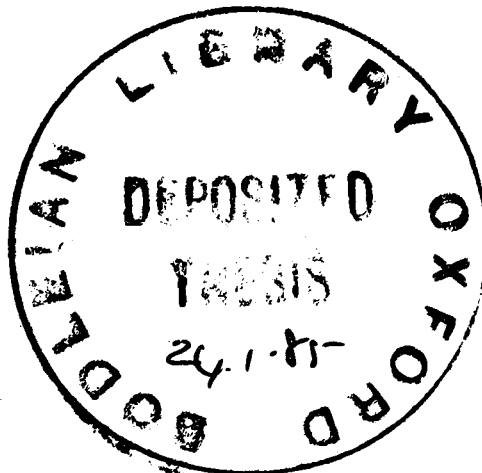


THE EXPERIENCE OF PERIPHERAL REGIONS IN AN AGE OF INDUSTRIALISATION:

THE CASE OF DEVON, 1840-1914.



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ABSTRACT

This thesis addresses the unresolved question of whether industrialisation helps or hinders progress in the peripheral regions of developing economies. Devon is seen as a 'sample of space' within which the breaking down of regional identities by changes in the Victorian transport infrastructure can be monitored. As the county's fortunes were thus primarily dependent upon the course of development in the wider national economy the survey of changes in economic activity within Devon is concerned mainly with relating internal adjustments to external pressures and opportunities. The balance of these appears to have resulted in a demand 'leakage' from the county's economy, and a net outwards flow of migrants, for there was a chronic deficit in Devon's balance of payments with the rest of Britain. This was probably exacerbated by an outflow of capital. But the relative contraction of employment within the county took a selective form in accordance with the developing specialisation of activity across the national economic space. On the evidence of comparative wages in agriculture it seems that direct external demand was of central importance to the elimination of spatial differentials after 1870. But for the county as a whole there was no narrowing of the large shortfall between local wages and the national average before 1914. Sectors that benefited from external demand were few in number and their linkages with the rest of Devon's economy were too weak to stimulate general growth in the county, and the relatively unchanging distribution of demand throughout the nation that this reflected helped to maintain residual regional barriers to internal adjustment. The British economy was mature enough to pull the least developed regions away from pre-industrial levels of poverty but there was no inherent tendency to eliminate the broad tail which lagged behind the cutting edge of industrialisation.

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Extended Abstract

Despite the growing recognition that industrialisation has a spatial dimension, little attention has been given to the nature of development in the peripheral regions of Britain. The Victorian period is often seen as an age of maturity in which the benefits of the industrial revolution were generalised throughout the economy but this has not been subject to detailed historical examination. Neither is clear support offered by regional development theory. It has been argued by some that following the emergence of industrialisation in a small number of regions, the core areas, benefits subsequently diffuse outwards to outlying and less developed regions. This is disputed by others, who suggest that the spatial relationship established between dominant core and dominated periphery in the early stages of industrialisation is consolidated, not weakened, by later developments. A circle of cumulative causation leads to the further growth of core regions at the expense of the periphery. The elucidation of the determinants of change in the county of Devon is the subject of this thesis and it is offered as a contribution towards the clearer understanding of the process of regional change in 19th century Britain.

The emphasis of this study is on the interaction between Devon, as part of the economic periphery, and the rest of the British economy. It is not conceived as the history of a county seen in isolation from external developments. As a result of this approach, there are a number of methodological problems to be tackled, problems which help explain why few studies have attempted to link geography with economic history in a systematic way. In particular the abstract concept of 'the region' does not lend itself easily to practical usage. A region is probably best defined as the field within which any one commodity or service is produced and

consumed, so the regional map of a multi-commodity economy will consist of a hierarchy of overlapping layers. The administrative county is an artificial unit in this respect but its use can be justified on more than the grounds of expediency. As an arbitrary 'sample of space' it allows the changes in the hierarchy of regional identities to be studied. These changes were an important feature of Britain's 19th century economic geography.

The intractability of the source material also presents problems. The measurement of, among other parameters, regional output and productivity levels, the internal balance of trade, capital movements and government transfers are of clear importance to an examination of spatial change during industrialisation but they were not matters of concern to contemporaries. Attempts to quantify them, therefore, run 'against the grain' of documentary survival. However, if these awkward parameters were left aside and attention was given only to well documented aspects of the period, the result would be a partial history of Victorian Devon of little more than intrinsic interest. In order to assess meaningfully Devon's relationship with the rest of the economy it is necessary to construct proxies for the obscure variables. Commodity price differentials in space are measured to try to suggest the changes made to the county's regional structure by improvements to the transport infrastructure. Census employment statistics are used to underpin an examination of adjustments in the level and distribution of economic activity within Devon. Official railway and coastal shipping statistics are used to estimate Devon's visible trade balance with the rest of the nation. An attempt is made to judge the efficacy of Devon's response to the balance of external pressures and opportunities by using real wage series as a yardstick of success.

None of these proxies are fully adequate for the purposes for which they are employed. As a result, this thesis is concerned not with attempting to precisely quantify the balance of forces acting upon economic change in Devon but with synthesising the disparate strands of research undertaken, in

the hope of providing a qualitative picture of the nature of regional change in the Victorian period. To this end importance is attached to the use of other secondary work on the county, as well as to the primary research on regional structure, trade, migration and wages.

Superficially, the conclusions do not produce a picture of economic change on the periphery that is very different from that which is suggested by straightforward neo-classical theory. Economic activity continued to agglomerate in the nation's industrial core areas, forcing a relative contraction in Devon and an outwards balance of labour migration from the county. But this did not lead to an elimination of the wide differential in material living standards which had existed in the mid-19th century. The search for the mechanism which linked the fortunes of Devon to national economic change reveals salient features of this superficial pattern which help not only to establish the linkages underpinning the 'expected' adjustments but also to explain why the process was not taken to its natural conclusion.

It appears that Devon suffered from a chronic balance of payments deficit on its internal trade with the rest of the country, and this was probably exacerbated by an outflow of capital. This constituted a net leakage from the county's internal circular flow of income, and accounts for the contraction of Devon's level of economic activity as a proportion of total output. The rationalisation of employment took a selective form, however, because the unfolding pattern of national specialisation acted as a demand stimulus to agriculture, mining, tourism and other sectors able to compete on the strength of natural and other resource advantages. It is also clear that numerous firms in several of Devon's manufacturing industries were able to overcome locational disadvantages and compete successfully in external markets in the Victorian period, so the pattern of employment specialisation took a complicated form.

Agriculture is the only sector amongst the direct export earners for which there is sufficient documentation to show a clear rise in wages after 1870 that virtually eliminated the county-national differential by the turn of the century, but there are also hints that the direct impact of external demand had similarly positive effects on the other 'export' sectors. The Devonport naval dockyard was one of them. Even in the age of 'laissez-faire', central government provided a significant stimulus to the county's economy in the form of dockyard maintenance.

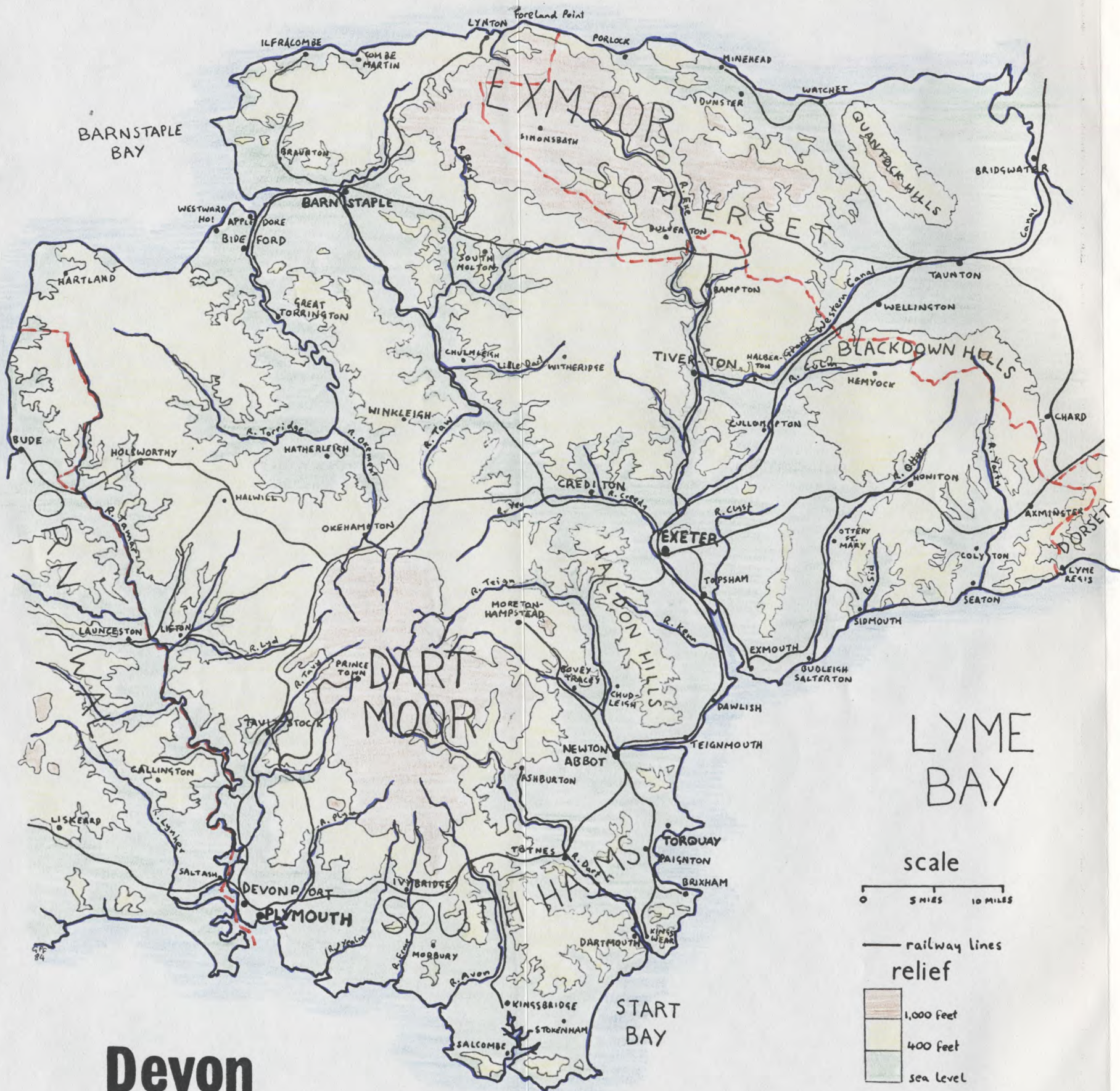
For the county as a whole, however, average wages appear to have remained substantially lower than national levels throughout the Victorian period. The 'export' sectors probably accounted for well under half of total employment. The rest of the local economy, sustained by the derived demand for materials, food, transport, houses and so on from the 'export' sectors, was apparently characterised by a trade off between underemployment and low productivity on the one hand, and low wages on the other. The survival of this low wage equilibrium is partly explained by the fact that migration was primarily influenced by the internal availability of employment. If it was related to comparative wages at all, it ceased to operate before inter-regional parity was reached. There is also a suggestion that despite the achievements of the railway age, the 'friction of distance' between Devon and the industrial core areas of Britain remained great enough in the Edwardian period for a number of traditional activities to survive behind a residual protective barrier of transport costs. They were overlain by the new, but not entirely replaced.

It seems that it was the exogenous stimulus of external demand which was mainly responsible for the elimination of the regional wage differential in the agricultural sector. It was the absence of a more general stimulus of this nature to the whole of the county's economy that most probably enabled the structural low wage equilibrium to survive. The British economy was articulated enough to ensure that Devon shared in the 'autonomous' benefit

of a secular fall in prices, (an important component of the Victorian rise in material living standards), but there was not enough change in the distribution of demand across the national economic space to eliminate the differentials which had apparently emerged in the early stages of industrialisation.

Thus the conclusions do not offer an explanation of regional change that is radically different to that which emerges from Hunt's study of Victorian wage differentials. Neither can they be substantiated with quantitative rigour. But the attempt to discuss Devon's role in industrialisation by applying concepts which are not often used outside of geographical theory adds some interesting and potentially significant detail to the outline picture. To what extent, for example, does the apparent increase in the tempo of change in Devon after 1870 reflect a turning point in core-periphery relations that can be linked to the onset of the 'Great Depression'? The answer to this and similar questions will not be provided until comparative studies have been made of other parts of the periphery in Britain, and of the core itself. It is hoped, therefore, that the approach taken in this thesis provides foundations for research on other areas, and can thereby contribute to a more informed appraisal of the mechanisms which operated between advanced and less developed regions during the industrial revolution.

Devon



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I have incurred numerous debts of gratitude in the course of researching and writing this thesis. The staff of the Devon Record Office and the Westcountry Studies Library in Exeter have been ever helpful and particular thanks are due to Sheila Stirling and Geoff Paley of the Devon and Exeter Institution for rendering friendly assistance beyond the call of duty over the years. I would also like to record my appreciation of the kindness of Mr. C.R.Elrlington, general editor of the Victoria County History, and the granting of permission by Dr. Michael Havinden to see local history theses at the Department of Economic History at the University of Exeter. This thesis would have taken longer to produce were it not for the efficiency of the office, library and computer staff at Corpus, particularly Jill Paterson, David Cooper and Frances White. I am also grateful to my parents for making it possible for me to enjoy ideal working conditions when carrying out research in Devon.

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LIST OF ABBREVIATIONS USED

<u>D.H.</u>	<u>The Devon Historian</u>
D.R.O.	Devon Record Office
<u>E.F.P.</u>	<u>The Exeter Flying Post</u>
<u>E.H.R.</u>	<u>The Economic History Review</u>
E.P.E.H.	Exeter Papers in Economic History
H.L.R.O.	The House of Lords Record Office
<u>J.E.H.</u>	<u>The Journal of Economic History</u>
<u>J.R.S.S.</u>	<u>The Journal of the Royal Statistical Society</u>
PP	British Parliamentary Papers
P.R.O.	Public Record Office
<u>T.D.A.</u>	<u>Transactions of the Devonshire Association</u>

The place of publication of all works
cited is London, unless otherwise stated.

CHAPTER ONE

Theories of Regional Development

-1-

In the literature of regional development theory there is considerable controversy with regard to the development prospects of peripheral regions in industrialising nations, but it is a problem which has received little treatment from an historical perspective in Britain. All too often it is assumed that regional differences were either non-existent or unimportant. This thesis takes a different view. The lack of interest shown in the spatial element of economic history bears out Samuelson's observation that the field is of interest for its own sake,¹ but 'space' is more than a geographical device for containing descriptive pictures. The production possibilities of an economy are determined not only by the number, quality and combination of resources but also by their distribution in space.²

While it is only natural that the analytical spotlight should tend to fall, most of the time, on the spectacular 'cutting edge' of industrialisation, the advance of best practice techniques and productivity, the subsidiary and consequential developments in the broader rearguard are not without significance for the process as a whole. A consideration of the impact of industrialisation on peripheral regions within a developing nation might facilitate the study of old problems from a different perspective. For example, it is possible that a better appraisal of the forces and inter-regional functional linkages underpinning disparities in regional income levels might have important implications for a full understanding of the crises of the 1830s and 1840s. Likewise, the peripheral manifestations of economic change during the 'mature' phase of industrialisation might illuminate hitherto obscure aspects of the late Victorian 'Great

¹quoted in G.McCrone, Regional Policy in Britain, (1969), p.49

²D.M.Smith, Industrial Location, (New York, 1971), provides a useful survey of the ways in which production costs vary with location.

Depression'. In these and other areas of debate it would be surprising if a study of the extent to which industrialisation 'pulled up' the national economic rearguard contributed nothing.

The direct consideration of these wider issues must await a more comprehensive survey of the economy's peripheral regions than can be accomplished in these pages. The more modest concern of this thesis is with the process of change during the Victorian period in one outlying part of Britain: the county of Devon. A large and fairly well defined county situated on the limb of the south-western peninsula, thus remote from the main centres of industry, it is well suited for a survey of this nature. Attention is concentrated on the period after 1840 or thereabouts, because these decades are often seen as marking the consolidatory phase of British industrialisation, during which the gains of the formative years were generalised throughout the economy.¹

But the actual patterns of change on the periphery in this period are far from distinct. It is in the hope of contributing towards a clearer elucidation of the subject that this thesis attempts to set Devon's economic development against the background of national industrialisation by laying stress on the channels of interaction, the internal exchange of goods, services and resources, and the process of response and adjustment.

-2-

One of the main reasons why the field has been neglected is the difficulty encountered in putting the abstract concept of 'the region' to useful purpose. It is a methodological problem which must be confronted as a preliminary to any spatial analysis of development, and may explain why geographers -not historians- have been the pioneers in the field and why, in consequence, the effects of industrialisation in the economic periphery have been neglected.

¹The classic example of this is provided by Rostow in describing the 'drive to maturity': W.W.Rostow, The Stages of Economic Growth, (Cambridge, 1960), pp.59-61

To Richardson the region is halfway between 'space' and 'spacelessness', a compromise towards the ideal of spatial analysis.¹ It is an expedient unit rather than a theoretically pure concept and has been applied to areas of space on widely differing criteria. Broadly, two uses are usually employed: the homogenous region, and the nodal region, but neither is adequate for the purposes of this investigation. While they depict areal economic specialisation and convey the importance of central places both seek to draw a single line around an area of land.² It is more realistic to build upwards from the definition of a region as the field within which any one commodity or service is produced and consumed. There are as many layers of regions as there are commodities in the output mix of an economy, and as many networks of boundaries as there are variations in the production and distribution costs of those commodities.

Seen in this way it is impossible to divide the British economy into a fixed number of regions:³ for some goods, which are characterised by extremely centralised production, the whole country may be one region. For many others, which are produced and exchanged locally, the country may be covered by a mesh in which the area of each region is no more than a few square miles. A regional map of an economy producing a wide range of goods will resemble a complicated Lösschian landscape, a pyramidal hierarchy of regions.⁴

Thus in terms of regional identity any one area will be characterised simultaneously by a multiple range of space relationships with other areas

¹H.W.Richardson, Regional Economics, (1969), chapter 9

²Richardson deals with these concepts of the region in more detail than is relevant here: ibid, pp.223-6

³'The number of different boundaries for any region is equal to the square of the number of geographers consulted', P.Haggett, Geography - A Modern Synthesis, 3rd. edn., (New York, 1979), p.257

⁴after A.Lösch, who drew up a picture of central places arranged in a hierarchy according to number of functions and their related spatial hinterlands: A.Lösch, The Economics of Location, (1967). It should be noted that the portrayal in this chapter of a hierarchy of regions differentiated by commodity is not precisely the same as Lösch's hierarchy of settlements differentiated by number of functions.

according to the number of commodities produced or consumed there. The theoretically smooth profile of the hierarchy of region sizes is likely to be interrupted where discontinuities in transport costs are imposed by physical barriers in the landscape and in these circumstances enough commodity area boundaries may coincide to give one particular area of space a clear economic identity.

As the industrial revolution significantly altered the structure of commodity production and distribution costs the already intricate regional structure must have been subject to fundamental change. This complicating factor provides the best justification for confining this empirical study to the administrative county of Devon. Although in many ways an arbitrary area of land it can be treated as a 'sample of space' within which not only economic development can be studied, but also changes in the regional structure itself. The detail of this is dealt with in chapters 2 and 3 but the task here is to follow up the implications of the Löschian treatment of the region for development theory in a general sense.

International trade theory might provide an organising framework for regional analysis, being an established wing of economic spatial studies, but it proves inadequate. Scenarios which give international trade a key role as an 'engine of growth' are of limited value within a nation where an outlying area is already intimately connected with economically advanced districts at a number of levels. The most crucial formal distinction between international and inter-regional trade is that whereas independent trading nations can compete on the basis of comparative advantage -because flexible exchange rates can vary the terms of trade- no such room for manoeuvre exists at an internal level. Over and above the diminishing level of 'natural protection' afforded by transport costs regions have to compete on the basis of absolute advantage, the balance of which is determined by resource endowments, factor prices and productivity.

On the other hand, political unity may mean that peripheral areas benefit from centrally directed regional policy,¹ and it may also fairly be assumed that the ease with which factors of production can be transferred within nations is greater than across political frontiers. Cultural differences between nations act as a barrier to the free migration of labour, and currency differences and exchange controls can likewise inhibit the international movement of capital. Regional development theory must recognise that peripheral regions are spatial subsets of larger economies and are not analytically analagous with independent trading nations.

These observations on spatial structure form the background for an examination of the differences of opinion in the theoretical literature with regard to the path taken by less developed regions in modernising economies. Although the concern of this thesis is not with locational aspects of the first emergence of modern industry it is impossible to avoid mention of the topic at this point. Clearly, modern economic activity does not emerge evenly spread over a whole country but rather originates in a few locations, perhaps in response to the pressure of local bottlenecks in the organisation of production. According to Friedmann they were the

'relatively small number of centres of change located at points of highest potential interaction within a communication field; innovations will tend to spread downward and outward from these centres to areas where the probability of potential interaction is lower.'²

Here is the optimistic view of the development prospects for backward regions. Industrialisation begins at the emergent growth poles -the 'poles de croissance' identified by Perroux as the dynamic spatial arrangement associated with development-³ but diffuses outwards to secondary cores and their associated hinterlands. This process is seen as an inevitable part of

¹As chapter 4.2 shows, this is something which cannot be ignored even during a century renowned for a 'laissez-faire' approach to government.

²J.Friedmann,'A generalised theory of polarised development' in N.M.Hansen (ed.), Growth Centres in regional economic Development, (New York, 1972), p.93

³F.Perroux,'Economic Spaces: Theory and Applications', Quarterly Journal of Economics, LXIV (1950)

sustained economic growth in the industrial core areas through their demand for the raw materials and agricultural produce of the periphery. The demand stimulus is one of the spatial spread effects of industrialisation and neo-classical economics suggests that it is consolidated by inter-regional flows of labour and capital, which adjust the distribution of economic activity in space to the mutual benefit of both core and periphery.

In Williamson's 'stages' theory of regional development there is a period of spatial divergence in the initial phase of industrialisation as traditional activities on the periphery are undercut by mechanical competition from the core.¹ Given time however, the pattern is reversed as further agglomeration in the core is limited by the diseconomies which result from overcrowding and high factor costs.

Studies of regional development in the U.S. economy, primarily those of Perloff and associates, and, more recently, Borts and Stein,² lend support to analyses of this nature. The latter measured the extent to which factor flows in a free and open economy were able to reduce regional inequalities in income per capita. They were satisfied that labour migration was central to their observation that the states with lowest per capita income in 1880 experienced the highest rates of income growth in the decades down to 1950.³ Williamson's own time series of regional wages in a number of economies at different stages of development also seem to show eventual income convergence in space following an early period of divergence.⁴ It is argued, then, that the absence of significant barriers to labour and capital

¹ J.G.Williamson, 'Regional Inequality and the process of National Development: a description of the patterns', Economic Development and Cultural Change, XIII (1965), pp.3-45

² H.S.Perloff, E.S.Dunn, E.E.Lampard, R.F.Muth, Regions, Resources, and Economic Growth, (Baltimore, 1960); G.H.Borts and J.L.Stein, Economic Growth in a free market, (New York, 1964). The decentralised character of source material for measuring variables such as output, income and capital accumulation in the U.S.A. is one reason why much of the current theory is American in origin, and why the territory has been but poorly charted in Britain.

³ Borts and Stein, Economic Growth, p.206

⁴ Williamson, 'Regional Inequality', Table 5, pp.34-6

movement within a national economy leads to an equalisation of factor returns during the mature phase of industrialisation.

It may therefore be assumed that the initial impetus for change comes from the core. Moreover, the diffusion of development does not take place on the basis of equality in the relationship of core to periphery: the former dominates the latter. Spatial specialisation of activity generally develops according to the core's need for raw materials and agricultural produce. It is this which usually underpins the spread of canal or railway systems in an industrialising country. The installation of facilities for cheap transport is of central importance in articulating a large area of space into one functioning economic unit. Thus the economic 'space' of the core region or regions engulfs what may previously have been relatively self-sufficient peripheral economies.¹ Through this informal 'domestic economic imperialism', cores organise their peripheries and set the bounds within which the latter may develop.

'Dominant core and dominated periphery together constitute a relatively stable spatial system in which the latter is successfully "colonised" chiefly to sustain the continued growth of the former'.²

Those who support the optimistic case for the development prospects of peripheral regions argue that this relationship does not compromise the opportunities for the spatial diffusion of industrialisation. The closer the links between core and periphery, the greater the demand stimulus from the former to the latter, the larger the low cost opportunities for investment by the former in the latter, and the easier the means of migration from the latter to the former. Spread effects 'trickle down' from the core through the channels of internal trade and investment and are consolidated by appropriate secondary adjustments in the economic structure of peripheral areas.

¹H.L.Gauthier, 'Geography, Transportation and Regional Development', Economic Geography, XLVI, (1970), pp.612-9

²J.Friedmann, 'Polarised development' in N.M.Hansen, Growth Centres, p.100

But objections may be raised. The view that 'domestic economic imperialism' is as much to the advantage of the periphery as to the core rests in large measure upon the assumption that shifts in the spatial deployment of resources occur in a frictionless manner and that once industrialisation is under way there is no continuing inherent bias of locational advantages towards the core. Many have argued for a much more pessimistic evaluation of the chances of economic development in peripheral areas.

This case was made forcefully by Gunnar Myrdal in the 1950s¹ and while -following him- much of the pessimistic regional development theory addresses itself to the problem on a global scale as a contribution to the debate on prospects for the Third World² this does not render it useless in a domestic context. The main thrust of Myrdal's argument was that the onset of industrialisation in a few favoured regions does nothing to restore a spatial equilibrium but rather leads to further polarisation between advanced and backward regions. Brown and Burrows expanded on the likely sources of 'cumulative causation', suggesting that it stems from the failure of diseconomies and diminishing returns to set in at the core.³ Far from the locational competitiveness of growth poles being eroded relative to other areas as industrialisation progresses, the initial advantages tend to be compounded by external economies of scale and other agglomerative effects. Demand continues to grow for the products of the core, which in expanding accounts for an increasing proportion of national economic activity. Thus, even if labour migrates from the periphery on a large enough scale to constitute a spatially equilibrating force, capital will continue to be attracted by investment opportunities in the core: a spatially dis-

¹G.Myrdal, Economic Theory and Underdeveloped Regions, (New York, 1957)

²S.A.Resnick, 'The decline of rural industry under export expansion', Jour. Economic History, XXX, (1970), pp.51-73, provides a good case study from South East Asia of the consequences of locking in to the world economy.

³A.J.Brown and E.M.Burrows, Regional Economic Problems, (1977), p.38 ff.

equilibrating force.¹

Myrdal also suggested that consideration of qualitative aspects of outmigration² reduces the likelihood of peripheral development from this source. As low incomes tend to be associated with limited access to education in most backward regions, both bolster the forces of inertia limiting migration in search of employment and/or higher wages. Those who move tend to be the more enterprising and energetic among the young age groups. While they constitute a qualitative improvement in the labour force of the core, the periphery is left with a more immobile, less enterprising and older workforce.³

Structural forces such as these combine to severely limit the opportunities afforded to the periphery once it comes within the 'economic space' of the core's expanding hinterland. Indeed, this change in regional structure during the course of industrialisation may lead to a deterioration in welfare and living standards in the periphery, through a breakdown in the traditional self contained pattern of economic activity. The spatial 'backwash' effects of core industrialisation, it can be argued, outweigh the spread effects. Production continues to be concentrated in the core areas and their needs tend to constrict residual economic activity in the periphery to agriculture, raw material extraction, and low order/low productivity manufacturing.

Changes in the spatial structure of the 18th century economy in Britain lend support to this pessimistic assessment. The decades which witnessed an acceleration in the pace of development in the emergent core regions also saw 'de-industrialisation' in outlying areas. East Anglia has been treated in this light by Coleman,⁴ and a similar case has been made for the vastly

¹H.W.Richardson, Regional Economics, (1969), p.264

²This awkward term is preferred to 'emigration' to avoid confusion between internal and external migration.

³Myrdal, Economic Theory, pp.27-31

⁴D.C.Coleman, 'Growth and decay during the Industrial Revolution: the case of East Anglia', Scandinavian Econ. Hist. Review, X (1962), pp.115-27

different county of Sutherland.¹ In the next chapter similar patterns are detected in late 18th century Devon. The century or so after 1750 saw a significant divergence in wage rates between industrial and agricultural counties so that by the early to mid 19th century there was a substantial disparity in average wages around Britain which roughly conformed to the spatial distribution of the industrial cores.² Pollard observed that the rise of modern industry in a certain few regions was 'tantamount to de-industrialisation elsewhere',³ and the implications of this for the measurement of total national output during the industrial revolution make the recent downwards revision of 18th and early 19th century British economic growth rates easier to understand.⁴

But was the subsequent period, the supposedly mature phase of British industrialisation, an era of convergence, as Williamson's theory suggests? Despite the work of Hunt on wages⁵ the patterns are not distinct and the evidence from Devon is ambiguous. Many of the structural features which inhibit peripheral development can be identified in the county in the Victorian period, but there are also signs of significant economic progress. On the surface there is no clear answer, but this thesis attempts to identify grounds for a resolution of the problem as a result of its search for the sources and mechanism of economic development in this one part of the periphery.

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In the next chapter a survey is made of the historical background to Devon's Victorian economic development and an attempt is made to graft the

¹ E.S.Richards, 'Structural change in a regional economy -Sutherland and the Industrial Revolution, 1780-1830', E.H.R., 2nd ser. XXVI, (1973), pp.63-76

² J.Caird, English Agriculture in 1850-I, (1852), pp.511-3; E.W.Gilboy, Wages in 18th Century England, (Harvard, 1934), pp.219-27, 242

³ S.Pollard, 'Industrialisation and the European Economy', E.H.R., 2nd ser. XXVI (1973), p.638. See also his Peaceful Conquest, (Oxford, 1931)

⁴ N.F.R.Crafts, 'British Economic Growth, 1700-1831: A Review of the Evidence', E.H.R., 2nd ser., XXXVI (1983), Table 5, p.187

⁵ E.H.Hunt, Regional Wage Variations in Britain, 1850-1914, (Oxford, 1973)

nebulous concept of regional structure onto the administrative county. Chapter 3 then traces the important changes in the transport infrastructure and assesses the impact this had on regional structure itself. The central chapters are then concerned with aggregate and relative changes in the spatial distribution and structure of output and its salient links with the rest of the national economy. Ideally this would be based around the measurement of regional output and the contribution of productive factors to the growth rate. American 'regional scientists' suggest that the structure of regional output can best be studied in the context of an elaborate input-output model, and that this in turn should be adjusted to an 'industrial complex approach' to overcome simplifications such as the assumption of linear production coefficients through time.¹

Unfortunately it is impossible to work at this level of sophistication with the data available on the British economy in the 19th century, but this does not rule out the chances of any progress in this field, for there is potential in the concept of the export base. Its central premise, explained and developed more fully in chapter 4, is that aggregate regional growth depends on the performance of that region's export activities,² and it thereby provides a suitable vehicle for studying a spatial subset of a larger economic whole. Employment statistics are put to use here,³ supplemented by qualitative sectoral surveys to flesh out the export base concept.

¹W.Isard, 'Notes on the use of regional science methods in economic history', J.E.H., XX (1960), pp.597-601; H.W.Broude, 'The significance of regional studies for the elaboration of national economic history', J.E.H., XX (1960), pp.588-96

²and in the context of this thesis exports and imports refer to trade carried out over the boundaries of the region, thus including trade with other parts of Britain as well as with overseas destinations.

³C.H.Lee, 'Regional growth and structural change in Victorian Britain', E.H.R., 2nd ser. XXXIV (1981), pp.438-52 uses employment statistics in macro-economic studies of region growth types in Victorian Britain. See also his Regional Economic Growth in the U.K. since the 1880s, (Maidenhead, 1971)

In chapter 5 the emphasis shifts directly to the point of interaction, and attention is focussed on Devon's balance of trade with the rest of the economy. The pursuit of the balance, part of the mechanism underpinning core-periphery relations, leads to an examination of capital transfers, and on to a study of labour migration in chapter 6. An attempt is then made to assess the efficiency of this adjustment process in chapter 7, mainly through the proxy of relative regional wage levels. Finally, the threads of analysis are drawn together, and an attempt is made to relate the implications from Devon's experience back to some of the wider horizons sketched in this introductory survey.

CHAPTER 2

The pre-Victorian background to development in Devon.

-1-

At over 2,550 square miles, the county of Devon was the third largest in England until reorganisation in 1974 and it occupies the broadest part of the south-west peninsula. There are 75 miles of varied landscapes between Prawle Point in the South Hams and Lynmouth's Foreland Point on the stern north Devon coast, but to the east the width of the land falls to only 35 miles between Lyme Regis and the Parret estuary. Before the Somerset Levels were drained in the 18th century the effective landward connection to the rest of Britain was a mere 16 miles wide, which made a formidable contribution to the traditional isolation of the peninsula. Steep gradients, heavy soils, wet weather and narrow lanes had always combined to make land travel difficult in Devon:

'For be they ever so well mounted upon their fyne and deyntie horses out of other countries after that they have travelled in this countrie but one journey they can forbear the second.'¹

The use of weights and measures in the county's markets which differed from national standards until well into the 19th century provides another example of the idiosyncracies bred by isolation which helped to set Devon apart from the rest of the country.²

Physiologically too, Devon and Cornwall stand apart from most English counties, having a great deal in common, geologically and climatically, with the rest of the upland fringe, in Wales, in the north, and in Scotland. West of the River Exe the county consists largely of Devonian sedimentary layers of hard grits, sandstones, slates, limestones and shales, buckled into a

¹J.Hooker, Synopsis Chorographical of Devonshire, (c.1600), as partly transcribed in W.J.Blake, 'Hooker's Synopsis Chorographical', T.D.A., XLVII (1915), p.336

²such as the Devonshire acre (1.2 statute acres) and the dairy pound of 18 oz. R.Stanes, 'Devon's History' in Devon County Council, Doorway to Devon, (1977), p.35

great east-west syncline by later earth movements.¹ The old red sandstone which forms the northern barrier of Exmoor rises again in south Devon, and the intervening trough is filled with carboniferous Culm Measures, giving rise to poor soils, and subject to the full force of Atlantic winds and rain.

Dartmoor dominates the county's geology. This hard granite intrusion, parts of which exceed 2,000 feet above sea level, established a radial pattern of drainage outwards to the coasts which was later followed by the lines of economic orientation in the pre-railway period. The sediments surrounding the Moor were metamorphosed by its intrusion, thereby creating the aureole of mineral rich rocks which for many centuries sustained a wide variety of mining activities.

East of the Exe, but extending southwards along the coast to Torbay, and with an arm thrust westwards into mid-Devon, lie the younger, Permian new red sandstones and marls which give rise to the renowned red earth fields, the richest agricultural land in the West. Eastwards still, the great belt of Jurassic and Cretaceous clay vales and chalk or greensand scarps reach into the county producing the East Devon plateau broken by numerous deep and warm combes. The greensand outlier of the Haldon Hills separates the Exe estuary from the Dartmoor foothills, and effectively sealed off Exeter from the south-west of the county.

Devon's eastern boundary runs north-westwards from the greensand plateau along the Blackdown Hills and onwards to the heights of Exmoor. While not as distinct a boundary as the Tamar Valley, which divides Cornwall from Devon, the eastern border would still have been a noticeable topographical frontier in the days when travellers were sensitive to the slightest of gradients.

¹For a detailed description of Devon's geology see E.M.Durrance and D.J.C.Laming (eds.), The Geology of Devon, (Exeter, 1982)

The old and resistant rock which underlies 80% of the county gives it a generally higher altitude than the sedimentary hills and basins of lowland England, and this, together with its western location, accounts for the relatively high level of rainfall. Only in the Exe estuary is there less than 40 inches (102 cm.) of rain per year, whereas only 20-25 inches (50-64 cm.) falls in the Thames Valley. Close proximity to the sea is also responsible for Devon's relatively high humidity, but the air is clean and temperatures mild and the south coast is one of the sunniest parts of Britain.¹ All these were factors of importance to the early development of tourism.

Thus while its situation is fairly remote from the heart of Britain, and its physical structure in many ways forbidding, the geological, topographical and climatic characteristics accounting for, and deriving from these conditions created an environment which offered a wide range of economic opportunities to Devon's inhabitants through the centuries. It is not surprising to learn that far from being a poor and sparsely populated upland region of Britain, the county was, in the early modern period, one of the wealthiest and most industrious parts of the country.

Its agriculture, and not just that of the fertile red lands, was held in esteem by outsiders in the 17th century. Cromwell thought it the best he had seen² a view that had a great deal to do with the fact that virtually all of the county's arable land had been enclosed for at least two centuries, although as was to be expected in an area with large tracts of open moorland and heath, there was still a great deal of common grazing. On most farms some form of convertible husbandry was already the rule in Restoration Devon, generally incorporating long leys of maybe twenty years or more on the poorer soils of the Culm Measures where conditions were more

¹W.G.Hoskins, Devon, 2nd edn., (Newton Abbot, 1972), p.22

²ibid, pp.95, 540

suited to pastoral farming than to crop raising.¹

Sea sand and marl had for long been used to increase soil fertility for arable crops but from the Restoration onwards there was an increase in the use of lime to help improve yields, the diffusion of which across the county was generally helped by landlords writing appropriate covenants into leases.² However, evidence collected by Dean Milles in the 1750s for a history of the county seems to show that average crop yields had not increased above levels observed in the 1660s³ and from then onwards, as the pace of change in arable farming accelerated elsewhere, outside observers were increasingly critical of what they saw as the moribund and inefficient agricultural systems of Devon.

Arthur Young, William Marshall, and Charles Vancouver looked with disfavour at the long rotations on Devon farms, particularly the fertility sapping course of following wheat with barley and then oats, and argued that green crops, turnips, and potatoes ought to be incorporated to a much greater extent.⁴ On the institutional side also, the survival of three life leases well into the 19th century, as opposed to the more progressive leases at rack rents for short periods of years were criticised for the way in which they deprived the tenant of capital through his having to pay a hefty entry fine at the outset instead of an economic rent in annual instalments.⁵ Yet not all was bleak. Cider continued to be produced and exported in prodigious quantities, with 710,000 gallons being shipped from the South Hams

¹ Hoskins, Devon, pp.92-8; W.R.Curtler, 'Agriculture' unpublished paper for the Victoria County History (V.C.H.), of Devon Vol.II, Inst. of Hist. Research V.C.H. collection Envs 438/9

² M.A.Havinden, 'Lime as a means of agricultural improvement -the Devon example' in C.W.Chalklin and M.A.Havinden (eds.), Rural Change and Urban Growth, (1974), pp.126-9

³ S.Colepresse, 'A Georgicall Account of Devon and Cornwall in answer to some questions concerning agriculture' ed. R.Stanes, T.D.A., XCVI (1964), pp.269-302; R.Stanes, 'Devon agriculture in the mid 18th century: the evidence of the Milles enquiries' in M.A.Havinden and C.M.King (eds.), The South West and the land, E.P.E.H. 2, (Exeter, 1969), pp.56-8

⁴ A.Young, Annals of Agriculture, (1797), vols. 28-30, passim; W.Marshall, The Rural Economy of the West of England, (1796), Vol 1 p.135; C.Vancouver, General View of the Agriculture of the county of Devon, (1808). ch.XVII

⁵ Vancouver, op cit, p.428; Caird, English Agriculture, p.50

to London in 1820, and experiments were even being made with hop cultivation in east Devon at around the same time.¹

The natural endowment of the Westcountry's farmland and the sum of national agricultural changes were, however, tending to encourage a greater concentration on pastoral farming in Devon rather than crop raising. There may have thus been little incentive for improvement in arable farming practices but from the 18th century onwards there were signs of change on the husbandry side. As late as the 1750s it appears that most of Devon's cattle were of the ancient native black breed, hardy creatures suited to moorland grazing,² but by the turn of the century, when Marshall and Vancouver toured Devon, these had been wholly replaced by what are now regarded as the traditional Devon breeds. The red 'Devon' was kept mainly for beef and the large brown 'South Devon' was a renowned dairy breed.³ The rise of these improved strains can be attributed to the activity of selective breeders such as the Quartlys of Molland and the Davys of Rose Ash,⁴ both of which parishes are located in the Exmoor foothills.

The reputation of the improved Devon cattle appears to have increased from the 1780s and fears that herds may be sold off under the pressure of high prices during the Napoleonic Wars were unrealised. Inevitably though, greater attention was paid to crop raising than to husbandry during this period, with moorland and heath being enclosed for arable.⁵ Lime was used in increased quantities to prop up yields under the more intensive but still punishing courses of wheat, barley, oats and grass, and when the slump came in 1815 Devon was left without any permanent improvements to its arable

¹ D. & S. Lysons, Magna Britannica; VI: Devonshire, (1822), p.cclxxvii; G. Finch, 'George Brooke of Whimble 1785-c.1850' D.H., XXVIII (1984), pp.16-7

² Stanes, 'Devon Agriculture', p.60

³ Dairy markets outside the county were few in number in the pre-railway era, but Lysons noted that butter began to be shipped to London from the 1790s onwards: Magna Britannica, p.cclxxviii

⁴ G. Fussell, 'Four centuries of farming systems in Devon', T.D.A., LXXXIII (1951), pp.138-90

⁵ ibid, p.139

potential, such as in terms of soil drainage.

Devon's cloth industry was of national importance in the 18th century, having risen to prominence as the 'new draperies' made their appearance from the late 16th century onwards. The well established manufacturing of heavy kerseys was gradually replaced by the lighter serges, especially from the Restoration onwards, and the industry came to rely much more heavily than before on imported wool, usually from Ireland.¹ This in itself tended to impose a geographical specialisation on the Devon industry with spinning predominating around the importing towns of Barnstaple and Bideford on the north Devon coast. In most rural districts of North and West Devon spinning was taken on as a widespread secondary employment by the end of the 17th century, supplying yarn to the main manufacturing and finishing towns in the immediate hinterland of Exeter.

Weaving took place as far west as North Tawton, not far from Okehampton but it was the towns and villages of the Creedy, Exe, and Culm Valleys which dominated the industry. The rivers provided ideal sites for fulling mills, and their valleys direct connections to Exeter, which, as the finishing centre and point of departure for exports to northern Europe and Spain, owed its 18th century prosperity largely to this trade.² When Defoe made his tour of England in the early 1720s he saw the industry at the peak of its prosperity in Devon, and described the Exeter serge market as being the greatest in the country next to the brigg market at Leeds.³ Bradninch, Cullompton, Uffculme, Culmstock and Hemyock in the Culm Valley were particularly committed to the serge industry. Probate inventories from the parish of Uffculme show that by the late 17th century the industry was already characterised by an advanced concentration of ownership.⁴

¹W.G.Hoskins, Industry, Trade and People in Exeter 1688-1800, (Manchester, 1935), ch.2

²ibid, pp.36-7

³D.Defoe, A Tour thro' the whole island of Great Britain 1722-4; (new edn. 1927), Vol I, p.222

⁴Wiltshire Record Office, Probate Registers, Prebendal Court of Uffculme

Diversifying somewhat, through contacts made in Kidderminster, one group of businessmen succeeded in bringing carpet manufacture to Axminster in the 1750s and high quality rugs continued to be made there for 80 years, but at about the same time as this departure the competition of Norwich 'stuffs' and from the West Riding of Yorkshire began to assert itself in the fight for woollen cloth markets abroad.¹ This, and the debilitating effects of a succession of wars on Exeter's traditional outlets in Europe, was already taking its toll before the devastating impact of cheap cotton goods manifested itself towards the end of the century. In 1754 a record level of 403,800 serge pieces was exported from Exeter, but this had fallen to 127,000 by 1805,² the majority of which were taken by the East India Company on a contract which kept a few of the mills working into the 19th century. There were still 39 spinning mills left around the county in 1838, but only 20 a dozen years later. In 1850 the number of spindles per mill was 849, to the national average of 1095, and virtually no steam power was employed to work them.³ Weaving was still organised on a domestic basis in 1840, with no power looms to be found further west than Bath and Shepton Mallet.⁴ 3,370 looms were still at work in Devon in 1839, of which 1,590 were owned and supplied with work by merchants living in a small area to the south-east of Dartmoor, but remuneration was so poor that it was undertaken only as a secondary occupation, and by women.⁵ Austin was right in predicting that 'weaving will no longer give a designation to the race'⁶ although a small number of Devon's mills worked on throughout the 19th century.

¹Hoskins, Devon, pp.128, 325

²E.A.G.Clark, The Ports of the Exe Estuary, (Exeter, 1960), pp.115, 122

³Factory Returns PP 1839 XLII (41) pp.184-90, PP 1850 XLII (745) pp.458-63.

A footnote to the Devon section of the 1831 census gives the impression that the woollen manufacture was still the 'most worthy of notice' in the county: PP 1833 XXXVI pp.140-1

⁴A.Austin's report on South West England, Reports from Assistant Hand Loom Weavers Commissioners Part II PP 1840 XXIII (43-1) p.307

⁵ibid pp 250, 283

⁶ibid p.307. Something of the impoverished nature of the trade is suggested by the fact that in 1839 in the Crediton Union, of those adults obtaining relief from the Guardians for whom the occupation is known, 49% were hand loom weavers: ibid p.286

The making of lace had also spread in Restoration Devon, mainly into the cottages of female outworkers in the east of the county, and was said to have supported 4,700 people in the Honiton and Ottery St. Mary areas in 1699.¹ The industry flourished until fashions changed in the 1790s, and the development of machine made nets soon afterwards tended to increase productivity and move the work into factories. In the villages of east Devon down through the 19th century women worked on in steadily decreasing numbers for ever diminishing returns: the familiar response of a traditional industry in a changing economic climate -it becomes overshadowed by the new, but rarely completely eclipsed.

