.3	1891-95	2,150.3	1916-20	2,557.6
1871-75	1,348.8	1896-1900	2,455.4	1921-25	2,860.4
1876-80	1,743.9	1901-05	2,564.9	1926-30	3,014.4
1881-85	1,819.1	1906-10	2,432.7		

Source: Agricultural Statistics.

The quantity of cheese imported into the United Kingdom increased enormously in the last years of the nineteenth century. The yearly average

15. The exact position in these crucial years was as follows:

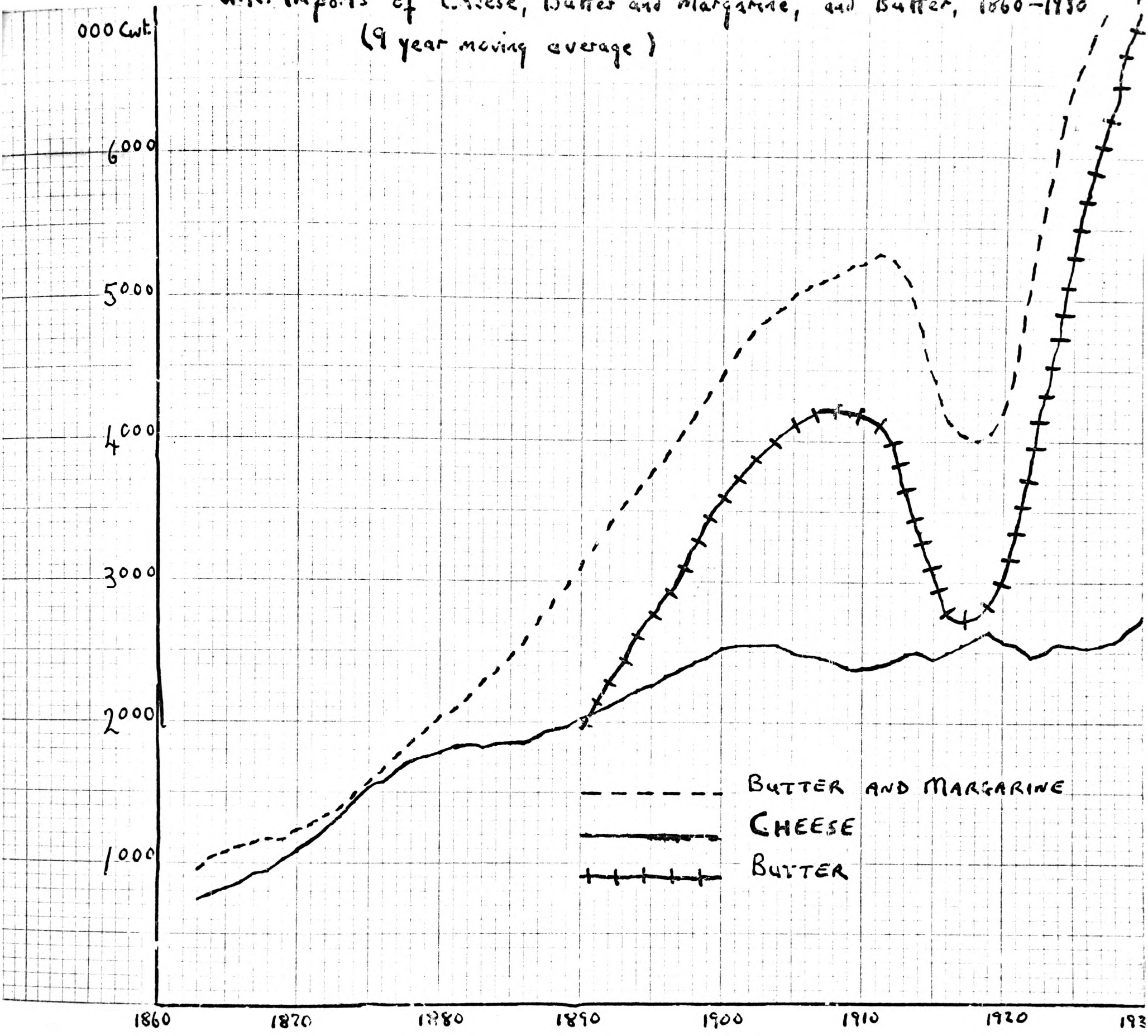
Cheese Prices, 1928-34 (s/cwt)

Type	Grade	1928	1929	1930	1931	1932	1933	1934
Cheddar	1	133/6	123/-	105/6	97/-	105/6	95/6	89/-
"	2	127/-	116/6	96/-	86/-	93/6	82/-	76/-
Cheshire	1	126/6	115/-	97/6	100/6	108/6	85/-	72/6
"	ungraded	-	109/6	94/6	94/6	104/-	76/6	66/-
Canadian	1	111/-	104/-	95/-	75/6	72/-	65/6	60/-
"	2	-	98/-	91/6	72/-	68/-	62/6	58/6
New Zealand	1	106/-	94/6	82/6	63/6	64/-	52/6	50/-
"	2	-	92/-	79/6	60/6	61/-	49/6	47/6

Source: Agricultural Statistics.

16. Only the briefest reference is made to the origins of the Milk Marketing Board. The whole question, involving a complete break with past policy, deserves separate treatment. It is not within the scope of this present study to deal with the many aspects of policy making in the 1930s.

U.K. Imports of Cheese, Butter and Margarine, and Butter, 1860–1950
(9 year moving average)



in the period 1911-15 was three times as great as that for the years 1861-65, while in the decade after the war imports rose by a further 20 percent. As the volume increased the sources of supply changed. During the 1860s and 1870s American cheese dominated the market, with something approaching three quarters of the total imports coming from there. The only large scale European supplier was the Netherlands. American dominance, at is peack in the years 1877-81, did not go unchallenged. The amount of milk available for export declined as domestic demand rose, but, more important, a new rival appeared. By abrogating in 1866 the Reciprocity Treaty that had existed between America and Canada, the Americans had deprived their neighbours of a market for meat and grain. The Canadians, forced to find new outlets, looked towards the dairy industry, and the British Isles, as an answer. Two years earlier, in 1864, the first cheese factory had been established in Canada. The stimulus of events in 1866 led to a new drive in dairying. By the late 1880s Canada was supplying the United Kingdom with one third of her imported cheese. America, supplying 44 percent, still led the field, but her share of the market had fallen considerably and showed no sign of recovering. By the end of the century America supplied only 17 percent of all cheese imports, while Canada provided 65 percent. However, as had happened in the case of America, rising internal demand limited exports. After the war Canada's contribution fell to 20 percent. The new star on the horizon was New Zealand. The possibilities of an extensive export trade to the United

Kingdom had been opened up only recently. It was in 1882 that the first cargo of frozen meat and butter had been shipped to London. The potential had been seen by the government, who offered a bounty to exporters. During the last two decades of the nineteenth century technical improvements in shipping, and the rapid growth of dairy factories in New Zealand, provided a solid spring board for the exporter of both cheese and butter. By the turn of the century New Zealand trailed behind the Netherlands as a supplier of cheese to the United Kingdom, but by 1914 the contribution had increased from 3 to 20 percent. The Great War curbed expansion, but the flood continued after 1918. By 1930 some 60 percent of imported cheese came from New Zealand.[17]

The cheese that reached England from the factories of Canada and New Zealand was a mass produced article. As such it did not come into competition with the best of the English make. Unfortunately for the English cheese maker, very little cheese, and fewer makers, came into this category. The small market for fine English cheese was not challenged, but at lower levels there was much to be said for Canadian Cheddar. The factories produced a uniform item, suited to the tastes of the developing mass market, at a price as low, or even lower than, that of its English rival. Many words were wasted in defence of best English cheese; too little was done to ensure a reliable supply of cheap cheese for the larger markets of the great cities and towns. Little attempt was made to discover and satisfy local tastes. Presentation and marketing techniques were primitive. The force of tradition kept the English cheese maker imprisoned in an earlier

17. Details from Agricultural Statistics, R. Cohen, op.cit., pp.36, 111. V. McCormick, A Hundred Years in the Dairy Industry, (Ottowa, 1968), and H.G. Philpott, A History of the New Zealand Dairy Industry, 1840-1935, (Wellington, 1937).

age. The possibilities of improvement were curtailed by a frame of mind which, for example, saw uniformity as 'a fad of the rich'.[18] As a result the English cheese maker limited his horizons to two markets, which, if not actually shrinking, were not expanding at any appreciable rate. On the other hand, there were the few skilled makers catering for the market in fine quality cheese. On the other, for the majority there was the local market where almost anything could be sold. In between had developed a new market, less discerning than the former, more discriminating than the latter. This market was developed and exploited by the foreign manufacturers, while the English dairy farmer stood looking on, out of touch with the new conditions of the nineteenth century, and increasingly squeezed out as a result.

However, it will not do merely to berate the dairy farmerfor his failure to move with the times. One must probe deeper into the question of the failure of the English cheese maker. His inability to maintain a hold on the market stemmed from two related facts. He could not produce a cheap and uniform quality article. The lack of uniformity was the result of a system based on the arts of each individual farmhouse. Cheese making as a science was hardly known in England. Under the influence of Joseph Harding, of Marksbridge in Somerset, an attempt was made to standardise the manufacture of Cheddar cheese. A widely travelled man, conversant with advances in science, he saw the necessity of standardised production to meet foreign competition. He initiated the teaching of dairying and cheese making as a technical subject. As well as advocating the use of

18. Alexander Watt quoted in Ag.Gaz., xxxii, (1890), p.317. It is difficult to say how typical was such a comment. Probably few were as articulate or as blunt as Watt. However, it cannot be denied that the arguments in favour of the individuality of the best English cheeses ignored the large amount of unreliable second and third rate cheese that was made annually.

"advanced" equipment, he introduced the first standard rennet, in 1875. The production of cheese was improved by the introduction of slip scalding, while by ripening cheese in warm rooms he was able to reduce the period of maturation from 9 to 12 months to only three. However, the impact of his ideas was limited. Dairy schools had little support from the government, and the number of people passing through the various courses was never high. Moreover, the products of the travelling schools, and those universities which offered such courses, did not emerge into the world of practical cheese making until the end of the century. Even then one is tempted to ask just how many of the gentile young ladies who learned cheese making at Reading ever went into the cheese room after their training was over. All in all the effect of these attempts at education were almost negligible. Any attempt to influence the bulk of farmhouse cheese makers without government aid for a wide scale onslaught, was doomed to failure. For various reasons such aid was not forthcoming. Consequently the variety of cheeses made in England was not restricted to the various districts, but was extended to every farmhouse.

The problems involved in making good quality cheese were intensified by the lack of skilled labour, which became felt increasingly as the century progressed. Not only were dairymaids harder to find, but wives and daughters no longer wanted to spend their days elbow deep in curds and whey, but preferred the "silk and satin" of contemporary rhyme.[19] Or so one would imagine if contemporary complaints were to be believed. In fact

19. "Man to the plough,
Girl to the cow,
Boy to the barn,
Wife sew and darn,
And your rent is soon netted.
Man tally-ho,
Girl piano,
Boy Greek and Latin,
Wife silk and satin,
And you'll soon be gazetted."

such criticisms were not confined to the late nineteenth century. Their volume might have increased, but this was a reflection of distress, rather than an explanation. A more plausible interpretation than new found and inappropriate tastes, was that the decline in cheese making had become self reinforcing. As people were squeezed out, or lured away from, the cheese room the skills were allowed to decay. When a new generation, unversed in the mysteries of the cheese making, grew up, the decline in this branch of dairying received a further impetus. In other words, the absence of skilled labour was both cause and effect of the overall decline in cheese making.

Outside factors also played their part. Though a random factor, the weather could have a serious short and medium term effect. During the last quarter of the nineteenth century the effect of the weather not merely intensified problems, but obscured the fundamental problem. 1879 was a disasterously wet year. According to Baker, in the August of that year the 'pastures on clay lands are as wet as in the winter. Grass all trodden away and cattle sink in to their knees....Greatest rot amongst sheep and beasts ever known.'[20] 1880 was little better, while the severe winter and wet summer that followed added to the farmers' misery. It was not simply a question of ruined harvests and diminished yields. The pasture land of the west of England deteriorated quite markedly. Little, reporting in 1881, wrote 'it is said that in a considerable part of North Wilts. the value of the land for dairy purposes has diminished 50 or 60 per cent.'[21]

20. E.L. Jones, Seasons and Prices, (1964), p.174.

21. R.C.Ag., Parl. Papers, 1881, xv, p.419.

More specific evidence came from a Chippenham surveyor, one H. Smith, who told the commissioners that

> 'the make of cheese...is about two tons less than it ought to be on a farm of 150 acres. A farmer with a dairy of 30 cows ought to make six tons of cheese in order to make it pay; and the last two years, owing to the great deterioration of the grass, they have not made more than 3½ to 4 tons, and that at a less price.'[22]

Over the border in Dorset conditions were very similar. It was reported that the Blackmoor Vale 'has suffered much from floods..For the last two or three years the dairy produce is said to have been lamentably deficient owing to the immutritious quality of the grass.'[23] Similar evidence was forthcoming from Somerset and Derbyshire.[24] In itself a fall in the quantity of cheese made was not necessarily a bad thing. What was serious was the decline in the quality, which exposed English manufacturers to competition from imported cheese. The wet seasons of the early 1880s were a cruel blow, following the disasterous year of 1879 when virtually no cheese had been made in some areas because of a huge influx of American cheese, which had knocked the bottom out of the market, to the detriment of all. However, the weather swung from one extreme to the other. The floods of the 1880s were replaced by the droughts of the 1890s, which culminated in the summer of 1893, which was as disasterous in its way as 1879 had been in the other. The lack of feed was a serious blow to the dairy farmer, who was faced with falling yields and rising costs for artificial feed as the pastures burnt up.

Adverse seasons were unwelcome blows, but they were essentially accidentals. Unfortunately, they were all too easily seen as the root cause of the trouble that afflicted the farming community, and they became the

22. ibid., p.31.

23. R.C. Ag., Parl.Papers, 1881, xvii, Q.49,444, p.660.

24. R.C. Ag., Parl.Papers, 1881, xvi, p.400, xv, Q.30,615, p.39.

pat excuse for poor performances. Yet one adds together these factors - bad seasons, labour troubles, and unscientific methods - they do no more than illuminate the many facets of the problem, of why the English dairy farmer lost control of the home cheese market but they do not get to its roots. In the final analysis the crucial factor was the presence of an obvious alternative - the liquid milk trade. Put another way, there was an ever decreasing incentive to face up to the challenge of foreign competition in the cheese trade. The first class cheese maker was not seriously troubled by the presence of cheap imported cheese. Further, he tended to be among the leaders of advanced opinion. For the ordinary producer the new milk trade was like manna from heaven. There was no foreign competition, the market appeared to be ever expanding, there was a rapid turnover, and there was no dependance, financial or otherwise, upon the cheese factor. For his wife the attraction was as great: freedom from the drudgery of cheese and butter making.

The force of the argument can be seen when one looks at the history of cheese factories in England. Here, in theory at least, was the answer to the foreigners' challenge. Uniformity could be guaranteed, and reductions in costs effected. Yet cheese factories never became popular in England. Unless one believes that this was simply the result of the English farmers' sturdy independence, a further explanation is needed. Psychology apart, and there seems little reason to believe that the American, Canadian or New Zealand farmers were any less independant, an answer emerges from the very early days of the cheese factory in England. Briefly, the situation was as follows. The success enjoyed by the

American factory cheese led the Royal Agricultural Society of England, in 1868, to carry out an investigation into the American system. The enquiry had been instigated by Lord Vernon, of Sudbury Hall, near Derby, who was one of the leading agriculturalists at both local and national level. In 1870 the Derbyshire Agricultural Society, again inspired by Vernon, decided to introduce a factory system on a limited scale in the county. Two factories were set up, and run by two American experts, the brothers Schmerhorn. Technical problems, and the opposition of the local cheese factors, were overcome, and the success of the factories led others to experiment. The exact number of cheese factories opened is not clear, but in 1874 there were at least six in Derbyshire. The idea spread, and factories were established in Staffordshire, Cheshire, Somerset, and Gloucestershire.

However, instead of mushrooming the movement petered out. Some new factories were opened in the following years, but in many cases their life span was short. The greatest concentration was in the Staffordshire-Derbyshire area. In 1889 there were 16 on the North Staffordshire Railway between Derby and Ashbourne.[25] Derbyshire cheese, however, did not sell. Some factories switched to the manufacture of Cheddar, but their survival was largely due to the fact that they became adjuncts of the liquid milk trade, acting as safety valves, regulating the supply of milk. As producers of cheese they were of little importance. In 1908 the total output from factories in England and Wales, and a large proportion of the make came from Welsh factories, was a mere 53,000 hundredweights.[26]

25. Ag.Gaz., xxix, (1889), p.38.

26. Census of Agricultural Production, op.cit., p.584.

As Fussell points out, the expansion of factory production was limited by the lack of skilled managers,[27] but neither this, nor the mere presence of a competitor, albeit a powerful one, is sufficient to explain the short life, and limited impact of the factory system in England. If the presence of a competitors was sufficient to defeat a would-be rival Danish butter would never have been seen in England! More significantly, the costs of production were cheaper abroad, but this was partly offset by transport charges. Further, it is by no means certain that costs in England could not have been reduced to a competitive level if a factory system had been adopted on the same scale as in North America and Australasia. The point, which Fussell mentions without grasping its full significance, was that there was an alternative outlet, that is milk selling, present from the outset of the cheese factory experiment. Moreover, the alternative was soon seen to be more lucrative. As early as 1874, only four years after the founding of the system in England, the Derby factory was sending milk to London. Fussell comments that 'this was a sad falling away from the original project, but...perhaps inevitable.'[27] At worst this reflects a sentimental hankering after the dying art of cheese making; at best a failure to grasp the fundamental situation. Simply, the returns to cheese were less than those to milk. As the shake out from cheese making proceeded apace the gross returns per gallon became less divergent, but net returns favoured the milk seller, especially when transport costs were kept to a minimum. The cheese factories, therefore, became an intermediate step towards, and an important part of, the liquid

27. Fussell, op.cit., p.295.

28. ibid., p.296.

milk trade. From a primary concern with cheese making, and a minor interest in the liquid milk trade, it was a simple step to move into the milk trade on a large scale, and to use the cheese making facilities as a safety valve in the case of both short and long term disequilibrium between supply and demand. This was one of the major problems facing the milk seller, and one to which there was no solution as long as individual farmers sent their supplies without reference to the state of the market. The practice of sending milk"on spec" was no real solution. It did not satisfy the distributor, and it put a heavy financial responsibility on the producer of accommodation milk. With a central collecting depot it was possible to respond more sensitively to daily fluctuations in demand, without running the risk of expensive wastage. If necessary milk could be held back, and converted into cheese. Moreover, cooling plants could be incorporated, thus further reducing much of the risk associated with the trade. Regularity of output was difficult to achieve, but even more so was regularity of quality. The longer the milk was kept, and the more it was moved about, the greater became the risk of deterioration. Therefore, as the cheese factory became more an adjunct of the milk trade the quality of its produce fell, and, thus, its overall importance declined.

It is impossible to say how the dairy industry would have developed if there had been no milk trade. Some drastic reorganization would have been necessary to adjust to foreign competition., but it is not inconceivable that cheese making, in farmhouse and factory, would have persisted. In the event, factory cheese making never became widespread, while in the farmhouse it was a story of steady decline. The challenge of foreign imports was never really taken up, primarily because there was no incentive, no need to

do so. The side step was far more attractive than the head on tackle.

The outcome, as we have seen, was a marked decline in farmhouse cheese making in the years 1870 to 1890. Thereafter, in spite of a small recovery at the turn of the century, cheese making was of limited significance, except in south Cheshire and parts of Somerset. Elsewhere the art languished, local cheeses disappeared, and the milk churn became ubiquitous. The position of the cheese maker was made worse by the conditions prevailing during the war years, when the chief concern was to ensure an adequate supply of milk. The decline did not end with ceasing of hostilities. The attraction of high, and fairly stable, prices was sufficient to entice cheese makers in Shropshire, south Cheshire, and Somerset to give up their traditional livelihoods. However, the last, great flight came at the end of the 1920s. Imports topped the three million hundredweight mark, glutting the market and dragging prices down to disaster level. Cheese producers hastily moved into the liquid milk trade, but the decision was hardly a wise one. The sudden accession of a large number of new producers in a market that was already oversupplied threatened the whole dairy industry. The Permanent Joint Milk Committee tried to bolster up prices, but its lack of monopoly control was fatal to its policy. Undercutting was rife, prices fell lower every year, and collapse seemed imminent. The importance of dairying to British agriculture added force to the arguments of those who sought government aid. In 1931 the government threw over the traditional free trade policy, and two years later the Grigg Commission report was published, and became the basis of the Milk Marketing Board, which gave producers control of prices, and a monopoly

over all supplies, provided they would guarantee to take all the milk offered to them.[29]

Cheese making was finally relegated to a role of relative insignificance by the traumatic events of the inter war years. Yet, paradoxically it would seem, total cheese production had increased during the 1920s. However, it was not the farmhouse but the factory that contributed to the increase. Surplus milk factories had been set up in Sussex, Wiltshire, and Hampshire for example. The 1,324 registered farmhouse cheese makers of 1933/4 were all that survived. It was a far cry from the mid nineteenth century when cheese had been made on almost every farm in the country.

29. Ministry of Agriculture, Economic Series,30, (1932), p.9.

III

(b) Butter

Superficially, the history of butter making followed the same course as that of cheese making. Over the course of fifty years the percentage of milk available for human consumption that was devoted to butter making declined from 30 percent to 15. Beyond this, however, there were certain important differences. The manufacture of butter was geared essentially to the local market. Anyone with a cow, let alone a herd, could make the odd pound of butter for sale at the weekly market, in a way that was not open to cheese makers. As a consequence butter making was widespread in the mid nineteenth century, but there were few specialist areas. The London market had been lost to the foreign invader earlier, and the potential of the towns and cities was not realised for precisely the same reasons that applied to cheese making - lack of uniform quality. Demand for butter increased markedly as per capita consumption rose, and the total population increased. The gap between home supply and demand had necessitated imports, but the position of the English butter maker deteriorated in the face of ever increasing competition from abroad.

The few specialist areas were chiefly in the remoter parts of the country. In the south west peninsula, lacking a large local market, the manufacture for export up-country was the major outlet. For similar reasons the lakeland counties of Cumberland and Westmorland relied heavily upon butter sales in the industrial towns of the neighbouring counties. Elsewhere, the presence of a good local market was the key. Butter

making persisted in parts of Lancashire, long after it had disappeared elsewhere, because of the steady demand from Manchester. North west Shropshire also remained a butter producing area. Further south the greatest influence was London. In parts of Northamptonshire, Cambridgeshire, and Essex butter was made for sale in the capital. Similarly, the Vale of Aylesbury and parts of Dorset were devoted to the same trade. The trade, however, was a limited one. The essentially parochial nature was clearly seen in Sussex, where, relatively speaking, a large amount of butter was made, but very little moved outside the county. Further, the trade was never organised on the same line as the cheese trade with its factors, fairs, and so forth, or the milk trade with its network of railway supplies.

By the turn of the century butter making was of very limited significance, despite the many words written about its virtue. Although Buckinghamshire and Dorset still provided some butter to London, the chief manufacturing areas were those isolated parts where the liquid milk trade was not a practical proposition. Devon and Cornwall, Cumberland and Westmorland remained the strongholds. In the isolated parts of north east England butter was manufactured, but only on a small scale. According to the figures in the 1908 Census of Production, the total amount of butter sold off farms in the whole of England represented only just over one percent of all the milk available for human consumption. The war years accelerated the decline, and the high prices realised for liquid milk were the final blow. By the end of the 1920s the domestic butter industry had

been dismissed as 'practically confined to small-scale production for local requirements in districts out of range of the liquid milk market...'[30] It is difficult to argue with this conclusion. In Wales butter making retained some importance, especially as an adjunct to stockrearing, but in England, the art had all but disappeared.[30]

The discussion of the dairy industry in England has been hampered throughout by the lack of a reliable set of figures covering the period. This applies to butter making as much as to any other branch of the dairy industry. The problems of ascertaining the size of the manufacturing side of the dairy industry brought a cry of near despair from the compiler of official statistics. In the 1922 Agricultural Statistics one reads that 'it is practically impossible to obtain sufficient information in regard to butter and cheese making to enable any reliable opinion to be found of the quantities of milk used for these purposes.'[31] There is small consolation in the fact that the available information for the nineteenth century is even worse. However, the problem must not be sidestepped. Figures exist for the years 1908, 1925, and 1931, thus providing a base from which to work. The figures, however, appear to be at variance. According to the last two the amount of milk devoted to butter making in England and Wales was 11 percent. From figures quoted in the 1906 Census of Agricultural Production the figure was significantly lower, at 2 percent.[32] This figure can be criticised on several grounds. The survey only covered a small percentage of cattle owners in the country. The sample is unlikely

Ministry of Agriculture, Econ.Ser., 30, (1932), 9.

30. Butter making was of importance in the following areas of England: Cumberland, the Isle of Ely, Hereford, Huntingdon, West Suffolk, Isle of Wight, Duchy of Peterborough, and Westmorland. In no case did the percentage of milk converted into milk exceed 50 percent of the total available for human consumption.

31. Agricultural Statistics, 1922, p.65.

32. Census of Ag.Production, op.cit., p.584, and Agricultural Output...1930-1, op.cit., p.25.

to have been representative. In all probability it exaggerated the position and importance of the larger, and more progressive farmers. Conversely, the type of farmer likely to have been under-represented would have been the more backward, isolated one, the type who was most likely to be producing butter. On top of this one must remember that butter making was more important in Wales than in England. In view of these considerations one can suggest that in England, during the 1920s, some/5 at least percent of available milk was devoted to butter making. For the years before the Great War the figure was certainly higher, but probably no more than a maximum of 15 percent. It is even more difficult to give figures for the mid nineteenth century. It is probable, however, that butter making accounted for some 30 percent of the available milk. Translated into figures this represented a fall in production of about 60 percent, from half a million hundredweights to one fifth of a million, over the period as a whole. However, it must be stressed that these figures are very approximate and are intended to indicate the magnitude of the decline, rather than its exact proportions.

The question of decline can be viewed from another angle, namely that of prices. The evidence is limited, and in parts contradictory. In Lancashire markets butter prices kept relatively stable, except during the trade depression of 1883 to 1886, until the late 1890s.[33] In contrast London prices rose to a peak in the early 1870s, from whence they fell gradually for a decade. After a brief revival in the mid 1870s, the rate of decline accelerated, prices falling from 120/- a hundredweight in 1890 to under 100/- in 1900. Similarly, in the Vale of Aylesbury prices had fallen by 25 percent by the time of the second Royal Commission. According

33. Fletcher, 'Lancashire...' op.cit..

to Spencer, prices fell from 17/- to 20/- per 12 lbs. to 13/- to 14/-. As a result milk selling had replaced the old butter trade.[34] Precise figures for imported butter cannot be given for the whole period because no distinction was made between butter and margarine in the official figures until 1886. In the subsequent years, however, it was striking that the average price of first quality imported butter was lower than that of second quality English. Unlike cheese makers, the producers of butter were in direct competition with their foriegn rivals at all levels. With the exception of the war years, when prices were fixed against the interests of butter makers, outside factors largely determined the course of prices. Thus, for example, when the price of imported butter was sharply reduced in 1922, English butter prices slumped dramatically. Again, at the end of the decade, prices collapsed as the result of world overproduction, bringing considerable distress in Dorset.

The volume of butter imported into the United Kingdom increased at a staggering rate from the early 1860s to the end of the period under review, with only a check during the war years.

TABLE XXXII

Imports of Butter into the United Kingdom, 1861-1930 (000 cwt.)

1861-65	1,005.0+	1886-90	1,736.7	1911-14	4,057.0
1866-70	1,164.6+	1891-95	2,409.3	1916-20	1,767.0
1871-75	1,367.8+	1896-1900	3,246.6	1921-25	4,805.8
1876-80	1,893.0+	1901-05	4,025.5	1926-30	6,194.0
1881-85	2,284.9+	1906-10	4,229.3		

+butter and margarine

Source: Agricultural Statistics

34. R.C.Ag., Parl.Papers, 1894, xvii, Q.46,580-1, p.15.

Unlike cheese imports the bulk of the butter came from European countries. The bulk came from France and the Netherlands in the middle of the century. The situation changed over the next decades with the arrival of Denmark as a source of supply. By the end of the 1880s over 30 percent of imported butter came from Denmark, 27 percent from France, and 12 percent from the Netherlands. By the turn of the century both the latter countries had been superceded by Russia, who provided 10 percent of total supplies. In contrast Denmark had raised her share of the market to over 40 percent. However, for the first time supplies from the Antipodes were a significant source, supplying over 20 percent in the years immediately before the war. During the 1920s supplies were dominated by two countries, Denmark and New Zealand, the former providing 34 percent, and the latter 23 percent of total imports into the United Kingdom. However, by this time the home butter industry was scarcely a rival, having been effectively killed off by the events of the war years.

As with the trade in cheese the presence of milk trade was the key to the steady decline in the manufacture of butter. Although demand exceeded home supply there was little incentive to increase production. Cheap imports flooded into the country, and the English dairyman, rather than attempting to meet the challenge, turned to the liquid milk trade, with its promise of a rapid turnover, and greater convenience. However, other factors contributed to the downfall. The quality of English butter, generally speaking, was low and unreliable. For example the Agricultural Gazette maintained that Devon butter was amongst the worse sent to London.

Moreover, little was done to improve its quality.[35] In some way this was a rational response in that bad butter paid at the level of the local market. There most butter sold at some price, around 1/2d. to 1/3d. a lb. Thus, 50 lbs. of very good butter would fetch £3. 2. 6. With the addition of a little milk one had 55 lbs. of middling to good butter, which, at 1/2½d. a lb., would fetch £3. 6. 5½d. Lastly, add more milk or water, and one had 60 lbs. of poor butter that would fetch only 1/2d. a lb., but a total of £3. 10. 0. In other words, the addition of a little more milk or water could raise the total return from a given amount of butter by some 10 percent.[36] Unfortunately, such an attitude was self defeating in the long run. Fewer people were prepared to take anything that was on offer. Smollett's description of butter - tasting 'like train-oil thickened with salf' - was less of an exagerration than many would admit.

However, the dislike of cheap butter opened the way for fair and unfair practices. Basically the obvious answer was to blend the butter - the question was with what? The obvious step was to allow the percentage of water in butter rise above the legal level of 16 percent. The risk of prosecution appears to have been comparatively low, while in the case of action being taken the fines were hardly prohibitive.[37] There was a further possibility for the butter blender. Low quality butter, in particular Irish butter, which was frequently criticised for its high water content, could be blended with higher quality butter to the detriment of the latter. More subtle was the blending of butter and milk. The practice

35. Ag.Gaz., xxii, (1885), p.34.
36. Ag.Gaz., xxiv, (1886), p.559.
37. On the evidence of the Medical Officer's Report to the Oxford Local Boards the change of being apprehended and prosecuted would appear to be small. The number of samples taken in a year rarely rose above 100, and even where adulteration was found prosecution did not necessarily follow. In the cases where it did the fines were almost derisory, being at most £2.

was encouraged by the firm of Pearks Ltd., who sold butter on a large scale to gain an advantage in the cut throat retailing trade. No one wanted to condemn milk blended butter, but to make sure that it did not enter into fair competition with proper butter by being improperly labelled. Lastly, there was the possibility of combining butter with margarine, or with other fats. This was one of the greatest problems facing those employed in the butter trade. Looking at the question from the point of view of the English producer the intercine struggles of the big retailers were of little importance. The problem was that imports could further reduce prices by using adulterants in butter. Moreover, the new margarine trade was gradually undercutting the English butter maker in his own, local market. Margarine, often containing over 10 percent butter, was specially prepared to make it palatable. Further, by selling it in lumps wrapped in cloth, and giving it such fancy names as Butterpat, Creamo, Marbutta, or Milko, it could be passed off as butter,[38] at prices considerably below that of even the cheapest butter.[39]

Overall the English producer was not in a position to match his continental and antipodean rivals. The technical developments that took place, in particular the development of centrifugal seperator, could only be exploited within the framework of an organised factory or co-operative system. This was the key to success in Denmark, France, Ireland, and New Zealand, but in England there was little support for the idea. The reasons for this are precisely the same as those for the failure of the factory

38. Report from the Select Committee on the Butter Trade, (245) Parl. Papers, 1906, vii, p.441.

39. Margarine was retailed at between 4d and 8d. a lb., while the cheapest butter was priced at 11d.. Report...on Butter Trade, op.cit., 172, 174.

system for cheese making. Simply, the developments of the late nineteenth century were irrelevant to the farmhouse butter maker in England. The impact of new machinery was very limited, notwithstanding the publicity given to the Royal Dairy at Windsor. The contribution of education in dairying was minimal, despite the work of the Bath and West of England Society. A few butter factories were established, and they enjoyed a certain degree of success, but they were a drop in the ocean. More generally, the tendency to abandon butter making when at all possible continued. In consequence those who remained in the trade were mostly to be found in the remoter parts of the country.

When discussing the manufacture of cheese the failure of the factory system was used to illustrate the importance of circumstances. The same theme can be developed somewhat differently by reference to events in Denmark. Throughout the first half of the nineteenth century there had been much improvement in Danish agriculture. However, it was as a grain exporter that she was known. By the 1860s there had been some move towards dairy farming as a result of the high cost of grain production in terms of soil exhaustion. However, the shift in relative prices in the 1870s, coupled with the loss of the market in Germany, provoked a major change in outlook. The emphasis was shifted to livestock, but livestock as part of arable farming. In other words, grain was still grown but for use as feed. The greatest change was in the decline of the area classified as permanent pasture. The acreage under roots was increased considerably, to compensate for the fact that the Danish climate was not suitable for either pasture and hay or silage crops. Moreover, the expansion of dairy farming was

handicapped by the small size of the typical Danish dairy farm. Two factors enabled a breakthrough to take place. First was the invention of the centrifugal seperator, and, second, the development of co-operative creameries, which enabled the potential of the former to be exploited. With no alternative in the way of a liquid milk market, it was essential to develop the butter trade. By the 1880s the export of dairy produce was established. Necessity may have been the mother, but two capable midwives were present. First, there was a high level of elementary education in rural areas. Second, the willingness to accept new ideas was encouraged, not simply by such bodies as the Royal Agricultural Society of Denmark, but also by the government, who played a crucial role by providing credit facilities at vital points in time, by encouraging improvements, and by ensuring a high quality and efficient marketing system.

The outcome was a massive boom in dairy farming based on co-operation. The first such creamery was set up in 1881, and by 1890 there were over 600. The growth was facilitated by the fact that the largest group of farms, according to size, was those of 50 to 100 acres. With no large farmers to hold aloof from the scheme, the smaller dairies were quickly absorbed. In fact the drive behind the system came as much from the peasantry as from above. The result was seen in high quality, uniform butter. But the co-operative system extended beyond the production of butter. Co-operative butter export societies ensured uniformity, while at the same time taking the trade out of the hands of the middleman. Similar societies helped to improve the quality both of livestock and of seeds. The network of

societies, each contributing to the well being of the dairy export trade, was an impressive structure. The position was not strictly comparable to that in England. Two crucial differences deserve mention. First, the presence of a well educated and influential rural community, and, second, the absence of a trade in liquid milk. The first explains the ability to see, and the willingness to accept change and its implication, the second, the nature of the response.[40]

However, if the incentive to develop the butter trade in England in a whole was weak, it did not follow, as some contemporaries maintained, that it was impossible to make a living by manufacturing milk, rather than selling it raw. In west Cornwall butter making remained important well after the Great War. As well as domestic manufacture, which accounted for 45 percent of total production, there were nine creameries and one depot, scattered through the area. Only 13.7 percent of the milk was sold liquid, in comparison with 89 percent in Derbyshire. In the main butter was blended. For the producer the returns varied from 4½d. to 6½d. a gallon in summer, and from 8d. to 10½d. in winter. Yet despite the fact that prices were determined by imported butter, it was found that 'there was no appearance of poverty on the farms...dairy farming devoted to butter-making at world competitive prices can be made to pay.'[41] Small farms, relying on family labour, in an area in which there was little competition for land from industry, provided a solid basis. On this basis the creamery system had proved successful. However, for the rest of the country the response had been to duck the challenge, and to find an answer in another approach. The loss of the manufacturing trades was the price paid for the expansion of the liquid milk market.

40. E.Jensen, Danish Agriculture:Its Economic Development, (1937), H. Faber, Co-operation in Danish Agriculture, (1931)

41. E.J. Prewett, Manufacturing Milk, (Oxford, 1932), p.32.

IV

(c) Other Milk Products

The manufacture of butter or cheese, or the sale of raw milk, constituted the major elements of the dairy industry. However, there were other minor outlets, which must be mentioned for the sake of completion. Of these the most important, from the producers' point of view, was cream. Although almost exclusively associated with Devon, the manufacture of cream was found, albeit on a small scale, in the surrounding western counties of Cornwall, Somerset, and Dorset, in the north western counties of Cumberland and Westmorland, north Lancashire and the West Riding of Yorkshire, and to a lesser extent in Kent, east Sussex, Surrey and Hampshire, and the midland counties of Worcestershire, Shropshire, Warwickshire and Derbyshire.

TABLE XXXIII

Cream Production in England in 1908 and 1925 (gals.)

	South West	North West	South East	West Midland
1908	413,250	81,000	42,250	34,250
1925	338,093	108,637+	46,357	44,045 ++

+ including West Riding of Yorkshire
++including Derbyshire

Source: Census of Agricultural Production 1906 (C.6277)., Parl. Papers, 1912-3, x, p.198, Ministry of Agriculture, Economic Series 30, (1932), p.105.

According to the official returns total production in England and Wales fell from 728,750 gallons in 1908 to 650,000 gallons in 1925. However, as a percentage of total milk utilisation cream manufacture made little demand, consuming little more than one percent.

There were other by-products, which could be of great importance to the dairy farmer. It was often said that the profitability of dairying depended upon the effective utilisation of these by-products. Thus, the sale of whey butter, skim milk cheese, or simply skim milk, was of considerable importance. Unfortunately, there are no reliable figures, in fact very few figures at all, relating to these items. Although this is no great drawback in defining the essential structure of the dairy industry, it does add a further element of uncertainty in assessing its profitability.

Of less direct interest to the dairy farmer were the manufactured items such as powdered or condensed milk. These were factory products which, in some respects had no more impact upon the farmer than the manufacture of milk chocolate, or of biscuits. However, unlike milk chocolate, powdered or condensed milk could come into competition with liquid milk at certain income levels. However, these points are dealt with elsewhere, in the chapter on demand.

V

Ideally, one would like to conclude with a summary table, showing the changes in the structure of the industry that took place between 1860 and 1930 in the different regions of England. This is not possible. However, one can give some general indication of the overall change. Expressed as a percentage of the total milk available for human consumption the amount devoted to the liquid milk trade rose from roughly 30 percent in 1860, to 75 percent in 1900, and 80 percent about 1930. At the same times butter making consumed 30 percent, and 15 percent at the last two dates, while cheese making utilised 40 percent in 1860, 10 percent at the turn of the century, and 5 percent by 1930. These are only approximate figures and do not take into account the various miscellaneous manufactured milk products. Consequently the position of the liquid milk trade is somewhat exaggerated. Nonetheless, the overall impression is not seriously distorted. Fortunately it is possible to give a detailed picture for 1930.

TABLE XXIV

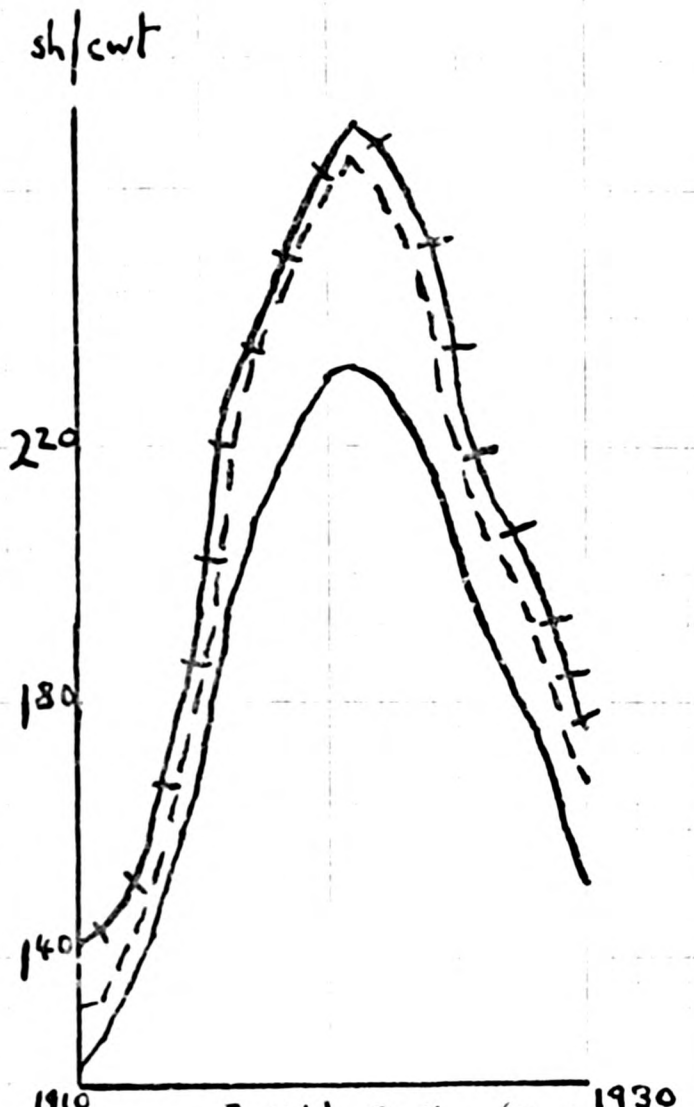
Regional Variations in the English Dairy Industry, 1930-1.

	East	North East	South East	East Mids.	West Mids.	South West	North West	North
	%	%	%	%	%	%	%	%
Total (gals)	82.2	70.8	124.7	115.1	158.5	177.6	277.6	122.4
Milk (gals)	70.8	42.4	111.3	101.1	126.2	116.3	220.6	91.9
	(86.1)	(59.9)	(87.3)	(87.8)	(81.1)	(65.5)	(79.5)	(75.1)
Butter (000cwt)	25	78	28	29	44	124	70	78
Cheese (000cwt)	1	+	1	4	133	104	247	5

+less than 500 cwt.

Source: Agricultural Output of England and Wales 1930-1, (C.4605) Parl. Papers, 1933-4, xxvi, p.26.

Butter and Cheese Wholesale Prices, 1910 – 1930
(9 year moving average)



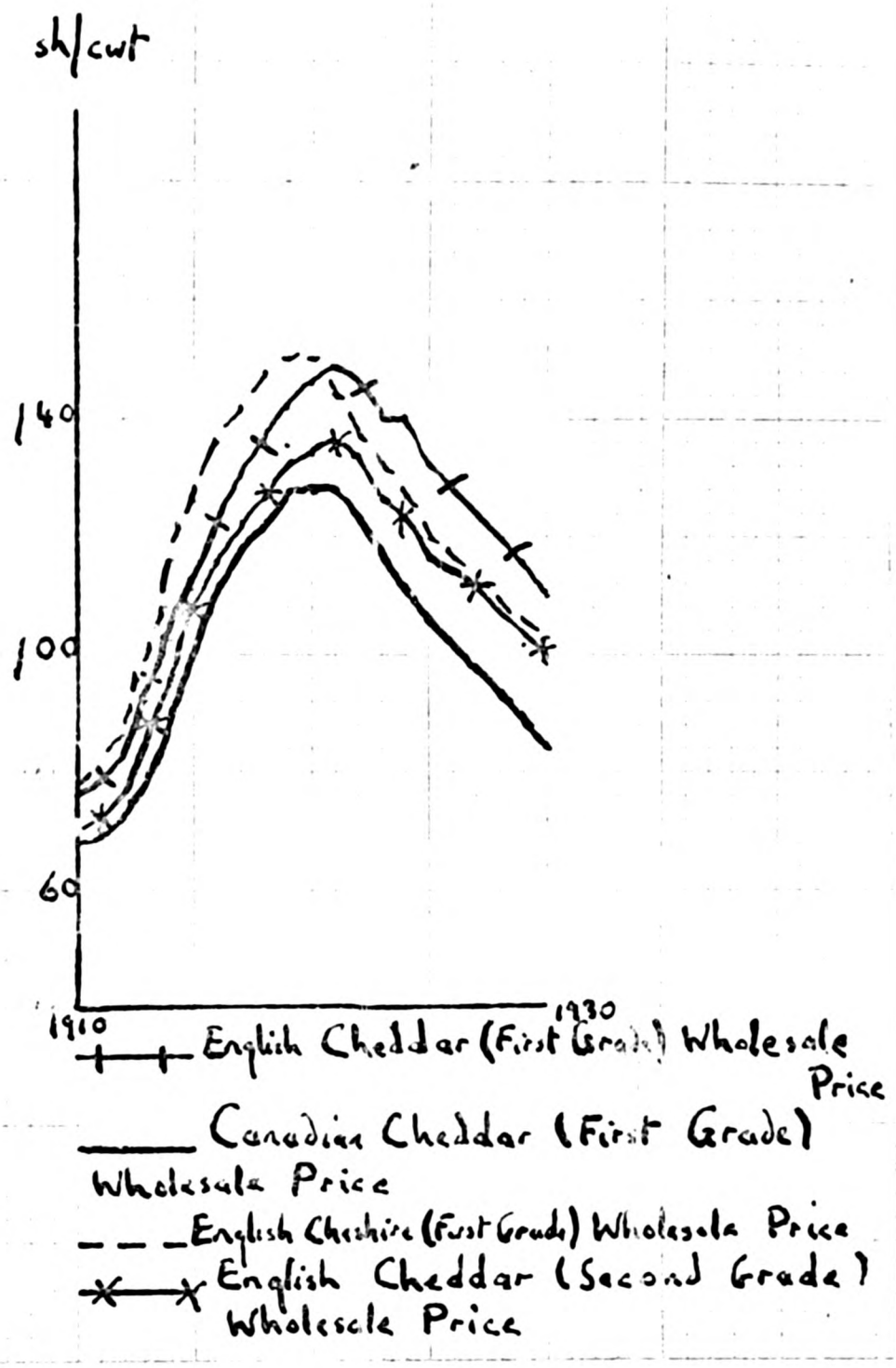


Table XXXV over....

CHAPTER 5

The Dairy Industry: Structure and Location.

(iii) Types of Dairy Farms

I

In the previous two chapters the dairy industry has been considered in terms of the type of produce. In this chapter the industry will be discussed in relation to the type and location of the farms. Broadly speaking one can distinguish five types of dairy farms. First, the urban cowshed, a sector of decreasing importance through the period under review, concentrating solely on the sale of liquid milk; second, the suburban farm, a response to the growing demand for liquid milk, but also selling butter, third, country farms, predominantly pasture, increasingly turning to the liquid milk trade, but also manufacturing butter and cheese in the summer months; fourth, arable dairy farms, again chiefly concerned with the milk trade, but producing some butter on a small scale; lastly, mixed farms, involved in all branches of the dairy industry. In the absence of any farm surveys for the years under review it is not possible to give a detailed description of these types of farm. However, the 1925 Agricultural Output of England and Wales contains sufficient information to provide a basis for a discussion of the organisation of the different types of dairy farms.

Table XXXV over....

TABLE XXXV

Aspects of English Farms, 1925.