Just as the availability of good quality wool from Devon's large flocks of sheep had originally helped to foster the cloth industry so too did other natural and agricultural resources stimulate a range of economic pursuits in early modern Devon. Many of them were never more than handicraft activities supplying local needs, but some were important enough to feature among the region's exports to other parts of Britain and overseas. The leather tanning industry was a case in point, with both cattle hides and oak bark being abundantly available in the 18th century. By the early 19th century it was strongly enough based to develop further using imported hides.²

Mineral deposits, particularly of tin and silver/lead, had supported mining over many centuries but in the 18th century it must have seemed as if those days were over. Limited manganese deposits were exploited from the 1770s onwards³ but the great tin deposits of Dartmoor had long been worked out, and the exploitation of West Devon's deep lodes of copper awaited the

¹E.Edgcumb-Edwards, Industries of Devon -IV, Lacemaking, p.3 (unpublished V.C.H.Devon Vol.II papers (c.1906) I.H.R. Envs. 438/439. In 1851 around 6,000 were thus employed in the whole county: PP 1852-3 LXXXVIII, p.361

²Clark, Exe Estuary, p.141. Shoes were exported from Ashburton, Kingsbridge, and Dartmouth to Newfoundland according to Lysons, Magna Brittanica, p.cccvi.

³ibid, p.cclxxix

external demand conditions and technology of the 19th century. Ball clay output rose in two areas, the Bovey Basin near Newton Abbot, and from Marland Moor, high above the Torridge Valley in remote and inhospitable country north-west of Dartmoor.¹ A considerable portion was exported direct to the northern potteries but there is also evidence of an increase in pottery making in North Devon and in the Bovey Basin after 1760. This, however, was mainly for local domestic use and it is perhaps significant that when William Cookworthy established a china manufactory in Plymouth in 1768 it removed to Bristol within two years.²

The relatively pure water of Devon's abundant streams and rivers was ideally suited to paper making, another industry which became firmly established in the county in the 18th century. It was helped by the decline in French imports, and perhaps further encouraged by the requirements of the cloth industry for wrapping and packing paper.³ However, like the cloth industry before it, paper making went into decline from the early 19th century in the face of competition from machine made paper, and the industry shrank back to the best sites, on the Exe and Culm Rivers.⁴

The marine environment was also of key importance to Devon's prosperity in the pre-industrial period. The natural harbours lying in the creeks and estuaries of both coasts had from earliest times encouraged a strong sailing tradition. Exeter was one of England's busiest ports after the Restoration, shipping bales of cloth to most parts of Europe and beyond in its own vessels. On the north coast Bideford had maintained thriving relations with North America since the 17th century through the tobacco trade but this was falling into decline by 1800.⁵

¹Lysons, Magna Brittanica, p.cccv; J.A.Bulley, 'The beginnings of the Devon ball clay trade', T.D.A., LXXXVII (1955), pp. 195-6

²G.H.Radford, 'Plymouth China', T.D.A., XLIX (1912), pp.383-93

³A.H.Shorter, 'The historical geography of the Paper-making industry in Devon 1684-1950', T.D.A., LXXXII (1950), pp.205-16

⁴ibid, pp.213-4

⁵M.Goaman, Old Bideford and District, (1968), p.70

Drift fishing was the mainstay of most coastal communities, with Brixham and Plymouth both sending out particularly large fleets, many still making the long journey across the Atlantic to the Newfoundland banks in search of cod in the late 18th century. By 1800 Brixham was the most important wholesale fish market in the west sending fish up to 50 miles inland by packhorse, and also as far as London by sea.¹

This widespread maritime activity stimulated a continuous demand for fishing vessels and merchant traders from the shipyards which were to be found in almost every creek on the north and south coastlines. Because of the generally small size of vessels required by Devon's shipmasters the smallest yards were able to survive until well into the 19th century.² At the other end of the scale was the Royal Dockyard at what came to be known as Devonport in the course of the 18th century. It was selected as a shipyard and naval base in the reign of William III for its sheltered site and strategic location guarding the Western Approaches, and its national role soon helped it become the biggest shipyard in the county, making a major contribution to the rise of the urban area of Plymouth-Devonport in the 18th and 19th centuries. Partly through the stimulus of the shipyard, and partly as a result of its own emerging commercial ascendancy in the west, Plymouth boasted a diverse range of industries by the early 19th century, from brewing and sugar-refining, to coach and glass making.³

It is quite beyond the scope of this thesis to attempt the task of trying to quantify the economic progress of Devon in the pre-industrial period but the qualitative sketch made above can be combined with evidence on population to suggest something of the relative quantitative changes in 18th century Devon relative to the nation as a whole. Contrary to previous

¹Hoskins, Devon, pp.213-4

²see, for example, R.S.Craig, 'Shipowning in the south-west in its national context 1800-1914' in H.E.S.Fisher and W.Minchinton (eds.), Transport and shipping in the Westcountry, E.P.E.H. VII (Exeter, 1973), pp.34-5

³M.I.Lattimore, 'A Study of Plymouth - A survey of its Physical, Historical Geography' unpub. Exeter Univ. M.A. thesis, 1958, pp.212-3

estimates it seems that Devon did share in the national upsurge of population growth at that time.

A comparison made between the 1801 Census population total and an estimate drawn from the 1674 Hearth Tax Returns suggests that growth was much faster than implied by the figures of Deane and Cole. They put forward a total of 331,119 for Devon's population in 1701,¹ whereas the Hearth Tax returns of 1674 suggest a total for that earlier date of only around 190,000.² Using the latter figure, growth over the intervening period up to the first census was similar to the rate for England (less Monmouth) shown by Wrigley and Schofield's new calculations.³

An estimate of Devon's general migration balance over the 13th century can be arrived at by applying Wrigley and Schofield's quinquennial English natural increase rates to the Devon figures alone, in order to arrive at a net migration figure by deducting the actual 1801 population total from the cumulative 'natural increase' total. In fact, because other evidence marshalled by Wrigley and Schofield suggests that by the early 19th century the rate of natural increase in Devon was already nearly 20% below the national average, the use of national rates would bias the result towards higher out-migration.⁴ If it is arbitrarily assumed that from 1761 onwards the Devon N.I. rate was 10% lower than Wrigley and Schofield's national average, then the use of these figures produces an estimate of net inwards migration to Devon over the 1674-1801 period of 20,178. There are many

¹P.Deane and W.A.Cole, British Economic Growth 1688-1959, 2nd edn., (Cambridge, 1963), Table 25, pp.108-9. Their consequent portrayal of Devon as a county of net outmigration is probably erroneous.

²T.L.Stoate, Devon Hearth Tax Return Lady Day 1674, (Almondsbury, 1982), p.viii. At 2.07 hearths per household there appear to have been 41,825 households in Devon at the time, suggesting a county population of around 190,000 using a multiplier of 4.5. The multiplier is, however, recommended only with caution by Eversley: E.A.Wrigley (ed.), An Introduction to English historical demography, (1966), p.78

³Devon: 1674 - 188,213, 1801 - 338,398, =80% increase; England less Monmouth: 1674 - 5.008 million, 1801 - 8.66 million, =73% increase: E.A.Wrigley and R.Schofield, The Population History of England, (1981), Table A3.3, pp.532-4

⁴ibid, Table A3.1, pp.528-9, pp.144-8

dubious assumptions involved in these experimental calculations but it would seem fair to conclude that, contrary to Deane and Cole's figures, there was probably no net out-migration from Devon over the post-Restoration century and a half. There may even have been some net inwards movement.

Table 2.1. Aggregate population change in Devon 1801-50.

	Population		Population increase	N.I.	Migration balance
1801	338,398	1801-10	40,308	11.2	2,407
1811	378,706	1811-20	65,487	12.9	16,634
1821	444,193	1821-30	49,957	12.7	-6,455
1831	494,150	1831-40	38,715	11.8	-19,594
1841	532,865	1841-50	34,600	12.0	-29,237

sources: Census of Great Britain 1851 PP 1852-3 LXXXVIII;
Wrigley and Schofield (1981) Table A3.1 pp.528-9, pp.144-8.
N.I.: Natural increase of pop.n, per 1,000 per annum

The early census returns and corresponding natural increase estimates allow slightly more detailed calculations to be made for the first part of the 19th century, and they suggest that the modest net inwards flow of people was converted to an outwards balance in the 1820s. The migration figures shown in Table 2.1 are calculated using natural increase rates that are arrived at by adjusting previous Devon figures according to the revisions introduced by Wrigley and Schofield for national rates.¹ The in-migration figure thus produced for the 1810s seems suspiciously high, but the overall trend probably represents reasonably well the true pattern over the first half of the 19th century.

It is probably also fair to say that the turning tide of migration reflects the general change in Devon's relative fortunes within the national economy during the Industrial Revolution. The structure of economic activity in Devon had in many ways been typical of pre-industrial England and by virtue of its size and varied resource endowment the county had played an important role in national economic life, but with the transformation of the

¹ Previous Devon figures: Deane and Cole, Table 26, p.115; Wrigley and Schofield revisions: see chapter 6, pp.174-5

wider national economy Devon came to occupy a more peripheral place. This historical perspective is useful in emphasising that we are not dealing, in the Victorian period, with a region which had always lain on the economic periphery, but rather one which had at one time represented the best of what the pre-industrial economy could achieve. As late as the 1780s a Devonian writer felt able to say of his county that it was

'so full of Great Towns, and those Towns so full of people, and those people so fully employ'd in useful and profitable trades, that -if we except London and its Neighbourhood- (and perhaps the Towns of Birmingham and Manchester) -it cannot in these respects be anywhere equal'd in England.'¹

-2-

Given this background, it is not irrelevant to the subsequent analysis to seek reasons why Devon failed to remain in the forefront of national economic life because this question may well have some bearing on the course of development after 1850. Why did Devon miss out on the industrial revolution?

The most obvious answer would be that since the 'workshops of the world' invariably came to be sited on the coalfields, the absence of this key fuel in Devon² must explain why it was largely left behind during the central period of industrialisation. Certainly the main source of the enormous increase in energy which fueled the rise in the economic growth rate was coal and coal-burning technology, but as Musson has shown, water power continued to be of vital importance until well into the 19th century and von Tunzelmann suggests that the social saving to the economy as a result of steam power was of only minor proportions in the early stages of industrialisation.³ Devon was certainly at no geographical disadvantage as far as water power was concerned, a fact fully recognised by contemporaries,

¹W.Chapple, A Review of Risdon's Survey of Devon, (Exeter, 1785), p.33

²apart from small poor quality deposits near Bovey Tracey used locally for cottage fuel and in the Bovey Pottery. Murrays Handbook for Devon and Cornwall, (1859), p.71

³A.E.Musson, 'Industrial motive power in the U.K. 1800-1870' E.H.R., 2nd ser. XXIX (1976), p.435; G.N.von Tunzelmann, Steam Power and British Industrialisation, (1978), pp.156-8

including the editor of Risdon's Survey of Devon, writing in an introduction to the edition published in 1810:

'Those who are conversant with the rapid strides which manufactures have made in England within the last few years by the help of machinery, and with the decided superiority which their construction, and the means we possess of putting them in motion, gives this country over all others in this respect, cannot but be struck with the fitness of the county of Devon for such establishments. The unequalled power of working engines by falls of water, which its numerous streams afford, and which trace their courses with declivities that render them efficient for the most powerful machines; the numerous excellent harbours, the valuable productions of the soil and of the bowels of the earth, and the facilities for extending inland navigation, contribute to render it one of the most favoured, though most neglected counties in this point of view, in England. Coal certainly must be brought by sea, but when it is recollected that one of the great uses of that invaluable article in manufacture is to produce motion by the formation of steam, it will appear that the falls of water here may supply its place in a better, and cheaper way.'¹

These observations support the recent findings of Gordon that only a small fraction of economically available water power in Britain was utilised in the early 19th century,² and may suggest that in places such as Devon, where there was still a great deal of untapped water power potential, the absence of coal need not have constrained industrial growth. However, when costs other than those of motive power are considered the reasons why that physical potential remained untapped are easier to see.

Risdon's editor lamented both the absence of a 'general spirit of turning the natural products and advantages of the county to the best account' and the fact that 'valuable substances are sent to various parts of England for manufacture or use'³ but it would be wrong to hold any supposed lack of entrepreneurial initiative responsible for the lack of development in late 18th and early 19th century Devon. Enterprising individuals did in fact attempt to widen the industrial base of the peninsula, as shown by the

¹'J.T.' (John Taylor, a correspondent with the Lysons brothers in the 1820s - Lysons, Magna Britannica, p.cclxxxiii), Introduction to Risdon's Survey of the county of Devon, (1810), p.xvi

²R.B.Gordon, 'Cost and use of water power during Industrialisation in New England and Great Britain: A Geological Interpretation', E.H.R., 2nd Ser. XXXVI (1983), p.258

³Introduction to Risdon's Survey of Devon, p.xxvii

attempts of Cornish copper miners to set up smelting works in the peninsula, but this lasted only until 1806, when it was finally defeated by the need to use 33 tons of coal to produce one ton of refined copper.¹ The location costs imposed by these physical realities are the key to an understanding of the limitations to individual enterprise set by the wider economic environment Devon found itself in by the early 19th century. The absence of local coal deposits may not have limited potential energy supplies but it did preclude the establishment of important metalliferous industries in the county; it was not a folly that ores and clay were shipped out from Devon to be processed elsewhere, it was inevitable.

Part of the explanation must therefore be that the resource endowment of Devon meant it could not develop the industries which elsewhere were among the sectors experiencing high growth rates and structural change. More generally, the product mix of Devon's total output, bequeathed by current and historic spatial cost structures, may simply have proved to be a relatively infertile basis for rapid growth as it had little to offer the fastest growing markets created by industrialisation. Leaving aside the arguments as to its independence of supply when considered in general macro-economic terms, if potential demand -composed of an ordered 'shopping list' derived from composite income and price elasticities (a hierarchy of 'wants')- can be perceived as being spread equally across space, then the demand stimulus for industrialisation will be felt first at the places where the economic structure is already weighted towards those 'new' industries.²

¹J.C.Goodridge, 'The Historical Geography of the Copper Mining Industry in Devon and Cornwall, 1800-1900', London. Ph.D., 1967, pp.256-7. Neither was the spirit of enterprise lacking in the textile sector. There is, for example, the (undoubtedly over-embellished) story of the two Tiverton cloth manufacturers who narrowly escaped with their lives from Norwich after what today would be called an industrial espionage mission: M.Dunsford, Historical Memoirs of the town and parish of Tiverton, (Exeter, 1790), pp.201-2

²An equal spread of demand in space presumes regional integration. If this is lacking in the early stages of industrialisation then it is even less likely that peripheral areas will receive a demand stimulus.

To some extent then the precise location of economic growth was a matter of chance, with the odds loaded in favour of particular areas by resource and factor endowments. Given the structure of demand, Devon's inherited 'product mix' was not a good recipe for industrialisation. Individual entrepreneurs could only work within this framework: they could not overcome the deeply embedded structural barriers to change through their efforts alone. Despite efforts to modernise with, for example, the machine spinning of wool, the cost structures of Devon's woollen cloth mills combined with, and further compounded, sluggish demand to put the industry into decline. Shipbuilding enjoyed a boom in Devon's dockyards, but the physical facilities did not exist to move into the production of large ocean-going vessels when iron hulled ships began to replace those built of wood.¹

In short, while the county of Devon had many and varied natural and resource advantages over other areas, they were generally not of the type which encouraged rapid economic development in the turbulent climate of the late 18th and early 19th centuries. This would appear to be reflected in the differences between the Devonian and national employment structure as revealed by the 1841 Census returns, in Table 2.2. Reservations must be held over the accuracy of these figures, particularly in terms of their value in drawing comparisons with later years² but there are fewer dangers involved in making relative comparisons between different parts of the country in 1841 itself. The female proportion of the labour force in Devon, 26.8%, was only slightly larger than the British average and the overall activity rate was slightly lower, at 96.5% of the national average.³ Differences in the distribution of the workforce were much greater, as Table 2.2 shows.

¹see chapter 4.3, p.127

²as discussed in the introductory section to chapter 4 below, pp.32-4, 89, in conjunction with the sources of the series from which these figures are drawn: C.H.Lee (ed.), British Regional Employment Statistics, 1841-1971, (Cambridge, 1979)

³although at 35.8% of the population, (37.1% in G.B.) the 'economically active' population was significantly lower than in 1851, when it was 44.6% in Devon, and 44.9% in G.B.: Table A1.1, Appendix 1, p.256.

Table 2.2. Employment Distribution 1841; Devon and Great Britain.

	Devon	%	Great Britain	%	S.I.C. no.s
Agriculture, fishing	56,153	29.3	1,526,454	22.2	1
Mining, quarrying	2,233	1.2	235,070	3.4	2
Manufacturing	46,417	23.9	2,328,051	33.9	3-19
Construction	12,567	6.6	371,262	5.4	20
Services	61,813	32.3	1,807,241	26.3	21-7
Not classified	12,188	6.4	608,352	8.8	NC
TOTAL	191,371	100.0	6,871,637	100.0	

sources: Appendix 1, Table Al.1, p.266; Lee, Employment Statistics.

S.I.C.: Standard Industrial Classification, 1968, as used by Lee.

The surge in manufacturing and mining employment on a national scale accounts for the lower proportions employed in agriculture and the tertiary sectors than in Devon. Whereas substantially greater numbers were employed in manufacturing than in agriculture or services in the country as a whole, the situation was reversed in Devon, where under a quarter of the active population was returned in the manufacturing sector. In some of the industries mentioned previously Devon was still well represented -ship-building employment for example accounted for 1% of the county's workforce, as opposed to 0.4% nationally, and there was proportional parity in the leather industry, at 0.7% of the total workforce.¹ Of greater importance in an absolute sense were the textile industries, employing still nearly a fifth of the county's manufacturing workforce (or 4.3% of the total), but by this time the national proportion was 12.6%.²

Within the already dominant tertiary sector in Devon, fully 50% of employment was female 'miscellaneous (mainly domestic) service'. Combined with an activity rate which was lower than the national average this hints at the existence of a large residual element in the county's labour force; another indicator, perhaps, of Devon's relative economic deterioration as the old order changed in the formative decades of the industrial revolution.

¹see Tables Al.1 and Al.2, Appendix 1, pp.266-7; Lee, Employment Statistics
²ibid

The foundations for the study of the ensuing changes in Devon's relationship to the national economy are not complete without viewing this background from a more spatially analytical perspective. The introductory discussion of regional structure raised the point that physical barriers could disrupt the theoretically smooth profile of the hierarchy of regions by introducing discontinuities in transport costs. By attempting to bring out the levels at which this kind of resolution occurred in mid 19th century Devon it is hoped that a useful characterisation can be made of the functional relationships operating within the 'sample of space' represented by the administrative county.

Generally speaking, the more traditional the economy, the less centralised the location of production, and areas not much bigger than a village or parish could be relatively self-sufficient. As late as 1850, the picture of village life emerging from White's Directory of Devonshire was, according to W.G.Hoskins, of a

'compact self-contained society: the parish church, the chapel, the school; mills and fairs; mansions that gave employment and supplied the lead for village clubs and societies; and every kind of shop, craft and trade that the village could need.'¹

Even allowing for a degree of romanticising, it would still be fair to suggest that most of the consumption needs of Devon's rural settlements could be met from either within the village or from the local market town, the hinterland of which can probably be accepted as a basic and long-standing tier in the regional hierarchy.

The traditionally poor quality of Devon lanes set a narrow limit to the spatial influence of the average country market, determined by a days packhorse journey to and from the town and giving a radius of between five and ten miles. By 1850 it is clear from the trade directories that each substantial market town had a relatively well developed market day carrier

¹Hoskins, Devon, pp.243-4

service but as late as the 1820s it seems that wheeled traffic had yet to assume dominance:

'Almost all farmers rode to fairs and markets on horseback, the roads not being good enough for gigs, on which there was a heavy tax. Purchases from the towns were brought home in panniers, or in a cart, which probably had been sent with corn for sale by retail in the market.'¹

Market distribution was supplemented by the work of itinerant salesmen and pedlars, often working out from the towns themselves, and perhaps buying wholesale from the larger centres such as Exeter, Plymouth, Bideford and Barnstaple, which would assume the role of higher order towns in a Christaller settlement landscape and hierarchy.

In the woollen cloth industry too, although in decay by the 1830s, the spatially limited pattern of production and exchange was an important enough feature to be remembered decades later:

'The Ashburton carts were wont to come at frequent intervals to Moreton-hampstead, as well as to other places, and take away large quantities of yarn which had meantime been spun in the cottages, and these carts brought cloth and serge, which had been made in the Ashburton factories, to supply the needs of the neighbourhood.'²

The importance of market towns to their rural hinterlands lay behind the division of the country into Census Registration Districts and Poor Law Unions in the 1830s and 1840s, and the same arrangement was carried forward with the constitution of Rural District Councils in the 1880s. The circulation of local newspapers probably also reflected the spatial influence of market towns, but the only information on this comes from the one or two papers which printed the extent of their circulation on the title page. Besides, the proud claim of the Kingsbridge Gazette in the 1830s of sales 'in Kingsbridge, Modbury, Salcombe and the whole of the South Hams'³ was aimed more at increasing advertising business than at providing

¹W.H.Gamlen, 'Agriculture in north east Devon 50 to 60 years ago', T.D.A. XII (1880) p.383; see also J.Cossins, Reminiscences of Exeter 50 Years Since, (1878), p.37, for similar references to goods being brought to market by pannier.

²W.H.Thornton, 'Concerning some old habits and decaying industries formerly prevalent in Devon', T.D.A., XXXIX (1907), p.164

³The Kingsbridge Gazette, passim

information for the historical geographers of posterity.

While the market towns constituted an important tier in the structure of regional organisation it is unrealistic to assume that in the 19th century the vast majority of economic transactions took place solely within their hinterlands. Local self sufficiency was limited by the trading of many common articles of consumption over long distances. An overview of transport modes makes it clear that the special characteristics of Devon's physical geography reinforce the pre-industrial cost structures which channelled most freight onto coastal routes and navigable waterways instead of on land. The two long indented coastlines gave it a large number of sheltered harbours, from most of which it was relatively easy to reach important outside centres, such as South Wales, Bristol, Gloucester, Southampton and London.

The generally hilly nature of the terrain made wheeled transport painfully slow and costly even within the county, let alone eastwards to the rest of Britain. Wheeled traffic had failed to make much headway in the county before 1800, and as late as 1860 it was said that there was not a single wheeled vehicle in the parish of Ringmore in south Devon.¹ Although a network of carrier services operated from the inns of market towns by the 1820s,² the Parliamentary railway enquiries suggest that the total volume of good carried into and out from the county in the mid 1830s would have been no more than 50,000 tons, while at the same time 400,000 to 500,000 tons of cargo space was contained in the ships entering and clearing coastally at the county's harbours.³

There was a large number of small sailing vessels, varying in style from estuary to estuary, from the Brixham sloops, to the Dartmouth sailing barges, to the smacks of the north Devon harbours, mostly in the 30-50 ton range and therefore versatile enough to moor in creeks and harbours

¹C.Sheldon, Trackway to Turnpike, (Oxford, 1928), p.142

²Pigott's National and Commercial Directory, (Manchester, 1828)

³Land figures calculated from evidence presented to Select Cttee., 1836: see Table 3.1, p.47. Shipping figures estimated from Navigation and Shipping Returns, see Appendix 2.2.

inaccessible by road.¹ These small vessels were probably of optimal size given that in the pre-railway era most requirements were for small individual consignments delivered fairly regularly, and they also minimised the capital burden to be carried by the multitude of independent skippers working along the coasts.

An historian of Barnstaple, writing in 1830, proudly stated that there were four ships trading regularly to London -one every twenty one days- five to Bristol -once a fortnight-, 'a considerable mercantile intercourse with Liverpool, but no regularly appointed vessels' and that 'Vessels are constantly trading from hence to different parts of Wales, but without any fixed rule, or period for sailing'.² This pattern would have been repeated for every harbour in the county to a greater or lesser extent and as late as the turn of the century coal was unloaded direct from South Wales onto a small beach on the north Devon coast³. A healthy level of maritime activity around Devon's coasts not only maintained a high volume of trade but also supported the shipbuilding industry and earned revenue by supplying shipping services to other British and foreign trades. It has been estimated that while the population of Devon and Cornwall amounted to around 5% of the national total in the 1840s, its inhabitants (mainly those of Devon) owned 13% of the nation's sailing vessels of less than 50 tons burthen.⁴ It would seem that even finished goods, which could usually bear high transport charges, arrived in Devon by sea, and not just the low value to bulk commodities which it never paid to send more than a few miles by road. James Dabb, for example, a wholesale draper in Plymouth, received finished cloths

¹M.Bouquet, Westcountry Sail, (1971), p.10 ff., J.E.Horsley, 'Shipping of the port of Dartmouth in the 19th century', in S.Fisher (ed.), The South-west and the Sea, E.P.E.H. I, (Exeter, 1968)

²J.B.Gribble, Memorials of Barnstaple, (Barnstaple, 1830), p.593

³Combe Martin; E.D.Parsons, 'Growing up in Shamwick', Devon Historian, XIX (1979), p.25

⁴R.S.Craig, 'Shipowning in the South-west in it's national context, 1800-1914', in S.Fisher and W.Minchinton (eds.), Transport and Shipowning in the Westcountry, E.P.E.H. VII, (1973), p.34

from Glasgow, Yorkshire and Manchester by steamer.¹ The few canals built in Devon were almost all of short length, connecting inland towns and quarries with coastal harbours.

After the market towns then, a series of port based hinterlands probably formed the next important system of regions in the peninsula. Clark sought to define more precisely this structure with regard to the Exe and Teign estuaries on the strength of topography, the transport infrastructure, and information on commodity distribution, such as the destination of coal consignments inland from Topsham quayside.² He found it difficult to set boundaries to the regional influence of Exeter-Topsham on the Exe estuary, and Teignmouth and Newton Abbot on the Teign without recourse to the further definition of a 'central core hinterland' for each, within which every settlement depended entirely on the port for its maritime contacts and supplies from external sources.³ The central core hinterland of Exeter was said to consist of the lowland quadrilateral of the lower Exe basin, including the valleys of the Culm, Creedy, Clyst and Otter, while that of the Teign covered the smaller area of the Bovey basin and the southern part of the Teign valley. Beyond the central core lay a larger area, with which links were not so strong, yet still important.

The physical barriers of the Haldon Hills and Dartmoor limited Teignmouth's hinterland, but Exeter was able to make its influence felt eastwards to the Blackdown Hills on the Somerset border, northwards up the Exe to Tiverton and Bampton, and, because the blocking presence of Dartmoor made the city the best placed of the south coast ports to serve mid-Devon, westwards towards Okehampton. Brixham, Dartmouth and Salcombe were all among these other south coast ports so it is not surprising that maritime

¹South Devon Railway Bill, H.L.R.O. HC Evidence 1844, Vol. 37.

²E.A.G.Clark, 'The estuarine ports of the Exe and Teign, with special reference to the period 1660-1860: a study in historical geography' London Univ Ph.D thesis, 1957; and Ports of the Exe Estuary, pp.73-7, 137-8

³Clark, 'Ports of the Exe and Teign', p.354

activities such as fishing and triangular merchant shipping were more important to them than trade based on inland produce.¹ There were fewer physical limitations to Plymouth's hinterland; Dartmoor lies off to the north-east and the Tamar is navigable upstream to within easy distance of Tavistock. At least as early as the 1840s and probably earlier still, there was a regular traffic of barges travelling from the fruit growing village of Beer Ferrers down the Tamar to the markets of Plymouth and Devonport.² The city's hinterland also reached far into Cornwall, and was eventually strengthened by the extension of the national rail network west of the Tamar after 1859.

In north Devon the more rugged coastline is broken only by the Taw-Torridge estuary so that of all the harbours along the coastline only Bideford and Barnstaple were able to establish hinterlands of more than a few square miles in size. The long distance of hilly terrain separating these ports from those to the south naturally made outwards maritime connections more important to their local regions. For most of the 19th century, for example, Ilfracombe's tourist trade was largely based on trippers arriving by steamer from Bristol and the South Wales coalfield.³

Something of the sense of isolation of north Devon from the south is brought out by the map of carrier services operated in the county in 1844, on the eve of the arrival of the railways (see Fig.2.1 overleaf). More than ten services per week operated in a long arc from Tiverton southwards down the Exe Valley through Exeter and around the southern edge of Dartmoor to Plymouth, which also had frequent connections to Okehampton and into Cornwall. There was less traffic into east Devon from Exeter, and also north-westwards from the city. The Barnstaple/Bideford area had its own small network of connections, with frequent services to South Molton, which

¹Craig, 'Shipowning in the South-west', pp.47-8

²R.Evans, Home Scenes, or Tavistock and its Vicinity, (1846), pp.128-9

³F.B.May, 'The development of Ilfracombe as a resort in the 19th century', Univ. Wales M.A. thesis, (1978), p.25

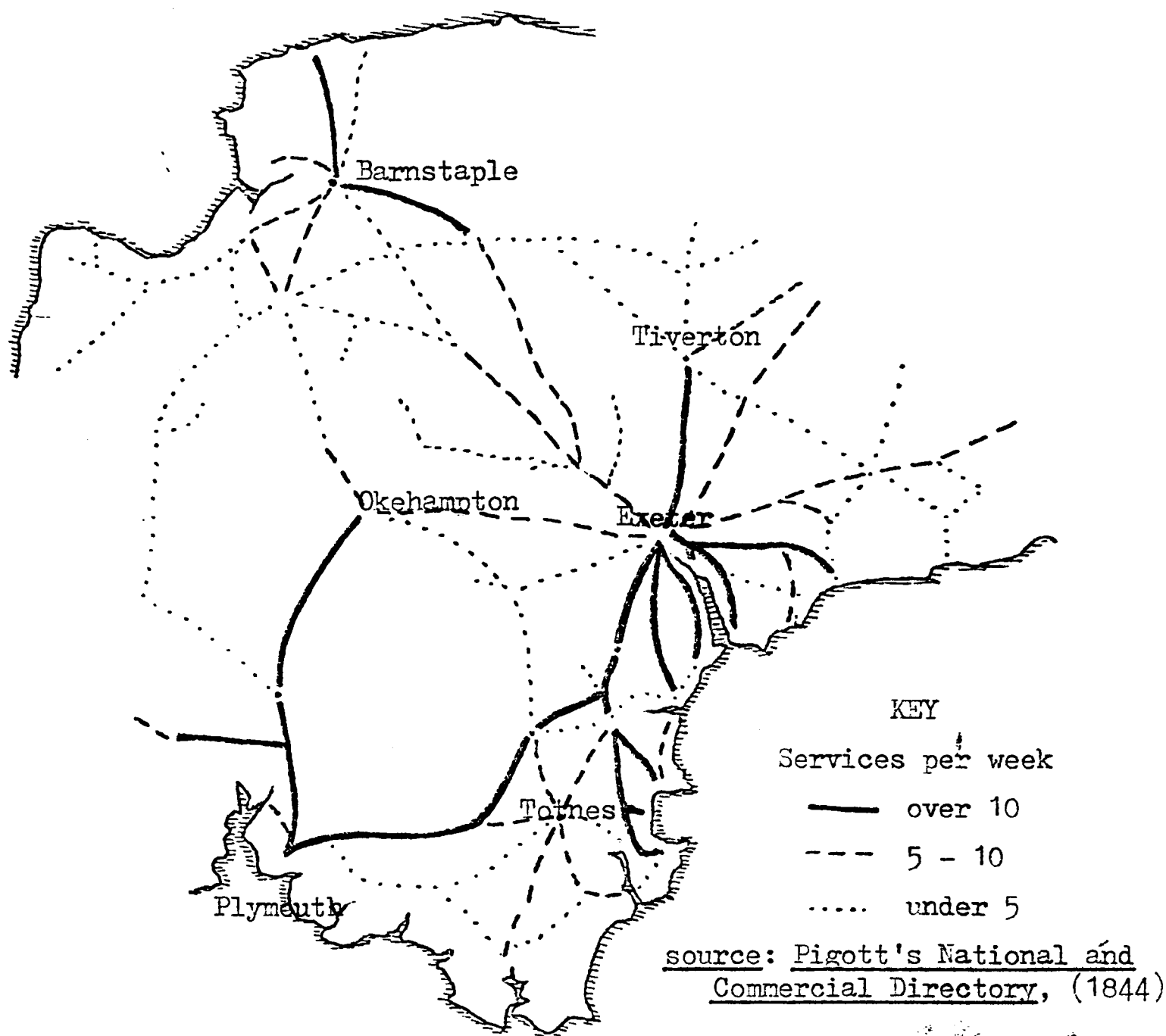


Fig. 2.1 Devon Carrier Services in 1844

was in turn a smaller market town for its own area of north Devon. Places such as Simonsbath, in the Somerset part of Exmoor, looked to South Molton for market services¹ rather than to Dunster or Minehead in Somerset.

The relative lack of traffic between north and south Devon is also brought out in the report of the Board of Trade Railway Department on railway schemes in Devon and Cornwall in 1845 when weighing the relative advantages of a Tiverton to Barnstaple line as opposed to an Exeter-Crediton-Barnstaple line. Having considered (unfortunately unspecified) traffic tables 'and other evidence' the committee favoured the former, given

¹J.M.Slader, Days of Renown - the story of Mining on Exmoor, (Bracknell, 1965), p.17

'that it would save twenty miles in distance upon the great bulk of the traffic going towards London, Bristol and the North, as compared with the Crediton route; while for the much smaller portion of the traffic going towards Exeter and Plymouth, it would involve only a circuit of about eight miles.'¹

And of that small traffic to the south 'it has been fully ascertained that three fourths is by way of Exeter'² thus confirming the influence of the county town over what trade there was to the north of Devon.

Given the likely importance of the port based hinterlands in Devon's pre-railway regional structure, the high cost of long distance land travel in the county,³ and the large expanse of country in mid to west Devon lying at a great distance from navigable water, it is not surprising that much of central Devon was isolated beyond the market areas of any of the ports in the early to mid 19th century. Abortive plans had been made as early as 1792 to build canals inland from Plymouth, Bideford and Exeter, linking up near Okehampton, but costs were too high to make the project a feasible proposition.⁴

Another scheme aimed at breaking the isolation of central Devon foundered for similar reasons in 1831. In his report on this scheme, for a railway from Bideford to Okehampton, the engineer gives a valuable insight into the difficulties attending the supply of groceries, ironmongery and general merchandise to the Okehampton district.⁵ These goods, coming mainly from Bristol, would be forwarded on his railway, instead of having to take the dangerous route to Plymouth around Land's End. By railway

'they would, I am informed, by Gentlemen concerned in the trade, be sent this way to Tavistock, and the surrounding country, thereby preventing a considerable time being lost in their transmission. It is a known and admitted fact, that goods are frequently forwarded from the different ports in the Bristol Channel, to the southern coast of Devonshire,

¹PP 1845 XXXIX (35), p.200

²Prospectus for the Taw Valley Extension Railway and Dock Co., 1845 D.R.O. 50/11/128

³Traffic tables submitted to Commons Cttee. by the Bristol and Exeter Railway Co. show that in 1836 short carrier hauls of less than ten miles accounted for more than 50% of all roads traffic between Bristol and Exeter Hs.Lords Record Off. HC Evidence 1836 Vol 2 (B.E.R.),pp.204-8

⁴Hoskins, Devon, p.157

⁵D.R.O. 1292M/Rlys 4

around the land's end, and do not arrive at their destination until after the expiration of the time allowed for payment of the goods by the wholesale dealer, (that is to say) 3 months. The travelling agent calls for the money before the arrival of the goods! What an incalculable benefit would this Railway confer on both the Wholesale and retail Dealers, in affording a certain means of conveyance!'¹

However, the calculated benefits could not have been great enough to persuade potential investors to turn the idea into reality, for it was not until over three decades later that Okehampton was reached by railway, and then from Exeter, not the north coast. The effects of this isolation are brought out by the figures in Table 2.3 below, compiled from an 1843 Return of current prices in Poor Law Unions. They show that in 1842-3, just before

Table 2.3 Price of a basket of commodities in Devon towns, 1842-3

(cost in shillings of 33lb. bread, 35lb. potatoes, 2.5lb. bacon, 1lb. sugar, 0.5lb. butter, 0.5lb. cheese, 1oz. tea, 0.5lb. soap, 1cwt. coal)

	Including coal		Excluding coal	
	shillings	% of mean	shillings	% of mean
East Stonehouse	7.96	91.1	7.15	93.5
Plympton St.Mary	8.38	95.9	7.4	96.8
Torrington	8.44	96.6	7.44	97.3
Newton Abbot	8.53	97.6	7.5	98.1
Tiverton	8.53	97.6	7.29	95.4
Axminster	8.6	98.4	7.33	95.9
Barnstaple	8.61	98.5	7.8	102.0
Totnes	8.64	98.9	7.54	98.6
Exeter	8.75	100.1	7.61	99.5
Crediton	8.8	100.7	7.47	97.7
St.Thomas	8.88	101.6	7.76	101.5
Bideford	8.91	101.9	8.18	107.0
South Molton	9.1	104.1	7.82	102.3
Tavistock	9.28	106.2	8.21	107.4
Okehampton	9.68	110.8	8.17	106.9

sources: PP 1843 XLV (554), pp.176-9, Honiton and Kingsbridge are among the Unions omitted by this return. Exeter figures taken from Corp. Poor. accepted price tenders, D.R.O. Court Books No.20

the first railway arrived in Devon, a fixed basket of commodities cost 21% more in Okehampton than in East Stonehouse, one of the central districts of Plymouth. The price of some commodities, particularly coal, varied greatly according to distance from the main lines of communication: while the range

¹quoted in Sir R.Lethbridge,'The Bideford and Okehampton Railway of 1831', T.D.A., XXXIV (1902), p.179

between the cheapest and most expensive place covered was 20% for the 'basket' as a whole, the range for coal alone was 71%. In 1842 coal could be had in Bideford -within easy reach of the South Wales coalfield- for 14s3d per ton, while in Okehampton it cost 31s per ton.¹ No wonder that central Devon was described as being 'destitute of coal' at this time.² In the majority of households it would have been necessary to substitute other fuels, yet even when coal is excluded from the calculations, the regional price gradients remained much the same.

Table 2.4. Agricultural Wage Rates in Devon 1833-40

(Devon = 100)

Plymouth District:	108	Mid-Devon:	96	East Devon:	90
South Hams:	107	Barnstaple/		North-west Devon:	85
Exeter district:	101	Bideford area:	95		

sources: Poor Law Commissioners Rural Questions PP 1834 XXX (44) App.3, part 1, pp.125-36; Peel Papers, British Museum Add. MSS 40536 fo.64, 40587 fo.180, quoted in W.G.Hoskins and H.P.R.Finberg, Devonshire Studies, (1952), p.428, and see Appendix 4.4.

The physical conditions and attendant transport difficulties which underlay the regional variations observed in the supply of goods and consumption possibilities were also important in determining variations in the wage rates of agricultural labourers around the county. The figures in Table 2.4 are presented for those parts of the county for which there were enough individual surviving wage quotations between 1833 and 1840 to make tentative local averages calculable. Wage rates often varied substantially from parish to parish so, as with the price figures quoted above, these figures undoubtedly underestimate the true range and variety across the county at this time. Even with the data muted in this way, it is clear that the better soil conditions and accessibility of the 'red lands' of South Devon and the possibility of alternative employment in urban centres combined to make wages higher than average between Exeter and Plymouth,

¹PP 1843 XLV (554), pp.176-9

²Cornwall and Devon Central Railway prospectus 1845 D.R.O. 50/11/129

south of the Moor. The bleaker surroundings and rural isolation of much of north Devon account for the lower wages prevailing there. In the mid 19th century the lot of the farm labourer in mid and west Devon had hardly improved from the 1790s, when Marshall was told by labourers that they could not live on '6s. per week and honesty'¹. The relative lack of alternative male employment, a common problem in neighbouring Dorset, probably also explains the low level of wages in east Devon. It will be noted that the variations in Table 2.4 exacerbated, rather than compensated for, the effects on regional living standards produced by the cost of living variations shown in Table 2.3.

The regional isolation of central Devon went deeper than the material differences shown by these wage and price comparisons. Stephens has found that in the 1860s often more than twice as many couples made marks on their marriage certificates in Registration Districts such as Okehampton, Torrington and Holsworthy than in the Exeter and Newton Abbot areas and parts of Plymouth.²

Unfortunately it is not possible rigorously to substantiate the pattern of market town areas overlain by port based hinterlands which has been suggested as a likely regional structure in preceding pages, because of the difficulty of pinning down the concept of the region in practical terms. By resting on intrinsic logic and circumstantial evidence the pattern can only be vague. A more appropriate spatial classification at the 'port based hinterland' level may be simply to divide the county into two separate coastal regions and the inland residual. The ease of contact between adjacent estuaries, and their mutual contact with distant suppliers probably undermines the validity of inter-port economic boundaries, but it is still not easy to verify the suggested regional structure.

¹W.Marshall, Rural Economy of the West of England, (1796) Vol 1, p.107; and see also chapter 7.3, pp.221-2

²W.B.Stephens, 'An anatomy of illiteracy in mid-Victorian Devon', in J.Porter (ed.), Education and Labour in the South-west, E.P.E.H. X, (Exeter, 1975), p.12

Charting commodity price fluctuations offers a slightly more thorough approach. If regional structure is composed of a hierarchy based on the production and distribution fields of individual commodities, the existence of regional identities may well be reflected by variations in the fluctuations and direction of trends of, say, basic foodstuff prices around the county. The raw data is relatively abundant, for reports of weekly and monthly markets were published regularly in the provincial press throughout the century,¹ but coverage is still far from systematic, and even if it was, the evidence could not be conclusive. For example, to know whether an absolute price differential in space signals the existence of a regional barrier for that commodity, previous knowledge is needed of the distribution of production. If widely produced, the differential could represent something of a barrier preventing the equilibrating exchange of stocks, but if produced in just a few locations, the price differential could represent no more than the transport cost from A to B, that is, within the commodity region, such as in the case of coal at Okehampton.

Conversely, if the price of a particular good is the same -and exhibits the same temporal fluctuations- in more than one place, it does not necessarily follow that those places are all part of the same region with production concentrated in one central location. It could be that the background cost structures and local demand curves produce roughly comparable prices without the individual production centres being intimately linked with one another. The problem becomes circular: exploitation of the full potential of information on spatial price variations requires a sounder background knowledge of commodity regional production structures. In the absence of this empirical base, the evidence of price information cannot be

¹The newspapers consulted are listed in Appendix 4.1. Grains appear to have been sold by sample from at least the 1850s onwards -accounts of the Exeter bread riots of 1847 show that the corn exchange operated on sample by that date (E.F.P., May 20 1847)- but for most goods, particularly in the pannier markets, the prices are the retail prices actually paid by consumers.

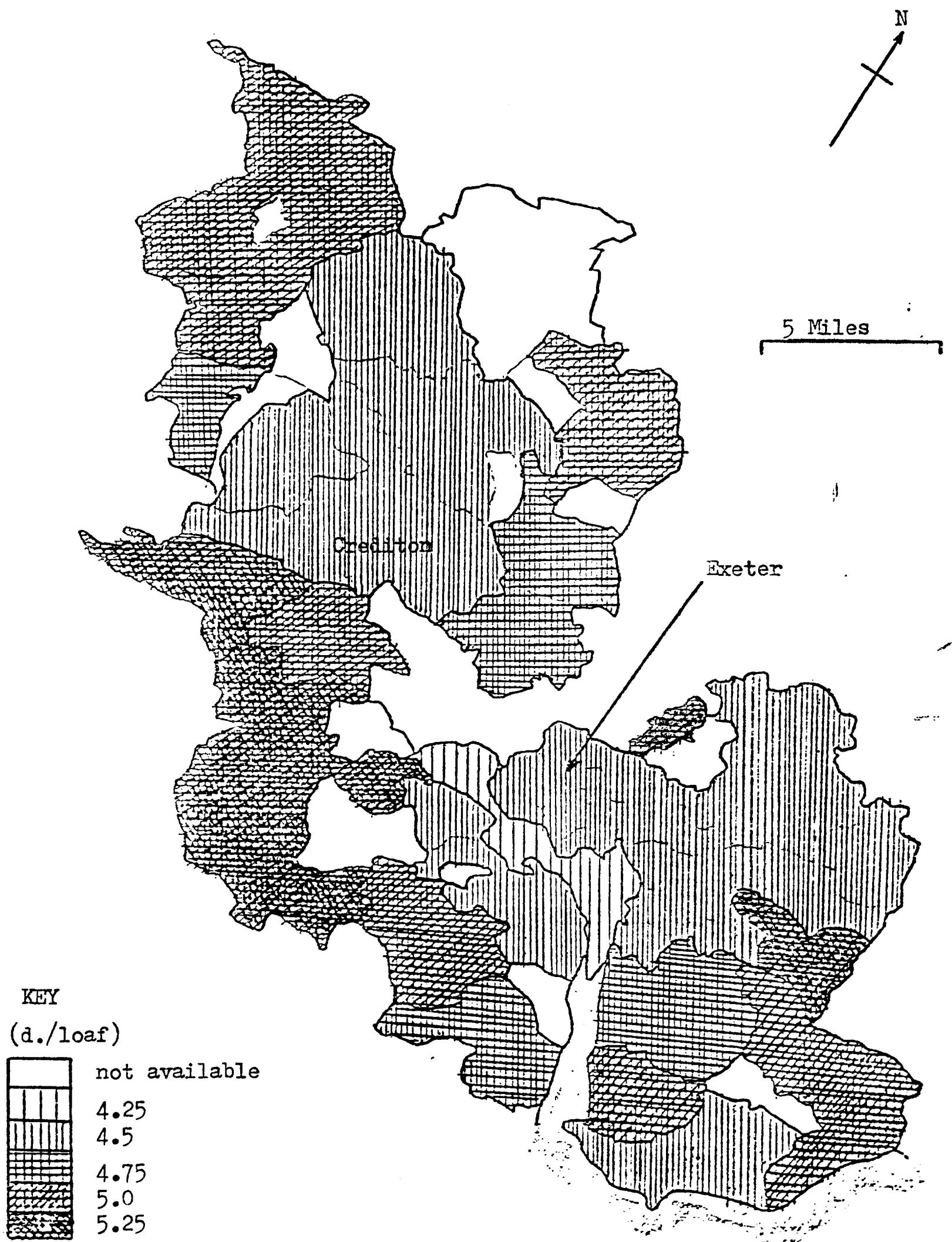


Fig. 2.2 Parish Bread Prices, St.Thomas and Crediton P.L.U.s, 1859
 (cost to P.L.U. authorities of bread supplied to the Outdoor Poor)
source: D.R.O. Poor Law Minute Books: St.Thomas, Vol.8; Crediton, Vol.11.

definitive, but is not without use for illustrative purposes.

The hinterlands of the coastal ports (bounded according to commodity transport costs) were the most likely form of spatial organisation in Devon with regard to goods of a higher order than those produced and consumed exclusively within small localities. It is surely also a reasonable supposition that in those parts of central Devon which were isolated from navigable water there would have been a material incentive to substitute local for 'imported' produce as far as possible, thus consolidating the extent of local economic autonomy. The likelihood of this is perhaps enhanced by the degree of local variation in the price of bread -a 'low order' commodity- in what was a relatively accessible area: that of the St.Thomas and Crediton Poor Law Unions (P.L.U.s). Fig. 2.2 uses the recorded tenders from bakers to supply bread to the outdoor poor in 1859 showing it to have been cheapest in lowland parishes around Exeter and Crediton. It was more expensive in remoter parishes in the Haldon Hills, west of the Exe, and in the hilly Culm Measures country north west of Crediton.

Over greater distances structural price differentials of substantial magnitude can be observed for other foodstuffs not subject to centralised production. Potatoes, for example, were consistently cheaper around the north Devon coast than in south Devon, a differential ascribed by Parsons mainly to climatic and soil conditions.¹ On the other hand, showing the commodity region hierarchy in static form, there were some goods which hardly varied in price across the whole country, let alone just in the county of Devon. In an analysis of the return of prices in 480 Poor Law Unions in England and Wales in 1842/3, Crafts calculated the coefficients of variation in price for each quoted commodity and used these to suggest that for some commodities such as sugar and tea, national markets already existed.²

¹S.R.Parsons, 'The standard of living of the working class in the south west of England during the Industrial Revolution 1750-1850. With special reference to the county of Devon' Exeter Univ M.A. thesis, (1977), p.35

²N.F.R.Crafts, 'Regional Price Variations in England in 1843', Explorations in Economic History, XIX (1982), pp.51-70

Despite the warning given above about the danger of concluding from cases of price similarity that only one market exists, this would not seem unreasonable as they were both imported goods. His figures also show the much greater range of prices of butter, cheese, potato, oatmeal and coal around the country in 1843. The production and distribution costs of these and other similar commodities had evidently prevented the spatial harmonisation of their prices in the early Victorian period. The articulation of a fully fledged national economy had not been achieved by the mid 19th century.

CHAPTER 3

Transport and Regional Change

On the face of it railway transport created the potential for comprehensive change in the pattern depicted at the end of the last chapter in the second half of the 19th century. In so doing it must have enabled the core to extend its direct economic influence over an increasingly large area of space, breaking down the last vestiges of economic 'independence' on the periphery. The first half of this chapter attempts to reconstruct the essential changes in the transport infrastructure during the Victorian period in Devon and the second part returns to the spatial perspective of the last chapter to assess the impact made by these changes.

-1-

If, as Jack Simmons has argued, no other tract of rural Britain comparable in size with Devon and Cornwall was altered so much by the railway, then it is to the Bristol and Exeter Railway, hereafter the B.E.R., that one must look for signs of the revolution.¹ The practical impetus for its promotion came not from within, but largely from merchants and industrialists in Bristol seeking an extension of their markets into the South-west peninsula. They presented detailed information to the statutory Parliamentary enquiry in 1836, and this provides the foundations for this survey. The line was opened to Exeter in May 1844.

In its evolving attempt to regulate railway 'mania', the House of Commons resolved in 1836 that Committees on Railway Bills should enquire into the sufficiency for economic activities of the present means of conveyance, stating the present traffic on land and water between the termini, current charges and time occupied, the number of passengers and the

¹J.Simmons, 'Railway Competition in Devon and Cornwall', Jour. Transport History, IV (1959/60), p.13

weight and description of goods expected upon the proposed railway and the amount of income expected to arise from the provision of passenger and freight services.¹ In a few cases it appears that traffic tables submitted to committees have been lost but the vast majority have survived in manuscript minutes of evidence in which careful and very detailed scrutiny of the projections and surveys by the Bill Committees stand in authoritative contrast to the vague and reckless optimism about prospects issued by speculators in their outline prospectuses.²

A breakdown of freight traffic on land and water was submitted to the Committee on behalf of the B.E.R. by its traffic surveyor,³ the land traffic tables being compiled from a three week day and night survey carried out in January 1836.⁴ Figures for water-borne freight were supplied by Customs and Port officials in the various ports affected by the proposed railway. Even with the great quantity of data made available it is not entirely possible for us now to reclassify it so as to study the interchange across the Devon county boundary as the main interest of the enquiry was with the infrastructural link and its total volume of business. This is a problem that dogs most attempts to use surviving material (drawn mainly from transport operators and those authorities charged with monitoring the activities of these quasi-monopolistic companies) to reconstruct Victorian patterns of transport and trade. The best that can be hoped for is to be able to follow the changes in total volume of traffic. Even with this, however, it has to be remembered that Devon's traffic cannot be separated from that generated in Somerset and, after 1859, with Cornwall.

¹Votes and Proceedings 1836, p.189. There were other requirements with regard to land acquisition, technical and engineering questions which are not of relevance here.

²For examples of railway prospectii, see Salisbury, Yeovil and Exeter Railway Company (?1850/2) D.R.O. 961M/54, and the Cornwall and Devon Central Railway (1845) D.R.O. 50/11/129. Neither scheme obtained Parliamentary approval

³The following section is all based on the examination of the B.E.R.'s scheme in H.L.R.O. HC Evidence 1836 Vol.2

⁴This may underestimate the average weekly traffic given the inhospitable nature of the roads in winter.

Table 3.1. Bristol-Exeter Road Traffic, 1836

'MERCHANDISE in stage vans, waggons and carts': (tons per annum)

Bristol & Exeter	2,808	Bristol & Somerset towns	2,418
Exeter & Cullompton	6,084	Others, short carrier hauls	15,795
Exeter & Tiverton	5,109		
Tiverton & Uffculme	1,404	Merchandise Total:	33,618
AGRICULTURAL PRODUCE (including lime):			19,422
COAL distributed by cart, (mostly below Taunton):			18,896
TOTAL:			71,936

source: H.L.R.O. HC Evidence 1836 Vol.2 (B.E.R.), pp.197-208

The results of Hennings survey do enable some observations to be made about the composition of traffic on the roads between Exeter and Bristol in the 1830s. The tonnage per annum presentation in Table 3.1. was arrived at by scaling upwards from the hundredweight per week figures recorded in the actual survey, so the winter collection date probably imparts a downwards bias to the figures. No reason is given in the original record for the lack of information on origins and destinations of agricultural produce, but if 'merchandise' is considered alone it is clear that the average distance any cargo was carried was fairly short, as would be expected when rates per ton-mile were so high on the roads. The through traffic between Exeter and Bristol comprised only 8.4% of the total, and the short hauls of under ten miles over 50%. The large coal traffic was mostly that which was being distributed to the smaller towns and villages in the hinterland of Taunton, the terminus of the Grand Western Canal, which provided a navigable water link, via Bridgwater, to the South Wales coalfield.

This was one of the many trades thought likely to increase once a railway had been built, the effects of which, the Railway Company suggested, would also lead to the redirection of other road traffic onto its line (such as the estimated 4,250 tons of carrier traffic on the roads between London and Barnstaple and Exeter) and also the capture of a substantial proportion of the coasting trade. These and other estimates which combined to arrive at

Table 3.2. Expected Freight Traffic on the B.E.R.

(tons per annum)

MERCHANDISE:

from stage waggons:	22,920	London-Bridgwater:	2,000	
from carriers:	18,178	from Grand Western Canal:	10,000	
Agric. produce:	17,040			
		Merchandise Total	96,036	96,036
from coastal shipping:				
Gloucester-Exeter:	4,766	COAL Newport-Exeter:	7,500	
" -Bridgwater:	4,932	distrib. below Taunton:	40,000	47,500
Bristol- Exeter:	1,000			
" - Bridgwater:	5,500	MERCH. and MINERALS TOTAL:		143,536
London- Exeter:	9,700			

LIVESTOCK:	16,000 cattle to Bristol, average distance: 50 miles
	87,000 sheep " "
(heads)	3,000 cattle to Exeter, average distance: 20 miles
	20,000 " to London, " " 50 miles
source: as for	13,000 sheep " "
Table 3.1	24,140 calves, sheep, pigs, to Bristol

the total for expected freight traffic on the line, shown in Table 3.2, were accepted by the Committee,¹ which went to give a general endorsement to the proposals of the B.E.R. There is, however, a suspicious degree of accuracy in some of the estimates put forward, such as the expected 4,766 tons of merchandise transferred from the Gloucester-Exeter coasting trade, which is not only extremely precise, but also nearly five times higher than the expected (and curiously rounded) transfer of 1,000 tons of traffic from the Bristol to Exeter coasting trade. The difference is probably accounted for by the inclusion in these sub-totals of transferred traffic from other routes: a Gloucester carrier, giving evidence before the Committee, was of the opinion that a direct railway from Bristol to Exeter would channel through Gloucester, south-westwards, a high volume of manufactured articles from the north which in 1836 was largely going to the south-west by an indirect route via London. These complicated calculations and interpretative problems serve to limit the authority of the figures of estimated total traffic on the railway. In general though, given the poor quality of the

¹The Exeter Flying Post went as far as to say that the 'estimates were proved before committee' (16 June 1836), my emphasis.

road network in the South-west it may not have been too over-optimistic for the Company to expect that the merchandise and mineral volume carried would, at 143,536 tons, be double the then current land traffic volume when transfers from other routes and modes (surely a reasonable expectation) are included. The line did, for example, have a catastrophic effect on the trade of the Great Western Canal, the revenue of which had amounted to £4,900 in 1844, but only £956 by 1853.¹ It would seem, however, the coal trade excepted, that the estimates did not place much emphasis on the railway's potential for generating new trade by virtue of any 'revolutionary' impact on the provision of transport services. This is an important point to bear in mind in moving on to compare the actual performance of the railway in its initial years of operation with the calculated expectations of its promoters.

Table 3.3. Freight traffic on the B.E.R., 1844-60 (tons)

1844	54,573	1848	139,157	1857	402,663
1845	109,198	1849	117,647	1858	386,737
1846	114,680	1853	227,864	1859	408,523
1847	125,670	1856	354,070	1860	467,853

Sources: 1844-9: E.F.P. 29 Aug 1844, 27 Feb, 6 Mar, 4 Sept 1845, 12 Mar, 10 Sept 1846, 11 Mar, 9 Sept 1847, 9 Mar, 7 Sept 1848, 8 Mar, 6 Sept 1849, 7 Mar 1850; 1853: P.R.O. RAIL 75/121; 1856-60: Railway Returns (listed in Appendix 2.2).

Until 1849 the line was leased to the Great Western Railway for working, which paid a basic rent plus tolls in proportion to traffic to the B.E.R. Through the B.E.R.'s statements of revenue to shareholders' meetings, as reported in the press, it is possible to trace the level of freight traffic during the line's first years of operation, as shown in Table 3.3. When compared to the first available official returns and an isolated figure for 1853, the volume of traffic appears to have grown relatively slowly in the 1840s, not even reaching the 1836 estimate for expected traffic within its first five years. However, to begin with, a large volume of passenger

¹C.M.Hadfield, The Canals of South-west England, (N.Abbot, 1967), pp.111-2

traffic kept the directors happy and the Chairman reported to shareholders in February 1845, with reference to the first period of full working of the line, that 'a larger amount has been received than was expected'.¹ Yet by September of the following year he was reported as saying that

'he should be very cautious under present circumstances, after the experience he had had in making promises which possibly might not be fulfilled'.²

Within three years it was decided to terminate the Great Western's lease following complaints from the shareholders that not enough had been done to maximise the Company's business.³

Whether it was due to the direct working of the line or not, the 1850s witnessed a significant upturn in the volume of freight carried by the Company, an upturn that is only partly explained by the construction of the lightly loaded Somerset Central line. It would seem likely that there was a time lag between the full opening of the line and a significant rise in freight traffic, suggesting that it took more than the arrival of a railway to stimulate trade with peripheral parts of the country. If the relative price of coal in the county is any guide, however, it would seem that the impact of improved transport was more immediate.⁴ In 1856, when detailed Parliamentary statistics begin, merchandise traffic on the B.E.R. was 122% higher than the estimate made in 1836, but mineral traffic -mainly coal- was 197% higher: a differential which probably reflected a high price elasticity of demand for coal amongst consumers in the South-west.⁵

The chance survival of a B.E.R. traffic register from the first half of 1853 permits a more detailed analysis of the growth of traffic,⁶ and because it appears to have been compiled from the individual traffic returns

¹E.F.P., 6 March, 1845, p.4

²E.F.P., 10 Sept. 1846, p.4

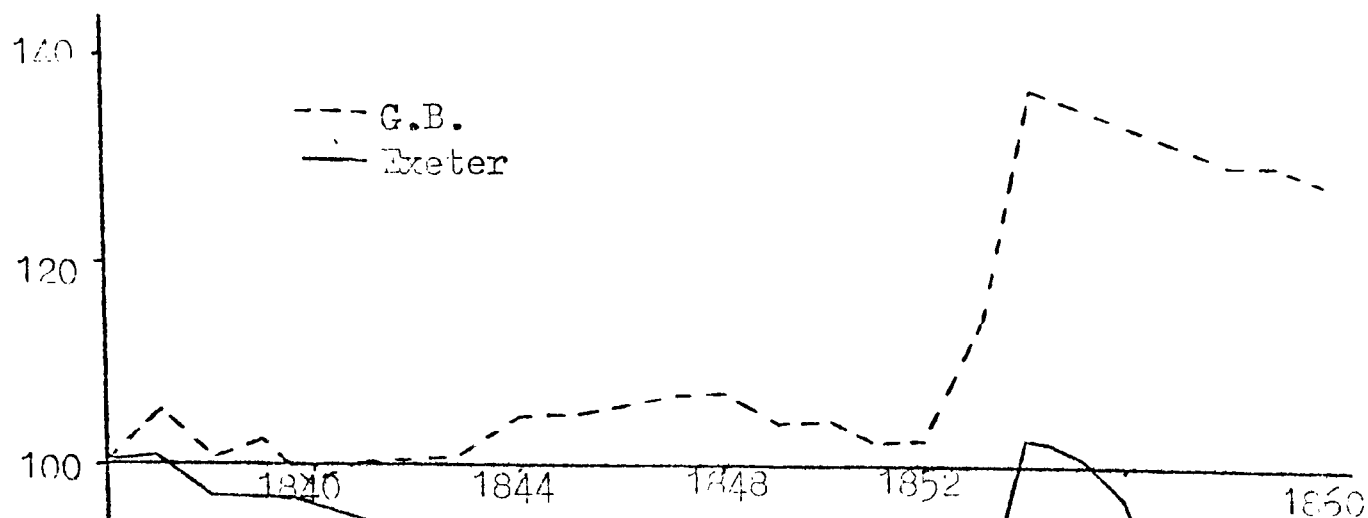
³E.F.P. 7 Sept. 1848, p.4

⁴see Fig. 3.1 overleaf

⁵H.L.R.O. HC Evidence, 1836 Vol.II, PP 1856 LIV (2082),(2147),

⁶P.R.O. RAIL 75/121

Fig. 3.1 The price of coal, 1836-1860



sources: G.B.: 'national average export price', Mitchell and Deane, Historical Statistics, chapter XVI, Prices 8, p.483; Exeter: Tenders accepted by the Corporation of the Poor, D.R.O. L.C. Court Books 18-20

from each station before aggregation the flow of traffic can also be reconstructed. It therefore provides an opportunity to study the land-borne exchange of commodities between Devon and the rest of Britain.¹

Connected at either end with lines owned by other companies, the B.E.R. carried a fair amount of through traffic, the destinations of which are not given, but it would seem likely that the directional flow of the through traffic was similar to that of the B.E.R.'s internal freight. For example, a greater volume of merchandise was carried westwards from the G.W.R.'s terminus at Bristol to the South Devon Railway's line beyond Exeter than was carried eastwards out of the peninsula. The pattern which emerges from the B.E.R.'s own traffic is quite clear: no minerals were carried landwards out of Devon to offset the 20,000 tons of coal brought inwards from Bridgwater, where it would have been trans-shipped from South

¹Table A2.2, p.274, summarises the major identifiable flows on the railway in that year.

Wales coasters. There was also a heavy deficit in the general merchandise trade (which is unfortunately not broken down into further detail).¹ Most of this trade took place between Bristol and Exeter, but the high proportion of merchandise imports to the county from Bridgwater would suggest a continuation of the pre-railway links with the coastal trade, with goods being shipped in from South Wales and the Severn Valley. The livestock trade was virtually as uni-directional eastwards as the mineral trade was westwards, with Bristol the only important market.

The Parliamentary returns form the basis of the analysis of railway carried freight in the second half of the century,² a period which saw the network grow, mature and become consolidated into the two camps of the G.W.R. and the London and South-Western Railway (L.S.W.R.), as shown on Fig.3.2.³ The L.S.W.R. opened a direct line from Waterloo to Exeter in 1860, much to the joy of the numerous Exeter businessmen who had complained about the rates charged by the B.E.R.,⁴ but it causes further problems in the interpretation of the railway returns. It is only reasonable to expect that this second line into the South-west came to carry a not insignificant proportion of Devon's total railborne freight after 1860, but because the printed returns are only available at aggregated company level it is impossible to separate the traffic of the Exeter-Salisbury-Waterloo line from the rest of the L.S.W.R.'s large network. Likewise, when the Great Western took over the B.E.R. and the S.D.R. in 1875 the Railway Returns

¹At some stations 'general merchandise' consignments were the only ones dealt with and it is possible to calculate the ton/mileage rates being paid. The average on traffic shipped into Devon = 3.43d/ton/mile
The average on traffic leaving Devon = 4.89d/ton/mile
but there were only nine cases of each and there are too many possible special factors -warehousing and transfer costs, and so on- to prevent this representing the relative value of goods exchanged.

²Railway Returns are listed in Appendix 2.1.

³The chronology of railway development in the south-west is well covered by D.St.John Thomas, A Regional History of the Railways of Great Britain. Vol.1 -The West Country, rev. edn. (Newton Abbot, 1966)

⁴for example, E.F.P., 10 Mar 1853, p.8



Fig. 3.2 The Devon Railway network in 1913

Key to G.W.R. branch lines:

1 Hemyock branch	7 Brixham
2 Barnstaple	8 Ashburton
3 Dulverton	9 Kingsbridge
4 Moretonhamstead	10 Launceston
5 Feathfield	11 Yealmpton
6 Kingswear	12 Princetown

cease to be of any use in charting the level of freight traffic to and from the region. Further potential analytical problems arise after 1859 when Devon ceased to be the westwards terminus of the national rail network with a bridge opened across the Tamar. However, as the historian of the Cornish railways has put it,

'the [Royal Albert] bridge was supposed to let in the Devil. What in fact trickled in were all kinds of national unifying influences - to the true Cornishman, of course, these were the very Devil. But the old order disintegrated only slowly, and it was largely for this reason that the Cornwall Railway was so poor a proposition financially. For instance, Cornishmen were reluctant to accept mass-produced Midland goods, while only a few were persuaded to venture as far afield in their own country even as far as Plymouth.'¹

Cornwall's busiest railways were the small independent lines running to the coast, rather than the east-west trunk route,² so it is likely that the coasting trade to and from the county held its own until later in the century.

Accounting for the impact of the L.S.W.R.'s arrival in Exeter is a more important and difficult matter. The B.E.R. realistically accepted that it would lose some trade to the new railway, but professed itself ready and willing to adapt and compete.³ This was done in two ways: firstly by improving its own services, such as by the rebuilding of Exeter St. Davids station after 1860 to increase terminal efficiency, especially with regard to connections with S.D.R. and North Devon Railway (N.D.R.) traffic,⁴ and secondly, by seeking some form of operating agreement with the L.S.W.R. The latter company was allowed to build its own goods shed at the new St. Davids station, but it remained unused for two years while the B.E.R. vainly tried to 'persuade' the L.S.W.R. to enter into some form of traffic sharing agreement.⁵

¹ St. John Thomas, Regional History of the Railways, Vol.1, p.99

² ibid, p.99

³ The August 1860 report to half yearly meeting by the Chairman stressed this: E.F.P. 29 Aug. 1860, p.3

⁴ St. John Thomas, Regional History of the Railways, p.43; Simmons, 'Railway Competition', (1959/60), p.21

⁵ E.F.P., 20 April 1864, p.5

A more analytical approach to the problem involves comparing the ratios struck between the levels of B.E.R. and S.D.R. traffic before and after 1860. Until that date the B.E.R. was the only line on which S.D.R. goods could be sent on eastwards out of Devon, so that if the L.S.W.R. captured a significant proportion of the B.E.R.'s trade thereafter it can be expected to show up as a deterioration in the B.E.R.'s freight business vis-a-vis that of the S.D.R. The problem of dealing with route extensions can be contained by expressing freight volumes in relation to open track mileage but the only available figures refer to the freight volume carried over the entire network, and not just that part which was exchanged at Exeter

Table 3.4. B.E.R. and S.D.R. Freight Business Ratios, 1857-67

(adjusted for changes in track mileage; S.D.R.= 1 in all cases)

	General Merchandise	Minerals	Cattle	Sheep	Total Freight Receipts
1857	2.66	5.08	6.14	26.1	3.39
1858	2.58	4.25			3.31
1859	2.99	4.42	5.73	32.7	4.53
1860	2.92	3.29	5.36	20.9	3.86
1861	2.64	3.83	4.85	21.3	3.65
1862	2.34	3.53	4.74	8.6	3.37
1863	2.26	3.34	3.57	8.5	3.16
1866	2.82				3.79
1867	2.94				3.9

source: derived from Table A2.1

St.Davids. It is not surprising, therefore, that the figures presented in Table 3.4 are far from conclusive, showing a gradual decline in the ratio of B.E.R. to S.D.R. freight rather than a definite break around 1860. The suggestion of only gradual decline is perhaps endorsed by the more general observation that the L.S.W.R. never carried much goods traffic. At Plymouth in 1877, while the G.W.R. carried 323,136 tons of goods into and out from the main dockyard station, the L.S.W.R.'s total was only 31,516 tons.¹

¹W.F.Collier, 'The trade of Plymouth', Ann. Rept. & Trans. of the Plymouth Institution, VI (1876-8), p.398

Table 3.5. Merchandise and Mineral Tonnages carried, B.E.R. and England and Wales, 1856-75

	MERCHANDISE		MINERALS		TRACK MILEAGE	
	E.& W.	B.E.R.	E.& W.	B.E.R.	E.& W.	B.E.R.
1856	20.67	213	33.31	141	6,352	125
1875	55.51	509	113.47	373	11,789	204
change: (1856 = 100)	269	239	341	265	186	163

source: Railway Returns PP 1856 LIV (2082, 2147), 1876 LXV (c1609). England and Wales: million tons, B.E.R.: thousand tons

Affairs improved for the L.S.W.R. with the opening of its separate line to Plymouth in 1890, after which date it helped to develop market gardening in the Tamar Valley to supply London with fruit and flowers.¹ For the period up to 1875, when the Railway Returns cease to be useful for present purposes it can only be said that a direct comparison of 1875 tonnages with 1856 tonnages will tend to understate the amount of rail-borne traffic to and from the South-west by an unknown, though probably minor, degree.

With this in mind it would seem, from Table 3.5, that growth in total traffic on lines into Devon grew at roughly the same rate as the national average in the mid-Victorian period. Taking track mileage into account, merchandise tonnage carried by the B.E.R. grew by a factor of 1.467 between these dates (mostly before 1866) as against a factor of 1.466 for England and Wales, but mineral traffic growth was not as fast as the national rate. Given that allowance for the L.S.W.R. would inflate the 'Devon' figures it is clear that after an initially slow start, railway trade into the county grew as fast as in the rest of Britain from the 1850s. It is likely that most of the merchandise traffic was in the London direction in the mid 1870s, for of the total traffic exchanged by the B.E.R. at Bristol in 1874,

¹ F.Booker, The Industrial Archaeology of the Tamar Valley, (Newton Abbot, 1971), p.204

£36,000 was with the Midland and Northern systems, and £146,000 with the Great Western.¹

Extending the analysis into the last quarter of the century requires another change in the basis for comparison because of the nature of the material. This consists of a printed compendium of goods traffic handled at all G.W.R. stations issued by the General Manager's Office at Paddington in the inter-war period.² Figures are provided for every tenth year from 1903 onwards, abstracted from more detailed records of annual business that no longer exist. There is no means of tracking the changing level of traffic between 1875 and 1903³ but the nature of the 1903 figures does at least allow us to measure the total volume of freight being handled by all stations on the G.W.R. network within Devon. For comparative purposes therefore, the mid 19th century figures must be reworked in order to estimate the volume of business transacted within the county.

The only basis for estimating the Devon share of total B.E.R. business is the 1853 traffic register used earlier, at which time freight carried in and out of the county, and the county's own internal traffic, amounted to 50.2% of the network total for merchandise, 55.3% of minerals, 53.9% of livestock, and 57.5% of total freight receipts. Subsequent additions to route mileage in Devon were roughly in proportion to the Company total, so it is probably not too unreasonable to use these proportions in the calculation of Devon's gross traffic in 1856, 1860 and 1875. Although the coverage is different, the results in Table 3.6 show similarities with those of Table 3.5, suggesting a relative similarity between local and national freight traffic growth. Columns 1-3 of Table 3.6 show the same pattern of

¹ J.Allport, evidence to The Select Cttee on the G.W. and B.E.R. Bill (1876), P.R.O. RAIL 1066/353, p.151

² P.R.O. RAIL 266/44-54. The Devon figures are summarised in Appendix 2.1, part iii), pp.275-6

³ The monthly traffic returns of the passenger station manager of Exeter St.Davids have survived, and cover the years between 1885 and 1926 (P.R.O. RAIL 266/112) but the space for goods traffic on these forms was always left blank.

Table 3.6. Railway Traffic Devon (G.W.R.) and England & Wales 1856-1913

	-1-	-2-	-3-	-4-	-5-
	Merchandise 000 tons	Minerals 000 tons	1 + 2	Livestock 000 heads (1875: receipts)	Track Miles
1856: S.D.R.	78.4	37.0	115.4	5.8	56
B.E.R. (Devon %)	106.9	78.1	184.9	72.5	25
DEVON total	185.3	115.1	300.4	78.4	81
Eng.& Wales	20,669.0	33,310.0	53,979.0	7,938.0	6,352
Devon as % of E.& W.	0.896%	0.346%	0.55%	0.99%	1.28%
1860: S.D.R.	131.8	70.9	202.7	14.7	74
B.E.R. (Devon)	146.4	97.5	243.9	91.0	25
DEVON total	278.2	168.3	446.5	105.7	99
Eng.& Wales	24,541.0	49,704.0	74,245.0	9,159.0	7,583
Devon as % of E.& W.	1.13%	0.34%	0.6%	1.15%	1.31%
1875: S.D.R.	329.2	169.6	498.9	£2.3	122
B.E.R. (Devon)	280.0	216.1	496.1	£5.1	50
DEVON total	609.2	385.8	995.0	£7.4	172
Eng.& Wales	55,508.0	113,467.0	168,975.0	£814.9	11,789
Devon as % of E.& W.	1.1%	0.34%	0.59%	0.9%	1.46%
1903: G.W.R. Devon	682.1	892.5	1,574.6	-	225
Eng.& Wales	83,853.7	290,834.0	374,688.3	-	15,501
Devon as % of E.& W.	0.81%	0.31%	0.42%	-	1.45%
1913: G.W.R. Devon	875.2	1,164.8	2,060.0	257.1	
Eng.& Wales	100,951.0	387,873.0	488,824.7	13,726.2	
Devon as % of E.& W.	0.87%	0.3%	0.42%	1.87%	

sources: Railway Returns as listed in Appendix 2.1; Devon 1903, 1913: P.R.O. RAIL 266/44-54. The figure for livestock carried in Devon in 1913 is calculated from the number of livestock wagons forwarded from the G.W.R. stations, on the assumption that the wagons were full, and that they carried 10 cattle or 17 sheep. In 1866, 'half a livestock box' was said to be 5 cattle: PP 1866 XVI (427), p.720

Devon retaining its relative share of the national total while both were expanding, although compared to the distribution of open track mileage (column 5) that share was low. On the surface it appears that there was measurable deterioration in a relative sense over the last quarter of the century, with the G.W.R. Devon share falling to 0.42% of the national total of merchandise and minerals tonnage in 1903 and 1913. In absolute terms, total freight tonnage in Devon rose by 123% between 1860 and 1875, but increased by only 58% over the ensuing 28 years. The annual growth rate fell from around 10% in mid-century, to 2% in the last quarter.

There are two important qualifications to be considered which compromise the suggestion of late century deceleration in Devon's trade growth in Table 3.6. Firstly there is the problem of allowing for the traffic of the L.S.W.R.. Through amalgamations and network extensions it was operating 203 miles of line in Devon in 1903, compared to the 225 miles of the G.W.R. One of its earliest acquisitions was the North Devon Railway, in 1862, the traffic of which, before that date, can be added to the Devon total. Because it never carried a great deal of freight traffic, the inclusion of the N.D.R. raises the Devon share of total national merchandise and minerals tonnage from 0.55% to just 0.62% in 1856, and from 0.6% to 0.68% in 1860. In 1858 the goods receipts per open track mile on the N.D.R. were only 28% of the average of the S.D.R. and the B.E.R., an order of magnitude to be borne in mind during the next stage of the calculations aimed at assigning a role to the L.S.W.R.

The tonnage of goods that the Devon L.S.W.R. network would have had to have been carrying in 1903 for the county to have maintained its mid-century share of the total (0.6%) can be arrived at in a straightforward manner, yielding a tonnage of goods carried for every open mile of L.S.W.R. track which was only 68.5% of the G.W.R. network freight density in Devon. While this may at first sight appear to be a reasonable figure it begins to look over-optimistic when it is remembered that around half of the L.S.W.R.'s Devon network consisted of very lightly loaded branch lines -the entire system to the north and west of Exeter was known as the 'withered arm' and was a prime target for the 1960s Beeching cuts.¹ Even if the 68.5% loading figure is accepted Devon's relative deterioration remains because the L.S.W.R. system must also be included in the 1875 calculations. At 68.5% of the G.W.R. network density the L.S.W.R.'s business would have increased Devon's national share of merchandise and minerals traffic to 0.39%, which

¹R.Williams, The London and South-Western Railway, (1968) covers the general history of the line.

is to be compared with the purported 0.68% of 1903. For this decline to have been cancelled out, the L.S.W.R. would have had to have steeply increased its freight loading, relative to the G.W.R. Devon network, only after 1875, by which date many of its lightly loaded rural branch lines in east and north Devon had still to be built. There is little evidence to support the proposition that the L.S.W.R. made spectacular enough advances in the last quarter of the century in Devon to offset the relative deterioration in the county's share of national freight traffic as represented by G.W.R. evidence.

On the other hand, to the extent that the S.D.R. and the B.E.R. interchanged business at Exeter there is a degree of double counting in the Devon total for freight volumes in 1856, 1860 and 1875 in Table 3.6. This overstates the total for those years, and thereby understates the amount of growth between 1875 and 1903 by an unknown amount. Once more it is impossible to arrive at a satisfactory answer to this problem but for one one stretch of the B.E.R. main line east of Exeter a direct comparison of business transacted can be made over half a century and excludes double counting. The station by station figures for 1903 can be aggregated and set alongside those for the same stretch of line in 1853, revealing that there was a 162.1% increase in traffic over the intervening half century.¹ This compares favourably with the 89% growth of the G.W.R. Devon network between 1856 and 1903 as shown in Table 3.6, taking track mileage increases into account.

But despite the fact that some of the freight carried on the B.E.R. in the 1850s will have been carried on the direct Barnstaple to Taunton line by 1903, it must be assumed that the growth of traffic on the main spinal route out of the county was greater than the county average, so this figure represents more than just double counting if one seeks to apply it to the county total. Assuming that main line traffic grew at a 25% faster rate than

¹P.R.O. RAIL 75/121, RAIL 266/44-54

the county average a new estimate of Devon's freight traffic can be arrived at by means of a backward projection from the 1903 figure using the sample track growth rate. A figure of 240,000 tons of freight for the 1856 Devon network is produced, reducing the Devon share of national tonnage from 0.55% to 0.44% in column 3 of Table 3.6. On this interpretation, therefore, the relative deterioration of Devon's railway traffic was of only minor proportions.

Given the less than precise nature of the useful material it would in any case be wrong to ascribe any great significance to such marginal changes in the relative balance between two series of figures so massively different in absolute scale. Suffice to say that the rail-borne traffic of Devon continued to grow in the last quarter of the century at roughly the same rate as that of the whole nation. The composition of the 1903 figures do allow the rough trade balance to be calculated for general merchandise and minerals, and once more lend themselves to comparison with the 1853 breakdown of B.E.R. traffic east of Exeter. On this 25 mile long stretch of line there was a 148% increase in the net received tonnage of minerals annually (almost wholly coal), and a 310% increase in the net received tonnage of general merchandise.¹ Although the basis for comparison is not strictly fair it is worth noting the change in emphasis between these categories from that observed for their relative growth between 1836 and 1856 when it had been coal traffic that led the way. This could be interpreted as evidence of the percolation downwards of higher living standards working through to the 'sucking in' of merchandise imports from elsewhere in Britain.

Whatever the ambiguities that surround the relative growth of railway traffic within, and to and from, Devon compared to the whole national network, its effect on other land carried freight was unmistakeable.

¹P.R.O. RAIL 75/121, RAIL 266/44-54

Kanefsky has shown how local turnpike income plummeted from the 1840s onwards¹ and long distance carrier services were almost wiped out. In 1850 682 listed carriers operated out from Devon's towns and villages, falling to 515 in 1878 -virtually all short distance market services- and to 477 by 1902.²

'As the railways advanced [into Devon] the last survivors of the stage coaches, following the precedent of the pack-horse traffic, retreated, like the remnants of a broken and fugitive race, into the wildest, most remote and most inaccessible parts of the county.'³

The coasting trade was not so adversely affected by the advent of the iron road in the South-west of England. The general inadequacy of independently held port and customs records of shipping movements for documentation purposes force us to rely on the official Navigation and Shipping Returns, which were compiled by the Registrar-General of Shipping at Customs House in London, and published annually.⁴ These monitored the size of the growing merchant fleet and recorded the number and tonnage of vessels entering and clearing each Customs Port in the foreign, colonial and coasting trades. Given that the main interest here is with trade volumes, the emphasis is placed on aggregate shipping tonnages rather than on shipping numbers, but despite the apparent neatness and accessibility of the figures it is not possible to directly equate the recorded net shipping tonnage calling at a port with the likely tonnage of imported goods.⁵ Nevertheless, the close year to year correspondence shown in Fig. 3.3 between the registered tonnage of coastwise shipping entering Devon's ports and the imported tonnage of coal between 1867 and 1896⁶ suggests that the official figures are still a serviceable proxy for the level of the coasting and foreign trade. In the absence of other suitable material there is little alternative to making

¹J.Kanefsky, 'Railway Competition and turnpike roads in east Devon', T.D.A., CIX (1977), pp.62-3

²White's Directory of Devon, (1850), (1878), Kelly's Directory, (1902)

³Sheldon, Trackway to Turnpike, p.170

⁴listed in Appendix 2.2

⁵the measurement of shipping tonnage is discussed in Appendix 2.2, pp.277-8

⁶Also published annually; see Table A2.5., p.280

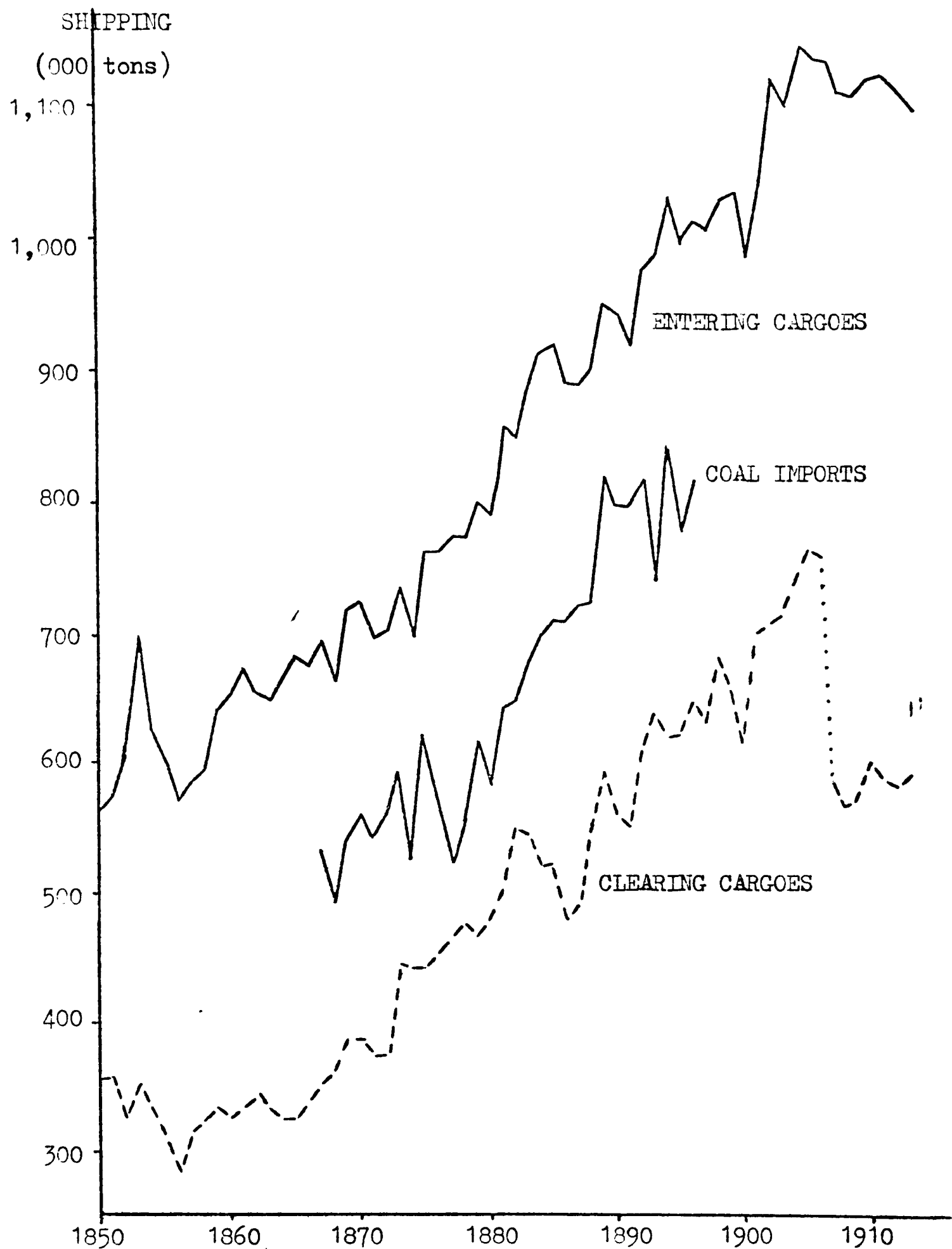


Fig. 3.3 Coastwise shipping tonnages entering and clearing from ports in Devon

SOURCES: Shipping tonnages: Table A2.4, pp.279-80, (clearing shipping tonnage revised downwards in 1907 to take account of ballast);
Coal tonnages: Table A2.5, p.280

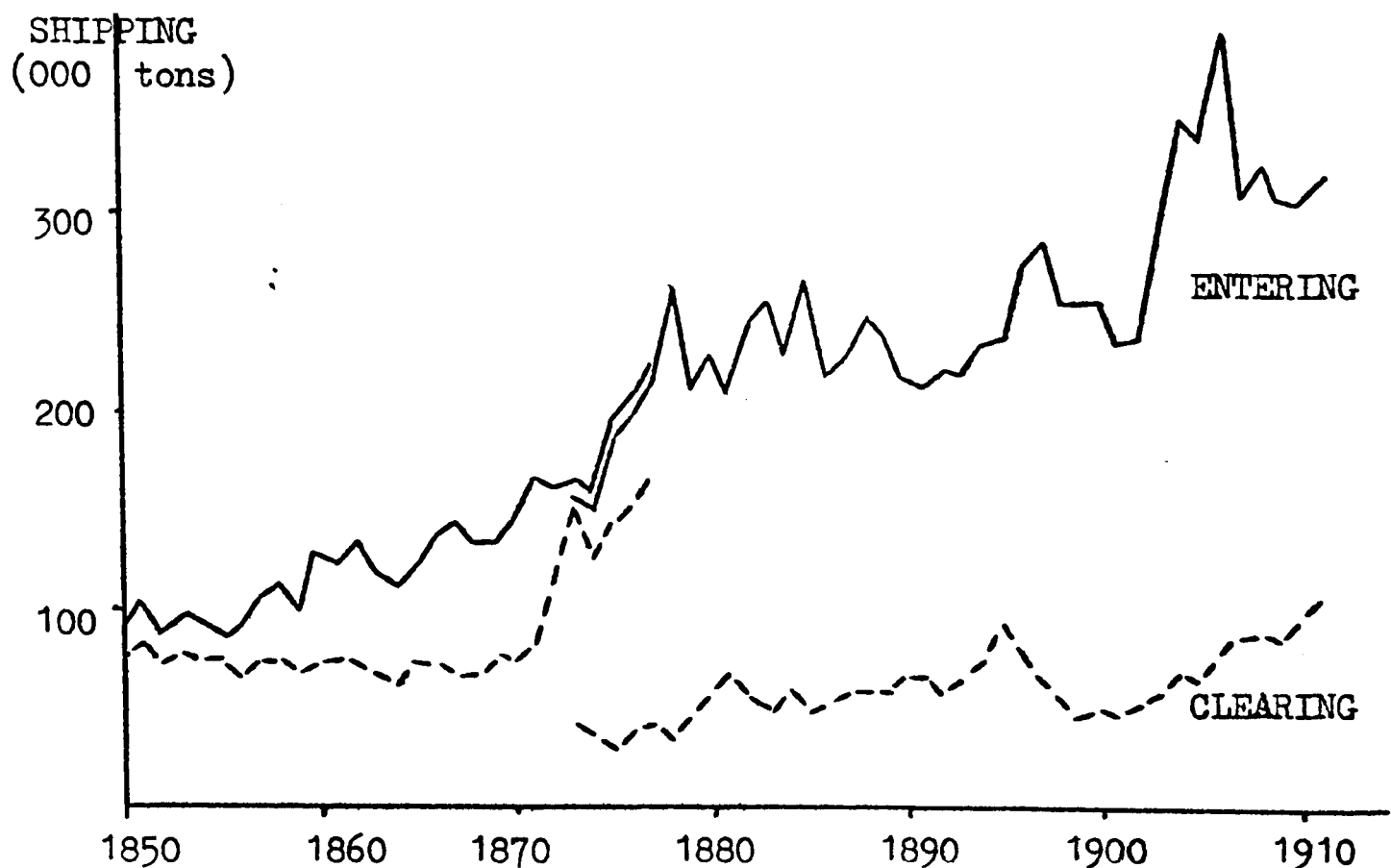


Fig. 3.4 Foreign and Colonial Shipping tonnages at Devon ports

source: Table A2.4; both series were revised downwards in the 1870s.

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as much use of them as possible.

The annual totals of shipping tonnages entering and clearing the Devon Customs Ports is plotted in Fig. 3.3 and shows that coastal traffic did not stagnate in the railway age. The increase in imports seems to have accelerated after the early 1870s, before which time coastal exports remained more or less at an unchanged level. Exports were always a significantly smaller quantity than imports, and the revision of the 'tonnage of shipping clearing' figures in 1907 (before which time some vessels recorded as clearing with cargoes had in fact been in ballast) substantially increased the recorded scale of that deficit. This revision suggests that the actual rate of increase in export volumes was slower than that which is depicted in Fig. 3.3. A growing deficit is also observable in the foreign and colonial trade to and from Devon's harbours (Fig. 3.4), which again becomes particularly noticeable upon a reclassification of 'clearing' ships in the 1870s. Foreign exports probably remained unchanged throughout this period, while imports from abroad tended to rise, particularly in the 1870s, and again in the 1900s.

Table 3.7. Water and rail borne freight tonnage, Devon, 1856-1903

	-1-	-2-	-3-	-4-
	Total in coasting trade	Foreign trade	1 + 2	Railways
1856	853,194	161,693	1,014,887	156,000
1860	979,767	200,474	1,180,241	232,000
1875	1,208,058	215,273	1,423,331	517,000
1903	1,825,196	352,635	2,177,831	819,000

sources: Tables 3.6, A2.4. Note that the railway total is at 52% of the level shown in Table 3.6, thus excluding freight carried within Devon (based on actual proportion in 1853).

One particularly impressive fact to arise from these figures is that the total volume of traffic in the coastal trade was always greater than that carried to and from the county by rail, as shown in Table 3.7 above. Because the coal figures show that the shipping tonnages tend to underestimate cargo volumes if anything,¹ the difference between columns 3 and 4 in that table outstrips any impact that inclusion of the L.S.W.R.'s business could make. Railway traffic obviously increased faster than coastal traffic, and in value terms was probably more important before 1914, but the latter did continue to grow throughout the railway age.

It was increasingly concentrated in the Customs Port of Plymouth (which effectively means the harbours of Plymouth Sound alone), which received 50.8% of registered shipping tonnage in 1841 and 67% in 1911. The port accounted for 47.6% of the shipping volume clearing coastally from Devon's harbours in 1841, rising to 83% by 1881, then falling back to 75% by 1911 due to the increasing export of clay from Teignmouth. Unlike several other harbours in the county, which failed to expand in the Victorian period, Plymouth Sound was blessed with natural deep water facilities, and these were improved upon from the 1840s onwards.