Size acres	Distribution per 100 acres Cows & Heifers	Pasture	Arable	Grass (Roots Rotation) 1.7	2.8	No. of Farms	Cows & Heifers Per Farm
1-5	14.9	82.9	17.1	1.7	2.8		
5-20	17.3	79.7	20.3	2.2	4.7	14,000	15.4
20-50							
Arable	8.08	13.37	86.63	7.80	21.79	12,075	2.8
Pasture	18.88	92.69	7.31	1.22	1.46	46,821	6.3
Mixed	4.01	51.88	48.12	5.54	13.31	18,135	4.9
50-100							
Arable	6.81	15.85	84.15	7.53	21.80	10,183	4.9
Pasture	16.14	88.81	11.19	1.74	2.57	28,935	11.6
Mixed	11.90	52.20	47.00	5.52	13.20	20,857	8.6
100-150							
Arable	5.41	17.27	82.73	7.86	20.45	5,806	6.6
Pasture	14.17	86.66	13.34	1.91	3.19	12,972	17.4
Mixed	10.33	51.99	48.01	5.54	12.94	12,904	12.8
150-300							
Arable	4.07	17.74	82.26	8.60	18.21	7,432	10.9
Pasture	12.35	85.34	14.66	2.04	3.57	12,419	25.5
Mixed	8.72	51.24	48.74	5.76	12.05	15,394	18.3
300-500							
Arable	3.41	18.05	81.95	9.51	17.31	2,705	12.9
Pasture	8.79	85.25	14.75	2.00	3.38	2,514	37.1
Mixed	7.20	49.36	50.64	6.19	11.56	4,237	36.9
Over 500							
Arable	2.90	17.02	82.98	11.23	18.06	1,302	21.3
Pasture	6.26	86.51	13.49	1.77	3.11	682	44.1
Mixed	6.18	47.72	52.28	6.79	11.64	1,330	43.6

Source: The Agricultural Output of England and Wales, 1925, C.2815, Parl. Papers, 1927, /xxv, pp.88, 89, 91, 93.
(C.2815)

The importance of the small pasture farm in the English dairy industry emerges clearly from these figures. However, one must not overlook the contribution from the medium sized mixed farms. The traditional dairy farm in England had always been a small, grassland concern, being a total acreage of less than 100 acres, but since the 1860s there had been a steady increase in milk production concentrated on mixed farms. Basically, a

wholesale change from grain to milk was only feasible in a few exceptional cases, whereas on a mixed farm it was considerably easier to change the emphasis between different enterprises.

In contrast to Denmark arable dairying was of limited importance in England. The number of cows and heifers per 100 acres of arable and pasture land slumped markedly as the size of the arable farm increased, but even where the stocking density was at its highest arable farms came a poor third behind the other types of farm.

Although the pastoral dairy farm predominated in England it is not possible to say precisely how many of these farms there were at any one time. They were, however, in a large majority in such counties as Derbyshire and Lancashire and, to a lesser extent, Cheshire. In the south west their hold was weaker owing to the more diversified character of the agriculture of Wiltshire, Gloucestershire, and Somerset. The general features of these farms were straightforward. Characteristically, they had a large proportion of land under grass - 80 percent and over in some cases - and very little under roots. In size they rarely exceeded 100 acres. For example, in the year 1885 over 90 percent of all the farms in Lancashire were under 100 acres. In all the major dairying counties the percentage of farms under 100 acres was above 80 percent whereas in Northumberland and the East Riding of Yorkshire the figure was 64 and 75 percent respectively. Table XXXVI shows the position in greater detail, and it can be seen from the figures that the characteristic size of the predominantly grassland dairy farm was between 20 and 100 acres.

TABLE XXXVI

Farm Sizes in Selected English Counties, 1885.
(as percentage of total farms)

	Lancashire	Derbyshire	Northumberland	Yorkshire,E.Riding
up to 5 acres	18.5	26.5	6.1	32.6
" 20 "	50.8	59.7	36.0	54.5
" 50 "	77.5	77.9	50.6	65.2
" 100 "	92.1	89.0	63.5	74.7

Source: Ag.Stats. Parl.Papers, 1886, lxx, 114-6. (Calculated from data for the counties in question.

According to figures collected for the year 1895 the average farm size in Lancashire, Cheshire, Derbyshire and Staffordshire was below 50 acres,[1] a figure that did not change significantly for the rest of the period. The south western counties were basically the same with regards to the size of dairy farms. In Somerset the average size of all farms was 59 acres but in Wiltshire the figure was 108 acres. However, this was no more than a reflection of the fact that the south of the county was dominated by very large arable farms.

The size of the farm, coupled with the fact that these dairy farms were preominantly family farms, using no hired labour, limited the size of the herd. However, if there were few herds of 60 in number the stocking density was very high. In terms of produce these farms had a higher percentage of cheese and butter makers - though the number fell markedly over the period - simply because they were the traditional dairying areas of England.

Confirmation of these general observations comes from the various

1. The following figures are given for the average size of holdings in 1895. Cheshire 42 acres, Derby 41, Gloucester 66, Lancashire 40, Somerset 59, Stafford 47, Wiltshire 108. Returns as to the Number and Size of Agricultural Holdings in Great Britain in the year 1895, C.8243, (Parl.Papers, 1896, lxvii), p.8.

descriptions of the dairying counties in the agricultural literature of the times. It was held that, in the middle of the nineteenth century, the dairy farms of Somerset ranged in size from 50 to 120 acres. A similar size was to be found in north Wiltshire, while in Gloucestershire the dairy farms were distinguished by their small acreage.[2] In every case there was a predominance of pasture over arable land. Despite changes in the size and nature of output there was little change in the basic nature of these farms. Some 4,000 dairy farms in Derbyshire were surveyed in 1930, and it was found that the average farm size was 83 acres, of which only 9 acres were arable. On 3,145 of the farms, the average herd size was 14.8 cows in milk, while the overall stocking density was 16 cows in milk per 100 acres of cultivated land.[3] The description could have come from 1860 as easily as from 1930.

Judged in terms of number and output the second most important type of dairy farm was based on a mixed farming system. In this way the farmer had greater freedom to adjust enterprises according to price trends. It was this type of farm that played a crucial role in the adaptation to change in the second half of the nineteenth century. With a greater acreage under crops it was possible to grow roots and even grain for feed, thereby utilising the fall in prices that ruined so many arable farmers in the last quarter of the century. Once again the smaller farms were more numerous

2. J. Bravender, 'The Farming of Gloucestershire', op.cit., T.D. Acland, 'The Farming of Somerset', J.R.A.S.E., 1st.ser., xi, (1850-1), 705, J. Caird, English Agriculture in 1851, (1952), 75. There are also several references to farm types, e.g., the J.R.A.S.E. annual farm prize competition, and the annual farm visits reported in the J.B.E.F.A., but particularly in the latter cases there is a tendency to concentrate on the larger and better farms of any given district, and cannot, therefore, be taken as wholly typical.
3. F.J. Prewett, A Survey of Milk Marketing in Derbyshire in June 1928, (Oxford, 1930), p.10.

and, also, had a higher stocking density. In contrast to the strictly pastoral dairy farms the mixed were more scattered. A large number were situated in the west of England, and, indeed, were characteristic of parts of Cheshire and Somerset, but they were more commonly associated with the east Midlands and central England. With the greater emphasis on crops more use was made of roots as feed for cattle. However, in the absence of any comprehensive survey of these, or any other, farms one must guard against misleading generalisation. One point can be made firmly. The mixed farm was crucial in the expansion of milk production, especially in the last decades of the nineteenth century. The most important single factor determining the presence of milk selling as a farm enterprise was location. The majority of mixed farms, as well as allowing a change of balance within an existing farming system rather than having to develop a completely new enterprise, were also conveniently sited in relation to the ever expanding urban market. Some indication of the importance of this type of farm can be gained from the fact that in 1906 over 60 percent of the whole milk sold in England and Wales came from mixed farms of over 50 acres.[4] Not all of these were new entrants, but a significant proportion fell under this nomenclature.

Arable farming was the basis of the Danish dairy industry. The idea of turning many acres over to grass to be grazed by cattle was completely alien. In part this stemmed from the difficulties of growing grass but it also reflected a different, and in many ways more efficient, means of

4. 1908 Census of Agricultural Production, op.cit., 582.

dairying. In England, however, arable dairying was of limited significance. This is not to say that there was no dairying in the arable counties of England. There was, and it increased, but the increase was accompanied by an increase in the acreage of grassland whereas in Denmark the opposite was the case. On the arable farms of England, that it those with a maximum of 20 percent grass, the cow was of minor importance. The large arable farms of Wiltshire, for example, had comparatively large herds, but the dairy was leased out annually to a dairyman, the farmer taking no real part in the enterprise.[5] But this was not arable dairying in the true sense, for the herds were usually kept on the clay lowlands of the farm. In the eastern counties some attempt was made to follow the Danish practise. How many tired this new departure one cannot say, but it is unlikely that the number was large. Even in the 1920s the presence of a milk producer in the Kesteven district of Lincolnshire was still something of a novelty.[6] Closer examination of one such farm reveals certain characteristics of, and problems facing, such farms in England. Until 1921 the farm had been 447 acres in size, of which 56 acres were permanent pasture. In that year a further 111 acres of permanent pasture were added, upon which the cattle were grazed. The belief that dairying depended upon having grazing land explains much of the failure of dairying to spread in the eastern counties. The climatic conditions of the area were not conducive to the growth of grass. Moreover, the knowledge of grassland

5. The letting of dairies was a common feature of the western counties. Found usually on the larger farmers, dairies of 20 to 50 cows were led, usually from Candlemas (February 2nd.) The farmer provided a stipulated area of grass and feed, the dairyman taking the produce of the cow including the calf. The amount paid per cow varied according to the type of animal, but at the turn of the century fell between £10 and £15-10 per cow per annum. See for example J.H. Burton, 'The Letting of Dairies - a West Country Custom', J.B.D.F.A., xxvi, (1912), 28-37.
6. F.J. Prewett, Milk Production on Arable Land, (Oxford, 1929).

husbandry at the time was limited, and the lack of a suitable strain of grass curtailed possible expansion. To return to the details of the farm, some 80 cows in milk were kept, equivalent to 15 per 100 acres, compared with the local average of 3.5 to 5.99 acres were devoted to lucerne, and 30 to swedes and mangolds. Of the remainder a little over 200 acres was given over to barley and oats. The cattle, in summer, were fed lucerne, cut green and carried to them. In winter roots, straw, and some lucerne provided the bulk of their diet. Cake was also fed to the cost of £8 a cow a year. This represented approximately one third of the total expenses per cow. However, of greater significance was the fact that the system involved a high expenditure on labour, a sum of £5.16.0 a cow a year. One of the major draw backs of any arable system was the large amount of labour required. If a large labour force was kept throughout the year it was extremely difficult, as well as expensive, to keep them busy all the time, while the keeping of a smaller number of men involved risk at such crucial times as harvest, when the demand for labour was very heavy. On top of this the level of money wages was rising. The dairy farmer of, say, Cheshire, relying upon family labour alone, was in a far stronger position than his eastern rival who had to employ labour. With no aid from the government and only limited advice from the various agricultural bodies in the country, it is not surprising to find that arable dairying in England remained very much the isolated exception to the general rule.

The last two categories to be described were associated with centres of population, but as the number of one increased those of the latter

decreased, the latter were, of course, the urban cowsheds. The best known were those in London, but they were to be found in most large towns.

TABLE XXXVII

Cows and Heifers kept in Middlesex and the City of London

1798	8,500	1886-90	14,650	1911-15	10,578
1866-70	13,098	1891-95	14,474	1916-20	9,502
1871-75	14,222	1896-1900	14,614	1921-25	8,808
1876-80	16,803	1901-05	12,938	1926-30	7,561
1881-85	15,579	1906-10	12,006		

Source: J. Middleton, A General View of the Agriculture of the County of Middlesex, (1796), p.351. Agricultural Statistics.

According to Morton's survey of 1866 over a thousand cows were kept in the districts of Marylebone, St. Pancras, Islington, and Hackney, and between five hundred and one thousand in Fulham, Kensington, Clerkenwell, Shoreditch, Whitechapel, Mile End, Old Town, Lambeth, Camberwell, and Greenwich.[7] In these districts the average number of cows per cowhouse varied from between eight to twenty four. In such areas as Hanover Square the average was higher but more often the figure was below ten. In Poplar, Streatham, Tooting and Balham the figure was approximately six, in Wandsworth and Plumstead four. The range of cattle houses supplying London with milk was considerable but it must be repeated that the typical cowhouse was a small scale enterprise, often in the less salubrious quarters of the metropolis. However, as long as there is no alternative source of supply the number of cows and their keepers in the capital increased. The impact of the suburban farmers was limited. As late as 1868 the high cost of grains, and the problems of transport were held to

7. Morton, 'On London Milk', op.cit., p.74.

be sufficient to swingthe balance in favour of the urban milk producer, notwithstanding the higher costs of feed, labour, and rent he had to face. The initial effect of the railways was to reduce the costs facing the urban cowkeeper. It was cheaper to bring in grass, hay and mangels, and to remove dung by rail. Nonetheless, the cost was still high. Consequently, high yields were essential. Cows, therefore, were changed frequently, as often as every eight months, to ensure yields of some two gallons a day. This in turn increased costs as the buying of replacements was not fully offset by the returns from the carcase of the old cows. With the advent of railway milk from the 1850s onwards the position of the urban producer came under increasing competition. From that date the relative position of the country supplier increased, while after the 1870s the absolute contribution from the London cowsheds decreased.

The reasons are not difficult to find. In the first place the increase in population was so great that it was impossible for the urban cowsheds to expand sufficiently to meet the new demand. The expansion of London posed other problems. The pressure on land increased, forcing up rents. As boundaries were pushed outwards the costs of carting food and so forth increased. At the same time competition from country suppliers was increasing. Daily the railways were bringing in more milk. In the 1860s some 10 million gallons a year were brought into the capital, by the end of the century the figure had reached 40 million. Moreover, as the milk trade increased new men stepped in. Booth noted that

> 'the cowkeepers have been a rapidly decreasing body: since 1870 the trade has yearly fallen more and more into the hands of large companies, who look entirely to country farmers for their supply, and now (c.1890) town fed cows provide but a great drop in the great ocean of milk which is daily consumed by Londoners'. 8

8. C. Booth, Life and Labour of the People in London(1902), 2nd.ser., Industry, vol.iii, pp.173-4.

By the end of the century there were less than 500 licensed cow houses in the capital.[9] But it was not simply a question of changes in the supply of milk. The economic viability of the urban cowkeeper was threatened from another direction. The growing volume of cheap imported meat that came into the last years of the nineteenth century greatly reduced the price of cow beef. This had been a valuable source of income, and its decline destroyed yet another prop upon which the cowkeeper relied. More nebulous, but nonetheless potent, was the effect of changes in the climate of opinion about the milk supply. Morton stoutly defended the cowhouse during the upheaval of 1865-6. 'I believe,' he told members of the Society of Arts, 'that the milk made in them [urban cowhouses] is better than what is delivered at the railway stations from the country....'[10] There was much truth in the argument. Souring of milk was to remain a problem well into the twentieth century. However, opinion was gradually shifting. No longer was milk "warm from the cow" accepted as a guarantee of purity. Criticism was increasing. Ruegg, writing in the middle of the nineteenth century, spoke of

> 'half underground dens and cellars in which the cows were kept for the greater part of the year, standing knee deep in filth, with little or no ventilation and with hay, brewers' grain and turnips as their only food.' [11]

Some of the charges were exaggerated, but the criticisms and fears were confirmed and augmented by the events of 1865. The spread of cattle

9. ibid., 175. It is a striking fact that over half of the London cowkeepers were Welsh. Used to a hard life and a low standard of living they were able to eke out a living at a level that was not tolerated by others. In many cases their position was worsened by the fact that they were used to no other life, and, being Welsh speaking they tended to form an isolated sub-culture in London.
10. Morton, 'On London Milk', op.cit., 67.
11. H.H. Ruegg, Observations on London Milk, showing its Unhealthy Character, (n.d.), quoted in J. Drummond and A. Wilbraham, The Englishman's Food, (1958), 299.

plague through the cowsheds of London was matched in speed by the circulation of criticisms, usually exaggerated and sometimes false, through the streets of the capital. The psychological impact of the murrain was considerable, but with the passing of the danger old attitudes reappeared. As late as 1860 London milk sellers were attempting to sell country milk as town produced. However, as the quality of the country supply was improved opinion hardened in its favour.

The situation was complicated by the effects of legislation to improve the quality of the milk supply. The presence of a series of laws was no guarantee of action. In fact the low number of prosecutions in several areas suggests that the direct impact of the adulteration laws was limited. The indirect influence upon opinion was probably more important in the long run. By the 1890s there were widespread criticisms of all sources of milk supply, but it was the town suppliers who bore the brunt of the attack. The effect can be gauged from the fact that between 1891 and 1894 the London county council reduced the number of licensed cowhouses from 673 to 491, though there were still 50 licensed cowhouses in 1930. London was the most spectacular example of the decline of the urban cowkeeper but a similar process was taking place in the other towns and cities of England, but at a slower pace. At the turn of the century in York there were a large number of very small urban producers. However, it was in Liverpool that the cowkeeper survived the longest. In almost all towns of England the cowkeeper had disappeared by the 1920s but in Liverpool, as late as 1934, there were still 272 registered cowkeepers, keeping some 4,000 cows. [13]

13. Hill, 'Liverpool', op.cit.

Proportionally, there were three times as many cows in Liverpool as in London. However, one must not see these figures out of perspective. In Liverpool in 1934 there was only one cow per 200 of the population - hardly a significant source of supply.

As the urban cowhouse declined both relatively and absolutely as a source of supply, the farm on the fringe of the town increased in importance. In part some of these have already been covered. The 50 acre dairy farm on the edge of Trowbridge, for example, falls into the pastoral category. However, despite this overlapping it is important to draw attention to the large number of farms, often no more than small holdings, that sprung up around every town and city in response to the demand for liquid milk. It is impossible to characterise these farms in terms of land use, but the important point is that the owners or tenants of such farms were almost entirely producer-retailers. Unlike the long distance supplier suburban farmers did not have to rely upon the wholesaler. Consequently their position was that much stronger, and their returns that much larger. In the majority of cases the farms were small and could be run without recourse to hired labour, thereby reducing production costs. There were certain disadvantages, chiefly in the form of higher rent, but taken overall the farm situation on the fringe of any and every town was the most profitable of all those engaged in the dairy industry.

II

Having described the major types of dairy farms one is left with certain problems relating to the organisation of the farm. Three points in particular deserve attention: tenancy agreements, credit facilities, and labour problems.

The first, and obvious point to make is that the majority of dairy farmers were tenants. Consequently their tenancy agreements could have had an important effect in helping or hindering adaptation to changing conditions. In the established dairying the problems of restrictive agreements was not severe, but in other parts of England the whole tenancy system militated against the development of dairying. As Kindleberger[14] argues the system was suited to the needs of wheat farming rather than to livestock husbandry with its need of smaller units. The large arable farms of eastern England may have been the wonder of Europe, but what was required in the latter stages of the nineteenth century was small, labour intensive units. In other words, the break up of farms was needed. But this was a difficult and expensive task, made worse by the limited capital and lack of security facing many landlords. Without aid there was little incentive for the tenant to change, particularly as he received no compensation for improvements. The reluctance to build the necessary new barn, or even to adapt the old one, was reinforced by a collective mental block that afflicted most landlords. (The Duke of Northumberland appears to have been an exception). There was a marked reluctance to modify farming covenants. The four course system held powerful sway in the minds of many landowners and farmers. For those wishing to reduce the acreage

14. C.P. Kindleberger, Economic Growth in France and Britain, 1851-1950, (Cambridge, Mass., 1964), 246-7.

under roots or crops the restrictions could be irksome. The "depression" provided a belated breakthrough. In Essex, for example, landowners were glad to have tenants under any conditions rather than have no tenants at all. However, the question of timing was crucial. Many landlords were loath to reduce rents, believing the troubles to be temporary. As a result many farmers either abandoned farming, as in the Vale of Pewsey, or were so impoverished as to be unable to carry out any fundamental changes in their farming system even after the granting of rent reductions. In many cases the reductions in rent, by reducing the total pay-roll, added to the problem - landlords being further unable and unwilling to maintain or improve farms. Thus, the rigidities of the tenancy system in England were reinforced by the strains of the time, producing a situation which hampered the change to, and improvement of, dairying.

However, from the late nineteenth century onwards there was a trend towards farm owner occupation. The difficulties of finding tenants in some parts of the country during the 1880s and 1890s led some landlords to sell some of their land. In 1888 some 14.5 percent of holdings in England and Wales were owner occupied, a figure that represented 15.4 percent of the area under crops and grass. The agricultural revival of the early twentieth century checked the trend, particularly among larger than average farms. However, in the years 1909-11 there was extensive selling of land. The landowners came under increasing attack. The Agricultural Holding Act of 1908 appeared to embody the hostility of the nation, and acted as a spur to the break up of estates. The position, in fact, was more complicated. By the turn of the century the great landowners, having fought a long

rearguard action, were forced to accept that the balance of power within the country had changed for good. The introduction of death duties, and the collapse of farm prices after 1921 were the final blows. Between 1909 and 1927 the percentage of owner occupied holdings increased from 13.0 to 36.6. More significantly, by 1927 no type of farming was out of step with the general trend, whereas in 1909 there was less owner occupation in the pasture areas of England and Wales, largely because more capital was required there.[15] Despite the importance of this trend it must not be forgotten that the number of tenant farmers in the dairy counties was in the region of 90 percent during the nineteenth century, and was still over 60 percent in the 1920s. However, in other parts of the country, precisely in those areas that needed greater freedom, the trend towards owner occupation can be clearly seen from the late nineteenth century.

An over rigid tenancy system was one barrier to change. A further potential obstacle, hinted at earlier, was lack of capital. The financing of agriculture, and in particular of agricultural change, was of crucial importance, but little is known in detail of the source of capital available to the farmer. However, before exploring the possibilities it is necessary to sketch in the financial needs of the farmer. On the one hand there were short term expenses, such as wages and general running costs. On the other were the long term costs, such as improvements in the form of laying down to grass, expanding the hard size, or building new barns. (In the case of tenant farmers the latter was the responsibility of the landlord).

15. S.G. Sturmey, 'Owner-Farming in England and Wales', Manchester School, xxiii, (1955), 245-68.

As a result of the small size of the units involved farmers have never made use of the stock exchange as a means of financing agriculture to any great extent. On the contrary, agriculture has always had a very high self financing ratio. In the mid-twentieth century as much as 80 percent of all capital employed by farmers was provided by farm savings,[16] and there is every reason to believe that a similar figure applies to the nineteenth century. Thus it was common for farming families to build up savings over the course of generations, and plough the money back into the farm, or in many cases the farm was purchased before improvements were carried out.

The banks played a comparatively unimportant role, particularly in reference to long term investments. In the 1960s they provided only 10 percent of the capital used in agriculture,[17] and, once again, it is unlikely that the position had altered significantly over the previous fifty or one hundred years. However, one must not ignore the role of the banks completely. In the early and mid nineteenth century the country banks were closely linked to the fortunes of the agricultural community. Vincent Stuckey, a Somerset banker, noted that 'many of the respectable farmers in our county keep accounts at our banks, and at one period of the year they frequently leave cash with us....at another period we are in the habit of accommodating them'.[18] What was true of the early nineteenth century applied throughout the period - the banks played an important role as suppliers of short term credit.

16. Finance for Farmers, (The Ernest Sykes Memorial Lectures), (1967). S.G. Hooper, Sources of Agricultural Finance, p.21.
17. ibid.
18. cited in S.G. Hooper, The Finance of Farming in Great Britain, (1955), p.16.

The distinction between long and short term loans is a crucial one. Long term investment came largely from within farming, either from the tenant or owner occupier, or from the landlord. Short term credit, however, came from outside. The landlord could act as a source of short term credit by not insisting upon prompt rent payments, but the chief source was the local bank, and to a lesser extent the local dealer or auctioneer. For the dairy farmer, or more precisely the milk seller, recourse to short term credit was less common than for any other type of farmer. Milk selling involved comparatively small seasonal credits. The rapid turnover, "the nimble ninepence", as it was sometimes called, was one of the great attractions of the milk trade. A cheque once a fortunight, or even once a week in some cases, was a safeguard against indebtedness. In contrast the cheese maker had to wait until the end of the season before he received the bulk of his income. During good years he might have sufficient reserve to tide himself over, but it was common for the cheese maker to be indebted to the factor, who provided a valuable service, particularly in times of low prices.

Very little is known of the precise amount of capital invested in agriculture in the nineteenth and early twentieth centuries. Only a little more is known of the amount of money loaned by the banks to the farming community. In 1926/7 £51 million was loaned to the farmers of England and Wales. Of this £26 million was in the form of long term loans, and £25 million in the form of short term loans.[19] It is difficult to draw many conclusions from one set of figures. However, it is striking that the amount of long term loans was only just in excess of that of short term loans. One would have expected the latter to be smaller but in the crisis conditions of the 1920s it is not surprising to find that there was as much need for short

term credit as for long term, investment loans.

Overall, therefore, change was largely financed from within the farming industry. During periods of prosperity this worked well. In depression the matter was more complicated. On the one hand the availability of capital was less, which must have curbed the rate of change, but on the other hand the very existence of a depression increased the pressures for change.[20]

Lastly, one must look at the question of labour supply. It is not difficult to find complaints about the inadequancies of milkmaids, milkers, cowmen, and family throughout the period. However, not all the criticisms were the carpings of the old at the young of every generation. During the early years of the twentieth century the number of competent milkers and dairymaids was beginning to arouse genuine fears. But the problem was not spread uniformly over the country. On the small family farms the problem did not exist to any significant extent. Similarly, in certain Wiltshire villages, for example, Alton Priors, Kingston Deverill, and Stanton St. Bernard, where there was a strong tradition of working for the local "big farmer", there was no shortage of labour. In contrast, there was a decline in dairying in Oxfordshire in the 1860s and 1870s because of the lack of good milkers.[21] However, it is significant that this shortage of labour was only temporary, and that by the end of the century milk selling had spread to many parts of the county. The presence of an outside attraction in the form of a large

20. for a detailed study of the question of farmers' responses to depression and the example of one county see E.L. Jones, The Evolution of High Farming, 1815-65, with reference to Herefordshire, Oxford D.Phil thesis 1962.
21. J. Darby 'Oxfordshire Agriculture and Stock Farming', J.R.A.S.E., 3rd.ser. x, (1878), pp.123-54, especially 140.

town could lead to problems. For example, the growth of Swindon, and the railway works, made itself felt on the surrounding farmland areas.[22] Numerous examples could be cited to support the well known fact that the agricultural population declined in the second half of the nineteenth century. Of greater significance was the impact of this decline on the dairy industry. If the labour supply were decreasing, relatively or absolutely, one would have expected either (i) a restriction on the rate of growth of the dairy industry, or (ii) the introduction of labour saving devices, or (iii) an increase in the amount of work performed by farmers. With the exception of Oxfordshire, and possibly Gloucestershire, there is little evidence to suggest that the expansion of dairying was curbed to any significant extent by labour shortage pressures. The question of labour saving machinery is complicated by the fact that the switch from cheese and butter making to milk selling helped circumvent the problem of an inadequate supply of dairymaids. However, the evidence suggests that in the majority of cases the reasons for changing were other than a lack of competent dairymaids. The obvious aid to all branches of the dairy industry was the milking machine. Experiments in Great Britain were carried out in the 1890s but it was not until after the Great War that a satisfactory machine was used - and even then it was on a limited scale. Equally, significant is the fact that there was little demand for a milking machine until the very end of the nineteenth century, and even in the years immediately preceeding the outbreak of war the volume of demand was far from

22. Richard Jefferies, The Toilers of the Field, (1894), see the essay 'Wiltshire Labourers', Overall the evidence is scanty and difficult to interpret. General complaints were common, but on closer examination the problems were often less than suggested by the more sensational writers.

overwhelming. It is likely, however, that many farmers increased their work load, but one is still left with the conclusion that, with regard to the dairy industry, shortage of labour was not a serious problem in the majority of cases.

There is a further aspect to the question of labour, namely that of productivity. The time devoted to dairy operations can be divided into two general categories: milking and other activities. Throughout the period 1860 to 1914 all milking, to all intents and purposes, was done by hand. Although a first class milker could handle as many as twelve animals in an hour, few attained this level. Ten was considered good, and eight average. There is no evidence to suggest that there was any significant improvement by 1914. (If anything there was a fall, but to what extent it is impossible to say with any precision). On average, therefore, the milking time per cow can be taken as 7.5 minutes throughout the period in question.[23] As milking was carried out almost invariably, twice a day this meant that 15 minutes per cow per day were devoted to milking. Of the time devoted to non-milking tasks - fetching cows, preparing them for milking, mucking out and washing down the shed, cleaning utensils, feeding, fetching and preparing the food - it is less easy to say with precision. Undoubtedly more time was taken at the end of the period than at the beginning. The requirments of the hygiene laws, the greater awareness of the benefits of good feeding, and the greater use of prepared foods, though resulting in a greater quantity and better quality of milk, necessitated a larger amount of labour then in the mid nineteenth century, when the cows were largely left to themselves, even in winter.

23. ex.inf. F. Williamson, Tarporley, R.F. Stratton, Kingston Deverill, W.H.G. Stone, Trowbridge, A.G. Stratton, Aton Priors, and W. Denly, Corston.

when less attention was paid to cleanliness, when concentrated feeds were almost unheard of by the majority of farmers, and when all year dairying was a rare occurance. A figure of 10 minutes per cow per day for the early twentieth century would appear to be reasonable for non-milking activities.[24] One can do little more than guess at the corresponding figure for c.1860. While remembering the comparatively undeveloped state of dairying at this time, one must not exaggerate the primitive nature of farming in the mid nineteenth century. Taking into account the various tasks that did not appear on the work roster of 1860, one may suggest that non-milking time took no more than 5 minutes per cow per day of the milking season.[25] Table XXXVIII summarises the position in 1860 and 1910.

TABLE XXXVIII

Labour Productivity in English Dairying, 1860 and 1910.

	1860	1910
Length of milking season (days)	245	280
Milking time per cow per day (minutes)	15	15
Non-milking time per cow per day (minutes)	5	10
Annual milking time (hours)	61.25	70
Annual non-milking time (hours)	20.42	46.67
Annual average yield (gallons)	350	450

	Annual Average Yield Per Cow	Annual Average Milking Time	Annual Average Milking Labour per 10 gallons	Milk Output Per Milking Labour Hour
1860	350	61.25	1.75	5.70
1910	450	70	1.56	6.43

	Annual Average Total Labour	Annual Average Total Labour per 10 gallons	Milk Output per Total per Total Labour Hour
1860	81.67	2.33	4.29
1910	116.67	2.59	3.83

24. See G.H.H. Pettit, 'Labour in the Cowshed', J.R.A.S.E., c, pt.ii, (1939), 46-55.

25. The figures in Table XXXVIII make no allowance for non-milking days. If these are included in the results are as follows:

	Annual Average Yield per Cow	Annual Average Total Labour	Annual Average Total Labour per 10 gallons	Milk Output per Total Labour Hour
1860	350	91.67	2.62	3.82
1910	450	161.25	3.58	2.79

These figures underline the fact that there was a decline in labour productivity over the 30 years in question.

The most significant feature of the table is the fact that labour productivity, expressed either as total hours required per ten gallons or as milk output per total labour hour, was lower in 1910 than in 1860. The explanation is straightforward: more time was consumed in non-milking activities as a result of the greater attention paid to cleanliness, feeding, and general care. However, it must be stressed that the greater amount of work involved was accompanied by the production of a higher quality good. Nonetheless, a decline of over ten percent in labour productivity does raise the question of whether farmers were aware of the declining position, and why they continued in this action. Superficially, it would appear reasonable to argue that the need for more labour, at a time when the market was not improving, if not actually deteriorating, and when milk prices were falling, would erode profits. In some cases this was doubtlessly true, but in many others the problem was more apparent than real. The majority of dairy farms were small scale concerns relying on family labour. The opportunity cost of the labour required to extend the milking season, and to meet the requirements of the law, was small. Thus the increase in national milk production was, in part the result of higher milking labour productivity (i.e. via higher yields per cow), and partly the result of a reduction in farm un(der)employment or the substitution of work for leisure time.

CHAPTER 6

The Cost Structure and Profitability of the Dairy Industry.

I

The cost of producing a gallon of milk can be divided into two major categories: first, at-the-pail production costs, second distribution costs. The former consists of a further two component parts: (i) overhead costs, such as part of the rent of the farm, or capital charges for buildings and machinery, as well as depreciation of the herd, the machinery, and the dairy buildings. (ii) running costs, namely wages and feed. Of these items the most important by far is the cost of feed which accounts for approximately half of the total production costs. To gain any impression of the changing cost structure it is necessary to examine each item in detail. In this way it is possible to extract from the welter of local details general trends that determined the broad outline of the period. However, it should be stressed at the outset that within the general outline was to be found great variation. The type of farming system could vary from all grass to all arable dairying depending upon geographical location, local tradition, and the idiosyncracies of the individual farmer. Within any area the emphasis placed upon the use of concentrates or upon the wisdom of breeding replacements, for example, distinguished between dairy farmers while skill, hard work, and sheer luck cut across all categories of men.

Detailed studies of milk production costs leave little doubt that feed was the most important single item. Unfortunately the precise size of this importance is difficult to extract from the surviving pre-1914 material.

Yet, although it is rare to find detailed figures for feed costs for the nineteenth century certain points are still clear. Of these the most important is that the use of concentrates increased markedly. In 1860 their use was limited but by the end of the century their popularity was such that over-feeding was the problem.

TABLE XXXIX

Volume of Concentrated Feed imported into U.K., 1860-1930. (tons)

	Oil Cake	Cottonseed Cake		Oil Cake	Cottonseed Cake
1860	108,826	20,034*	1910	317,066	690,171
1870	158,453	120,304	1920	227,000	443,000
1880	241,157	229,520	1930	455,000	517,000
1890	282,616	314,050			
1900	394,889	406,435			

*1861 figure

Source: Agricultural Statistics.

The increased use of concentrates, though helping to increase yields, was not itself sufficient to reduce production costs. However, over the period 1867/71 to 1894/8 the price of oil cake in the United Kingdom fell by 37 percent, and that of maize by 45 percent.[1] The second Royal Commission on the Agricultural Interest produced evidence showing that the fall in agricultural prices, which had averaged 23 percent for liquid milk and 18 percent for English cheese between the years 1861 to 1894, had been accompanied by a fall in money costs. For example, Henry Rew reporting on the Salisbury Plain area quoted figures that revealed reductions of as much as 45 percent in the case of maize. The price of linseed cake had fallen by 25 percent, undecorticated cotton cake by 23 percent, and decorticated cotton cake by 20 percent.[2] Similarly, in north Devon the

1. Fletcher, "Lancashire....", op.cit.
2. R.C. Ag., Parl. Papers, 1895, xvi, 484.

price of foreign barley and English oats had fallen by 30 percent, and that of maize by 50 percent during the same period.[3] Certainly it did not pass unnoticed that the fall in corn prices, a burden to the arable farmer, was a boon to the livestock husbandman.

After the turn of the century the position becomes clearer with the advent of the Board (later Ministry) of Agriculture's price indices. A small but steady increase in the cost of concentrates in the years before 1914 was magnified and distorted by the abnormal conditions of war. By 1920 the price of maize stood 128 percent higher than that for the base years 1911-13. Linseed and cottonseed-cake was 177 percent higher, while brewers' grains were 196 percent above the pre-war level. However, during the 1920s prices slumped dramatically, falling below the pre-war level by the end of the decade, having risen briefly in 1927 and 1928.

TABLE XL

prices of

Index Numbers of Feeding Stuffs, 1921-30. (1911-13 = 100)

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Imported Barley	184	132	115	149	144	122	148	147	120	80
Imported Oats	166	147	135	135	146	130	142	152	125	89
Linseed Cake	192	166	142	153	152	139	136	146	153	120
Cottonseed Cakes	193	152	136	154	148	116	125	151	139	95
Maize	179	149	152	167	167	128	135	167	156	104
Barley Meal	195	141	124	152	148	126	146	145	126	85
Maize Meal	167	136	145	158	158	127	127	155	145	105
General Index	181	146	136	154	152	125	139	154	139	96

Source: Agricultural Statistics.

However, concentrates were not the only type of feed used. Although they accounted for half of food costs in the 1920s their significance diminishes as one moves back through time. Information on home grown feed is not impossible to find and it is known that there was an increase in

3. R.C. Ag., Parl. Papers, xvi, 10.

the amount of roots fed to dairy cattle and the introduction of new items, such as cabbages, during the second half of the nineteenth century. Equally, it is known that more attention was paid to grassland management, but to translate these facts into meaningful monetary terms is not an easy task. From the scattered evidence that exists it appears that in the third quarter of the nineteenth century more attention was paid to feed which resulted in increased costs per cow. Increase yields, however, probably off-set most of this increase. After 1880 the cost of producing roots and so forth on the farm doubtless fell but there is insufficient evidence to state the size of this fall.

The problem is the result of two strands. First, the evidence from the 1880s is atypical, the product of exceptional men boasting their achievements. Second, the data collected just before the Great War is not comparable because of the variations in standards adopted. Thus in the figures quoted in Table XLl Turnbull's estimates refer to cows yielding 800 gallons a year, a figure well above average. Equally untypical was the heavy expenditure on food alone, amounting to 70 or 80 percent of total production costs. However, of greater significance is the percentage breakdown of feed costs.

TABLE XLl

Composition of Feed costs, c.1880, 1905 and 1910. (as %)

	c.1880		1905	1910
	(i)	(ii)	(iii)	(iv)
Grazing	20.8	9.6	25.5	18.4
Home Grown	61.0	50.0	39.3	31.1
Concentrates	18.5	40.4	35.2	50.5

Source: cols. (i) and (ii) Agricultural Gazette, xxi, (1885), 499. R.E. Turnbull, 'Selection and Management of Dairy Cattle', J.B.D.F.A., iv, (1887), 15-36. col. (iii) Papers in the possession of Mr. A.G. Stratton, Alton Priors, Wilts. col. (iv) Journal of the Board of Agriculture, xix, (1913), 923-8.

Literery evidence supports the idea that the proportion of home grown food in the total feed bill declined over the course of the second half of the nineteenth century until concentrates and home grown foods each accounted for the same proportion of the total feed cost, a proportion in the region of 40 percent.

For the years 1910 to 1914 there is evidence relating to food costs in Surrey and Kent, Berkshire, and the West Riding of Yorkshire. The basis of the calculations show certain variations. Both hay and oat straw were valued at a lower rate for Berkshire than for the other regions, the difference being 5 and 10 shillings a ton respectively. The figures shown the food cost of a gallon of milk to be 4.6d. in Surrey and Kent, 4.4d. in Berkshire, and 6.5d. in the West Riding.[4] These figures provide an insight into the absolute level of production costs but more detail is given for the immediate pre-war conditions and is reproduced in Table XLII.

TABLE XLII

Gross Production Costs of Milk (d/gal.), c.1914.

	Suburban Farms		Predominantly Grass Farms		Mixed Farms	
	d.	%	d.	%	d.	%
Food	4.83	54.2	3.72	59.6	4.14	57.2
Labour	1.60	18.0	1.30	20.8	1.42	19.6
Miscellaneous	2.48	27.8	1.22	19.6	1.68	23.2
Gross Costs	8.91		6.24		7.24	

Source: Journal of the Board of Agriculture, xxiii, (1916), 596-7).

Piecing together the scraps of evidence one is able to build up a picture of the changing structure of milk production costs in the years before the Great War. With more reliable figures for the post-1914 period one can see that the absolute level of milk production costs rose sharply

4. J.M.Ag., xxi, (1914), 149-50, 640-2.

during the war years but fell to a level some 50 percent above the pre-war figure. (see Tables Ll and Lll).

The most comprehensive cost data available relates to the mid-1930s. Strictly speaking the information falls outside the period under review. However, though prices were falling steadily in absolute terms throughout these years there is no reason to think that the relative importance of the various items changed significantly.

TABLE XLIII

Food Cost of Milk Production, 1934/5.

	Percentage of food costs accounted for by					Food as percentage of gross production costs
	Concentrates	Hay	Roots	Grazing	Others	
Northern	53.4	28.5	4.8	10.4	2.9	58.0
North-Western	52.8	24.2	5.3	14.4	3.3	59.4
Eastern	51.6	19.7	14.5	12.1	2.1	51.9
East-Midlands	52.9	22.0	7.6	14.0	3.5	60.0
West-Midlands	48.5	25.0	6.5	17.5	2.5	60.0
North Wales	50.2	28.6	4.8	15.4	1.0	60.1
South Wales	43.5	26.8	2.0	27.1	0.6	57.4
Southern	48.7	24.4	11.0	12.5	3.4	57.5
Mid-West	38.3	27.5	9.0	25.3	1.9	54.0
Far West	41.8	21.2	10.2	21.4	5.4	61.8
South-Eastern	50.2	23.4	9.3	12.8	4.3	54.2
All Regions	49.2	24.6	7.5	15.6	3.1	57.6

Source: Milk Investigation Scheme: Cost of Milk Production in England and Wales. Interim Report no. 1 Sept. 1st. 1934 - Sept. 30th. 1935, (Oxford, 1935), Appendix 1 Tables 8 and 10, 78, 80.

The importance of feed in gross production costs, and of concentrates in food costs, clearly emerges from the table, but equally important are the regional variations. The use of concentrates is of greater importance in the north and east of England but it is striking how small a part of

food costs they comprise in the mid- and far-west. A glance at the "grazing" column provides the explanation. The importance of roots in the east of England is also striking though not surprising. Elsewhere roots and green fodder are comparatively unimportant, especially in the north. In comparison with pre-war days the obvious contrast lies in the greater significance of concentrates and the relative decline in the importance of grazing, but the overall importance of food costs remains the same.

The next most important item of expense for the milk producer was labour. During the third quarter of the nineteenth century the trend of agricultural wages followed an upward path. However, for a decade after 1877 the average wage level fell. There was a recovery during the 1890s but in the first decade of the twentieth century, though wages regained the heights of the 1870s, prices also rose resulting in a worsening of the standard of living for many people in these pre-war years. The war years saw a marked rise in the wage level of the agricultural worker. A minimum wage level was agreed upon and even though this legislation was later abandoned wages in agriculture during the 1920s were nearly double those of the early twentieth century.[5]

From the scattered evidence relating to the nineteenth century it appears that hired labour accounted for some 10 to 12½ percent of gross costs.[6] There are no figures for family labour but it must be stressed

5. Between 1914 and 1917 wages doubled - for example a cowman in south Wiltshire received 21/- a week compared with 14/- at the outbreak of war. In the last year of the war wages rose by a further 25 percent. Thus the same cowman would be receiving 25/- to 26/- a week in 1918. Royal Commission of Agriculture, Parl. Papers, 1919, viii, 579. (C.473)

6. see Ag.Gaz., xxi, (1885), 499, xxiii, (1996), 391, xxv, (1887), 10 J.R.A.S.E., 2nd. ser.1, (1865), 338-43.

that on a large number of dairy farms this was the only type of labour used. Similarly, on those farms where hired labour was used the usual method of economy adopted was to increase the amount of family labour as far as possible to offset rising wage levels. With the greater detail available for the inter-war years it is possible to give a more accurate idea of the importance of labour in overall costs.

TABLE XLIV

Labour Costs of Milk Production, 1934/5.

	Employees d/gal.	Family d/gal.	Total	Total labour costs as % of Gross costs	Family labour as % of all labour
All Regions	1.61	0.56	2.17	21.3	25.8
Northern	1.63	0.59	2.22	21.3	26.7
North Western	1.22	0.81	2.03	19.8	39.9
Eastern	2.22	0.19	2.41	23.7	7.9
East Midlands	1.55	0.54	2.09	22.1	25.8
West Midlands	1.32	0.59	1.91	19.5	30.9
North Wales	1.51	0.56	2.07	20.8	27.1
South Wales	1.00	0.38	2.38	25.2	58.0
Southern	1.67	0.38	2.05	21.4	18.5
Mid-West	1.77	0.41	2.18	22.5	18.8
Far-West	1.22	1.13	2.35	22.6	48.1
South Eastern	2.32	0.17	2.49	21.6	6.8

Source: as for Table XLIII.

Once again the contrast between the east and west of England is clear; the latter area, in this instance, characterised by the greater use of family labour. However, the use of hired labour increased not only as one moved from west to east across the country but also as one moved from small to large herds in any area. Where the herd size was under 10 - and it should be remembered that as late as 1945 the average herd size was 15 - family labour accounted for 88.5 percent of all labour

whereas on farms with over 80 cows it represented a mere 6.2 percent.[7]

Taken together feed and wages accounted for 70 to 80 percent of gross production costs throughout the period. By comparing the fluctuations in their prices with those of milk one has a good indication of the varying prosperity of the dairy industry. Table XLV shows detailed figures for the period 1860 to 1900. Certain comments need to be made. First, the price of cottonseed and linseed have been taken as an indication of concentrated feed prices. This is largely a matter of convenience. The series of figures for these items are more comprehensive than those for cottonseed- and linseed-cake and they show no significant variation in price from that of the cake form. Second, to obtain some indication of the changes in cost of home grown feed and grazing data for English oats and the rent of agricultural land have been used. Both are open to criticism but are employed in the absence of reliable series for more sensitive indicators. Thirdly, the changes in the ratio of the various items of feed give rather crude jumps whereas in practice the changes would have taken place more gradually. Lastly, the only available series of milk and cheese figures relate to the London market and, therefore, exaggerate the fall in wholesale prices. With these limitations in mind the table does give an overall idea of the changing prosperity of the English dairy industry.

7. Milk Investigation Scheme: Costs of Milk Production in England and Wales, Interim Report No. 1 Sept. 1st. 1934 to 30th. Sept. 1935. (Oxford, 1937). 57.

TABLE XIV

The Profitability of the English Dairy Industry: Price, Wage, and Feed Indices, 1860-1900. (1861 - 70 = 100)

	1 Agricultural Wages	2 Cotton -seed	3 Linseed	4 Maize	5 English Oats	6 Rent	7 Feed/Wage Index ≠	8 £ Wholesale Cheese	9 £ Price Milk
1860	97.1	-	90.8	113.7	103.0	100*	101.1	104.0	80.7
1861	98.2	91.9	95.4	105.0	100.2	100*	99.3	99.9	89.7
1862	98.2	101.0	105.0	93.0	95.3	100*	97.2	91.8	89.7
1863	98.2	97.9	108.6	90.4	89.3	100*	94.1	94.5	80.7
1864	98.2	88.6	97.9	89.6	84.8	100*	91.0	94.5	85.2
1865	98.2	88.2	98.6	89.7	92.2	100*	94.7	101.3	116.6
1866	98.2	92.9	103.6	90.1	103.8	100*	100.9	108.0	107.6
1867	100.3	105.2	106.0	127.9	109.6	100*	106.5	110.8	107.6
1868	102.5	118.0	95.4	120.0	118.5	100*	111.3	97.2	107.6
1869	103.7	106.7	93.6	95.7	109.6	100*	105.6	99.3	107.6
1870	104.7	109.7	95.8	98.4	96.4	100	99.5	102.7	107.6
1871	113.4	105.2	100.0	109.5	106.2	95	106.3	104.0	107.6
1872	123.3	101.1	106.0	100.9	97.8	95	105.1	97.2	107.6
1873	127.6	93.6	101.8	100.6	107.3	105	109.9	97.2	107.6
1874	133.0	96.2	99.0	120.5	121.7	106	118.4	90.5	134.5
1875	127.6	104.2	93.3	113.2	121.0	106	116.4	91.2	134.5
1876	127.6	95.9	88.6	91.0	110.8	107	109.8	89.5	134.5
1877	127.6	101.3	95.0	92.2	109.4	106	110.2	101.3	134.5
1878	124.4	104.0	87.9	86.0	102.7	107	106.1	87.8	134.5
1879	116.8	97.9	88.3	77.3	91.8	105	98.7	76.3	134.5
1880	109.1	95.8	91.1	85.5	97.4	95	98.4	95.9	107.6
1881	107.9	92.9	85.4	88.6	91.8	94	95.2	87.8	107.6
1882	105.9	90.1	76.9	101.8	92.2	91	94.7	89.1	107.6
1883	104.7	89.5	73.3	93.0	90.4	95	93.0	91.8	116.6
1884	102.5	90.2	75.6	83.9	85.5	96	90.4	89.1	98.7
1885	101.4	82.8	76.2	76.8	86.9	93	88.7	95.9	98.7
1886	99.3	70.9	73.0	69.9	80.2	84	82.7	78.3	98.7
1887	102.5	67.5	65.5	68.9	68.6	86	79.3	87.8	103.1
1888	104.7	77.9	67.3	77.3	70.7	79	81.3	82.4	103.1
1889	105.9	83.1	71.6	67.5	74.9	82	83.3	79.7	94.2
1890	109.1	67.4	72.6	64.7	78.4	83	83.5	77.0	94.2
1891	109.1	70.7	73.7	89.3	84.4	82	88.3	75.6	94.2
1892	109.1	69.8	69.8	75.9	83.7	82	87.2	74.3	98.7
1893	107.9	74.8	72.6	68.4	79.1	78	83.9	71.6	94.2
1894	107.9	67.6	67.3	64.1	72.1	79	78.5	71.6	83.0
1895	105.9	56.6	60.9	65.5	61.2	76	74.2	63.5	80.7
1896	105.9	56.7	55.5	51.8	62.3	76	72.6	54.0	71.7
1897	107.9	56.4	55.9	48.7	71.4	74	75.1	68.9	71.7
1898	110.2	58.2	61.6	56.3	77.7	74	79.4	58.1	71.7
1899	112.4	68.8	66.9	59.0	71.7	73	79.9	71.6	74.0
1900	114.0	78.1	89.0	64.8	74.2	71	83.5	71.6	76.2

*estimate

≠ 1861-70 W2:CLM 1:EO 4:R 1
1871-80 W2:CLM 2:EO 3:R 1
1881-1900 W2:CLM 2½:EO 2½:R 1

£ London prices - exaggerate fall in prices.