They helped the city to dominate Devon's overseas trade to an even greater extent than the coasting trade. The port accounted for 88% of shipping tonnage entering the county's harbours from abroad in 1901, and 70%

¹see Appendix 2.2, p.278

of the shipping clearing to overseas destinations. Most of the other 30% was clearing from Teignmouth, the main outlet for the rising ball clay exports of the Bovey Basin.¹ The relatively low overall level of foreign exports from Devon was dominated by such shipments of raw materials: Plymouth's exports were said in 1914 to consist of wool, china clay, tin and copper ore.² On the other hand, imports from abroad appear to have increased briskly, and much of this is to be associated with Plymouth's developing role as a distribution centre for the South-western peninsula. A combination of good port facilities and railway connections gave it the largest hinterland of any settlement west of Bristol.

From what we can tell from the odd surviving account books of coasters, and such records of coastal cargoes as were kept by port authorities, the coastal trade was also dominated by low value to bulk commodities. In the first decade of this century the barge 'Indus' carried small consignments of sand, rubble, poles, wood, firewood and dung up and down the Tamar and the ketch 'Alford' which worked out from Bideford dealt mainly in coal, but also carried clay, manure, oats, and occasionally grain in the mid 1890s.³ At Exmouth in 1894, coastwise imports consisted almost wholly of coal. 16,440 tons were landed that year, and only 4,300 tons of other goods, mainly stone, manure, and culm.⁴ Some general cargoes were still being brought into Barnstaple from Bristol by steamer in 1896 on a regular basis but cargoes of coal, manure and flour were much more important.⁵

It is probably this specialisation towards low value to bulk goods that accounts for the continuing ability of the coasting trade to play an important part in Devon's internal trade links in the railway age. For 1903,

¹Clark, thesis, (1957), Appendix 18 (ii)

²Kelly's Directory of Devonshire, (1914), p.494

³I.D.Merry, The Shipping and Trade of the Tamar, National Maritime Museum Monographs and Reports, XLVI (1980), p.14; B.Greenhill, The Merchant Schooners, (1951), p.252

⁴Clark, thesis, (1957), Appendix 9, p.xvii

⁵W.F.Gardiner, Barnstaple 1837-97, (Barnstaple, 1897), p.90

when net coal imports on the G.W.R. network amounted to 115,292 tons, coastal imports can be estimated at around 900,000 tons¹. One part of Devon where the arrival of a railway may be thought to have had a major impact on coastal shipping was Barnstaple, which had previously had very poor landward connections to south Devon and the rest of England. However, as Table 3.8 below shows, the opening of the North Devon Railway did not have a dramatic effect on the business of the port although there was some decline in traffic absolutely, and relative to the county total two or three years later.² The arrival of Barnstaple's second line, from Taunton in 1873, was welcomed by merchants of the town, who were able to increase inwards coastal coal shipments to supply the inhabitants of South Molton by rail.³

Table 3.8. The North Devon Railway and Barnstaple's coasting trade

(The N.D.R. was opened to connect Exeter with Barnstaple in 1854)

	N.D.R. merchandise and mineral tonnage carried	Barnstaple Customs Port, ship tonnages		Devon total	
		Entering	Clearing	Entering	Clearing
1853		48,977	19,492	699,433	355,407
1854	n.a.	50,399	15,564	625,847	329,109
1855	n.a.	52,778	18,944	603,754	313,098
1856	34,583	50,849	20,895	570,795	282,399
1857	38,038	41,294	17,359	587,456	314,160
1858	51,409	49,439	13,908	596,553	325,211

sources: N.D.R.: Table A2.1, p.273; Coastal traffic: Shipping Returns

On the south coast, a G.W.R. coal and coke rates and despatch book shows that in 1892 large consignments of coal were being landed at Plymouth's Millbay Docks and sent on as far afield as Penzance, Newquay, Weston-super-Mare, Frome, Yeovil and Ilminster by rail.⁴ Heavy chemicals

¹P.R.O.RAIL 266/44-54; Coastal tonnage interpolated from 'volumes entering' trend after 1896, when direct coal import figures cease.

²The isolated figures for Devon's overall coastal traffic in the 1840s (Table A2.4, p.279) suggest that if the arrival of railways had any effect on this trade it was generally positive, not negative.

³A.Grant,'Some Barnstaple ships of the mid 19th century', T.D.A., CIII (1971), p.136

⁴P.R.O. RAIL 253/193

arriving at Exeter in 1875 had completed only the last part of their journey by rail: they were shipped from Glasgow to Bristol on coastal steamers.¹ The dovetailing of traffic and potential for complementary development was not lost on contemporaries, and probably explains why shipowners and port authorities welcomed rather than feared railway extensions. Indeed, many accused the railway companies of not doing enough to ensure good links were forged between stations and wharves. One Plymothian wrote in 1877 that

'the two railway companies ... have at last carried their competing lines to Plymouth, in a timid, hesitating, roundabout sort of fashion, looking, it would seem, anywhere for their traffic except where only it is to be found -that is, where the harbour, the population, and the enterprise are. ... To view the splendid harbour from the Hoe, and to walk from there to the railway station, is a descent indeed from pride to humiliation.'²

Table 3.9 Average vessel tonnage in the Coasting Trade, Devon, 1841-1901

	1841		1854		1881		1901	
	In	Out	In	Out	In	Out	In	Out
Barnstaple	41.9	42.9	47.0	48.5	50.0	64.3	51.2	49.4
Bideford	52.8	52.8	45.6	59.5	41.7	35.4		
Dartmouth	74.9	47.7	53.2	38.6	88.0	67.6	127.3	46.2
Exeter	84.1	63.9	98.5	51.3	70.9	65.1	71.1	67.9
Plymouth	105.2	69.2	115.9	122.5	195.5	237.2	284.0	282.8
Teignmouth	(with Exeter)		105.5	84.8	133.3	104.2	243.7	174.2

source: compiled from Navigation and Shipping Returns listed in Appendix 2.2
 In: ships entering port; Out: ships clearing port

The concentration of trade into Plymouth inevitably led to the demise of many older small import trades, such as that of the Salcombe 'fruiters' which imported dried fruit from the Azores every autumn.³ Table 3.9 shows that while the average size of vessel handled at Plymouth rose significantly in the second half of the century it hardly changed at all in north Devon. The same can be said for Exeter, where there was virtually no room for improvements in docking facilities to accommodate bigger vessels except at

¹G.Cooper, evidence to the Select Cttee on the G.W. & B.E.R. Bill, (1876), P.R.O. RAIL 1066/353
²Collier, 'The trade of Plymouth', (1876-8), p.387
³D.F.Murch, 'Trading vessels of Salcombe Haven 1820-90' in H.E.S.Fisher (ed.), Ports and Shipping in the South-west, E.P.E.H. IV, (1970), p.121

the eastern side of the estuary at Exmouth. Yet though the business of these ports dwindled it can best be characterised as being overlain rather than replaced by the new. At the same time as large ocean going 400 ton vessels were being unloaded by modern cranes at Millbay Docks, Breton boys were arriving in smacks at small south Devon harbours to push handcarts of onions around the villages as far inland as Ashburton.¹

In short, it was the excellence of Devon's location with regard to seawards communications, and the opportunities for complementary connections with the railway network that ensured the continued growth of coastal shipping to and from the county in the second half of the century. It maintained its share of the national total throughout the period at around 5.8-6% of shipping tonnage entering ports, and 2.9-3% clearing. ¹

-2-

These changes in the infrastructure probably had the effect of consolidating an already fairly well -if loosely- articulated economy. Comparisons of year to year economic indicators in Devon and the country as a whole suggest that, whatever the physical connection, economic activity in this part of the periphery was closely linked to that of Britain as a whole. It is possible to use the figures on the tonnage of coastal shipping entering each customs port as a rough proxy for changes in consumption (see Fig.3.5), as long as they are used in a relative sense with their limitations of coverage and accuracy borne in mind. The smoother curve of the England and Wales total is explained by the difference in scale between that series and the Devon series, but both display a similar pattern of short term cycles of roughly five years duration.

The comparison of national and local fluctuations in price indices over the second half of the century in Fig. 3.6 also displays a close correlation, and it is quite possible that the apparent differences in the

¹J.Satterly, 'Memories of Ashburton', T.D.A., LXXXIV (1952), p.42

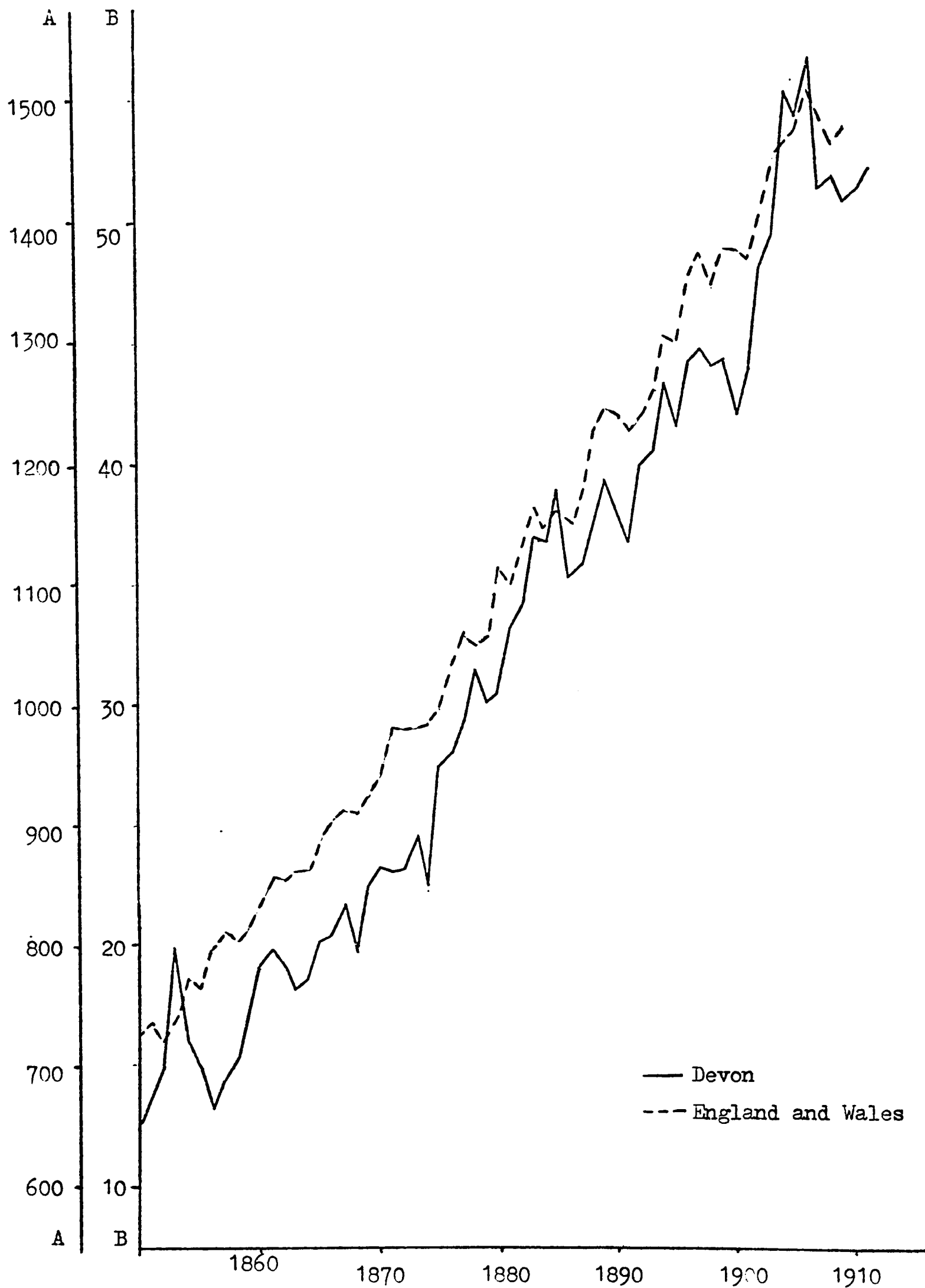


Fig. 3.5 Shipping Tonnages entering ports, 1850-1911

A: Devon (units = 000 tons); B: England and Wales (000,000 tons)

source: Navigation and Shipping Returns listed in Appendix 2.2, p.278

Fig. 3.6 The cost of living, Devon and the U.K., 1845-1905

(Devon, 1845 = 100; U.K., 1850 = 100)

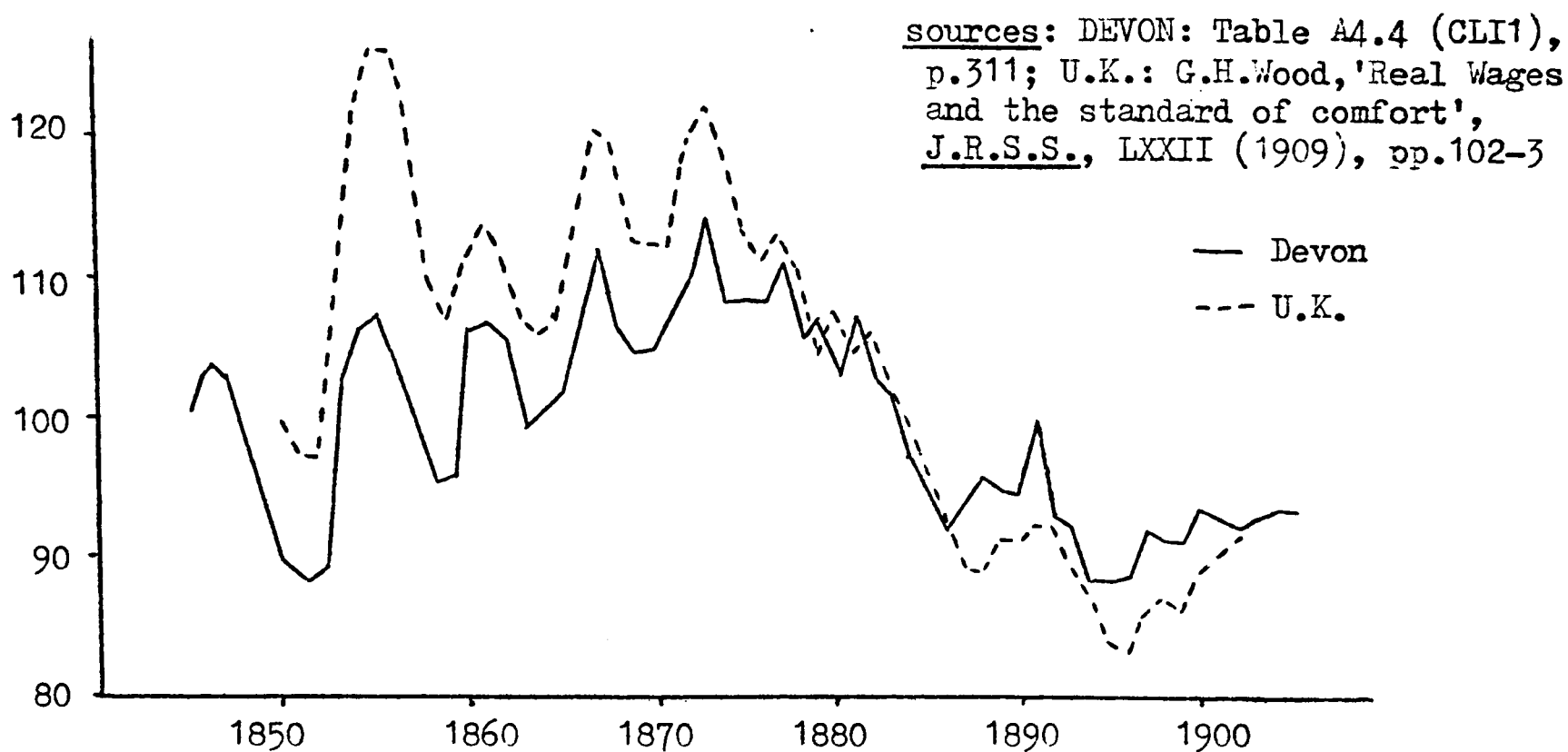


Fig. 3.7 The cost of living, Devon and the Black Country

1840-1900

Index of the price of 7 4lb. loaves of bread, 1lb. salt butter, 1lb. cheese, 2lb. meat, 1lb. sugar, $\frac{1}{4}$ lb. tea, $\frac{1}{2}$ lb. bacon. 1850 = 100

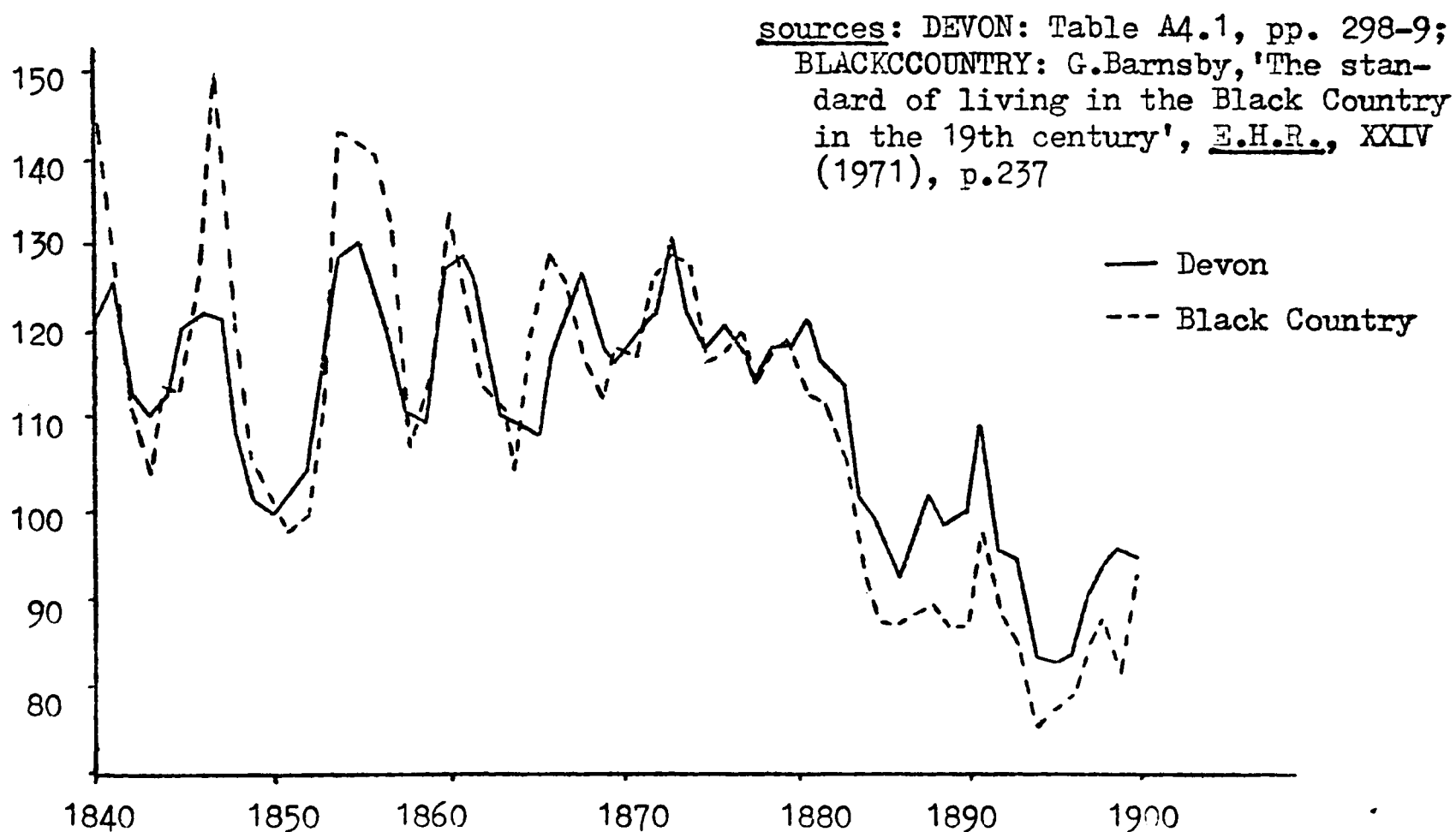


Table 3.10. Wheat prices, Exeter and Lincoln, 1886-95

	EXETER		LINCOLN	
	s./qtr	Index	s./qtr	Index
1886:	30.4	100.0	30.25	100.0
1887:	29.0	95.5	31.42	103.9
1888:	32.0	105.3	30.5	100.8
1889:	-	-	29.1	96.1
1890:	31.04	102.1	31.42	103.9
1891:	36.0	118.4	36.58	120.9
1892:	28.0	92.1	30.0	99.2
1893:	26.4	86.8	25.83	85.4
1894:	19.2	63.2	22.08	73.0
1895:	25.04	82.4	22.75	75.2

sources: S.R.Haresign, 'Agricultural Change and Rural Society in the Lincolnshire Fenlands and the Isle of Axholme, 1870-1914' East Anglia Ph.D 1980, p.64; Exeter Flying Post market reports, passim

slopes of the secular trends can be explained by differences in weighting procedures.¹ A comparative price index for Devon constructed using the same weights as Barnsby's cost of living index for the Black Country produces an example of greater clarity and shows a very close correlation, as shown in Fig.3.7.² Even two wheat markets as far apart as Exeter and Lincoln could show striking similarities in wheat prices and trends by the 1880s and 1890s (see Table 3.10). The implied national homogeneity in cost of living fluctuations was already been well established by 1850, for Parsons also found broad agreement between price trends in Devon and the nation as a whole during the century after 1750.³ Recent research tends to suggest that at least a century before the railway age, transport improvements were able to break down a significant amount of local economic autonomy⁴ and help to establish national average composite price trends and the kind of regional structure in Devon outlined earlier.

¹see discussion in Appendix 4.3, pp.314-6

²The greater fall in the Black Country series after 1880 is probably explained by Barnsby's use of P.L.U. contract price material, which were had greater potential for economies of scale than retail prices.

³Parsons, thesis, p.226

⁴M.Freeman, 'Introduction' to Freeman and D.Aldcroft (eds), Transport in the Industrial Revolution, (Manchester, 1983), p.24

While this appears to belittle the incremental 'regional' effect of the railways the regional variations discussed in the last section shows it would be wrong to assume there was little left for them to do. By offering significant reductions in real transport costs over other modes their potential to reduce absolute price differentials in space at any one moment in time was greater than the scope for further synchronisation of short term price movements. While we lack the kind of appropriate cross-sectional data that is available for 1842/3 at any later date, there are indications that some basic foodstuffs were relatively cheaper and much closer to the national average by the Edwardian period than they had been in the 1840s.¹ The dramatic reduction in county-wide coal price variations between the 1840s and the 1900s, shown in Fig. 3.8, probably highlights the kind of changes taking place between Devon and the rest of the country in a wider sense. The improvements in transport efficiency during this period could only have increased the tendency towards national markets which was observed in static form by Crafts.²

In 1872 the prospect of a traffic working agreement between the Great Western Railway and the London and South Western Railway caused concern in the South-west. The Devonport Guardians, for example, voiced fears that the increased transport costs (which the reduction of competition would entail) would increase pauperism through its effect on prices in the city, implying that the influence of railways on the structure of distribution was of profound importance by this time.³

This influence must undoubtedly have extended to the spatial orientation of activity within the county. The port based hinterlands had looked outwards away from each other and outwards to the sea, but the railway network focussed traffic inwards to Exeter and on eastwards through

¹ see chapter 7, Table 7.3, p.210

² Crafts, 'Regional Price Variations', and see ch.2, pp.43-4. In 1831 it was estimated that coal transport costs would fall from 1.12s/ton/mile to 4d on the Bideford to Okehampton line: D.R.O.1292M/Rlys4

³ P.R.O. RAIL 1066/351

the spine of the peninsula. This change appears to be illustrated by South Molton, which had always looked westwards to Barnstaple and the sea. By the 1880s, however, the local newspaper was regularly printing the weekly market reports from Tiverton, Exeter and Bridgwater, to which relatively distant eastern towns the railway provided a link, and only rarely from Barnstaple, less than ten miles away.¹

The spread of the railway network must also have been responsible, to a great extent, for the relative concentration of retail and other service functions in the larger towns that was noted by Morgan in the decades after 1856.² As the process developed, distribution activities became increasingly concentrated in the larger settlements, to which access became easier from much wider areas, and the coastal port hinterlands must have lost much of what regional identity they had previously possessed. But it was the sort of subtle and gradual trend which often escaped the observation of contemporaries. The introduction to a county directory of 1878 stated that

'the lines of communication in mid Devon are fast returning to the ancient trunk routes, via Bristol to Launceston and Falmouth; and via Exeter and Okehampton to all the mining districts. In a year or two the South Devon route will be left to invalids and pleasure seekers'³

This failure to see the increasing importance of Plymouth as a distributive centre for the South-west must have surprised the growing numbers of wholesale factors and distributors in the city itself. As the old village self-sufficiency described by Hoskins broke down, Plymothians were discussing the effects of marginal changes in railway rates on the market area of their city vis-a-vis that of Bristol, the nearest comparable rival.⁴

These considerations, and the evidence of average and composite price trends all indicate significant changes in regional structure following the spread of railway transport, allowing the further growth and reinforcement

¹South Molton Gazette, 1880s, *passim*

²M.A.Morgan, 'Devon and Cornwall, A Study in Changing Space Relationships' Cambridge Ph.D. 1957, pp.119-34

³Whites Directory of Devonshire, 2nd. edn (1878), p.19

⁴J.C.Inglis, 'Harbour Accomodation in the West' Ann. Reports Trans. of the Plymouth Institution, IX (1884-5) pp.154-75

of national economic unity. But it does not necessarily follow -as Gauthier seems to suggest¹- that the transfer of economic activity from captured periphery to dominant core was an inevitable corollary of network extension into Devon. The increasing harmony of price trends and differentials could indicate no more than that transport improvement makes available to the economy sufficient resources to allow the transfer of stocks between normally 'independent' regions to ease local gluts and shortages. That the arrival of a railway in a previously isolated area did not automatically lead to the transfer of output to a more optimal central location is suggested by more than speculation about theoretical possibilities: where such schemes were proposed there was always a great deal of local enthusiasm from factory owners as well as from consumers. In Okehampton and Ashburton, where isolation may be thought to have amounted to local protection, even cloth producers looked forward ambitiously to market extension with the aid of a railway, rather than feared that they would become vulnerable to outside competition.² The Hele Paper Company in the Culm Valley was only able to expand once the Bristol and Exeter Railway line opened; in the half century after 1850 employment quintupled, and output increased tenfold.³ The spatial concentration of production in the 'core' regions of an economy certainly depended upon the existence of cheap communication links but did not necessarily automatically follow their institution.

Most of the forgoing section attests to the influence of transport improvement on the lowering of regional barriers in the Victorian period, but it is important not to carry this through to an assumption that railways imposed a monolithic national economy throughout the land. It is clear that for the basic commodities other than coal portrayed in Fig.3.8 the full

¹see chapter 1, p.7

²Brief for promoters of the Ashburton, Newton and South Devon Railway Bill D.R.O. 924M/B1/2

³E.Edgcumb-Edwards, 'Industries' V.C.H.Devon Vol.II papers, I.H.R. VCH collection, Introduction, p.15

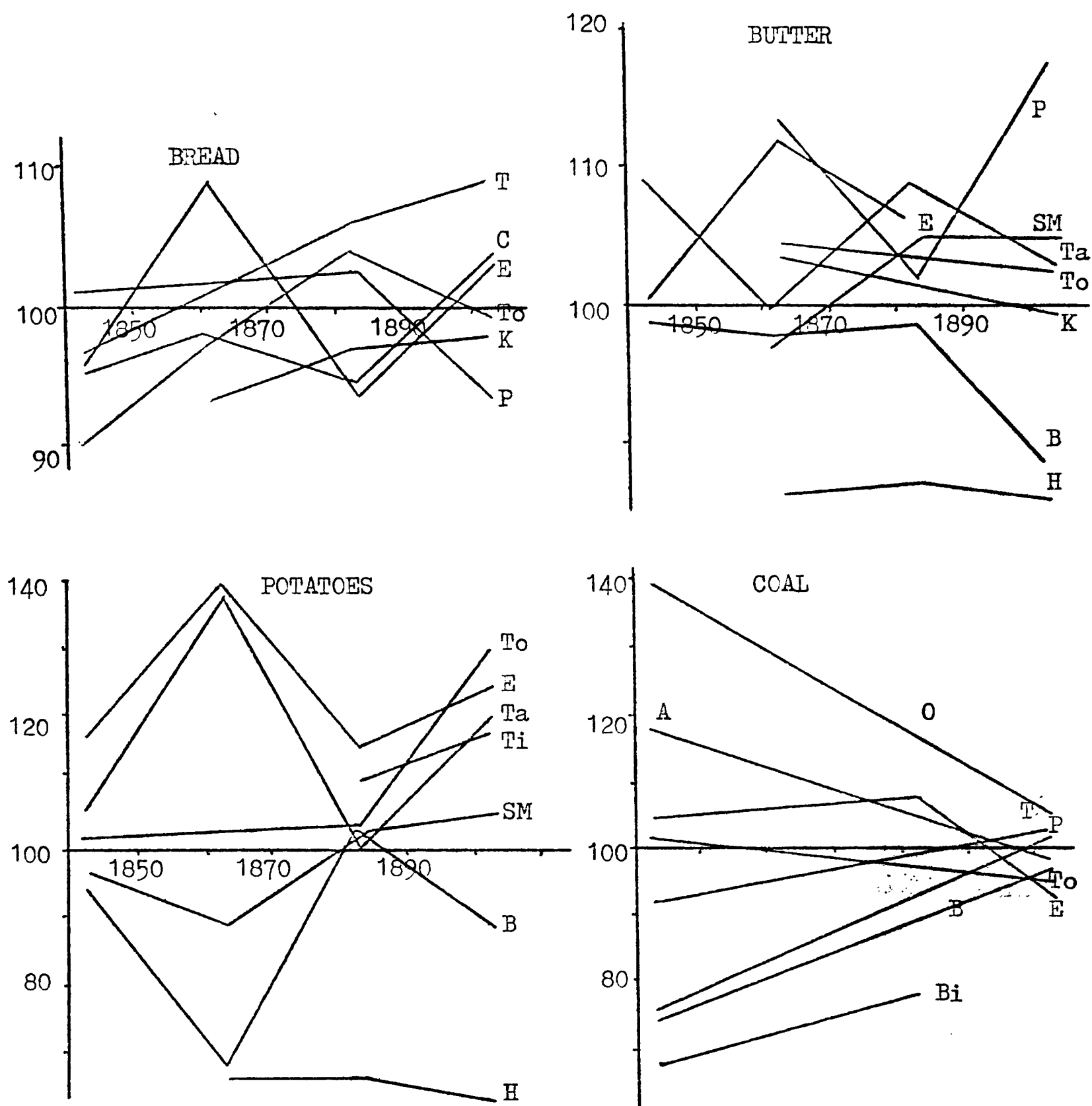


Fig. 3.8 Commodity Price Variations In Devon Towns, 1842-1905

Survey dates: average prices over periods 1842-3, 1858-64, 1880-5, 1900-5. At each survey date the town price price of each commodity is expressed as a percentage of the county average price.

KEY: T: Torrington, C: Crediton, E: Exeter, To: Totnes, K: Kingsbridge, P: Plymouth, SM: South Molton, Ta: Tavistock, B: Barnstaple, H: Holsworthy, Ti: Tiverton, O: Okehampton, A: Axminster, Bi: Bideford.

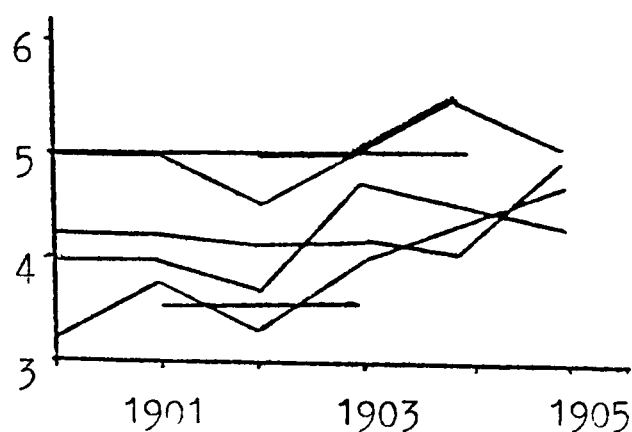
sources: listed and discussed in Appendix 4.1, pp.293-5

Fig. 3.9 Short term Commodity Price Fluctuations

Price movements in
various Devon towns.

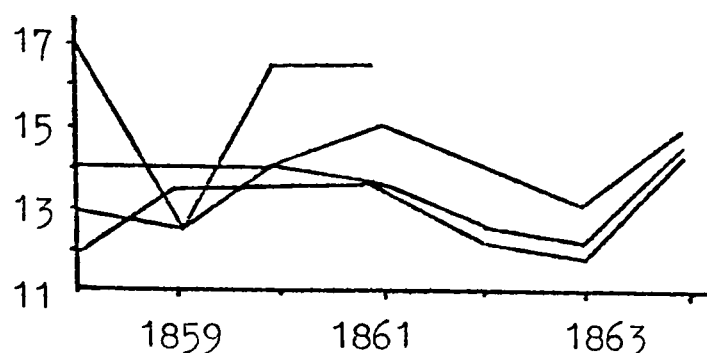


BREAD, 1858-64
(d./4lb. loaf)



BREAD, 1900-5
(d./4lb. loaf)

ii



BUTTER, 1858-64
(d. per lb.)



POTATOES, 1858-64
(d./20 lbs.)



POTATOES, 1900-5
(d./20 lbs.)

sources: as for Fig. 3.8.

harmonisation of price levels around the county had certainly not been reached by the Edwardian period. This price data is drawn from market reports which unfortunately do not survive in sufficient quantity to allow a systematic analysis to be made of a large and unchanging number of towns around Devon. Even where there is a long surviving run of one particular local newspaper the markets from which reports were printed quite often varied from week to week and month to month. But there is enough to show that for several basic goods the cross-county pattern was characterised more by chaos than by stability and unity, and this is also picked out by the sample of short-term price movements in Devon towns shown in Fig. 3.9.

It would seem reasonable to conclude that items such as bread, butter and potatoes were produced and exchanged within local markets and that well into the railway age it was not worth transporting potatoes, for example, from market to market to even out price differentials. It could not have been the case that producers were unaware of these differentials for it was common for newspapers to print up to a dozen or so market reports from around the county next to each other week in and week out. Consumers were certainly aware of what they clearly thought to be irrational, or even unjust, price variations, as frequent letters to the press testified:

'How is it' wrote 'A Sufferer' in 1872, 'that the price of bread varies so much in the same county and in localities not far apart? The quartern loaf, which is sold at 6.5d in North Devon, and at Totnes, and even so near as Kenn [less than ten miles from Exeter], is charged at 8d. in the villages immediately around Exeter. Why should there be this wide difference in cost? Is it that the bakers are more exacting near the city, or will they not go to the cheapest market for flour?'¹

It is quite possible that production costs did vary from place to place but for something like bread, the difference was unlikely to have been great enough to justify to moving loaves around the county.

The impact of the railway lay in reducing the number of activities in which this spatial independence of production and distribution survived, but for some basic goods the possibility of significant variation in

¹E.F.P., 26 June 1872, p.3

price trends and movements remained right through the period under study. Potatoes, which were noted as having been traditionally cheaper in north Devon than around Exeter in the pre-railway era, were consistently cheaper in markets there, such as Barnstaple and Holsworthy, than in Exeter right down to the 1900s.¹ Coal prices in the countryside often remained significantly higher than in the towns. In 1883 the Exeter Corporation paid 20 shillings per ton for coal, but the price at Farway in hilly east Devon was 26s.6d. The county average price was under 20 shillings per ton in 1892 but the churchwardens at Swimbridge, not far from Barnstaple, had to pay 25s.² With regard to wages, as late as 1893 the officially negotiated hourly rates of pay of shipwrights in Dartmouth were 22% higher than in Brixham, just five miles away.³ It is not surprising to find evidence of spatial variations in the cyclical level of economic activity. North Devon saw a boom in its building industry in 1885 yet in none of the towns across Britain surveyed by Parry-Lewis was there a similar marked upswing in the same year; nor was there much evidence of cyclical harmonisation between those towns.⁴ Spatial variations in cyclical activity survived into the post-war period.⁵

To take another and wholly different example, the fishing industry of the small harbours and villages of the east Devon coast was apparently still self-contained in the Edwardian period. The catches were consumed locally, and there was only economic 'contact' with external fish markets when there were specific shortages elsewhere that drove, for example, Plymouth dealers into Sidmouth in the December which saw herrings at three times their normal

¹Barnstaple potato price as a percentage of the Exeter price: 1842-3: 79.5, 1858-64: 47.7, 1880-5: 88.7, 1900-5: 71; figures drawn from newspapers listed in Appendix 4.1.

²D.R.O. ECA Court Corp. Poor, Minute Book 11; D.R.O. 67A/PW1,V; D.R.O. Swimbridge PW2,V; Table A4.1, p.299

³Standard Time Rates, PP 1894 LXXXIii (c5767) p.790

⁴H.Strong, Industries of North Devon, 1889, reprint (Newton Abbot, 1971), p.67; J.Parry-Lewis, Building Cycles and Britain's growth, (1965), p.107

⁵C.Harris and A.P.Thirlwall, 'Inter-regional variations in cyclical sensitivity to unemployment in the U.K., 1949-64', Bulletin of the Oxford University Institute of Economics and Statistics, XXX (1968).

price yet still abundant in Lyme Bay.¹

There can be no doubt that Devon was much more firmly part of the national economy in 1914 than it had been in 1840, but these examples bear out the essential point that the enormous range of space-cost structures for individual goods allowed pockets of economic independence to survive alongside and despite the general tendency towards uniformity. Considered in relation to the theoretical hierarchy of commodity regions, the examples used in this chapter are few in number and isolated. They cannot measure the precise amount of restructuring which took place because it is impossible to know where they slot into that hierarchy. But because it would seem that low order foodstuffs may have retained long standing spatial arrangements of production and distribution in the railway age it is at least possible that at a slightly higher level -such as that of 'craft' manufacturing activities- the advantages of location may not have swung overwhelmingly in favour of centralised modern industry in the core regions. The fact that increases in transport efficiency were not fundamental enough to render 'space' a redundant concept can now be carried forward to the examination of the responses of Devon's economy to the wider structural changes in Victorian Britain.

¹S.Reynolds, A Poor Man's House, (1908), pp.188-9

CHAPTER 4

Economic Activity: Structure and Change

4.1. An Overview

-1-

Expressing the structure of regional economic activity in terms of demand provides a useful approach to understanding the changes which took place in the Victorian period. In simplified form a model of demand in a regional economy is analagous to that of any open economy: consumers distribute their demand between internal and external producers, and producers respond to demand from internal and external consumers. Because the emphasis here is on the spatial aspect of the equation, savings and investment are subsumed with imports and exports to the extent that they represent withdrawals from and injections into the region's circular flow of income. Savings invested inside the region do not represent any net change in regional income; savings invested outside the region represent a net withdrawal from the region, and constitute a deficit on the 'balance of payments'.

Regional income can be increased in any combination of three ways: firstly, through completely autonomous increases in productivity which raise the local production possibilities curve; secondly, through an increase in external demand for the region's goods and services; or thirdly, through a decrease in import demand either absolutely or as a proportion of the region's aggregate demand. The first of these is unlikely to be the source of the dynamic for income growth in a peripheral region for it requires the identification of an indigenous stimulus to such improvements in economic efficiency: the same 'chicken and egg' argument used by those who reject theories of demand based industrialisation on a wider scale.¹ Given that

¹for example, J.Mokyr, 'Demand vs. Supply in the Industrial Revolution', J.E.H., XXXVII (1977), pp.981-1008

Devon must be seen as an economic sub-set of a greater whole any stimulus to productivity change is much more likely to have derived from the stronger pressures exerted by industrialisation already taking place elsewhere than from autonomous change in the periphery.

Export base theory suggests that the most likely source of growth is through the external demand channel. Development is generated through the operation of the multiplier between export sectors and the rest of the regional economy, the base sectors, which produce for local needs only.¹ But the fact that the external sector was of a much greater size than the county under study means that there was also potential for growth through the import channel.

Here the analogy with the traditional open economy model breaks down.¹ Because Devon is likely to have accounted for only a fraction of the value of total trade, its demand for imports could well have fallen without having any adverse effect on demand from the external sector for Devon's exports. Thus any hypothetical reduction in the unit price of imports could have worked to reduce the aggregate value of imports and thereby effect a permanent improvement in the peripheral region's equilibrium level of income. In Devon's case it seems that price and income elasticities worked to increase the volume of imports² but this is a secondary feature which does not undermine the possibility of growth through the import channel.

-2-

Employment statistics can be pressed into service in attempting to relate the Devonian experience to this mechanism of regional change. In that they lend themselves so easily to systematic treatment, the census employment tables often give a somewhat illusory impression of authority. However, inaccuracies at the collection and collating stages, problems of

¹A good summary of export base theory is to be found in H.W.Richardson, Regional Economics, (1969), pp.336-9

²see chapter 3, p.61

classification, and the difficulty of capturing seasonal, part-time, and secondary occupations all contribute to the problems of dealing with the material itself. In 1841 labour was classified into 877 occupations and thereafter refined into 17 orders, 91 sub-orders and 400 identifiable groups, all of which have been reworked by Lee to fit the 27 industrial orders of the 1968 Standard Industrial Classification.¹ This standardisation is of undoubted value to historians of the Victorian economy and is particularly useful to regional studies, but problems inevitably arise. One of the most important is indicated by the fact that in 1841 8.8% of the British workforce was 'not classified' -the fourth largest single sector!² Comprising mainly general labourers, artisans and mechanics, this reflects the unresolved question faced by the Census authorities of whether to classify labour by industry (making vertical distinctions), or by occupation (horizontal distinctions). The size of the 'not classified' sector registers the extent to which Lee was unsuccessful in establishing a completely 'industrial' classification. Many of those returned in the Census as general labourers would also have been unemployed at some time or another, and this is another area where Victorian censal material obscures rather than reveals the true picture.

Furthermore, until 1881 individuals who had actually retired from particular trades or occupations were returned under those occupations and not distinguished from those still at work. However, since in this chapter the emphasis is on the relative employment in Devon vis-a-vis Great Britain as a whole this is not a major drawback as there was little difference between them in the effect of this change on activity rates. In Devon the activity rate as measured by the census data fell from 44.7% in 1871 to 42.4% in 1881 with the withdrawal of retired people, and the corresponding change for Great Britain as a whole was from 44.9% to 42.8%.³

¹Lee, Employment Statistics, p.4

²see Appendix 1, Table Al.1, p.266

³Table Al.1

Perhaps the most important distortion of the true employment structure was brought about by the inclusion in manufacturing sectors, until 1911, of those employed in retailing and distributing goods rather than in fabrication itself, consequently inflating the true size of the manufacturing sector. The implications of this are dealt with in greater detail in the fifth part of this chapter, but for the time being, because there is no alternative, this survey must rest on the original figures - Lee's 'Series A' data- for the sake of continuity.¹

They can be used to produce estimates of the importance of the export base within the county's economy by attempting to separate those employed in producing for export from those employed in catering for internal demand.² This requires the calculation of location quotients for each employment sector. The location quotient of a particular industry in a certain region is obtained by dividing the region's share of national employment in that industry by the region's share of total national employment. An industrial location quotient (LQ) of more than unity indicates that a region has more than a proportionate share of national employment in that industry, and vice versa. When calculated for all employment sectors at a given date they provide a rough and ready measure of the region's relative employment bias.

The exercise proceeds by assuming that each region's industrial structure should conform to the national pattern, (in which case every industry would have an LQ of unity) so that in sectors with LQs greater than unity, exported goods are being produced. Total employment in each of these sectors is divided by the LQ to give the numbers engaged in producing solely for internal use, base employment, the residual being the numbers in 'export' employment.

If these calculations are made for each industry in the region with LQs greater than unity a figure for the total number of people engaged in

¹Lee, Employment Statistics, p.5

²It is described in detail in H.W.Richardson, Elements in regional economics (1969), pp.29-30

Table 4.1. 'Export' employment in Devon, 1841-1911

	1841	%	1871	%	1911	%
Agriculture etc..	13,613	42.5	16,082	31.8	21,392	30.4
Ships/Marine engineering	1,171	3.7	838	1.7	2,592	3.7
Clothing & Footwear	2,242	7.6	5,398	10.7	850	1.2
Construction	2,266	7.1	1,858	3.7	2,759	3.9
Profess./Scien. services	401	1.3	1,631	3.2	1,884	2.7
Misc. services	9,310	29.1	11,417	22.5	16,777	23.9
Public admin., defence	2,826	8.8	13,406	26.5	24,062	34.2
TOTAL	32,009	100.0	50,630	100.0	70,316	100.0
as % of total county employment:	16.7%		18.7%		22.6%	

source: derived from Tables A1.1, A1.2

production for export can be easily arrived at. The results for Devon in 1841 are shown in Table 4.1 above. On the face of it this table produces some interesting results. As a share of the county total, 'export' employment rose significantly between 1841 and 1911, and more than doubled in absolute terms. For most of this period agriculture appears to have been the dominant 'export' sector, although the build up of military forces, mainly in the Plymouth area, increased the importance of 'Public administration and defence' by 1911. Location quotients can pick up the effects of derived demand, employment generated only indirectly by 'export' demand. It may well be that 'Miscellaneous (largely domestic) services' come into this category, for many servants were undoubtedly employed in the tourist industry, and likewise the construction industry was probably stimulated by the capital requirements of tourism.