Sources: see over...

Sources: Mitchell and Deane, op.cit., 350, 488-9, figures recalculated. Report on Wholesale and Retail Prices, Parl.Papers, 1903, Lxviii, 83, 192-3. H.A. Rhee, The Rent of Agricultural Land in England and Wales, (Oxford, 1947). (321)

These figures, despite their limitations, bear out the impression gained from the literary sources. From the 1860s to the mid-1880s the milk producer was in a strong position. The cost of feed and wages increased after 1860 reaching a peak in 1874 but wholesale milk prices rose at a greater rate and did not start to fall until after the slump in production costs. For the decade 1875 to 1885 the relative position remained almost the same as production costs and wholesale prices fell. However after 1887 the position altered significantly. The wholesale price of milk continued to fall but the cost of production began to rise for a few years and then fell at a slower rate than the returns to milk. The figures show the late 1890s to be the time of real crisis and it was during these years that the greatest volume of complaint was heard from the milk producing interests of England.

For the cheese maker the position was less cheerful. With but a brief break in the late 1880s the fall in wholesale prices was greater than that in the costs of production. The gravity of the situation was reflected in the diminution of this sector of the dairy industry.

For the twentieth century available data is greater in quantity and more comprehensive in coverage. It is, therefore, possible to give a more accurate picture of the changing fortunes of the dairy trade. The figures in Table XLVI are not perfect - there are no readily available figures for the cost of roots for example - but represent an advance on those used in the calculations for the nineteenth century.

TABLE XLVI

The Profitability of the English Dairy Industry: Price, Wage, and Feed Indices, 1906-1930. (1911-13 = 100)

	1 Agricultural Wages	2 Concentrated Feed	3 Hay	4 Oats	5 Feed/Wage Index /	6 Wholesale Price Milk	7 Dairy Produce //
1906	90	95*	90	92	92	91	92
1907	90	95*	91	95	93	94	94
1908	90	95*	74	90	88	94	94
1909	90	95*	78	95	90	94	94
1910	90	95*	89	87	91	94	94
1911	92	96	94	95	95	97	98
1912	93	108	113	108	106	103	103
1913	97	96	92	96	95	100	100
1914	100	100	77	105**	94	103	103
1915	115*	137	106	152**	124	117	118
1916	130*	187	152	168**	162	157	153
1917	142	274	187	251**	202	191	190
1918	190	287	257	249**	233	251	243
1919	230	268	292	264	255	300	284
1920	285	273	151	287	273	303	296
1921	298	181	140	172	201	263	247
1922	208	146	130	147	167	179	173
1923	180	136	101	135	146	174	171
1924	180	154	101	138	146	170	169
1925	206	152	107	138	152	170	169
1926	208	125	108	127	142	170	166
1927	207	139	111	128	147	160	156
1928	206	154	125	147	156	161	161
1929	210	139	118	125	151	169	165
1930	211	96	86	87	128	161	153

*estimate /M4:CF5:H07 // M15:B3:C2
except **where
H5:02, otherwise
average of two.

Sources: Agricultural Statistics, Astor and Murray, The Planning of Agriculture, (1933), 15.

The figures bear out once again the strength of the milk producers position in the 1920s. Of greater interest is the fact that the early war years saw the dairy farmer in a relatively worse position than that enjoyed

immediately before 1914. In part the figures give a false impression of the situation as many dairy farmers fell back on home grown feed to offset rising costs but it still remains true that it was only in the last two years of the war that milk prices reached a high level that gave large profits. It was in the years 1917 to 1921 that inflated prices drew many farmers into the trade, the impact of which is clearly seen in the huge price fall in 1922 which ruined many milk producers.

The fluctuations in feed and wages give a good indication of the fortunes of the dairy farmer over the years in question. However, there were other costs which though of lesser importance, must be considered. Of these the largest is replacement charges. According to the 1934/5 figures they accounted for some 10 percent of the gross production cost of a gallon of milk. Unfortunately there are no comparable figures for the late nineteenth century. It is, however, possible to offer some general comments. The average milking life of a cow was between four and five years, after which she was sold for cow beef. This meant that between 20 and 25 percent of the milking herd had to be renewed annually. In part this was met by breeding replacements on the farm but this was never a universal practice. In fact it was one that declined, especially in and around towns where flying herds became common. The import of springers from Ireland[9] provided a source of relatively cheap replacements but many farmers had to rely upon the local market. Here the general trend in prices followed that of milk itself.

9. In 1913 755,000 cattle classified as stores, milch cows, springers, and calves were imported from Ireland. The trade fell off during the war years and never recovered the pre-war level except in 1924, but by the late 1920s the level was approximately two-thirds of that of 1913. These cattle were not of the highest quality and were, therefore, scorned by many but during the 1920s they proved ideal on the downlands of such counties as Wiltshire and Hampshire. Detailed figures are quoted in the Ag.Mkt.Rep. for the years in question.

In view of the importance of cow replacement as a capital cost it is necessary to explain the comparatively short active life of the dairy cow in England. In part it was a reflection of the dairyman's concern with the meat value of the cow. Rather than keep a good milker until she was ten or twelve years old he preferred the more short term policy of cashing in the meat value when the cow was six or eight years old. The increasing importation of cheap meat in the last decade of the nineteenth century by lowering the price of cow beef, partly checked this attitude but it was a habit not readily rejected. A more fundamental reason can be found in the prevalence of diseases which curtailed the productive life of many of the national dairy herd. Mastitis was so common as to be accepted as part of the natural order of things and as such to be accepted fatalistically. Foot-and-mouth disease broke out in every year between 1869 and 1886, reaching serious proportions in 1869-71, 1874-5, and 1876-7. Pleuro-pneumonia was rampant in 1865-6 and 1870-1, while cattle plague, at its height in 1865-6, is estimated to have carried off 100,000 cattle in the 25 years from 1869 to 1894.[10] The outbreak of 1865-6, which threatened the milk supply of London, is the best documented outbreak. The figures are of staggering proportions - 83,000 cattle attacked in England, of which 13,000 were killed, 51,000 died, and only 8,000 are known to have recovered, with a further 15,000 healthy cattle killed by way of a safety precaution[11] - and were a serious setback to the dairy industry at large. A closer examination of the figures reveal

10. R.Trow Smith, op.cit., 317-8.

11. R.C. on Cattle Plague, Parl.Papers, 1867-8, xviii.

a further explanation of the prevalence of disease. The counties worst hit tended to be those with the highest density of cattle. Cambridgeshire was something of an exception but the worst hit county was Cheshire. The heavy concentration of cattle resulted in a situation conducive to the rapid spread of disease. Moreover, the greater intensity of the dairy industry in England compared with, say, Ireland added strains that further reduced the working life of a cow. Improvements in vetinary knowledge and application, plus the effects of governmental action, curbed the losses due to disease but the battle was never won. During the 1920s foot-and-mouth disease caused serious losses, especially in Cheshire and the recent attack of the same disease showed how much more has to be discovered.

Lastly, one must consider the miscellaneous charges that make up the gross production cost. Under this heading are included charges for the cowshed and dairy buildings, for repairs and deterioration of dairy equipment, for a share in the general farm expenses, for vetinary charges and for the upkeep of the bull and service charges. The material is such that it is impossible to speak with any accuracy about such items as vetinary charges or servicing fees. However, this is not too serious a deficiency as the total contribution to gross production costs from miscellaneous charges is in the region of 10 percent only. There is, however, one aspect that allows of more detailed comment - rent. Rhee's figures for agricultural rents show that there was an upward trend until the mid-1870s thereafter rents fell reaching a low in the first years of

the twentieth century, from whence they rose until the collapse in prices of the 1920s.[12] However, the position varied between farm types. For example, in Yorkshire the reduction in rents between 1874 and 1894 on all grass farms was 12.8 percent. As the percentage of grass decreased the amount of rent remission increased until on farms with only a quarter of their acreage under grass the figure was 26.2 percent.[13] Similarly, in Wiltshire on the Longleat estates rents from the dairying areas were, on a constant acreage, six percent lower in 1894-5 than in the peak years 1874-8, and were six percent above the average for the years 1869-73. In contrast, on the Wilton estates which were predominantly arable lands rents received in 1895-9 were 43 percent below the peak years of 1869-73.[14] In other words, although there were rent reductions in the dairying areas they were not usually on a large scale. However, in certain areas the fall in rent was significant in that arable land could be rented at a low price and then turned over to dairying at a profit. This was the approach adopted by Stratton and Farmer in Wiltshire and McConnell in Essex.

The position was very similar after the war. Rents on pasture lands, as well as tending to be higher, fell less than those for arable.

12. H.A. Rhee, The Rent of Agricultural Land in England and Wales, 1870-1945, (Oxford 1947). (Table 2 col.14 and diagram 1). The question of agricultural rents is dealt with in F.M.L. Thompson 'The Land Market in the Nineteenth Century', Oxford Economic Papers, n.s.ix (1957), 285-308, R.J. Thompson, 'An Inquiry into the Rent of Agricultural Land in England and Wales in the 19th Century', J.R.S.S., lxx, (1907), 587-624 and J.T. Ward, 'Farm Sale Prices over a Hundred Years', Centenary Supplement to the Estates Gazette, 3rd. May 1958, 47-9. Rhee's figures are used as they are the only ones for the whole period.
13. R.C. Ag., Parl.Papers, 1895, xvi, p.565.
14. Victoria County History, Wiltshire, vol.iv, 103-4.

TABLE XLVII

Average Rents per acre in England, 1925 and 1931. (s/acre)

Size (acres)	Arable 1925	Arable 1931	Pasture 1925	Pasture 1931	Mixed 1925	Mixed 1931	All 1925	All 1931
Over 1 under 5	51	51	64	63	56	56	62	61
5 20	46	43	53	50	47	45	51	49
20 50	39	37	44	41	39	36	42	40
50 100	33	29	37	34	33	30	35	32
100 150	29	25	33	30	30	26	31	28
150 300	25	20	30	26	27	23	28	24
300 500	21	17	26	23	24	19	24	20
500	18	13	23	19	21	15	20	15

Source: Agricultural Output....1931. op.cit., p.481.

Rents are an obvious reflection of farming profitability. The larger rent remissions granted to tenants on arable land was a recognition of their decreasing profitability in comparison with livestock farming. However, a great deal of work remains to be done on the subject before one can generalise with confidence.

Having considered the major components of gross production costs on the farm one must move on to a consideration of distribution costs. For the milk producer there were two major alternatives. If he were a producer-retailer he had to take the milk to the nearest town - a journey of five miles at the most - which necessitated the possession and upkeep of a horse and cart as well as churns and measuring cups. If, however, he were selling wholesale he had to get the milk to the nearest station, which, again, necessitated the ownership of a horse and cart, and then pay for the transport of the milk to the buyer's station and for the return of the empty churns. References to the cost of transporting milk by rail in the mid-nineteenth century are scanty. Dodd, writing of the 1850s refers to charges of ¾d. a gallon for journeys of up to 40 miles and of 1d. a gallon

for journeys over this distance. While there were complaints that charges in Lancashire had been raised from ½d. to 1d. a gallon.[15] Surveying the position between the 1870s and 1890s Kindleberger concludes that railway charges fell by about ½d. a gallon. The variations between the different companies was resolved by the 1888 Railway and Canal Traffic Act. The various charges were as follows: transport charges ranged from 1d. a gallon for journeys up to 20 miles to 2d. a gallon for distances of over one hundred miles. Terminal charges at either end were 1½d. per full can, while loading and unloading cost 1d. per empty can and 2d. per full can. Lastly, cans were returned empty at the rate of 2d. a can up to twenty miles and 6d. a can over one hundred miles.[16]

The cost of transporting the milk to the station is virtually impossible to calculate but it should be remembered that the strain involved on the animal necessitated its yearly replacement. A contributor to the Journal of the Board of Agriculture attempted to assess distribution costs for the immediate pre-war years. Distinguishing between three types of dairy farm, suburban, predominantly grass, and mixed, he calculated that distribution costs per gallon were 0.21d. for the suburban farm i.e. keep of the horse, for the grass farmer 2.52d. consisting of 0.44d. for the keep of the horse and 1.04d. for railway rates, and finally 1.20d. per gallon for the mixed farmer, 0.42d. and 0.78d. being the respective cost of horse and rail transport.[17] The Linlithgow Committee was of the opinion

15. G. Dodd, "The Food of London", J.of Ag., 364-78. July 1856.
16. Report of Board of Trade in accordance with....Railway and Canal Traffic Act, 1888, (413-21), Parl.Papers, 1890, lxiv, 32, 108, 190, 265, 341, 422, 497, 572, 647.
17. J.Min of Ag., xxiii, (1916), 596-7.

that distribution costs were higher. According to their figures the average rail charge was about 1½d. a gallon while the cost of transporting milk to the station varied between ¼d. and 1d. a gallon.[18]

After the war the level of rail charges was almost double that of the period 1911-13. However, in May 1922 rates were reduced and during the remainder of the decade the average cost of carriage per gallon was fractionally under 1½d.[19] The Railway Clearing House scale laid down a minimum quantity, 12 gallons, and a minimum charge ⅔d. a gallon, but thereafter the charge varied from 0.78d. a gallon for journeys up to 20 miles to 2.34d. for journeys of over 150 miles. The alternative of road transport was probably more expensive over short distances - 1d. to 1½d. a gallon - but over long distances costs were much lower, being less than 1d. a gallon in some cases.[20]

The butter and cheese producer was also faced with certain distribution charges. Thus, if cheese were sold off the farm the producer was expected to pay some part of the cost of delivery - on average this amounted to ¼d. a lb. in the 1920s - if cheese were sold at a fair he would have to pay a toll and a pitching charge. The cheese factor played an important part, particularly in those areas producing Cheshire cheese, but his services were not free. If cheese were sold by the factor the producer paid him a commission - approximately ¼d. a lb. in the 1920s - or if the factor bought the cheese at the farm there was the cost of storage to be paid for by the farmer. The butter manufacturer was in a similar

18. Ministry of Agriculture and Fisheries: Departmental Committee on Distribution and Prices of Agricultural Produce; Milk and Milk Products. Parl.Papers, 1923, ix, 22.
19. Ag.Mkt.Rep., xxv, (1928), 30th.Mar., 1, xxvi (1929), 5th.Apr., 2, xxvii (1930), 28th.Mar., 1, xxviii (1931), 10th. Apr. 2.
20 Ministry of Agriculture and Fisheries, The Fluid Milk Market in England and Wales, Econ.Ser. 16, 24.

position, having to pay for the services of the higgler. However, as the greater part of home produced butter on sale was sold direct to the consumer the most common expense was that of reaching the local market. In some areas such as Devon butter was sent "up country" to London by the producers who had to face the railway charge but it would be wrong to suggest that there were many people in this category.

The limitations of the data is such that it is impossible to give a precise idea of the importance of distribution charges and miscellaneous charges to the dairy farmer. However, in contrast to feed costs and wages they are of limited significance. A similar vagueness in analysis applies to the returns to dairying. Trends in the price of milk, butter, and cheese can be defined with reasonable accuracy, but it is very difficult to give any precision when talking of the by-products of the dairy. In assessing net farm costs the value of manure and calves has to be taken into account, but no reliable figures are available for the nineteenth century. One assumes that manurial value increased as the quality of feed rose, but no quantification is possible. Similarly, one must mention other by-products such as whey butter and cheese, skimmed milk, and pig fattening. With the expansion of the liquid milk trade such sidelines decreased in importance, but it should be stressed that in some cases the sale of the by-products could mean the difference between success and failure. This was particularly the case with the urban cowkeeper who relied upon the carcase value of his animals. The import of cheap meat reduced the value of cow-beef which contributed to the decline of the urban cow-house.

11

The trends examined in the previous section provide the essential framework within which to consider the changing structure of the English dairy industry. To add meat to these bones we will conclude this chapter with a consideration of certain examples which illustrate the major changes that took place between 1860 and 1930.

From the early 1850s one can trace the rise of the liquid milk trade in several parts of the country. With the advent of the railways a new market had been opened and in the early years of the trade a good profit could be netted. W.H. Heywood, a dairy farmer from Dunham Massey in Cheshire, saw this and abandoned cheese making accordingly. Moreover, he wrote to the J.R.A.S.E. to tell them of his success. The figures, reproduced in Table XLVIII, only give a rough indication of the relative position of cheese making and milk selling.

TABLE XLVIII

Profits on a Cheshire Dairy Farm Selling Cheese and Milk, 1865.

Cheese				Milk			
Expenses	£	Produce	£	Expenses	£	Produce	£
Rent 200 acres x 40/-	400	Cheese @ 60/-	750	as for cheese making plus £100 for cost of cows to keep up supply	1124.15	Milk @ 7d.	1065
Tithes & rates	58.15	70 lambs	96.5			70 lambs	96.5
Labour	296	50 ewes	37.10			50 ewes	37.10
Seeds	42.0	Wheat	180			Wheat	180
Bills	52.10	Pigs	150			Pigs	150
Improvements (draining, boning, & Repairs)	125						
Miscellaneous	50						
	1024.15		1213.15		1124.15		1428.15

Profit: (i) from cheese £189 = 11%
(ii) from milk £304 = 27%

Source: W.H. Heywood, "The Comparative Profit from Making Cheese or Butter, Selling Milk, or Grazing." J.R.A.S.E., 2nd.Ser.1, (1865), 338-43.

No indication is given of transport costs, though one may safely assume that the costs of marketing were roughly equal. More serious is the failure of the figures to distinguish between the costs of the three enterprises pursued on the farm. But there is one further point that throws some doubt on the value of the estimates. In both cases "pigs" are included under the produce column. It was a common practice to rear pigs feeding them on the whey from the dairy. With the advent of milk selling this was no longer possible - unless the farmer sold skimmed milk as if it were whole milk - so one would expect production costs to be higher if the pigs had to be fed from an alternative source. However, apart from this possible error, which would exaggerate the profits to be made from milk selling, the figures do suggest that there was a considerable profit to be made even at a time when cheese was selling well. Heywood's experience, however, is unlikely to have been typical. According to his figures his cows yielded about 700 gallons of milk a year. Moreover, it would seem that the expense per cow was also high. With a profit of nearly 2d. a gallon the ensuing price fall can hardly have inconvenienced Heywood. For the run of the mill dairy farmer, with a cow yielding 400 gallons a year, spending £10 a year on the upkeep of each animal and making a profit of 1d. a gallon in the 1860s there was a definite risk of profits being eroded away,[21] by the late 1880s and 1890s. Unfortunately, detailed figures for this period are not readily available. Certain writers attempted to estimate the costs of production but they tend to be exceptional cases. For example, R.S. Turnbull made various estimates

21. S. Copland, Agriculture, (1866), Vol. 1, p.750-2.

but his assumption - a cow yielding 800 gallons a year - is sufficient to invalidate his conclusions as of general application. Similarly, few farmers can have spent £27 to £30 per cow per year.[22] In practice most dairy farmers spent only a third of this sum and never hoped for yields of more than 400 gallons from their cows. In fact at this level an annual expenditure of more than about £12 would result in a loss at the average price for milk then prevailing.

By the turn of the century conditions had changed considerably. In particular greater attention was paid to the feeding of concentrates to the dairy herd.

TABLE XLIX

Cost of Milk Production on a Wiltshire Farm, 1905*

Expenses:	£		%	Receipts	£
Food				Milk	2292
Cake and Meal	448		23.0	Calves	84
Home Grown	351)		25.7		2376
Straw	150)		16.0		
Pasture	325	1274	65.4	Profit	92
Labour		332	17.0		
Other Cattle		208	10.7		
Miscellaneous		138	7.1		
GROSS FARM COSTS		1952			
Transport		292			
Milk Cart and Horse		40			
TOTAL COSTS		2284			

*for 100 cows in milk

Source: Papers in the possession of Mr. A.C. Stratton, Alton Priors, Wiltshire.

In comparison with the profits enjoyed 40 years earlier a profit of 4 percent was somewhat small but after the trials of the late nineteenth century any sort of profit was welcome. But it was not simply a question

22. Ag. Gaz., xxi, (1885), 499, R.E. Turnbull, "The Selection and Management of Dairy Cattle", J.R.A.S.E., iv, (1887), 15-36.

of changes in the level of profits. As the result of changing price trends there had been considerable structural modification in the dairy industry. Near centres of population the profitability of milk selling over cheese making had not been destroyed despite the large increase in supply thanks to the flood of cheap imports. However, further away from the cities the three branches of the dairy industry were in equilibrium.

TABLE I

Estimated Return per Gallon of Milk Equivelent. (in d.)

	1 Liquid Milk		2 Cheshire Cheese		3 Cheddar Cheese		4 British Butter
	Apr-Sept.	Apr-Mar	June-Nov	Apr-Mar	June-Nov	June-May	Apr-Sept
1906-7	4.75	6.0	6.3	6.7	7.0	7.0	5.9
1907-8	5.25	6.4	6.0	6.3	6.7	6.7	5.7
1908-9	5.25	6.5	5.7	6.2	6.45	6.5	5.9
1909-10	5.25	6.25	5.9	6.3	6.4	6.4	5.8
1910-1	5.25	6.4	5.7	6.0	6.2	6.5	5.9
1911-2	5.5	7.2	6.5	6.8	6.3	7.8	6.1
1912-3	5.4	6.8	5.9	6.2	7.0	7.0	6.1
1913-4	5.57	7.2	5.9	6.4	7.05	7.4	6.2
Average	5.3	6.6	6.0	6.4	6.8	6.9	5.9

1 Average London contract price minus 2d. a gallon.
2 Average monthly price of 2nd quality cheese at Whitchurch, Nantwich and Chester
3 Average monthly price of 2nd quality cheese at Bristol and London minus ½d. a lb.
4 Average monthly price of 2nd quality butter at town and country markets plus ¾d. a gallon.

Source: R. Cohen, The History of Milk Prices, (Oxford, 1936), 24.

The movement towards equilibrium was distorted by the exigencies of war, but the need to discover information upon which to base the price fixing policy resulted in the first general survey of milk production costs. Some 7,500 were contacted and from the returns it was found that 'many

witnesses had no ideas as to the cost of production of milk until they had worked it out for the purpose of giving evidence.'[23] However, after two interim reports the committee reached a decision on the subject.

TABLE 11

Cost of Milk Production, England and Wales, 1919/20.*

	Winter			Summer			Whole Year		
	d.		%	d.		%	d.		%
Labour	4.99		11.3	3.72		24.5	4.43		14.1
Purchased Feed	10.06	22.7		3.35	23.4		7.21	22.9	
Home Grown	20.88	47.2	71.3	1.32	8.7	52.4	12.31	39.1	67.4
Grazing	0.61	1.4		3.08	20.3		1.69	5.4	
Other Dairy Stock	5.98		13.5	2.15		14.2	4.31		13.7
General Expenses	1.47		1.20				1.35		
Depreciation									
(i) Machines	0.16		3.9	0.15		8.9	0.15		4.8
(ii) Cows	0.09			0.00			0.00		
GROSS COSTS	44.24			15.7			31.45		
Credits									
(i) Cows	0.00			2.22			0.93		
(ii) Other Dairy Stock	4.06			3.55			3.84		
(iii) M.V.	2.62			0.28			1.74		
TOTAL CREDITS	6.68			6.05			6.51		
NET COST	37.56			9.12			24.94		

*M.B. estimates include delivery costs

Source: Final Report on an Investigation into the cost of Milk Production from 1st. October, 1919, to 30th. September 1920, (C.1305), Parl. Papers, 1921, xv, p.9.

For the milk producer these were good years. Production costs of just over two shillings a gallon compared well with the average selling price of about two shillings and threepence. But once again one must not forget that there was considerable variations throughout the country as was revealed by evidence submitted by the National Farmers' Union. They found that not production costs could vary from 10.02d. to 24.0d. per gallon during the summer months and from 19.5d. to 39.0d. per gallon during the winter.[24]

23. Interim report as to the Establishment of Differential Zones and the Estimated Cost of Production of Milk in the summer of 1919, C.483, Parl.Papers, 1919, xxv, 4.
24. Final Report on an Investigation into the Cost of Milk Production from 1st. Oct. 1919 to 30th. Sept. 1920, C. 1305, Parl.Papers, 1921, xv, 553f: See Appendix.

Looking at the cost structure as revealed by these figures certain points emerge. Food is a larger proportion of costs and labour a smaller than for pre-war years when food represented under 60 percent of total costs and labour 20 percent. It would seem that this was simply the result of distortions brought about by the war for by the 1930s the position had reverted to pre-war conditions relatively speaking, although the absolute cost of production had increased considerably.[25]

25. The following estimate is given in the J.Min of Ag., xxiii, (1916), 596.

Cost of Production of One Gallon of Milk.

	Suburban Farms		Predominantly Grass Farms		Mixed Farms	
	d.	%	d.	%	d.	%
Food	4.83	54.2	3.72	59.6	4.14	57.2
Labour	1.60	18.0	1.30	20.8	1.42	19.6
Miscell-aneous	2.48	27.8	1.22	19.6	1.68	23.2

TABLE LII

Cost of Milk Production, England and Wales, 1934-5.[26]

	Wholesale Producers		Intermediate Producers		Graded Producers		Producer-Retailers	
	d.	%	d.	%	d.	%	d.	%
Purchased	2.89		3.31		3.45		3.53	
Home Grown	2.05		2.05		2.15		1.75	
Grazing	0.91		1.04		0.99		0.89	
Total Food	5.85	58	6.40	57	6.59	48	6.17	51
Employees	1.61		1.67		2.70		2.57	
Family	0.56		0.81		0.47		0.58	
Total Labour	2.17	21	2.48	22	3.17	23	2.95	24
Miscellaneous	1.16	11	1.25	11	2.53	19	1.49	12
Replacements	0.98	10	1.13	10	1.35	10	1.57	13
GROSS COSTS	10.16		11.26		13.64		12.18	
Credits								
(i) Calves	0.44		0.49		0.47		0.44	
(ii) M.V.	0.31		0.30		0.35		0.29	
TOTAL CREDITS	0.75		0.79		0.82		0.73	
NET COST	9.41		10.47		12.82		11.45	

Source: Milk Investigation Scheme: Costs of Milk Production in England and Wales, Interim Report 1, Sept. 1st. 1934 to Sept. 30th. 1935, (Oxford, 1937), 25.

The structure of costs is roughly the same for all groups except the graded milk producer but it should be noted that the producer-retailer, usually a small man, had higher total costs but could survive by cutting out the expense of middlemen. More interesting is the position of the graded milk producer. To meet the required standards extra costs were

26. Costs also varied with farms size.

	Up to 10 cows	10.1 to 20 cows	20.1 to 30 cows	30.1 to 40 cows	40.1 to 50 cows	50.1 to 60 cows	60.1 to 70 cows	70.1 to 80 cows
Total Food	6.29	5.91	5.87	5.83	6.02	5.95	5.64	5.51
Total Labour	2.45	2.41	2.27	2.26	2.21	2.01	1.87	1.99
Misc.	1.89	1.99	2.07	2.30	2.42	2.06	1.80	1.94
Gross Farm Costs (d)	10.63	10.31	10.21	10.39	10.65	10.02	9.31	9.44

	80.1 and over
Total Food	5.75
Total Labour	1.78
Mis.	2.04
Gross Farm Costs (d)	9.57

Milk Investigation Scheme, op.cit., 57.

almost inevitable. In the first place there was the capital outlay required to bring the cowshed up to standard. An adequate supply of water was essential, as were such items as a steam boiler, a sterilising chest and so forth, while it was also important to see that the floor of the cowshed drained easily and could be cleaned with the minimum of trouble. On top of this there was the expense of the tuberculin test itself, and minor costs such as extra fuel and a licence. Lastly, extra labour was required as the cows had to be well groomed. The extra costs were estimated at £6.13.10 per cow but this was offset by the higher returns, an extra 3d. a gallon, that accrued to the producer of Grade A milk.[27]

27. V. Liversage, "The Economic Aspect of Grade A (T.T.) Milk Production", Scottish Journal of Agriculture, ix, 1926, 1-9.

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The detailed examination of the cost structure and profitability of the dairy industry during the period 1860-1930 has been so far treated in isolation. To put the changes into a better perspective one needs to compare the fortunes of the dairy farmer with those of men in other branches of agriculture. The declining fortune of the arable farmer is well known but little work has been done on other aspects of livestock farming. In the absence of detailed work on the subject a rough check has been carried out by comparing the prices of London milk contracts, middling quality beef and mutton, and the feed/wage index calculated for earlier discussions of the dairy industry. Several points should be made. The feed/wage index, though valid when talking of milk and beef production, cannot be seen as an accurate reflection of the cost of producing mutton. Equally, it must be remembered that the sheep farmer was faced with a dramatic slump in the price of wool which seriously affected the financial viability of his enterprise. Lastly, the use of London Hospital contract milk prices exaggerates the profits especially in the years before 1880. With these warnings in mind the figures suggest that milk prices fell less than those of both beef and mutton until the 1890s when a clear distinction emerges between milk and mutton and beef; the latter maintaining its profitability throughout. However, by the outbreak of war both milk and mutton prices had recovered somewhat and though milk prices rose more slowly during the early war years they held - or more accurately were held - better during the price fall of the 1920s. Strikingly the fall in the price of fat cattle was greater than that of the feed/wage index. Thus, it would apear that, taking the period as a

whole, milk production was the most profitable branch of English agriculture - a point reflected by the growth in size and importance of the dairy industry, which had emerged in 1930 as the backbone of English agriculture. More research is required to enable a more detailed comparison to be made but the general point is scarcely in question.

Table 111over.....

TABLE 1111

The Profitability of Livestock Husbandry, 1860-1900 and 1906-1930.
(1861 - 70 = 100)

	Middling Beef	Middling Mutton	London Milk	Feed/Wage
1860	95.2	90.0	80.7	101.1
1861	95.2	98.0	89.7	99.3
1862	88.5	94.1	89.7	97.2
1863	93.0	94.1	80.7	94.1
1864	99.8	100.0	85.2	91.0
1865	104.3	113.7	116.6	94.7
1866	106.6	107.8	107.6	100.9
1867	102.1	98.0	107.6	106.5
1868	97.5	92.2	107.6	111.3
1869	104.3	100.0	107.6	105.6
1870	108.8	102.0	107.6	99.5
1871	120.1	115.7	107.6	106.3
1872	118.0	119.6	107.6	105.1
1873	127.0	123.5	107.6	109.9
1874	115.7	104.0	134.5	118.4
1875	124.7	115.7	134.5	116.4
1876	118.0	113.7	134.5	109.8
1877	111.1	105.9	134.5	110.2
1878	111.1	107.8	134.5	106.1
1879	102.1	102.0	134.5	98.7
1880	111.1	105.9	107.6	98.4
1881	108.8	111.8	107.6	95.2
1882	115.7	117.7	107.6	94.7
1883	115.7	119.6	116.6	93.0
1884	111.1	104.0	98.7	90.4
1885	99.8	92.2	98.7	88.7
1886	90.7	98.0	98.7	82.7
1887	81.6	82.3	103.1	79.3
1888	88.5	92.2	103.1	81.3
1889	88.5	98.0	94.2	83.3
1890	86.2	88.2	94.2	83.5
1891	90.7	82.3	94.2	88.3
1892	86.2	82.3	98.7	87.2
1893	90.7	82.3	94.2	83.9
1894	88.5	82.3	83.0	78.5
1895	83.9	86.3	80.7	74.2
1896	77.1	76.5	71.7	72.6
1897	81.6	80.4	71.7	75.1
1898	81.6	72.5	71.7	79.4
1899	90.7	80.4	74.0	79.9
1900	95.2	88.2	76.2	83.5

Continued over....

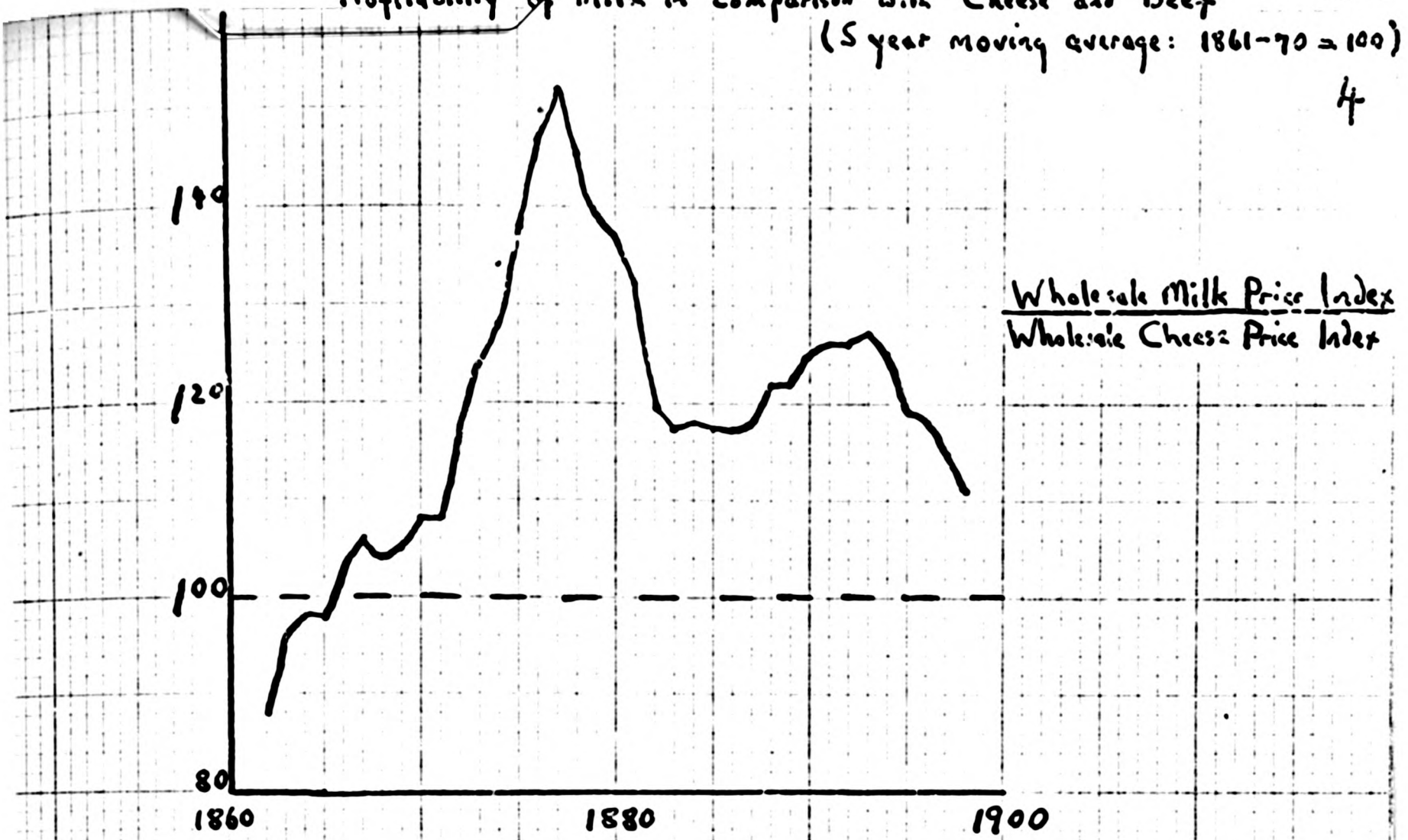
	Fat Cattle	Fat Sheep	Fat Cattle Milk	Feed/Wage 11 (1911-13 = 100)
1906	88	107	91	92
1907	92	107	94	93
1908	93	97	94	88
1909	95	83	94	90
1910	99	93	94	91
1911	94	90	97	95
1912	102	103	103	106
1913	104	110	100	95
1914	106	113	103	94
1915	136	130	117	124
1916	158	157	157	162
1917	205	197	191	202
1918	211	210	251	253
1919	232	230	300	255
1920	263	287	303	273
1921	227	217	263	201
1922	163	200	179	167
1923	151	187	174	146
1924	153	187	170	146
1925	151	183	170	152
1926	141	157	170	142
1927	137	150	160	147
1928	138	167	161	156
1929	133	157	169	151
1930	133	160	161	128

Source: as for tables XLV and XLVI and J.R.S.S., xlix, (1886), 637, 640 J.R.S.S., lvi, (1893), 241-2, 245, J.R.S.S., lxiii, (1900), 101-2, 105. J.R.S.S., lxxvii, (1913), 569-1

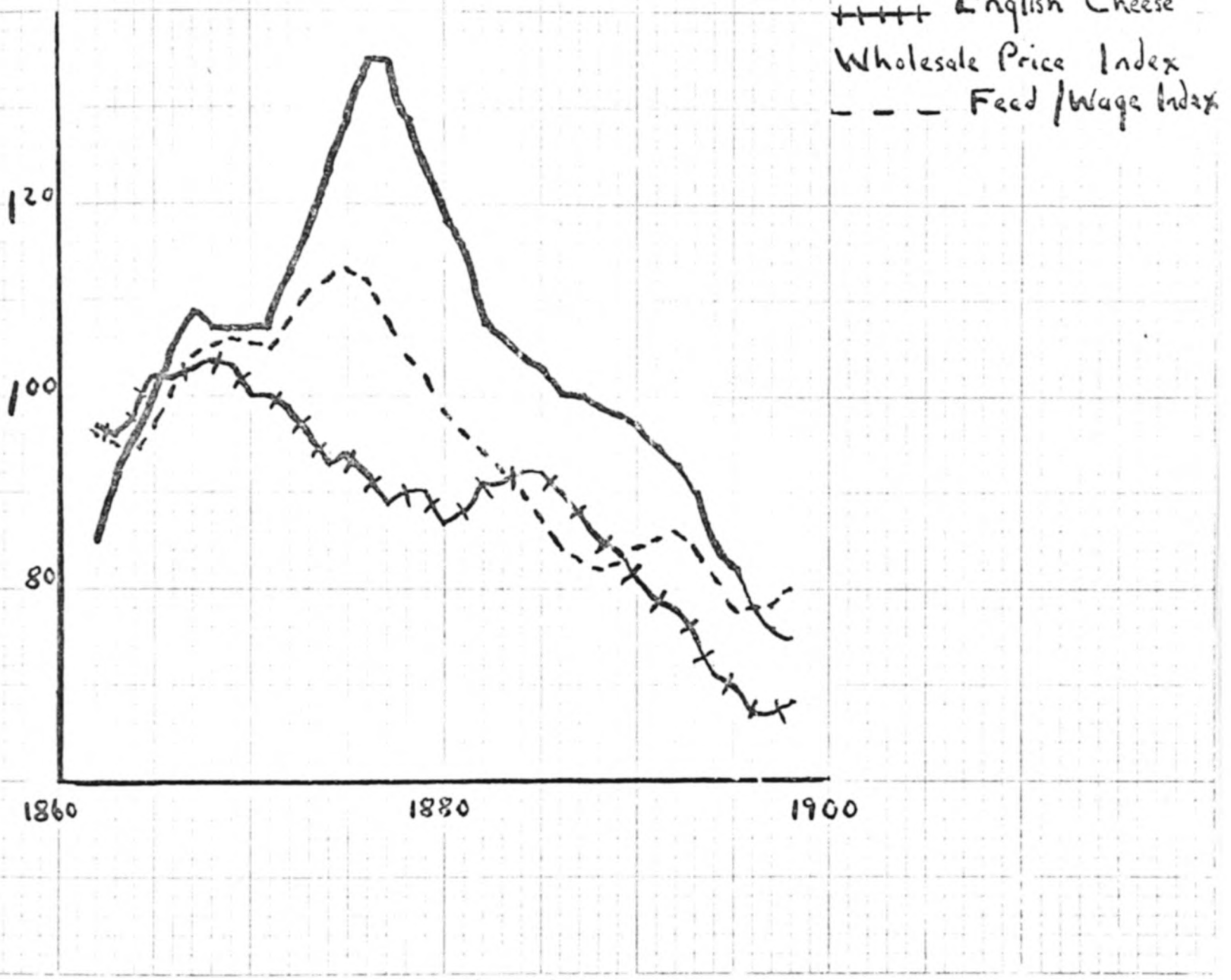
Profitability of Milk in comparison with Cheese and Beef

(5 year moving average: 1861-70 = 100)

4



Profitability of English Dairy Industry:
Wholesale Milk and Cheese Price Indices
compared with Feed/Wage Index, 1860–1900
(1861–70 = 100)



APPENDIX

The evidence submitted by the N.F.U., see note 24, reveals the variations that existed throughout the country. The following extra examples are given here to avoid cluttering up the text with a mass of figures. The farms are numbered according to the N.F.U. evidence.

Farm No. 6: Berkshire -- 500 acres of which 384 pasture. 73 cows and heifers kept of which 81 percent in milk.

	1st. May 1919 - 1st. Oct. 1918	1st. Oct. 1918 - 1st. June 1919
Food (incl. grazing)	£297. 19. 0.	£1,193. 0. 8.
Work of pastures	65. 8. 0.	
Manures	215. 1. 3.	
Labour	179. 14. 6.	276. 15. 0.
Depreciation (cows)	260. 0. 0.	347. 0. 0.
% of Rent	6. 5. 0.	8. 17. 4.
Keep of Bull	33. 0. 0.	22. 10. 0.
Depreciation of Machinery	21. 5. 0.	35. 0. 0.
Repairs etc.	22. 4. 0.	33. 15. 0.
General expenses	239. 18. 0.	328. 12. 10.
Delivery Charges	48. 14. 0.	72. 19. 4.
	1,389. 8. 9.	2,318. 10. 2.
Credits	61. 0. 0.	120. 0. 0.
Net Cost	1,328. 8. 9.	2,198. 10. 0.
Cost per gallon	16. 9d.	38.47d.

Farm No. 7 : **Essex** -- 947 acres of which 263 pasture. Milking herd of 65.

	1st May - 30th. Sept. 1918	1st. Oct. 1918- 31st. Jan. 1919	1st. Feb. - 30th. Apr.
Purchased food	£297. 14. 6.	£128. 14. 0.	£ 95. 2. 3.
Home grown	78. 15. 0.	374. 10. 0.	303. 14. 3.
Hay & straw		326. 14. 0.	239. 11. 0.
Green forage	81. 0. 0.		
Roots		249. 15. 7.	252. 9. 0.
Pasture & Aftermath	264. 13. 1	66. 3. 3.	
	722. 2. 7.	1,145. 16. 10.	890. 16. 10.
Labour	188. 1. 7.	219. 18. 6.	167. 3. 3.
Deprec.cows.	262. 12. 6.	265. 15. 0.	184. 5. 0.
General	98. 17.10.	81. 9. 3.	63. 5. 6.
Transport	33. 0. 0.	27. 0. 0.	20. 13. 0.
Interest on Capital	61. 12. 1.	47. 17. 8.	35. 19. 0.
Management	44. 0. 0.	34. 0. 0.	26. 0. 0.
Gross cost	1,410. 6. 7.	1,841. 17. 3.	1,388. 2. 7.
Total Yield	21,123	13,879	9,904½
Average value of cow	£40	£40	£40
Gross cost per gallon	16.02d.	31.85d.	33.64d.
M.V.	-	2.5	2.5
Net Cost per Gallon	16.02d.	29.35d.	31.14

Farm No. 79: Cheshire - 195 acres arable, 60 pasture: mixed farming. 30 cows of which 28 in milk

	1st. May - 30th Sept. 1918.	1st. Oct. 1918 - 30th. Apr. 1919
Pasture	£ 73. 0. 0.	
Clover	68. 0. 0.	
Home Grown	39. 10. 0.	£754. 18. 9.
Purchased	172. 0. 0.	365. 5. 0.
	352. 10. 0.	1,120. 3. 9.
Labour	90. 0. 0.	153. 15. 0.
Depreciation	142. 17. 6.	37. 15. 10.
General	21. 5. 0.	17. 17. 6.
Delivery	16. 9. 7.	22. 15. 2.
Interest	35. 0. 0.	35. 0. 0.
Management	10. 0. 0.	26. 0. 0.
Share of		
(i) liming	14. 10. 0.	1,433. 7. 3.
(ii) hedging	61. 15. 0.	87. 10. 0.
Gross cost	2,033. 9. 7.	1,325. 17. 3.
Credits	36. 13. 4.	87. 10. 0.
Net Cost	1,996. 16. 3.	1,325. 17. 3.
Total Gallonage	8,373	11,252
Net cost per Gallon	1/6½d.	2/4¾d.

Farm 85: Dorset - 153 acres pasture, 11 arable. 42 cows and heifers.

	May - Sept. 1918		Oct. 1918 - Apr. 1919.	
Mangels	£ 20. 0. 0.	Grazing	£ 17. 10. 0.	
Cabbage	10. 0. 0.	Purchased	235. 11. 8.	
Cake	66. 5. 0.	Home grown corn	70. 0. 0.	
Pasture	209. 5. 0.	Hay and Straw	514. 0. 0.	purchased
Extra Keep	95. 10. 0.	Swedes & Mangolds	250. 0. 0.	
	401. 0. 0.		1,087. 1. 8.	
Labour	93. 19. 6.		145. 15. 1.	
Depreciation	119. 2. 8.		96. 0. 0.	
General	51. 11. 5½		80. 19. 7.	
Delivery	76. 10. 0.		25. 17. 0.	
Interest	50. 0. 0.		70. 0. 0.	
Management	33. 0. 0.		45. 0. 0.	
Gross Cost	825. 13. 7½		1,550. 13. 4.	
Credit	24. 0. 0.		52. 0. 0.	
Net cost	801 13. 7½		1,498. 13. 4.	
Gallonage	13,895		10,927	
Net cost per gallon	14d.		33d.	
		M.V.	2¼d.	
		Net Cost	30¾d.	

It should be noted that the N.F.U. figures contain estimates for the costs of delivery, as did the official enquiry, whereas the figures for 1934/5 do not consider this factor.

CHAPTER 7

Technical Change in the Dairy Industry.

I

The years after 1850 were ones of great significance for English agriculture. The application of science and technology to many spheres of farming life suggested that a new era had been embarked upon, a new era in which traditional methods had at last been discarded, and a new scientific approach adopted. The appearance of machinery in field and farm, the application of science to the growing of crops, and to the breeding and feeding of livestock, all suggested that the new day of science with practice had dawned. There is, however, a danger of treating these developments out of context. Collins, in his article on harvest technology,[1] has drawn attention to the importance of intermediate technology in the development of English agriculture in the second half of the nineteenth century. The mere presence of a reaping machine was not sufficient to ensure its acceptance and application. As long as the supply of labour was satisfactory the attractions of intermediate technology - simplicity, cheapness, easy maintenance, flexibility, and satisfactory labour saving without serious technological redundancy - more than outweighed those of the harvesting machines. The last quarter of the nineteenth century saw a radical change in conditions. The profitability of corn growing declined at a time when labour was becoming more scarce. Economies were essential and there was a greater rate of

1. E.J.T. Collins, 'Harvest Technology and Labour Supply in Britain, 1790-1870', Ec.H.R., 2nd. ser., xxii, (1969), 453-73.

adoption of reaping machines in these years. There is, therefore, a danger of adopting an oversimplified approach to technical change. The mere enumeration of improvements is interesting, and does have a validity of its own, but to suggest that a catalogue of inventions can act as an index of agricultural improvement is naive. It is, of course, essential to know the state of technical development at any time, but the more relevant problem is that of application. Quite simply one must try to determine the rate at which new ideas were adopted, and the impact they had. Thus, for example, one needs to look at the factors involved in the adoption of the milking machine, but to devote time to a detailed study of the Laval separator is unjustified in view of the minimal impact it made on the English dairy industry as a whole.

Concentrating upon the dairy industry, the first question to be answered is one of definition; what constitutes a technical change in the dairy industry? Should one restrict the discussion to better equipment, better animals, and better means of management? Or should one include wider consideration, such as better transport? In practical terms one cannot exclude from the analysis the superstructure within which the dairy industry developed without making a nonsense of the subject.

The two most significant developments, without which there would not have been a liquid milk trade as we know it, were, first, refrigeration, and, second, railway transportation. There is no paradox in this order.