However, while LQ based calculations represent the best attempt at quantifying 'export' employment that can be made using county level employment data, they are subject to strong reservations. Being based on straightforward comparisons of employment relatives, LQs do not take into account the impact of the national overseas trade balance on implied internal trade flows, but rather treat Britain as a closed economy. They also ignore different regional taste and expenditure patterns, different

income levels, and perhaps most importantly, different regional productivity levels. It is more than likely that in many cases where an industry's LQ is greater than unity this is accounted for by lower productivity in that industry, more employees being needed to produce a level of output that was produced elsewhere with fewer workers. In Table 4.1 this is probably the explanation for the appearance of the construction and clothing industries among the export employers.

Also obscuring the picture, but a fault more to do with the nature of the employment classification than with the crude assumptions surrounding the LQ technique, is the extent to which 'export' employment within a sector is concealed by the importation of similar goods into the regional economy. For example, while mining does not appear in Table 4.1, the vast majority of the copper and tin mined in west Devon was consumed beyond the county boundaries. The LQ for mining was only 0.35 in Devon in 1841, however, because an even greater quantity of coal was imported, the produce of employment elsewhere which raised the national mining employment figures well beyond the Devon proportion. The only way to solve this problem would be to obtain data firm by firm and build a spatially orientated input-output table, an impossible task for this period.

-3-

Even an accurate calculation of export employment would quantify only half of the spatial demand model, for account has also to be taken of withdrawals from the county's circular flow of income. The mechanism which increased regional income could also operate in the opposite direction. The physical balance of 'injections' and 'withdrawals' across the county boundary is examined at greater length in the next chapter but suffice it to say here that this trade and payments balance probably amounted to a net leakage of demand from the Devonian economy during the Victorian period. Support is offered to this view by the figures in Table 4.2 overleaf which show a clear differential in the rate of employment growth between Devon and

Table 4.2. Actual and expected employment growth in Devon, 1841-1911

	Employment total				Employment total		
	Actual	Expected	1 as % of 2		Actual	Expected	1 as % of 2
	-1-	-2-			-1-	-2-	
1841:	191,371	-	-	1881:	257,932	354,228	72.8
1851:	255,448	260,839	97.9	1891:	273,400	403,410	67.8
1861:	269,152	292,606	92.0	1901:	282,122	452,975	62.3
1871:	271,328	330,498	82.1	1911:	311,144	509,047	61.1

sources: Table A1.1. The distribution of employment between males and females was similar in Devon and G.B., as were activity rates.

Great Britain. There was a relative shrinkage of Devon's economy.

'Expected' employment shows the hypothetical size of the Devonian workforce had it grown by the same rate as the British total, but the actual size fell far short of this figure. Between 1841 and 1911 employment in Devon grew by less than two thirds of the national rate. By way of contrast, the share of national employment located in London, Warwickshire, Staffordshire, Lancashire, the West Riding of Yorkshire, Durham, Strathclyde, Glamorgan and Monmouthshire rose from 39.3% in 1841 to 50% in 1911. Employment, and presumably also production, became increasingly concentrated in the core areas, reducing the relative importance of Devon and other counties on the economic periphery.

Strong forces were clearly at work to consolidate the effects of the locational influences at work during the early industrial revolution. In the second half of the century the coal fields may no longer have been of paramount importance, but even economic activity less constrained than before by spatial limits to energy supply was drawn towards locations offering external economies of scale of a wider nature.¹ Access to skilled labour, capital goods suppliers, overseas markets and raw materials operated to sustain the process of concentration into the already dominant areas.²

¹P.J.Perry, A Geography of 19th century Britain, (1975), pp.117-9

²Lee, 'Regional Growth and Structural Change', p.449. For example, in the late 19th century the rapidly growing consumer goods and service trades of South-East England were highly integrated, and probably dependant on being located close to one another.

Table 4.3. Differential and Proportionality shift in Devon, 1841-1911

	Total net shift -1-	Prop. shift -2-	as % of 1	Diff. shift -3-	as % of 1
1841-1851	-5,391	-5,803	107.6	412	-7.6
1841-1861	-23,454	-3,609	15.4	-19,845	84.6
1841-1871	-59,170	-10,112	17.1	-49,058	82.9
1841-1881	-96,296	-14,386	14.9	-81,910	85.1
1841-1891	-130,010	-20,337	15.6	-109,673	84.4
1841-1901	-170,853	-24,819	14.5	-146,034	85.5
1841-1911	-197,903	-31,963	16.4	-165,940	83.8
1851-1911	-188,482	-36,589	19.4	-151,893	80.6

sources: as mentioned in text; Table A1.5, p.270. Prop.: proportionality shift; Diff.: differential shift.

With this background one would expect, in probing slightly deeper into the figures, to find that poor growth performance by individual sectors was more responsible for Devon's relative decline than the adverse employment structure noted in chapter 2. Shift and share analysis allows this to be measured with more precision.

Using the 'expected' and 'actual' employment figures from Table 4.2, the shortfall between the two (total net shift) can be divided into two parts. The first, differential shift, is arrived at by calculating for each individual industrial order in Devon the difference between actual employment growth and expected growth (again using the national growth rate for that industry) at each census. These results are summed to give the regional differential shift in any one year and this is subtracted from the total net shift to arrive at the second element in the division, the proportionality shift.¹ Differential shift shows how much of the shortfall in employment is due to less than national growth rates in individual sectors, and proportionality shift shows how much is due to adverse industrial composition.

Table 4.3 above shows the results of running these calculations for the Devon employment figures between 1841 and 1911, with a final line which moves the base year forward to 1851 as a check on the earlier results. The

¹sectoral differential shifts are shown in Table A1.5, p.270

Table 4.4. The sectoral distribution of employment; Devon, G.B., 1841-1911

percentages	1841		1881		1911	
	Devon	G.B.	Devon	G.B.	Devon	G.B.
Agriculture, for., fishing	29.3	22.2	20.0	12.5	14.7	7.8
Mining, quarrying	1.2	3.4	1.6	4.9	1.3	6.8
Manufacturing	23.9	33.9	25.7	36.6	25.4	39.0
Construction	6.6	5.4	7.7	6.9	7.2	6.3
Services	32.3	26.3	39.0	30.4	44.9	33.6
Not Classified	6.4	8.8	5.8	8.7	5.4	6.5

source: Table A1.1, p.266. (Series A data.)

mode of compilation of the original statistics changed substantially between 1841 and 1851, and it will be seen from Table 4.3 that there was also a large difference in the balance of differential and proportionality shifts between 1841-51 and 1841-61. Apart from that first decade the results show conclusively that the deficiency in Devon's employment growth performance was due much more to the poor growth performance of individual sectors rather than to an adverse structure.

This is not to dismiss the influence of the employment structure itself. Table 4.4 shows that there was apparently little in the way of fundamental change in the second half of the 19th century away from an employment structure which in 1841 underemphasised the rapidly growing manufacturing sectors. This proportion hardly altered at all in Devon between 1841 and 1911, the increase in service employment coming almost entirely as a result of relative decline in agriculture. Perhaps more strikingly, if the 27 individual industrial orders from which this table is drawn¹ are arranged in a rank order of growth rates in absolute terms² the industries in the top half of the list accounted for 56% of county employment growth in the 1841-1911 period. Thus the structure of employment was such that the 13 slowest growing sectors out of 27 still accounted for 44% of the increase in jobs over the whole 70 year period. Towns like Exeter

¹listed in Table 4.5, p.91

²ranging from electrical engineering, which grew from nothing in 1871 to a total of 1,114 in 1911, to agriculture, which declined by 18.6%

were prominent in the county's economic structure, but their residential character offered little obvious scope for rapid growth in the 19th century.

So the sectoral composition of the Devonian workforce seems not to have been conducive to economic expansion, but within that structure the individual growth performance of the constituent elements made the situation a great deal worse. The possibility cannot be absolutely precluded that productivity change in Devon could have been different enough from the nation as a whole for this employment data to unrealistically underestimate the county's relative growth rate, but had such a margin existed it would not have escaped the notice of contemporaries. It is more likely that the adverse differential shift reflects real trends in Devon's contribution to national output, the relative decline in which would appear to be part of the process of agglomeration into the main industrial areas of the nation.

If, however, Table 4.1's suggestion that 'export employment' was of increased importance is correct, the implied further development of regional specialisation would have meant that rationalisation took a selective form. Table 4.5 overleaf suggests that this was indeed so. In it, each of Lee's 27 industrial groupings is arranged in rank order of employment growth between 1841 and 1911 relative to the respective averages for Great Britain as a whole, an index which can be thought to provide some indication of the nature of economic specialisation in Victorian Devon. The table appears to divide itself fairly neatly into three groups: a wedge of tertiary or service sectors (including food, drink, and tobacco, in which most were employed in retailing¹) surrounds the county average, separating the primary and secondary sectors into two groups of significantly differing relative performance.

In moving on to look further at the process of structural change the influence of 'export' demand, of retained internal demand, and of import penetration could be discussed for each of these industrial orders but it is

¹see below, p.140, and also Table A1.4

Table 4.5. Sectoral employment growth in Devon, 1841-1911

Industrial Sector	Devon growth/ G.B. growth 1841-1911	Devon: 1911 emp. /1841 emp	Sectoral share of total Devon employment in:		
			1841	1881	1911
Bricks, pottery, glass, cement	1.542	5.22	0.1	0.3	0.4
Elec. engineering	1.458	65.53*		0.01	0.35
Mechan. engineering	1.115	17.77	0.1	0.8	1.5
S Public admin., defence	1.0	6.33	2.8	5.6	10.7
S Distribution	0.991	4.41	0.5	0.94	0.7
Agric., fish., forestry	0.866	0.82	29.3	20.0	14.7
Other metals	0.814	3.23	0.3	0.4	0.6
Other manufactures	0.778	4.16	0.05	0.07	0.1
Instrument engin.	0.745	1.81	0.1	0.2	0.1
S Gas, elec., water	0.729	33.17	0.01	0.1	0.4
Not classified	0.71	1.40	6.4	5.8	5.4
S Misc. services	0.655	1.42	24.3	21.7	21.2
S Prof./Scien. services	0.646	2.98	2.5	4.3	4.6
DEVON TOTAL	0.611	1.63	100.0	100.0	100.0
S Food, drink, tobacco	0.592	2.75	3.3	4.4	5.6
S Insurance, banking	0.578	16.39	0.06	0.3	0.8
S Construction	0.575	1.79	6.6	7.7	7.2
S Transport, communication	0.568	4.86	2.2	5.5	6.5
Paper, printing	0.558	4.70	0.5	1.0	1.4
Clothing, footwear	0.552	1.26	9.2	10.1	7.1
Textiles	0.522	0.91	4.3	3.3	2.5
Timber, furniture	0.507	1.49	1.5	1.4	1.4
Leather, fur	0.487	1.18	0.7	0.6	0.5
Ships/marine eng.	0.463	2.66	1.0	1.0	1.6
Vehicles	0.415	2.05	0.5	0.5	0.6
Chemicals, allied industries	0.395	2.80	0.3	0.3	0.5
Mining & quarrying	0.353	1.85	1.2	1.6	1.3
Metal manufacture	0.257	0.92	2.0	1.6	1.1

sources: calculated from Lee, Employment Statistics, and Table A1.1.

S: service sector; *: growth between 1881 and 1911. Series A figures used.

easier to proceed by taking each main division of the employment structure in turn: agriculture, manufacturing (and mining), and services. There is, however, one possible source of external stimulus, local and central government spending, which it is easier to deal with separately, and this is considered first.

4.2. Government Expenditure

-1-

It may well seem a curious proposition that in an age of rampant 'laissez-faire' government expenditure of one kind or another could be seen as having any role, conscious or unconscious, to play in stimulating regional development, but that possibility is suggested by both empirical and theoretical considerations. In parts of the country where the construction industry was not sustained by the capital requirements of large scale manufacturing industry, contracts to build, say, village schools in the wake of the 1870 Education Act may have assumed a role of some importance. It is clear from reading Hugh Strong's account of the Barnstaple Iron Foundry that in the 1880s much of its output took the form of park benches, railings and other miscellaneous municipal furniture for the local borough council.¹ Aid of a more explicit and telling nature was given in the form of a Treasury grant made available to the Devon County Council in the Edwardian period to save the remnants of the Honiton lace industry.²

Theoretically too, if collective agency at some stage imposed a statutory minimum level of services across a country characterised by significant spatial variations in per capita income, the effects on the local economy, both in terms of the impact of expenditure and the burden placed on local taxable and rateable resources, would probably have been greater in the less well off areas than the average across the nation. It is clearly important to distinguish between central government and local government finance, as both their purposes and revenue sources differed greatly from each other. Furthermore, it may be thought that if the object of the exercise is to determine the net effect of government spending on a particular region then the local element can be ignored, on the grounds that before the advent of the central rate support grant its fiscal activities

¹Strong, Industries of North Devon, pp.7-8

²Kellys Directory of Devonshire, (1914), p.341

simply redirected funds within that region rather than constituted a net 'injection'.

This would be too simplistic an approach in view of the fact that by the turn of the century Treasury subventions to local authorities for specific and general purposes were already an established feature of British public finance.¹ This made it possible that less developed regions (which might be expected to have contributed relatively less, per capita, to the public purse than the more heavily industrialised areas could have received a net stimulation from this channel. Furthermore, statutory provisions for the level of local authority activity in, for example, municipal social investment in aid of environmental health, might have had the effect of retaining within the area ratepayers' money that might otherwise have been indirectly invested elsewhere in Britain, or abroad. With regard to central government it is possible to imagine a situation in which the effect of expenditure was, among other things, to spread evenly over the country money raised from taxpayers and businesses which were disproportionately located in the more prosperous areas.

However, while this may have been the effect of that part of central government spending given in the form of Treasury grants to local authorities, it must be remembered that the main areas of government expenditure remained debt charges and defence commitments right through the 19th century. Most of the money raised by taxes, customs and excise was redirected to government debt holders, administrative expenses -mainly in London- and Army and Navy maintenance at home and across the Empire. Looked at in terms of the flow of funds between regions, most parts of the country would have been net losers, but there were points of stimulus where expenditure was concentrated in domestic defence establishments, and not least among these, of course, was the naval complex at Devonport. As a

¹A.T.Peacock & J.Wiseman, The growth of public expenditure in the U.K., 2nd edn., (1967), ch.3

special and specific case deserving of separate attention it is dealt with following the next section.

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Figures 4.1 and 4.2 chart the rise of local authority and civil central government expenditure over the late Victorian period, showing that it fell largely to the former to carry out the nation's will to increasingly regulate economic life and provide collective services. Despite an earlier rise in the 1870s the main increase in municipal expenditure came no earlier than the last decade of the century. In their study of the growth of UK public expenditure Peacock and Wiseman show that local authority current spending as a percentage of G.N.P. rose from around 2% in 1870 to 3.4% in 1890, 5.1% in 1900, and to 5.5% in 1913, and find that in real terms relative to national output, government spending between 1890 and 1913 grew no more slowly than in the whole 1890-1955 period.¹ The task here is to analyse in more detail what these changes amounted to within the county of Devon.

Not surprisingly, a great increase in the detail and accuracy of local authority accounts was required by Parliament as the permitted scale of municipal activity expanded from the 1860s onwards. In the 1860s the annual Abstract of County Treasurers' Accounts and the Local Taxation Returns give figures for the rate income of counties, boroughs, hundreds, the ad hoc collection of local Improvement Commissioners, and Treasury contributions towards the County police and the administration of justice. By the eve of World War One the Local Taxation Returns had expanded to fill an 800 page volume among the annual Accounts and Papers. Individual current accounts, loan accounts, public utilities accounts, and, where relevant, 'Exchequer Contribution Accounts' are given for each County, County Borough, non-County Borough, Urban District and Rural District Council, and are aggregated for England and Wales only in those administrative categories rather than by

¹Peacock and Wiseman, Public Expenditure, Table 2, p.42

Fig. 4.1. Local Authority Receipts, England & Wales, 1868-1913

Source: B.R.Mitchell & P.Deane, Abstract of British Historical Statistics, (1962), Public Finance 9, pp.414-5

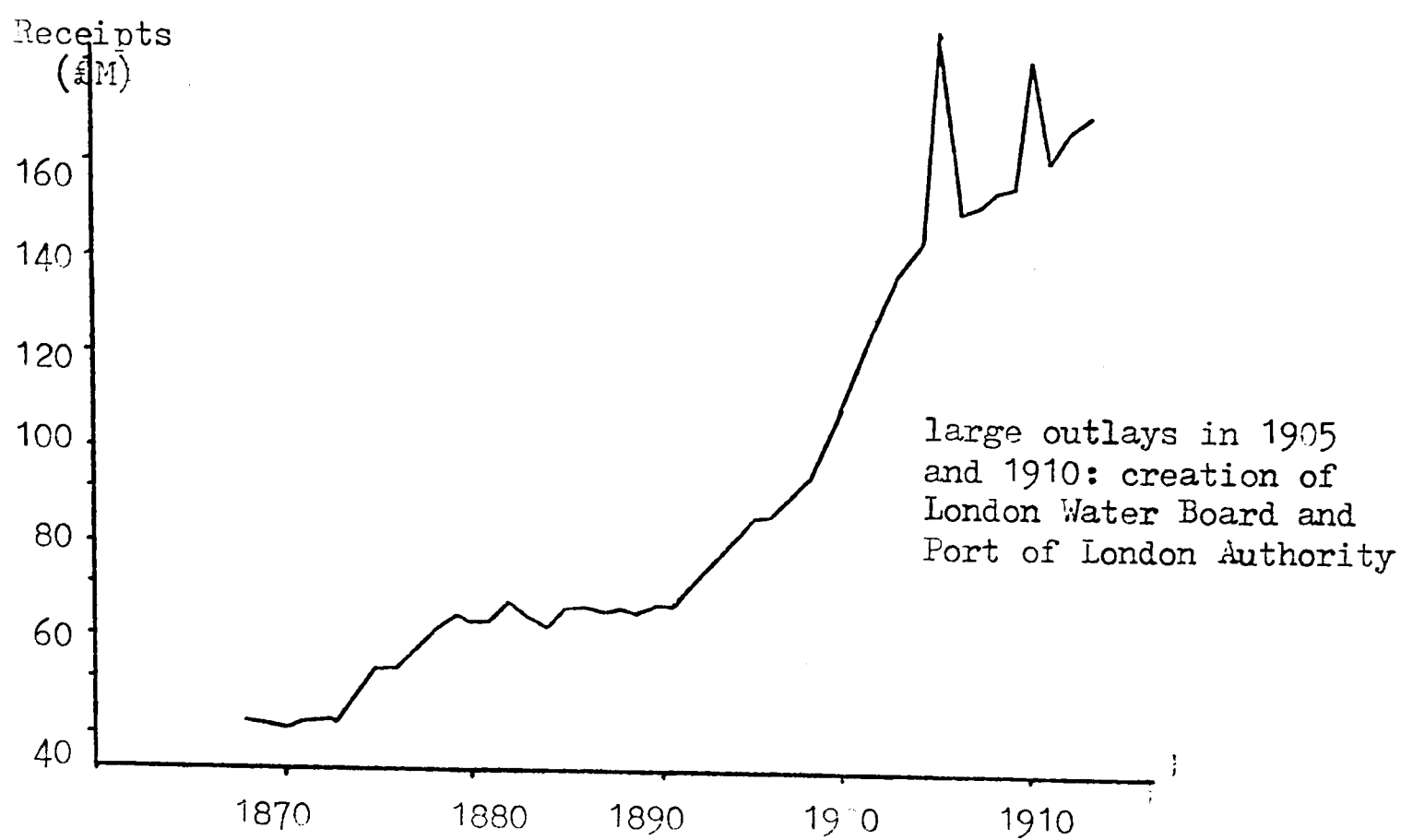
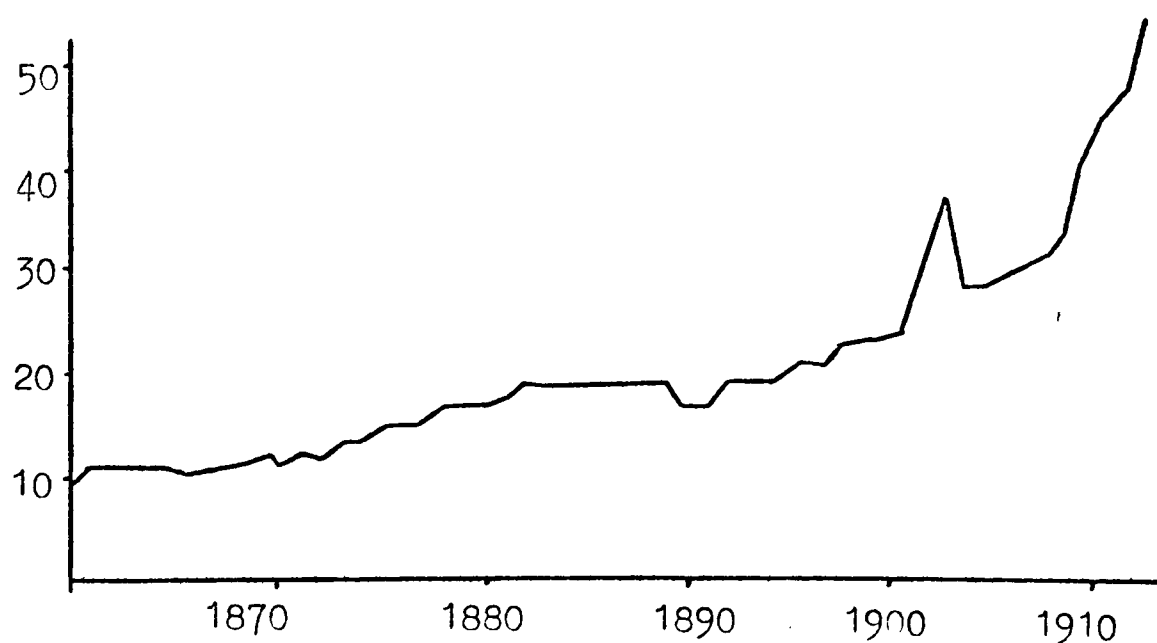


Fig. 4.2. U.K. Civil Central Government Expenditure, 1860-1913

source: Mitchell and Deane, (1962), Public Finance 4, pp.386-9



geographical county. The reconstitution of the local authority transactions into a total for the county is an arduous and time consuming process, so it was decided to concentrate on the financial year 1912-3, when total local authority expenditure reached its pre-war peak.

In 1867-8 the rate income of all local authorities in the county of Devon amounted to £405,819, of which 79% was levied for poor relief and most of the rest divided between highways maintenance, law and order and a few public health initiatives.¹ At this time rates were easily the most important source of income; the County Treasurers' Accounts show that at this time Treasury subventions amounted to no more than £10,000.² The rates constituted a burden of 3s.3.5d in the pound on the county rateable value of £2,481,687, compared to a figure for England and Wales of 2s.11.25d in the pound. This comparison would seem to support the contention that parts of Britain with less than average incomes were likely to be faced with higher than average rates burden, and apparently so even before the era of 'municipal socialism'.

By 1913 an unprecedented expansion in the scale and range of activities engaged in by local government had taken place.³ The task of aggregating the accounts of the Devon County Council, the three County Boroughs of Plymouth, Devonport and Exeter, the ten non-County Boroughs, 24 Urban District Councils, 17 Rural District Councils and the Parish Councils was complicated by inter-authority transfers and grants, but when these are accommodated it is found that the gross receipts of Devon's local authorities in 1912-3 was £2,336,800. Further details are shown in Table 4.6 overleaf. This table illustrates quite clearly that local government was greatly involved not just in the redirection of funds through rates and grants but also in the administration of largely or wholly commercial

¹Local Taxation Returns, PP 1867-8 LIX (497)

²Abstract of County Treasurers Accounts, PP 1868-9 LII (248), pp.15-9

³The Local Taxation Returns for 1912-3, PP 1914 LXVIII (425), form the basis of analysis for the rest of this section.

Table 4.6 Devon local authorities gross receipts, 1912-3

	£ 000s	%		£ 000s	%
Rates	1,046.3	44.8	Gas	145.5	6.2
Central Govt. Grants	474.9	20.3	Electricity	93.4	4.0
Loans	237.0	10.1	Transport	65.2	2.8
Property income	18.1	0.8	TOT. UTILITIES INCOME	414.9	17.8
Other sources	60.0	2.6	Other direct charges	85.9	3.7
Water	145.5	6.2	TOTAL	2,336.8	100.0

source: Local Taxation Returns, 1912-3, PP 1914 LXVIII (425)

concerns on behalf of the local community. These services and utilities, including harbours and markets as well as those specified above, might well have been provided by private enterprise (and in many places were), so in a discussion of the redistributive effects of local government they are best left to one side. For comparative purposes then, attention will be limited to that portion of revenue comprised by rates, grants and loans other than for the public utilities.

Of this new total of £1,708,700, poor relief expenditure accounted for only 20%, easily outstripped by the 30% spent on education, and the 22% committed to highway maintenance. Transfer payments, i.e. mainly loan charges and poor relief expenditure, comprised around a third of total local authority expenditure in Devon, the other two thirds representing the direct use of real resources through expenditure on goods and services, much of which provided labour intensive employment.

When a comparison is made between Devon and the average for England and Wales with regard to the source of receipts -including and excluding the probably exceptional Greater London area- (see Table 4.7 overleaf) it is interesting to note that there was a broad similarity between the percentages of revenue derived from rates. It will also be seen that a substantially higher proportion was available to Devon in the form of Central Government grants for specific and general purposes than in the country as a whole, which allowed the county to be less dependant on raising loans to finance its activities. This too would lend support to the theory

Table 4.7 Sources of local authority receipts, 1912-3

%	Rates	Grants	Loans
Devon	61.2	27.8	11.0
non-met Eng.& Wales	61.1	22.4	16.5
Eng.& Wales	65.7	21.1	13.2

source: as for Table 4.6

that Devon was a beneficiary of the redistributive effects of the structure of local government finance, but a per capita calculation puts this into a different perspective. Treasury grants to non-metropolitan local authorities in England and Wales amounted to 58.6p per head of population in 1912-3, and 63p in Devon. Furthermore, the theoretical net inflow of Treasury grants to Devon would have been far less than the near £500,000 gross as this sum was drawn from a total made available to local authorities of £21,700,000; if the tax contributions of Devonians on this account were in proportion to their share of the national population they would have amounted to around £400,000, thus reducing the net inflow to minor proportions.

Table 4.8 Rates levels, Devon and England and Wales, 1912-3

	-1- Assessable property value (£)	-2- Pop'n 1911	-3- Rates (£)	-4- 3 as % of 1	-5- Rates/ capita
Eng.& Wales	211,563,049	36,070,492	68,200,000	32.24	£1.89
non-met. E & W	166,397,957	31,548,807	50,614,000	30.42	£1.60
Devon	3,672,463	699,703	1,046,340	28.49	£1.50

source: as for Tables 4.6, 4.7

It remains to be seen whether there was any possibility of internal redistributive effects by virtue of a higher rates burden than the national average. In fact, as Table 4.8 shows, the burden of rates on property and on a per capita basis in Devon was actually lower than the national average, both including and excluding London.

This does not contradict the notion expressed earlier that statutory minima would have imposed a disproportionate burden on ratepayers in the less developed parts of the country, as most of the interventionist

legislation of the late 19th century was of a 'permissive' character and framed with the intention of attempting to clear up the most glaring deprivations that were a consequence of industrialisation in the larger cities. In the quiet backwaters of the country where poverty was of a more shadowy nature, such as in the small south Devon port of Dartmouth,¹ this 'permissive' framework would have allowed the elected custodians of municipal economy to fulfil their duties with the degree of efficiency expected by the middle and upper class ratepayers.

The general apathy and lack of forceful protest over rate rises as features of local politics in Exeter, for example,² are easier to understand in this light, and is further explained by the observation made as long ago as 1877 by the statistician Craigie that ratepayers' complaints were muted because a relatively high proportion of total municipal spending was accounted for by 'voluntary' expenditure on local facilities and amenities.³ On the eve of the First World War a large part of local government activity still consisted of taking responsibility for the provision of public utilities and amenities, whether waterworks, libraries or schools, that could be seen as being of tangible benefit to the local community and which might have been alternatively provided by private enterprise anyway. As such it could be argued that they are not prime examples of interventionist activity.

When this is coupled to the fact that total local authority expenditure in England and Wales amounted to £4.46 per head -only £3.34 in Devon- at a time when national income per capita was around £50⁴ it becomes

¹A Local Government Board sanitary inspector investigated conditions in the old town following evidence of corruption by Borough councillors, and found them to be as bad as the worst cases he had come across in large urban areas: R.Freeman, Dartmouth, A new history of the port and its people, (1983), pp.127-9

²R.Newton, Victorian Exeter, (Leicester, 1968), Ch. XII, XIII, passim

³P.G.Craigie, 'The cost of English Local Government', J.R.S.S., XL (1877), pp.262-96

⁴PP 1914 LXVIII (425); B.E.Supple, 'Income and demand 1860-1914' in R.Floud and D.N.McCloskey (eds.), The Economic History of Britain since 1700, (1981), II p.122

clear that it would be wrong to assign any significance to the interventionist and redistributive potential of local authority action before the First World War, beyond being important to a few firms here and there.

-3-

The impact of expenditure by the Navy in Devonport was quite another matter, not only by virtue of the scale of financial involvement but also because its specific role was to maintain and invest in a large shipbuilding complex with all its subsidiary operations. As mentioned earlier, because it is impossible in practice to calculate the amount of direct and indirect taxation paid out by Devonians to central government the net 'injection' represented by Naval spending at Devonport cannot be measured, but the Navy Dockyard Expenses Account, presented to Parliament annually with the Navy Estimates give detailed figures for gross spending.

They reveal that in the financial year 1867-8, for example, £494,782 was spent on shipbuilding, maintenance, and overheads in the Dockyard, a direct injection of funds greater than the entire income of local authorities in Devon in the same year.¹ Devonport benefited from the late Victorian concern to upgrade the Royal Navy, with substantial increases in the breadth of activity in the 1890s, when it was said that £10,000 was paid out in wages each Friday,² and again after 1907. In 1912-3, 'Direct, Incidental and Establishment' expenditure in the Dockyard amounted to £2,212,294, thus still broadly comparable with the gross receipts of Devon's local authorities.³ The increase is mirrored by the available employment figures which show that the yard provided 1,400 jobs in 1850, before the Keyham extension was opened, 2,830 in 1862-3, around 3,000 in 1878, rising

¹PP 1870 XLVI (307)

²H.F.Whitfeld, Plymouth and Devonport in times of war and peace, (Plymouth, 1900), p.430

³For 1867-8: Navy Shipbuilding and Dockyard Transactions, PP 1870 XLVI (307), pp.364-439; for 1912-3: Navy (Dockyard Expenses Account), PP 1914 LIII (134), App. C., pp.468-9

steeply to 9,000 by 1914 when it accounted for over 10% of total city employment.¹

It is likely that some proportion of this expenditure would have left Devon in order to buy essential materials not available locally, but the steady growth of the yard over more than two centuries had enabled most operations to be self-sufficient within a fairly small area. In 1859, the Dockyard was described as encompassing within its 142 acres a blacksmiths' shop with 48 forges, numerous other workshops, a foundry which was 'probably the largest in the Kingdom' and the capacity to undertake repairs on 20 ships at any one time.²

A tentative estimate of the contribution it made to the changing level of economic activity in Devon as a whole can be made by setting Dockyard expenditure against rough calculations of 'aggregate county income', a concept theoretically analagous with national income. In an effort to reduce the limitations imposed by this hazardous exercise assumptions are made which bias the result towards being a low estimate of the importance of Devonport Dockyard to the county's economy. Accordingly, the figures presented below as approximations for county income are intended to overstate its rate of growth over the 1870-1913 period, and to overstate that income level in the terminal year. This is done by proceeding on a per capita income basis by assuming that there was parity in per capita income levels in Devon and the nation as a whole in 1913 -which, as chapter 7 suggests, is unlikely-³ and that in 1870 the Devon figure was only £26 per capita compared to a national average of £30.⁴

In an alternative equation, aimed at estimating a high figure for the contribution of the Dockyard to the county's economy, it is assumed that in 1913 Devon's per capita income was only 90% of the national average. These

¹Navy Accounts, PP 1864 XXXVIII (47), pp.428, 468; White's Directory, (1850), p.644; White's, (1878), p.272; Kellys Directory, (1914), p.502

²Murrays Handbook for Devon, p.114

³see Table 7.12, p.246

⁴per capita figures for the U.K.: Supple, 'Income and Demand', p.122

Table 4.9 Devonport Dockyard and the county economy 1870-1913

A) <u>Devon:</u>	LOW ESTIMATE OF IMPACT		HIGH ESTIMATE OF IMPACT	
	1870	1913	1870	1913
County Income £000s	15,643	34,990	15,000	31,490
Dockyard Spending £	516,733	2,212,294	620,000	2,700,000
Dockyard %	3.3	6.32	4.1	8.6
UNDER LOW ESTIMATE	Growth in County Income		123.7%	(A)
(1870 -1913)	Growth in non-Dockyard County Income		116.7%	(B)
	(B)/(A)		0.943	

B) Plymouth Conurbation: (Low estimate)

	1870	1913	
City income £	4,343,000	13,241,000	growth in non-Dockyard city
Dockyard spending £	516,733	2,212,294	income / growth in total
Dockyard %	11.9	16.7	city income = 0.912

sources: Navy Dockyard Expenses Account PP 1914 LIII (134), App.C, pp.468-9
Aggregate income estimates calculated as described in text, using
Supple,'Income and Demand' in Floud & McCloskey, Economic History of
Britain, Vol.II, p.122

calculations are shown in Table 4.9 along with a similarly experimental estimate of the Dockyard's importance within the built up area of Plymouth itself, which contains the further assumption that per capita income within the city was perhaps 15% higher than the county average in 1870, and 20% in 1913. Counterbalancing this in the low estimate of impact is the assumption that there was no other Naval expenditure in the Plymouth area outside the dockyard, while for the high estimate approximations are included for naval outlays on the Royal William Victualling Yard in Plymouth and on the wages and salaries of officers, marines and ratings stationed in the city.

The range in results produced by these differing assumptions is not enormous; part A) of Table 4.9 shows that the direct injections represented by Naval expenditure may have amounted to between 6.3% and 8.6% of total county income in 1913. A crude ratio of 'non-Dockyard' to total county income growth rates suggests that without the Dockyard county income growth would have been at least 6% slower than it actually was, and performing the

same sums with the high estimate figures produces an 'upper bound' of 10%. These figures for the direct impact are almost certainly underestimates for the assumptions do not include any multiplier effects the naval shipbuilding industry may have had on the rest of the region's economy. There is a great difference between 'eliminating' the Dockyard's impact in 1913 and attempting to depict the situation in that year had the Yard never existed.

Much of the secondary demand was probably confined to the built-up area of Plymouth itself where the Yard, and the Navy in general, was of enormous importance to economic activity. In 1908 it was reported that

'sailors of all grades are of great importance, since for them shopkeepers cater, and by them the tone of town life is largely determined'.¹

Part B) of Table 4.9 suggests that Naval expenditure at Devonport accounted for at least 16.7% of total 'city income' in 1913, but because population and (probably) income grew faster in the city than in Devon as a whole the order of magnitude of the Dockyard's contribution to the growth rate of the city's economy was probably no greater than to that of the whole county, or at least 8.8%. In a purely dynamic sense of course, the increase in Dockyard spending as a proportion of the total income increase between 1870 and 1913 would have been much greater.

The statistics used here are in no way as rigorously defined or controlled as those brought to bear in econometric counterfactual exercises but the interpretative problems are similar. For example, even if the results are accepted at face value it is difficult to decide how big or how small a 6-10% contribution to a growth rate actually is. The analysis is forced back to qualitative considerations, in particular to the nature of this 'free' injection of resources into the economy of Devon. A 6-10% contribution to the growth rate would have been of limited significance if the money it represented had consisted only of transfer payments to sailors in barracks, but it was in fact invested in equipping and maintaining a

¹PP 1908 CVII (Cd3864), p.745

shipbuilding and repairing facility which was the largest single industrial enterprise west of Bristol, let alone the largest in Plymouth. This point is only refined -not` compromised- by the fact that the multiplier is likely to have operated more through the channels of employment income and materials purchases than through a direct stimulus to local manufacturing, because of the limits to sub-contracting imposed by the Admiralty's traditional desire for self-sufficiency in its shipyards.¹

Thus if a role for public expenditure in spatial economic development is to be sought in 19th century Devon it is to be found through the effect of central government defence spending rather than through the increasingly elaborate structure of local government. Even then the effect was probably diffused fairly locally. The dynamo of economic activity in the productive sectors of the county's economy must be sought elsewhere.

¹ a theme developed by R.C.Riley and J.L.Smith, 'Industrialisation in Naval Ports: the Portsmouth case', in B.S.Hoyle and D.A.Pindar (ed.), Cityport Industrialisation and Regional Development, (Oxford, 1981)

4.3. Agriculture and Fishing

-1-

Devon's diverse resource advantages made the primary sectors a likely source of 'export' earnings in the 19th century, and given the county's long tradition of maritime activity fishing deserves attention here as well as agriculture. Brixham was the most important wholesale fish market in the west in 1800, and in the Lysons' day London and Bath were among the distant markets supplied from the town.¹ The speed of railway communications obviously widened the potential inland demand for fish, and it was said that as early as 1848, within four years of the line penetrating into Devon, the G.W.R. was earning £250 freight income per week for carrying Devon fish to London.² This could well have represented over a fifth of the total freight income earned by the G.W.R. within Devon at the time,³ and the local provincial press obviously deemed it worthy of special mention.

Throughout the 19th century the Brixham sailing fleet was comparable in size to that of Plymouth, and trawlers from the town were involved from the outset in the exploitation of the previously untapped fish stocks of the North Sea.⁴ Eventually, however, it was the richness of these waters, and the proximity of the East Coast harbours to the large northern markets that was mainly responsible for the decline of fishing in the Westcountry. It had never been large in terms of employment: the 1,605 fishermen registered in the 1851 census amounted to just 0.6% of total county employment, and numbers had fallen to 1,295, or 0.4% of the total, by 1911.⁵ Even in Plymouth, where the largest fishing fleet was to be found on the eve of the First World War, there were still ten times as many drift nets than the more efficient trawl nets, and the expense of steam trawlers could not yet be

¹Lysons, Magna Brittanica, p.ccxvi

²E.F.P., 6 Apr.1848 p.3

³see Railway Returns freight income estimates: Table A2.1, p.272

⁴P.Russell, 'Notes on the Brixham Fisheries', T.D.A., LXXXIII (1951), p.289

⁵PP 1852-3 LXXXVIII (1691), p.357, PP 1911 LXXIX (Cd7019), p.26

justified given the difficult state of the trade.¹ For those who worked out from small harbours or open beaches in small boats, fishing was a precarious livelihood. One such small fisherman in the early 1900s believed it would be worth giving up if he could earn a regular 15 shillings per week on dry land, which was hardly more than the earnings of agricultural labourers at the time.²

While the Devon fishing industry of the 19th century provides an illustrative example of one source of export earnings, and some of the linkages through which it generated secondary manufacturing and support services in the port towns, it can hardly be considered to have made a major impact on the county's economy in this period. In a sense the raw potential was there, in terms of fish stocks, sheltered harbours and a skilled workforce, but the balance of fortune swung towards waters and coasts which were better endowed. By 1928, when only 2,160 tons of fish were landed at Brixham, 94,000 tons were brought into Hull.³

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The causes of the decline in fishing in Devon are not without relevance to the agricultural sector. Like fishing, the county's agriculture was blessed with a number of long standing resource advantages but they too were vulnerable to external competition during the Victorian period. However, the much larger scale, and more diverse nature of agricultural practice in Devon, compared with fishing, allowed more room for manoeuvre, giving the agricultural sector opportunities to accommodate and overcome the pressures of retrenchment of the 'Great Depression' and remain a vital source of export earnings for the county.

As late as 1865, according to Hawke's calculations, wheat production in Devon met 58% of the county's consumption requirements,⁴ which is

¹Russell, 'Brixham fisheries', Hoskins, Devon, pp.214-5

²Reynolds, A Poor Man's House, p.110

³Russell, 'Brixham fisheries', p.293

⁴G.R.Hawke, Railways and economic growth, (Oxford, 1970), p.107

possibly an indication that while wheat remained at relatively high pre-1870s prices it was not always more economic to buy in external supplies. The 'high farming' climate of the mid-Victorian period may well have been a spur to improvements in arable farming practices in Devon, a few signs of which had been noted by Tanner in 1848 amid his general criticism of the local husbandry. He found that some progressive farmers were using turnips and potatoes to prepare the soil for corn, but on the whole he believed that the old Devon course of taking three exhaustive corn crops in succession could not be too severely condemned as it was a 'complete check to agricultural improvement'.¹

The following decades saw gradual improvements in rotations, manuring and ploughing (oxen had still been used in 1850)² and slow progress was made on the better soils with modern drainage up to 1870.³ Arable improvements did not come to an end in the changed circumstances of the 'Great Depression', when grain prices tumbled and vast tracts of land were laid down to grass, although in aggregate terms the retreat from corn was swifter in Devon than in the nation as a whole. In 1870 wheat accounted for 122,728 of the 291,461 acres of land growing crops in Devon, or 42%, with the remainder divided equally between barley and oats; green crops -mainly potatoes- covered another 148,734 acres.⁴ By 1895, wheat was grown on under 44,000 acres, a fall of 65% in a quarter of a century. The barley acreage fell by 36% over the same period, but oats had increased by 48%, to 125,141 acres.⁵ It was noted in 1895 by R.H.Rew, an assistant Commissioner

¹H.Tanner, 'The farming of Devonshire', Jour. Royal Agric. Soc. England, IX (1848-9), p.466. A local writer asserted in 1857 that there was no system of crop rotation in north Devon: J.Dobbs, 'Notes on north Devon farming', Jour. Bath & West of England Soc., V (1857), p.318

²Whites Directory, p.36

³F.Punchard, 'Farming in Devon and Cornwall', Jour. Royal Ag. Soc. Eng., 3rd Ser. I (1890), p.516

⁴Agricultural Statistics, PP 1870 LXVIII (c223). In the first years of collection Devonian farmers were said to have been amongst those most reluctant to supply information: Jour. Royal Ag. Soc. Eng., 2nd ser. IV (1867), p.219

⁵PP 1870 LXVIII (c223), 1896 XCII (c.8073)

reporting on north Devon to the Royal Commission on Agriculture, that oats were an important element in the most common rotation of the time. They were used as a prelude to wheat or barley, followed by a root crop, then sown once more before the ground was laid down to grass for two or three years.¹

Table 4.10 Crop Yields, Devon and England 1880s-1903/12

		1880s	1903/12	Change %	Devon as % of English average		Change %
					1880s	1903/12	
Wheat	England	28.94	31.31	+8.2			
	Devon	21.45	27.26	+27.1	74.1	87.1	+17.5
Barley	England	34.35	32.99	-4.0			
	Devon	28.5	30.95	+8.6	83.0	93.8	+13.0
Oats	England	42.1	41.23	-2.1			
	Devon	32.34	37.99	+17.5	76.8	92.1	+20.0
Potatoes	England	6.32	6.03	-6.6			
	Devon	5.48	6.41	+17.0	86.7	106.3	+22.6
Hay	England	1.42	1.34	-5.6			
	Devon	1.21	1.24	+2.1	85.2	92.4	+8.5

sources: The 1880s figure is the 'estimated ordinary average' arrived at by 'enumerators specially selected for their practical experience in agricultural matters as well as local knowledge of the crops in the districts in which they were severally employed': Agricultural Returns for 1883, PP 1884-5 LXXXIV (c4537),p.227; 1903-12 = average yields for that decade as presented in the Returns for 1913: PP 1914 XCVIII (Cd7325), pp.159-68. Figures are bushels per acre, tons- potatoes & hay.

The integration of these arable courses with leys and permanent pasture was clearly an important feature of Devonian farming in general at this time: in 1885 mixed farming, combining arable and permanent pasture, was practiced on 82% of all farms over five acres in size in Devon, while in England as a whole the proportion was only 59%.² Even though the balance was heavily towards the pastoral aspect, the fact that crops were being raised on most farms gave individual farmers a welcome degree of self-sufficiency in the face of a difficult economic environment³ and probably helps to

¹R.H.Rew,'North Devon', report to Royal Commission on Agriculture, PP 1895 XVI (c.7728) p.5

²Agricultural Holdings PP 1886 LXX (c4848) pp64-78. Devon's soils, having a high level of acidity required periodical ploughing, liming & fertilising to prevent the pastures deteriorating, which partly explains the extent of ley farming: M.A.Morgan,'South West England' in J.Mitchell (ed.) Great Britain: Geographical Essays, (Cambridge, 1962), pp.196-7

³J.Cornwell, Earth to Earth, (1982), p.81; Rew,'North Devon', p.11

explain the attention given to improving crop yields in the county during the last quarter century of this period, as shown in Table 4.10.

While the increases in Devonian land productivity were relatively impressive, yields were still mostly lower than the national average in the Edwardian period; absolute retrenchment had continued throughout. The acreage sown with wheat and oats stabilised after 1895, but the land sown with barley shrank further, as did that under green crops, falling from 127,905 acres in 1895 to 106,105 acres by 1912. In the latter year cereals were grown on 212,021 acres in Devon, only 22% of which was devoted to wheat.¹ Devon's farmers apparently responded rapidly to the changing economic climate, especially with regard to wheat, and by 1893/4 they were growing only 21% of the county's consumption requirements. Since 1865 the wheat deficit, as estimated by Hawke, had much more than doubled, from 1.58 million bushels to 3.88 million bushels.²

With other, more intensively cultivated products, opportunities remained brighter, and in many of these Devon maintained an export trade throughout the 'Great Depression'. Cider is perhaps the most obvious example: as a percentage of all cultivated land orchards were three times as important in Devon than the national average.³ Improved access to external markets by the Edwardian period also allowed South Devon farmers to reap the full benefit of their mild climate and sheltered valleys by developing market gardens. The London and South Western Railway carried a heavy traffic in fruit from the Tamar valley to London⁴ and according to the observations of Peter Kropotkin in 1912, the market gardens formed the basis of the

¹PP 1896 XCII (c8073), 1912-3 LXXIX (Cd6021)

²Hawke, Railways and Economic Growth, p.109. In 1912, however, Exeter millers still bought locally grown wheat to grade up alongside the stronger imported strains: A.D.Hall, A Pilgrimage of British Farming, 1910-2, (1913), p.363

³R.H.Rew, 'North Devon', p.7; cider was particularly important to the South Hams and continued to be exported throughout the period, although concern over its quality led to the formation of the Devon Pomological Society in 1884: Curtler, 'Devon's Agriculture' I.H.R. VCH papers Env. 440

⁴Booker, Industrial Archaeology of the Tamar Valley, p.204

Edwardian farming recovery in the region. Full advantage was taken of the long growing season with South Devon asparagus being sold at Covent garden in November, and there was also a brisk trade to London in early vegetables, such as potatoes.¹

Intensive cultivation, while profitable, was locationally too circumscribed to counterbalance the conversion of arable land to pasture. The increase of the latter was great enough to actually raise the total acreage of agriculturally used land in the county from just under a million acres in 1870, to 1,203,000 by 1910. Clover, sainfoin and other rotating grassland accounted for 161,659 acres of Devon's farmland in 1870, and permanent pasture for another 372,469 acres, the combined total occupying 55% of the total cultivated land in that year.² This percentage had risen to 74% by 1910, and of the 350,000 acre increase all but 31,500 acres was laid down to permanent rather than rotating grassland.³ These figures exclude the large areas of unimproved upland used mainly for rough grazing, mainly on Dartmoor and Exmoor.