The presence of a railway network was no guarantee of success. As long as milk remained uncooled, and, therefore, liable to rapid deterioration, there was a very real limit to the use of any form of transport, not least the railway. Milk had to be rushed to the station, the churns loaded, and later unloaded, having been subjected in between times to a jolting journey in an ordinary wagon. As Sheldon observed in 1869, 'some people think that they are indebted to the railways for their supply of country milk. This is a mistake. The milk must still have been produced in the immediate neighbourhood of London, had not the method of reducing the temperature of milk by means of the refrigerator been discovered.'[2] The method to which Sheldon was referring was that of Lawrence. The principle was the same as that used in modern coolers[3], and had the advantage of being both cheap and efficient. The use of this cooler in the milk trade owed much to George Barham of the Express Dairy Company. Aware of the necessity of cooling milk, he also knew that the brewers had equipment to chill liquids. Lawrence, in fact, had lent his equipment to the brewing trade. Barham, however, was able to persuade him to modify his device for use in the milk trade. This was done, and the cooler was first shown at the Cardiff Royal Show of 1872. The Lawrence was not the only cooler on the market, but it was the only one that combined efficiency with cheapness. However, there were other cheap methods of cooling milk. The cheapest was the use of snow and ice, a practice found in Scandinavia

2. J.P. Sheldon, Dairying, (1912), 128.
3. For details of the Lawrence refrigerator see Fussell, op.cit., 179.

and parts of American, but it was not suited to the climatic conditions of England. The appearance of the Lawrence refrigerator finally killed any hopes for this scheme.

The cooler held out obvious advantages for the dairy farmer, and from a perusal of the agricultural press of the day it would appear that it was widely adopted in a relatively short space of time. Writing in the Journal of the Royal Agricultural Society of England in 1881, H.M. Jenkins thought the Lawrence to be sufficiently well known for him to do no more than allude to it.[4] This comment, though not false, must be seen in its proper context. It is quite likely that the cooler was well known among that limited section of the agricultural community that read that particular journal, or who went to the Royal Shows, but that is not to say that it was well known among the general body of dairy farmers in the country at large. (More detailed work is needed on this subject. At present the agricultural machinery industry has been sorely neglected by agricultural historians. Until someone has studied this field in depth, and can produce figures for the sales of such items as refrigerators one must depend upon deduction from limited evidence). It is not insignificant that in 1902 L.M. Douglas, writing more particularly about the use of refrigeration in butter making, but having spoken of their use in cooling milk sent to the towns, noted that 'a generation ago refrigerating machines were hardly known...their adoption in dairies or butter factories was slow, and, up to the year 1896, very few machines

4. J.R.A.S.E., 2nd. ser., xvii, (1881), 645.

could be found in such establishments.'[5] The truth of the matter probably lies between the optimism of Jenkins and the pessimism of Douglas. The latter, however, serves as a reminder of the dangers of confusing the appearance of a new technique with its general acceptance and use.

If little is known of the chronology of developments in refrigeration, the opposite is true of railway advance. In 1848 there were just under five thousand miles of rail open in Great Britain. Twelve years later, this figure had been increased to over nine thousand, and by the end of the century was over eighteen and a half thousand miles. Similarly, there was a considerable increase in the volume of goods carried by rail in the same period. The farmer stood to gain in both directions. The railway offered a cheap and fast means of transport to the urban markets, and could also bring into the countryside fertilisers and feed. This represented a major breakthrough for the agricultural community. From the dairy farmers' point of view the potential was not fully realised at the outset because of the problems of deterioration of liquid milk. However, taken together, the railway and the refrigerator opened up new horizons for many farmers. Without these advances the demand for milk would have remained ineffective, and the English dairy industry would have developed along different lines.

5. L.M. Douglas, 'The Application of Refrigerating Machinery to Modern Dairy Practice, J.B.D.F.A., xvi, (1902), 23-4.

II

External changes enabled a redefinition of dairy farming to take place, but there were internal improvements that consolidated the position of the dairy farmer. When one looks at the equipment used in the dairy one is faced with something of a paradox. Writers, and not merely contemporary ones, have described the various improvements in, for example, churns, curd breakers, and so forth, but in no case can these developments be said to have had a marked effect on the dairy industry in England. This is not to say that the Laval separator was insignificant in itself, or that the introduction of standard rennet, or the use of the thermometer was of no importance in the development of cheese making. The point is that these changes took place on such a limited scale in England during the period that their influence was marginal. The Laval in Denmark, or the standardisation of cheese making in America had profound effects upon the dairy industries of these countries - and indirectly on this country - but to devote pages of text to these advances as if they had a direct bearing on English dairying is misleading. The striking feature of both butter and cheese making in England during these years was the unimproved state of manufacturing milk. The practice and traditions of ages past were still followed in many farms. The butter making regions of England tended to be the remoter areas, lacking contact with urban life. These farms, for all their many virtues, were not centres of change in any meaningful sense. Similarly, the failure of the cheese factory system to expand, and the persistence of farmhouse

cheese making meant that there was limited scope for the adoption of new ideas. Small scale production made investment in better equipment or machinery unlikely, while traditional farmhouse customs were a social barrier to advance.[6]

There is, however, one item of equipment that must be considered in greater detail - the milking machine. Official figures for farm machinery were not collected before 1942, thus making it difficult to assess the precise nature of the spread of these machines. The development of the first efficient milking machine in Great Britain did not take place until the last decade of the nineteenth century. William Murchland, of Kilmarnock, invented the first milking machine to work on the principle of continuous suction. The air was drawn by means of a hand pump in this case. The operation of milking a cow took from between eight to ten minutes, a rate that was only average when compared to hand milking time. The initial promise of the machine did not come to fruition. Its action was too drastic, and resulted in damage to the udder of the cow. A new technique, the pulsator, was developed by another Scot, Alexander Shields of Glasgow, and was first shown, under the name of the Thistle Mechanical Milking Machine, in 1895.[7] Technical problems remained a barrier to adoption. Sheldon referred to the ideal milking machine as 'an unsolved mechanical problem'[8] in 1912; a sentiment echoed by Mackintosh a decade later. He continued to comment that 'it is open to doubt if mechanical

6. The improvements that did take place are usefully summarised in Fussell, op.cit., and V. Cheke, The Story of Cheesemaking in Britain. (1959).
7. For technical details, and the pre-history of the milking machine see Fussell, op.cit., 195-9.
8. J.P. Sheldon, Dairying, (1912), 194.

milking has been brought to a stage of perfection commensurate with the time, money and labour which has been spent on the subject.'[9] However, there were other barriers to the general acceptance of the milking machine. In the first place was the expense. McConnell installed a machine in 1903 at a cost of £240. With a herd of 80 the outlay per head was not excessive, but for the smaller dairy farmer this was a considerable sum, and there was no guarantee of success. As McConnell, and several others, found to their cost milk yields often fell as a result of the introduction of machine milking. Moreover, as long as there was an adequate supply of labour the advantages of the milking machine were far from obvious. For the large farmer the saving in wages was attractive, but for the small, family farmer there was none of the same urgency. The question of labour supply was crucial. Thus, it was among the London cowkeepers at the turn of the century that some of the earliest examples of adoption were found. These were the people faced with the most serious labour shortage. Similarly, the effect of wartime conditions on the supply of milkers acted as a stimulus to the acceptance of mechanical milking on many farms. By the end of 1917 some 1,400 to 1,500 herds in Great Britain were machine milked.[10] Even making allowance for the fact that these herds were above average size, the number of cattle being milked by machine could not have exceeded two percent of the total dairy herd. The third interim report on the production and

9. H. Mackintosh, Dairy Cattle, (1923), 59. Despite the undoubted improvements that took place in the functioning of the milk machine in the inter-war years, it was still fairly common to find these machines drawing blood, as older farmers will testify.

10. Final Report on the Production and Distribution of Milk, c.483, Parl. Papers, 1919, xxv; Report of Enquiry into the Use of Milking Machines, p.676.

distribution of milk, published in 1919, carried a report on an enquiry into the use of milking machines. Replies were received from 130 people. The views, though not necessarily typical, shed interesting light upon the subject. The replies clearly show the importance of labour shortage, accentuated by the demands of war. The overwhelming opinion was in favour of reliable hand milkers, but equally clear was the acceptance of the fact that such labour was not available. The replies suggest that the machines no longer did so much damage to the cows - 110 out of 113 said they had had no such injury - but against this must be set the fact that only a very small minority found that it was not necessary to strip the cows by hand after machine milking. Further, just under 30 percent of the respondents found that yields were reduced, while a similar proportion found that the lactation period had been shortened.[11] From the available evidence it would appear that by, say, 1918 the advantages and disadvantages of machine milking roughly cancelled themselves out.

During the 1920s the position began to change, and a clearer advantage to the dairy farmer emerged. With money wages running at approximately double the pre-war level, and the threat of overproduction bringing prices to a disasterously low level, there was a great incentive to reduce costs where possible. The milking machine held out possibilities, but one must beware against exaggeration of its importance. It should be noted that, as late as 1939, only eight percent of the herds, and fifteen percent of cows and heifers in England and Wales were milked by machine.[12] Moreover machine milking was more common in large herds. In a survey of 415 herds it was found that an average of 36 percent

11. ibid.
12. A.Bridges, 'The Economics of Machine Milking', Journal of the Ministry of Agriculture, xlvi, (1939), 63-72.

were machine milked. However, among herds of over 40 the figure was 58 percent, whereas for herds of up to 20 it was between 6 and 7 percent.[13] The same survey concentrated upon 24 herds, of assorted sizes, and found that the advantages accrued to the owners of large herds. In the case of large herds that were not increased in size with the introduction of machine milking labour costs were cut by £1.1 per cow. Where the herd size was also increased, and the smallest increase was 20 percent, labour costs per cow were reduced by £3.2. For the small herd, not increasing its size, there was very little, if any, saving in labour costs. In the case of the small herds that were increased in size, and the increases averaged one third of the original herd size, there was a saving in labour costs of £2 per cow.[14] However, against this had to be set the cost of the machine, and the cost of running and maintaining it; for the small dairy farmer the advantages were not still clear cut.

The most important breakthrough was not achieved within the conventional framework. By a simple reversal of the usual order A.J. Hosier, of Wexcombe in Wiltshire, was able to achieve very large savings in costs, while producing high quality milk on poor land.[15] Instead of bringing the cattle to the machine to be milked, Hosier decided to take the milking machine to the cows. His "milking bail" could cope with 60 to 70 cows, and required the services of only one man and one boy. The system was most popular in Wiltshire and the surrounding counties, where some 110 bails were in use by 1930. The bail system was the

13. ibid.
14. ibid.
15. See Chapter 10 for greater details.

most spectacular example of the substitution of machine for hand labour in dairying. However, it was limited to certain parts of the country. Elsewhere it was only gradually, as technical improvements and changing economic conditions made themselves felt, that the milking machine was used. Of the two major suppliers of milking machines in this country, Alfa Laval and Gascoigne's, the latter did not start up until the 1930s, and by the time of the first census of agricultural machinery in 1942 there were only 23,860 milking installations in England and Wales [16] - approximately one machine to every 150 cows and heifers.

16. Ministry of Agriculture, A Century of Agricultural Statistics, (1968), 71

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Improvements were not restricted to equipment alone. On the contrary, some of the major advances in dairying had nothing to do with machinery, but were concerned with improving the quality of stock and its produce.

It goes without saying that a cow must eat in order to produce milk, and that the composition of her diet was therefore important. During the nineteenth century it became evident that something more than natural foods was required if production was to meet demand. However, the only guide to the correct diet was the stockman's eye. Feeding was an art, based on personal and collective experience, and, as such, was open to considerable variation. At its best this art could produce fine results, but in the majority of cases there was room for considerable improvement. The theory of nutrition was developed during the nineteenth century. The story, from Thaer, through Henneberg and Stohmann, to Kuhn and Kellner, has been told elsewhere.[17] However, if the theory of nutrition had been formulated by the early twentieth century, this was not to say that these changes had effect on the farm. It was not until after the Great War that such people as Boutflour and Mackintosh were able to spread the gospel of scientific feeding to the general run of English farmers.

References to starch and protein equivalents are not to be found in the pages of the agricultural press of the nineteenth century, but practical men were attempting to evaluate the worth of foodstuffs

17. C. Tyler, 'The Development of Feeding Standards for Livestock', Ag.H.R., iv, (1956), 97-107.

in relation to the production of milk. One of the earliest, and best, series of experiments was carried out by T. Horsfall of Burley, in Yorkshire, during the 1850s. Having estimated a maintenance and production ration in terms of hay, (an unreliable index, unfortunately, because of the great variation in composition), he made use of "artificial feeding" to produce a manageable diet. To check the effectiveness of his system, Horsfall kept milk records, and weighed his cattle regularly.[18] This was exceptional, but rule of thumb approaches of this nature were increasingly adopted by the more progressive farmers during the following decades. The most obvious innovation was the feeding of cottonseed, linseed, and oilseed cakes. The benefits were clearly seen. With concentrated foods it was possible to achieve large increases in milk yields. However, there were drawbacks. Cakes were often heavily adulterated, so that their nutritive value was scarcely higher than ordinary cereals, which could be purchased more cheaply. The popularity of cake feeding was not greatly affected by these dangers, and by the end of the century the practice had become near-obsessive, with the result that some cattle were overfed. In part this was no more than the result of excessive zeal coupled with insufficient means of gauging requirements, but the situation was made worse by the frame of mind that placed exaggerated importance on the carcase value of dairy cows.[19]

18. T. Horsfall, 'Management of Dairy Cattle,' J.R.A.S.E., 1st.ser., (1856), 260-83.
19. For example, E. Mathews, Economics in Dairy Farming, (1903), commented that 'overfeeding of milking cows seems to have been more practiced in England than elsewhere, the bulk of the farmers and breeders alike appearing always to have the carcase value of the animal in mind.' p.34.

Import figures show the increased use of such artificial foodstuffs during the nineteenth century. The ease with which this improvement can be charted, however, has given an exaggerated importance to this aspect of dairying. Cows cannot live by cake alone; nor did they. An alternative that became increasingly popular as the century progressed was grain. With prices tumbling the livestock farming was able to gain from the misfortunes of his arable bretheren. A further means of increasing yields was the feeding of brewers' grains. However, one must remember that such food was only a part of a cow's diet. Great importance was attached to the bulk feeding of cattle. By the mid nineteenth century mixed rations of pulped roots with chaff, straw and hay, all of which were steamed, were common. A refinement of this system was to leave the various components in dampened heaps to induce fermentation, which helped in the breaking down of fibrous matter. The use of roots had limitations. For example, turnips imparted a particularly unpleasant flavour to butter. Nonetheless, the practice became popular. Certain experts, Professor Long among them, doubted the value of feeding large quantities of food composed predominantly of water, but in view of the amount of water required in the production of milk, three gallons to each gallon of milk, and the inadequancies of water supplies in many cases, one can but conclude that the feeding of such foods was not so foolish as later writers suggested. In practical terms, there was more to be said for the feeding of cabbage, kohl rabi, and mangold, than there was for experimenting with Long's suggestions of maize and sorghum. Equally,

other forage crops, such as lucerne and Italian rye grass, were more suited to English conditions, and their use marked an advance in feeding methods that had come into practice by the end of the century.

The elements of balanced feeding, as known to modern writers, were all present in the nineteenth century, though some were in embryonic form. The most striking example is that of silage. The use of silos was not a new idea, but it was not until the mid nineteenth century that the idea was applied to forage crops. According to Fussell the idea was advocated in the 1844 edition of Stephen's Book of the Farm.[20] However, little progress was made until the bad seasons after 1879, when the loss of hay acted as a stimulus. A survey of 1885 found that there were some 1,200 silos in use in Great Britain, of which 963 were in England. Numbers reached a peak in 1887, and capacity in 1888, thereafter numbers fell off somewhat.[21] The 1885 survey gives figures for the counties of England. As the use of ensilage was chiefly associated with dairying it is no surprise to find that there were more silos in the dairying counties. Thus, there were 27 in Lancashire, 17 each in Cheshire and Staffordshire, 15 in Gloucestershire, and 11 in both Somerset and Devon, compared with only two in Cambridgeshire and Lincolnshire, and five in Bedfordshire. However, there were certain exceptions. In Kent there were 23 silos, in Norfolk and Surrey 13 and 11 respectively. With comparatively small numbers this was largely accident of personality; one of the leading exponents of ensilage happened to live in Norfolk. But

20. Cited in Fussell, op.cit., 129.
21. Silos and Ensilage, C.4536, Parl.Papers, 1884-5, lxxxiv, p.297.

there was something more to it than sheer accident. Ensilage enabled dairying to be extended to areas that were not suited to all grassland farming. Thus it is not surprising to find a comparatively large number of silos in those eastern counties, where dairying was extended towards the end of the nineteenth century. The large scale development of ensilage in England did not come until after the Great War. As one contributor to the Journal of the British Dairy Farmers' Association commented in 1918, 'up to the present it [ensilage] is comparatively unknown in this country, and is only being practiced by a little band of agriculturalists, whose restless enterprise keeps them abreast of the times.'[22] The enthusiasm of the minority is often misleading. One must not mistake the vocal outpourings of the enthusiast for general belief.

Dairying in England was characteristic of the west, rather than the east, of the country. The basis of the industry was the pasture land of these counties, and in assessing the improvements in feeding one must look to the question of grassland management. There was a strong and persistent belief that the quality of a pasture depended upon its age. It was considered foolish to plough up old pastures, and commonly held that a new pasture could never equal the old, irrespective of the amount of time and money spent. There was a germ of truth in this attitude. The best pastures tended to be the old ones, but this did not mean that they could not be improved, or that no new pastures of good quality could be laid down. Unfortunately, grass was taken for granted. Grass always

22. J.B.D.F.A., 5th. ser., xii, (1917-8), 226.

grew. Only slowly was it realised that good grass needed to be treated like any other crop. As this realisation dawned the unimproved state of English pastures became increasingly apparent. Sheldon, in 1912, observed that 'grassland is too generally left to take care of itself... this widespread neglect being the rule rather than the exception.'[23] A sentiment echoed a few years later by Long, who saw 'the imperfect cultivation of our grassland'[24] as a major barrier to progress in dairying. It was the failure to perceive the need for improvement, the ignorance of ignorance, that was serious. As late as 1876 one writer in a book entitled How to Farm with Profit Arable and Pasture Land, could say that 'permanent pastures...as a rule, do not require manuring.'[25] Fortunately, not all farmers left their pastures untouched. Manure was widely used, and as the century progressed the use of artificial fertilisers, guano, nitrates, phosphates, and so on, increased. In the 1850s the use of bones in Cheshire was a novelty, but by the end of the century the application of, say, basic slag was commonly accepted. The Cheshire farmer, and his neighbour in Lancashire, had fallen behind by the twentieth century, failing to advance upon methods used half a century before. In one respect this is fortunate in that it enables us to get a clearer picture of the extent of improvement made possible by the application of chemical fertilisers to pasture land. On a farm following the traditional practice of applying all manure to the fields,

23. J.P. Sheldon, Dairying, (1912), 42.
24. J. Long, Modern Dairy Farming, (1917), 4.
25. J. Walker, How to Farm with Profit Arable and Pasture Land, (1876), 26.

the cost of purchased food per cow in 1927 was £15. The value of the grass, in the same year, was £1. 13. 0 per acre. The following year lime was added liberally, with the result that the cost of purchased feed was reduced to £10. 11. 7. per cow, while the value of the grass was raised to £7. 11. 9. per acre. In the third year potash and phosphates were applied, again liberally, with similar results. Cost of feed was down to £9. 18. 11. per cow, the value of grass up to £9. 11. 0. per acre. In 1930, the last year of the experiment, three hundredweight of nitro-chalk was applied per acre. The cost of feed per cow was reduced to £8. 3. 9, while the value of an acre of grass had been raised to £13. 1. 7.[26] It should be stressed that production costs were high, but the improvement was considerable. Before applying back to the nineteenth century the experiences of the twentieth, certain points must be made clear. The improvement, though startling in the first years, would not usually continue to increase in the following years. In other words, it tended to be a once and for all improvement, which brought with it a treadmill effect, forcing the farmer to continue improving in order to maintain his position. Second, the quality of the chemicals used, and the knowledge of their use, was lower fifty years prior to the experiment mentioned above. Lastly, the scope for improvement was not always as great as in the particular example quoted. Nevertheless, the potential improvement from the use of chemical fertilisers remains clear.

There were other ways of improving the quality of the grassland. Of these the most spectacular was to drain the land thoroughly. The proud claims of the makers has been echoed by later historians. Orwin

26. J. Orr, Grass and Hay Farming, (1931).

and Whetham claim that 'tile dreins...would do for the clays what the turnip had done for the light lands...'[27] while Sturgess argued that drainage brought about a revolution on the claylands of England.[28] On closer examination this does not appear to have been the case. Jones and Collins point out that very little drainage took place on the clay soils, and was rarely accompanied by the use of artificial fertiliser and oilcake, in the period 1850-80.[29] During the last decades of the century the use of the latter increased, even in clayland dairying areas, but one must beware of exaggerating the importance of these advances.

The latter part of the century saw an increase in the acreage under pasture, at the expense of arable. In part the changeover was a natural one - the land "tumbled down to grass." However, there was a degree of deliberate policy, and attention was paid to the type of seed to be used, and to the general problems associated with grassland management. Advances were made in developing new strains of grass, but the problem of finding suitable grass for the drier eastern counties was not satisfactorily solved until the twentieth century. For the practical farmer the advances in science were of limited period in the period. Adulteration of seed was a serious problem, adding to the lack of knowledge, and lack of capital to invest in good pasture. It should be stressed that conversion to grass involved a double expense. First, the cost of the grass seed, and of new equipment, second the

27. Orwin and Whetham, op.cit., 5.
28. R.W. Sturgess, 'The Agricultural Revolution on the English Clays', Ag.H.R., xiv, (1966), 574-9.
29. E.J.T. Collins and E.L. Jones, 'Sectoral Advance in English Agriculture, 1850-80', Ag.H.R., xv, (1967), 65-81.

foregoing of the income from the wheat, or some other crop, for that particular year. During a time of falling incomes from corn the capital outlay involved in a proper conversion to grass could be, and often was, prohibitive. As a result many third rate pastures were used, with far from satisfactory results.

It could be argued that the advances in grassland technique would have benefitted the established dairy farmer. With better seeds available, and greater expertise percolating through the agricultural community, the potential was there for most, if not all, to realise. Theoretically this line of argument is sound, but it fails to allow for the strength of the status quo. Old beliefs die hard, and only a small minority of the dairy farmers in England would consider ploughing up and reseeding their pastures. In an age that may be termed "pre-mass media", when the "big sell" was not even a figment of Orwellian imagination, the process of adoption of any new idea was extremely slow. The picture, however, is distorted by the fact that only the progressive farmer tended to be articulate, and, therefore, to leave records, thus giving a false weight to their views. Silence, however, eloquent, is difficult to evaluate, but in those circumstances the atypicality of the prize winner at a Royal Show, or of a contributor to the agricultural press must be emphasised.

Not all was stagnation, however. Slowly but surely advances were made. The use of water meadows, or the growing of Italian rye grass were ways of getting an early bite that were adopted from the mid-nineteenth

century onwards. Stimulants, such as grains from the breweries and distilleries, were increasingly used, and in the last quarter of the century the feeding of corn became more widespread. Further, there were improvements in the equipment used. The mower, the tedder, and the rake were common by the turn of the century. In 1875 a two horse mower could be purchased for under twenty pounds. A horse rake and a tedder could be bought for under ten pounds each. This was not a prohibitive sum to pay. With labour costs rising, the mower was an obvious advantage, particularly as it held out the prospect of reducing the risk involved in hay making, by reducing the time taken in the process.

Having looked at the improvements in feeding that characterised the second half of the nineteenth century, one must attempt to assess the overall impact. The danger lies in exaggerating the amount of change. Writing in 1878 Morton gave the following summary.

> 'On ordinary dairy farms...the cows graze in the cow pastures during the summer, and as a general rule get nothing else, except perhaps a help with cabbage and clover or vetches brought to them when the grass is short. In winter they get mangolds and hay and perhaps some grains...or where they are treated better they may receive decorticated cotton cake and meal, in addition....'[30]

By the end of the century the position had changed somewhat. The consumption of cake was more widespread, and there was a growing awareness that cows needed to be fed according to their individual production needs. The custom of low feeding during the dry period was no longer prevalent, but the habits of 1900 were more like those of 1850 than of 1930. The potential was undoubtedly present, but the problem was one

30. ibid., 74.

of application. The breakthrough came in the interwar years, with the propaganding work of Boutflour and Mackintosh. Many of their ideas - opposition to excessive bulk feeding, balanced rations according to individual needs, and the importance of an adequate water supply - can be found in the nineteenth century, but they were restricted to a few people, and their impact was limited. By the 1920s these ideas were in common circulation among ordinary dairy farmers.

Notwithstanding the very real limitations outlined above, cattle in 1900 were better fed than in 1800, or even in 1850. New ideas and new techniques were slowly spreading through to the lowest levels of the farming community, and the full impact of the discoveries in nutritional theory was felt in the 1920s and 1930s. However, it is misleading to treat feeding in isolation. It was but one aspect of livestock management, and must be considered in conjunction with breeding. Herein lies the clue to the paradox that yields did not improve markedly at a time when the quality of feeding was improving. As long as attention was directed chiefly at meat, rather than milk, yields remained low. The "Shorthorn Craze" of the mid nineteenth century did considerable damage to the dairy industry, offsetting the gains from better feeding. Not until breeding and feeding policies were directed specifically to milk production would there be a dramatic improvement in yields. Strictly speaking this did not happen until the late 1930s and after the second world war. However, attitudes were changing, and this could be seen in 1900. Then were sown the seeds, the fruits of which were to be reaped in the mid twentieth

century.

The importance of a high quality national dairy herd can be readily appreciated, and there were plenty of writers during the period who advocated change in this direction. The quality of the average dairy cow was far from high, as a result of a combination of factors. The Show Ring mentality, though bringing profits to a few, was harmful to the farming community at large. The emphasis on dual purpose animals retarded the development of specialist milk breeds. All too often good milkers were slaughtered at an early age to make money in the short run, but thereby limiting long term progress. Lastly, the absence of good quality bulls in large numbers vitiated any attempt at a general improvement. Taken all-in-all, there were very few advances made in the sphere of cattle breeding during the nineteenth century. However, there was a growing awareness of the possibilities of improved breeding. Many practical farmers were developing deep milking cows by the common sense approach of using the highest yielding cows with good bulls. Rather than use any scrub animal, attention was paid to the record of the offspring to judge the merits of the sire. It is not easy to decide how widespread such practice was. By the end of the century improvement was under way, but one must not exaggerate. Improvement based upon empirical methods was inevitably slow, but there were other disadvantages. It is said that "like begets like", and to a certain extent this was true, but line breeding had its limitations, depending upon the breed of cattle. In particular, the Shorthorn was not a good

linebreeder. Thus there was little overall progress in the knowledge of scientific breeding, and this lack of progress curbed the potential gains that might have stemmed from better feeding.

The application of new knowledge was bolstered by attempts to foster and record progress. A registration scheme was introduced in 1914, but its impact was limited during the 1920s. More important was the spread of milk recording. The idea gained popularity in the late nineteenth century, largely under the influence of the British Dairy Farmers' Association, which organised yearly trials that illustrated the virtues of recording. The idea had an attractive simplicity. By keeping a regular check, either weekly or daily, on the quantity of milk yielded by each cow, it was possible to improve overall yields by weeding out poor producers, and using the deepest milkers as breeding stock. The references to the low standards of the majority and to the high yields of the few, it was suggested that great improvements were possible. Many of the claims were grossly exaggerated, and the suggestions were hardly suited to conditions on the majority of farms. The idea of milk recording did not catch on rapidly. In part this was due to the communication gap between the enthusiasts and the average farmer; in part the result of conservatism, and an unwillingness to take on extra paper work. Official recognition did not come until 1914, when the first national milk recording scheme was set up by the Ministry of Agriculture. The first year saw 16 member societies, including 264 farmers, 396 herds,

and 7,331 cows. The war years did not facilitate the spread of the scheme, and in the year 1917/18 there were only 27 societies with 8,755 cows. Following the war numbers rose, reaching 52 societies in 1920/21. The advantages of the scheme can be judged from the fact that the average yield of the cows registered rose from 579 gallons in 1918/19 to 687 gallons five years later.[31] This was a considerable increase, but the scope of the scheme was limited. The number of cows registered in 1922/23, some 63,000, represented less than five percent of the total dairy herd. Under the influence of the Milk Marketing Board the scheme was extended, but in 1939 it was noted with regret that 'taking the country as a whole official milk recording has not been enthusiastically adopted, for at the present time records are being taken of only some 6 percent of the cows.'[32] Undoubtedly there were unofficial recordings being taken, but once again one must conclude that this innovation had but limited impact on the dairy industry as a whole.

Attention was also paid to the quality as well as the quantity, of the milk supply. Developments in bacteriology helped to change the nature, and opinion, of milk. The discovery of tuberculosis bacilli in the early 1880s, and the association between human and bovine tuberculosis was the first step towards eradicating the threat. During the two decades before the Great War the process of pasteurisation was developed, but in the face of opposition from the medical profession. The sale of treated milk was limited. Firstly, it was largely restricted to infant feeding, secondly there were only a small number

31. Ag.Mkt.Rep., xxi, (1924), 26th Sept., p.2.

32. J. Mackintosh, The Evolution of Milk Production, in Essays Presented to Sir Daniel Hall: Agriculture in the Twentieth Century, p.406.

of producers and sellers. People such as Lord Rayleigh and Rupert Guinness, second Earl Iveagh, were exceptional men, in the forefront of the advances in the production of T.T. milk.[33] Similarly, such retailers as Ben Davies, and the Lane family were in the forefront of the drive for the sale of pasteurised milk.[34] However, it was not until after the war, when the Express and United Dairies decided to sell pasteurised milk in London, and the Midland Dairy Company did likewise in Birmingham, that the consumer felt any benefits.

Despite the health benefits of clean milk, demand was limited. This was largely the result of the high retail price. Clean milk from the Guiness dairy sold at one shilling a quart, fifty percent above the price of normal milk.[35] From the producers' point of view there was little financial incentive to improve the quality of the milk supply. The production of Grade A, clean milk, involved extra expense. First, there was the capital outlay on a well provided cowshed, with an adequate water supply, easy draining floors, and equipment, in the form of steam boilers, and sterilising chests. Second, there was the extra labour cost involved in keeping the cows clean. Third, was the expense of the tuberculin test itself, and, lastly, sundry costs, such as fuel, filters, and a licence. According to one calculation the extra cost of producing T.T. milk in the mid 1920s was £6.13.10 per cow, or 2.86d. per gallon.[36]

33. G. Martelli, The Elveden Enterprise, (1952), p.80. It is interesting to note that Lord Elveden was co-founder of the Tuberculin Tested Milk Producers' Association, which was intended to educate the public as well as to protect its members.
34. E. Capstick, Dairying Through the Ages, (handout from United Dairies), p10
35. Martelli, op.cit., 78.
36. V. Liversage, 'The Economic Aspect of Grade A (T.T.) Milk Production', Scottish Journal of Agriculture, ix, (1926), 1-9.

As long as there was no official recognition of T.T. milk, and no guaranteed extra returns there was no incentive to produce. The 1922 Milk and Dairy (Amendment) Act laid down standards for all milk sold as pasteurised. Heat treatment was prescribed - the milk had to be held at a temperature of 145-150 degrees fahrenheit for half an hour - thus deciding between the flash and holder methods of pasteurisation.[37] In practice a differential of 3d. a quart became accepted for the sale of Grade A milk, but it was no more than a convention. However, in conjunction with legislation on the standard of milk, and on the conditions under which it was produced, this was probably the most important advance in the dairy industry from the consumers' point of view.

Bacteriology also came to the aid of cheese and butter making. In his text book on dairying, written in 1912, Sheldon devoted a complete chapter to what he saw as 'the predominant achievement of our time, so far as the art and science of dairying are concerned.'[38] The isolation of the bacilli acidi lactici was of great significance, in that it enabled greater control to be exercised over the making of cheese, but in practical terms farmhouse cheesemaking was not affected to any significant extent by these discoveries. Cheese and butter making in England was in decline, and, though a few young ladies educated at Reading may have spread the gospel of bacteriology in the dark lands of

37. The "Flash" system, also known as the H.T.S.T. method, involved heating the milk for 15 seconds at 161 degrees fahrenheit. The holder system involved holding the milk at 145 degrees fahrenheit for 30 minutes.

38. J.P. Sheldon, Dairying, (1912), 285.

rural England, the old ways of cheese making, owing little to scientific advances, persisted. Sheldon summed up his chapter on Bacilli in Dairying with the observation that

> 'science has won for us more than half the battle, in isolating and cultivating and testing different kinds of bacilli...It remains for dairy managers...to reap the results of the victory by administering...the rules and regulations...with which every intelligent dairyer is familiar.'[39]

By this criterion there were few "intelligent dairyers" in the country, but more significant was the fact that, as far as England was concerned, the battle which science was winning was largely irrelevant.

39. Ibid., 309.

IV

The development of the dairy industry, in particular the rise of the liquid milk trade, was inevitably accompanied by technical change, however defined, but there was nothing spectacular to be compared with the advent of harvesting machinery. Traditional dairying had changed little in the course of the nineteenth century. The milk trade was something new, but the essential prerequisites, refrigerators and railways, were part of wider advances. The scope for mechanisation within the dairy industry was limited, all the more so as cheese and butter making was in decline. The mowing machine, the tedder, and the hay rake were developments, but not specifically associated with the dairy. The cream separator in the butter trade, and the use of the thermometer, standard rennet, and improved curd cutters, in the cheese trade were an important advance, but largely irrelevant to English conditions. The one major mechanical advance was the milking machine, which made no real impact even in the late 1920s.

Technical advances were not simply a question of new machines. The benefits of science were translated into improved knowledge of breeding and feeding. The former was still largely a matter of empirical advance, for the breakthrough in genetics did not reach the practical farmer on any significant scale before 1930. In the latter, theory had been transformed into practice by the end of the period. Better food was being put to better use by the 1920s. Lastly there was a significant improve ent in the quality of milk produced, which again came to the fore in the 1920s, but which can be traced back to the last decades of the nineteenth century.

Looking at the agricultural sector as a whole it becomes evident that any meaningful comparison is very difficult to make. An index of mechanisation sounds attractive, but it is difficult to construct. Likewise to talk simply in terms of labour productivity has its failings. In terms of output per man, production in the dairy industry fell between 1860 and 1910, but in a very real sense the product of 1910 bore little resemblance to that of 1860. It was not until the introduction of the milking machine on a large scale that there was a marked increase in output per man. The difference in time between the advent of the reaper and that of the milking machine highlights the problem of making comparisons between technical change in different branches of agriculture. Technological change does not come out of a vacuum, but is essentially a response to changing needs. Notwithstanding the major structural change took place in the dairy industry in the second half of the nineteenth century, it had not run up against the limits of hand technology until the turn of the century. Only then did it become necessary to find mechanical aids. As the necessity became more acute developments proceeded apace, but unlike with harvesting there was no intermediate step. Thus to talk of arable farming being more advanced than livestock husbandry simply because of the presence or otherwise of machinery is to adopt a simplistic approach that obscures the fundamental importance of the changing economic conditions that influenced agriculture as much as industry.

CHAPTER 8

The Marketing of Dairy Produce.

I

The marketing of any agricultural products involves a complex set of arrangements to link the numerous scattered producers and consumers. However, the dispersal of production, and consumption is but one aspect of the problem. Seasonal production, perishability, and the uncertainness of weather and disease, all add to the complexity and costliness of marketing. The dairy industry was no exception. However, in putting a new commodity, that is liquid milk, on the mass market, it provides a good example of the problems involved in the development of an efficient marketing organisation.

The marketing of liquid milk presented particular problems. As a result of its perishability, producers and consumers had remained in close proximity to one another over the years. This was in contrast to the general trend. Since the late sixteenth century the growth of large urban centres of population had actively broken down the old, local self-sufficiency. The physical separation of producer and consumer had called into being a new class of middlemen, and had led to the formation of a national market, in place of the collection of local markets that characterised pre-industrial Britain. Thus all types of foodstuffs were brought into the growing cities to meet the many and varied demands. [1]

1. For example see N. Gras, The Evolution of the English Corn Market, (Cambridge, Mass., 1926). R. Westerfield, The Middleman in English Business, (Connetiout, 1915). F.J. Fisher, 'The Development of the London Food Market', 1540-1640', Ec.H.R., v, (1933), 46-64., F.J. Fisher, 'The Development of London as a centre of conspicuous consumption in the sixteen and seventeenth centuries,' Transactions of the Royal Historical Society, 4th.ser., xxx, (1948), 37-50.

The one exception to this trend was milk, which was produced within towns well into the nineteenth century. The explanation was quite simple. In the absence of satisfactory means of preserving milk in its pure state for any length of time, the rate of deterioration of milk, combined with the speed of whatever form of transport was used to carry the milk, set a limit upon the area within which the production of milk could take place. With a fast horse this limit was about five miles at the maximum. During the seventeenth and eighteenth centuries the supply of liquid milk from town cowhouses, and suburban farms was sufficient to meet demand. Even London, by far the largest city, was not totally isolated from the countryside. A thirty minute walk was sufficient to bring the traveller to green fields. Furthermore, there were large tracts of land within the city limits which were devoted to agricultural purposes. In other towns and cities the presence of the countryside was even more immediate. However, as the percentage of the population living in towns increased, as the towns grew in size, so the countryside was banished further from the everyday life of greater numbers of people. This was not merely an aesthetic loss. The number of cows kept in the urban areas tended to become increasingly inadequate for local needs. The amount of land available for grazing decreased, both relatively and absolutely. There were two possibilities: either the supply of milk could have remained stagnant, while demand rose which would have resulted in higher milk prices, and lower per capita consumption, or new, extern l, sources of supply could have been found.

In a sense there was never any choice because external sources of supply were already in existence. The problem was to provide the link between country supplier and town consumer. For this problem to be solved two technical prerequisites were essential. The first was an efficient means of preserving milk beyond its normal span; the second was a transport system capable of reaching the numerous, but scattered, producers, and bringing their produce to the compact, but distant, urban markets.

Before looking in greater detail at the changes that took place, a word of warning must be given. Although the growth of "railway milk" is the most striking, and most important development of the nineteenth century in the dairy trade of England, it would be wrong to suggest that, by the end of the century, the liquid milk trade was carried largely, or wholly, by the railway system. This was emphatically not the case. The producer-retailer, living on the edge of any town or city, was of importance in 1900, even though his position had been partly eclipsed by the advent of rivals further afield. In the large cities his importance was least, but even here he was to be found. In the medium and small sized towns he remained a figure of considerable significance.

The necessary breakthroughs in refrigeration and transportation came in the nineteenth century, and enabled the growth of the rail borne milk trade to take place. As milk poured into the large cities a new figure, the wholesaler (or wholesaler/retailer) emerged, and was soon

to assume considerable influence over the milk trade. This development was most clearly seen in the capital, and it is here that attention will be focused, but it should be remembered that similar changes took place, on a smaller scale and, usually at a later date, in the other cities of England.

London, in 1860, received the greater part of its milk from internal sources of supply. There were at that time some 2,900 dairymen and an unspecified number of itinerant milk vendors.[2] The broad shouldered Irish milkmaid, carrying the milk on a yoke, was a common sight. The trade was poorly organised with the result that the large number of suppliers led to cut throat competition which helped to keep the urban milk seller at a low standard of living. However, as the quantity of milk carried into London by train increased, a new pattern slowly emerged. One of the leading figures was George Barham, who, almost alone, built up the first milk company based on the railway trade. His father, a dairy farmer from Kent, had come to London in 1827, and had set up a milk shop as well as having a milk round. His son, though apprenticed as a carpenter and builder, showed an early liking for his father's trade. On his own initiative he set himself up as a balancer, that is he acted as a go-between, balancing off surplus and deficit between various cow-keepers. His first dairy shop was purchased in 1858, and six years later he moved to Museum Street, Bloomsbury, near Kings Cross station,

2. Anon, 'The Supply of Milk - Natural and Artificial', F.M., 3rd. ser., xx, (1888-89), 500-1.

and set up "The Express Country Milk Supply Company". The crisis of 1865 helped to make Barham's reputation as a supplier of clean milk. This was to become a constant preoccupation, as the founding and furthering of the Dairy Supply Company bore witness. By the early 1880s, when the concern became "The Express Dairy Company Limited", it was the largest in London. Milk was brought from thirty counties, and retailed from Barking to Richmond, and from Wood Green to Tooting.[3] But it was not the only company. The Express had rivals in the form of the Aylesbury Dairy Company, the Belgravia Dairy Company, the Great Western Farm Dairies' Company Limited, the London, Gloucester, and North Hampshire Dairy Company Limited, and Welford and Sons Limited, all of whom competed in the London Milk trade. Moreover, these were the only companies that survived. With the boom in liquid milk during the last quarter of the nineteenth century, several companies were floated, but sunk rapidly, and the trade became increasingly concentrated in fewer hands. Gibbon, writing in 1889, commented on 'the tendency of the present day to concentrate matters in the hands of companies... evidenced by the fact that the large bulk of the wholesale milk business in the metropolis is in the hands of a very few men.'[4] As the large companies extended their grip on the trade the number of small men stagnated, in 1895 there were 1,450 compared with 1,465 in 1870, and finally declined. Similarly, the number of cowkeepers decreased as the

3. For greater detail of the Express Dairy Company see B. Morgan, Express Journey: A Centenary History of the Express Dairy Company, Limited, (1964).
4. G. Gibbon 'The Dairy Industry: Past and Present', J.R.A.S., 3rd. ser. xx, (1888-89), 123-35.

century progressed. The emergence of a group of powerful wholesalers affected all parties involved in the liquid milk trade. The wholesaler was the lynch pin of the system, but his power was out of proportion to the role and function he fulfilled. By the end of the century the milk trade was concentrated in so few hands that these men were able to dictate prices in both directions. There was little competition between the companies as it was in their interests to maintain stability, but even when one company did cut retail prices, as the Aylesbury Dairy Company did in 1891, the effect was felt by the producer, who received reduced prices, despite the efforts of various county dairy associations. Thus the farmer, already in a weak position owing to this isolated position, could not hope to get a better price by "touting around." There were many cases of dairy farmers going to London, visiting each firm in person in the hope of getting better terms, but in few cases was the ploy successful. The retailers were not in a stronger position, unless they had other sources of milk. Otherwise, like the farmers, they had to accept the price stated by the wholesalers. Thereafter they could, and did, undercut one another, but the risk was theirs, not the wholesalers'.

Although the importance of the food supply to the towns and cities has for long been recognised, comparatively little work has been done on the subject. There are no detailed studies of the major dairy firms, though it is true that some firms have published centenary histories which contain certain interesting facts. However, some indication

of the size and profitability of the trade can be obtained from the figures quoted in the annual Stock Exchange Year Book. The most important company was the Express. In 1865 its authorised and paid up capital was £100,000, at which level it remained until 1919, when it was raised to £200,000. The following year saw a further doubling of capital, but there was no further expansion until the end of the decade. During this time the company paid its shareholders a dividend that ranged between 4 and 8 percent. Between 1890 and 1910 the dividend that was paid averaged about 6 percent. After the war the position was better, dividends being 8 percent in every year, except 1926 when it fell to 6 percent. The Express, however, was not alone. The Aylesbury Dairy Company, registered in 1866, rivalled it in size, but not in success. The period of greatest expansion for the company was from 1875 to 1887, when the paid up capital was increased from £44,000 to over £215,000. From 1889, until its voluntary liquidation in 1926, paid up capital remained constant at £216,000. The company did not enjoy the same success as the Express. During the two decades after 1865 things went well, and the company paid dividends of 10 percent in fourteen of the years, and it never fell below 5 percent. Thereafter the position became bleaker. In five of the following six years there was no dividend paid out. In 1892 a dividend of 10d. in the £ was paid, and by the turn of the century this had risen to 1/3d., but hopes of a prolonged revival were soon dashed. By 1912 the dividend was down to 5d., and from 1914 no dividend was paid. More successful was the

company of Welford and Sons Limited, which was first registered in 1883. Paid up capital was £84,610 in 1885, and was increased to £149,997 in 1891. During these years the dividend paid rose from 10 to 20 percent. It fell to 10 percent in 1892, but remained at that level until 1912. The Dairy Supply Company was in a similar position, paying a dividend of about 7½ percent between 1880 and 1915. Lastly, one might illustrate the profitability of the large dairy companies by reference to the Belgravia Dairy Company, yet another company that started in the 1880s. Paid up capital was only £15,897 in 1883, two years later it was £55,000, rising to £75,000, and later £85,000 in 1886 and 1897 respectively. During these years the shareholders received a dividend of 8 percent, and of 6 percent in the period 1897 to 1913. Although the profits enjoyed by the dairy companies were not large when compared with other firms, there was still a marked contrast between the fortunes of the wholesalers and those of the producer and retailer in the last decade of the nineteenth century.

After 1900 there was a further burst of activity. One year previously the Metropolitan and Suburban Milk Supply Association took over the Great Western Farm Dairies' Company Limited, and assumed the new name of the Great Western and Metropolitan Dairies Limited. The authorised capital was raised, and paid up capital reached £123,500 in 1902. The Company extended its trade successfully, and emerged as a rival to the Dairy Supply Company and the Express. Another new rival

came from the west country at the same time. Wiltshire United Dairies Limited was the outcome of a series of amalgamations that had taken place at the end of the century. 1907 saw a crucial change in policy, when the company acquired the wholesale branch of the London, Gloucestershire, and North Hampshire Dairy Company. A small scale wholesale business in Paddington had been acquired six years earlier, but the big expansion in its trade took place in the years before 1914. However, the development of competition was curbed by the pressures of war. The demand for horses, as much as for men, turned antagonists into allies. In 1915 the Dairy Supply Company, Wiltshire United Dairies, and the Great Western and Metropolitan Dairies combined to form United Dairies. In 1915 the paid up capital was £832,999, three years later the figure had doubled, and reached over £5 million by 1930. At that date the company controlled over 750 shops, and just under 60 creameries and condenseries in England and Wales.[5] Moreover, it had paid its shareholders a dividend of between 10 and 14 percent.

With extensive interests in both the wholesaling and retailing of milk U.D. handled some 65 percent of the London milk supply. Such a hold on the market enabled the company to dictate the nature of the trade. The great platform milk markets of Paddington, Euston, Marylebone, and Clapham Junction gradually died out as the result of reorganisation and co-ordination. Equally signficantly, the quality of the milk supply was improved. By the end of the nineteenth century

5. Stock Exchange Year Book, (1931), p.3,139-40.

all the big dairy companies had set up country cooling depots, as well as having depots near the rail terminii in London. Furthermore, pasteurisation was gradually introduced for "nursery milk", despite the opposition of certain medical officials who had looked upon the practice as little more than a device to keep badly produced milk sweet long enough to sell it. The directors of U.D. decided that, as soon as the necessary building and equipment was available, they would pasteurise and bottle all the milk they sold. There was an element of risk in the decision. The extra expense of bottling milk, and of delivering bottles, put the company at a disadvantage when in competition with firms selling loose milk. However, with such a hold on the market U.D. was able to go ahead with a degree of confidence. Fears, if they were entertained, proved unfounded for the other retailers quickly turned to pasteurisation and bottling. For the consumer the benefits were obvious. There was a marked reduction in the incidence of infantile diarrhoea during the 1920s, and the cleaner milk supply was in part responsible.

The late nineteenth and early twentieth centuries saw important changes in the retailing of milk. The milkmaid, with yoke and pail, had disappeared from the streets of London by the 1870s. However, her demise did not mean the end of street vending. The producer-retailer still hawked his wares, in rivalry which verged upon open warfare with his competitors. There was, however, a distinct group of retailers, who acquired their milk either from the cowshed, or from the railway

station, or from one of the wholesale firms, and sold it from a shop. However, to hold their position in the market these retailers were forced to take to the streets, and deliver milk to their customers. It was no longer enough to provide the item, expecting the customer to come and buy. Nowthe customer had to be wooed. The lead was taken by the big retailing companies, who, as well as providing better quality milk, were prepared to deliver, in small quantities, three times a day, as well as offering side lines such as general provisions, eggs in particular. In one respect the service was first rate, but overall it proved expensive, and it was the customer that had to pay.

The milk roundsman was not the only immediate source of supply available to the general public. The growth of multiple shop retailing effected the dairy trade, as it did the trade in other foods and clothing. The Express was in the forefront of this movement, combining the retailing of milk and milk products with the sales of snacks. By 1900 the firm had 24 cafes, and was a rival to Joseph Lyons. Some idea of the breadth of interest involved can be gauged from the fact that Barham tried, unsuccessfully in the event, to take over Sainsbury's. Notwithstanding this setback, George Barham, on his death in 1913, left the company with 18 dairy branches, 15 shops, and 59 tea shops. Five years later the number of dairy shops had risen to 50, while there were 70 tea shops. The only rival was United Dairies. In 1920 U.D. had 470 shops, almost all of which were in the London area. Between these two firms were 68 percent of all multiple shop branches involved

in the dairy trade, and the figure had risen to 73 percent by 1930.[6] However, one must not exaggerate the importance of the multiple retail shop. In 1920, when there were 17 firms and 750 shops, they accounted for some 6 to 7 percent of the retail trade in dairy products, while in 1930, when there were 20 firms and 1,298 shops, they only accounted for 16 percent of the trade.

6. J.B. Jefferys, Retail Trading in Britain, 1850-1950, (1954), 232.

II

The rise of the liquid milk trade in the second half of the nineteenth century necessitated the development of a marketing system to deal with the particular problems of the trade. Having described the system that evolved in London, it is time to look at the costs involved in the marketing of milk. Almost by definition, the middleman was accused of making exorbitant profits, while providing no real service. Not all such attacks were so crude, but their persistence suggests that a closer look is needed. However, it is striking that there is little information on the costs of the various stages of marketing before the Linlithgow Committee's study published in 1924.

In the years immediately prior to 1914 the wholesalers in London charged, on average, approximately 1½d. a gallon more to the retailer, than they paid to the producer for milk delivered in London. During the period of wartime control, from April 1917 to January 1920, the margin for purely wholesale functions was fixed at 5d. a gallon, less the cost of rail freight. (The state bore the cost of any loss arising from the manufacture of surplus milk). In the summer of 1923 the margin had fallen to about 3½d. a gallon, but rose to 4d. a gallon during the following winter. At that time the wholesaler was buying at 20d. a gallon, and selling at 24d. The retail price of milk was 8d. a quart, or 32d. a gallon. The Linlithgow Committee, having examined the various estimates of the costs of handling liquid milk, concluded that the cost of pasteurisation, clarifying, and cooling, averaged out at 1½d. a gallon, but could range from as little as ½d. to 2d. The net profit

accruing to these firms was not as large as one would imagine from these figures. There was, for example, the large wastage of whey, and the cost of churns to be offset. Nonetheless, as the committee concluded, 'even after making due allowance for the reduced margin realised in practice...the nominal margins of 3½d. and 4d. at present obtaining in Glasgow and London respectively and in certain other cities are more than the trade should be called upon to bear for purely wholesale services....'[7] It is more than interesting to note that the co-operative wholesalers operated on margins of 1½d. to 2½d. From these figures it would appear that profits of up to 2d. a gallon were being made on wholesaling functions, a margin that many dairy farmers would have been pleased to have made in the 1920s.

However, it would be wrong to suggest that the relatively high cost of milk was simply the result of rapacious milk companies, using their strong position to dictate prices. The retailing of milk was an expensive process, made worse by the lack of overall organisation. Four types of retailing can be distinguished. First, there was the producer-retailer. Outside the cities this was the major source of supply. By going direct to the consumer there was the possibility of getting a larger profit, without forcing up the price of milk. Thus, in some villages, as late as the 1920s, prices were 2d. and 3d. a quart cheaper than in London. But with the growth of the large milk companies it became increasingly difficult to control even the local market. The

7. Ministry of Agriculture, Departmental Committee on Distribution and Prices of Agricultural Produce, Part 1, Milk and Milk Products, (1924), 32.

producer-retailer, however, had one trump card - he could undercut the largest of firms, providing he was prepared to work very hard at the task. And this many dairy farmers were prepared to do, but there was a limit beyond which it was no longer worthwhile, physically or financially, to go. Consequently, one found that paradoxical situation, noted by Jefferies in the 1870s and confirmed by Rowntree at the turn of the century, of an undersupply of milk in the very areas of greatest milk production.

A second type of retailer was the one who bought direct from the producer. There was considerable variation within this group, depending upon locality. Strictly speaking such retailers should have been in a position to offer lower prices, but the Linlithgow Committee noted the tendency of certain small scale retailers to charge London prices when buying from rural producers, whose costs of production were as low as 4½d. a gallon.[8]

In contrast to the small men were the wholesaler-retailers. The big dairy firms that had emerged at the turn of the century were not content to confine themselves to the wholesaling side of the trade alone. In all the large towns and cities of England there were large concerns, dealing with both sides of the trade, of which the largest was United Dairies. According to Linlithgow, the nominal margin after the Great War was 1/- a gallon, in comparison with pre-war figures of 5½d. in winter and 8½d. in summer. The position of the large concerns was open to question. Although it could be argued that the rise in

8. Ibid., 40.

costs during the war accounted for this margin, but it was undoubtedly true that the rationalisation of the retail trade, which had resulted from the growth of these large firms, went a long way towards offsetting the rise in wages and rents. The major criticism to be levelled against these firms was that they were in a position to reduce their margin on retailing - at least one large concern kept its total costs down to 8½d. a gallon - but did not do so. United Dairies argued that to do so would lead to the ruin of many smaller retailers. This was true, but the argument, with its veneer of consideration for the smaller man, cost U.D. nothing. On the contrary, it provided a cover for profitable action. Yet, it could also be argued, the wholesalers were acting against their own long term interests. One estimate claimed that a reduction of 4d. a gallon would have resulted in an increased consumption of milk of some 15 to 20 percent.[9] Such an estimate exaggerated the elasticity of demand for milk, but it was true that milk became relatively more expensive during the 1920s, thus limiting the growth of demand.[10] A reduction in price could well have brought benefits to the milk companies, as well as to their customers.

The last group were the retailers who brought their supplies from the large wholesaling firms. In the winter of 1922-23 the nominal margin for the retailer, purchasing the exact requirements, was 8d. a gallon in London and certain other cities. More generally in the provinces the margin was 6d. to 7d., which was approximately the pre-

9. ibid., 57.

10. see Chapter 9.

war figure for London. In the decade after 1913 the retailer had had to come to terms with several new problems. The emergence of the large wholesaler-retailers was a serious threat, particularly if they decided to cut prices. At the same time costs were rising. It was dearer to rent premises in 1923, while money wages had doubled. In 1914 a roundsman would do a 56 to 60 hour week for 25/- to 30/-, ten years later he was receiving 65/- for a 54 hour week. This was a considerable rise for wages accounted for some 55 percent of retailing costs, and it was impossible not to pass some of the extra costs on to the price of milk. But as rising costs made the small retailer uncompetitive, he found that the increasing number of fellow retailers, as well as the irregular retailer buying cheap from the railway station, plunged him into a situation of ever increasing competition. Consequently all sorts of measures were adopted to hold on to customers. Prices were reduced as far as possible, and, when this had been exhausted, a variety of services - thrice daily deliveries, the delivery of small quantities of milk on request, and so forth - were offered. Yet the customer, though receiving an incomparable service, had to pay for it. Quite simply there were toomany retailers, but the benefits of competition were lost in a welter of inefficiency. Over-lapping rounds, an inordinate number of shops, and labour consuming services pushedup the retail price of milk. Yet the sad truth remained that the small retailer, relying solely on the sale of milk, could only make ends meet on a margin of 8d. a gallon. The evidence for conditions outside London is so scanty that it is difficult to generalise,

but there seems to be little doubt that the basic problems, though in a less acute condition, were to be found in the provincial towns and cities.

TABLE LIV

Margins in the Marketing of Milk

	Contract Price	Wholesale Price	Retail Price	Margins Wholesale over Contract		Retail over Wholesale	
	d.	d.	d.	d.	%	d.	%
1855	6	8	14	2	33	6	75
1913	9	10.25	16	1.25	14	5.75	56
1918	20.7	25.7	31.7	5.0	24	6.0	23
1923	16.5	20.8	29	3.5	21	9.0	45

Source: G. Dodd, 'The Food of London', op.cit., p.376. Ministry of Agriculture, Departmental Committee on the Distribution and Prices of Agricultural Produce, (1924), Part 1, pp.7, 27.

It is difficult to summarise conditions that stretched over 70 years of considerable change. However, certain points do make themselves clear. The development of a market system for milk, owing to the peculiar nature of the commodity, and the separation of country producer and urban consumer, led to an imbalance that gave too much influence to the wholesaler, at the expense of the producer, retailer, and consumer. Owing to the piecemeal development of this system there was much wasteful duplication in collection and delivery that raised prices, without bringing any benefit to any of the groups concerned, except, perhaps, the customer. However, beyond this comparatively large profits were made by the large milk companies, who, by using their position to maintain prices artificially, did a disservice to the consumer, and ultimately to the producer, and probably acted against

their own long term interests by restricting the growth in consumption via high retail prices. This was particularly the case during the 1920s, and was probably true, though to a lesser extent, of the late nineteenth century. Without detracting from the good work done by the firms concerned in these years, in particular the promotion of pasteurisation, it was the case that 'the consumer is influenced more by prices than by statements of dietetic value'[11] and that, by maintaining retail prices, the large milk companies effectively priced milk out of the market.

11. Departmental Committee on Distribution...., op.cit., 57.

III

The marketing of manufactured dairy products had developed over the course of many years, and the nineteenth century saw few radical departures from the time honoured system, which was geared to the needs of the small producer selling in the local market. Thus, the sale of butter either direct to the consumer, or at the weekly fair, or to the local retailer was a common practice. With the development of retail shops in the late nineteenth century, and the decline in farmhouse butter making, the local weekly market became of less importance in the marketing of butter. There was a further outlet, the travelling collector, known variously as the higgler, huckster, or regrator. With the growth of large, new markets, physically separated from the producer, the middleman became of increasing importance. The butter producing counties, such as Devon and Cornwall, where there was no local large scale market, were dependent on the higgler for their well being. It was he who bought their produce, conveyed it to market, and sold it either to wholesalers or retailers. It was easy to criticise this man for making exorbitent profits, but, assuming that such criticisms were justified, his position was crucial, for without him a national market structure could not have developed.

The cheese factor played a similar role. The individual farmer, producing under one hundredweights of cheese a year, was not in a position to sell his produce direct to theretailer or even to the consumer If he wished he could sell at the local cheese fair, but these fairs

were usually wholesale rather than retail. In many ways it was more convenient for the factor to come to the farm and purchase the year's produce. There was room for bargaining, though the "top of the fair" price set a limit to the possibilities open to the producer. Though farmhouse cheese making declined during the second half of the nineteenth century, the position of the factors that remained in business was strengthened. The possibility of direct contact between producer and consumer, or producer and retailer, was limited. The factor, with his knowledge, expertise, and contacts in the trade, was in a far stronger position to look after the producer's interests, than the individual producer himself. Again it was easy to criticise the middlemen for being unproductive, but the truth of the situation was that the factor and the farmer needed each other, and it was in the interests of all concerned to work together, and this was the case more often than not.[12]

The growing railway network had a limited impact upon the traditional marketing structure. The dairy farmers of the south west were glad of the better facilities thus offered, but in the rest of the country, where butter making was largely geared to the local, country market the railways had a marginal effect. The amount of farmhouse butter was so small that, with the exception of first grade butter, which found a ready but limited market, the big retailers and multiple shops had no time for English butter, which had a reputation for poor and variable

12. For details of conditions in the sixteenth and seventeenth centuries see J. Thirsk, (ed.), The Agrarian History of England and Wales, 1500-1640, (1967), 466-592.

quality. Farmhouse butter found its markets in towns such as Salisbury, Marlborough, and Devizes, and here it was a matter of individual bargaining. In some cases the producer sold direct to the consumer, as for example at Carlisle, Ipswich, Lincoln, Shrewsbury, and York, in others to the retailer. A retailer buying in such a manner could hope to make a gross margin of 15 to 17½ percent, a figure prevailing both before and after the Great War, as compared with a 10 to 12½ percent margin if he bought from an intermediary.[13]

Sales outside the local market involved a more complex organisation. Firstly, the butter was taken to a primary wholesaler, who often combined this role with that of blender, to ensure regular supplies. The gross profit margin here, according to the Linlithgow Committee's findings, ranged from 2½ to 10 percent of the selling price. The importance of the blender to the producer should be stressed. Quite simply he extended the market available to the individual producer, thus enabling him to dispose of an otherwise unsaleable product. From the primary wholesaler the butter passed to the secondary wholesaler, usually a wholesale provisions merchant. At this stage the gross profit margin was about 5 percent. From there the butter went to the retailer.

If foreign butter had driven English produce out of the major markets, farmhouse cheese kept up some resistance, though even here competition, and an alternative outlet, had reduced production. The

13. Departmental Committee on Distribution..., op.cit., 64.

established system of marketing persisted, more or less unchanged. On top of the costs of manufacture the farmer had to pay the charges associated with the various methods of disposal available to him. Thus, if he sold at the cheese fair he had to pay for part of the tolls and pitching charge. If he sold off the farm he had to pay the cost of delivery, a charge roughly equal to the commission charged by the cheese factor for his services. Once the factor had the cheese, either from fairs or from direct sales, it was sent to the secondary wholesaler. At both stages the gross profit margin was some 3 to 4 percent of the selling price. In some cases the large retailers bought direct from the factor, who, in either case, made a gross profit of about ¾d. a lb., before the war, and a 1d. a lb. in 1924. Owing to the great variety of costs it is difficult to assess the profit made by the retailer. Before the war the figure was about 2½d. a lb., but had doubled after price controlling had been lifted. The figure had fluctuated somewhat, but overall gross profit margins were in the region of 13 percent.[14]

TABLE IV

Average Wholesale and Retail Prices in London of British Butter, Cheese and Milk, 1913 and 1922.

	1st. Quality Cheddar d/lb				1st. Quality Butter d/lb				Contract Milk d/gal			
	Wholesale	Retail	Margin d	Margin %	Wholesale	Retail	Margin d.	Margin %	Wholesale	Ret.	Margin. d.	Margin %
1913	8½	11	2½	29.4	14⅝	17½	2⅞	18.7	9	16	7	77.8
1922	14	18¼	4¼	30.4	23¼	26	2¾	11.9	15½	29	15½	87.1

Source: Ministry of Agriculture, Departmental Committee on the Distribution and Prices of Agricultural Produce, (1924), Part 1, Milk and Milk Products, pp.7, 62, 68.

14. ibid., 76.

These figures reveal the high costs involved in marketing milk. However, one must remember that the margins in the butter and cheese trade were largely determined by the price of imported goods. In other words, costs had to be reduced to ensure a profit. The milk wholesalers and retailers were not under the same pressures. Consequently, there was less need to rationalise and economise. With no direct competition of any significance in liquid milk to aid the consumer, he was left to pay for the inefficiencies of the milk companies.

IV

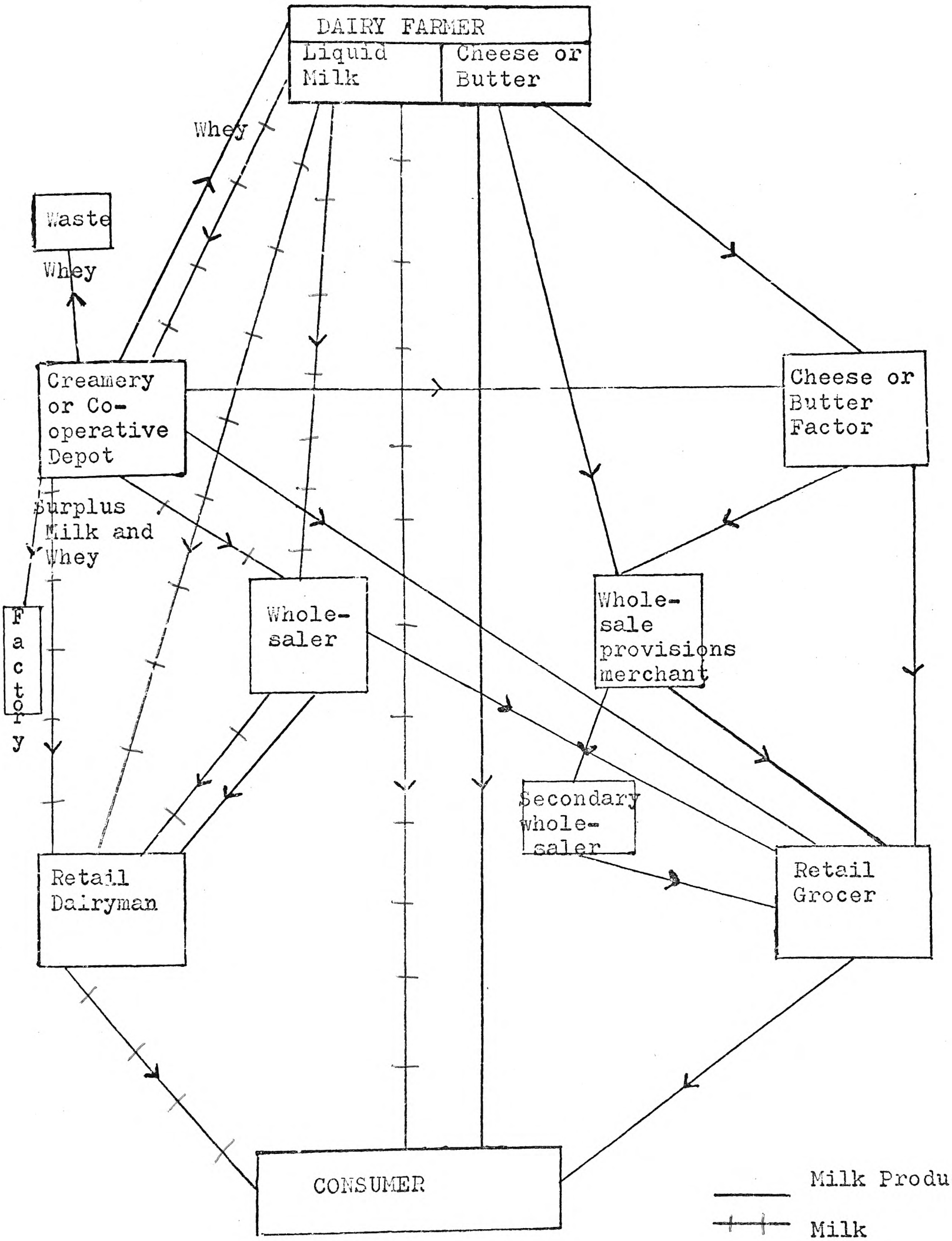
Strictly speaking the term marketing covers the various stages in the transference of ownership of any item. Thus we have traced the path of the various milk products, from the producer, through the wholesale and retail stages, to the consumer. However, the definition can be extended to include consideration of the standardising and grading of produce, and advertising and promotion of goods. The latter points are dealt with in chapter 9, but the former may be treated here.

The success of foreign cheese and butter in the English market can be attributed to several factors, but two are of considerable importance - cheapness and uniformity. The problem of relative costs of production being cheaper abroad was one that faced all English farmers during the years of free trade. But these were the conditions of the game, the framework within which one had to work. On the other hand, the question of quality was very much a variable, dependant on the skill and zeal of those involved in the trade. In England little attention was paid to producing uniform cheese or butter. The reason for this lay, not in the rugged individuality of the English farmer, but in the presence of a lucrative alternative, the liquid milk trade. The producers of highest quality cheese could always make a living, while the rest could switch to milk production. As a result of this trend away from farmhouse cheese making, and the limited growth of cheese factories, there was a marked lack of uniformity among English cheeses. The consumer, however, was becoming more discriminating.

and was no longer prepared to take pot luck, especially as imported cheese could be relied upon to be consistent in quality, even if it did not compare with the best farm cheese. Although the making of Cheddar had been standardised by Joseph Harding, there was still scope for individual variation, and as late as 1930 officials were bemoaning the lack of a suitable and accurate system of grading.[15] Attempts had been made. In December 1927 the Graded Cheshire Cheese Scheme was launched. At the end of its first six months it had 204 accredited members, who had produced 30,000 cwts. Moreover, the prices realised by the graded cheese were ½d. to 1d. a lb. higher than the prices for the best ungraded cheese offered at the same fairs.[16] Similarly, an English Cheddar Cheese Makers' Federation had been established to produce a uniformed and labelled product, but in neither case can it be said that the schemes made a big impact in the years under review.

The same was true of farmhouse butter. The quality varied from farm to farm, and from week to week. The manufacturing process was looked upon as a mystic art, rather than a science, and the outcome was nearly as many butters as there were buttermakers. Not surprisingly the foreign competitor was able to make large inroads into the English market. Fortunately for both the dairy farmers and the consumers of England there was an alternative at hand.

15. Ministry of Agriculture, Economic Series 22, op.cit., 60.
16. Ag.Mkt.Rep., xxv, (1928), 20th. Jan., p.1.



Milk Marketing Structure (adapted from Ministry of Agriculture, Departmental Committee in Distribution and Prices of Agricultural Produce, Part I, Milk and Milk Products, (1924), p.18.

CHAPTER 9

The Demand for Milk and Milk Products.

I

In dealing with the development of the English dairy industry attention has been devoted almost entirely to the supply side. It is now time to look at the demand factors that operated during the period. The importance of demand needs no stressing but one can profitably look at the theory of the subject and at certain attempts at measuring the factors influencing demand before examining the particular case in detail.

Demand is a function of the price of any given commodity, of the price of other goods, of the level of income, and of taste. Certain relationships can be stated between these factors. As the price of a good falls one would expect to find an increase in its purchase, and a decline in the purchasing of competing goods. On the other hand if the price of a substitute good fell one would expect a lower demand for the original good. If, however, the price of a complementary good were to fall one would expect the demand for the original good to increase. Lastly, as income rises one would expect demand for some but not all goods to rise. In all cases taste is generally taken as an exogenous factor, but it must be recognised that a change in taste would alter demand. Looking at total demand all the factors mentioned operate but the position is complicated by the size of the population and the distribution of income within this population.

From these general points it is not possible to say how the demand for any good will change. Only empirical study can provide the answer but before looking at certain studies it is necessary to define three forms of

elasticity. First, elasticity of demand is the proportional change in quantity demanded divided by the proportional change in price. There are five possibilities: if demand is unaffected by change in price this is said to be perfect inelasticity; if the change in demand is less than that in price this is termed as inelasticity of demand; unitary elasticity is where the proportional change in price and demand are the same; elasticity of demand is the reverse of inelasticity of demand, that is the change in demand is greater than that in price; finally perfect inelasticity is that condition where purchasers preferred to buy all at one price and none at a higher. Second, one has income elasticity of demand or the proportional change in the quantity demanded divided by the proportional change in income. In certain cases demand can fall with increased income but usually the responses are as for the first four defined above. Last, one has cross elasticity, that is the proportional change in the quantity of one good demanded divided by the proportional changein the price of another good.

Prices and sales data gives ample scope for the economist to calculate various elasticities but unfortunately price is not the most important factor determining demand. This is neatly illustrated by a study of conditions in Sweden between the wars carried out by Wold and Jurèen.[1] Between 1922 and 1929 the price of Swedish butter fell by 10 percent and of margarine by 25 percent. The consumption of margarine in Sweden, however, rose fourfold whereas butter consumption fell slightly. Wold and Jurèen were forced to admit that 'during this period the habits of butter and margarine consumption have been influenced by price, income and other

1. H.Wold and L.Jurèen, Demand Analysis, (New York, 1953).

factors in a manner that escapes our quantitative analysis.'[2] To the best of their abilities they could only ascribe 40 percent of the demand variation to changes in prices and income. Similarly, the same factors accounted for 50 percent of the demand variation for milk in Sweden in the years 1926-29, and for a mere 24 percent in the years 1921-39.[3] It may well be that the situation was exceptional but it does suggest the very real limitations of quantifiable demand analysis.

2. Ibid., 386-7.
3. Ibid., 288.

II

(a) Milk

The first task to be tackled is that of assessing the per capita consumption of milk during the period under review. Throughout these years there was a multitude of complaints, asserting that the quantity of milk consumed was inadequate for the well being of the nation. However, the pundits were not agreed upon the precise quantity of milk that was actually consumed. It was generally agreed that the consumption of liquid milk increased, but data for the mid nineteenth century is scanty and has to be treated with great care. An anonymous contributor to the Farmer's Magazine of 1859, that is before the large expansion of the liquid milk trade in the 1870s and 1880s, estimated the daily consumption of milk in London to be one quarter of a pint per person.[4] This same figure, but applied to Great Britain as a whole, was arrived at by Morton twenty years later.[5] However, the same writer in 1868 had reckoned daily per capita consumption in London to be one fifth of a pint.[6] These figures give a range in consumption of milk from 9.1 to 11.4 gallons per person per year. Two points should be borne in mind. At this time the consumption of liquid milk was lower in England than in the rest of Great Britain, and within England London had one of the lowest, if not the lowest, levels of per capita milk consumption. Nevertheless, it is unlikely that per capital milk consumption in England during the 1860s was significantly greater than nine gallons per person per year. Moving forward in time some thirty years one finds a greater amount of information on the subject. Moreover, there is a fair degree of agreement between different writers, all of whom conclude

4. F.M., 3rd.ser., xvi, (1859), 500.
5. J.C. Morton, 'Dairy Farming', J.R.A.S.E., 2nd.ser., xiv, (1878), 647-701.
6. J.C. Morton, 'Town Milk', J.R.A.S.E., 2nd.ser., iv, (1868), 69-98.

that annual per capita consumption rose from about 15 to 20 gallons between 1890 and 1914.[7] In the inter-war years more attention was paid to milk as a foodstuff, but during the 1920s per capita consumption scarcely rose, being calculated as 22 gallons per year in 1930/1.[8] To check these figures the following table has been calculated.

TABLE LVI

The Supply and Demand of Milk in England, 1861-1931.

I Population (millions)	II Consumption per head per year	III Total Consumption (million gallons)	IV Supply (million gallons)	V Supply (IV) Population (gallons)	VI Supply (I) (IV) Demand (III) (Percent
1861 19.07	9	171.6	-	-	-
1871 21.57	9	194.2	190.5	8.8	98.1
1881 24.68	15	370.2	352.7	14.3	95.3
1891 27.54	15	413.0	490.3	17.8	118.7
1901 29.74	20	594.7	536.6	18.1	90.2
1911 34.07	20	681.3	663.0	19.4	97.3
1921 35.69	20	713.9	718.1	20.1	100.6
1931 37.82	22	832.0	825.8	21.8	99.3

In view of the nature of the figures used the results show a satisfactory congruence, except for the year 1891. The excess of supply over demand in that year may be no more than a "mathematical error", in that per capita consumption could have been higher than contemporaries thought. However, there is a further explanation. The total supply figure makes no allowance for waste, and the discrepancy may be no more than a reflection of the glutted state of the milk market in the years around 1890.

7. The figures for c.1890 are summarised in H.Rew, 'An Inquiry into the statistics of the Production and Consumption of Milk and Milk Products in Great Britain', J.R.S.S., lv, (1892), 244-86, see also Cohen, op.cit.
8. The Agricultural Output of England and Wales, 1930-31, C.4605, Parl. Papers, 1933-4, xxvi.

General figures of this nature serve a useful purpose, but in many respects they conceal as much as they reveal. The increase in per capita consumption - 66 percent between 1860 and 1890, 33 percent between 1890 and 1910, and 10 percent between 1910 and 1930 - is of importance, and suggests an improvement in dietary standards, but one needs to look in greater detail at the different levels of consumption throughout society. In his role as medical officer of health Edward Smith discovered and made known the sorry state of the poor.

The first point to be considered is that of the changing level of per capita and total demand for liquid milk.... Smith had first been drawn to the subject as a result of the Lancashire cotton famine of the autumn of 1862, when his first enquiry covering 44 families and 36 single people was carried out. The following year he carried out a second survey which covered 42 households of silk weavers and throwsters from Spitalfield, Bethnal Green, Coventry and Macclesfield, 31 households whose breadwinners were needlewomen in London, 10 Yeovil kid-glovers' families, 21 families engaged in stocking and glove weaving in and around Heanor in Derbyshire and 21 shoemakers families in Staffordshire and Northampton. This total of 125 families was supplemented by 509 sets of diets from rural labourers' households, of which 377 were from England, 51 from Wales, 29 from Scotland and 52 from Ireland. The results of these pioneering studies are very valuable but certain limitations are present. The second enquiry was carried out after a poor wheat harvest when food supplies were more expensive than usual - a fact that may cause an underestimation of the actual level of consumption

of certain foods. More significantly, Smith's survey was restricted to industrious and thrifty labourers - a fact which almost certainly exaggerated the level of consumption among the 'poorer labouring classes' because it excluded not just the thriftless but also those incapable, for one reason or another, of full work.

In his report to the Privy Council in 1863 Smith attached an appendix (number 6) on "The Conditions of the Poorer Labouring Classes in England". He concluded that on average these people consumed on average 32 fluid ounces (1.6 pints) of milk per week, in comparison with figures of 85 fluid ounces in Wales, 124¾ in Scotland and 135 in Ireland.[9] Within England the range could be quite startling. Among silk weavers and throwsters the weekly average per person was 1.1 pints, but in two London areas, Bethnal Green and Spitalfield the figures were 1.6 and 7.6 fluid ounces. Admittedly this was whole milk which was not commonly found in towns such as Coventry and Macclesfield, but here the amount of milk consumed by the same type of person was higher. In Coventury the figure was 11.5 fluid ounces weekly and in Macclesfield 41.5.[10] Needlewomen were worse off consuming so little - an average of 7 fluid ounces a week - that they used to buy their daily milk by the farthing. Yet in certain instances the consumption of liquid milk could be high. For example among the stocking and glove weavers investigated by Smith there were a few families consuming as much as 21 pints a week, compared with the weekly average of 6 pints a week for this group. However, such cases were exceptional and were more than offset by those who consumed

9. Report of Medical Officer of Health, Parl.Papers, 1863, xxviii, Appendix 6, pp.216-329.
10. ibid.

little or no milk. Among the latter must be included the agricultural labourer. Paradoxically the labourer in the arable areas probably stood a better chance of getting a supply of milk than his fellow in the dairying counties for in these regions either all the milk was sent to supply the urban market or, owing to the manufacture of milk products only skim and butter milk was available. The situation was described eloquently by Richard Jefferies writing of his native Wiltshire. 'Milk', he wrote in 1874, 'they [the agricultural labourer] could not get milk for money....all the milk went to London.'[11] In the same year he had noted that 'though in the midst of a country teeming with milk, it is often with the utmost difficulty that she [a mother] can obtain any for her babe....'[12] Smith, in more prosaic terms had described a similar position prevailing in the early 1860s. Then the possibility of obtaining the by products of the dairy was still a possibility where the farmer could be bothered to sell the skimmed milk. With the great expansion of the liquid milk trade, centred on the growing urban centres, rural areas suffered increasingly from a shortage of milk. By the turn of the century, when Rowntree made his study of the rural labourer the position had reached a shocking state. Among 261 people from 62 families the average consumption of all forms of milk - that is including skimmed, separated, and condensed milk - was 0.88 pints per week, or 0.13 pints per day. Of the 42 families studied three-quarters consumed whole milk and in over a quarter of these cases the milk was a gift. In 11 cases the families had either condensed

11. Richard Jefferies, The Toilers of the Field, (1894), 198.

12. ibid.

or separated milk or no milk at all. The mother of a family in this category from Oxfordshire, told Rowntree 'we can't buy milk. I generally get a tin of Swiss once a fortnight; it goes farther and we only use it in tea. We haven't had fresh milk in the house for seven years.'[13] Thus it would appear that for this group of people in this respect standards fell during the later nineteenth century. However, owing to the lack of detail for the years about 1860 it is not possible to assess the change for other groups, except to say that conditions almost certainly improved in respect to milk but that in some cases the improvement was only marginal starting from a base at, or just above, zero.

Table LVII over.....

13. B.S. Rowntree, How the Labourer Lives: A Study of the Rural Labour Problem, (1918), 44.

TABLE LVII

Estimates of Milk Consumption among different social-economic groups in England, 1863, 1892, 1904, and 1932. (Gallons per Annum.)

(a) 1863

Indoor Worker	4.9
Agricultural Labourer	10.4

(b) 1892

East London	3.9
Manchester-working class	9.13

(c) 1900

Very Poor	9.1
Poor	7.28
Standard Working Class	13.2
Highly Paid Working Class	31.4
Average Working Class	13.2
Agricultural Labourer	5.91

(d) 1904

Labourers	5
Artisans and Mechanics	12

(e) 1904

Wages per Family per week	
under 25/-	5
25/- to 30/-	6.4
30/- to 35/-	10.0
35/0 to 40/-	10.0
over 40/-	10.5
Average	9.1

(f) 1932

Wages per week per head	
under 10/-	7.2
10/- to 15/-	13.7
15/- to 20/-	16.9
20/0 to 30/-	18.9
30/- to 45/-	29.3
over 45/-	35.1
Average	20.2

Manchester (b)

Middle Class	13.69
Small Country Town	14.83
Putney and Wandsworth	20.84
Manchester Average	24.32
Health resort	27.38
West London	34.22
North London	36.66

York 15.47 (c)

Lower Middle Class	25
Upper Middle Class	39
Upper Class	31
Weighted Average	15

Sources: (a) Edward Smith, Report of Medical Officer of Health, Appendix 6, Conditions of Nourishment of the Poorer Labouring Classes in England, Parl.Papers, 1863, op.cit.
(b) Rew, J.R.S.S., op.cit., p.266.
(c) Calculated from data from C. Booth, Life and Labour of the People in London, (1902), 1st.ser., Poverty vol.1, pp.136-9. S. Rountree, A Study of Rural Poverty, (1918), How the Labourer Lives: p.391.
(d) Third Report of Committee appointed to enquire into The Production and Consumption of Meat and Milk in the United Kingdom, J.R.S.S., lxvii, (1904).
(e) Calculated from Board of Trade 2nd. series of Memoranda, Statistical Tables and Charts, c.23370 I. Consumption and Food Costs in Workman's Families in Urban Districts in the United Kingdom, Parl.Papers, 1905, lxxxiv, pp.27 and 32.
(f) Cohen, op.cit., p.5.

Several points emerge from this table, notwithstanding the difficulties of making comparisons between groups not strictly comparable. First, one can see the great variation between the poor and wealthy sections of the community in their consumption of liquid milk. But significantly in 1932 the consumption level of the best paid was five times that of the lowest paid whereas in 1892 the difference was tenfold. In other words the improvement in milk consumption was largely concentrated among the lower classes, with the increase falling off as one moves up through the social/economic ranks. The position is further complicated by the fact that the term "milk" could include not just whole milk, but also skimmed, condensed, and separated milk. The consumption of these commodities among the poor increased considerably during the last decade of the nineteenth century and the succeeding years. The palatability of "the tin of Swiss" made it a popular item for those who could not afford whole milk. The growing distress that afflicted some sections of the country in the 1920s (and more so in the '30s) increased the sale of whole milk substitutes.

The consumption of liquid milk varied with time and economic status as one would expect that it also varied with locality. The position is well illustrated by the findings on the quantity of milk consumed by urban workmen's familities, published as a command paper in 1904. In the north of England the daily consumption of milk per head of family was 0.23 pints, in the Midlands 0.21 pints. In contrast the figure for London and the rest of England was 0.17 pints. Put differently workmen in the north spent 5.31 percent of the food-money on milk, in the Midlands 4.86 percent, in London 4.48 percent, and in the rest of England and Wales 4.70 percent.[14] The

14. Board of Trade 2nd. series of Memoranda, Statistical Tables, and Charts (C.2337). Average weekly cost and Quantity of Milk consumed by Urban Workman's Families, Parl.Papers, 1905, lxxxiv, p.32.

popularity of porridge in the north of England was the crucial difference. In an age that did not exort all to eat and drink alike local tradition became of significance. Thus was the northern labourer - rural and urban - better provided for than his southern counterpart.

Despite these variations there can be no doubt that at all levels the consumption of milk rose. Total demand rose as the population increased and the per capita intake grew. The reasons for these changes are not so straightforward, with the exception of the steady increase in population through the period. Between 1860 and 1930 the population of England rose from 19.07 million to 37.82 million. However, the structure of the population did not remain unchanged. In 1861 13.5 percent of the population was under 5 years of age. By 1901 this proportion had fallen to 10.9 percent and decreased to 7.5 percent in 1931.[15] In absolute terms the number of children under five increased, but the potential growth suggested in the total figures was not fully realised among the group that consumed most liquid milk. In other words the doubling of the population in these 70 years probably lead to an increased consumption of just under 100 percent. To this, however, one must add the increase of 144 percent in per capita consumption. It is this latter increase that must be explained. It is not sufficient to say that the explanation was simply increased production. If this were the case one would have expected a greater rise with none of the problems associated with the late 1880s or 1920s. Demand played a far more positive role. Although milk as a food for babies was nothing new in the nineteenth century it was not seriously considered,

15. These figures actually refer to England and Wales but there is no reason to believe that they do not hold for England alone.

either as food or drink, in the early part of the century. By the middle decades a new demand was developing, and continued to do so throughout the century. Coming as it did at a time when technical developments had opened new possibilities for the English farmer and foreign competition was driving him from traditional methods it provided a life line gratefully accepted by the farming community. Though this new demand grew sluggishly at times it played a role the importance of which is not always fully appreciated by agricultural historians.

In seeking an explanation in the growth of per capita milk consumption the first point to be considered is the level of income. The level of money wages tended to rise over the course of the second half of the nineteenth century but there were sharp falls after the mid 1870s, after the mid 1880s and after 1890. However, of greater relevance is the course of real wages for empirical study shows that greater proportion of successive increments of the rising real wage of the community is spent on proteins such as meat and dairy produce. Between 1860 and 1900 average real wages tended to rise except for a brief spell in the mid 1860s and during the second half of the 1870s.[16] There were year to year fluctuations but overall the trend was conducive to the growth of demand for milk. Between 1900 and 1914 the position deteriorated somewhat but after the war real wages rose during the 1920s. The problem is to decide to what extent changes in income altered the demand for milk. One would expect that to find that the demand for milk was relatively income inelastic. Stone's calculations for the inter-war years based on budget surveys of 1937-9 and time series

16. Mitchell and Deane, op.cit., 344-5.

for 1920-8 gave the income elasticity of fresh milk as 0.5.[17] Owing to the nature of the evidence it is not possible to give an accurate figure for the second half of the nineteenth century. However, it seems reasonable to suggest that the position was roughly the same. The scatter diagrams show that liquid milk consumption rose with income, and that the rate of increase was greater as a higher income level was reached that is, there was a change in consumption patterns as the standard of living rose.[18]

Of more direct importance is the level of retail milk prices. During the second half of the nineteenth century there was a remarkable uniformity about retail milk prices. In the mid 1850s the price was 16d. per gallon, the same figure as in 1900. Between 1866 and 1876 the price rose by a penny a quart and during the following decade the price varied between 16 and 20d. a gallon during summer and winter respectively.[19] However, there is a danger of assuming that conditions were uniform throughout the country and conformed to the pattern of London quoted above. In fact the evidence for 1903 shows that the actual price level varied considerably. Moreover, one would expect prices to be more responsive outside London, where large semi-monopolistic wholesale companies did not operate. Unfortunately, it is very difficult to translate these suspicions into concrete figures owing to the limitations of the evidence. Nonetheless, one is left with a very strong feeling that

17. R. Stone, 'The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938. (Cambridge, 1954), 322-7.
18. See Appendix A.
19. Reports on Wholesale and Retail Prices, Parl.Papers, 1903, lxviii, 279.

relatively speaking milk became more expensive as other retail prices, in particular meat prices, fell. Wood's average retail price index shows a rise of 22 points between 1850 and 1873 from 100 to 122 thereafter the level fell reaching 89 in 1900.[20] But the level of per capita milk consumption rose throughout the period 1860 to 1900. Thus it would appear that changes in taste were of considerable importance during these years, completely offsetting any effect that might have resulted from the relative stability of retail milk prices during a period when the overall level of retail prices was falling.

However, during the twentieth century, and particularly after the Great War, the position changes. In comparison with home produced beef and veal, and home produced mutton, milk became relatively cheaper for the housewife. There was, however, competition from other sources. Milk substitutes and cheap imported meats were available at prices attractive to those on lower levels of income. Table LVIII shows the growing imports of meat and milk substitutes as well as the growing home production of powdered and condensed milk.

TABLE LVIII over.....

20. Mitchell and Deane, op.cit., 344-5.

TABLE LVIII

Imports of Meat, Condensed and Powdered Milk, and U.K. Production of Condensed and Powdered Milk, 1891-1930. (000 cwt.)

	Imported			Home Produced	
	Meat (M cwt)	Condensed Milk	Powdered Milk	Condensed Milk	Powdered Milk
1891-95	10.4	500.4	-	-	-
1896-1900	15.8	798.7	-	313.0*	10.0*
1901-05	17.4	909.5	-	400.2	11.0
1906-10	18.9	948.2	-	556.0	17.0
1911-15	22.5	1,287.1	45.0/	706.8	33.6
1916-20	23.2	2,214.8	68.8	864.8	76.0
1921-25	28.8	2,156.2	92.8	1,138.6	128.0
1926-30	30.0	2,567.4	203.4	1,385.4	154.4

*1900 only / 1914-15 only

Sources: Agricultural Statistics, A.R. Prest, Consumer Expenditure in the United Kingdom, 1900-1919, (C.U.P., 1954), 37. R. Stone, The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938, (C.U.P., 1954), 92, 94.

During the decade before the Great War the price of milk altered scarcely at all in relation to other goods. However, after the war there was a clear difference. In 1921 the retail price of milk was 146 percent above the 1914 figure. The retail price of home produced mutton had risen by a similar amount whereas home produced beef and veal had risen by 139 percent, imported mutton by 111 percent, and imported beef and veal by 95 percent. Only condensed milk was relatively more expensive, its price having risen by 168 percent. By the end of the decade the position was roughly the same: compared with the 1914 price level in 1930 the price of home produced mutton had risen by 76 percent, liquid milk by 74 percent, imported mutton by 69 percent, home produced beef and veal by 66 percent, imported beef and veal by 42 percent, and condensed milk by 28 percent.[21]

21. Stone, op.cit., 51, 95. A.R. Prest, Consumer Expenditure in the United Kingdom, 1900-1919, (Cambridge 1954), 18, 38.

The relative dearness of liquid milk at a time when there was considerable unemployment and only limited growth in real income resulted in a decade of very sluggish demand, during which time the per capita consumption of milk scarcely rose. There had been periods before when the demand for milk had fallen off as the result of industrial depression but they had been comparatively short, only three or four years, but between the ending of hostilities in 1918 and the advent of the Milk Marketing Board in 1933 there were 15 years during which the demand for milk levelled off after the marked rise that had taken place in the second half of the nineteenth century. The situation appears all the more ironic when one remembers that it was at this time that more was done to improve the quality of the milk supply and make this improvement widely known than at any previous time.

Relative price movements and the level of incomes allow of some quantifiable analysis but it would be very wrong to suggest that prices were the most important factor influencing changes in consumption. It is evident from the foregoing discussion that changes in the dietary habits of the population were of crucial importance, and it is to this question that we must now attend.

III

Looking at England at the time of the Great Exhibition one would have found that milk served two major purposes. First, it fulfilled its traditional role as a food for children, second, it served as a medium within which to cook. Raw milk as a beverage was considered either foolish or the preserve of a food crank. The first two elements in the pattern did not change significantly. Milk was still used for culinary purposes well into the twentieth century. Equally, as a baby food milk remained an obvious choice. In fact the demand for milk for this purpose probably increased for two reasons. First, the structure of the population of England and Wales did not alter during the second half of the nineteenth century. The percentage of the total population aged four and under remained at the 10 to 11 percent mark, but the absolute number in this group increased with the rise in overall population. Second, the nineteenth century saw a marked decline in the incidence of breast feeding which suggests that there was a greater demand for milk from the cow. Two warnings, however, are necessary. It is difficult to say whether this decline was spread evenly over the whole century, and even if it were it does not follow that more milk was consumed. Cheap patent foods, largely of a farinaceous nature provided a cheap alternative and it was not uncommon for young children to be silenced, if not actually fed, with a spoonful of gin or some-such spirit.

Nonetheless, there was an increase in liquid milk consumption especially after 1870, an increase that involved the development of new habits. One may surmise that the influx of people from rural areas into

towns was responsible, to some degree, in bringing the habit of milk drinking to the towns. However, there were other pressures. For example, the growing popularity of tea and coffee as beverages boosted liquid milk consumption, while milk and soda became popular by the late 1900s. Further, these habits were aided by the spread of the temperance movement. Rew noted in 1892 that 'the tendency of the present generation in the direction of temperance has aided not only - as may be assumed - to increase the consumption of milk as a beverage, but also to direct attention to its supply as a matter of vital concern to the health and well being of the community at large.'[22] This last point was the important one - the significance of the temperance movement, as far as liquid milk consumption is concerned lies more in the propaganda given to milk than in the actual number of people who signed the pledge.

The question of propaganda is an important one. Although the late nineteenth century saw a marked rise in the consumption of liquid milk when compared with the 1920s it still remains true that, in comparison with other European countries, the consumption of liquid milk in England was on the low side. In part this can be explained in terms of prices - meat being far more expensive on the continent that in England thereby making milk and milk products more attractive - but this in itself is not wholly satisfactory as an answer. Insofaras the Englishman held an opinion on the subject of milk - and there was widespread apathy and ignorance of the matter - it was likely to be an unfavourable one. Put simply many people feared milk. Today one associates milk with health and wholesomeness. A hundred years ago it had connotations of dirt and disease. Moreover, there was a solid

22. Rew, op.cit., 244.

basis of fact upon which to base this view. The conditions in which milk was produced and vended were often appalling by nineteenth century, let alone mid twentieth century, standards. Smollett's description of the London milkmaid and her wares is an exaggeration but it is worth stressing that a considerable amount of milk came to the consumer from diseased cows via germ-ridden utensils. Not surprisingly milk was responsible for the transmission of several diseases. Of these the most feared was tuberculosis from diseased cows but the lists of associated diseases included typhoid, enteritis, diptheria, scarlet fever, and epidemic diarrhoea - a frightening catalogue.[23] Moreover, in the early years of the liquid milk trade the position had been worsened by the prevalence of adulteration. The use of "the cow with the iron tail" was often a response on the part of the small retailer to the diminishing margins which he was faced with. But equally it was nothing more than a means of exploiting the consumer in many cases.[24] Tales of the use of sheep's brains and bruised snails belong to the world of fiction but chalk was commonly added to the diluted milk to restore it to a suitable colour. A further fraud was to sell skimmed milk as whole milk. Here the problem was to restore the lost flavour. To achieve this salt was used while treacle was added to give sweetness. Lastly, preservatives, such as boric acid, sodium salicylate, and potassium nitrate, were added to the concoction.[25] However, it would be wrong to suggest that such conditions

23. see for example H.A. Macewen, The Public Milk Supply, (1910).
24. During the early nineteenth century London milk was often referred to as "whitning" from the common practice of adding chalk and flour to milk that had been watered down. Equally significant was the fact that the London milk-seller announced his wares with the cry "Mi O", a corruption of demi-eau.
25. F.A. Filby, A History of Food Adulteration and Analysis, (1934), 231, W. Blyth and H. Cox, Foods: Their Composition and Analysis, (1927), 250.

prevailed consistently throughout the period. Attempts were made to establish and enforce standards of cleanliness. In 1860 an Adulteration of Food Act was passed, but is impact was negligible. A permissive act, it fell foul of local vested interests, considerations of economy, and inertia.[26] Critics, led by The Lancet attacked the act for its ineffectiveness. As a result of their pressure a new act was passed in 1872, followed two years later by a report which became the basis of the Sale of Food and Drugs Act of 1875, which became the basis of present law on the subject. There were still many loopholes, particularly with the question of milk, but conditionswere improving and the more flagrant abuses had disappeared. By the late nineteenth century the customer was more likely to be cheated than poisoned. It is not easy to assess the efficiency of the act. The number of samples taken was often very small and can hardly be considered representative. However, the act was bolstered by further measures - the Contagious Diseases (Animals) Acts of 1878 and 1886, the Dairies, Cowsheds and Milkshops Orders of 1885, 1886, 1889, as well as local health regulations. The incidence of adulteration was higher in the larger towns. According to an entry in the Dairy Note Book of the Journal of the British Dairy Farmers' Association of 1894 noted that 'London continues to be much more worse off than provincial towns in this matter [of the adulteration of milk]. While more than one-fifth of the samples of milk from the metropolitan districts were pronounced to be adulterated, the average proportion in the other "thirty two large towns" of the Registrar General's Returns was less than one-tenth. Manchester and Salford are conspicuous for comparative freedom from adulteration, the

26. J. Burnett, Plenty and Want, (1968), 257.

proportion of condemned samples being only about fiveper cent, while at the other end of the list is West Ham, where 35 samples were condemned out of a total number of 75 analyses.'[27] Attitudes were changing as well. By the end of the nineteenth century it was considered to be bad practice to adulterate milk and other foods. The cumulative effects of the acts and the influence of propoganda had led to an appreciable improvement in the quality of milk on sale to the general public, by the end of the century.