However, a simple shift from arable to pasture would not have been enough to guarantee security for the Devonian farmer as there was significant import competition in many livestock and dairy produce markets from the 1880s onwards. The impact of Australian and New Zealand lamb may explain, for example, why the rapid growth in Devon's sheep flocks came to an end around 1890. Total numbers had risen from around 700,000 in 1850⁴ to nearly a million before a severe attack of murrain in mid and south Devon in 1879, recovering from 774,000 in 1880 to reach 914,000 a decade later. After 1890, however, the total remained between 830,000 and 875,000 until the

¹ J.H.Porter, 'Peter Kropotkin on Devon Agriculture', D.H., XVII (1978), p.26; It was written in 1908 that while rents had fallen by 20-30% during the depression, 'the long continual fall seems at last to have been checked, and recently rents have shown a slight tendency to rise': Curtler, 'Agriculture', p.12

² PP1870 LXVIII (c223)

³ PP 1911 C (Cd5585)

⁴ as estimated in Whites Directory, p.37

First World War, apart from a brief rise in 1910.¹ The increase had been concentrated in north and north-west Devon where the small native hill sheep were well adapted to the inhospitable weather, although they were gradually being improved through the introduction of Leicester and Cotswold rams.² Wool was no longer the most important product -most flocks were kept to rear lambs for markets outside the county, and Rew found that under pressure from New Zealand lamb by the 1890s, farmers could only hope to make a reasonable return from sheep if they could get the lambs to market by February and March rather than the traditional month of May.³ Pig numbers showed a similar pattern to those of sheep, reaching a peak in the early 1890s at around 124,000 and falling thereafter to under 100,000 as imported bacon competed with what had been a thriving trade in young porkers from east Devon to London until the 1880s.

In contrast to sheep and pigs, however, cattle numbers suggest that during this period Devon's farmers were able to reap the benefit of the earlier work by the Quartlys of Molland and a number of other breeders in developing the high quality North Devon breed of beef cattle. The 126,683 strong beef herd of 1870 grew steadily to 196,313 by 1912, and while still largely sold at two or two and a half years of age for fattening further east, Rew noted in the 1890s that an increasing number of cattle were being fattened as well as reared in north Devon.⁴ This would have increased the average value of any given volume of cattle 'exports' as the trend developed.

The Devon dairy herd grew at less than half the rate of the beef herd in the 1870s, from 74,257 beasts to 80,280, but grew by another 39% to reach 112,000 in number by the eve of World War One, a rate of growth which compares favourably with the 31% growth of the beef herd over the same post-

¹PP1880 LXXVI (c2727), PP1890-1 XCI (c6524), PP1911 C (c5585)

²Curtler, 'Agriculture', p.14. On the moors the native breeds remained.

³Rew, 'North Devon', p.10

⁴ibid, p.14

1880 period. The Exe and Culm Lowlands, the combes of East Devon, and to some extent the South Hams shared in this growth, and their high quality milk and dairy output was well able to compete with rising imports after 1880. Devon was too far removed from London to benefit from the booming liquid milk trade to the metropolis,¹ but as real incomes rose within the county there was a considerable indigenous demand, particularly from the large built up areas of Plymouth, Torbay, and Exeter.²

-3-

Given that land use and stock changes alone cannot have ensured solvency for Devon's farmers it is also important to look for potential sources of productivity improvement. To the extent that organisational changes laid the foundations for this, the evidence on farm sizes in Devon appears favourable. In 1913 the average Devonian farm, at 70 acres, was 19% larger than in 1869-70, and 12% larger than the average for England and Wales (62 acres) in the latter year.³ Direct surveys of agricultural holdings were undertaken by the Board of Agriculture in 1885 and 1895, and it appears from their results that most of the increase had taken place within a decade or so of the onset of the 'Depression'.⁴

In the last two decades or so before World War One the number of farms of more than 300 acres in size fell by 25% in Devon, while those in the 50-100 acre bracket rose by 8%, or by 317 in number, and those between 20 and 50 acres by 12%, or 319 in number. It would seem that there was a fairly radical 'shake-out' in a short period of time followed by a period of

¹as revealed by G.W.R. milk carriage returns: P.R.O. RAIL 253/33 & 36

²Hall, British Farming, pp.360, 366

³Agric. Stats. 1870: PP 1870 LXVIII (c223) p.390; 1913, part I: PP1914 XCVIII (Cd7325) pp.244-7. In 1913 only a tiny acreage was farmed in units of less than five acres, and if these are excluded the average farm size in Devon was 83.1 acres, to England and Wales' 78.2 acres.

⁴Agric. Allotments and Holdings: PP 1886 LXX (c4848) pp.64-78; 1896 LXVII (c8243) pp.523-84

stability at a new level of viability,¹ possibly because the exploitation of growing markets for dairy produce, fruit and vegetables in the late 19th century could be undertaken on small farms.

In 1885 there was, in fact, a sharp differentiation between the small number of wholly pastoral or arable farms, and the much more prevalent mixed farms. While the average size of the former was just 20 acres, the average mixed farm in Devon was 108 acres in extent, which may suggest a great deal of scope for the realisation of what scale economies were associated with adopted farm machinery.²

As less than 18% of the county's farms were owner-occupied in 1895, the role of landlords, or perhaps their increasingly professional agents,³ in promoting these changes cannot be underestimated, and if the evidence of two of Devon's largest estates is any guide, investment remained fairly high throughout the 1870s and 1880s, when farm sizes were increasing. On the Duke of Bedford's estates between 1872 and 1892 annual investment in buildings, drainage and other improvements represented 21% of rental income, and on the Rolle estate, divided between two blocks in the north and east of the county, the proportion was as high as 44% over the same period.⁴ It is unlikely that smaller landowners would have been able to commit resources for investment on this scale, but in his survey of the county's farming Punchard commented that because the mid Victorian high farming boom may not

¹The process may, in fact, have started well before 1870, as the average size of farms in the three east Devon parishes of East Budleigh, Littleham, and Withycombe was only 44.9 acres in the early 1840s. The existence of a large part-time farming element, which was probably weeded out over subsequent decades, is suggested by the fact that only one third of those who farmed between 10 and 50 acres in East Budleigh were described as farmers in the 1841 Census: D.R.O. Tithe Maps E.Budleigh, Withycombe, Littleham; Census Enumerators Schedules P.R.O. HO 107/206-8

²PP 1886 LXX (c4848)

³Punchard argued in 1890 that the development of land agency as a distinct profession had improved agricultural estate management and the distribution of investment: 'Farming in Devon and Cornwall', p.516

⁴Estate accounts collected for the Royal Commission on Agriculture PP 1896 XVI (c8125) pp.488-99. Remissions were not granted on the Rolle estate before 1885, and in 1892, received rent had fallen by only 5.5% from the level of two decades before.

have been spectacular in Devon, investment made then had been safer than elsewhere, and reverses during the subsequent depression easier to bear:

'Farming for a profit and a living, and not for mere occupation, show or amusement, is the chief characteristic of the South-western agriculturalist.'¹

The increases in crop yields shown in Table 4.10 can be seen as one of the results of prudential investment in combination with the improvement in rotations mentioned earlier, and it serves as an example of reductions in unit costs (in this case, land) in the face of falling prices. Perhaps more important as a pressure on farmers' costs was the rising level of agricultural labourers' wages,² so the extent to which mechanisation was able to make inroads on the traditionally labour intensive structure of farming may well stand as a useful measure of the results achieved on the strength of organisational changes and investment rates noted above.

During the second half of the 19th century there was an increase in the use of machinery on farms, although there are few direct quantitative pointers to the nature of this development. County directories reveal that over the second half of the century there was a rapid growth in the number of agricultural implement manufacturers, agents and dealers in the county. They numbered 23 in 1856, 46 by 1883, and 54 by 1902.³ While these can only be seen as rough proxies, providing no more than the vaguest indications of output trends, the numbers which were located in small villages and hamlets suggest that the emphasis was towards cheap and unsophisticated machines, such as the light and adaptable ploughs produced in north Devon.⁴ The number

¹Punchard, 'Farming in Devon and Cornwall', p.536

²'Many (farmers) have reduced the acreage of their corn and root crops and laid down land to grass and supplied the place of hand labour with machinery, but notwithstanding all these attempts to diminish the labour bill it has crept steadily on'. W.J.Little, submission on Devonshire farming to the Royal Comm. on Depression in Agriculture, PP 1882 XV (c3375), p.20

³Kelly's Directory of Devonshire, (1856), (1883), (1902)

⁴Strong, Industries of North Devon, pp.125-33

of agricultural machine owners and proprietors in Devon was 8.5 times higher in 1901 than in 1871, compared to a tripling in England and Wales as a whole.¹ In 1911, however, the Devon percentage, at 0.32%, was still only half the national average, and so small anyway that it is only of limited value as a rough proxy. Yet contemporaries seemed impressed with the pace of change on Devon's farms. It was observed in 1890 that

'steam and water power are rapidly being brought into requisition, greatly economising labour and facilitating the general work of the farm'²

resulting in the relatively rapid decline in the size of the Devonian farm labour force, as shown in Table 4.11.

Table 4.11. Male Agricultural Labour Force, 1841-1911

	DEVON		ENGLAND AND WALES	
	Numbers	Index	Numbers	Index
1841	40,892	82.2	960,382	76.1
1851	49,756	100.0	1,261,970	100.0
1861	42,241	84.9	1,142,225	90.5
1871	34,452	69.2	955,567	75.7
1881	30,788	61.9	870,798	69.0
1891	26,410	53.1	780,707	61.9
1901	20,494	41.2	616,812	48.9
1911	21,770	43.8	664,617	52.7

sources: Census Occupation Abstracts, 1841-1911, listed in Appendix 1

Between 1851 and 1901 the Devon male agricultural labour force fell at a 15% faster rate than the national total, and it seems that there was a similar differential in the rates of decline of the female farm labour force.³ Across the country as a whole, the number of male agricultural labourers for every 100 acres of cultivated land fell from 3.65 to 2.43

¹Census of England and Wales, PP 1873 LXXII (c872), PP 1902 CXVIII (Cd1271)

²Whites Directory of Devonshire, (1890), p.51

³Arriving at an unambiguous figure for the latter is difficult given the lack of consistency among mid-century enumerators in distinguishing between women field workers and indoor farm servants. It would seem that in 1901 women field workers were only 5.9% of their 1861 numbers in Devon, reflecting both the impact of legislation concerning female farm work and the indirect effect of increasing living standards among labouring families, which is taken up in chapter 7, p.218

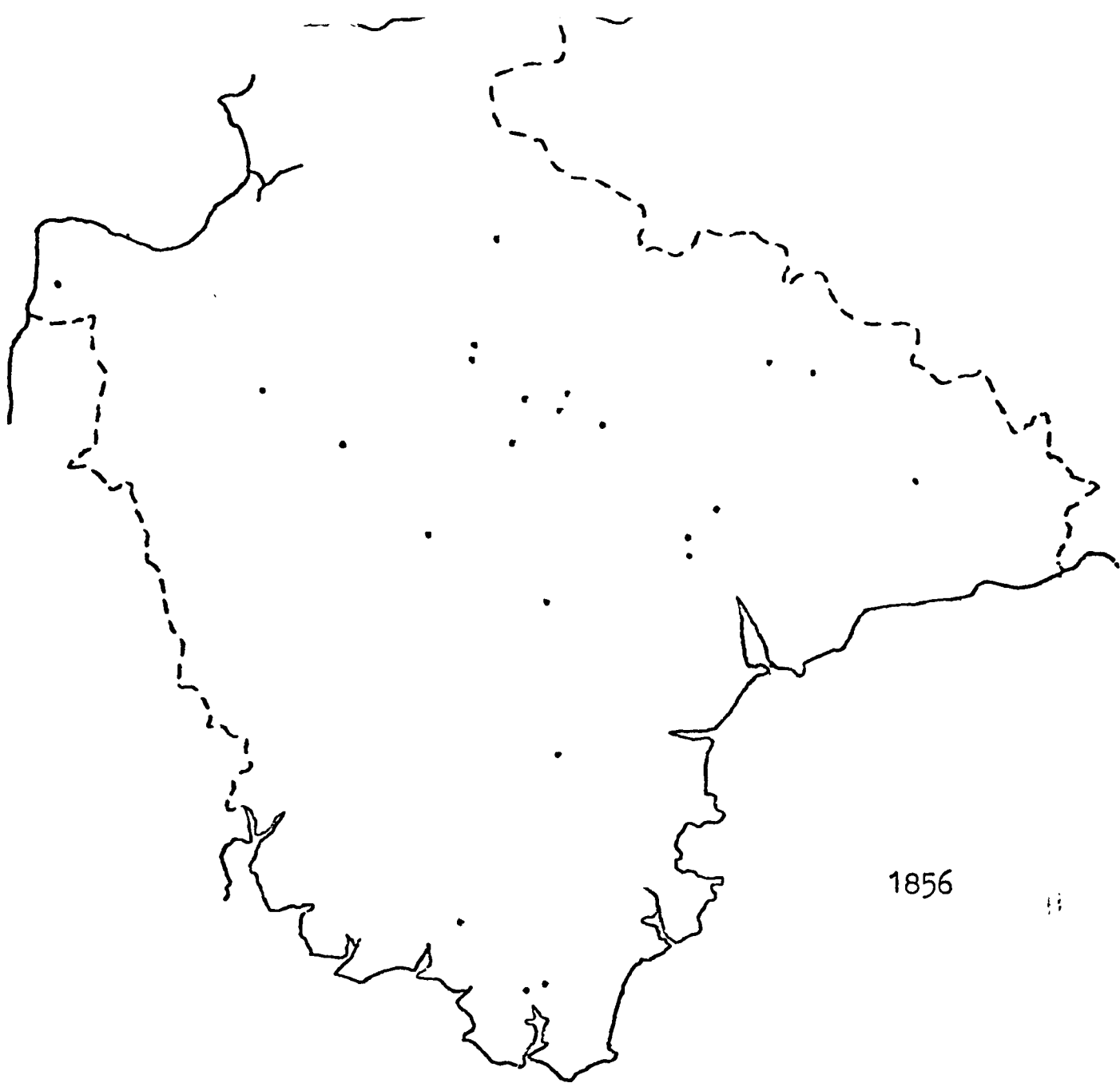
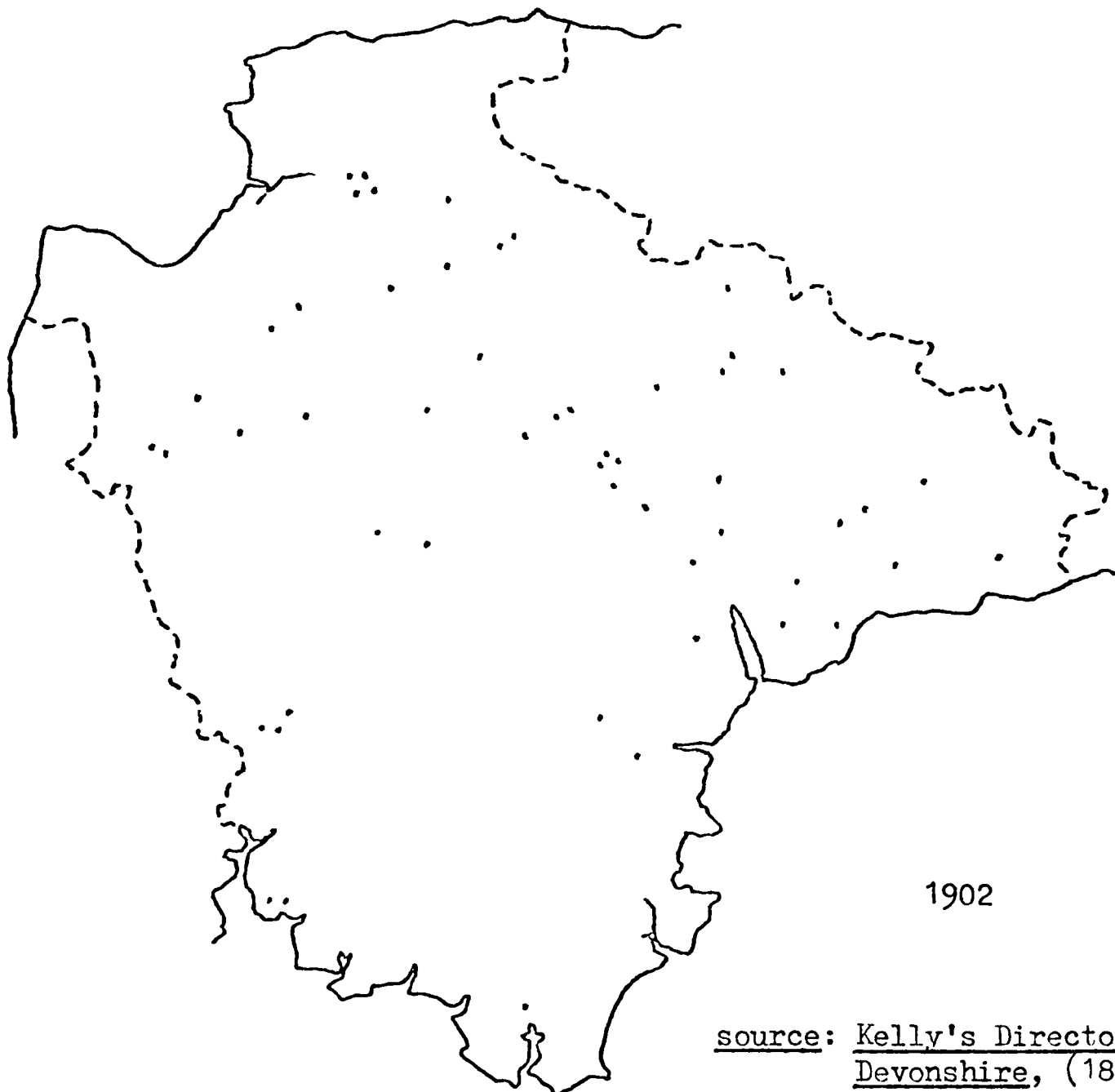


Fig. 4.3 Distribution of agricultural implement manufacturers and dealers



source: Kelly's Directory of
Devonshire, (1856, 1902)

between 1871 and 1911, but from 3.34 to a mere 1.8 in Devon.¹ There are indications that it was in the north of the county, where conditions had traditionally been poorer, that change was fastest. Fig. 4.3 shows that after the main expansion of agricultural implement manufacturers and dealers their numbers were still sparse in the South Hams compared to the distribution north of Dartmoor, and a comparison of migration rates from rural parts of the Culm Measures country and the South Hams consolidates the implication of relatively faster rationalisation in the north. Between 1841 and 1910 the average decennial net out-migration rate per thousand inhabitants was 14.86 in the South Hams, but 18.48 on the Culm Measures.² It is likely that the continued arable farming, and increase in intensive market gardening in the South Hams meant the retention of more labour than north of the Moor.

-4-

Although the shift from arable to pasture must have also contributed to the reduction in labour requirements, within the pastoral sector itself the productivity potential of new farm machinery was limited by the arable bias of 19th century agricultural technology. Surveying the region in 1917, Cochrane observed that

'it has been said that these western counties, and more especially Cornwall, used more machinery to the acre than any other county. It probably was true of Cornwall in 1891, but I think it could not be said of either Cornwall or Devon in 1913 or 1914, or if it was so the machinery was concentrated very largely on about the 25% of tillage which was left'³

Improvements in productivity to compete with the challenge of imports within the pastoral sector had to be sought in other ways. Rew reported that consumption of artificial manures and feedstuffs had risen by five times⁴

¹Land: Agric. Stats, PP 1871 LXIX (c460), PP 1912-3 LXXIX (Cd6021).
Labourers: Census Occupational Abstracts, PP 1873 LXXII (c872), PP 1912-3 LXXIX (Cd7019)

²calculated from Table 6.6, p.186

³A.H.D.Cochrane, Report on Devon to the inquiry into Wages and conditions in agriculture, PP1919 IX (Cmd. 25), p.276

⁴Rew, 'North Devon', p.14

between 1875 and 1895 in North Devon, and this was undoubtedly one way in which the unit costs of livestock farming could be reduced. It seems, however, that the most successful approach was to combine such cost-reducing changes as were possible with attempts to maintain or increase the unit quality of output.

Despite the rising tide of imports of pastoral produce it was still possible to obtain premium prices for high quality beef and dairy goods, particularly as railways gave access to a large enough market to maintain an adequate volume.¹ The earlier development of refined beef and dairy cattle by Devon breeders was of no small importance to the resilience displayed in the late Victorian period. In 1883 W.J.Harris, an enterprising farmer at Highampton in West Devon, demonstrated to enthusiastic local landowners and farmers his new silage building, the first of its kind in the county. It not only saved labour in haymaking but also improved the quality of the butter produced by his herd of cattle.²

The Torridge Vale Butter Factory was set up in 1874 to produce a consistent quality of butter, and by the late 1880s it was collecting milk in farmers carts from parishes in all directions from Great Torrington, and selling butter, cream, eggs and poultry to London, the Midlands and the North.³ In east Devon four farmers in the village of Hemyock set up a co-operative dairy in 1886 to produce and market their own butter⁴ and by the Edwardian period the Devon County Council Education Committee was sending a travelling dairy school around the county, complete with trained instructresses, as an aid to the quality of local dairy produce.⁵ It was

¹It was held that while the Devonian practice of scalding the cream may have taken the edge of delicacy from the flavour of the butter, it produced a much more consistent quality than usual, which rarely became rancid. Large quantities were despatched by rail to the Midlands, fetching high prices: T.D.Acland, 'Devonshire Butter', Jour. Bath & West of Eng. Soc., 3rd Ser. XVIII (1886-7), pp.296-9

²E.F.P., 5 Dec. 1883. Harris also set up pilot smallholdings on 500 acres of his Halwill estate, mostly laid down to grass; Curtler, 'Agriculture', p.14

³Strong, Industries of North Devon, p.121

⁴R.Stanes, 'Notes on the Culm Valley', D.H., XIX (1979), p.31

⁵Curtler, 'Agriculture', p.15

probably improvements such as these, as well as the fact that Devon was beyond the spatial limit to the influence of the London liquid milk trade, which enabled non-liquid milk dairy output to remain higher for longer in the West than elsewhere in England.¹

In addition to these efforts to maintain and increase competitiveness Little and Rew were both impressed by the willingness of farmers to devote time to the 'minor products' which found a wide sale in local pannier markets. In 1881 Little found that in the north of the county

'a great deal is done in the way of poultry, the market cart of light construction, filled with poultry, pork and vegetables being a feature quite distinct from South Devon'²

and in 1895 Rew reported that the attention paid to pannier markets and clotted cream production by farmers' wives and daughters in the north of the county reduced the risk of underemployment on the smaller holdings.³

It is quite likely that this willingness to cater for small local markets was a domestic aspect of the adaptability which helped to ensure that agricultural products remained prominent among the exports from Devon. As early as 1859 the M.P. and landowner J.W.Buller had spoken of the benefits of increased integration with national markets:

'He [Buller] might ask practical farmers how they would dispose of their produce if it were not for railways to convey it at a cheap rate to distant markets? He would ask them how they were to pay their rents without being able to dispose of the produce which superior culture had brought them? And when he saw, day after day, large trains of North Devon cattle going by railway, he felt that it was to the spread of railways that the present agricultural prosperity was mainly due.'⁴

¹D.Taylor, 'The English dairy industry, 1860-1930', E.H.R., 2nd Ser. XXIX (1976), p.590; in a speech to the Stockland and Dalwood Agricultural Society in 1886 Sir John Kennaway referred to the 'dangers' posed by the arrival of New Zealand butterine but argued that Devon's agricultural future still lay with dairy produce: E.F.P., 20 Oct. 1886, p.3

²Little, PP 1882 XV (c3375), p.16

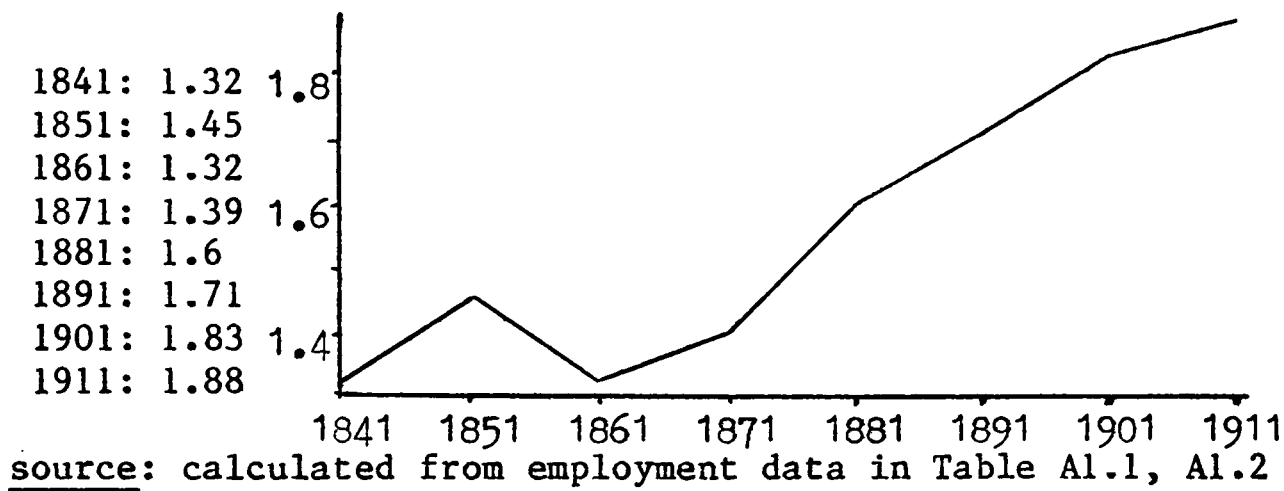
³Rew, 'North Devon', p.15. In the 1880s the Pilton Glove Factory was using large quantities of eggs for 'treading' leather - a linkage with local industry which must have benefited local poultry farmers; Strong, Industries of North Devon, p.36

⁴J.W.Buller Esq., in his speech as Chairman of the Knowstone, Molland, and East and West Anstey Agricultural Society, Oct. 1859, as reported in the Tiverton Gazette, 18 Oct 1859

It was a viewpoint that could only have been more solidly held by the end of the pre-war period, for an estimated export of 78,370 head of livestock from the county by railway in 1856 had increased to at least 250,000 by 1913.¹

The increasingly outwards orientation of Devon's agriculture is also suggested by 'export employment' figures calculated with location quotients in Part 4.1. of this chapter, and worth mentioning here for illustration. They give the proportion of the Devonian farm workforce producing for export as 24.2% in 1841, rising to 28% in 1871, and to 47% by 1911; while the absolute values thus shown are crude the trend is probably not without value. The corresponding LQ trend plotted in Fig. 4.4. probably underestimates the true rise in relative specialisation if labour productivity is considered. As this probably rose in the latter part of the period² there would have been a reduction in the upwards bias which undoubtedly affects the 1841-61 figures, so the overall rise would appear more striking.

Fig.4.4.: Location Quotients and agriculture in Devon 1841-1911



It must have been the strength of external demand more than anything else which underpinned the relative prosperity of agriculture in Devon, a prosperity which is suggested by a range of direct evidence. Agricultural bankruptcies were much fewer in number than in the East Anglian and Midland

¹Table 3.6, p.58, for calculation of internal trade flows
²see discussion of agricultural wages and productivity implications in chapter 7.3, pp.230-1

granaries¹ and the assistant Commissioners to the two Royal Commissions on Agriculture both reported that farming appeared not to have suffered as much in Devon as elsewhere in Britain.² Even the farmers themselves, at their local agricultural society dinners in the 1880s, acknowledged that they were not as badly off in Devon as their counterparts in other parts of Britain.³ Scarcely a farm was unlet in north Devon according to Rew,⁴ and the significant rise in the number of rural banking offices after 1880 is probably a testimony to the increased potential for saving amongst farmers.⁵

Given this state of affairs it is not surprising to find, in Table 4.5. that the agricultural sector in Devon performed better relative to its national counterpart than did total county employment, despite the inevitable decline in absolute numbers. This relative prosperity and the increasing concentration on producing for export shows that far from being an indicator of provincial economic backwardness, the consistently higher proportion of the Devonian workforce engaged in agriculture than in the nation as a whole represented a rational deployment of resources in response to external demand.⁶

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

²Little, 'Devon farming', p.19; Rew, 'North Devon', passim

³reports in various provincial newspapers bear out the latter point. See, for example, the North Devon Journal and Exeter Flying Post for autumn months in the 1880s, passim

⁴Rew, 'North Devon', p.12

⁵Before 1880 only two communities with less than 1500 population had banking offices; in 1890, 13. N.L.Armstrong, 'The development of banking in the South-west of England 1844-90' London Ph.D 1937, endmap

⁶Among males only, agriculture still employed 20.3% of the workforce in Devon in 1911, compared to 10.6% in Great Britain as a whole.

4.4. Mining and Manufacturing Industry

-1-

While the traditional richness and variety of Devon's farmland provided a firm basis for the positive development of agriculture, background conditions were not so favourable for the secondary sector of the county's economy. In aggregate this led to a relative retreat from industrial production in Devon which appears to fit well with the general trend towards the concentration of economic activity into the core regions. In 1911 almost as many Devonians were employed in agriculture as in manufacturing industry.¹ Even so, Lee's Series A employment figures register a slight rise in manufacturing and mining employment between 1851 (74,595) and 1911 (83,532), indicating both the expansionary climate of the time and the fact that not all the cost advantages were loaded against industry in this part of the economic periphery.

Energy supply, for example, was not completely dominated by the locational 'straitjacket' of coal deposits. Water power continued to meet the needs of many concerns throughout the 19th century: the Finch Brothers Foundry produced a wide range of individually designed agricultural, china clay and mining hand tools using three water wheels driven by the youthful Taw on the edge of Dartmoor right down to 1960.² The small and adaptable Otto gas engines produced by Crossley's in Manchester from 1876 onwards were also popular among small companies and farmers in the west of England.³ Furthermore, it should be stressed that for the many manufacturing processes which remained unmechanised energy requirements were in any case very low.

In those industries -characterised more by labour intensity than energy intensity- Devon was at a cost advantage over many other locations because, as chapter 7 tentatively suggests, average wages in Devon were

¹see Table 4.14, p.141

²R.A.Barron, Finch Brothers Foundry, (Okehampton, 1983), pp.6-7

³B.D.Hughes, Introduction to Strong, Industries, (1971), p.xxii

around 75% of national levels,¹ and in specific trades and between specific locations the differential was probably greater still. The decision by Westacotts of Barnstaple to build a shipyard in Appledore was guided by the 'important consideration of cheap labour in the locality'.² It was a factor of long standing importance in trades where the advance of technology had yet to find a solution to low productivity hand production. This helps account for the importance of clothing in Devon's manufacturing sector. It is doubtful, for example, whether Vincent and Duncan would have opened their Bideford collar factory but for the low wages prevailing there.³ In the Torrington area glovemaking was an important source of employment throughout the century, but had always been poorly paid. Women could expect to earn no more than 3s6d at it in 1840, but most preferred it to the alternative of wool weaving.⁴

Natural resources provided another cost advantage to be exploited in Victorian Devon. External users required a range of minerals and building stones, and foremost among these was copper. The rich and relatively easily worked lodes of the Tamar valley yielded an increase in production from about 5,000 tons per annum in the 1810s to a peak of 41,513 tons of ore in 1862⁵ and although dwarfed by the mighty Cornish industry to the west, mining had a profound impact on the economy of west Devon. Devon Great Consols, the largest local mining company, built a railway in 1858 to the port facilities which were developed at Morwellham on the Tamar to ease the load on the canal built forty years earlier. It was written of Devon Great Consols' Wheal Maria in 1859 that

¹see Table 7.12, p.246

²Strong, Industries of North Devon, p.98

³ibid, p.77

⁴A.Austin, Asst. Hand Loom Weavers Commrs.Reports, PP 1840 XXIII (43), p.287

⁵Lysons, Magna Brittanica, p.cclxxxiii; Goodridge, 'The historical geography of the copper Mining Industry', & 'Devon Great Consols: a study of Victorian mining enterprise', T.D.A., XCVI (1964), p.233

'the wealth of this mine has caused a diligent search to be made in the neighbouring hills, which are clouded with smoke, and bristle with engine-chimneys'.¹

Yet as the shallow lodes were worked out, and more productive mines in the Far East came on stream, this scene of grimy industry disappeared from view. Despite the often ingenious efforts on the part of mine captains to sustain operations, output fell to only 5,182 tons by 1887.²

Devon Great Consols survived until the end of the century largely by concentrating its attention on arsenic mining after 1868; the on-site calcining works above the Tamar produced 2,500 tons of arsenic in 1871, rising to 3,500 tons two decades later, in response to a rising demand from paint, dye, glass and weedkiller manufacturers.³ Along with other minerals of Dartmoor's metamorphic aureole -lead, silver and zinc- arsenic continued to be mined right through the Victorian period and as early as 1869 Devon Great Consols' was producing 50% of world output.⁴ There were other minerals in Devon which accounted for an important share of total national deposits. The mining of umber at Ashburton, on the southern edge of the Moor, hardly ever employed more than twenty men in the 1860s and 1870s, but it was one of the only sources of the mineral in Britain.⁵ Likewise, the barytes mines which succeeded the lead workings of the middle Teign Valley in the last quarter of the century came to produce an important share of national output, for which there was, like arsenic, a growing market as technology became more scientific in nature and the industrial economy demanded an increasingly diversified range of raw material inputs.⁶

Such developments helped to keep the mining industry alive in Devon. In the short term the cyclical fluctuations in national demand led to flurries of activity in some parts of the county that were of a less

¹Murray's Handbook for Devon and Cornwall, p.107

²Hoskins, Devon, p.139

³Goodridge, 'Devon Great Consols', p.243

⁴Goodridge, thesis, p.168

⁵F.Pilkington, Ashburton -the Dartmoor town, (Ashburton, 1978), p.96

⁶C.J.Schmitz, 'The development and decline of the Devon Barytes Industry 1875-1958', T.D.A., CIX (1977), p.117

permanent nature, particularly as far as iron ore deposits were concerned. Seams of a rare form of micaceous haematite lying east of the Dartmoor granite yielded 20 tons of ore per annum in the 1880s, which the Scottish Silvoid Co. raised to over 400 tons by 1905¹ but most of Devon's iron ore deposits were worked on a more irregular basis. The economic upswing of the 1850s had produced an iron mining boom on Exmoor and in 1859 it was reported that

'large districts of the moors are now in the hands of three of the principal iron companies of the Kingdom, viz. the Ulverstone of Lancashire and the Dowlais and Plymouth of South Wales. Their steam machinery is expected to raise about 300,000 tons of iron ore annually. Two lines for a mineral railway have been surveyed.'²

Neither was built, and when compared with output figures of 1,163 tons for the 11 years from 1856 to 1867³ the wildly ambitious aims of the prospectors stand as a telling illustration of the hollow nature of so much of the ephemeral euphoria generated by contemporary speculators.

Great hopes were also pinned on the Bulkamore iron mine near Buckfastleigh, but it collapsed after the early 1870s iron ore boom.⁴ In common with the rest of Devon's mineral produce, the 4,400 tons of ore it produced in its short life were carried out of the county to be smelted on the coalfields. While there may have been few physical constraints on the location of many industries in Devon during the Victorian period, this did not apply to heavy industry.

Thus the ball clay which was mined in ever increasing quantity in the Victorian period was also exported largely in unprocessed form. The white pipe clay of the Petersmarland deposits could only be exploited in volume when a railway had been laid from Bideford to the remote field above the Torridge valley, but output then doubled from 5,000 tons within five years after 1885. It reached 20,000 tons per annum by 1905, mostly being shipped

¹ M. Atkinson and C. Schmitz, 'Kelly Iron Mine, near Bovey Tracey', D.H., XI (1978), pp. 27-34

² Murray's Handbook, p. 134

³ Slader, Mining on Exmoor, p. 33

⁴ M. J. Messenger, 'Bulkamore Iron Mine', D.H., XIV (1977), pp. 15-6

from Bideford to Liverpool then exported.¹

In south Devon, the ball clay deposits of the Bovey Basin were larger and more accessible than those of the north, and were providing 20,000 tons per annum as early as the 1820s.² The clay was dug, handled and trans-shipped from barges to coasters and ocean-going vessels by traditional labour-intensive methods that remained unchanged even as the volume shipped out from Teignmouth rose from 30,000 tons in 1850, to 65,000 tons by 1880, and to over 100,000 tons by 1905.³ An increasing share of this total was mined and shipped by the Watts, Blake and Bearne partnership, which absorbed the other two ball clay companies in the area by 1900, and also marketed the clay mined by the Marland Brick and Clay Co. of north Devon. Generating further expansion, it also aggressively sought out overseas markets and shipped clay direct from Teignmouth to Spain, Holland, and the Baltic area.⁴

However, from earliest days there had been something of a pottery industry in Devon, and the strong relative growth of employment in 'bricks, pottery, glass, and cement making' between 1841 and 1911 in Devon (see Table 4.5) shows that the industry was able to compete effectively with the Potteries during the Victorian period also. Except around Bovey Tracey, where a poor quality coal had been used to fire the kilns since the late 18th century, this competition rested upon the quality of the clay and the skill and initiative of the potters. According to Strong in 1889, the products of the Peters Marland Brick and Clay Co. found outlets throughout the country, notably the terra cotta used on sumptuous buildings in Chelsea and Brighton, but most sales were to the local construction industry.⁵ Near Newton Abbot Candy and Co. Ltd. also mass produced bricks, tiles and drainpipes from coarse Bovey clay,⁶ so in both brick making parts of the

¹M.J.Messenger, North Devon Clay, (Truro, 1982), pp.17-21

²Lysons, Magna Britannica, p.cclxxxv

³Bulley, 'The Devon ball clay trade', p.200; Clark, 'The estuarine ports of the Exe and Teign', thesis, App.18 (ii)

⁴L.T.C.Rolt, The Potter's Field, (Newton Abbot, 1974), p.47

⁵Strong, Industries, pp.172-3

⁶Rolt, The Potter's Field, pp.55-7

county the industry was able to expand more rapidly than the nation as a whole because of resource advantages at a time when traditional building materials were being rapidly replaced with standardised bricks.

Another industry, although of an entirely different nature, in which Devon had enjoyed locational advantages for centuries was shipbuilding, but the second half of the century saw these advantages eroded in the face of the shift towards steamers, and large steel hulls. Even in Devon's own coasting trade, which had been dominated by small sailing vessels until the 1850s, steam was ascendant from 1880 onwards.¹ The effect on the industry on the north coast is illustrated by the figures in Table 4.12 and it is likely

Table 4.12 Shipbuilding output in north Devon, 1800-1914

(tonnage per decade)					
1800-9:	21,017	1840-9:	13,734	1880-9:	2,514
1810-9:	20,102	1850-9:	24,300	1890-9:	1,179
1820-9:	10,925	1860-9:	19,851	1900-9:	3,875
1830-9:	9,977	1870-9:	16,127	1910-4:	626

source: G.Farr, Shipbuilding in North Devon, National Maritime Museum Monograph, no. 22 (1976), pp.70-2

that the commercial yards of the south Devon coast showed the same pattern, with output falling dramatically in the 1880s and never recovering. In that decade the average tonnage of vessels built in north Devon was 62.9 tons while the U.K. average stood at 587.3 tons.² Many yards had no response to these changing external conditions and closed down, but some found enough business to continue as ship repairers.

The changing technological foundation of shipbuilding made it inevitable that the industry should suffer a general decline in Devon but it did not die because several firms were able and willing to cater for specialist markets. This observation leads conveniently into the discussion of a means of industrial survival in Devon which has parallels in the

¹Navigation and Shipping Returns: PP 1851 LII (155); PP 1886 LXIV (c4827)
²Farr, Shipbuilding in north Devon, pp.71-2; B.R.Mitchell and P.Deane, Abstract of British Historical Statistics, (Cambridge, 1962), Transport 2, pp.221-2

agricultural sector: the successful identification of specialist high quality markets, the proper exploitation of which offset the region's higher production costs against premium selling prices.

At Appledore, with a deep water site on the Torridge estuary, the Cock brothers began making steel barges, schooners, steam tugs, coasters and trawlers from 1901 onwards.¹ On the equally sheltered and deep Dart estuary on the south coast there was something of a shipbuilding revival in the 1880s led by William Avis of Kingswear, who built small vessels below register size (50 tons), and Simpson, Strickland and Co.² The latter firm built itself an entirely new complex in 1893, complete with a design office, engineering and boiler shops, carpenters' and coppersmiths' shops, and a steel boatbuilding yard in which it produced versatile steam craft, many for export. Sound engineering ability combined with an inventive team which was experimenting with petrol installations in the 1890s; the yard was 'years ahead of its time'.³

In the pottery industry too there were firms that drove traditional resource advantages to the limit by specialisation. When Charles Hubert Brannam took control of the family pottery in Barnstaple in 1879 it was earning a precarious living by turning local red clay into rough domestic crockery. During the next decade he switched attention increasingly towards highly decorated Victorian ornaments, which he designed himself, and managed to obtain several Royal warrants.⁴ This prestige was the key to large orders from aristocratic households at home and abroad and by the turn of the century Brannam's pottery was one of the most prosperous companies in Barnstaple. Charles Hubert ensured that his sons gained professional training in the Edwardian period before taking control of the works. In so doing he helped to ensure a continuation of the effective strategic planning

¹Farr, Shipbuilding in North Devon, p.16

²Horsley, 'Shipping of the port of Dartmouth', p.55

³ibid, p.55, R.Freeman, Dartmouth - A New History of the Port, p.122

⁴P.Brannam, A Family Business, (Exeter, 1982), p.4

that had originally seen salvation through a specialisation towards the high quality end of the pottery market, thus overcoming the high cost of fuel compared with the firm's main competitors in the Midlands.¹

A similar policy lay behind the prosperity of Shapland and Petter's cabinet works on the banks of the Taw. Shapland had been involved in furniture making in Barnstaple and London since the 1830s and had been quick to adopt the art of machine moulding which he had admired while in the United States. The vitality of the firm is well illustrated by the fact that the Raleigh works were completely rebuilt within a year of a devastating fire in 1888. The opportunity was taken to re-equip with the latest American machinery, thus enabling Shapland and Petter to continue to thrive in the high quality furniture market.² The pages of Hugh¹ Strong's survey of north Devon industry alone would allow these examples to be multiplied but it is impossible to know the extent to which his more subjective observations were embellished by local pride.

Yet it is not necessary to rely on evidence of this sort to show that even in the fields of metals and engineering, where it may perhaps be thought that the odds were stacked heavily against Devon's chances to compete, there were successful firms in the Victorian period. The Garton and King Iron Foundry in Exeter enjoyed a sound reputation as general ironmongers, and radiator, stove, range, and boiler makers in the mid 19th century. A catalogue of company records shows that by the turn of the century they were concentrating on the fitting of stoves and boilers in domestic and institutional buildings in the Exeter area, and they had also built a trade in exporting boilers to the Dominions.³

The Bodley iron foundry, also in Exeter, was a typical general engineering firm of the mid 19th century supplying pumping equipment and

¹Brannam, A Family Business, p.23

²Strong, Industries, chapter XV; Gardiner, Barnstaple, 1837-97, p.83

³D.R.O. 2783B; M.R.Eisenstadt, 'The Garton and King Iron Foundry 1860-1900' Univ. of Exeter Dept. Ec.Hist. (1979)

farm machinery direct to local consumers. This orientation of their business is shown by the distribution of sales in 1861: 96% of their clients were within Devon and 43% within Exeter itself, while of the other 4% the majority lived in Somerset and Cornwall.¹ The last decades of the century saw profound changes which ensured the foundry's survival in the face of pressures for concentration in the industrial core, and it moved away from making a wide range of general castings, stoves and engines towards accurately cast iron gearings. Partly through its adoption of the machine moulding techniques developed by the textile machinery engineers of Lancashire it was able to build firm contracts with large general engineering companies elsewhere in Britain.² In 1880 the proportion of the foundry's clients located in Devon had fallen to 71.5%, with 9.7% in London, and 18.8% elsewhere. By 1908 only 35% were in Devon; 26% of customers had addresses in London, and a further 35% in the Midlands and the North.³

Because the accessible sources for the business history of 19th century Devon are probably skewed towards the successful firms it is unlikely that those cited here (and others in dressmaking, papermaking, lacemaking, tanning and woollen textiles)⁴ reflect the experience of all the county's industrial concerns. They do show, however, that there were ways in which firms on the periphery could compete and survive in areas of economic activity which may on first sight be thought the monopoly of the industrial heartland of Britain. One of the requirements for the success of this strategy was entrepreneurial flair, so to the extent that industrial survival was secured by specialisation it would seem that Victorian Devon had not lost the spirit of initiative which was detected for an earlier period in chapter 2.