However, there was still the problems of milk-borne diseases. As a factor in child mortality milk undoubtedly played a part. The report of the Royal Commission on the Effect of Food derived from Tuberculous Animals on Human Health left little doubt on the subject, but irrespective of the truth of the matter it was commonly believed that milk was the cause of many fatalities not merely among children. The position was exaggerated by sensationalist reporting - a matter in which The Times laid itself open to criticism. The popular press campaign of the 1890s and 1900s helped consolidate the lack of faith in the country supplier that existed among some consumers. To what extent this limited the growth in demand for liquid milk is difficult to say. In the short run the vitriolic attacks upon the country milk producers probably had a limited effect, but overall the fear of impure milk and the ignorance of the benefits of the genuine article must have restricted growth. No simple summary appears possible without distorting the situation. The contradictions that existed are summed up by the report of the Royal Commission on Tuberculosis when

27. J.B.D.F.A., ix, (1894), 177.

it spoke of 'the preference of English people for drinking cows' milk raw, a practice attended by danger, on account of the possible contamination by pathogenic organisms.'[28]

Public fears were gardually allayed as the practice of pasteurisation became more widespread. In 1884 the International Health Exhibition was extolling the virtues of milk and bemoaning the fact that 'two-thirds of the inhabitants of London, or indeed of England, (do not have) any practical knowledge of what pure milk is'.[29] But the situation was improved slowly. The process of pasteurisation was known before 1914 but was not practiced on any significant scale. Some wholesalers and the large retailers were testing for adulteration and infection but the situation had not been greatly improved. In the event it was a totally extraneous factor - the Great War - that brought about the biggest impulse for change and therefore increased milk consumption. The effect was the combination of two factors. In the first place the gravity of the situation was revealed when hospitals began to test their milk and found to their horror that it was heavily infected with 'B.Coli' and other impurities. In 1916-17 20 out of 30 samples of milk delivered to Manchester hospitals had more than one million bacteria per c.c. Similarly, milk supplied through infant welfare centres in London to mothers and babies in the same year was also generally contaminated.[30] The shock galvanised people into action and the tuberculin test was applied more widely. At the same time

28. Report of the Royal Commission on the effect of food derived from tuberculous animals on human health, C.7703, Parl.Papers, 1895, xxxv, 634.
29. C.W. Wigner, A Lecture on Pure Milk, in Health Exhibition Literature Vol. vi, Health in Diet, Part III (Lectures), (1884), p.111.
30. E.H. Whetham, The London Milk Trade, 1900-1930, (University of Reading, 1970), 5.

the war had shown how undernourished many Englishmen were - the failure of nearly one third of the volunteers and conscripts to pass the necessary medical examination was a major shock - and the preoccupation with the nutritional value of various foods showed the value of milk. Together these two facts paved the way for the growth in liquid milk consumption that took place in the 1930s.

The demands of wartime had brought about profound changes in the distribution structure of the London milk market and this also played a part in transforming the public image of milk. It was not until 1923 that pasteurised milk was recognised as a special designation but it was pioneered in London by United Dairies, the largest of retailers in the country. As a result deaths from infantile diarrhoea and tuberculosis of bovine origin were reduced, thus greatly helping to reduce the number of infant deaths. At the same time the work of such men as Dr. Stenhouse Williams at the National Institute for Research in Dairying, Wilfred Buckley and the National Clean Milk Society, as well as those at the National Milk Publicity Council, made popular the ideal of pure milk and helped to put the theory into practice. It is easy to exaggerate the role of the N.M.P.C. The amount of money available was limited, its campaign was often weak, lacking the force of the Wholesale Fruiterers' Association's "Eat More Fruit". Ignorance and fear were not routed overnight but the killer image was fast fading into the background. Per capita milk consumption was restrained during these years but one must not let this detract from the importance of these years in the development of the healthy image that milk enjoyed in the 1930s through to today.

IV

It is not easy to make detailed international comparisons in the absence of reliable and readily available statistics for other countries. Nonetheless, the evidence, such as it is, indicates that per capita milk consumption was considerably higher in Scandinavia, Denmark, Switzerland, and America and higher in France, Germany and Holland. Only Italians and Spaniards appear to consume less liquid milk than the English as the following table shows.

TABLE LVIX

Per Capita Milk Consumption in Selected Countries. (gals/head p.a.)

c.1900 I		c.1914 II		1920s III		IV
Belgium (1898)	47	Sweden (1914)	70	Switzerland (1925)	83	(1922) 67
Holland (1902)	40	Denmark (1914)	69	Sweden (1924)	68	
		Switzerland (1914)	67	Denmark (1923)	57	
		Germany (1913)	61	Norway (1920)	51	
		U.S.A. (1917)	42	U.S.A. (1925)	46	(1925) 55
		Canada (1916)	26	Austria (1923)	31	
		Hungary (1914)	24	Belgium (1923)	21	
		U.K. (1914)	22	Poland (1923)	21	
		Italy (1913)	4	Hungary (1923)	20	
				France (1924)	15	(1922) 22
				England & Wales (1927)	15	G.B. (1924) 19
				Germany (1925)	10	
				Canada		(1922) 27
				Spain		(1925) 14

Source: columns I, II, IV U.S. Department of Agriculture, Statistical Bulletin 25, (Washington 1929), 156, Ministry of Agriculture, Economic Series 16, (1927), The Fluid Milk Market in England and Wales, 131.

Some of these figures appear a little far fetched. It is highly unlikely, even allowing for the effects of war, that consumption of liquid milk in Belgium fell from 47 to 21 gallons per year per head of population. However, the effects of war do go some way towards explaining the otherwise

huge discrepancy between the figures for Germany in 1913 and 1923. (The latter figure refers only to Berlin, incidentally). Allowing for the roughness of the estimate it still remains true that the amount of milk consumed in England and Wales was below that in other European countries, and in certain cases the difference was considerable.

Briefly the explanation lies in the relative price of meat and milk. Generally speaking, in most European countries meat was considerably dearer than milk. In Britain, on the other hand, meat was comparatively cheap and in abundant quantities. To a large extent this was a reflection of differences in the geographical background and agrarian structures of the countries concerned.

(b) Cheese and Butter

The liquid milk market was in the fortunate position of enjoying natural protection from foreign competition. Some milk was imported from France and Holland but the quantity was insignificant despite the exaggerated fears expressed at the time. The market for manufactured milk products, in marked contrast was open to the full force of international market forces. The quantity of cheese and butter has been given earlier[31] and it should be stressed that throughout the period imported cheese and butter became of increasing importance in the dietary of the country. It is relatively easy to calculate the per capita consumption of imported dairy produce but the opposite is true of home produced cheese and butter. The inadequacies of the date on production are so great, particularly for the third quarter of the nineteenth century, that only approximate figures can be given.

TABLE IX

Estimates of per capita Cheese and Butter Consumption (lb./p.a.)

Authority	United Kingdom Butter Home (i)	Butter Import (ii)	Cheese Home (iii)	Cheese Import (iv)	United Kingdom Imported Butter (v)	Imported Cheese (vi)	England Home Produced Butter (vii)	Cheese (viii)
1870	-	-	-	-	5.0	4.6	4	6
1876 Bear	6.05	5.52	8.53	5.01	-	-	-	-
1886 Bear	5.85	7.16	8.27	5.14	7.4	5.8	-	-
1891 Long	5.6	9.4	7.9	5.7	10.8	7.0	2	3
1892 Rew	6.2	8.8	5.9	6.1	-	-	-	-
1924-7 Min of Ag*	1.7	13.7	2.2	7.3	15.1	5.8	2	3
1932	2.1	18.9	-	-	-	-	-	-

* England and Wales

Soure: J. Long, Dairy Farming in Land, its Attractions and Riches, (1891)
H. Rew, J.R.S.S., op.cit., 268-71, Ministry of Agriculture, Economic Series 22, (1930), 37, Econ.Ser., 30, (1932), 21.

31. See Chapter 4, p. 149 and p.166.

The figures in column v - viii are calculations based on official figures for cheese and butter imports and the estimates made elsewhere for home consumption in England. These calculations tally fairly well with the estimates relating to the consumption of imported dairy produce. There is, however, a definite discrepancy in relation to the consumption of home produced cheese and butter. In part this is the result of comparing figures for the United Kingdom as a whole with those for England alone. In the latter the domestic cheese and butter industry was appreciably smaller than in the other three countries. Furthermore, one must remember that the assumptions made by Long and Rew on the question of yields are open to considerable doubt. If the consumption of home produced cheese and butter in England was as great as suggested by these writers either the average yield per head of the dairy herd must have been higher or the liquid milk trade must have been smaller - conclusions that run contrary to other evidence on these aspects of the subject. One is left with the conclusion that the estimates in columns vii and viii are more reliable than the others, nothwithstanding the fact that they come from contemporary observers.

Although the overall situation was condusive to an increase in demand for dairy produce the present problem is to distinguish the factors that led to a fall in per capita demand for Farmhouse butter and cheese in England. The answer is not difficult to discover: imported butter and cheese generally speaking, was cheaper and of a more uniform quality than the home produced articles. Moreover, there was competition from cheap substitutes, especially margarine. The difference in retail

prices could be quite marked: home produced butter at the turn of the century averaged about 1/3d. a pound whereas imported butter averaged about 1/2d. but could be as cheap as 11d. a pound. Margarine, at the same time, retailed at between 4d. and 8d. a pound.[32] Yet in many respects the battle for the butter market had been fought and won long before 1900. The London market had been taken over by foreign competitors by the mid-nineteenth century and their success in the large towns and cities was achieved in the following decades. During these years the contrast in prices was more marked. The price of fresh butter in Westminster in 1853 was 1/3d. per pound while salt butter retailed at 11d. By the late 1860s fresh butter sold at 1/6d. a pound while salt butter sold at 1/2d.[33] The home producer could not compete at these price levels, and the consumer was scarcely prepared to pay more for an article that was often, though not invariably, inferior and lacked uniformity. A similar situation applied to the retail cheese market. During the last quarter of the nineteenth century American and Canadian cheese cost about 2d. a pound less than English Cheddar and Cheshire.[34] By way of illustration one may consider the years 1900 to 1901. At this time Dutch cheese was selling at 6d. a pound, American cheese of ordinary standard retailed at the same price while the best quality sold at 8d. or 9d. On the other hand Cheshire cheese was selling at 9d. or 10d. a pound while Cheddar cost the housewife 9d. or 10d.[35] Once again it remains true that by 1900 the English cheese maker had lost control of the mass market. The period of greatest competition had been

32. Report from the Select Committee on the Butter Trade, Parl.Papers, 1906, vii, (245) Q.2151, p.118, 2454, p.132, 2508, p.134.
33. Report on....Wholesale and Retail Prices, op.cit., 282.
34. ibid., 290.
35. Ibid.

in the years 1879 - 1895, during which time prices collapsed dramatically three times in 1879, 1886, and 1895. There is not sufficient evidence on retail prices of butter and cheese to give a detailed picture of the position before 1886 but the scattered evidence strongly suggests that the increased consumption of imported dairy produce was the result of falling prices in relation to home produced goods and of better, more reliable quality.

It was not until after the war that any real attempts were made to standardise and promote English cheese. By the end of the 1920s the Cheshire Cheese Federation and the English Cheddar Cheese Makers' Federation had been formed but their impact upon consumption in the years before the establishment of the Milk Marketing Board was limited.[36]

36. Ministry of Agriculture, Economic Series, 22, (1930), pp.70-84.

VI

As with the consumption of milk it is not easy to find reliable figures by which to carry out comparisons between various countries. Table LXI gives a rough indication of the position.

TABLE LXI

Per Capita Butter and Cheese consumption in selected countries.(lbs.p.a.)

Butter	c.1914		c.1925
Canada	(1911)	28	30
Australia	(1913)	26	30
N.Zealand	(1914)	22	34
Denmark	(1914)	18	19
U.K.	(1914)	17	15
Netherlands	(1917)	17	15
Sweden	(1917)	17	--
U.S.A.	(1919)	15	17
Germany	(1913)	15	9
France	(1919)	11	11
Switzerland		--	11

Cheese	c.1914		c.1925
Germany	(1912)	13	-
Denmark	(1914)	12	-
Netherlands	(1912)	10	12
Norway	(1910)	7	-
Australia	(1913)	5	4
Canada	(1911)	3	3
New Zealand	(1914)	3	6
France		-	14
Italy		-	12
G.B.		-	10
U.S.		-	4

Source: U.S. Department of Agriculture, Statistical Bulletin, 25, (Washington, 1929), 81, 124, Ministry of Agriculture, Economic Series 22, (1930), 37, Econ.Ser., 30, (1932), 22.

The figures for butter consumption reveal a marked contrast in the consumption levels of Canada, Australia and New Zealand and all other countries in the list. It is important to note that in Canada the consumption of margarine was banned, but in Australia the high level of domestic consumption is very striking in view of the export of butter from this area. Other producers, notably Denmark, concentrated so heavily on production for export that domestic consumption was, if not low, reduced - margarine making up the difference. Looking at the cheese figures there is a definite link between low domestic consumption and the major exporting countries. The figures for European countries are

imperfect but simple inspection suggests that the belief in low cheese consumption in Great Britain is borne out by fact.

In conclusion one has to look at the figures in tables LX and LXI in relation to the question of the standard of living in England. Simply, is there any significance in these figures? or do they simply reflect differences in the agricultural bases of the countries concerned? The idea of a milk-equivalent league, gauging the standard of living enjoyed by countries has a certain aesthetic satisfaction but in practice the structure of agriculture varies so considerably from area to area that it would be foolish to attempt any generalisation based on milk alone. To offer any worthwhile standard of comparison it would be necessary to convert all consumption figures into calorific equivalents. However, for any individual country it is possible to offer certain comments. In Britain there can be no doubt that the per capita consumption of both milk and butter increased throughout the period, while that of cheese increased until about 1890 whereafter it levelled out and fell off slightly during the war and its aftermath. Even making allowances for the unequal increases in consumption between different income groups one can say that in this respect the standard of living of the people of Britain rose. Not only was more consumed but the items were of a better quality. Beyond this point one must proceed with caution. In comparison with the rest of Europe the level of consumption of milk in all its forms was low, but man does not live by milk alone - John Bull was very much a meat eater.

APPENDIX

There is only a limited amount of material relating to the price and volume of sales of milk during the second half of the nineteenth century. As was stressed in the foregoing chapter this evidence presents serious problems of interpretation. The probable errors involved, and the approximate nature of the estimates render any detailed analysis almost meaningless. Generally, as one would expect, the per capita consumption of milk increased with real wages. The two accompanying graphs show per capita consumption plotted against (i) net national income per head of population at constant, 1900, prices, and (ii) a real wage index, 1850= 100, for the years 1871 to 1901. In both cases the general pattern emerges clearly.

For the inter-war years the greater availability of data makes possible more detailed analysis as the following table shows.

Over.....

Demand Analysis for Foods, Based on Budget Surveys 1937-9 and time series 1920-8

	Income Elasticity	Substitution Elasticity with respect to Own Price	Home Produced Beef and Veal
FRESH MILK			
(49)	0.50 ± 0.18	-0.41 ± 0.17	0.78 ± 0.18
(50)		-0.12 ± 0.24	
(51)		-0.49 ± 0.13	0.73 ± 0.15

		Own Price	Carcase Meat	Margarine
BUTTER				
(73)		-0.38 ± 0.14	0.52 ± 0.35	
(74)		-0.38 ± 0.16		0.06 ± 0.18
(76)		-0.33 ± 0.14	0.56 ± 0.34	
(77)		-0.34 ± 0.15		0.13 ± 0.18
(78)		-0.46 ± 0.14	0.57 ± 0.33	
(79)	0.37 ± 0.08	-0.45 ± 0.16		0.11 ± 0.18
(80)		-0.38 ± 0.15	0.54 ± 0.39	-0.03 ± 0.19
(81)		-0.41 ± 0.13	0.63 ± 0.30	
(82)		-0.42 ± 0.15		0.19 ± 0.17
(83)		-0.34 ± 0.15	0.52 ± 0.38	0.04 ± 0.19
(84)		-0.46 ± 0.15	0.57 ± 0.37	0.0 ± 0.18
(85)		-0.43 ± 0.14	0.56 ± 0.33	0.10 ± 0.17

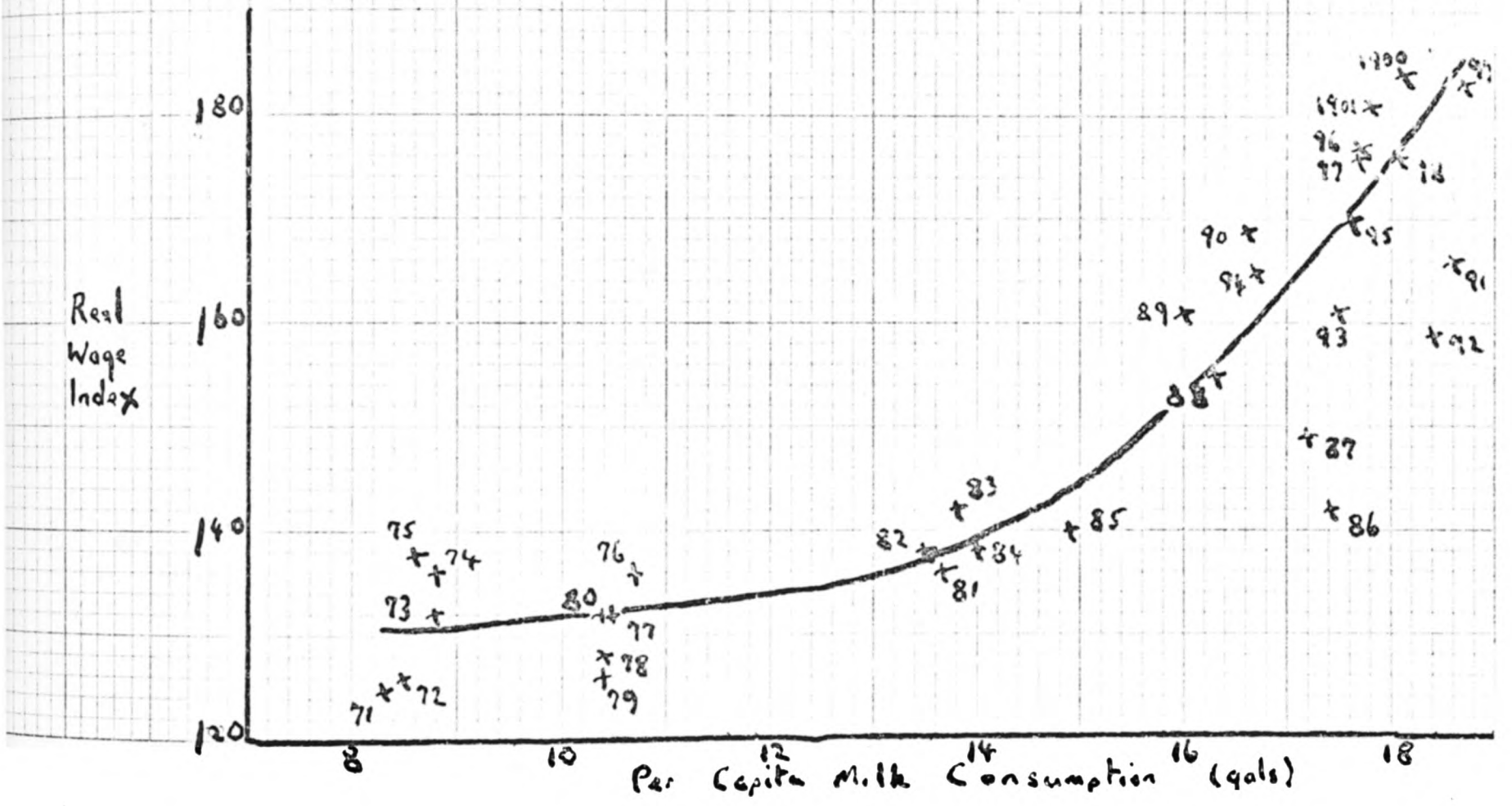
		Own Price	Butter	Imported Beef & Veal
CHEESE				
(87)		0.22 ± 0.16	-0.45 ± 0.22	
(88)	0.21 ± 0.08	-0.09 ± 0.12		0.65 ± 0.30
(89)		0.17 ± 0.11	-0.60 ± 0.16	0.84 ± 0.23

		Own Price	Butter
MARGARINE			
(91)		0.06 ± 0.24	0.67 ± 0.20
(94)	0.16 ± 0.11	0.06 ± 0.18	0.91 ± 0.17
(95)		0.05 ± 0.25	0.69 ± 0.22
(97)		0.01 ± 0.17	0.01 ± 0.17

Source: R. Stone, The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938, (Cambridge 1954), pp. 322-7.

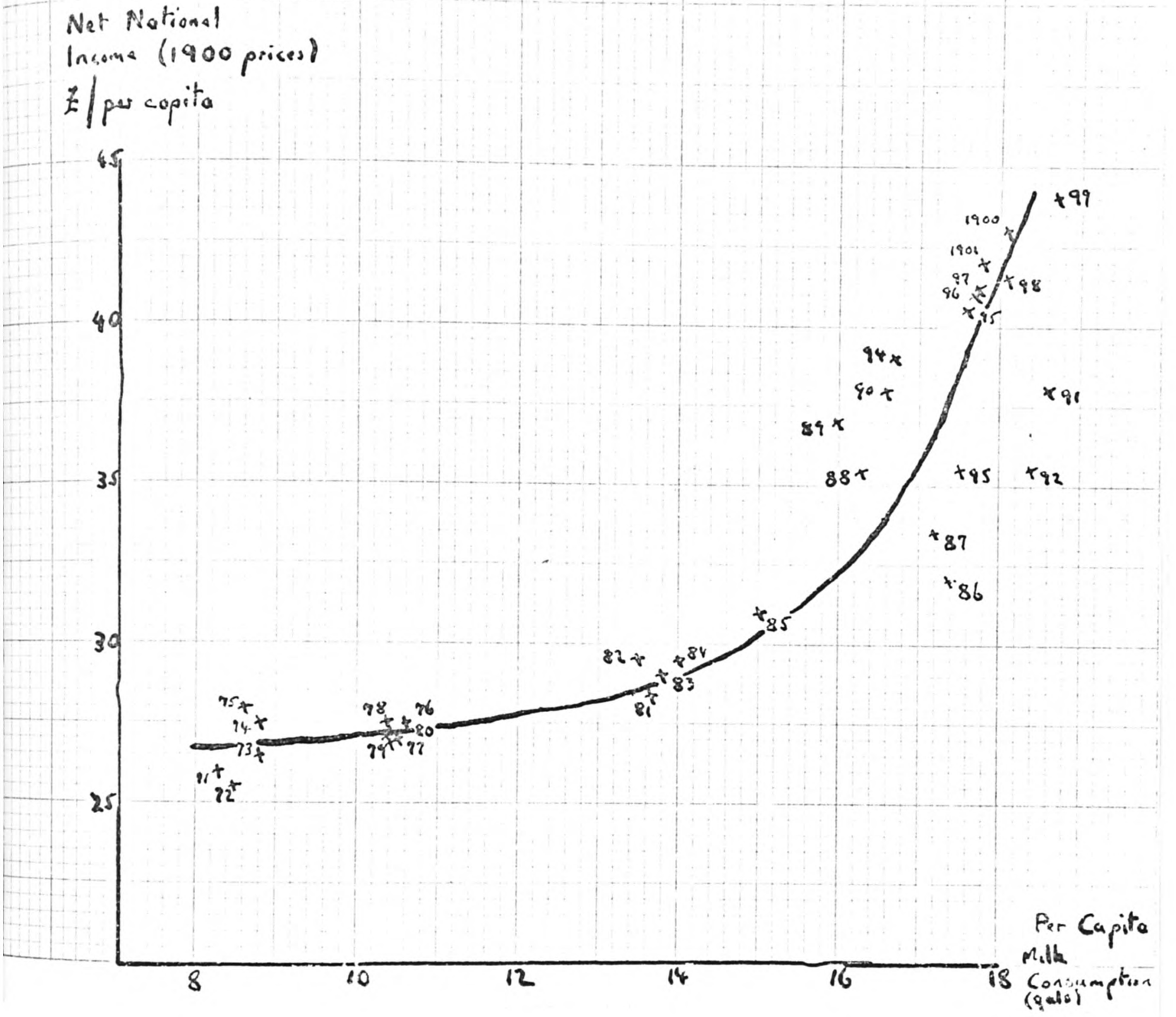
Fresh milk shows a significant income elasticity, and a significant substitution elasticity with respect to home produced beef and veal. Both butter and cheese who small but significant income elasticities. The former has a significant substitution elasticity with carcase meat, the latter with imported beef and veal.

Per Capita Milk Consumption and Real Wage levels, 1871 – 1901



at its geological basis. In Wiltshire there is a distinct two-fold division. On the one hand there was the large area of chalk, mainly in the Salisbury Plain area in the south, but including the Marlborough

Per Capita Milk Consumption and Net National Income, 1871 – 1901



at its geological basis. In Wiltshire there is a distinct two-fold division. On the one hand there was the large area of chalk, mainly in the Salisbury Plain area in the south, but including the Marlborough

CHAPTER 10

Wiltshire: A Case Study.

(i) The General Agricultural Background.

The study in depth of a single area needs little justification. It can be argued that such work provides the essential units without which general studies can become meaningless. One cannot deny that regional responses, in all their varieties, must be accorded full recognition, and not forced into a general pattern; nor can one deny that, in the present state of knowledge, too little is known of local conditions and that too much emphasis is placed on generalised terms, such as the claylands or the livestock farmer, which often obscure as much as they reveal. The present study is not intended to be a comprehensive agricultural history of Wiltshire, but rather to show the development of dairying in the county against the background of the general trends described earlier. There is, however, a further purpose to this chapter. A local study is a convenient means of testing hypotheses. In this case the hypotheses will be concerned with the characteristics of the successful/progressive farmer. The task, however, is to sketch in the salient features of the development of dairy farming in Wiltshire between 1860 and 1930.

To understand the agriculture of any area it is necessary to look at its geological basis. In Wiltshire there is a distinct two-fold division. On the one hand there was the large area of chalk, mainly in the Salisbury Plain area in the south, but including the Marlborough

Downs further north, and on the other the clays, running roughly north-east/south-west across the north of the county. For the most part they consisted of Oxford and Kimmeridge clay, the latter outcropping in the south west of the county, to the south of Mere. There was also to be found London clay, in the south east, not far from Salisbury. Lastly, there was a belt of Upper Greensand laying between the chalk and the clay lands. The Pewsey Vale was the best known area, but the same base rock was found in the vallies of the Wylie, in the Warminster area, and the Nadder, from Dinton to Fare in the north, and across the border to Shaftesbury in Dorset.

The basic geological division was reflected in the nature of the agriculture. The chalk lands were, by the mid nineteenth century, famous as sheep and corn kingdoms, while the clays were devoted to dairying in general and cheese making in particular. The Pewsey Vale at this moment in time, though containing some heavy soil, was a noted corn producing area, having more in common with the south than the north of the county.

South Wiltshire, with its huge farms and prosperous farmers, had received much praise from many observers who marvelled at the pitch of technical efficiency to which the classic four course system had been developed. In spite of the doom laden prophesies that had been aired in 1846 the middle decades of the nineteenth century had been a period of considerable profit for the arable farmer. An increasing amount had been brought under the plough, the acreage under corn reaching a maximum of 227,363 acres in 1875. A new breed of sheep had been

developed, and the county flock increased steadily to over 700,000 in the late 1860s and early 1870s. In contrast dairying, though not totally absent from the south of the county, was hardly considered "proper farming" by the big sheep and corn barons. As a general rule the dairy was let out, a practice common in the west of England. Little attention was paid to this side of farming - except by the dairymen - though in the neighbourhood of Salisbury and in the Wylye valley there had been improvements in management, in that the water meadows had been used for the grazing of dairy stock as early as the 1840s.[1] However, the general picture was one of neglect in the mid century years.

The interdependence of the sheep and corn system exercised a strong attraction over the minds of many farmers. A striking example of what became a crucial inability to break out of the shackles of the four course system was afforded by A.G. Street, the father of the well known writer. Ditchampton Farm, near Wilton, was in the sheep country of Wiltshire, and a flock of 400 Hampshire Downs were kept on a 630 acre farm. Right through until the Great War some 400 acres were kept as arable land, despite the changing circumstances that had greatly reduced the profitability of arable farming. The father's attitude was summed up by the one line; 'one didn't farm for cash profits, but did one's duty by the land.' Not until the 1920s

1. E. Little, 'Farming of Wiltshire', J.R.A.S.E., v, (1844-5), p.167. For a more generalaccount of the agriculture of Wiltshire in the nineteenth century see volume four of the Victoria County History, (1959), edited by R.B. Pugh and E. Crittall.

when A.G. Street, the son, took over was there a marked change in the farm system. Then, somewhat belatedly, milk production was taken up.[2] Fifty years earlier, however, many Wiltshire farmers were so preoccupied with corn that they had no time for cattle. The sheep corn system was improved to a state of technical perfection. The importance of the system was reflected in the fact that, by 1870, over 30 percent of the agricultural land was devoted to it. Unlike much of England Wiltshire enjoyed good harvests until the end of the 1870s. The blessing was a mixed one for the expansion of arable farming continued during these years. The effect was to deplete resources thus intensifying the problems that finally broke in 1879. In that year the fall in corn prices was too severe for the system to withstand. Technical efficiency was of little use in the face of such adverse price movements. The collapse of prices had devestating effects on some farmers. At its worse the land was left uncultivated to revert naturally to grass. Little in his report to the Richmond Commission commented on conditions in part of the arable area of Wiltshire as follows:

> 'in the neighbourhood of Devizes may be found the most patent and unmistakeable evidence of agricultural distress. Here are several farms containing many hundreds of acres of more than average natural fertility, which are uncultivated, or to use a local expression "lying to lark leeze", some of the land having been untouched since Michaelmas 1878.'[3]

There is a danger of exaggerating the situation, mistaking the exceptional for the normal, but there can be little doubt that the collapse of wheat prices was a serious blow that had very severe

2. A.G. Street, Ditchampton Farm, (1946), see also Farmers Glory, (1932).
3. R.C.Ag., Parl.Papers, 1881, xvi, p.419.

short term effects. The collapse of prices in Wiltshire was quite marked. At Hungerford, for example, the average price per quarter of wheat in the years 1870-77 was 54/- but in 1878 and 1879 it fell to 44/-. At Amesbury the price of wheat fell from 56/7 in 1872 to 43/3 in 1879.[4] The expansion of the early 1870s had depleted resources and the collapse of prices had drastically reduced incomes so that, in the short run, the arable farmer - assuming he wanted to change his farming system - was in a weak position from which to consider the expenses of a conversion to grass and some form of livestock husbandry. As well as foregoing the expected income from crops money was required for the purchase of seed, and for the process of laying down to grass, as well as for more stock.

It is, therefore, not surprising that there was no immediate response to the trauma of the late 1870s. More striking was the lack of large scale adaptation later in the 1880s. The economic problems, in particular raising the necessary capital, were not inconsiderable and the amount of change required in the structure of farming was also large, but one of the greatest problems was the psychological block to change. The failure to see the permanence of the new conditions, and the beguiling beauty of the existing system were powerful obstacles to change which, in conjunction with the other problems, delayed adaptation and thereby increased the problems to be faced in the future. However, change did take place, if somewhat slowly, and the change brought a greater community of interest

4. ibid., pp. 475, 477.

between the two parts of the county, but before looking at these developments, one must turn to the dairying areas and look at the course of events in the quarter century before the fateful year of 1879.

In the mid nineteenth century the Cheese Country of the north of the county had attracted little attention. Caird in his survey found little to praise. 'The green fields', he observed, 'are often wet and undrained, and the luxuriant hedgerows more numerous than useful...'[5] There were few large farms to catch the eye, on the contrary 'the want of them is everywhere discernible in the poached pasture fields, and the young cattle huddled behind the hedges for shelter from the February blasts.'[6] Where it existed farm yard accommodation was often inadequate, 'the dairy cows are kept during the winter in open yards, wading often to their knees in filth, while manure is looked upon as a troublesome nuisance...and much of it is accordingly washed off by the winter rains into the nearest ditch or water-course.'[7] In the face of all this criticism, summed up as a 'very primitive state of husbandry'[8], it is easy to lose sight of the other side of the coin. Yet Caird was forced to admit that 'the dairies are exceedingly clean and well managed'[9], a fact of some significance in view of the depression that had hit much of English agriculture at this time. However, Caird was one of the few to see

5. J. Caird, English Agriculture in 1851, (1852), p.74.
6. ibid., p.75.
7. ibid., p.77.
8. ibid., p.78.
9. ibid., p.78.

the importance of livestock husbandry. Unfortunately too many ignored this side of his writings, and dismissed such areas as north Wiltshire as backward and unimportant. Undoubtedly some of Caird's criticisms were well founded, conditions were bad, but that was not to say that they remained so for the next two or three decades. Drainage was improved on some farms for example,[10] while in the prevailing favourable market conditions dairy farmers prospered. Table LXII shows that the price of first quality cheese at the Chippenham market remained steady until 1878.

TABLE LXII

Average Cheese Prices: Chippenham, 1858-1879. (s/cwt)

	Broad Doubles	Prime Cheddar	North Wiltshire Loaf
1858-60	62-6	68-6	63-6
1861-65	59-6	65-0	63-0
1866-70	64-6	68-6	67-0
1871-75	62-0	68-0	64-6
1876-77	62-3	72-9	63-9
1878-79	53-0	65-9	59-3

Source: Devizes Advertiser, 1858-79, North Wiltshire Herald, 1861-79.

At this level the dairy farmer could expect a good return in conditions that continued to favour the livestock farmer in general.[11] Moreover, the local cheeses, the loaf and the double, were skimmed milk cheeses, which meant that the dairy farmer had a further source of income - whey butter which sold at between one and two shillings a pound in the years before prices fell in the late 1870s. However,

10. R. Jefferies, Unequal Agriculture (originally written in 1877) in The Hills and the Vale, (1909), p.139, North Wiltshire Herald, August 17th 1871, reference to E.T. Middleditch of Bluneden, Jefferies, Hodge, op.cit., vol. ii, p.131, Anon, 'Dairy Management in North Wiltshire', F.M., 3rd. ser., xix, (1861), p.292.
11. see Chapter 1, p. 35ff.

there was an alternative to cheese making which offered an equally good, if not better, return and alleviated the problem of finding skilled labour for the dairy. The liquid milk trade which developed in the second half of the nineteenth century was of great importance to the whole agricultural community. Wiltshire dairy farmers were fortunate in that the county was well provided with rail links to other parts of the country, particularly London. The major network had been completed by the 1860s. The Great Western Railway reached Swindon in 1840, and Chippenham the following year. In 1847 Salisbury and London were linked on the London and South Western line. Within the county Chippenham, Trowbridge, and Westbury were linked in 1848, Warminster and Heytesbury in 1851, and Wilton and Salisbury in 1856, completing the connections belonging to the Wiltshire, Somerset, and Weymouth railway. Lastly, in 1862 the Berkshire and Hampshire Extension Railway linked Devizes, Pewsey, and Savernake.

The early years of the milk trade are shrouded in the proverbial mists of time. In this case the mists can be seen, if not penetrated, about 1850. The Richmond Commission was told of the development of dairying on both sides of the Great Western Railway but no date was given.[12] However, certain facts do suggest that Wiltshire was one of the first counties to be involved in the liquid milk trade to London. The Kelly's Directory for the county in 1855 noted that 'the railways open for the farmer the market of London, Oxford, Bristol,

12. R.C. Ag., Parl.Papers, 1881, xvi, p.439.

Bath, Cheltenham, and Gloucester,'[13] and it is known that milk was sent from Gloucestershire to London in 1850.[14] These facts only suggest that it was possible for Wiltshire to be on the London milk route but the belief is given some substance by Richard Jefferies, who commented upon the rise of the dairy farmer from a rude and primitive position to one of prosperity during the 1860s and 1870s as a result of the milk trade.[15] If a doubt hangs over the 1850s and early 1860s there can be no doubt that the decade after 1865 saw a marked growth in the milk trade from Wiltshire. The late 1870s, however, were not good years for the Wiltshire dairy farmers, despite the relative strength of their position, as the trade was faced with an overproduction crisis. Jefferies referred to the problems of finding a market for liquid milk, a fact that would appear to be supported by the decline in the number of cows and heifers in the county in the late 1870s, recorded in the official returns. It would seem, therefore, that the sudden rush into the milk trade in the previous years had led to a temporary imbalance between supply and demand. In part this was the result of a shift from cheese making to milk selling in the north of the country after the disasterous fall in cheese prices in the years 1878 and 1879, but there were also areas thatswitched into milk selling from arable before the slump of 1879. For example, the village of Corsley, situated to the south west

13. Kelly's Directory of Wiltshire, (1855), p.2.
14. Bravender, op.cit., pp.173-4.
15. Jefferies, Hodge, op.cit., vol. ii, p.132.

of Salisbury, had been predominantly wheat growing parish, but between 1870 and 1880 the conversion of arable to pasture took place and dairying became of prime importance.[16] Significantly the parish was only three miles from the Great Western Railway.

1879 was a year of depression in all parts of the county, and can be seen as something of a turning point. Corn prices slumped in the face of foreign competition while a flood of American cheese reduced all prices to a ruinous level. On top of this bad seasons inflicted serious, though temporary damage. The value of dairy land was greatly reduced, which in turn led to a fall in the make of cheese.[17] However, it would be wrong to exaggerate the importance of these events. On the one hand the collapse of cheese prices, by increasing the indebtedness of producers to the factors, threw into relief the advantages of the liquid milk trade. On the other one must remember that the trend towards milk selling was already under way as the evidence of Sir Gabriel Goldney suggested, and that of the railway companies confirmed.[18] Similarly, the slump in corn prices was a stimulus to the movement away from arable to pasture, but the trend was already under way in certain areas. Lastly the obvious advantage enjoyed by the dairy farmer, the cheapening of feed as corn prices dropped, was an importance stimulus but to a practice which had been carried on since the 1840s.

The dominant characteristic of the developments in the agriculture of Wiltshire in the decades between 1879 and 1914 can be stated simply as the expansion of the liquid milk trade. The

16. M.F. Davies, Life in an English Village, (1909), p.87.
17. see Chapter 4, p.154.
18. R.C.Ag., Parl. Papers, 1881, xv, Q.15, 891, p.555.

acreage under corn decreased markedly while that returned as permanent pasture increased. Along with this the county flock shrank at a remarkable rate while the county herd grew, though at a slower rate than the decline in sheep numbers. However, the growth of the dairy herd in Wiltshire followed the national pattern only in the most general terms. The expension of dairying in the early 1870s resulted in an oversupply crisis facing Wiltshire farmers, which was reflected in the number of cows and heifers which decreased slightly during these years. It was not until the late 1880s that there was a marked surge forward in numbers, and this was soon checked by a further overproduction crisis which characterised most of the 1890s. For the decade the size of the county dairy herd increased but slowly, and it was not until the opening of the new century that the growth rate increased. During the years immediately preceding the Great War, however, the expansion in numbers was considerable, the growth rate exceeding two percent per annum, compared with an average rate of 1.4 percent per annum for the period 1866-1915 as a whole.

Table LXIII over....

TABLE LXIII

Changes in the Structure of Agriculture in Wiltshire, 1866-1930.

Nos. in 000s. Index 1896-1900 = 100.

	Dairy Cattle nos.	Dairy Cattle index	Total Cattle nos.	Total Cattle index	Total Sheep nos.	Total Sheep index	Corn acres	Corn index	Permanent Pasture acres	Permanent Pasture index
1866-70	48,952	77.5	78,857	70.4	738,252	140.7	219,936	148.5	283,177	66.9
1871-75	50,199	79.5	87,084	77.8	733,415	139.7	223,094	150.6	306,987	72.5
1876-80	48,853	77.4	87,625	78.2	678,011	129.2	216,219	146.0	330,743	78.1
1881-85	51,678	81.9	94,254	84.2	621,080	118.4	200,391	135.3	368,774	87.1
1886-90	59,052	93.6	104,771	93.6	624,068	119.0	175,096	118.2	396,777	93.7
1891-95	60,269	95.5	108,142	96.5	584,989	111.5	164,140	110.8	414,052	97.8
1896-1900	63,126	100.0	112,002	100.0	524,764	100.0	148,109	100.0	423,607	100.0
1901-05	66,853	105.9	114,194	102.0	472,283	90.0	135,451	91.5	433,797	102.4
1906-10	76,247	120.8	124,180	110.9	474,769	90.5	131,029	88.5	452,099	106.8
1911-15	81,402	128.9	128,305	114.6	408,650	77.9	130,930	88.4	452,952	106.9
							Arable		Permanent Pasture	
1916-20	84,690	134.2	133,034	118.8	272,855	52.0	271,914		402,244	
1921-25	91,694	145.2	136,711	122.0	222,235	42.4	247,210		347,642	
1926-30	100,713	159.9	147,348	131.5	240,666	45.8	205,730		390,234	

Source: Agricultural Statistics.

The expansion in dairying was more striking in the south of the county. Rew, reporting on the Salisbury Plain district, concluded that 'the chief alteration which the depression has brought about in the ordinary method of farming is...a large extension of dairying... milk production has been largely taken up as a mainstay.'[19] The most striking example of this changeover came from the Pewsey Vale, which had tumbled down to grass during the 1880s after a large scale exodus of farmers in 1880 brought about by the refusal of the Marquis of Aylesbury to grant a permanent reduction in rents. By the end of the decade these farms had become part of the huge farming enterprise of S.W. Farmer, who, in partnership with Frank Sutton, ran 14,000 acres of land. At its zenith, about the turn of the century, the firm of Frank Stratton and Company, as it was then, had 25,000 acres and 2,000 cows to its name. From the outset dairying had been introduced with an eye to the London market. Farming on such an extensive scale enabled costs to be reduced so that output per unit of capital employed increased. Similarly, output per acre was lower than on a more intensively worked farm but output per man was increased by making full use of the labour force. By 1911, when Daniel Hall was touring the country, the Pewsey Vale was established as the centre of an area vital to London for its supply of milk.

The striking point of Frank Stratton's success was the speed at which it was achieved. In 1879 he took over an arable farm at

19. R.C. Ag., Parl.Papers, 1895, xvi, p.18.

Manningford Bruce from his uncle, and continued to farm it as an arable concern. In Stratton's own words

> 'for years I never grew more than eight sacks of corn per acre...So matters went until 1885 when Henry Ferris gave up at Manningford Bohune...I had not the capital to take it, but Sam Farmer said he was convinced that the two farms could be worked together economically; so we went into partnership. We started at once a Dairy and sent milk to the Aylesbury Dairy Company.'[20]

Stratton's account of his career is interesting in that it sheds more light on his partner Sam Farmer. Farmer, a trained doctor but forced to give up this career because of ill health, is usually dismissed as the sleeping partner, doing no more than providing the capital for the enterprise. From Stratton's account it would appear that he played a more active role. The initiative at the outset came as much from Farmer as from Stratton, while once in business his partner described him as 'a first rate financier, buyer, and seller.'

The enterprise soon expanded. In 1888 Charlton and Cuttenham were rented. Some crops were grown but as the land was heavy some of the land was grassed down and two dairy herds established. In 1890 the holding was increased by the acquisition of Wilsford Lake, and two years later the pair took over Rushall from Alfred Stratton. Not until 1917 was there a reversal in the policy of laying down to grass, and only then was it the exceptional circumstances of war and legal requirements that forced them to do so.

But Frank Stratton was not alone in responding to the changed conditions of the last quarter of the nineteenth century. James Stratton, the son of the famous agriculturalist Richard Stratton,

20. Frank Stratton, An Account of a Wiltshire Farmer's Career, n.d. typed notes in the possession of A.G. Stratton, Manor Farm, Alton Priors, Wilts.

took over a farm at Salthrop in 1861 where he concentrated on dairying. Five years later he moved to Chilcombe, just over the border in Hampshire, but continued to farm in Wiltshire at Alton Priors, Alton Barnes, and at Shaw Farm. At Chilcombe he was the first farmer in the district to use steam ploughing and was an early and passionate advocate of the use of nitrate of soda. However, his greatest achievement was the speed and success with which he changed the nature of his farming in the 1870s and 1880s. Realising the extent of foreign competition in corn he laid down large areas of arable land to grass and built up a herd of between 300 and 400 cows, as well as keeping a flock of sheep. In all some 5,500 acres had been converted to grass by the early 1880s, a large dairy had been established, and the milk was sent to London. The misfortune of the arable farmer was to his benefit for he was able to buy cheap Russian barley for cattle feed. As well as this James Stratton was exceptional at spending some three to four thousand pounds annually on artificial fertilisers. No records survive to tell precisely how successful he was, but there was little doubt in the mind of his fellows that he was one of the most successful and prosperous men of his times in both counties.[21]

A similar story emerges from the farming career of William Stratton. Although better known for his work as one of Her Majesty's commissioners on agriculture he was an active and successful farmer

21. Wiltshire Cuttings, xiv, p.15, Kept at Devizes Museum.

at Kingston Deverill in the south west of Wiltshire. The farm had been taken by his father in 1864. According to William Stratton's son

> 'when my father took the farm most of the land that was level enough to be cultivated was under the plough, the downs were unenclosed and the water supply was restricted to the stream and a few ponds in the downs. This was a tough proposition to tackle, the hill land was poor, not kindly for barley, the bottom land was wet and bad working in anything but a dry season.'[22]

This was obviously an uneconomic proposition and William Stratton knew this, and he also knew the risk he was taking, but more important he knew of a solution. The first step was to get the help of the landlord, Lord Bath, before setting about the conversion from a corn to a cattle farm. According to Richard Stratton new dairy buildings were erected, land was laid down to grass, fences were erected, hedges planted, and ponds made. 50 cows were milk and the milk, initially, was made into cheese. In 1880 a further farm was taken at Fertwood. Here the emphasis was on sheep but the enterprise did not pay and, consequently, their number was reduced while the head of cattle was increased. There was still one major handicap to be overcome - the lack of an adequate water supply. The problem became acute in the dry summers of the 1890s. Once again Lord Bath was prevailed upon - and equally significantly once again he responded - and a supply system, initially driven by wind but soon after by oil engine, was installed. The water supply system was crucial in the 1890s and later in the 1920s. The cost involved could be prohibitive for the

22. R. Stratton, Account of Farming History of Stratton Family, n.d., Reading University Farm Records, Wil.6/8,1

ordinary tenant farmer. Undoubtedly many farmers were held back by the refusal and inability of landlords to undertake improvements, but not all fell into this category.

The extension of dairying, and the sale of milk to London, was continued in the decade before the Great War, by other members of the Stratton family. Richard and Jack, sons of William, kept the family tradition going at Kingston Deverill and Fortwood, while at Alton Priors a cousin, Guy, followed a similar path. Guy Stratton had taken over in 1888, and, in the following years, milk was sent to London for the first time from that part of the Pewsey Vale. A further development was the extension of dairying onto the hills. This was first introduced in the early twentieth century. The cows were allowed to run free throughout the year at heights of up to 964 feet. Milking was carried on in "skillings", rough lean-tos, but this led to a problem of poaching.[23] Especially in winter the land readily churned up and it was not until Hosier developed the moveable bail that this was overcome. Hosier, incidentally, was a regular visitor to the Stratton's farm, though it is not clear to what extent he was indebted to his neighbour.

Great emphasis has been placed upon the Stratton family, and rightly so for they were one of the most progressive families in the county and their careers vividly illustrate the lines along which Wiltshire agriculture developed in these years. But the attention

23. ex.inf., A.G. Stratton, and Wiltshire Cuttings, xviii, p.153.

bestowed upon them also reflects the lack of information about other farmers. The Strattons were exceptional but they were not alone. Others, often far smaller men, were also able to adapt to the new conditions but less is known of their actions. However, there is some evidence. For example, the history of the Woods family at Church Farm, Wingfield,[24] just outside Trowbridge was probably typical of the small dairy farmer who had started as traditional cheese makers. In the 1870s the farm, of 160 acres, carried a herd of 40. Something like eight to nine tons of cheese were produced annually. With the exception of the year 1879 no milk was sold as liquid. By the end of the decade, presumably as a result of the prosperity of these years, the herd size was increased to 60. The total production also rose and reached a peak of 14 tons in 1884. Thereafter, notwithstanding further increases in herd size, the total annual make from the farm decreased. In 1893 only ten tons were made, and it was evident that the sale of liquid milk was more profitable. The sale of milk in winter had been started in 1890 on a moderate scale - £61 being received from this source - but it was soon expanded. In 1895, the last year in which cheese was made, the income from liquid milk was £179. The following year saw the final abandonment of the old system of dairying. The account books show that 1,563½ barn gallons of milk were sold in this year, but by 1903 it was 28,991 imperial gallons, a slight decrease, reflecting the problems of oversupply that beset the dairy farmers in the 1890s.

24. Reading University Farm Records, Wil. 9/1,1,2,3.

In some respects the Woods were not wholly typical. From their records it appears that they were first class cheese makers, and it was not until the later stages of the depression in cheese prices that they finally abandoned traditional dairying. The less skilful had left well before then. Unfortunately there is little evidence relating to these people. The general picture, however, is clear. From 1860 to 1878 the price of cheeses at Chippenham had stayed fairly constant. There were year to year variations, for example prices fell badly in 1862 and 1872, but there was no downward trend in these years. 1878 and 1879 were disasterous years. The price of all types and grades of cheese fell dramatically, and though there was a recovery in the following year it was short lived. From 1880 until the 2nd of the century the trend was clearly downwards. The price of first quality Broad Doubles and of Prime Cheddar had fallen by between 20 and 30 shillings a hundredweight, while for lower grades the position was even worse. In contrast milk prices, though falling from the high level of the early 1870s, offered a better prospect of success. By the turn of the century the manufacture of North Wiltshire cheese, had almost ceased, while the making of Cheddar, which had spread from Somerset, was on a much smaller scale. The total amount of cheese pitched at Chippenham was an average of 17.7 tons a month in 1872. Twenty years later this had fallen to 7.4 tons, a decline of nearly 60 percent.[25]

25. Figures totalled from North Wiltshire Herald for 1877 and 1892.

Sir Gabriel Goldney, referring to his estate near Chippenham, told the Commissioners in 1894 how he had 'tried making Cheddar cheese, but after a couple of years...found it not so profitable, taking labour into account, as selling milk.'[26] Goldney was not alone. As he testified there had been a great increase in milk selling in the county, but nothing comparable in cheese making. It is not possible to quantify the decline in the number of cheese-makers nor in the quantity of cheese they made, but it appears clear that by 1914 the majority of dairy farmers in the north of Wiltshire were selling milk rather than converting it into cheese. Some indication of the size of the cheese trade can be gathered from the fact that the number of cheese factors in the county rose from 18 to 20 between 1855 and 1875, but fell to 5 in 1890 and finally reached a mere one in 1907, at which level it remained until the outbreak of war.[27]

Some idea of the nature of change that took place within the county after 1880 can be gained from Table LXIV, which shows details of three areas. The first, Amesbury, was a typical chalk-land district, while Melksham was typical of the dairying country. The third, Cricklade, in the north of the county was predominantly a dairying district but the commitment was less than in the Melksham region.

26. R.C.Ag., Parl.Papers, 1895, xvi, pt.2, Q.15,091, p.67.

27. Details from Kelly's Directory for Wiltshire, 1855, 1890, 1907, and 1911, and Post Office Directory of Wiltshire, 1875.

TABLE IXIV

Changes in Amesbury, Cricklade, and Melksham, 1880 and 1913-5.

	1880			1913-5		
	Amesbury	Cricklade	Melksham	Amesbury & Salisbury	Cricklade	Melksham
			(per 100 acres crops and grass)			
Corn Crops	30.89	13.94	6.81			
Green Crops	18.59	3.98	2.57			
Permanent Pasture	31.06	75.70	86.73	45.0	86.4	91.0
Cows and Heifers	9.40	12.44	19.23	6.1	18.8	25.1
All cattle	18.00	22.42	30.25	9.3	27.8	38.5
All sheep	132.01	18.02	8.92	68.0	12.9	3.7

Source: Agricultural Statistics, 1913-5, R.C.Ag., Parl.Papers, 1881, xvi, p.416.

The inclusion of Salisbury with Amesbury makes direct comparison difficult. Nevertheless, the figures do show the variations and changes at and between the two dates.

The movement into the liquid milk trade, which characterised Wiltshire agriculture in the last quarter of the nineteenth century, was reflected in the rise of several firms dealing in the trade with milk in its various forms. The early history of many of these firms cannot be given with confidence as very little evidence has survived. However, the general outline is clear. Between 1880 and 1911 several dairy firms came into being in the county, joining the pioneers of the milk trade. The Aylesbury Dairy Company had set up a depot at Swindon, which, in 1876, was capable of handling 3,000 gallons of milk a day. In practice it ran at a daily level of 2,000 gallons, supplying London with milk and converting any surplus into cheese.[28] Three years later the North

28. North Wiltshire Herald, June 3rd., 1876.

Wiltshire Dairy Company set up a cooling depot at Stratton to facilitate the milk trade, while further south the Salisbury, Semley, and Gillingham Dairy Company, which had been founded in 1871, by an ex-London milk seller, Thomas Kirby, specifically for the London trade, continued to expand its trade, handling 1,500 gallons a day in 1880. Of these firms the largest was the Aylesbury Dairy Company, which was first registered in 1866, but it was an outside firm operating within the county whereas the others had sprung up from within. Under the leadership of Reginald Butler the North Wiltshire Dairy Company was to become one of the major components of Wiltshire United Dairies, an amalgam of firms formed in 1896. The other major force behind the establishment of this group was Charles Maggs. Some time during the 1880s - some claim it to be 1881, others 1886 or 1887, but the detail is not vital - the firm of Anglo Swiss (Nestles) decided not to renew the contracts of several farmers in the Melksham district. One of these farmers, Maggs, was prevailed upon to buy a seperator, and a collecting dairy and butter factory was set up forthwith. It was on this basis that the firm developed. In 1896 an amalgamation was effected with the North Wiltshire Dairy Company and four other smaller firms, at least one of which, the Frome Dairy Company, was already under Maggs' control. The major concern was still butter. The Melksham factory dealt with 2,000 gallons of milk a day in winter and 5,000 gallons in summer, but the London milk trade was looked upon as no more than a profitable sideline. A wholesaling outlet in London had been purchased in 1901 but the main site of operations was Paddington station itself. The butter

trade, however, was suffering from the competition of cheap Australasian produce. The first response was to switch to butter blending and distribution at the expense of local production. The range of products was extended to include condensed and dried milk, but there was also a major expansion of the trade in liquid milk to London. This was the major growth sector but the manufacture of dried and condensed milk acted as a stabilising factor in the face of a fickle market in London. From a turnover of £80,000 in 1897 the firm expanded until in 1915 the turnover was £1,100,000, though, it must be added, profits were at a lower level. By this time Wiltshire United Dairies had established itself as one of the major dairy companies in the capital, and it was in that year that the firm joined with the Dairy Supply Company and several others to form United Dairies.

Although the question of the manufacture of milk products is outside the scope of this study one must make mention of the presence of the Anglo Swiss Company in Wiltshire. Their first factory was established in 1873 at Chippenham, and was followed by developments at Staverton and Salisbury. Their significance lies in the fact that they provided a further alternative for the dairy farmer. The London milk trade involved certain expenses and risks and in the Chippenham area, for example, the majority of local farmers preferred to send their milk to the local factory, even though prices were not as high as those offered by the London wholesalers.

Thus it can be seen that the last quarter of the nineteenth century and the first decade of the twentieth was a period of marked change in

the character of Wiltshire agriculture. The fame of the county had once rested on the sheep and corn barons of the south. By 1914, however, their glory had largely passed, and in their place had risen a new group of men, the once despised "teat pullers". Despised they may have been but they were able to make money. The relative fortunes of the two types of agriculture can be seen from the estate records of Longleat and Wilton. To the south of Westbury there was an area of the Longleat estate devoted to dairying. During the years 1894-5 the amount of rents actually received - that is after deducting remissions from nominal rents - were, on a constant acreage, only 6 percent below the average for the peak years 1874-8, and were 6 percent above the average for the years 1869-73. The tenantry appeared to manage well. In 1879, the year of disasterous cheese prices, fresh debts incurred by tenants equalled 5½ percent of gross rentals. Thereafter there were no significant debts until 1893, when they were two percent of gross rents. In contrast on the Wilton estate, which was largely devoted to sheep and corn husbandry, serious arrears began to appear as early as 1874. Two years later debts were equivalent to 5 percent of the gross rental, in 1879 11 percent, while during the period 1884-8 they averaged 10 percent, reaching a peak in the following year when accumulated arrears stood at £20,468 on a gross rental of £24,659. The Wilton estate had been at its peak of prosperity in the years 1869-73. By the end of the century rents, on a constant acreage, were over 40 percent down on this figure.[29] There does not appear to be any evidence suggesting that there was any

29. V.C.H., vol. iv, op.cit., pp.103-4.

wholesale abandonment of farms in the north of the county to compare with that in the Pewsey Vale. However, there was something of a decline in the 1890s. In eighteen predominantly pastoral parishes in the north of the county the total number of farmers and dairymen stayed roughly constant at the level of 440 throughout the period from 1878 to 1891, but from that year until 1906 the number fell to a low of 370.[30] Thus it would seem that the pull of the land was at its weakest during the last decade of the nineteenth century - a point that accords well with the fact that this period was one of very low milk prices throughout the country.

The outbreak of war came at a time when prices were rising and the farming community as a whole were beginning to prosper again. The cry of "business as usual" applied to the land as much as to industry and trade, but the demand for manpower soon made itself felt, especially in the dairying counties. The loss of milkers evoked a two fold response. Reversing the trend of the previous half century women returned to milking, while in other cases milking machines were introduced to prevent the dispersal of herds. Labour shortage was not the only problem. The quantity of concentrated food imported fell, and though preference was given to the dairy herd it still meant a reduction in this form of feeding. For Wiltshire the blow was less severe than for, say, Suffolk, as the pasture lands afforded an alternative. In fact the county dairy herd increased in number, taking the years 1916-20 as a whole. The upward trend in numbers was in fact broken in 1916, but the check was a

30. Details from <u>North Wiltshire Directory</u>.

temporary one. High prices were an obvious incentive, especially as cheese prices were fixed at an unprofitable level, and many farmers were induced to join the milk trade, especially in the last year of the war. Unfortunately the period of prosperity was short lived. The price of milk collapsed from 2/6d. a gallon to 6d., a collapse that spelt ruin for Wiltshire Farmers, one of the largest co-operative organisations that was engaged in the milk trade.

The collapse of milk prices in the early 1920s did not spell the end of dairying in Wiltshire. The effect was traumatic and many less efficient producers went to the wall, but in comparison with the price of other agricultural products milk prices held up well during the first post war decade. This in itself was good cause for adapting farm practice to accommodate milk production but the expansion of dairying in Wiltshire, and in surrounding counties, was greatly aided by the work of A.J. Hosier of Wexcombe, who developed a new system of dairying based on the use of portable milking bails. The system was simple yet revolutionary. Basically the normal practice of bringing the cows to the shed for milking was reversed. The milking machine, housed in a portable bail, was taken to the cows. The overall effect was to reduce running costs, improve the quality of the land, and produce cleaner milk.

The details of the system, as well as of the man, deserve closer attention.[31] The farm at Wexcombe, off the Hungerford to Salisbury road,

31. A.J. and F.J. Hosier, Hosier's Farming System, (1951), gives a personal account, complete with family details, for the whole period between the wars.

consisted of 1,000 acres of chalk land, up to 750 feet above sea level in elevation, and 700 acres in the vale. In the nineteenth century this would have been a classic sheep and corn farm with possibly a small dairy in the vale. (It is interesting to note that Hosier's father was an arable farmer who had been ruined in the 1880s). Under Hosier's regime in the 1920s there were cows, not sheep, running on the downland. A milking herd of some 300 cows was kept, there being a total of 450 cattle in all. Five milking bails were used, each operated by one man and one boy, while the total regular farm staff was only 16. The cows were, in the main, non pedigree Shorthorns bought from Ireland. Their yield was comparatively low, ranging from 500 to 725 gallons per year per cow in milk. The use of the milking bail had been intended initially to overcome the problems of the Wexcombe estate, which had no roads, badly sited buildings and no dairy facilities. However, it was soon evident that the low cost system was ideally suited to the depression conditions of the 1920s. Thus though the idea was developed to meet the conditions of the post war years the original discovery owed more to the problems of local farm topography than to general economic trends. One of the first benefits to emerge from the system was the saving on the wages bill. On a normal farm in the district a herd of 60 cows would require seven to ten men as well as boys, whereas Hosier needed only one of each. The second advantage was a reduction in the risk and incidence of disease. As a result Hosier was able to sell the majority of his milk as Grade A (T.T.), thus realising a higher price

per gallon. Lastly, by running the cattle on what was the second rate pasture land of the downs he was able to improve its quality without spending large sums of money on artificial manure. In other respects Hosier was well ahead of his contemporaries. His farm was highly mechanised, and the management of the farm was carefully thought out with strict departmentalization to make full use of labour. Expensive crops such as mangolds and cabbages were not grown. The quantity of bulk food given to the cows was small in comparison with others, but the prime concern was to reduce costs as far as possible and to make full use of every item. For example, he was prepared to feed corn, but only if the selling price was unattractive to him. Similarly, if the selling price of hay was below the estimated cost of production and cutting the hay was not cut. The advantages of Hosier's system can be seen from the following figures prepared by the Institute of Agricultural Economics at Oxford.

TABLE LXV

Cost of Production per Gallon of Milk (d.)

	Costs compiled in S.E. (Kent).	Costs compiled in Oxford.	Hosier's costs, average 1924/5 - 1926/7
Labour	2.9	3.2	1.5
Concentrated food	4.0	4.3	4.7
Bulk Food	5.3	4.5	1.5
Total....	12.0	12.0	7.7

Source: C.S. Orwin, A Pioneer of Progress in Farm Management: A.J. Hosier, (Oxford, 1931), p.30.

There were, however, limitations to the system. Firstly, it was suited to light soil areas only. On very wet, retentive soil the problems of poaching were considerable. Further, the system was best

suited to large farms. The stocking density was very low, one cow to five acres, but more particularly the optimum field size was about 30 acres. The adoption of the milking bail involved capital outlay that could be prohibitive but probably the greatest obstacle lay not in the purchasing of the bail, nor in the cost of fencing, but in the expense involved in providing an adequate supply of water. Much of the chalk land in the south of England was not watered and, therefore, was not immediately suited to the bail system. Hosier had to fence and water his land, but his position was strengthened by the fact that he had sold up an arable farm before the collapse of prices in the early 1920s. Overall, however, the system proved a profitable one.

TABLE LXVI

Profits on A.J. Hosier's Dairying Interests, 1923/4-1926/7.

	Number of Cows Milked	Average Yield	Value Produced per cow	Value Produced per gal.	Cost of Production* per cow	Cost of Production* per gal.	Profit per cow	Profit per gal
1923/4	80	633gals	£33.10	12.2d	£22.6	8.5d.	£11.6	3.7d.
1924/5	80	658	38.15	17.2	23.10	8.6	15.5	8.6
1925/6	154	720	40.2	13.4	23.15	7.9	16.7	5.5
1926/7	210	725	40.12	13.6	21.10	7.1	19.2	6.5
1927/8	300	670	37.10	13.0	27.5	9.7	10.5	3.3

*no allowance for overhead costs

Source: A.J. Hosier and R.H. Hosier, Hosier's Farming System, (1951), 24-5, W.E. Cole, Systems of Dairy Farming, (1930), 309.

Even making allowance for the omission of overhead costs, including transport charges, attributable to the dairy the system showed a good profit. However, it would be wrong to exaggerate the impact of the bail system on Wiltshire dairying by 1930. In a survey of the use of milking bails, carried out in 1932, Dixey and Messer found 102 bails

in use on 86 farms (excluding the farms owned by Hosier), of which 32 farms were in Wiltshire.[32] The total quantity of milk produced by the bail system was limited - equivalent, it was calculated, to the needs of a medium sized town the size of Leicester - but the new producers were serious rivals to the older milk producing areas whose costs tended to be higher.

Hosier was not the only Wiltshireman to exert a decisive influence on events in these years. Robert Boutflour did a lot of his early work as an agricultural adviser in the county. In many respects his work in popularising the ideas propounded by the nutritionalists, with its emphasis on reduced bulk feed, balanced diets according to individual needs, and adequate water supply per gallon of milk produced, was equally as important, if not more so, than the more spectacular successes of Hosier. The two systems, however, blended together and in combination provided a very efficient means of producing milk.

The ideas of Hosier and Boutflour were not common in Wiltshire in the 1920s, but there were men willing to take up new ideas. At Kingston Deverill and Alton Priors two members of the Stratton family, Richard and Guy, were in the forefront of the move into dairying and the adoption of the milking bail. The Strattons were big men farming, respectively, three and two thousand acres. On farms of that size it was possible to run several enterprises, and to switch the emphasis between them as market conditions fluctuated. However, in both cases the farms had been originally sheep and corn concerns, but had been

32. R.N. Dixey and M.Messer, Open Air Dairying, (Oxford, 1932).

adapted to dairying. On Guy Stratton's farm in the Pewsey Vale dairying had been fostered since well before the Great War. Moreover the practice of running the cows on the downs had been followed since the turn of the century. During the inter war years two dairy herds were kept. One of 100 in the vale, stocked at about one to three acres, and one of 60 on the hills, stocked at about one to four acres. Grain was grown on the farm for feed, as were green crops for silage, but there was a fairly heavy expenditure on ground nut and decorticated cotton cake. No detailed accounts were kept - like many farmers the chief concern was with the system as a whole, rather than with the profitability or otherwise of each enterprise - but the following figures give some indication of the scope of the operation.

TABLE LXVII

A.G. Stratton: Milk Production and Revenue, 1923/4-1934/5.

	Daily Milk Production (gals.)			Annual Revenue
	Summer	Winter	Average	£
1923/4 - 24/5	261	227	244	5,415
1925/6 - 29/30	247	245	246	5,306
1930/1 - 34/5	295	285	290	5,292

Source: Papers in the possession of A.G. Stratton, Manor Farm, Alton Priors, Wilts.

The farm at Kingston Deverill had a similar history. At the turn of the century there had been but one dairy herd, on the clay, chiefly concerned with the manufacture of cheese. By 1918, when a second herd was started, the position had changed and cheese making had been totally abandoned. Milk production was further intensified in 1920 when a third

herd was set up, making a total of 160 cows. Hosier bails were introduced in 1928 and 1930 to meet the problem of reduced labour supply. Again the size of the concern enabled grain to be grown on the farm for feed, or for sale when prices warranted such action. Although a large amount of money was spent on artificial feeds there were rigorous economies in other directions. The herd replacements were almost exclusively cheap Irish stirks, while little was done before the second world war to improve the quality of the pastures. On the hills the cows had as much as five acres per head. However, "real meanness and extreme hard work" proved vital components of the recipe for success during the hard years following the false boom of the 1914-20 period.

TABLE LXVIII

R.F. Stratton: Salient Features of Farm System, 1922-39.

	1922-25	1926-30	1931-34	1936-39
Sales (£)				
Cattle	3,619	3,974	3,059	4,779
Sheep	3,698	4,042	3,781	3,462
Corn	2,968	2,378	962	1,414
Dairy	5,185	4,744	3,653	3,782
Purchases (£)				
Cattle	1,903	2,706	1,748	2,837
Feed	2,835	2,983	2,160	2,658
Labour	4,217	3,725	2,898	2,875
Profit (£)	3,134	1,941	212	1,839

Source: Papers in the possession of R.F. Stratton, Manor Farm, Kingston Deverill, Wilts.

Closer examination of the Stratton farm helps to explain the success of the man. Several striking points emerge from Table LXIX. The large percentage of capital in the form of livestock, 72 percent,

explains the high turnover rate of 101 percent compared with the normal figure of about 70 percent. Looking at expenditure generally the total costs are remarkably low, nearly half the average for Wiltshire, the saving on feed being particularly marked. Lastly, one is struck by the heavy reliance upon the dairy as a source of income. The figure, approximately 40 percent, on a farm of this size running four major enterprises, is a large one. When one remembers the relatively recent move into the milk trade, in comparison with the well established sheep and corn tradition, the dependance on the dairy is further highlighted.

Table LXIX over.....

TABLE LXIX

Details of Manor Farm, Kingston Deverill, 1930.

Acreage and Capital

	Total	Per 100 acres
Total Acreage	2,810	
Permanent grass including enclosed down	2,024 1,300	72 46
Total Capital	£16,560	£589
Capital in plant implements and machinery	2,298	82
Profit as % of capital	15.91	

Costs (£)	Total	Per 100 acres	Per £100
Labour	3,058	109	25
Purchased feed	2,765	99	22
Purchased Seed and manure	262	9	2
Railway	170	6	1
Others	482	17	4
Total Production	6,737	240	54
Rent	1,492	53	12
Rates	68	2	-
Others	1,461	52	12
Total Maintenance	3,021	107	24
All Costs	9,758	347	78

Profit and Loss Account

	Total	Per 100 acres
Total Production	£12,493	£445
Production costs	6,737	240
Gross Margin	5,756	205
Maintenance costs	3,021	107
Net Margin	2,735	98
Interest on capital at 5½	828	30
Surplus for unpaid labour/management	1,907	68

Output (£)	Total	per 100 acres	Per £100
Cattle	1,508	54	12
Dairy	4,856	173	39
Sheep	2,728	97	22
Pigs	622	22	5
Poultry	50	2	-
Total live-stock	9,764	348	78
Crops	2,367	84	19
Sundries	362	13	3
Total	12,493	445	100

Source: Analysis of accounts kept by R.F. Stratton (and in his possession) carried out by University of Bristol, Department of Agriculture and Horticulture.

The Strattons were one of the leading farming families in the county, and one has to look beyond their successes to get a fuller picture of the general state of play in Wiltshire. There is a limited

amount of material for the 1920s, but a fairly accurate impression can be obtained from a study carried out by Blundell and Dawe of the Bristol province, that is Gloucestershire, Herefordshire, Somerset, Wiltshire, and Worcestershire, for the year 1934/5.[33] The survey covered 110 farms carrying 4,154 cows, of whom 3,247 were in milk. The total gallonage produced was 2,425,336, equivalent to a yearly average of 584 gallons per cow and heifer, or of 747 gallons per cow in milk. These figures were equivalent to a daily average yield of 1.60 gallons per cow and heifer, or 2.05 gallons per cow in milk. Of the milk produced 89.2 percent was sold, mainly wholesale, but about 10 percent retail, 3.6 percent was sold to employees, and 3.0 percent fed to livestock. Only 4.2 percent, some 104,000 gallons, was used for farm manufacture, of which 90 percent was made into cheese.

The cost of production was similar to that described in an earlier chapter. Gross farm costs amounted to 10.17d. per gallon, from which was deducted 0.78d. for the value of the calf and manure, giving a net farm cost of 9.39d. per gallon to which had to be added 0.11d. for farm delivery costs, thus giving a final figure of 9.50d. per gallon production costs.

The vast bulk of the milk was sold through the Milk Marketing Board, and the returns were 10.29d. per gallon which represents a profit of approximately 7.8 percent on costs, or 6.6 percent on total capital invested.

33. C.V. Dawe and J.B. Blundell, The Financial Aspect of Milk Production, University of Bristol, Department of Agriculture and Horticulture, (1935).

TABLE LXX

Cost of Milk Production in Bristol Province, 1934/5.

	Per Cow in Herd £	s.	d.	Per Gallon d
Foodstuffs				
Purchased	5	10	9	2.28
Homegrown	4	12	6	1.90
Grazing	3	4	1	1.32
Total	13	7	4	5.50
Labour				
Paid and unpaid	5	5	9	2.17
Miscellaneous	3	13	3	1.51
Herd Depreciation	2	8	1	0.99
GROSS FARM COSTS	24	14	5	10.17
Credits				
Calves and manure	1	17	9	0.78
NET FARM COSTS	22	16	8	9.93
Farm Delivery costs		4	10	0.11
ALL COSTS	23	1	6	9.50

Source: slightly adapted from C.V. Dawe and J.E. Blundell, The Financial Aspect of Milk Production, University of Bristol, Department of Agriculture and Horticulture, (1936), p.4.

This survey, while giving a general impression of the region as a whole, does not show how Wiltshire dairy farmers fitted into the picture. In another study on the cost of winter milk production Dawe and Blundell compared various areas within the Bristol province.

Table LXXI over...

TABLE LXXI

Winter Feed Costs in areas of the Bristol Province, 1934/5.

	All Herds	Wiltshire Downs	Cotswolds	Vale Districts Wiltshire	Gloucester	Worcs.
Number of herds	133	16	20	13	24	18
Gallons per cow in herd per day	1.51	1.62	1.35	1.53	1.65	1.56
Average number of cows per herd	38	70	42	41	26	28
Daily Food Cost per Cow (d)	11.20	10.25	11.11	11.20	12.80	12.50
Food Cost per gallon (d)	7.40	6.33	8.24	7.33	7.77	8.01
	lb	lb	lb	lb	lb	lb
Concentrates per cow per day	6.56	6.60	6.52	6.14	7.18	8.27
Hay and Straw per cow per day	12.65	12.14	13.84	13.41	13.77	12.12
Succulents per cow per day	12.19	16.94	10.20	12.55	11.90	10.37
Concentrates per gallon	4.34	4.08	4.84	4.01	4.35	5.30
Dry Matter per cow per day	18.20	18.33	19.02	18.52	19.63	19.26
Starch per cow per day	9.43	9.15	9.60	9.39	10.54	10.47
Starch deficiency	0.97	1.49	0.43	1.05	0.17	-
Starch surplus	-	-	-	-	-	0.06

Source: C.V. Dawe and J.E. Blundell, Winter Feeding for Milk Production (An Economic Study), University of Bristol, Department of Agriculture and Horticulture, (1936), pp.37, 41.

The farmers of the Wiltshire Downs were conspicuous for their low costs, the result of a high average yield and a large starch deficiency. Low food costs also characterised the Wiltshire farmers in the vale. The starch deficiency was again high but with high average yields once again acting as a compensating factor. Winter grazing was of less

importance in the north, on the smaller farms. However, this failing in technical excellency was offset by financial rewards. Low output, as long as it was accompanied by low costs, appears to have been the key to success.

Looking at the years 1925 to 1928 certain differences appear between successful and unsuccessful farmers in Wiltshire, as can be seen from Table LXXII. First, there was an obvious difference in size, the most profitable farms being almost half as large again as the most unprofitable. These latter farms had a greater percentage of arable land and a lower proportion of enclosed down. Both points are significant. In the conditions of the later 1920s arable farming was under heavy pressure, and the ability to switch enterprises was a sign of a progressive farmer. The percentage of enclosed downland was the reverse side of the coin. Improved downland held out the possibility of success, and it is not surprising that the most successful farmers had a higher percentage of their land classified as enclosed down. One must not exaggerate the point as part of the difference was no more than a matter of geographical location, for percentage of unenclosed down was twice as high on the successful farms. Looking at the capital invested in these farms one is struck by the fact that more money was involved on the least successful farms. However, the overall total is of less importance than its composition. The characteristic of the profitable farm was a large amount of money invested in livestock, and a correspondingly low amount in deadstock.

TABLE LXXII

Characteristics of the five most successful and five most unsuccessful farms in the Wiltshire Agricultural Accounting Society, 1925-8.

	Five most Profitable Farms			Five most Unprofitable Farms		
Average Size (acres)	1,473			902		
	Total	%		Total	%	
Permanent Pasture	530	36		397	44	
Enclosed down	457	31		36	4	
Unenclosed down	74	5		90	10	
All grass	1,061	72		523	58	
Arable	412	28		379	42	
	Per 100 acres	%		Per 100 acres	%	
Total Capital (£)	1,000	-		1,056	-	
Capital in livestock	567	58.7		556	52.7	
Produce	281	28.1		315	29.8	
Implements	132	13.2		185	17.5	
Total Output	652	-		584	-	
Output from						
Cattle	53	8.1		16	2.7	
Milk	272	41.7		239	40.9	
Sheep	125	19.2		105	18.0	
Pigs	15	2.3		10	1.7	
All livestock	465	71.3		370	63.4	
Crops	158	24.2		198	33.9	
Sundries	29	4.4		16	2.7	
Total costs	566	-		648	-	
Cost of						
Labour	169	29.9		228	35.2	
Foodstuff	170	30.0		161	24.8	
Manure and seeds	24	4.2		26	4.1	
Rent	61	10.8		74	11.4	
Others	142	25.1		159	25.1	
Profit	86			-		
Loss	-			64		
Profit / Loss as % of capital	8.6			6.1		

Source: C.V. Dawe, Wiltshire Agricultural Accounting Society: Analysis of Four Years Financial Accounts, paper in the possession of R.F. Stratton.

Although it has been argued that conditions favoured the production of milk, it does not follow that emphasis on this enterprise was an assurance of success. On examining the outputs of the farms in

question there is no striking difference in the amounts accruing from milk. In fact the difference appears to lie in the cattle enterprise, but more important is the fact that the importance of crops was substantialy less on the more successful farms. The last and most important difference, however, was in the costs of production. Not only were costs of production per 100 acres different - 14 percent higher on the least profitable farms - but their structures were not the same. The successful farms spent more on feed as a percentage of total costs, but appreciably less on labour.

The tendency of profitable farms to be large should not be taken as an absolute. The Wiltshire Agricultural Account Society was largely composed of "big" farmers. Of 40 members in 1929 only five farmed under 150 acres, whereas 15 farmed over 1,000. Not all members were successful and not all non-members were failures. As one example of a successful non-member one may take W.H.G. Stone of Trowbridge, whose enterprise, in both senses of the word, characterised much of Wiltshire dairy farming in the 1920s. His farm of 180 acres was of above average size without being large. He and his brother kept a herd of 70 Shorthorns, of whom 50 were in milk. Milk recordings was not practiced, but any obviously bad milkers were quickly sold. Costs were kept as low as possible, chiefly by growing as much feed as possible on the farm. Similarly, labour costs were kept low. Two or three men had to be employed to do the milking, but everything else including the milk round was carried out by the brothers. The establishment of the round illustrates the

tenacity of the men. The initial spur was the refusal of the Trowbridge Co-operative Society to take their milk. The Stone brothers retaliated by under-cutting the Co-op. by 1d. a pint, and by building up a round through the hard slog of knocking on doors and offering a wider range of services, usually in the form of special deliveries, than any of their rivals. As producer/retailers they were able to get better returns than those who sold wholesale. However, their success was not simply the result of economy and hard work. The Stones had an eye to customer wants. They bottled milk, and were the first in the district to go over to the production of accredited milk. This gave them a good local reputation, which was instrumental in their gaining a contract to supply the nearby hospital.

A similar story emerges from the career of W. Benly of Corston. Starting out on his father's farm of under 50 acres he moved after four years to a farm of just under 300 acres at Sparsholt. Although a mixed farm the emphasis was on milk. Thus corn and barley grown was chiefly for feed, but, more important, a good milking herd of Friesians and Ayrshires was built up. Owning his own Friesian bull he was able to breed his own replacements. Although not faced with a serious labour shortage in the area machinery was introduced. A Hosier bail was bought in the late 1920s which, with a stacker, was to prove of great value during the following decade. The milk was sent to London, but an alternative retail outlet was developed in Oxford which involved harder work but better returns.

The Hosiers and the Strattons claim greater attention because of their spectacular successes, but it should be remembered that they were outnumbered by the Stones and the Denlys of the farming world. It was on the backs of the latter that the success of the period was borne. Against this it must be remembered that there were many who failed to come to terms with the post war conditions. Of these some would have failed in almost any conditions, but others suffered as the result of the new, harsh conditions of the 1920s. Yet in Wiltshire the extent of suffering was less than in many other counties, including those also engaged in the milk trade. In part this was the result of the work of such men as Hosier and the Strattons opening up and developing new aspects of farming, but equally it owed much to the considerable toil of smaller men who were forced to work hard, adapting the system to include new ideas where possible, economising to reduce costs in order to make the more traditional form of dairying pay.

The personal element, though often played down, was crucial but in conclusion one must stress the trends that were in action forming the framework within which each farmer had to work. Basically, the cost of producing milk was falling at a greater rate than its price. In contrast the production of corn became increasingly unprofitable, while an enterprise such as sheep showed little profit irrespective of the degree of specialisation. With up to 15 percent of production from sheep the profit per acre in Wiltshire in 1930 was 3/-. Above that

level the profit was only slightly larger, being 4/- an acre. On the other hand as the percentage of income from milk rose so profits increased. Thus, at 40 percent the profit was only 2/- an acre, but at 70 percent it was 14/-, and was as high as 34/- an acre on those farms given over entirely to milk production.[34] Two further points deserve mention. First, the purchase of artificial feeds, though increasing yields, brought about a corresponding increase in production costs. Second, the greater the amount of capital in dead-stock the lower the level of profits. Mechanization was not the answer as costs tended to rise at roughly the same rate as production. The overall situation was best summed up by Messer in his survey of agricultural distress in 1931. Speaking of the remarkably small number of Wiltshire tenants giving notice or asking for rent reductions, he observed that he could 'only account for this by saying that dairying had saved the situation.'[35]

Four parishes in different parts of the county provide an illustration of the position in the late 1920s. Lacock, situated four miles south of Chippenham, and three miles north of Melksham, was in the heart of the milk country. Predominantly a pasture area it had been involved with dairying for centuries, and with the liquid milk trade since the middle of the nineteenth century. A low lying area it was well provided with road and rail facilities. In June 1927 there were just over 400 cows in milk in the parish. The produce

34. C.V. Dawe, Wiltshire Agricultural Accounting Society: Factors Affecting Wiltshire Profits, University of Bristol, Department of Agriculture and Horticulture, 1932.
35. M. Messer, The Agricultural Depression of 1931, (Oxford, 1937), p.30.

of 367 was sold wholesale, of 27, owned by two farmers, retailed locally, and of 12, owned by one man, made into butter. Similarly, in Bulkinton, between Devizes and Trowbridge, where of 225 cows in milk the produce of 185 was sold wholesale, of 20 retailed locally, and of 20 made into butter. In both cases the amount of milk sold wholesale was about 90 percent. In Coombe Bisset, three miles south west of Salisbury, the position was somewhat different. There were fewer cows in milk in relation to the size of the parish, but also the milk was channelled into the liquid milk trade, some being sold wholesale the rest retailed in Salisbury. The only manufacturing carried out in the area was at the co-operative cheese factory which had been set up by the local farmers to deal with the problem of surplus milk. Lastly in Everesleigh, in the Pewsey Vale, milk production for export out of the county had been started in the 1920s, a reflection of 'the tendancy to develop the Marlborough Downs and Salisbury Plain as milk-producing areas supplying the London market.'[36] In all parts of the county dairying had become the mainstay.

Thus, by 1930 Wiltshire had established itself as one of the leading milk producing counties of England. While the county dairy herd had increased steadily the flock had decreased to under a quarter of a million in the 1920s. At the same time the acreage returned as arable declined by a further 25 percent. Only the size

36. F.J. Prewett, A Survey of Milk Marketing: Based on Conditions in Wiltshire and Somerset and the City of Bristol, June 1927, (Oxford, 1928).

of the farms remained roughly constant.[37] Taking a more general view of the developments in the period as a whole Wiltshire was in the forefront of the rise of the liquid milk trade. In the nineteenth century it was among the first to enter the London market. Particularly after 1879 cheese making was abandoned as an increasing number of farmers concentrated on the more lucrative alternative of selling liquid milk, a trend that in turn gave rise to the growth of companies dealing with the trade. During the war years one such firm, Wiltshire United Dairies, became one of the props of the greatest combine yet seen - United Dairies. After the war the growth of the milk trade proceeded apace. Once again Wiltshire came to the fore in the persons of Hosier and Boutflour. This, then, is the background against which we will set certain characters to see how and why they responded to the economic forces outlined above.

37. See for example in the years 1895 and 1927.

Farm Size	Number		Percentage	
	1895	1927	1895	1927
Above 1 under 5 acres	1,822	1,204	25.9	18.8
" 5 " 20 "	1,761	1,447	25.0	22.6
" 20 " 50 "	920	1,180	13.1	18.4
" 50 " 100 "	675	848	9.6	13.2
" 100 " 300 "	1,152	1,214	16.4	18.9
Over 300	610	514	8.7	8.0
Total Farms	7,040	6,407		
Average Size	108	115		

Source: Prewett, Survey of Milk Marketing, op.cit., p.9, Parl.Papers, 1896, lxvii, p.8.

CHAPTER 11

Wiltshire: A Case Study.
(ii) The Problem of Change.

I

In the literature on economic growth an increasing amount of attention has been paid to the role of entrepreneur. However, the recognition of the importance of this man in industry and commerce has not been extended to the sphere of agriculture. Although it is regognised that English agricultural history cannot be interpreted in terms of the "great names" of Coke, Tull, and Townshend there has been little work carried out on the nature of the main body of farmers. It is somewhat strange that, while attention has been paid to both landlords and labourers, the tenant farmer has been grossly neglected, even though it was he who provided the crucial drive for improvement.

The present chapter is intended to remedy in part this deficiency. In the preceeding pages has been developed a simple economic model which attempts to describe and explain the trends that brought about the development of the dairy industry, and in particular of the milk trade. It has been argued that, at a time when general demand factors were conducive to an expansion of milk production, price trends confirmed the changes within the structure of English agriculture brought about by foreign competition. The returns to milk producers in the 1860s and 1870s were very high, and even in the following decades the fall

in price was offset by a fall in the cost of production. Similarly, after the Great War the fall in the cost of labour and feed was greater than the fall in the price of liquid milk. Taken together these factors explain the general shift into milk production during the period. There remain, however, certain problems that do not fall within the scope of such a model. These problems can be brought together in the following general question: given the fact that market conditions were changing in favour of dairy farmers, why did some adapt almost immediately, whereas others in very similar positions failed to do so? or, put another way, are there any characteristics that distinguish the progressive farmer from the rest of his fellows?

Before answering these questions it will be necessary to look at recent theory and certain studies in order to acquire the necessary analytical tools, in so far as they are applicable back in time. Then one will be able to turn to some concrete examples, the result of a series of interviews carried out among some Wiltshire farmers who were in the forefront of developments in the 1920s.[1]

1. See Appendix.

II

Innovations: theory and practice in the twentieth century.

Since the last world war a large amount of work has been carried out, largely in America but to an increasing extent in Britain, on the problems associated with the diffusion of innovations. Although there are differences of opinion on the relative importance of certain factors in various circumstances there is a general agreement on the major features of the process whereby ideas are spread.[2] The adoption process, in its ideal state, is seen as a five stage progression from awareness, through interest, evaluation, and trial to adoption. The time scale involved in this process depends upon two major sets of considerations: those relating to the nature of the innovation itself, and those relating to the nature of the individuals in their particular society. The most important characteristic required of an innovation, which is defined as any idea perceived as new by the individual concerned, is recognisable relative advantage. This can take the form of increased profitability, reduced labour needs, and so forth but the greater the advantage as seen by the potential adopter the faster the rate of adoption is likely to be. However, the innovation needs to be compatible with existing circumstances. A change involving a violent upheaval in manners and mores stands less chance of being accepted than one which fits into existing patterns of behaviour. Closely allied to this

2. A convenient summary of work done is given in E.M. Rogers, The Diffusion of Innovations, (New York, 1962).

consideration is the complexity of the innovation. Once again the greater the problems involved in comprehending and adapting an innovation the slower its rate of adoption. Two lesser factors also deserve mention. The divisibility of the innovation, that is the extent to which it can be tested on a small scale, and thedegree to which the results can be communicated through the social system can help or hinder the rate of acceptance.

When plotted over time the adoption process follows a bell shaped curve, which derives from the nature of learning and the effect of interaction. Such a curve can be divided into five categories, which can be seen as the following ideal types.[3] The first group, the leading $2\frac{1}{2}$ percent, are the innovators, the venturesome few. Eager to the point of obsession their passion for new ideas tends to lead them out of their local peer group into more cosmopolitan circles. These people are usually distinguished by two factors: their ability to understand and apply complex technical knowledge, and a degree of financial security to absorb the losses from unsuccessful innovations. The second group, the early adopters, are a more integrated group in relation to their local society. Cosmopolitan contacts are not lacking but their local contacts put them in the position of being the man to check with before adopting an idea. In other words they are the epitome of successful but discrete use of new ideas. In the

3. The divisions are arrived at by using the two parameters of the distribution, the mean year of adoption ($\bar{x}$) and the standard deviation (σ) of the distribution. From these one gets the following categories: (i) $\bar{x}-3\sigma$ to $\bar{x}-2\sigma$, (ii) $\bar{x}-2\sigma$ to $\bar{x}-1\sigma$, (iii) $\bar{x}-1\sigma$ to $\bar{x}$, (iv) $\bar{x}$ to $\bar{x}+1\sigma$, (v) $\bar{x}+1\sigma$ to $\bar{x}+3\sigma$.

third group one finds the early majority, a more cautious group, but noted for their leadership of local opinion, summed up in Pope's words, "Be not the first by whom the new is tried, nor yet the last to lay the old aside." The fourth category comprises the late majority, those forced into adoption by a combination of economic necessity and increasing social pressure. Lastly, one has the laggards, hidebound by tradition, lacking contacts with and feeling alienated from the rest of the world. Table LXXIII summarises the characteristics of these groups.

Table LXXIII over.....

TABLE LXIII

Composite Picture of Adopter Categories.

Category	Salient Features	Personal Characteristics	Communication Behaviour	Social Relationships
Innovator	Venturous, willing to take risks	Youngest age, highest social status, largest and most specialised operations, wealthy	Closest contacts with scientific information sources, interaction with other innovators, use of impersonal sources greatest	Some opinion leadership, very cosmopolitan.
Early Adopters	Respect, regarded as role model by others	High social status, large and specialised operations	Greatest contact with local change agent	Greatest opinion leadership, very localite
Early Majority	Deliberate, consider innovation after peers have adopted	Above average social status, average sized operations	Considerable contact with change agent and early adopters	Some opinion leadership
Late Majority	Sceptical, overwhelming pressure from peers needed before adoption	Below average social status, little specialisation, small income	Ideas from peers who are usually late or early majority, less use of mass media	Little opinion leadership
Laggards	Traditional, orientated to the past	Lowest social status, little specialisation, lowest incomes, oldest	Neighbours, friends, and relatives with similar values main information source	Very little opinion leadership semi-isolates

Source: E.M. Rogers, The Diffusion of Innovations, (New York, 1962), p.185.

Having categorised adopters into ideal forms one must turn to more particular cases. The amount of work of this nature as yet carried out in Britain is limited, but it is worth looking at certain

studies as they throw some light on the application of this type of analysis to historical evidence. Sheppard looked at the ways in which the first dairy farmers to take up a new technique, in this case immersion cleaning, came to hear about it.[4] He emphasised the importance of the farming press, the National Agricultural Advisory Service, and to a lesser extent the trade in spreading new ideas. This is not surprising, but it does highlight one problem facing the historians. In a time when there was no Milk Marketing Board, no N.A.A.S., and when the National Institute for Research in Dairying was only just establishing itself the sources of information were more limited, which must explain the relative lack of speed with which ideas spread at that time. One must allow for the greater importance of the market place as a source of information, but this was not sufficient to provide a ready means of contact between the innovators and the early adopters on the one hand, and the majority on the other. In other words one must remember that one is dealing with what may be termed a pre-mass media age.

A similar problem arises when dealing with the importance of the social-economic status of a particular person. In the first place there is the problem of comparing to unlike ages. However, though cars, televisions, and refrigerators were not to be found on any scale even in the 1920s it is possible to find items of comparable standing for the earlier period - pianofortes instead of portable record players. More serious is the differences in attitude toward material possessions.

4. D. Sheppard, 'A Study of the ways in which the first dairy farmers to take up a new technique came to hear about it', Farm Economist, ix, pt.5 (1958-61), pp.196-203.

It could be argued that as a result of mass advertising there is a new attitude towards possessions that would render futile any direct comparison with the inter-war years, let alone the 1890s. There is much truth in this argument. Thrift, the reduction of expenditure and a near stoical indifference to material well being characterised many of the men who survived the depressions of the late nineteenth century and the inter-war years. However, one must not exaggerate the difference. Conspicuous consumption still existed, even though its form differed from that of today. Thus one finds that despite the variations of one age from another there appears to be a common factor of a pattern of consumption which left the purchaser in an elevated social position as judged by the standards of his day.

With these qualifications in mind one can turn to a more general study of the factors affecting the adoption of new farm practices in central Wales, and the east midlands of England.[5] As the result of a series of questionnaires sent to the farmers of the two districts it was concluded that the adoption of new farm practices in mid-Cardiganshire was significantly associated with total gross farm income, social-economic status, use of information and advisory services, farm social type, farming type, farm size and farm family stage. It was fairly significantly associated with neighbourhood and extra local social participation, but not with age, national or

5. G.E. Jones, Factors affecting the adoption of new farm practices, Oxford B.Litt. thesis (1960).

social origin, nor with total and local social participation. In contrast in the East Midlands the significant factors were farmer's age, education, and labour ratio, while gross income and farming type were only fairly significant. Certain points emerge of a general nature from this study. First, the importance of an inter-related and self-re-inforcing cluster of factors - in the case of Cardiganshire farmers these were total gross income, socio-economic status, farm size, and farm social type. Second, the fact that the importance of any given factor, for example age, is not constant in every case. Lastly, one has in this study some indication of the type of factors that are involved, and the type of question that has to be asked.

III

The Wiltshire Interviews.

When G.E. Jones set about his survey, mentioned above, he had few problems of evidence. He was able to contact all the farmers in the two districts, and received answers from all but a few. For the historian the position is not so favourable. Even with a period in the very recent past, such as the 1920s, it is verydifficult to contact everyone concerned. Survivors are comparatively few, and not all of them can, or will, tell of their experiences. It is virtually impossible to get a representative cross section of the farming community at that time, largely because there is but an eloquent silence about those who failed. One cannot, therefore, hope to carry out a comprehensive survey. However, it is possible to discover more about some of the men who farmed in the 1920s. Successful farmers, those in this case who survived the depression of the inter-war years, acquire something of a local reputation (and sometimes a national one), which can be explored. In exceptional cases it is possible to build up a picture of members of a past generation from personal reminiscences of relatives, and from the records of the people themselves. Both approaches have been adopted to enable the following sections to be written.

It was possible to interview ten men, all of whom in their different ways could be described as progressive farmers, who were farming in the 1920s. To the material gathered from these interviews has been added information on two other Wiltshire dairy farmers of

this time, gleaned largely from the local press, a source used to confirm and supplement the interviews. As a result of the family pride and generosity of one particular family it proved possible to collect material relating to a further eight farmers who were active from the 1880s until the Great War. It should be stressed that of the twenty men subjected to analysis more than a half came from the one family, the Strattons. This is both a strength and a weakness. A strength in that the family made available a large amount of material, containing information that was not to be found elsewhere. A weakness in that there is a danger of taking the characteristics of one family to be typical of a larger group. Nevertheless, there is sufficient contrast between the men, and sufficient examples of failures among other members of the family, to suggest that their characteristics were not simply "family quirks".

At first the nature of the evidence suggested a division based upon time, that is the 1920s and the 1890s, corresponding to direct personal contact for the first group and indirect methods for the second. However, on closer inspection it became clear that there was a more realistic division to be made based on farm size.

(i) <u>Large Farms: The Stratton Family</u>.

It has been said, no doubt by the Strattons themselves, that Wiltshire was made for the Strattons. Behind the hyperbole is more than a grain of truth, at least for the past one hundred and fifty years.

The presence of a large and successful farming family is not unusual, but it is striking that since the mid nineteenth century the Stratton family, in one or more of its branches, has been associated with leading ideas in the farming community, not just of the county, but of the country. This is not the place for a family history but in relating the farming experiences of this family one has a vivid commentary both on the course of agriculture in these years, and on the nature of improving farmers.