¹ Foundry Journals 1861-9

² C.McCombe, 'The end of an era: the closure of Bodley Brothers and Co.Ltd., Exeter', Foundry Trades Journal, 30 Mar.1967

³ Foundry Journals 1861-9, 1903-7, G.H.Lowe, 'The Bodley Iron Foundry 1860-1940', Univ. Exeter Dept.Ec.Hist. (1969)

⁴ E.Edgcumb-Edwards, 'Devon Industries', VCH Papers, passim

Attempts were made in many fields to stay abreast of the times. Devon was one of the first parts of the country to experiment with hydro-electricity after the spread of electricity from 1880 onwards. Between 1881 and 1894, of 9 stations in England, 3 were built in Devon, at Okehampton, Lynton and Chagford, to generate public and domestic lighting. Plans were also laid to supply Exeter, Plymouth and Tiverton from similar sources.¹ The chairman of Exeter's Chamber of Commerce in 1902, the energetic H.A.Willey (who had built up one of the largest engineering firms in the south-west), even considered that the development of an automobile industry in the city was a practical possibility because gas and electricity no longer made it necessary to build on the coalfields. However, a report commissioned from a Coventry manufacturer on the project advised that such a capital intensive scheme would be a risky venture for a city which did not have a vehicle building tradition, as a skilled labour force and experienced managerial team was needed.²

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Here lay the externally imposed limits to entrepreneurial drive, representing something of the economic and geographical barriers which no amount of home grown ambition could overcome. In aggregate, the potential sources of industrial competitiveness surveyed above were left with dwindling room for manoeuvre by the self-reinforcement of industrial concentration in the core regions. Yet the external economies of scale which underpinned agglomeration on a national scale also operated, with muted force, further down the regional hierarchy. The concentration of economic activity into fewer locations occurred within Devon as well as between Devon and the rest of the nation, as shown in Table 4.13 overleaf.

¹D.G.Tucker, 'The early years of hydro-electricity for public supply in Devon' D.H., XV (1977), pp.21-32

²Exeter Evening Post 15 Jan 1902, 10 Mar 1902

Table 4.13 Spatial distribution of employment in Devon, 1851-1911

Settlement	accounting for	% of county employment in	
		1851 (% popn)	1911 (% popn)
Plymouth and Devonport		15.25	16.1
1 Ply.,Dev'p't & E.Stonehouse			27.31
Exeter		6.24	5.8
2 Exeter and Heavitree			30.4
3 Torquay and Paignton			29.7
4 Barnstaple			7.27
5 Newton Abbot			5.3
			8.68
			6.9
			7.9
			7.2
			2.16
			1.7
			1.94
			2.0
TOTAL 1-5			51.08
Other towns			47.5
Rural districts aggregate	c 70		16.38
			32.54

	1851	1911	change
Rural employment	c. 161,000	101,241	-60,089
Urban employment	c. 94,000	209,903	+115,785

Of the urban employment increase of 115,785,

Greater Plymouth accounted for	c. 50,000	43.2%
Torbay:	c. 16,400	14.2%
Exeter:	c. 9,500	8.2%
TOTAL for 3 largest centres:		65.6%

sources: Census Reports for 1851 and 1911, Appendix 1, p.265. Estimation procedures described in text. East Stonehouse (in Plymouth) and Heavitree (at Exeter) were parts of the urban structure which lay outside the County Boroughs and thus not included in the 1851 statistics.

While the presentation of material in the 1911 Census Reports makes it easy to analyse the distribution of employment around the county in that year, urban data in the 1851 Census is limited to the three County Boroughs of Plymouth, Devonport and Exeter. Nearly a third of total employment was to be found in the Plymouth urban area in 1911 -its share had nearly doubled since 1851- and just over half was concentrated in the county's five largest settlements. When manufacturing employment is considered alone the proportion rises from 51.1% to 59.5% in 1911. 35.9% was in Plymouth alone, where manufacturing employment had more than doubled since 1851, from 13,464 to 28,502. In the metal fabricating and engineering sectors (classes 6-12 in the Standard Industrial Classification) 72.8% of employment was in the five

largest towns, 58.1% in Plymouth alone, a share which had risen rapidly from only 24.8% in 1851. Metal manufacturing and engineering employment quadrupled in the city between 1851 and 1911.

The primacy of 'Greater Plymouth' owed a great deal to the Royal Dockyard at Devonport and the injection of demand it represented, even if direct linkages with industry outside the Yard were not strong. An upsurge in investment in the 1890s increased capacity and allowed huge ironclads to be built by the turn of the century.¹ This was matched by a rise in net migration to the city from around 3,000 in the 1880s to 17,000 in the 1890s,² and in the years before World War One over 10.5% of all city employment was within the Dockyard gates.³

Of equal importance was the continued strength of the city's commercial coasting and overseas trading role, which -while independent of the Dockyard- benefited from the same sheltered deep water site and strategic situation advantages which had led to the rise of shipbuilding. By the Edwardian period there were two soap factories in the city, commercial ship and boat building and engineering firms, lead, paint and brass works, Reckitt's starch and blue manufactory, extensive saw mills, flour mills, breweries and distilleries, mostly located in the Dockside areas of Devonport, Millbay, Sutton, and Cattewater. Over 500 men were employed by three major firms in manufacturing chemical manures, described as a capital-intensive industry where

'the latest mechanical appliances for increasing the output and facilitating the export of their produce have been adopted'.⁴

Being almost entirely import processing industries they indicate the importance of Plymouth's role as a medium sized international port to the wider economic structure of the city and it is likely that this base

¹Whitfeld, Plymouth and Devonport in times of war and peace, p.430

²calculated from Census data taken from tables A3.1, A3.2, pp.286-9

³Dockyard employment, 1913: 9,000, 1911 Plymouth, Devonport, East Stonehouse total: 94,597; Kellys Directory, (1914), p.502; 1911 Census, PP 1913 LXXIX (Cd7019), p.86

⁴Kellys Directory, (1914), p.494

generated the external economies of scale which increasingly concentrated Devon's industry into the Plymouth area. The combination of port and Dockyard can perhaps be seen as providing the 'critical mass' for agglomeration which enabled Plymouth to become the most important 'pole de croissance' in the West.

The obverse of this picture of industrial concentration in the Plymouth-Devonport area was that there was a massive decline in rural employment, as also shown in Table 4.13. The 1851 figure, suggesting that around 70% of total county employment was to be found in rural districts, is estimated on the basis of aggregate agricultural employment, assuming that agriculture provided 45% of rural jobs in that year.¹ Even allowing for a wide margin of error it is clear that as late as 1851 the majority of county employment was located in rural areas. In 1911, after a large absolute fall in total agriculture still provided between 40 and 45% of all rural jobs, but it seems that rural manufacturing employment fell much faster.²

The attrition of the handicraft trades by factory production has been traced in some detail by Saville³ and the Census reports provide ample evidence of this change in Devon. The 6,003 lacemakers of mid 19th century Devon had been reduced to 1,700 by 1911, the ranks of boot and shoe makers fell from 8,436 in 1861 to 2,229 by 1911, and in both of these examples, the reductions were accompanied by the concentration of the remaining workforce into larger establishments than had previously been the case.⁴ As late as 1889, when Hugh Strong visited Vaughan's Glove Factory at Torrington, gloves were still put together in the homes of women in villages for miles around,

¹ as suggested by the employment figures reconstructed for the Torrington and Axminster R.D.s in that year: PP 1852-3 LXXXVIII (1691-1) pp.356-7

² Manufacturing employment in Axminster and Torrington R.D.s = 29.9% of total 1851; 14.3% of total in all R.D.s 1911. (The figures cannot be further disaggregated in 1911)

³ J.Saville, Rural Depopulation in England and Wales, (1957), pp.20-30

⁴ Table A1.1; and see, for example, the large shoe factories set up in Crediton: J.H.Porter, 'Radical Shoemakers', D.H., XXVI (1983), pp.3-4

especially in Sheepwash, which was separated from the factory by nine miles of winding and muddy lanes, but by 1908 it was reported that the gloves were all made in the factory.¹ Outside of agriculture most of the disparate stimuli to the laggard Devonian economy emanating from elsewhere in Britain made their major impact primarily, but not exclusively, in the county's larger towns.

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While the forgoing analysis rightly concentrates on the ways in which industry in Devon adapted to compete for 'export' orders, external demand, the importance of the internal circular flow of income and demand should not be underestimated, particularly in the light of the last chapter's conclusion with regard to the survival of low level regional identities throughout the Victorian period. Strong's descriptions of industry in north Devon are prefaced with the remark that 'the area still suffers from the same basic problem of poor communications'² and while this may have imposed some strains on would-be exporters it must also have meant that it was cheaper to obtain, say, domestic furniture or machined mill parts, or tanned leather, from local factories, workshops and tanneries than it was to 'import' them from elsewhere in Britain. Because several basic manufactures may have lain beneath the threshold of economic transport costs over more than short distances the spatial confinement of multiplier effects could have set a limit to the concentration of industry into the largest settlements.

Derived demand from the agricultural sector, for example, is reflected in the proliferation of plough, tool and machine makers on a small scale in the market towns and villages of the county. It was said in 1860 that most of the implements used by north Devon farmers came from local manufacturers based in the towns, villages, and even small roadside hamlets of the

¹Strong, Industries, p.91; E.Edgcumb-Edwards, 'Devon Industries' V.C.H. Devon papers, Introduction, p.12

²Strong, Industries, p.xi

district.¹ Their numbers subsequently grew rather than diminished because they included in their ranks competitive and innovative craftsmen such as 'Dicky' Bawden of the 'Star' Plough Works at South Molton who invented and patented his own light and adaptable ploughs suitable for the heavy clay soils of the surrounding Culm Measures, and John Huxtable, who designed and made ploughs, rakes and drills to suit local conditions in the north Devon villages of Brayford and Filleigh before 1895.² There was no check to the rise in numbers of agricultural engineers before the turn of the century, and this in turn generated a demand for basic castings from foundries in the larger towns, such as Parkin's Bonhay foundry, and Vicarys of Exeter.³

The chain of derived demand could be retained within a fairly small area in the Victorian period: in the Tavistock district the rapid growth of copper mining over the first 60 years of the century created demands for pit props and pumping engines which at first could only be met from external sources. From 1848 onwards, however, Messrs. Nichols, Williams and Co. were producing steam engines in the town and replacing previous supplies from South Wales, Shropshire and Birmingham. They were also able to find their own distant markets after local copper mining went into decline from the 1860s onwards.⁴

Many of the small north Devon factories and workshops in a wide range of trades that were still dependant on water power availed themselves of the services of Garnish and Lemon, who were established millwrights and engineers at Pilton, outside Barnstaple. They in turn obtained their basic

¹ J. Mortimer, 'The agriculture of north Devon' Jour. Bath and West of England Agric. Society, VIII (1860), p.87; he went on to say that 'the implements have of late been much improved. Few districts possess a better collection of drills, ploughs, drags and harrows.'

² Strong, Industries, pp.125-33; A. Jewell, 'Some cultivation techniques in the south-west of England' in W. Minchinton (ed.), Agricultural Improvement: Medieval and Modern, E.P.E.H. XIV (1981), pp. 100, 104

³ W. Sleman, 'The battle of the ploughshares', Foundry Trades Journal 16 Oct. 1975

⁴ Goodridge, thesis, p.254

castings from Rafarels Barnstaple Foundry¹ which in 1897 had trebled in size in just thirteen years. Being dependant on a wide range of local customers the firm had developed a very adaptable fitters' department, and the plumbers and coppersmiths' shop could fabricate from brass, copper, lead, zinc and tin, as well as from iron.² Chapple's Yard, a tannery in Great Torrington, supplied dressed skins to glovemakers in the town and in Barnstaple.³ The rise of tourism stimulated the construction industry in the latter part of the century, which in turn created work for local quarries, brickmakers, heat engineers and iron founders.

Numerous firms 'internalised' these backward linkages, and directly engaged in activities ancillary to their main or original purpose. The machine lace factory at Derby, in Barnstaple, designed and made all its own equipment in a workshop powered by one 60 horse power steam engine, as did the iron foundry of Bodley Brothers in Exeter.⁴ Also in Barnstaple, the vertically integrated Raleigh cabinet works of Shapland and Petter performed all operations from sawing timber through to producing finished furniture. By building extensive wharfage and storage facilities on the banks of the Taw, and directly engaging in the timber trade, Shapland and Petter generated external economies of scale that were of benefit to other Barnstaple cabinet makers in the 1880s and 1890s.⁵

Although information on more than a handful of individual firms is sparse it is likely that the relative remoteness of Devon from the nation's major industrial centres enabled a fairly high proportion of total demand to be retained within the circular flow of income. When Strong described the Marland Brick Works in 1889 he beleived it

'worthy of remark that the fitting of the machinery was all done on the spot, 'Devon' being the motto of Mr. Ludlam [the proprietor]'.⁶

¹Strong, Industries, p.129

²Gardiner, Barnstaple, 1837-97, p.85; Strong, Industries, p.8

³ibid, pp.139-40

⁴ibid, p.27; C.McCombe, Foundry Trades Journal, 30 Mar 1967

⁵Gardiner, Barnstaple, p.83

⁶Strong, Industries, p.167

For reasons such as these it is not surprising to find the pages of Kellys Directory revealing a remarkable diversity of manufacturing activity around the county up to the eve of World War One, in many cases generating more than purely local demand. Tavistock still retained the iron foundry and engineering works which the long dead copper mining industry had called into existence a century before.¹ Only 3,000 people lived in Great Torrington but 500 were employed in making silk gloves, and of Bideford it was said that the prosperity of the town had greatly increased since the introduction of cuff and collar manufacturing, supplemented by an iron foundry and a pottery. Kingsbridge, a market town deep in the South Hams, and no bigger than Torrington in 1911, boasted a brewery, a large flour mill, an iron foundry and an implement works, and Dartmouth made paint and beer as well as ships at Simpson and Strickland's yard. Two large woollen factories survived at Buckfastleigh, supplying serge and blankets to the Navy, and this small town of under 2,700 people on the edge of Dartmoor also had a woolcombing factory, a paper mill, and two tanneries. Newton Abbot also possessed a large tannery and 400 men were employed in the G.W.R.'s locomotive repair and carriage building works.² As a manufacturing ancillary to the railway system, the establishment of the works in 1876 reduced 'import penetration' to the county, for in their absence the G.W.R. would have used similar facilities elsewhere. At Tiverton, Heathcoats lace factory employed around a thousand people in the Edwardian period.

Nor were 'new' industries unrepresented in the industrial structure of Devon's smaller towns: bicycles were built at several establishments in Barnstaple in 1897,³ and the early registers of motorcars and cycles in the county show that several enterprising engineers around Devon were assembling motorcycles by 1905. The first county register includes three 'Royal Darts'

¹For next section see Kellys Directory, (1914) under alphabetically listed individual towns

²R.Jones, A book of Newton Abbot, (Bradford on Avon, 1981), p.72; Kellys Directory, (1914), p.434

³Gardiner, Barnstaple, p.87

built by Prowt of Dartmouth, two 'Oketons' from Day and Sons of Okehampton, and two Exe Vale Cycles built by Stennor and Co. of Tiverton from parts supplied by Minerva and B.S.A.¹

Stimulative forces other than those which derived from geographical concentration were at work. While in an aggregate sense the latter was undoubtedly crucial, as shown by the dominance of Plymouth, resource advantages, cheap labour and the successful exploitation of specialist markets also played their part in maintaining and improving the level of internal and 'export' demand for Devon's manufactures. Furthermore, national economic expansion not only stoked up regional income through the 'export' demand channel, but also -when compounded with the effect of distance- may well have allowed numerous firms on the margin of competitiveness the room to survive. In this way peripheral development can be envisaged as proceeding not wholly by the replacement of the old by the new, of handicraft by factory production, of rural industry by urban, but partly by the overlaying of the old by the new.

These sources of industrial resilience explain why a number of manufacturing sectors are to be found in the upper third of Table 4.5, the 'league table' of relative growth performance.² They grew faster than the county average, and some faster than the national average, but were outliers of growth against a general background of retrenchment as imports rose and industrial concentration proceeded in the heartland of Britain. The inevitable results of this general drift can be seen in the poor relative employment growth in Devon of the industries in the lower half of Table 4.5. Here are to be found the expected victims of spatial rationalisation across Britain that accompanied the further development of the textile making, chemicals, basic metal founding, and vehicle building industries.

¹D.R.O. 2131 O/X LR6; P.A.Kennedy, 'Devon Register of Motor Cars and Cycles 1903-5' in Fisher & Minchinton (eds.), Transport and Shipping in the West

² country
see page 91 above

4.5. The Service Sector

-1-

Whatever the importance of manufacturing change in Victorian Devon, both in its own right, and for what it tells us about the process of spatial economic change, it was the tertiary sector which dominated the county's employment structure, as shown in Table 4.4. As the percentage occupied in agricultural work declined, that in service employment increased while the manufacturing share remained relatively static. Mining, manufacturing and construction accounted for 35.1% of the employment increase in Devon between 1841 and 1911, services for the other 64.9%, while in Great Britain as a whole services accounted for only 42.8% of employment growth, with mining, manufacturing and construction providing 57.2%.

Furthermore, until now all the employment data has been based on what Lee calls his Series A data, which tends to overstate manufacturing employment levels relative to services, because until 1901 enumerators grouped the specialist retailers and distributors of goods with those who manufactured the same items, and only general retailers appear in the 'distribution' sector. After the turn of the century censal data was collected in a way which allows a more accurate classification of the employment structure, with non-manufacturing workers transferred to more appropriate categories.¹ The biggest change brought about by this transfer is to reduce 'food, drink and tobacco' from 5.6% to 1.4% of total employment in Devon in 1911 by reclassifying 13,000 individuals under 'distribution', which rises from 0.7% to 9.2% of total employment. The effect of these transfers is much more serious for manufacturing in Devon than in the nation as a whole. While national manufacturing employment in 1911 is reduced by 19.1% on changing to Series B figures (and services increased accordingly), the reduction was as high as 35.6% in Devon in the same year.² The results

¹Lee, Employment Statistics, pp.30-8

²Table A1.4, p.

Table 4.14 Distribution of employment, Devon & G.B., 1911

	Series A figures			Series B figures		
	Devon employment	%	G.B. %	Devon employment	%	G.B. %
Agric., fishing	45,701	14.7	7.8	49,455	15.7	8.12
Mining, quarrying	4,141	1.3	6.8	2,439	0.8	6.23
Manufacturing	79,391	25.5	39.0	51,106	16.2	31.4
Construction	22,463	7.2	6.3	22,447	7.1	6.21
Services	142,411	45.8	33.6	173,119	54.9	41.9
Not classified	17,037	5.5	6.5	16,517	5.2	6.21
TOTAL	311,144			315,083		

source: Tables A1.1, A1.4; Lee, Employment Statistics

of this reclassification are shown in Table 4.14.

The figures in Table 4.15 below are necessarily based on Series A data, because there is no practical way of measuring the extent to which non-manufacturing jobs were included in the manufacturing employment totals before 1901, but adjustment to a Series B classification would probably only increase, not decrease the percentage of new jobs contributed by the tertiary sector. Over half of the total employment increase in Devon was accounted for by public administration, defence, transport and miscellaneous services. The six 'successful' manufacturing sectors in the upper third of Table 4.5 contributed just 6.9%. In 1908 it was reported that although

Table 4.15 Major contributors to employment growth, Devon, 1841-1911

Employment classification	emp. increase 1841-1911	% of Dev total
Public administration and defence (Defence alone)	28,141 (23,400)	21.4 (17.8)
Miscellaneous services	19,575	14.9
Transport and communications (Domestic service alone)	16,087 (13,793)	12.3 (10.5)
Food, drink and tobacco	11,084	8.4
Construction	9,896	7.5
Professional & scientific services	9,594	7.31
TOTAL EMPLOYMENT INCREASE	131,275	100.0

source: Table A1.1

Plymouth was

'to some extent an industrial place altogether apart from dockyard activities (it) is nevertheless not a great industrial centre, nor do its surroundings help it to become one, for Devonshire is not in any sense of the word an industrial county.'¹

Around three quarters of the large build up of defence forces was based in the Naval barracks of Plymouth and Devonport. Although undoubtedly constituting an important presence in the local economy it is reasonable to question whether enlisted servicemen were 'economically active'. If removed from the employment structure the rate of county employment growth between 1841 and 1911 from 62.6% to 50.7%, or by nearly a fifth. This is another testimony to the importance of direct government spending, in the form of transfer payments to servicemen, in sustaining the level of aggregate income within Devon. As far as the effect on the employment structure is concerned, Table 4.16 overleaf shows that even when servicemen are excluded from Devon's figures the underlying structure was much more firmly weighted towards the tertiary sector than the national average, despite the fact that defence forces have not been excluded from the comparative national figures in columns 1 and 4 of that table.

Even in Plymouth, with the largest concentration of industry in the county in 1911, service employment (excluding defence forces) constituted 46% of the workforce, well ahead of the Series A national figure of 33.6%, and over 16% were working in the miscellaneous (i.e. mainly domestic) service sector alone. In Exeter the service sector accounted for 52% by 1911 (on Series A data). The city's industrial heyday had ended with the Napoleonic Wars, and equipped with the amenities of a county town, it did not take long to assume the atmosphere of a relatively quiet residential establishment.² Through supplementing its long-standing domination of the county carriers trade by becoming the railway network route centre for

¹PP 1908 CVII (Cd3864), p.743

²as described well by W.G.Hoskins, Two Thousand Years in Exeter, (Chichester, 1960), pp.95-8

Table 4.16 Employment distribution without defence forces, 1911

Percentage distribution	Series A data			Series B data		
	G.B.	Devon		G.B.	Devon	
	total	total	without defence	total	total	without defence
	-1-	-2-	-3-	-4-	-5-	-6-
Agric., fishing	7.8	14.7	16.1	8.1	15.7	17.6
Mining, quarrying	6.8	1.3	1.5	6.2	0.8	0.9
Manufacturing	39.0	25.5	27.9	31.4	16.2	18.2
Construction	6.3	7.2	7.2	6.2	7.1	8.0
Services	33.6	45.8	44.9	41.9	54.9	49.4
Not classified	6.5	5.5	6.0	6.2	5.2	5.9

source: Appendix 1; 1911 Census Vol. X, Occupations

Devon, employment in transport increased faster in Exeter than in Plymouth throughout the period,¹ but for the rest it gives the impression of having been a city content with its established banks, hotels and shops, with a few workshops and small factories gathered at the foot of the hill near railway and river.

Employment in Torbay was likewise dominated by the tertiary sector and -as in Exmouth, the next largest seaside town in Devon- only about 20% of its workforce was engaged in manufacturing in 1911.² In the Torquay Municipal Borough and the Paignton Urban District 27.4% of the working population (and in Exmouth, 30.6%) were domestic servants, and these towns had ratios of domestic servants to enumerated occupiers or families that were 50% higher than the average county level in 1911.³

¹Exeter's share of county employment in transport and communication rose by more than 60%, 1851-1911, from 9.2% to 14.7%, while Plymouth's rose by 40%; derived from Census Tables, 1851, 1911, listed in Appendix 1

²Calculated on Series A figures, so the true proportion was probably 15% or less: 1911 Census, Occupations, PP 1913 LXXIX

³In the Administrative County there were 247 'other domestic indoor servants' to 1,000 separate occupiers or families; in Exmouth U.D.: 374; in Torquay M.B.: 383. Census 1911, Occupations PP 1913 LXXIX (Cd 7019), Devon, Table 25

Towns such as these came to be dominated by tourism, which was perhaps the most obvious beneficiary within the service sector of the positive stimulus of external demand. Morgan provides figures for the number of hotels and boarding houses listed in county directories, and his total rises from around 1,000 in 1856 to 3,100 by 1914. In 1856 75% of these establishments were to be found on the coast -a tenth in Torbay alone- and in 1914 85%, by which time Torbay accounted for 25% of the county total. 42% were to be found on the short length of coastline between Dartmouth and Exmouth.¹ However, such figures as these cannot take account of the vast range in size of these units of accommodation, or fluctuations in occupancy rates and the length of the season. The very nature of the trade hinders quantification. Hoteliers and guest house keepers tended to be self-employed so it is impossible to trace changes in their standard of living and in the profits of their businesses.

Direct employment in the tourist trade is also difficult to pin down, but the following figures, which include restaurant and coffee house keepers, lodging and boarding house keepers, innkeepers, hoteliers and publicans, barmen, and servants in hotels, lodgings and restaurants, can perhaps be taken as something of a guide. Only from 1861 is there enough information in the Census occupations volumes, and even then one or two elements have to be estimated on the basis of proportionality displayed in later censuses when there was further dis-aggregation. In 1861 it appears there were around 5,500 individuals employed in the occupations listed above, a total which more than doubled to 11,226 by 1911.² The seasonal nature of the trade must mean that the Census figures (collected in March or April) severely underestimate peak employment levels, but in dynamic terms the increase compares very favourably with the rise in aggregate employment

¹Morgan, 'South West England', Fig.26, p.207

²1861 Census PP 1863 LIIIIi (3221), pp.365-72; 1911 Census PP 1913 LXXIX (Cd 7019), pp.86-98

in the county of 16% between the same dates.

The combined population of the main holiday towns of Torquay, Paignton, Teignmouth, Dawlish, Exmouth, Sidmouth, Beer, Seaton, Ilfracombe, and Lynton rose from 34,441 in 1841, to 48,405 in 1861, 69,350 in 1881, and 95,386 by 1911, giving a rate of growth not dissimilar to that of the employment group shown above.¹ This 'export orientated' sector may thus have doubled in size in the half century after 1861, but that is as far as the quantitative data takes us, and for further assessment the qualitative nature of tourism in Devon must be considered.

It was founded on the patronage of upper class visitors and the history of many resorts throughout the 19th century is dominated by resistance to changes which may lower the social tone of the town, thereby dissipating atmosphere of exclusivity which attracted the aristocracy. Torquay had been the 'Queen of the watering places' since the Napoleonic Wars when, with the continent 'closed', titled visitors discovered the sheltered aspect and mild climate of the town to their liking. Doctors recommended towns like Torquay and Exmouth to their wealthy invalid patients as suitable winter resorts.² It is no surprise to learn that the plans of the South Devon Railway to extend a line from Newton Abbot to Torquay were

'strongly opposed by a respectable body of inhabitants in the town as uncalled for, and calculated to injure the place',³

but the worst fears of the 'quality' resorts, that they would be over-run with drunken hordes of working class roughs, were not realised. Long distance rail travel was beyond their reach throughout the century not least because, as on the line to Ilfracombe, fares were priced to keep undesirables out while ensuring the gentry got quick access to the resort.⁴

¹Census reports as listed in Appendix 3.1, p.282

²Hoskins, Devon, p.118

³Report of the Railway Dept. of the Board of Trade on schemes for extending railway communication in Cornwall and Devonshire PP 1845 XXXIX (89), p.201

⁴F.B.May, 'The development of Ilfracombe as a resort in the 19th century', Wales M.A. thesis, 1978, p.279

The railways did give access to the holiday resorts to middle class tourists for the first time, and in volume terms it was this which underpinned the rise of tourism in the county. The character of some towns -Lynton and Sidmouth come to mind- remained that of genteel watering places, with titled visitors and residents 'of independent means', but it was the family holiday resorts with sandy beaches and guest houses to offer, such as Paignton and Exmouth, which came to dominate the trade.

Yet the impact of tourism on Devon's economy as a whole was probably fairly limited. Visitors from outside the county were a source of invisible income (and bearing in mind their social composition this probably reached a higher level 'per visitor' than in day tripper resorts) but their money was largely spent on accomodation, food and transport. It was the hoteliers, restaurateurs and retailers who reaped the direct benefit, with some additional employment and income generated for servants, local farmers and, possibly, building firms. Linkages with manufacturing industry were at best tenuous and mostly confined to purchases of craft products, a market that Brannam's Barnstaple pottery was adept at tapping by persuading high class Ilfracombe and Lynton retailers to sell their decorated vases and ornaments during the season.¹ Circumscribed in its effect on the wider economy, tourism was probably also limited in its spatial impact within Devon for although small towns on the fringe of Dartmoor had begun to attract visitors, such as Chagford,² tourists were still largely to be found only in the coastal resorts before World War One. The rise of middle class tourism may also have helped to create, in large measure, the kind of seasonal unemployment problems which still beset many coastal resorts today.

A further intimation that the impact of tourism was limited is perhaps given by the sources of investment in the 'social overhead capital' needed by any aspiring resort in the 19th century: the hotels, assembly rooms,

¹Strong, Industries, p.59

²Kellys Directory, (1914), p.134

promenades and landscaped gardens which attracted the visitors. In many towns this would appear to have been too great a burden for the local tourist industry to bear (although it may of course be questioned whether this type of investment could in any circumstances be expected to have come from private sources) and the work was undertaken by aristocratic landlords or through 'municipal enterprise'. Thus it was Lord Rolle, of nearby Bicton, who laid the foundations of modern Exmouth in the 1860s, and Sir Lawrence Palk who was the prime mover in the development of Torquay.¹ At Teignmouth the work was undertaken by the Improvement Commissioners set up by Act of Parliament in 1836 and given powers to levy rates to finance their activities.²

Within the holiday towns tourism must have had a profound impact on economic and social life; beyond being a source of 'invisible income' in the county's trade balance it provided contacts with the rest of the country and enabled the holiday towns to enjoy a wider range of entertainments than would otherwise have been the case. The benefits of the social overhead capital of tourism were not 'internalised' within the industry. But not even Torquay could match the enormous growth of resorts such as Blackpool, Scarborough, Bournemouth and Brighton, for Devon was too far from the major industrial and population centres to attract a great volume of working class trippers. It was a source of considerable consternation to the hoteliers of Ilfracombe that their town was the exception to this rule, that it was within the reach of South Wales steamers which brought boatloads of Welsh miners and steelworkers across the Bristol Channel to disturb the town's carefully nurtured social tone.³

Employment in tourism may have doubled between 1861 and 1911, but even if the figure for 1911 quoted on page 144 above is doubled to take account

¹E.R.Delderfield, Exmouth Milestones, (Exmouth, 1948), pp.203-4; Hoskins, Devon, p.502

²J.A.Bulley, 'Teignmouth as a seaside resort', T.D.A., LXXXVIII (1956), pp.159-61

³F.B.May, 'The development of Ilfracombe', p.249

of seasonal variations it amounted to no more than 7% of the county workforce, and the combined population of the holiday towns also listed there represented just 13.6% of county population in the same year. Given that the proportion had only been 4.5% in 1841, the rise was significant, but it should be kept in perspective, especially given the speculation about limited multiplier effects made above. It was not until the inter-war or even the post-war period that tourism rose to a place of first importance in Devon's economic structure, and to treat it as a key element in Victorian development is to confuse contemporary impact with future promise.

-3-

While the rising importance of tourism to export earnings shows that not all service sectors were strictly 'tertiary' in their relationship to the dynamic of regional economic growth, there is evidence to suggest that far from being a positive response to the demands of specialisation, employment in several service occupations was of a 'residual' nature. Large numbers were employed at low productivity casual work, including the army of domestic servants, and though the evidence is thin, it is likely that most of them were poorly paid.¹ Newspaper adverts and a few household accounts do provide some examples of the remuneration of domestic servants but in the absence of any known national average rates for similar work and since they are not comparable with other occupations, little meaning can be extracted from them. In rural Devon domestic service apparently accounted for only 8% of the workforce in 1851, when there was still a substantial range of work available in the countryside. By 1911, after widespread depopulation, it was virtually the only form of employment to have increased its share, having risen to 18.4% of the total.² For many of those who were left in the

¹In 1890, when even ordinary agricultural labourers in the surrounding rural district were earning over 17s6d per week, the Corporation of Plymouth was employing night sweepers in the city at 18s. Agricultural labourers: PP 1900 LXXXII (Cd346), p.251; Plymouth Corporation Special Committee Minutes D.R.O.(P) P5/X2, p.114. See also chapter 7.4, pp.239-40.
²1851: based on Axminster and Torrington R.D.s; 1911: Rural R.D.s total

countryside it was the only available source of work by the Edwardian period. An economic survey of the South-West in the inter-war years also noted the large numbers employed in domestic service, and not least among the causes cited were the 'indications that the distribution of income was more uneven than in the country as a whole' and that there were few alternative sources of employment.¹

As a proportion of the total female workforce, domestic service was consistently higher in Devon than in Britain as a whole, and the differential tended to increase. In 1841 the proportion, at 61.7%, was 12% higher than the national rate, and by 1911, although it had declined to 55.3% of the female workforce, 39% higher.² Alternative employment to the absorptive sponge of domestic service developed slowly in Devon, and one is inclined to agree with Eric Richards that 'the domestic service sector of the Victorian economy was, in part, a form of disguised unemployment'.³

Although it is often assumed that economies with large tertiary sectors have reached a mature stage of development, in Devon it is more likely to have represented an extension into the nineteenth century of low productivity 'fetching and carrying': work that remained labour intensive because of the low opportunity cost of labour. The relatively slow development of alternative employment probably meant that more of the county's inhabitants remained in very unrewarding and unremunerative work of this sort than across the nation as a whole.

-4-

A low opportunity cost of labour may not have been without significance to the substantial rise in employment in transport, communications, public utilities, finance, and the professions, the

¹Survey Committee of the University College of the South-west of England, Devon and Cornwall: A Preliminary Survey, (Exeter, 1947), p.182

²derived from Appendix 1, Table A1.3, and Lee, Employment Statistics

³E.Richards, 'Women in the British economy since about 1700: an interpretation', History, LIX (1974), p.348

ancillary modern services associated with industrialisation which Gould differentiated from the traditional service sector that was part of pre-industrial life.¹ The expansion of these sectors, however, was not achieved simply because low wages enabled Devon to compete against external suppliers, because most of the demand for these services was not spatially transferable. Unlike in agriculture or manufacturing industry, there was no challenge of import penetration to compete with here. Insurance and financial services could be obtained from London in the age of the telegraph if need be, but gas, electricity and water had to be supplied from local sources, and transport needs could not be met without local carriers and train services. Factories, houses and public buildings could not be imported as finished products from other regions. Employment in these services was the inevitable by-product of locally retained multiplier effects of other economic activities both directly and through the consumption of individuals needing housing, basic utilities and shops.

This secondary role in the economic structure of the county probably explains why most of the service sectors are grouped around the county average in the rank order of relative employment growth vis-a-vis Great Britain shown in Table 4.5. Subject to the same rationalisation as most productive sectors in the Devonian economy, they nevertheless did not suffer relative decline at the rate of many manufacturing sectors nor grow as fast as others. They formed a wedge between the two groups, as would be expected of services meeting the perennial and, on balance, growing ancillary needs of others.

Although it is difficult to convert the employment figures into a picture of the output structure, given not only the lack of data but also the intrinsic difficulties of estimating productivity in the service sectors of an economy, it is probably reasonable to assume that the output mix of the Devonian economy was less weighted towards the tertiary sector than the

¹J.D.Gould, Economic Growth in History, (1972), p.60

distribution of employment suggests. However, this does not alter the fact that in a relative sense the county's economy was dominated by, if not based upon, the service sectors throughout a period which saw important structural changes at national level. The selective impact of external demand and the need for essential services to be provided locally have been suggested as elements in the maintenance of the tertiary sector. Its relative total size in the county economy, however, probably has more to do with the failure of the primary and secondary sectors to grow as fast as their national counterparts than with any positive growth of services, and it is possible that the survival of 'residual' low paid work accounted for the higher than average services to base ratio that this implies. Except insofar as tourism, defence and perhaps a few other specialist services were sources of invisible income, the rise of the tertiary sector was not an example of specialisation which made a positive contribution to the circular flow of income. Rather it was a rise brought about by default.

CHAPTER 5

The Balance of Payments

When related back to the circular flow of income model and the export base theory the message of chapter 4 is fairly clear, even if the changes are not precisely measurable. A diverse range of goods and services were sold to the rest of Britain throughout the Victorian period, for the complex pattern of spatial location costs and the numerous responses to wider demand conditions enabled the specialisation of activity to take a form more complicated than simple regional development theory would suggest. As some successful enterprises are to be found in the slowest growing industrial sectors an exhaustive listing of the sources of export earnings would require information firm by firm. In aggregate it would seem fair to accept the conclusion derived from the crude location quotient calculations that the contribution of these 'export employers' to the county's economy increased through time. While this export demand, supplemented by naval spending at Devonport, would have increased the county's internal income flow, imports also appear to have risen, thus limiting the multiplier impact of export earning activities.

The changes wrought in Devon's economic structure during the Victorian period having been surveyed, this chapter attempts to sharpen the focus on the point of interchange itself, the balance of payments, which emerges from the spatial demand model as being of key importance to the mechanism of regional change. Because internal trade consisted of exchanges across borders unmarked on maps and was not subject to active contemporary interest the resultant paucity of useful source material prevents this crucial element of regional economics from being satisfactorily quantified but it is possible to get further than the vague implications of the last chapter. This paves the way for the subsequent study of other parts of the mechanism of regional change.

5.1. Trade

-1-

In the mid 19th century the county's exports were dominated by agriculture, following the decline of the woollen textile industry, and these were diverse in character. While the substantial grain shipments from Exeter had largely died out by the end of the Napoleonic Wars an increase in milling facilities in Plymouth permitted significant quantities of flour to be sent coastwise to other parts of Britain.¹ The trade in arable produce was not dead by the 1830s; the surveyor of the proposed Bideford to Okehampton railway in 1831 estimated that the line would carry outwards 520 tons of wheat, barley, oats and potatoes from north west Devon,² but the largely pastoral nature of the county's agriculture meant that in terms of commodities the landward droving of livestock towards the fattening areas was dominant. The Clerk to the Bristol cattle market estimated that in 1835 two thirds of the 22,600 cattle and 126,700 sheep entering the market had been driven from Taunton and Exeter.³ In the 1840s, north Devon sheep, cattle and barley were regularly shipped across the Bristol Channel and competed strongly with local produce in the Swansea market.⁴

The export of unrefined mineral ores has also been mentioned before. In addition to copper, ball and pipe clay, barytes and other minerals, Devon's geology provided a number of building stones which were sent to other parts of Britain: the Haytor granite tramway was built in the 1820s to connect with the Stover canal, which lead to the Teign Estuary, to facilitate the coastwise shipping of granite quarried on Dartmoor.⁵ There were also extensive slate quarries around Ashburton on the southern edge of

¹Clark, Ports of the Exe estuary, pp. 124-6

²report of R.Hopkins, D.R.O. 1292M/Rlys 4; also reported in Sir R.Lethbridge, 'The Bideford and Okehampton Railway of 1831', T.D.A., XXXIV (1902), pp.168-200

³minutes of evidence on the Bristol and Exeter Railway Bill: H.L.R.O. HC Evidence Vol 2 (1836), p.111

⁴F.V.Emery, 'Contact between North Devon and South Wales in the 1840s', Devon and Cornwall Notes and Queries, XXVII (1957), p.206

⁵Hoskins, Devon, p.156

the Moor which created a substantial volume of traffic, the annual 15,000 tons of which the promoters of the Ashburton, Newton and South Devon Railway believed would be transferred to their line. Their analysis of the goods traffic of the area shows that this fairly small district exported a variety of goods in the mid 19th century, and, more significantly, that as well as low value to bulk raw materials, stone and agricultural produce, they included woollen cloths, leather and paper:¹ an illustration that Devon was still in a position to export basic manufactures at this time.

The import trades were dominated, by volume at least, by basic necessities which were not available within the county, particularly coal, and culm for limekilns.² It is not surprising to see contemporaries list manufactured goods prominently among the imports, including copper and tin goods from London and the north, and unspecified 'Manchester wares' but probably of more significance were the semi-manufactures. An Exeter merchant giving evidence to the Select Committee on the Bristol and Exeter Railway Bill in 1836 stated that the main items imported from Bristol were 'iron in bars, casting and sheet iron, and hoop iron, and boxes of tin, bricks, stone, ware and glass bottles'³. In other parts of the county, it also seems that unfinished or semi-finished goods were imported to supply manufacturing establishments, thereby limiting the import penetration of finished goods in the pre-railway era. Hides and bark were imported to the leather making areas of South Devon and timber was brought into the shipyards of the north and south coasts.⁴ The 'shop goods' and 'general cargoes' of harbour import records are rarely broken down further but the more detailed list given in Hopkins' report on the district through which his line from Bideford to Okehampton was to have passed gives an idea of the range of groceries and other goods which were brought in to supply this one part of north Devon.

¹D.R.O. 924M/B1/2

²Clark, Ports of the Exe estuary, pp.137-9

³H.L.R.O. HC Evidence 1836 Vol. 2, p.61

⁴D.R.O. 924M/B1/2; A.Grant, 'Some Barnstaple sailing ships of the mid 19th century', T.D.A., CIII (1971), pp.133-45

They included 500 tons of iron, 200 tons of salt, 100 tons of sugar, 50 tons of soap, 50 tons of porter, wines and spirits, 50 tons of cheese, candles, pepper, fruit, seeds, starch, tea, tallow, vinegar, ironmongery, grates, nails, shot, tin, wire, lead, white lead, hops, leather, oils, paints and vinegar.¹

-2-

While illuminating with regard to the composition of Devon's trade this does not reveal much of the scale of transactions in each direction. Unfortunately the records of transport operators which are of some use in measuring the volume of trade reveal little of its composition. In this respect, the Bristol and Exeter Railway traffic register of 1853 is typical. All it enables us to say is that a greater volume of goods was carried westwards into the peninsula than was carried out: in the first half of 1853 Devon's deficit on merchandise trade was 8,286 tons, its deficit on mineral trade was 19,909 tons, while 14,709 head of livestock were sent out eastwards.² This general state of affairs was unchanged a decade later when J.C.Wall, Goods Manager of the B.E.R. stated that

'the traffic of the Bristol and Exeter, and the West of England Railways generally is a traffic going westwards as to general merchandise, and we depend, to a great extent, on the carriage of cattle for the return journey.'³

The B.E.R. had encouraged a switch to the dead meat trade, and had erected slaughter houses at Tiverton station for that purpose, and it had led to a fall in the price of mutton in Bristol from 10d. to 7d. per pound.⁴ This may help to account for the apparent failure of the trade in cattle to reach the company's 1836 projections by 1856, in which year 12,853 cattle were carried. Even if the actual (rather than the expected) traffic of 1835 is considered, when roughly 15,000 cattle entered Bristol market from the

¹D.R.O. 1292M/R1ys 4

²P.R.O. RAIL 75/121; see Table A2.2, p.274

³PP 1866 XVI (427) Select Cttee on Trade in Animals, minutes of evidence, p.536

⁴ibid, p.537

South-west, the railway appears to have performed badly.¹ The number of sheep had risen from the 85,000 driven from Devon and Somerset in 1835, to 118,420 on the B.E.R. in 1856 but this represents growth of less than 2% per annum. There is little doubt, as chapter 4.3 concluded, that in the long run the railway provided the essential link which allowed Devon's agricultural exports to expand but it would appear that this growth was sluggish until at least the 1850s. The railway itself was apparently unable to directly generate a great change in the fortunes of the Devonian agricultural economy.

The signs are that the deficit on merchandise traffic remained. In the November-January quarters of 1874/5 and 1875/6 the B.E.R. received 12,420 tons of goods from the Midland Railway, but sent only 6,700 in return.² Net merchandise imports to Devon by rail were 16,572 tons in 1853, and had risen to 93,607 tons on the G.W.R. Devon network fifty years later, an increase of around 8% per year.³ The return trade in livestock could not hope to match this volume growth, let alone the probable value growth, although on the main line eastwards from Exeter the number of beasts apparently doubled, from 31,490 to 64,500 over the same period of time.⁴

Consideration must also be given to coastal traffic in any attempt to make even a vague and tentative estimate of the internal trade balance, using the Navigation and Shipping Returns. The number of years for which figures on imports and exports are shown in Table 5.1 is limited to those for which sufficient information is available for the railways. For coastal trade 1913 is preferred to 1903 as the collection of statistics was revised

¹H.L.R.O. HC Evidence 1836 Vol. 2, p.111

²J.Allport, evidence to the Select Cttee on the G.W. and B.E.R. Bill, 1876, P.R.O. RAIL 1066/353, p.110

³The presentation of statistics in P.R.O. RAIL 266/44-54 is by means of showing goods received at, and forwarded from each station, so while it is not possible to determine the origin and destination of consignments the figures net out to show the balance of imports into Devon.

⁴As mentioned before, in chapter 3, this may to some extent understate the growth of traffic given that much of the north Devon livestock which travelled on the line in 1853 is likely to have transferred to the Barnstaple-Taunton line after 1875.

Table 5.1. Visible Trade Volumes and balance, Devon, 1853-1913

TOTAL TONNAGE (Merchandise and minerals) CROSSING COUNTY BOUNDARY

	Coastal shipping	Foreign and colonial trade	Railways	TOTAL
1853	1,054,840	178,574	100,000	1,333,414
1856	853,194	161,693	156,000	1,170,887
1875	1,208,058	215,273	517,000	1,940,331
1903	1,825,196	352,635	819,000	2,996,831
1913	1,703,420	c.350,000	1,070,000	3,123,420

	'EXPORTS'	'IMPORTS'	BALANCE
1853	449,957	883,457	-433,500
1913	999,616	2,123,803	-1,124,187
1853-1913:	x 2.22	x 2.4	x 2.59

sources: Navigation and Shipping Returns as listed in App. 2.2;
 1853: P.R.O. RAIL 75/121; 1856, 1875: Railway Returns, (see Table
 A2.1, pp.272-3; 1903, 1913: RAIL 266/44-54

in 1907 to exclude vessels clearing in ballast. It is not worth making the assumptions necessary to include the L.S.W.R. goods traffic as the marginal difference this would make to the outcome would be swallowed within the wide margin for error which unavoidably accompanies the fact that the registered shipping tonnage figures cannot be taken to represent the true volume of imports and exports more than most approximately.