The Stratton ancestry can be traced back into the sixteenth century, if not before, but it was not until the early nineteenth century that they emerged from the general ruck of farmers in the county. The great grandfather of James Stratton had a dairy herd of 60 Shorthorns, at a time when they were far from common, noted for their high yields, while Stratton himself was known for the quality of the cheese he made.[6] However, the dairy was a means to an end, and in 1828 he took an arable farm in the Pewsey Vale. Livestock farming in the Stratton family was limited to a branch in the north of the county. The breeding of Shorthorn cattle became the speciality of Richard Stratton at Wroughton. His son, of the same name, continued his father's work in the county, and later in Newport, and was largely responsible for the foundation of the Dairy Shorthorn Society. He was reputed to have been one of the first to introduce and use flaked maize as a feed for stock, and during his long and active life - he died in 1937 at the age of 95 - he was a member of the Council of the Royal Agricultural

6. J. Stratton, Rural Reminiscences, (1901), Wiltshire Tracts 71, no.4, Devizes Museum.

Society, president of the Shorthorn Council for 30 years, and also established the Monmouth Chamber of Agriculture, as well has having several outside interests. In 1860, when father and son were farming together at Broad Hinton, the Mark Lane Express carried an article on their enterprise. The farm comprised 1,800 acres, of which 700 acres was downland and pasture, and a further 350 acres laid down for hay each year. A herd of 330 Booth Shorthorns were kept, and special attention was paid to their milking qualities. The farm itself was considered advanced for the time. For example, the cows were well attended, being stalled in winter. Steam ploughing was practiced, an innovation that enabled the Strattons to get rid of twenty oxen and thus to increase the number of cows kept on the farm, while steam power had been used in the draining of the land to a depth of eighteen inches. However, much of the son's work was to be carried on outside the county. But Richard Stratton, the 'doyen of British agriculturalists' as his obituary[7] called him, was but one of four members of the family who made a name for themselves in the second half of the nineteenth century.

Another son of Richard Stratton (senior), James, followed in his father's footsteps concentrating upon dairying, and adding to his possessions even in time of distress for much of the agricultural community.[8] Not only was he successful but he achieved this in a

7. Wiltshire Cuttings, xix, p.90.
8. Wiltshire Cuttings, xiv, p.15.

short space of time, during the 1870s and 1880s. Realising the extent of foreign competition in grain he laid down large areas of arable to grass and built up a herd of some 300 to 400 cows, as well as keeping the more traditional flock of sheep. In all some 5,500 acres had been converted to grass by the early 1880s,[9] and the milk sent to London. James Stratton was exceptional. Not only did he buy cheap Russian barley to use as feed, but he spent between £3,000 and £4,000 annually on artificials. When giving evidence before the second Royal Commission on Agriculture he was asked, 'You have never been afraid of stepping out of the beaten track?' The answerwas a significant 'No.'[10]

The same could have been said by William Stretton, who as a tenant farmer had been a member of the first Royal Commission, under the Duke of Richmond. He was also chairman of the Cattle Disease Committee, and served for over twenty years as Chairman of the Central Chamber of Agriculture. However, William Stratton was also a practical farmer with a farm at Kingston Deverill in the south west of Salisbury Plain. He was known as 'a pioneer in Wiltshire in fencing in the downs and laying down to grass when foreign competition made corn-growing unprofitable.'[11] A similar approach was adopted by the better known Frank Stratton, in partnership with Sam Farmer, who

9. R.C.Ag., Parl.Papers, 1894, xvi, pt.i, Q.6,424, p.194.

10. ibid., Q.6,669, p.201.

11. Wiltshire Cuttings, iii, p.127.

built up a huge combine of some 14,000 acres, based on the Pewsey Vale, from whence milk was sent to London.[12]

By the turn of the century a new generation of Strattons appeared. Yet another Richard Stratton, this time farming at Kingston Deverill, was associated with the furtherance of dairying in the south of the county on a farm that a quarter century previous had been a sheep and corn concern. Unlike the dairy farmers of the Swindon area he was not interested in milk as such, but was prepared to produce it, unlike many of his Hampshire neighbours, in order to survive. His chief love remained with sheep and corn but despite the scorn showered on the dairy - it was said that he refused to dismount and enter the dairy, but merely shouted his instructions from a distance - this enterprise was extended precisely because it paid for the rent.

A cousin, Guy Stratton, was also in advance of the majority of farmers, not simply because of his emphasis upon dairying but because of his use of machinery on the farm. The first milking machine was introduced to the farm in 1914, while prior to this date tractors and green crop loaders, the latter used in the making of silage, were in use. The work of Guy Stratton was terminated by his unfortunate death in an accident in 1918, but the tradition of progressive farming was continued by his son, also named Guy. The two dairy herds were increased in size to 100 in the vale and 60 on the hills by 1930. A similar conversion from corn to milk continued at Kingston Deverill

12. See Chapter 10, pp 336-7

where the Richard Strattons, father and son, built up their dairy from one herd of 70 at the turn of the century, to two totalling 120 cows in 1918, and finally to three herds in 1920, when a further 40 Shorthorn cows were bought. In the late 1920s the first moving bail was introduced onto the farm, Richard Stretton being the third person to take a bail after a visit to Hosier at Wexcombe. Two years later in 1930 a second, fixed, bail was bought as the open air system was extended in the face of falling prices and increasing labour scarcity in the district.

The last centre of the Stratton family to be described was centred on the village of Codford St. Mary. Here milk selling had been introduced by Jack Stratton before the Great War. After the war he was aided by an extremely capable farm manager, Jack Houghton Brown, who later took over one of the farms, at Lower Pertwood, as well as marrying into the family. Milk yields were raised by selecting the best animals which passed through their hands as a result of the large scale trade in Irish heifers, with which they were closely associated. The outcome was an average yield of some 800 gallons a year for their herd. Houghton Brown, having attended Reading University was aware of the new ideas in feeding and housing, and was largely responsible for the improvements in buildings, including the provision of an adequate supply of water, and for the introduction of improved feeding, feeding for production, and milk recording. When Jack Stratton retired from active farming his nephew, Michael, took over and built up one of the largest and most efficiently run herds

in the district.

The success of the Stratton family is most impressive. Over several generations they produced men in the forefront of the adoption of new ideas, men prepared to alter their ways of farming, and prepared to respond positively in the face of potential crisis. Such ability deserves closer attention.

(ii) Large Farms: Two Other Successful Men.

The Strattons were not alone in adapting to the changing conditions of the last quarter of the nineteenth century and the first of the twentieth. Another successful father and son were the Reeds of Stanton St. Bernard. Like his father before him Mr. M.J. Reed concentrated upon the production of milk for the liquid market, with wheat and sheep (in the inter-war years) as subsidiary enterprises, even though their farm of 1,200 acres was on chalk soil. At its peak in 1952 the dairy comprised six herds, each of 60 animals. However, at the outset in the early years of the twentieth century there had been only 80 cattle. The post war years saw a marked expansion of the milk enterprise and by the end of the 1920s there were some 200 dairy cows of which 60 were run on the downs. The early use of a Hosier bail was another example of the Reeds progressive nature. The father had used steam tackle from an early date, and had introduced a milking machine around the time of the Great War,[13] when very few were to be found in the district. The

13. This is a good illustration of the problem of vagueness in interviews. In this case the respondent could only refer in general terms that embraced a decade or more. However, as milking machines were not common even in the 1930s the drawback is not a serious one.

father had used the first binder in the area, and the first lorry for milk delivery purposes, while the son was among the first to use a combine harvester. Coupled with this was a dedication to farming that made itself evident in close supervision of the farm labour, and hard work on the part of the Reeds themselves. The outcome was undoubtedly a successful one.

The last person to be included in this section, A.J. Hosier, is an exception. In the first place it was not possible to interview the man, and the only surviving son was not well enough to give any information. However, there is a biography of the man which gives a detailed account of his life, and it was thought that this provided sufficient evidence to include Hosier, who was undoubtedly one of the leading Wiltshire farmers of the inter-war years, in the analysis. The details of Hosier's career, combining the roles of inventor and innovator, have been dealt with earlier and need delay us no longer.[14]

(iii) Average Sized Farms: Four More Successes.

Enterprise and ability was not the sole preserve of the large landowners. The development of Wiltshire agriculture owed much to the endeavours of such men as the Stone brothers and W. Denley,[15] who survived in the face of adverse conditions without the advantages of large capital assets enjoyed by the Strattons. A further example of the success of a small farmer is afforded by the career of Mr. W.J. Duckpitt of Ogbourne St. Andrew. His first farm was a mere forty acres, a part of his father's holding. However, this did not deter

14. See Chapter 10, pp. 349-52
15. See Chapter 10, pp. 363-4

him from experimenting with battery hens as an additional source of income. This coupled with milk production proved profitable and the Buckpitts were able to take a farm of 400 acres. On the more exposed land Mr. Buckpitt developed his own covered yard, which were considered, by the Farmer's Weekly among others, to be well in advance of the practice of the district. However, in other respects the Buckpitts were not in the forefront of new ideas. They used hand milking throughout the inter-war period, though it must be stressed that under 20 percent of the dairy herds in England and Wales were machine milked by the late 1930s.

The last person to be introduced is Mr. S. Russell of Blunsdon. His family came from Somerset, and had moved to Wiltshire in the 1880s bringing with them the art of Cheddar cheese making, which soon replaced the local double Gloucester. From the 1890s milk was sold to London in the winter and cheese making confined to part of the summer. By the time Mr. Russell took over, that is after the Great War, cheese making had been totally abandoned on the farm and all the milk was sold liquid to London. Although a pioneer of the Fordson tractor, Mr. Russell lagged in certain respects. Machine milking was not introduced until after 1940, while he remained with Shorthorns throughout the inter-war years, even though Friesians were becoming common in North Wiltshire by 1930.

Thus it can be seen that each of the farmers mentioned had some claim to be considered as an "improving farmers", in the sense of being in the early majority category for several innovations. There

is, nonetheless, considerable variation between Hosier at one end of the scale and Russell at the other. One further point should be stressed. No attempt has been made to trace the diffusion of a particular innovation, such as the Hosier bail. Instead a more general definition has been adopted, and attention focussed on some of the farmers involved in the development of dairying, which was the major characteristic of Wiltshire agriculture in the period, in the county. Not surprisingly the people involved were among the innovators and early adopters of several new ideas, the milking machine and the bail being the obvious examples, but this has been taken as an indication of their innovativeness, and, as such, the starting point from which it is hoped to discover something of the charcter of the men who, by common consent, have been seen as leading figures in the agricultural community.

IV

The men under review will be considered in the light of the following factors. (i) Farm Size. (ii) Gross income. (iii) Farm type: that is full time or part time. (iv) Age, at the time of innovation. (v) Family stage: that is unmarried, early married, or with children of non-working age. (vi) Education. (vii) Information sources: including attitudes towards the agricultural press, attendance at Shows, use of impersonal sources such as lectures, and reliance upon neighbours. (viii) Social participation locally. (ix) Extra-local activities and contacts. (x) Socio-economic status. A general high/medium/low division has been used.

Group A: Farms over 1,000 acres.

Of the twelve men in this category one, Hosier, is most obviously in the innovator group. The Strattons and Houghton Brown fall into the early adopter category, and in some cases shade off into the innovator group. Only one, Reed, is not obviously an early adopter type, but even in this case there is sufficient evidence to include him at the lower level of this group. Thus, though there is no control group with which to compare these men, it would appear reasonable to argue that they represent the leaders of opinion in the farming community of Wiltshire.

The first characteristic, and the basis of the division of interviewees, is above average farm size. Allowance must be made for the area from which the sample is taken, that is the chalk lands

where farm sizes tend to be large, but it is still striking that all the farms in this group are over 1,000 acres when the overall average farm size for the county at this time was in the region of 120 acres. The significance of this connection is two fold. In the first place the size of the holding, and the greater number and combinations of enterprises possible, gives far greater flexibility, as well as enabling economies of scale to be introduced. Secondly, the social significance of large scale landowning is important in the development of extra-local contacts - a point that will be expanded later.

Closely connected with farm size is gross income. The evidence on this point is weak. Few of the farmers interviewed kept detailed financial records. At least one had destroyed what few records he had kept in the 1920s, while the rest were not able to remember, or chose not to remember, their precise standing in the matter. However, knowing for the 1920s the size of the dairy herd on each farm, the average yield, and the price of liquid milk it has been possible to calculate an approximate figure for income from milk. Moreover, as it was repeated that milk provided about one third of gross income on the larger, more diversified farms, one has a general idea of the gross income on these farms. For the 1890s the evidence is very scanty, but it seems reasonable to assume gross income was well above average. Certainly for the 1920s there is no doubt that the men in this group enjoyed a high gross income, probably over £10,000 per annum in every case. Further, the absolute level of income from

milk was high, while the relative dependance upon one enterprise on such large farms is striking. Specialisation is an important common factor. The importance of a high level of gross income is straightforward. The greater scope for improvement, and the greater coverage against failure, are obvious points but it should be stressed that the problems of raising capital were less for the big farmer than for the small man with only forty acres and a low income.

Looking at the farms in less economic terms the first point that emerges is that all the farms were run on a full time basis, which, for the large farms in this group, is an expected and unsurprising answer. More significant is the fact that all but one was under 30 and only one was married and had a family at the time of innovation. (There is some doubt about the nineteenth century Strattons but in most cases the responsibilities of a young family were avoided until the head of the family had established himself in farming.) The rest were either in the early years of marriage or were unwed. The significance of this lies in the emphasis upon and the need for hard work. Both husband and wife were expected to work hard and observe strict economies. It can be argued, with the benefits of hindsight, that such hard work led to bad management in certain cases, but this argument is irrelevant to present purposes because, in the absence of developed management techniques in farming in the 1890s and 1920s, in the prevailing circumstances rigid economy and hard work were seen to be essential. Thus, to achieve both, a family of small children

was a positive disadvantage; hence the importance of being either unmarried or early married without children.

One would expect on a priori grounds to find that the progressive farmer, in any community, would be, if not well educated in any absolute sense, better educated than the majority of their fellows. This is certainly the findings of more recent research but in looking at an earlier age one must remember that there was a different attitude towards education, and less opportunity than exists today. Further one must remember that for some of the men interviewed, in particular A.G. Stratton, the possibility of further education was ruled out by the advent of war. In view of these considerations the question of educational advancement was approached in two ways. First, the obvious questions - did you go to agricultural college? etc., - were asked and the answers supplemented by an details given on what might be termed self education. Second, attitudes towards education today were sought by asking what education had, or would have, been given to a son. All the men in this group were aware of the importance of technical education and praised the work of the various advisory bodies. However, the Strattons (including Houghton Brown) took a wider view of education. For the progressive farmer they saw a broad education, extending well beyond the study of agriculture, as essential. In other words they saw the value of education in the broader outlook and wider range of contacts, rather than in the greater technical knowledge of the various processes in farming.

In terms of actual educational achievement every man in the group was above average in that they had all been to grammar school. Moreover, three out of the five Strattons farming in the 1920s had been to university, while in the case of an interrupted education, A.G. Stratton, there was ample evidence of a wide range of outside interests that had been developed from an early age. Direct comparison with the 1890s is difficult to make. However, though educational possibilities were more limited, of the four men for whom there is information three had been to the local grammar school while the fourth was a trained doctor. Thus it would seem that the group was characterised by an above average educational standard and an awareness of the potential of education in the broadest sense of the word.

Educational standard alone is not a satisfactory index. Sources of information reveal more of the nature of the progressive farmer. Again the question was approached in two ways. First, the simple factual approach was adopted. Second, interviewees were asked to evaluate the various sources of information.

All of the men in the group read at least one agricultural journal and, if one is allowed to classify The Field with Farmer's Weekly and Farmer and Stockbreeder, all looked at a second regularly, once a week. The value placed on the agricultural press was not uniform. One, Reed, had little time for such journals as the Farmer's Weekly and only read Country Life and The Field for pleasure.

Another, A.G. Stratton, found the agricultural press a useful means of keeping up to date and finding new ideas. However, of the remainder the three for whom there is information all found such journals of limited use because, not only did they consider themselves to be ahead in ideas, but they made strenuous efforts to keep in advance of the ideas being popularised in the agricultural press. For these people contact with other progressive men, which usually meant contact outside the local community, was more important. Moreover, for these three, Richard and Michael Stratton and Houghton Brown, and Guy Stratton lectures were an important source of new ideas. It is no coincidence that the first three all went to university.

The reverse of this particular coin is the use of neighbours as a source of information. It is important to distinguish between the stages at which neighbours can act as a source of information and advice. There is an appreciable difference between first hearing of an idea from a neighbour, and relying upon his advice in first trying or taking up something new. Neighbours played no part in the formative stage of the Strattons' farming lives. Though there was contact between Hosier and several members of the Stratton family this was a meeting of peers. Otherwise the Strattons considered, and therefore kept, themselves apart from local farmers as far as the first hearing, trying and adoption of new ideas was concerned. The best example of this self centred and self sufficient attitude

involves Michael Stratton, but fails outside the period under review. However, it is included in this analysis because it encapsulates the essence of this particular attitude. The "Grasshoppers", a high level discussion group, was founded in 1942 and was made up of twelve of the leading farmers from Wiltshire and Hampshire (including Michael Stratton and Jack Houghton Brown). The twelve met regularly, once a month, to discuss general policies and particular problems. Relying upon mutual experience the group played a crucial role in the formulation of ideas and the development of practical policy on the farm. This group was exceptional in that it was organised formally, but the same attitude on an informal basis characterised all the men in the group, with the possible exception of Reed.

Considered in this light the Strattons have some of the characteristics of innovators, in that they were outside the local farming community and, therefore, played a limited role as opinion leaders. However it would be wrong to suggest that there was no direct transference of ideas. In the case of A.C. Stratton, and his father, both had a reputation for being highly mechanised farmers who acted as advisors on such matters. The other members of the family, however, were somewhat more remote, from their immediate neighbours. In the same way they did not use either the local markets or agricultural shows as a means of gaining information. Even the N.F.U. was more a means of contacting similar farmers in other parts of the county than as a source of new ideas.

The role of neighbours gives some indication of social participation, but the point needs to be developed further, as it is one that has been stressed by recent researchers. Within the local community the men in this group all played an active role, except Hosier for whom the relevant information is not available. The record of the Strattons is, once again, impressive. All eleven members of the family was either a J.P., a local school governor, a county or district councillor, or some combination of these.

The degree of extra local activity varied between the various members of this sample group, but with the exception, once again of Reed, all were involved in activities that took them outside the county. Much of this took the form of work for the N.F.U., but non-agricultural matters also took them away from their farms.

The last point to be considered is that of socio-economic status. It has been relegated to last position, not because of its lack of importance, but because of the difficulties encountered in collecting reliable evidence on the subject. It was notpossible to build up an index based on the ownership of various household items, consequently only a general, impressionistic, assessment was made. In no case could it be said that the men in this group were in the "low" category; on the contrary most would be considered to fall into the "high" classification.[16]

16. See Appendix for discussion of the problems of assessing socio-economic status.

Group B: Farms of 100 acres.

The four men in this group were not, and did not see themselves as, innovators or early adopters. However, in no way could they be classified as late majority. In other words they fall into that broad band of early majority men, who provided the hard core of support which determined whether or not an innovation came into general currency.

In terms of acreage all four farms were above average size, but in two cases the farmer started on a very small scale. Not surprisingly gross farm income was appreciably lower than that of the farms in Group A. The evidence on this point is very weak, but, in the absence of precise figures, it is clear from the comments of the interviewees that the dependance upon the dairy was much greater than on the larger farms. In two cases there was little choice to the dairy. Around Trowbridge and Swindon agriculture was synonymous with milk production, but in the other two cases the emphasis upon milk selling was deliberate policy.

Full time farming characterised these four men, as it did the men in Group A. However, in this case the point is of some significance for it is often argued that some - though precisely how many has never been said - farmers survived periods of depression by finding subsidiary sources of income. Of the four men in question not one made an attempt to move out of farming to supplement income. More work needs to be done on this question but it would seem that in many cases the presence of an outside

source of income reflected the failure of the farmer in his primary concern, except in those cases where the farm was more of a smallholding and, as such, looked upon as a part time concern.[17]

There is also little difference in age between the two groups. All were under 40 at the time of main concern, that is the depression years of the 1890s and 1920s, but all the evidence shows that in all but one of these particular cases innovativeness did not decrease appreciably with the passing of time. Similarly, there was no major difference in terms of family stage. In group B three were unmarried and one early married in the 1920s. Not until the concern was on a firm footing were the responsibilities of parenthood entered into.

A major divergence, appears, however, when one looks at the question of education. In terms of achievement the four men in this group are no more than average in that the education, at the local school, did not extend beyond the minimum laid down by law. All left school as soon as possible in order to enter farming, and one of the four had pursued any academic interests in later life. There was also a difference in attitude towards education. One of the four, Russell, had little time for such things, drawing a sharp distinction between the college specialist and the practical farmer,

17. There would appear to be, superficially at least, some points of similarity with areas of agricultural depression in the seventeenth century where domestic industries were developed to offset falling incomes. In both cases the new sources of income were taken after the primary, agricultural concern failed. However, it would seem that whole regions were affected in the seventeenth century case (that is the development of light land corn production hit the old claylands) whereas in the nineteenth century the response was confined to individuals in areas favourably sited. In the case of Wiltshire it would be necessary to compare the north and south of the county to see if there is a valid distinction to be made.

a distinction that favoured the latter. The remaining three, however, saw that education could be important. All felt that this was more the case since the last war than in the 1920s. However, the important difference between the two groups was in their definition of education. Whereas the men of group A tended to look upon it in a broad sense, the men of group B saw it largely in terms of improved technical knowledge that was directly applicable to the farm. Thus they were full of praise for the advisory services such as those provided by N.I.R.D. and N.A.A.S., and thought that day release courses were a valuable advance. However, none of them saw the value of education in wider terms. It would be misleading to call their attitude blinkered, but there was an inability to stand back and look beyond their immediate position that contrasted markedly with the attitude of the Strattons in these matters.

It is not surprising, therefore, to find that these men also differed in their attitudes towards sources of information. All four read at least one farming journal and found the agricultural press generally a useful source of information. In this respect they differed from the men in group A who were, or tried to be, ahead of such opinion. Other impersonal sources such as lectures did not come into their experience. Instead a greater degree of reliance was placed upon fellow farmers, particularly in the latter stages of adoption. However, three of the four men were prepared to act in defiance of the local consensus opinion on at least one

occasion, even though there was a greater sense of belonging to the local farming community. The evidence gleaned from looking over the fences of the Strattons and Hosiers of the world tended to be considered more important than that from their neighbour's backyard. The one exception was Russell who had a far more traditional cast of mind than any of the other interviewees. Although he exhibited certain characteristics of a progressive nature, much of his success was due to the fact that the crucial decision, that of changing from cheese manufacturing to milk selling, had been taken by his father while he had to do little more than keep in the same furrow, as it were. The difference between Russell and the rest is best illustrated by the fact that he did not look upon himself as a progressive farmer, even though he had to admit that in his early days he was in advance of the times in certain respects.

The degree of social participation was much less with the second group than with the first. Only two played an active role in local society, both in the local church. Of the other two one, Buckpitt, spent most of the 1920s working extremely hard in order that he and his wife might move from their forty acres farm to something larger. However, even under these conditions there was nothing to suggest that they were cut off from the rest of society. The other, Stone, was in a similar position in that a large amount

of his time was taken up with establishing his milk round from scratch, and maintaining it in the face of considerable competition. Somewhat paradoxically Stone was the only one of this group to have any extra local activities. This took the form of negotiating on behalf of the local milk producers, first with the milk wholesalers, and, second, with the Milk Marketing Board at the time of its inception. The other three, unlike most of those in group A, had no such contacts to take themselves outside their particular village.

The difficulties of assessing socio-economic status have been mentioned earlier. At this point all that needs to be said is that the problems were greater for this group than for the first. On the very general classification adopted one fell into the "low" category, one was on the border between "low" and "medium" during the 1920s while the other two were in the "medium" grouping.

V

Having looked at the two groups in some detail it is time to draw together the threads. However, before offering some conclusions one must stress the limitations of the evidence. Basically one is attempting to see an answer on the basis of a mere dozen interviews. It would be foolish to expect anything but a tentative and limited answer to emerge. It has never been suggested that the interviews offer a comprehensive picture of Wiltshire farmers in the 1920s. However, even on the more limited scale of this study there is the danger, in the absence of a control group, that the men interviewed are all wholly atypical. There is little to be done that would improve this position, short of seeking out every surviving Wiltshire farmer who had been active in the 1920s - a task that could take years. However, in the context of Wiltshire agriculture, there does appear to be a good case to be made for considering the interviewees as innovators/early adopters on the one hand and early majority men on the other. The first group are characterised by possessing large, but specialised, farms with high gross income. They tend to be well educated, with wide horizons and wide ranging contacts. Lastly, they tend to be of high socio-economic status. The latter, though having only average sized farms, with correspondingly smaller gross incomes, were more dependant on a single enterprise (milk). With no further education their outlooks tended to be narrower, and their social participation less extensive. Further, their socio-economic status was lower than that of the

innovators/early adopters without being below average.

However, there are further limitations, which refer more to the analysis than to the evidence. Some, if not all, of the characteristics described above have been shared by unprogressive farmers. One must ask how valid are the criteria that have been used. It is important to remember that there is nothing absolute about any of the points. For example, progressive farmers do not have to be well educated, but they do tend to be so. However, this does not give a complete answer. Looked at another way the most striking point of the analysis is its orthodoxy. The progressive farmers have their large farms, high gross incomes, youth, and higher education. But the really impressive point is not the success of the Strattons, for whom conditions were often highly favourable, but the achievements of the smaller men who managed to achieve a considerable degree of success in adverse conditions. Starting their careers in a period of depression, lacking capital, land, and education they still managed to succeed. Extreme hard work and rigid economy explain a lot but there is something more, a courage and vision that is all the more striking for being found in such unlikely surroundings. Here then is the major weakness of the analysis thus far. It is often said that sociology spends £x to show one the way to the whorehouse, when what is needed is an explanation of how the institution works. Mutatis mutandis it

could be said that we have only been shown the progressive farmer. In this case the great omission would seem to be the psychological factors that determined which of the Strattons should succeed (for not all of the family were successes) as well as which of the general body of farmers should not fail. For there is one characteristic common to all the men mentioned in the previous sections. All were determined not to be beaten. For Duckpitt it was expressed as a refusal to go under in what was seen as a "sink or swim" situation. For Richard Stratton (senior) and his generation it took the form of riding "a straight line after the hounds", while for Richard Stratton (junior) and his cousins it was a question of "professionalism". The phraseology may have differed but the basic drive was the same. This complex of ambition, the desire to succeed, the refusal to accept or even contemplate defeat, and sheer personal pride becomes crucial. More work needs to be done on the subject, but, in the final analysis, a powerful devotion to farming and a strong will to succeed are probably more important than any other single factor that has been used to define the two groups in earlier sections.

Table LXXIII over...

TABLE LXX111

Characteristics of some leading Wiltshire Farmers

Group A: Farms over 1,000 acres.

	R.F. Stratton*	A.G. Stratton*	M. Stratton*	J. Stratton*
Farm Size (acres)	2,920	2,000	3,500	3,500
Gross Income (£)	17,600	(15,000)	(10,000)	(10,000)
Income from Milk (£)	4,840	5,400	(4,000)	(4,000)
Farm Social Type	Full Time	Full Time	Full Time	Full Time
Family Stage**	Early Married	Early Married	Early Married	Early Married
Age**	Under 30	Under 40	Under 30	c.40
Educational Level	University	Local Grammar	University	Local Grammar(?)
Agricultural Press				
(i) Read regularly	Yes	Yes	Yes	Yes
(ii) Source of ideas	No	No	No	Not known
Contact with neighbours				
(i) Source of ideas	No	No	No	Not known
(ii) Advice on adoption	No	No- ltd.	No	Not known
Lectures	Yes	Yes	Yes	No(?)
Local Social Activities	Yes	Yes	Yes	Yes
Extra-Local Activities	Yes	Yes	Yes	Yes
Socio-economic status	High	High	High	High
Evidence of innovativeness	Early use of bail and milking machine, and extension of down-land dairying.	Early use of bail and milking machine and extension of downland dairying.	Improved breeding feeding, and management.	Extension of dairying in late nineteenth and twentieth century.

Continued over....

TABLE LXXIIIcontinued

	J. Houghton Brown*	A.J. Hosier*	M.J. Reed*
Farm Size (acres)	2,500	1,700	1,200
Gross Income (£)	(10,000)	(9,000)	(8,000)
Income from milk (£)	(4,000)	(4,500)	(3,500)
Farm Social Type	Full Time	Full Time	Full Time
Family Stage**	Early Married	Married + Family	Unmarried
Age**	Under 30	c.40	Under 30
Educational Level	University	Local Grammar	Local Elementary(?)
Agricultural Press			
(i) Read regularly	Yes	Yes	Yes
(ii)Source of ideas	No	No	Possibly
Contact with neighbours			
(i) Source of ideas	No	No	Yes - ltd.
(ii)Advice on adoption	No	No	Yes - ltd.
Lectures	Yes	Yes	No
Local Social Activities	Yes	Not known	Yes
Extra-local Activities	Yes	Yes	No
Socio-economic status	High	High (?)	Medium/High
Evidence of Innovativeness	Improved feeding, breeding and management.	Invention and adoption of bail	Early use of milking machine, extension of downland dairying

Continued over...

TABLE LXXIII continued

	R.F. Stratton	A.C. Stratton	F. Stratton S. Farmer	J. Stratton
Farm Size (acres)	2,900	2,000	14,000	6,000
Gross Income (£)	not known	not known	not known	not known
Income from Milk (£)	not known	2,300	not known	not known
Farm Social Type	Full Time	Full Time	Full Time	Full Time
Family Stage**	not known	not known	not known	not known
Age**	Under 30	Under 30	Under 30 Under 30	Under 40
Education	Local Grammar	Local Grammar	Local Grammar Trained Doctor	not known
Agricultural Press				
(i) Read regularly	Yes	Yes	Yes	Not known
(ii) Source of ideas	not known	not known	not known	not known
Contact with neighbours				
(i) Source of ideas	(no)	(no)	(no)	(no)
(ii) Advice on adoption	not known	not known	not known	not known
Lectures	No	No	No	No
Local Social Activities	Yes	Yes	Yes	Yes
Extra-local Activities	Yes	Yes	Yes	Yes
Socio-economic Status	High	High	not known	not known
Evidence of Innovativeness	Extension of dairying including on downs	Use of machinery, development of downland dairying	Conversion of Pewsey Vale to milk prod.	Large scale conversion to dairying.

Continued over..

TABLE LXXIII continued

Group B: Farms of 100 acres	W.H.G. Stone*	M.J. Bucknitt*	W. Denly*	S.Russell*
Farm Size (acres)	180	40(400) /	80(300) /	120(400) /
Gross Income (£)	(2,750)	(1,000)	(3,500)//	(1,250) //
Income from Milk (£)	(1,500)	(520)	(1,750)//	(1,000) //
Farm Social Type	Full Time	Full Time	Full Time	Full Time
Family Stage**	Unmarried	Early Married	Unmarried	Unmarried
Age**	Under 30	Under 30	Under 30	Under 40
Educational level	Local elementary	Local Elementary	Local Elementary	Local Elementary
Agricultural Press				
(i) Read regularly	Yes	Yes	Yes	Yes
(ii)Source of ideas	Yes	Yes	Yes	Yes - ltd.
Contact with Neighbours				
(i) Source of ideas	Yes	Yes	Yes	Yes
(ii)Advice on adoption	Yes - ltd.	Yes - ltd.	Yes - ltd.	Yes
Lectures	No	No	No	No
Local Social Activities	No	No	Yes	Yes
Extra-local Activities	Yes	No	No	No
Socio-economic Status	Medium	Medium/Low	Medium	Low
Evidence of Innovativeness	Early accredited milk production	Improved covered yards	Early use of bail and stacker	Early use of tractor

* interviewees

** at time of innovativeness, i.e. 1890s or 1920s

/ // the figures in brackets refer to the size of the farms to which interviewees moved. estimates based on larger acreage.

(...) replies in brackets indicate either unverified or estimated response in which the element of doubt is sufficiently small to warrant inclusion.

APPENDIX

The interviews, which provided the basis for this chapter, were organised on a two part basis. The first thirteen questions were entirely factual. The only real problem here was that of lack of memory or mistaken recollections. To overcome this danger all answers were checked as far as possible with reliable sources such as local press. However, for the four men in group B it was impossible to carry out a thorough cross check. The remaining eleven questions were intended to seek out attitudes and opinions. Consequently the danger of distortion was greater. In the first place there was the danger of expecting, and therefore getting, a particular answer. Secondly, there was the danger of the interviewee feeling that a certain answer was expected of him. Awareness of the danger is some safeguard against it, but as a further precaution the second part of the interview was turned into a more general conversation. This had the disadvantage of bringing about a rambling and irrelevent reminiscence but it was felt that a more casual approach had a greater chance of success in two ways. One, a greater degree of confidence was developed which lessened the chances of the expected answer being given. Two, it did not restrict matters to particular points in the questionaire but allowed the answers to relate to the particular experience of the interviewees. The greater flexibility was felt to be more than

adequate compensation for the sacrifice of some precision.

There were, however, certain particular problems relating to the questionnaire. In Part 1 no one had an exact idea of the average yield per cow, only one kept detailed accounts, and even he could not cost the production of milk. As a result only a general assessment could be made, hence the vagueness of Table LXXIII when referring to gross income and income from milk. Although greater detail would have been welcome there was sufficient information for present purposes.

The greatest problem was in trying to assess socio-economic status. Although it was possible, in most cases, to discover whether the interviewee had owned a telephone, a radio, a car for family use, had gas or electric lighting, and had taken daily newspapers and non agricultural journals, it was impossible to assess the state of the farmhouse, its buildings, yards, and roads except by reliance upon the interviewee's recollection of conditions in the 1920s when he was farming. There were obvious problems in a direct approach so the question was approached at a tangent by means of question 23, and to a lesser extent question 25. In view of the approach adopted and the impressionistic nature of the replies one could only give a very general assessment, based on a three fold, high, medium, low, division. The allocation into categories did not present any serious problems. Russell, with paraffin lamps and gas lights in the 1970s as well as the 1920s, was obviously not in the same category as Denly and Stone.

Buckpitt was no real problem for, though he started off in the low category he was obviously moving up by the end of the 1920s. Equally obvious was the fact that the Strattons, with their large and well appointed farms, were and had been in a yet higher category. The fundamental weakness, however, was the lack of a control group with which to compare these men. Consequently some of the judgements have been of an arbitrary nature. To a large extent this was inevitable given the nature of the evidence, but every attempt has been made to relate such judgements to the standards of the day, rather than allow them to be dictated by the fancy of the interviewer.

The questionnaire used in the interviewswas as follows:

Part I

1. What was the acreage of your farm(s)?
2. What was the soil type?
3. How many cattle did you keep? What sort were they? What breed were they?
4. What was the average yield per cow in your herd?
5. What was your gross farm income? What was your gross income from milk?
6. What was the cost of production per gallon of milk?
7. What was your feeding policy (summer and winter)?
8. What type of bull did you use?
9. How many full time men did you employ?
10. What machinery did you use? When was it introduced to your farm?
11. How many years have you been farming?
12. Have you always farmed in this part of Wiltshire? If not where else?
13. Have you always concentrated on milk production? If not when did you switch?

Part II

14. What are the advantages/disadvantages of milk production?
15. Did you attend agricultural college? Did any of your children?
16. How valuable were/are such colleges?
17. When did you leave school?

18. Which agricultural journals, if any, did you read?
19. Did you belong to the N.F.U. (or similar organisation)?
20. How useful are such groups (a) looking after the interests of the farmer?
    (b) bringing new ideas to one's attention?
21. To what extent in (a) experimenting with (b) adopting a new idea on your farm were you influence by (i) your own past experience (ii) the advice and/or experience of neighbours (iii) articles or advertisements in the agricultural press (iv) anything else?
22. Did you consider yourself to be progressive in your farming methods?
23. In what ways did you consider yourself well off? Did you own a private car, telephone, radio etc?
24. Did you belong to any outside, non-farming, bodies? Did these contacts take you away from your part of Wiltshire?
25. How did you meet the problem of falling prices in the inter-war years?

CONCLUSIONS

When a correspondent to the Agricultural Gazette in 1885 referred to the cow as 'a walking beatitude', he could have been expressing a view widely held by farmers, not merely of his own day, but of past and future generations. In the period under review, roughly from 1860 to 1930, dairying, and in particular milk selling emerged as "the backbone" of English farming. Although there were marked regional concentrations, in the north western and south western counties, every county had its specialist dairy area. At a national level, as a percentage of gross agricultural output in England milk contributed some 12 percent in the 1860s, 18 to 20 percent at the turn of the century, and over 25 percent by 1930. At this latter date milk was the most important single item produced on the farm. Neither beef and veal, nor mutton and lamb, contributed as much to gross agricultural output, while the value of arable farming as a whole did not equal that of milk production.

The changes in the structure of English agriculture, and of the dairy industry, can be seen as the result of the impact of two great forces: the internal pressure of demand, and the external pressure of competition. The impact was complex, at times contradictory, but the overall effect was to alter radically the structure of English agriculture.

On the demand side the crucial factors were the overall growth in numbers, the rising level of real wages, and the greater awareness of the dietetic value of milk. The first point is largely self evident -

the greater the number of people in the country the greater the potential market. However, in the absence of changes in purchasing power and consumption patterns, the impact of an overall increase in population was largely dependant on the number of young children. In the years concerned the percentage of children under five was roughly constant at 10 percent of the population, or, in other words, their total number increased. Population growth alone was not, however, the only factor at work. The potential market for milk was increased by an overall rise in purchasing power. There is no doubt that the wealth of the nation increased during the second half of the nineteenth century and the first quarter of the twentieth. The problem is to decide to what extent the various sections of the community enjoyed a share in the overall growth of wealth. The extent of poverty at the turn of the century shocked contemporaries, but, even though there was a large minority who had not benefitted, the remaining 70 to 75 percent of the population were better off in 1900 than in 1860, and better off in 1930 than in 1900. With more money at their disposal there was a tendency for people to spend a smaller proportion of their total income on food, but of that money spent on food more was spent on proteins than on starches. There was, however, a choice between the different forms of protein, and in England there was a marked preference for meat. Tastes did change, nevertheless, as knowledge and awareness of milk increased. Although some hostile attitudes remained, by 1930 milk was seen increasingly as a clean, wholesome food for all members of the family.

On the supply side trends favoured the milk producer. The last quarter of the nineteenth century saw the growth of large scale imports of cheap grain, meat, butter, and cheese. Prices fell considerably, and in many cases the reduction in production costs was insufficient to offset this fall. Owing to the nature of liquid milk there was no competition from abroad in this branch of agriculture. This is not to say that milk prices did not fall for this was a period in which all prices fell to a greater or lesser extent. However, with the exception of the 1890s and the late 1920s, when overproduction led to sharply reduced returns, the fall in milk prices was not as great as the decrease in the cost of production. Moreover, the dairy farmer was able to take advantage of the fact that the flood of cheap, imported cheese and butter enabled the liquid milk trade to be developed without forcing up the price of milk to prohibitive levels. The position was also eased by the advantages that could be reaped from the application of new knowledge. The use of artificial feeds and the application of fertilisers helped to increase output to meet the growing demand for liquid milk.

In terms of productivity and profitability the dairy industry performed most creditably in the years under review. Improved breeding, better feeding, greater care, longer seasons, and greater numbers increased the total yield of the national dairy herd. Output per animal rose, particularly after the Great War. However, output per manhour fell. Greater time was required, but the end product was of

superior quality. It is striking that the need for more labour did not result in the development of mechanical aids until the 1920s. This was not simply because of technical problems. Although there was evidence of labour shortages in some parts of the country it remained possible, before 1914, to expand the dairy industry within the limits imposed by hand labour. In part the expansion of dairying, and the legal requirments imposed upon milk producers, soaked up farm underemployment, but it was also true that many farmers, and their families, increased their work load considerably in order to remain in business.

Overall, therefore, conditions were conducive to the growth of the dairy industry. Hence, the striking feature of the period becomes, paradoxically, not so much the rise of the dairy industry, but the sluggishness with which it emerged as the leading sector of English agriculture. The reasons are not hard to find. To a large extent the answer was ignorance of the value of dairy farming among all sections of the community. However, there was more to it than a simple lack of knowledge. Old allegiances, the limitations of the existing tenurial system, and the lack of capital at crucial moments all played a part.

The first point, consumer ignorance, should be stressed. Today milk is generally accepted as the epitome of health giving food. However, this was emphatically not always the case. It is often true that what people choose to believe is more important than the reality

of the situation. This was the case with milk. False impressions, strengthened by sensationalist writings, took a long time to rectify. Smollett described London milk as

> 'the produce of faded cabbage leaves and sour druff, lowered into hot water, frothed with bruised snails; carried through the streets in open pails, exposed to foul rinsings discharged from doors and windows, spittle, snot, and tobacco quids from foot passengers; overflowings from mud carts, spatterings from coach wheels, dirt and trash chucked into it by roguish boys for the joke's sake; the spewing of infants who have slabbered in the tin measure, which is thrown back in that condition among the milk for the benefit of the next customer; and, finally, the vermin that drops from the rags of the nasty drab that vends this precious mixture, under the respectable denomination of milkmaid.'[1]

It would be nice to dismiss this as the outpouring of an embittered writer, suffering from a warped sense of humour. Unfortunately, though many of the criticisms were invalid in 1771, let alone in 1871, Smollett, in many ways, was merely giving expression to the fears of many. That these fears were illfounded was largely irrelevant. If the cruder jibes made by Smollett no longer applied by the end of the nineteenth century new threats, equally exaggerated, had appeared in the form of disease carrying micro-organisms. Not until the Milk Marketing Board started its massive publicity campaign was the dirty milk bogey finally laid.

The potential growth in demand was further restricted by conventions that associated milk with babies. More milk was consumed as tea, coffee, and similar beverages such as cocoa increased in

1. T. Smollett, The Adventures of Humphrey Clinker, World Classics edition, p.146.

popularity, but the habit of drinking milk in its raw state grew slowly. By the 1930s only some 20 percent of all milk consumed was drunk raw, compared with over 25 percent used in cooking, and over 35 percent consumed in tea, coffee, and the like.[2]

Ignorance, however, was not confined to the consumer. The farming community also failed to grasp fully the potential benefit that dairying could bring to the producer. The inability to see the permanence of change in the last quarter of the nineteenth century, coupled with the psychological difficulties of accepting milk producting as a legitimate part of farming, hampered the development of the dairy industry. Too often dairying was adopted in a negative, last resort, attitude rather than as a positive response to changing conditions. This outlook was well known to A.G. Street who wrote as a would be corn grower forced to adopt dairying,

> 'by comparison with every other branch of agriculture, and especially with grain growing, milk production is a lousy subject. Nobody likes it, neither master nor man; and everyone connected with farming would avoid it if he could. Amongst thousands of farmers it has always been considered the last refuge of the destitute, something to be faced only as an alternative to bankruptcy...but much as a farmer may have disliked milk production the price emphasis in the pre-war years fairly flogged him into it.'[3]

This would have made strange reading for the dairy farmer of Cheshire or Somerset, who was following a family tradition that stretched back over the centuries, but it was all too true of farmers in other areas. Moreover, there was little aid "from above" to stimulate change. Not

2. K.A.H. Murray and R.S.G. Rutherford, Milk Consumption Habits (1941), pp.35-7.
3. A.G. Street, Ditchampton Farm, (1946), pp. 69, 77.

only were landlords wary of such changes, but in the prevailing atmosphere of economic orthodoxy with its strong emphasis upon the virtues of laissez faire and free trade there was little guidance and less positive aid from the various governments until the 1920s.

To have exploited fully the potential market for milk considerable expense would have been involved. Radical changes in the tenurial syetem wouldhave been necessary, and large sums of money invested in new buildings as well as in more cows. Changes on this scale required something more than local initiative. Unfortunately the successive governments did virtually nothing. In this respect they stood in marked contrast to their continental counterparts, all of whom came to the aid of their farmers. In France and Germany the answer was to erect tariff barriers, a policy that was politically impossible in Britain. In Denmark the government adopted a different policy and helped to finance and organise the development of the export butter trade that saved the Danish farmer from ruin. The agricultural community in Britain, however, was not sufficiently important to attract more than passing attention. Royal Commissions and some very small grants for research and education were almost the sum total of the aid given to farmers until the 1930s. Consequently the dairy industry developed in an unco-ordinated fashion. At its worst the lack of rational organisation gave rise to a position in which milk was sent to London from Haverfordwest, via Cardiff, a distance of over 250 miles, while Cardiff supplies came

from Bridgewater in Somerset, and from Longdon in Worcestershire, respectively 60 and 65 miles away from the Welsh capital.[4] Wasteful collection was but one aspect of the problem. Lack of co-operation among farmers did not help matters as, for example, the benefits of bulk buying were lost, while the lack of education in comparison with such countries as Denmark and Germany put the English farmer at a further disadvantage. All in all, inadequate consumption, limited education, lack of co-operation, and the absence of government policy retarded the transformation of English agriculture, which was more suited to the growing of grain than to the production of milk. The limitations of the system finally became apparent to all in the early 1930s when the government intervened to rescue the English dairy farmer.

Throughout the period under review English agriculture was subject to the trends of the world economy. There was no protection from outside forces. For some farmers the outcome was disasterous, but the dairy farmer, generally speaking, was able to come to terms with conditions. The late 1890s were years of crisis when overproduction brought prices tumbling down. As a result the rate of growth in the expansion of the national dairy herd was checked until demand once again overtook supply. By the late 1920s the same problem reappeared, but this time in a more severe form. The demand for milk was scarcely increasing and, in view of the world situation, there seemed to be little prospect of a rise in milk prices. In the circumstances a

4. 3rd. Interim Report on the Production and Distribution of Milk, C. 315, Parl.Papers, 1919, xxv, p.637.

reduction in the number of dairy farmers appeared to be the only possible answer. However, the introduction of the Milk Marketing Board bypassed the problem. The 1933 scheme, in return for a guarantee that all milk offered for sale would be taken, gave milk producers their own marketing board, with control of prices and a monopoly over all supplies. The first action of the Board was to fix prices at a level, above that which had prevailed in the last months of market conditions, that would ensure the survival of its members. By keeping producer and retail prices higher than they would otherwise have been the Milk Marketing Board not only protected its members, but positively encouraged production, even though the liquid milk market was glutted and the world market for manufactured dairy produce was chronically oversupplied. This gain for the producer was paid for by the consumer, despite the fact that the Minister of Agriculture had the power to ban any action of the Board that was shown to be against the interests of anyone affected by it. The birth and early life of the Milk Marketing Board deserves closer attention than can be given here. For immediate purposes suffice it to say that the inception of the Board marked the end of a period of free trade and laissez faire during which English agriculture generally, and dairying particularly, underwent profound change. Despite the point of unresolved crisis at which the period ends there is little doubt that the dairy industry, which effectively meant milk selling, was the most important single sector of English agriculture.

In this expansion, described aggregately, it is possible by interview to see the development in terms of individuals in one area, Wiltshire. From this evidence it was possible to distinguish two types of farmer - the early adopter/innovator and the early majority adopter. The former was characterised by the ownership of large farms with large gross incomes. All had above average educational standards, which was evidenced in their breadth of vision. Not only were they well versed with current knowledge, they were also in touch with experimenters and leaders of opinion, which took them out of their local circle. Equally all were full time farmers, and though they tended to be young there was no evidence that their innovativeness decreased appreciably with age. The second group, the early majority men, were characterised by smaller farms and lower gross incomes. Although their achievements were often impressive they tended to be less cosmopolitan, and more dependant upon others to provide the new ideas than those in the first category. Again all were full time farmers and young at the time to which the interviews referred. The one common factor that united the two groups was largely psychological - strength of purpose. This determination manifested itself in the conscious striving of the first group, the early adopters/innovators, to be in the forefront of new ideas, and in the tenancity with which the second group refused to go under in what was often seen as a "sink or swim" circumstance.

Owing to the limited nature of the material - it was possible to collect information, some of it a little scanty, on twenty men only - it is not possible to offer a detailed analysis for the whole county but the general picture is clear. To what extent the evidence of Wiltshire applies to the rest of the county cannot be stated without further work in other areas. As far as the spread of innovations is concerned the county was fortunate in having such people as Hosier and Boutflour. However, for the purposes of identifying progressive farmers there is no a priori reason to believe that Wiltshiremen were fundamentally different from the rest of their fellow countrymen.

This aspect of the subject is the one that deserves to be developed further in other spheres. Although it is impossible to carry out a full survey for any area before the last world war there are still many men alive who farmed from the early years of this century. A single hour's interview with such people can reveal more detail and insight into their way of life than a day spent reading in a library. The opportunity is a golden one and should not be lost.

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