Table 5.1 reveals the expected picture of a large and growing deficit in the overall volume trade balance between Devon and the rest of Britain. Comparisons already drawn, in chapter 3, have suggested that the volume of trade grew roughly as fast as the internal trade of the whole country and it would seem that the import component of that volume grew faster than the export component, thereby exacerbating a physical deficit which was already large by the early 1850s. Even if these figures were known to be accurate their usefulness would be severely circumscribed by the fact that they aggregate into one sum the immense variety and changing proportions of the constituent commodities of Devon's trade with the rest of Britain; and knowing the latter would be only the first step towards arriving at a

'current account' balance of trade in value terms.

Devon's exports to the rest of Britain and the world undoubtedly remained dominated by agricultural produce, stone, mineral ores, clay and other basic materials although the specialised manufactures mentioned in chapter 4 cannot be discounted. The L.S.W.R. took finished lace from Barnstaple to Nottingham in the 1880s and also consigned Torrington gloves to London, 'from whence they are dispersed to the markets of the civilised world'.¹ The aggregate benefit of all these trades and others is reflected in the apparent doubling of the volume of exports between 1853 and 1913 shown in Table 5.1. On the main line east of Exeter merchandise imports rose by 3.9 times between 1853 and 1903, but exports still managed to increase by 2.6 times,² lending credence to the suggested increased importance of 'export employment'.

The import trade, however, was always much more concerned with finished goods and coal. Given the rise of the mechanical engineering industry it is likely that as the century progressed the relatively high amount of semi-manufactures imported in the 1830s was increasingly replaced by finished articles. The Garton and King Iron Foundry in Exeter gave up basic ironfounding in favour of buying in standardised sheet metal from the Midlands at some time during the Victorian period.³ At Sticklepath, the Finch Brothers Foundry continued to make a wide range of agricultural and mining edge tools but they also became agents for the sale in Devon of American axes and hay forks.⁴ In the South Devon fishing port of Brixham nets were made entirely in the town in 1837 by retired seamen and their wives, from spinning the hemp to finishing the nets, but in 1906 it was much cheaper to buy completed factory made nets from Belfast.⁵

¹Strong, *Industries*, pp.25,97

²P.R.O. RAIL 75/121, RAIL 266/44-54

³M.Eisenstadt, 'The Garton and King Iron Foundry, 1860-1900', Exeter Univ. Dept. Economic Hist. extended essay, 1979, p.24

⁴Barron, *Finch Brothers Foundry*, p.32

⁵W.H.Thornton, 'Concerning some old habits and decaying industries formerly prevalent in Devon', *T.D.A.*, XXXIX (1907), p.171

Coal, which must have comprised at least 50% of the import volume in 1853 and 40% in 1913,¹ had a very low value to bulk ratio, certainly much lower than that of the agricultural produce Devon exported. It is safe to assume, however, that the unit value of the non-coal imports (which in volume terms must still have been greater than the whole export total in 1913, if not in 1853) was well in excess of the unit value of exports. The implication for trade values to be drawn from this is that the value deficit was even greater than the volume deficit, and probably grew faster.

A large and increasing deficit is thus suggested for the 'current visible' balance of payments. Salient points raised earlier in this chapter and chapter 4 show that there may well have been compensatory surpluses on 'invisibles', such as those earned by the provision of shipping and distribution services.² The tourist industry would have made an increasingly important contribution down through the Victorian period in this respect, and mention should also be made of the 'externally derived' incomes of those who retired to Devon in this period, whether their income was earned on private capital built up and invested elsewhere, or came in the form of Naval and other pensions. Nor should the possible contribution of remissions by emigrants be ignored, although these are even less amenable to quantification.

As with visible trade, the net balance on these items cannot feasibly be estimated, let alone measured. But given the qualified interpretation of the impact of tourism in the last chapter, and the probability that this was nevertheless one of the most important contributors to 'invisible' income it would perhaps be reasonable to suppose that any surplus under this heading could not have gone far towards overhauling the deficit on 'visibles'. It remains to be seen whether the balance of transactions on the 'capital account' could have made any contribution.

¹ judging from the rough percentage of imports accounted for by coal 1867-96:

see Table A2.5, p.280

² Craig, 'Shipowning in the South-west', p.33.

5.2. Capital movements

While a vital element in the regional accounting framework, the capital account is about more than book balancing. Accordingly the analysis broadens from a survey of the exchange of goods and services to include changes in the spatial distribution of productive resources. The rest of this chapter seeks to identify the outline of inter-regional capital movements, and the next portrays the major trends of labour migration to and from Devon in the Victorian period.

-1-

It was seen in the introduction that the direction of balance of capital flows between core and peripheral regions during industrialisation is part of the dispute between those who have argued for optimistic and pessimistic views of development prospects on the periphery.¹ On the one hand, the potential for resource exploitation on the periphery is seen as likely to establish a capital inflow. On the other, it is argued that opportunities for investment continue to be located mostly in the established core regions, leading to disequilibrating capital outflows. The latter case would appear to have more to commend it. It is now generally accepted that not least among the means of financing the industrial revolution was the transfer of capital resources from areas of surplus, including the agricultural south, to industrial growth areas such as South Lancashire.² But the issue obviously requires more discussion than this for over a long period of time there would undoubtedly have been substantial changes in savings and investment ratios which could have affected the capital balance in space, and these are worth some consideration. It is probably not unfair to assume that as percentages of regional income both investment and savings were smaller on the periphery than on the core, with

¹see chapter 1, pp.8-9

²P.Mathias, The First Industrial Nation, (1969), p.174

savings greater than investment, though possibly not by a great deal in absolute terms. If these proportions had remained fixed, then as the peripheral economy grew (which it clearly did in Devon's case, even if not at the same rate as the nation as a whole) the absolute capital outflow will have increased. But it is likely that as the economic structure changed so too did 'S' and 'I' as proportions of 'Y'. Savings can be expected to have risen, if the original proportion was particularly low, but the investment proportion may well not have increased by the same amount, bearing in mind that we have already seen that a high proportion of employment increase in Devon was in the relatively labour intensive service sector. In a strict neo-classical model this would have worked through to lower incomes and an equilibratingly lower savings ratio, but this ignores the fact that average incomes rose during the Victorian period. If the gap between the savings and investment ratios was maintained in this way, peripheral development would indeed have been accompanied by an increasing outflow of capital resources both absolutely, and relative to the size of the regional economy.

Attempting to confirm or deny this hypothesis and identify noteworthy features of Devon's experience is difficult. Enough problems have been encountered by others in trying to reconstruct the pattern of change in the capital stock and investment at national level, let alone trace the levels and direction of capital transfers between sub-national economic or administrative units. In dealing with internal trade it was found that although it was impossible to reconstruct the vital direct economic parameters and indicators, it was at least possible to infer with some confidence from what could be learnt of the activities of the companies and institutions involved. Unfortunately, few of the institutions most closely attached with the business of capital management and movement, of which the banks are the most obvious, have left suitable accessible documentation for this approach to be satisfactory. The Devon Record Office's holdings of

banking records consists mainly of banknotes and the account books of private individuals rather than the archives of banks themselves.¹ In any case, the activities of the banks alone are less representative of all capital movements than the railways and coastal shipping movements are of internal trade. Other less formal and therefore less documented media of capital accumulation and deployment probably operated quite differently to banks, yet may well have been of equal or greater importance than the banking sector as functionaries in the capital structure. Investment by agricultural landlords is a good example.

With reference to the direct measurement of the capital stock, it may be thought that rateable values may provide a good proxy, but these assessments were clearly biased towards agricultural property.² Attempts at this sort of estimation for individual industries, let alone for the whole regional economy are also fraught with difficulties, as shown by Schmitz in his survey of the tin mining industry.³ On investment it is perhaps possible that enough could be gleaned from existing, if intractable, material to make judgements on investments made in certain large public utilities, a few manufacturing companies, and on the farming estates of the largest landowners. But long term investment by the owners of tens of thousands of acres -to pursue the agricultural example- cannot be assumed to be representative of the activities of the smaller landowners or the numerous owner-occupiers resting on the resources of perhaps 200 acres of land. It is doubtful whether many small owners could have matched the investment rate of

¹ J.H.Porter (ed.), 'The Devon Business Records Survey', unpublished calendar, D.R.O.

² gross value of property per head (taken from the Local Taxation Returns) in 1901 made agricultural P.L.U.s such as South Molton and Tiverton twice as wealthy as industrial Devonport: Weekly Mercury, 1 Nov. 1902

³ C.J.Schmitz, 'Capital formation and technological change in south-west England metal mining in the 19th century' in W.Minchinton (ed.), Capital Formation in South West England, E.P.E.H. IX (Exeter, 1978), p.25

30% of rental income reached on the Rolle estates during the 1870s and 1880s.¹ Moreover, it is likely that much investment may still have taken a non-monetised form in the Victorian period, as, for example, when a farmer spent some of his labour-time building a shed or clearing a field of stones. While not directly analagous, it is worth noting in this context that up to a quarter of India's capital investment in the post-war period is estimated to have taken a non-monetised form, thus posing enormous problems for precise quantification.²

Because of our interest with the spatial dimension of capital accumulation it is worth pointing out here that where there was non-monetised investment both the accumulation and deployment of capital resources took place without any spatial transfer. Indeed, investment does not have to be non-monetised for this to be the case. Not just in agriculture, but in other areas of the economy, direct investment out of internal resources obviously meant that capital movements were retained within the region. There is good reason to believe that this was a significant feature of Devon's capital structure during the period in question. At national level the financing of investment was often undertaken out of the retained profits of firms in many industries and there is no reason why this should not have been the case in Devon. Moreover, it is probably fair to assume that proportionately fewer of the capital projects undertaken by manufacturing firms in Devon would have involved large indivisible commitments likely to require external finance.³

If company structure is considered, it seems that even late in the 19th century partnerships were more common than limited companies,⁴ and since partnerships tended to rely more on personal resources and contacts

¹calculated from estate accounts collected for the Royal Commission on Agriculture, PP 1896 XVII (c8125).

²Gould, Economic growth in History, pp.123-4

³on the assumption that capital-intensive heavy industry was under-represented in the county's employment structure.

⁴Strong, Industries of north Devon, Kelly's Directory, (1914), passim

than did publicly quoted companies this may well have tended to circumscribe the spatial field from within which investment funds were drawn. There are also examples from within Devon of manufacturing or trading firms setting up their own private banks in order to attract and make use of local savings.

Gill, Rundle and Co. of Tavistock are a case in point. In the early 19th century they dealt in timber, coal and ironwork, and developed banking operations which undoubtedly resulted in local savings being lent to the local mining industry, with which they had close connections.¹ The prosperity of the local shipping industry in Brixham induced Green and Vittery to set up a bank in connection with the fishing trade in the 1830s. It survived for nearly half a century before being taken over by the Devon and Cornwall Banking Co. in 1875, as amalgamations began to increase.² When the Honiton Bank closed its doors in 1847 a number of firms in the area failed³ so again it would appear that a small private Devon bank was acting as a mechanism linking local savings to local investment and thus retaining capital movements within the county. Armstrong suggests that these banks displayed no small amount of resilience in the face of the trends towards joint stock banking: private bank offices increased by 13% in number in the nation as a whole between 1860 and 1880, but by 84% in Devon.⁴

Furthermore, much 'social overhead capital' was funded from local sources in one way or another: as foundation stones all over the county testify, many urban public buildings and improvements owe their existence to the 'munificence' of some local landowner, in all probability drawing on the rental income from estates in the same area. The provincial newspapers

¹ R.M.L.Cook, T.A.P.Greeves, C.C.Kilvington, 'Eylesbarrow (1814-52): A Study of a Dartmoor Tin Mine', T.D.A., CVI (1974), p.167

² C.E.Hicks, 'Early Banking in Brixham', T.D.A., LXXXIII (1951) pp.205-11

³ E.F.P., 20 Apr. 1848

⁴ N.L.Armstrong, 'The Development of Banking in the South-Western Counties in the 19th century with particular reference to Devon and Cornwall in the period 1840-90' unpublished London Ph.D thesis, 1937, p.32

of the time show that many public utilities and buildings were financed by local subscriptions, or through rates if organised by a Local Board or other municipal authority, another form of spatially circumscribed capital accumulation and deployment.¹ It is also interesting to note that the Exeter newspapers habitually listed the current prices of the stocks and shares of local companies throughout the period. The quotations included manufacturing concerns as well as utilities, perhaps implying that even when South-Western companies were publicly quoted, a significant proportion of their equity was held by people who lived in the same area. Profits which were surplus to investment needs were often held by firms in the form of local property.² Holding profits in bank accounts may well have amounted to an 'export' of capital. Just as a fair degree of 'internal retention' was detected in Devon's circular flow of income, so too does it seem that a similar pattern operated on the capital account.

-2-

Clearly there was also a stimulus from the external investment resources which flowed into the county to finance economic activity in a number of areas, in many cases linked with the external sources of demand which boosted Devon's income flow. There can be no doubt that a substantial proportion of the capital invested in the various branches of Devon's mining industry came from outside the county. The value to the national and international economy of Devon's ores and clays made their exploitation a sound investment. Chapter 4.4 has already described the interest shown in the mineral value of Exmoor by iron companies based in South Wales, an interest -and associated investment plans- that waxed and waned with the price of iron ore. Mention has also been made of Devon Great Consols, which mined copper from the extremely productive lodes between Tavistock and the

¹see chapter 4.5, p.147

²as was the practice of Brannam's Pottery of Barnstaple: Brannam, A Family Business, p.10; and to take a quite different example, Messrs. G.&C.Finch, Exeter wine merchants in the 1880s: D.R.O. D7/101/5, 930/11

Tamar Valley.¹ A Devonian, Josiah Hitchens, was responsible for developing the company's physical operations but his five partners in the firm in 1844 (the year of its foundation) were all London and Essex stockbrokers.²

In some areas of manufacturing, where mechanisation had failed to take care of particularly intricate assembly operations, there is evidence of capital inflows to Devon to reap the benefits of cheap labour. Vincent, from Yeovil, and Duncan, a Manchester calico dealer, set up as collar manufacturers in Bideford in 1870 for precisely these reasons; industrial unrest and high wages were making the trade unprofitable in London. They were obviously attracted by the willingness of the wives and daughters of Bideford and Appledore seamen to work at very low wages, compared to London or Manchester. This state of affairs was interpreted in true Victorian spirit by Hugh Strong, whose opinion it was that as far as Appledore was concerned, 'capitalists never bestowed a greater blessing upon labour'.³

External investment was also made in Devon's transport infrastructure to benefit external interests. During the 1830s the Bristol and Exeter Railway was seen as the means by which Bristol's market area could be extended into the south-west peninsula so it is not surprising to find that of the £1,292,600 share capital subscribed for by March 1836, 61.4% came from residents of that city, and a further 16% from London, already connected to Bristol by rail.⁴ Only £19,000, or 1.5% of the total, had been subscribed by Devonians. The size of this share suggests that there was something of a capital famine in the county. To ascertain whether this was the case, and whether in fact Devon attracted a net inflow of capital (being a less developed part of a maturing industrial economy), requires a closer look at savings and the mechanism by which they were tapped.

¹ see chapter 4.4, pp.123-4

² Goodridge, 'Devon Great Consols', pp.228-9

³ H.Strong, Industries of North Devon, p.77

⁴ Votes and Proceedings, House of Commons 1836, p.461-3

It is possible to draw some tentative conclusions as to the relative level of savings thanks to the work of Armstrong, on banking, and Parsons, on the standard of living.¹ If the number of banking offices is any guide it would appear from figures collated by Armstrong that the level of savings in Devon was not lower than the national average but may actually have been higher. The number of people to each banking office in 1844 was found to be 16,627 in England and Wales, but only 11,114 in Devon, and in 1860, 16,287 in England and Wales, 12,175 in Devon. The discrepancy remained until at least 1890.² Evidence such as this is naturally far from conclusive unless due account is taken of bank office sizes, and it would seem from the number of small private banks which were run as a part-time activity by solicitors that the average size of banks in Devon could well have been below the national figure.³

That there was an absolute increase in banking facilities (and, by implication, savings) cannot be in much doubt; Pressnell believed that farmers became substantial users of banking services during the Napoleonic Wars and that more of them 'developed the habit' in the second quarter of the century.⁴ It does seem, from the figures given by Parsons and Armstrong on savings bank deposits, that savings among people of modest means were relatively high in Devon. Savings Bank deposits per head of population were £2.80 in November 1844 and £3.16 in November 1860, rates which are stated to have been well above the national average.⁵ Agricultural labourers cannot be expected to have figured amongst the ranks of the rural savings bank

¹Armstrong, thesis; S.R.Parsons, 'The Standard of Living of the working class in the south-west of England during the Industrial Revolution 1750-1850, with special reference to the county of Devon', Exeter M.A. thesis, 1977

²Armstrong, thesis, p.126.

³Armstrong, thesis, pp.121,126; Finch, 'George Brooke of Whimble', p.18

⁴L.S.Pressnell, Country Banking in the Industrial Revolution, (Oxford, 1956), p.247

⁵Armstrong, thesis, pp.95-6

depositors although it was reported in 1868 that several villages ran benefit clubs to provide for sickness and funerals. The same authority went on to say that

'the agricultural labourer has not much chance of saving, except during those years when as a farm lad he lives and is boarded in his master's house'¹

and it is no co-incidence that prominent among small savers were domestic servants, who were also given their board and lodging and generally paid quarterly. The Devon and Exeter Savings Bank made a determined effort to tap this market, and through persuading the local clergy and gentry to act as receivers of deposits it became the second largest such bank in the country by 1830.² However, the deposits of Devon's Savings Banks, which amounted to £1,828,000 by 1860,³ were not invested locally, but were usually held in National Debt bonds,⁴ and apparently the solicitors who ran many of the small country banks also preferred to leave their surplus assets with London agents rather than seek out local investments.⁵

The message appears to be that although examples can be cited of small banks which had links with local industry, and which advanced money on a seasonal basis to farmers, the surprisingly high level of savings mobilised in Devon from an early date was channelled out of the county to be invested in London and redistributed by the national financial system. If this was the case during the early to mid-19th century when independent private banks held sway in Devon it was probably even more the case as the larger joint stock banks came to dominate banking in the area. Few of the

¹E.B.Portman, 'Report on Hampshire, Devon, and Cornwall' Commission on the employment of children, young persons and women in agriculture PP 1868-9 XIII (4202), p.121.

²Parsons, thesis, p.325.

³Armstrong, thesis, pp.95-6.

⁴R.E.Cameron, Banking in the Early Stages of Industrialisation, (1967), p.30

⁵Armstrong, thesis, p.121; R.W.Hidy, The house of Baring in American trade and finance, (Cambridge, 1949) describes how one private Exeter bank rose to international status in the 19th century; significantly, the Devonian connection was lost in the process.

remaining small country banks survived the crisis of 1878-9, and the 'nationals' strengthened their position. The Plymouth based Devon and Cornwall Bank survived until 1906, when it was taken over by Lloyd's, and Fox Fowler's Wellington Bank did not lose its identity until 1921,¹ but even these were very closely linked with national banking trends in the late 19th century.

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It is virtually impossible to arrive at a quantitative balance between the elements described above: the local circulation of savings and investment funds, external 'injections', and the outflow of bank deposits. It is an interesting exercise to arrive at estimates on the basis of macro-economic parameters, but the assumptions which have to be made inevitably lead to dubious results. A figure can be arrived at for the regional income of Devon in, say, 1890 by assuming that per capita income in the county was a certain percentage of the national average, but the only available proxy for this figure is a comparison of the wages paid in a few trades and industries. If the per capita figure was 90% of the national average² Devon's total income would have been £21.32 million in 1890.³ If the investment rate in the county was also only 90% of the national proportion - 5.7% in 1885-94 according to Deane and Cole⁴ then gross investment in Devon would have amounted to £1,094,000 in that year.⁵ There are no figures for

¹Armstrong, (1937), p.120.

²if the figures in Table 7.12, p.246, are accurate, this is an overestimate.

³Deane and Cole, British Economic Growth, p.330: income per head UK 1890 =£37.48. 1891 Census Devon population figure used.

⁴ibid, p.308

⁵Estimates can be made for agricultural investment in the same year, using estate accounts collected for the Royal Commission on Agriculture PP 1896 XVI (c8125). These suggest that a figure of 18s./acre can be used to generate an estimate of gross rental value for Devon's cultivated farmland. Re-investment at a rate of 15% of rental income (low compared to actual proportions on the large Rolle estate) gives an agricultural investment level of £160,580, which would be a not unreasonable 15% of 'total county investment'. While as tentatively based as the general investment figure, the independent sources used to estimate agricultural investment suggest that the latter figure is not without corroborative value.

total savings to set against this guess at the investment level, only estimates of bank deposits made by Armstrong. We can estimate stock, but not flow. In 1890 Post Office and other savings bank deposits in Devon stood at £2,842,000, and Armstrong suggests that total bank deposits amounted to at least £5,500,000.¹ Bearing in mind that a significant proportion of total county investment must have been made outside the banking sector, mostly in the form of recycled profits and perhaps share issues, it is quite possible that annual savings could easily have outstripped investment in the late Victorian period. This conclusion is supported by the discussion of theoretical points earlier in this chapter.

In theory, the relative interest rate differential between Devon and the nation as a whole should give a reasonable indication of the balance of capital flows, but again, it would require a great deal of work to arrive at a series of meaningful estimates which take account of all the varied conditions which affect the 'true' rate of interest. Regional interest rate differentials were not so much a subject for discussion among contemporary statisticians as the wages of agricultural labourers and others, and there is consequently little secondary material to work on. Armstrong postulated that 'deposits were plentiful and rates low', and that in the mid-19th century the rates paid to depositors may have been as low as 1% per annum, only rising above 3% to stave off a 'run'.² This implies that there was a net capital outflow from areas of low interest rates such as Devon. Yet even if the differential could be easily measured in this period it becomes of increasingly doubtful value because, as Minchinton has observed, local interest rates came to be more closely correlated with changes in the London market as the banks became more closely integrated with the national financial system.³ Capital was still transferred between regions, but because its

¹Armstrong, thesis, pp.92-3.

²Armstrong, thesis, p.115.

³W.Minchinton, Introduction to Capital Formation in South West England, pp.7-8.

price tended to be evened out in space by increased market efficiency, its movement would have ceased to be picked out by interest rate differentials.

It follows, of course, that if Devon's 'capital account' was in deficit there would have been some net gain to county income to bolster the 'current invisibles' account. Perhaps the most obvious manifestation of this was the expanding class of retired and leisured people mentioned in previous chapters who appear in the census schedules of quiet seaside towns as being of independent means. As they were subject to income tax under Schedule C - 'in respect of annuities and dividends', it would have been possible to make some quantitative assessment of their importance to county income, but for the failure of otherwise detailed Inland Revenue reports to provide the necessary information.¹ However, even with the inclusion of interest income earned on capital accrued and invested wholly outside the county it is unlikely that the inflow on this account could have overhauled the continual capital outflow which Devon appears to have suffered during the Victorian period.

¹For example, the Supplement to the 24th Report on the Inland Revenue, PP 1881 XXIX (c2979), pp.429-89, gives county by county statistics on assessments under Schedules A, B, and D, but no more than a summary figure for Schedule C.

CHAPTER 6

Population and Migration

-1-

Although it is impossible to set any figures upon either of the calculations it does appear that both the 'current account' and 'capital account' of Devon's trade balance with the rest of Britain were in deficit in the Victorian period, and that the deficit may well have grown in absolute terms, perhaps even as a proportion of regional income.

A state of permanent deficit may be thought to be impossible; basic accounting procedures demand that the books balance somewhere. However, while this is necessary for an equilibrium level of regional income to be maintained it is possible to conceive a situation in which this equilibrium was never reached. Because a trade and payments deficit amounted to the leakage of demand from the county there were inevitable tendencies towards shrinkage of Devon's level of economic activity. But because this occurred against the background of an ever-expanding national economy the shrinkage was more likely to be relative rather than absolute, and the trade flows and balances were themselves also subject to continual change. As Devon's economy adjusted to a payments deficit in one period external influences continued to act upon imports and exports in such a way as to 'renew' the deficit.

In such a fluid environment the analytical pursuit of the type of short-term equilibrium which features in abstract macro-economic modelling has little point. As it cannot be expected to have existed, the failure of the financial accounts to balance does not signify an inconsistency in the calculations, but rather points to the need to search for 'equilibrium' at a deeper level. If it is thought of as a stable balance in the relationship of core to periphery, the 'accounting' framework expands to include physical transfers beyond the financial book balancing which underpins the conclusions of the last chapter with regard to capital movements. Under

pressure of a trade deficit, and demand 'leakage', the peripheral economy adapted itself to the core by continuing to rationalise its structure and aggregate level of activity.¹ In an accounting sense the 'permanent trade deficit' was thus part of the mechanism by which production continued to be concentrated at the core at the expense of the periphery. Factor flows obviously played a large part in this apparent spatial concentration; it has already been seen that net capital movements probably exacerbated the 'financial' or 'demand' imbalance, but on the face of it labour movements can be expected to have had the opposite effect on the general equilibrium. In the changing balance between core and periphery, labour migration can perhaps be seen as the 'balancing item'.

That Devon experienced net out-migration over the Victorian and Edwardian period has already been mentioned, in Chapter 2, and is perhaps implicit in the observation of relative population and employment decline in Chapter 4. It is now time to study the mechanics of population change in more depth, particularly insofar as they reveal the nature of migration and its causes. Whether its effects can be related back to the hypothesis outlined above is considered more fully in the next chapter.

-2-

Because activity rates changed relatively little during the Victorian period² population change broadly follows the pattern outlined in chapter 4 and Table 6.1 charts the relative decline at county level. The straightforward deduction of actual inter-censal population increases from the 'natural increase' population change over the same period gives the net out-migration figures of Table 6.2.

The migration figures are compromised by the limitations of the data collected in the early years of civil registration when births in particular

¹This mechanism is described in a slightly different way by E.A. Robinson, 'Location Theory, Regional Economics and Backward Areas' in Robinson (ed.), Backward Areas in Advanced Countries, (1969), pp.16-7

²see Table A1.1, p.266

Table 6.1. Population change in Devon, England & Wales, Great Britain.

-1-	-2-	-3-	-4-	-5-	-6-	-7-
Year	Population of Devon	% growth	Eng.&Wales % growth	3/4	Devon % of E.&W.	G.B. % growth
1801:	338,398				3.73	
1811:	378,706	11.9	13.9	0.86	3.67	13.6
1821:	444,193	17.2	17.3	0.99	3.67	17.0
1831:	494,150	11.2	15.6	0.72	3.53	15.2
1841:	532,865	7.8	13.8	0.57	3.34	13.3
1851:	567,465	6.5	12.9	0.5	3.16	12.6
1861:	584,803	3.1	11.9	0.26	2.91	11.1
1871:	601,634	2.9	13.3	0.22	2.64	12.8
1881:	602,771	0.2	14.3	0.01	2.31	13.8
1891:	632,019	5.0	11.7	0.43	2.17	11.1
1901:	662,343	4.8	12.1	0.4	2.03	11.9
1911:	699,388	4.7	10.8	0.44	1.94	10.2

As published figures of Registration or Administrative County population sometimes fail to take account of boundary changes, the figures in column 2 have been aggregated from individual parish totals to ensure an unchanging area of coverage. The complete list of parishes is given in Appendix 3.1. National figures are taken from Mitchell and Deane, Historical Statistics, ch.1, Tables 10-11, pp.29-37

Table 6.2. Population change and net out-migration

-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Years	England & Wales % Pop. growth	Wales N.I. rate	Devon % Pop. growth	Devon N.I. rate	Devon Net Migration	Mig. Rate	M.R. (un- rev.)
1841-50	12.9	12.9	6.5	12.0	-29,237	-5.49	-3.37
1851-60	11.9	13.8	3.1	11.5	-47,637	-8.39	-6.91
1861-70	13.3	14.0	2.9	12.3	-54,807	-9.37	-8.32
1871-80	14.3	14.2	0.2	10.2	-60,470	-10.05	-10.05
1881-90	11.7	13.0	5.0	10.4	-33,199	-5.51	-5.51
1891-1900	12.1	11.8	4.8	8.1	-22,122	-3.34	-3.34
1901-10	10.8	11.8	4.7	7.6	-13,425	-2.03	-2.03

sources: see text; Mitchell & Deane, Historical Statistics, pp.29-37;
(column 8: migration rate calculated using un-revised natural increase figures for Devon)

were significantly under-registered. In their detailed study of English population change, Wrigley and Schofield used life tables to revise the official registered birth and death totals for England less Monmouth, and their calculations inflate the crude rate of natural increase by 21.5% in 1841-50, by 14.8% in 1851-60, and by 9.4% in 1861-70.¹ These ratios have

been applied to the Devon figures in columns 5-7 of Table 6.2, but the 'unrevised' migration rate (number of net migrants per year/1,000 population) is shown for comparative purposes in column 8. Since most previous work on internal migration in Britain has been based on the uncorrected Civil Registration data, when comparisons are required between Devon's experience and that of the rest of the country it is easier to use the uncorrected Devon figures than it is to recalculate the statistical basis of the national picture.

The clearest message of the table is that there was a sharp reduction in the rate at which people appeared, on balance, to be leaving the county after 1881. This played its part in the slightly better relative growth of Devon's population in the last three decades before World War One. The net exodus, which had been increasing significantly in each decade since the onset of the post-Napoleonic Wars depression,² and which was largely responsible for the virtual absence of any population growth in Devon between 1871 and 1881, was nearly halved in the ensuing decade, and continued to fall thereafter.

Further analysis requires the breaking down of these aggregate county figures in accordance with the spatial differences in employment growth and decline observed in chapter 4, broadly between urban and rural areas. Unfortunately, the presentation of censal population data, as organised into Registration Districts (R.D.s), does not make this task easy for they often included both increasing urban and declining rural parishes. For example, the Newton Abbott and Totnes R.D.s included the depopulating south-eastern fringe of Dartmoor as well as the rapidly growing resorts of Torquay and Paignton and the industrial market town of Newton Abbot. It was decided to

¹Wrigley & Schofield, The Population History of England, App.8, pp.631-7. For 1841-50, under-registration of births by 7.8% scales up to a 21.5% underestimation of the natural increase.

²Hoskins, Devon, p.99; see also Table 2.1, p.24

reconstitute the original parish population data of Devon into new district groupings of 10-20 parishes that more adequately reflect varying spatial economic circumstances. The main criteria has been to separate, as far as possible, areas of population growth from areas of decline in order that the dynamics of each may be studied separately. This division of the county was limited in only a few places, where parishes themselves included areas of both growth and decay.¹

The population trends for each district almost always represent the direction of trend of each parish within that district and Figure A3.1² shows that in the majority of cases this has been accomplished within the framework of a compact division of the county. For the large rural districts it is possible to do this while organising the parishes into more-or-less topographically homogenous groups but it will be noticed on that map that districts 5 (the Taw-Torridge estuary), 6 (North Devon coastal towns) and 7 (East Devon coastal towns) are composed of separated parts. This is the price of resorting primarily to a typological rather than topographical division of the county. It should be conceded that this in itself is open to the charge that such a criteria for division invites tautological or irrelevant conclusions, since the spatial units of measurement are not rigorously based on unchanging economic or environmental conditions.

On the other hand the charge is only partially relevant, as the main object of the exercise is to identify population dynamics, and only secondarily to relate those to their economic background. In any case, it appears to be safe in the majority of cases to discuss the local relationship of population to economy in the confidence that the districts as used here do not artificially obscure the true picture. For example, in the East Devon district it would be reasonable to suppose that a greater unity existed between the (separated) coastal resorts in terms of population

¹such as Holsworthy, a small market town with a large rural population.

²in Appendix 3.1, p.285

and economic change, and likewise between the rural parishes, than between spatially contiguous growth towns and decaying villages. There is in fact scarcely an exception to the rule that the growth districts correspond to 'urban Devon', and that the declining districts correspond to 'rural Devon', although the latter do include a number of market towns, such as Tiverton, Crediton, and Torrington, which failed to share in the growth of urban areas.

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Fig. 6.1 shows that the areas of population growth were located on or near the county's two coastlines, with the exception of Holsworthy and Okehampton -both of them small market towns and examples of large parishes where urban growth outweighed almost certain rural decline. Taken together, the chief distinction between these growing towns and the large rural areas between them is that whereas the latter reached a peak in their total population around the mid 19th century, the former went on growing through to the end of the period. The seven 'growth' districts and seven other small growth towns registering continued population growth had a combined population of 146,148 in the first census. This had risen to 266,000 by 1851, and reached 474,017 by 1911.¹ If anything, the organisation of the parish data understates the rise in the urban population, for many parishes which were affected by urban sprawl in the late 19th century (and are thus included in the growth districts) were wholly rural in 1801 or even 1851. The boundaries of 'Greater Plymouth' include the large Plympton St. Mary parish running up to the edge of Dartmoor, which cannot be considered to have been an urban parish in the first half of the century. Consequently the figure of 48,678 for Greater Plymouth's population in 1801 overstates the true size of the urban area at that date by around 10%, and thus understates the actual rate of increase over the subsequent century.²

¹see Table 6.3.

²Table A3.1. Central parishes population was 44,000 in 1801.

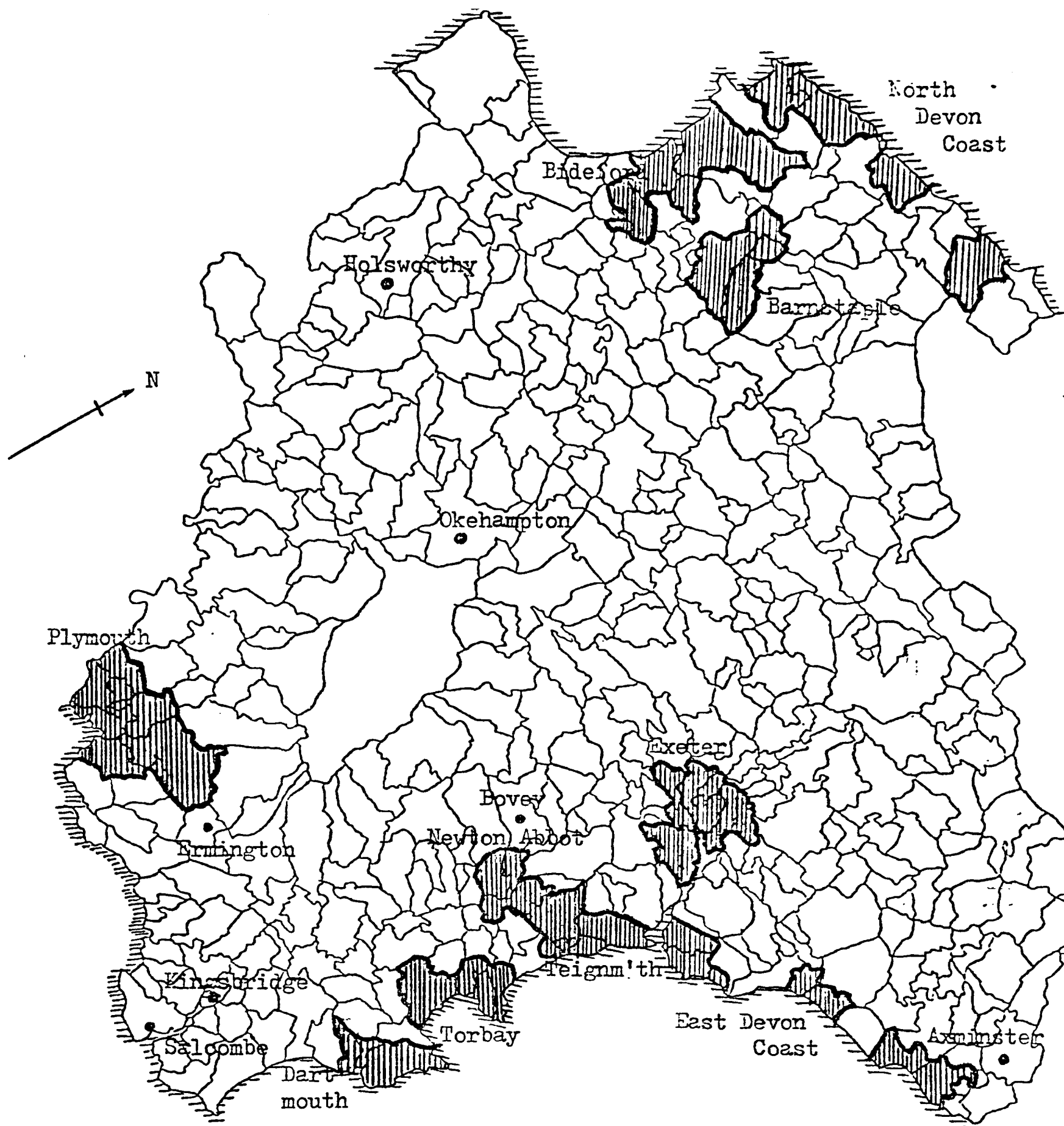


Fig. 6.1 Population Growth Parishes in Devon

-  Growth districts
- Other growth towns

Even with this downwards bias included, that rise was large enough, both relatively and absolutely, to dominate the urban population growth of the county. The inhabitants of 'Greater Plymouth' numbered 112,944 in 1851, and virtually doubled by 1911, to 220,687, an increase of 353% on the 1801 total. Population increase in Plymouth accounted for 52.5% of the total population increase of all the 'growth' districts between 1801 and 1911, and the same proportion holds for the post 1851 period alone.

Table 6.3. Districts of population growth, Devon, 1801-1911

District	1801		Index		1851		1881		1911	
Greater Plymouth	48,678	100	112,944	232	151,740	312	220,687	453		
Greater Exeter	22,546	100	45,454	202	52,165	231	64,562	286		
Torbay	10,891	100	27,385	251	48,954	449	66,089	607		
Teign Estuary	8,083	100	17,581	218	25,930	321	31,207	386		
East Devon Coast	6,471	100	13,902	215	16,127	249	23,699	366		
Taw-Torridge Estuary	11,889	100	24,072	202	26,185	220	31,511	265		
North Devon Coast	4,688	100	8,928	190	11,305	241	15,674	334		
7 other growth towns	9,924	100	15,734	159	16,673	168	20,588	207		
Growth dists. total	123,170	100	266,000	216	349,049	283	474,017	385		

source: Appendix 3.1

As Table 6.3 shows, 'Torbay' (extended to include the Dart estuary) displayed greater growth than Plymouth over the whole period, due mostly to the rising importance of the tourist industry. The growth of the 'Teign Estuary' reflects industrial and port development in Newton Abbot and Teignmouth as well as the effects of tourism. Taken together, the towns of Paignton, Torquay, Teignmouth, Dawlish, Exmouth, Sidmouth, Beer, Seaton, Ilfracombe and Lynton doubled in size in the first four decades of the 19th century, then doubled again by 1881. The pattern of growth in individual towns, especially the 'family resorts' such as Paignton and Exmouth, shows distinct increases in the rate of growth subsequent to the opening of railway links.

It is to be expected that many of the growth towns attracted a net inward flow of migrants over the same period, but it is only possible to quantify sub-national net migration trends by returning to figures for natural increase. Even then difficulties are raised because the areal divisions used in this chapter differ from the Registration District basis for enumeration of vital events. Fortunately this is not so in the larger settlements. The R.D.s of Plymouth, East Stonehouse and Stoke Damarel covered the vast majority of the population of Greater Plymouth, and likewise the crude birth and death rates available for the Exeter R.D. can be used with some confidence to construct migration estimates for the city.

However, the other growth districts of Devon fell within larger R.D.s which also included rural communities, and the environmental and population structure of these probably produced different rates of natural increase to the towns. Yet in the mid 19th century the background differences were probably not as pronounced as those between the wholly rural R.D.s and the inner urban ones. As the decades went by the growing districts would have accounted for a steadily increasing percentage of the total population of these R.D.s, so their natural increase rates would have got closer to the R.D. figures. For the purposes of this exercise then, the bold assumption has been made that the vital statistics of the R.D.s into which the growth districts mostly fall can be used to calculate tentative net migration rates for the growth districts alone. The crude rates of natural increase shown in the Newton Abbott R.D. have been used for the 'Torbay' and 'Teign Estuary' districts, those for the Axminster R.D. have been used for the 'East Devon Coast' and those for the Barnstaple R.D. have been used for the 'Taw-Torridge Estuary' and 'North Devon Coast' districts. These figures are used in the same way as before, to calculate the intercensal natural increase in population, which is then deducted from the actual increase to obtain an estimate of the net migration balance. The results are shown in Table 6.4.

Table 6.4 Migration and the 'growth' districts of Devon, 1841-1910

(1) Distribution of net migration gain 1841-1910

District	net in-migrants	% of total	district % of 1841 pop'n	net mig. as % of pop'n growth
Greater Plymouth	28,383	48.5	45.8	21.6
Greater Exeter	4,172	7.2	21.8	19.0
Torbay	22,095	37.7	10.7	48.9
Teign Estuary	2,660	4.5	7.9	16.8
East Devon Coast	1,226	2.1	12.5	11.2

(2) Gross in-migration to Devon

1851-61	1861-71	1871-81	1881-91	1891-1901
27,737	25,391	27,396	34,858	38,968

(3) Net migration balance of all growth districts

1841-50:	11,617	1881-90:	5,329
1851-60:	6,580	1891-1900:	16,306
1861-70:	-8,218	1901-10:	5,573
1871-80:	-8,516		

sources: calculated from Census Reports listed in Appendices 3.1, 3.2

In only five districts was growth strong enough to attract a net inwards flow of migrants over the second half of the century, and nearly half the total is accounted for by the Plymouth district alone. A small sample survey of Census Enumerators Schedules in 1871 and 1881 in Plymouth and Barnstaple supports the notion that Plymouth was a relatively attractive centre of in-migration.¹ Using the 'survivorship ratios' described on page 195 below, the sample suggests that gross in-migration to Plymouth was double the Barnstaple level, at 10 per 1,000 inhabitants per year, and that whereas 28% of migrants to Barnstaple came from beyond a forty mile radius, in Plymouth the proportion was 64%.

Thus the city attracted more than its proportionate share of migrants from outside the county. In 1891 22% of the total county population was enumerated in the Plymouth and Devonport Urban Sanitary Districts, but of

¹P.R.O. RG10/2112-7, 2128-9, 2182-4, 2191; RG11/2190-5, 2206, 2243-4, 2250

all Devonian residents not born within the county the proportion was 33.6%, and reached over 50% for natives of Cornwall and Ireland.¹ In many parts of Devon the in-migrants represented the first wave of the 'retirement industry', but in Plymouth the pages of the Census Enumerators Schedules record the shipwrights and engineers who had moved south-westwards from Sunderland, Birmingham and Portsmouth.²

The contribution of migration was also impressive in Torbay, given that the base population was much smaller than that of Plymouth but unfortunately the presentation of the printed Census material makes it impossible to measure the proportion of its in-migrants originating from outside the county. It is possible to estimate the gross migration flows using birthplace material and a technique described in detail later³ and some of the results are anticipated in part 2) of Table 6.4. They show a significant rise in the level of gross inwards migration to Devon after 1881 which Chapter 4.3 suggested was due mainly to economic bouyancy in the Plymouth area. With the rate of natural increase of population continuing to fall -from 12.3 per thousand in the 1860s to 8.1 per thousand by the 1890s- it would seem that net inwards migration to the growth centres of the county accounted for much, if not all, of the braking of the deterioration in Devon's relative population position vis-a-vis national figures observed after 1881 in Table 6.1.

Yet the third section of Table 6.4 shows that even in these 'growth' districts alone there was not always a healthy inwards balance of migration, for in the 1860s and 1870s the towns themselves contributed towards the high county level of out-migration. Furthermore, part 1) of Table 6.4 shows that in most of the 'growth' districts net migration gains accounted for no more than a fifth of population growth between 1841 and 1910. Not even in Torbay did this ratio exceed 50%, whereas in London, South Wales, Birmingham,

¹Census 1891, PP 1893-4 CVI (c7058) Birthplaces of inhabitants, p.213.

²St.Charles parish, Plymouth 1871; P.R.O. RG10/2112

³see pp.194-6

Lancashire, and Tyneside net in-migration was always of more importance than natural increase -and the rates of the latter were often at least as high, if not higher than in Devon's growth districts.¹ So even in the most consistently growing corners of Devon, performance in terms of aggregate population change and its components was well below that of Britain's industrial heartland.

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This qualified, predominantly urban, growth has to be set against the background of wholesale rural depopulation, a fate which also befell several of the smaller towns which were either too dependent on the fortunes of their agricultural hinterlands or too far removed from the major urban centres, or both, to avoid population losses.² Separating the 'growth' districts on Fig 6.1 lay vast tracts of countryside, the aggregate population of which reached a peak of 305,478 in 1841, having grown by 31% since the turn of the century. From this peak the 'declining' districts slumped to a total of 225,371 inhabitants by 1911, the greatest decennial loss coming in the 1870s, when the total fell by 7.7%. In 1911 the density of population in these districts, at 15.6 people per 100 acres, was almost as low as it had been in 1801.³

The estimation of migration levels involves the same process as that applied to the urban population districts, and is consequently subject to many of the same problems. Natural increase data must be taken from Registration Districts and applied to different spatial units to produce net migration estimates. However, it appears that in any one intercensal period there was not a great range of variation in natural increase rates across the rural R.D.s and if there was some kind of uniformity across the county

¹R. Lawton, 'Population changes in England and Wales in the later 19th century- an analysis of trends by Registration Districts' Trans. of the Inst. of British Geographers, XLIV (1968), pp.62-5

²such as Great Torrington, Honiton, Totnes.

³see Appendix 3.1, Table A3.1

in this way then the application of natural increase rates to only partially coterminous population districts is not likely to produce grave errors. Indeed, sample migration rates calculated directly for R.D.s in mid and west Devon (South Molton, Torrington, Holsworthy, and Okehampton) were found to be similar to those calculated for this chapter's population districts, with regard to both actual levels and the temporal direction of movement.¹

A further endorsement of this approach is provided in the final column of Table 6.5 overleaf, which compares the migration totals built up from the population district level calculations with the presumably more accurate total calculated for the county as a whole. Special problems are encountered in dealing with the 1840s, when it will be seen that the discrepancy between the two sets of figures was as large as 18.6%. Thereafter however, the totals agree to within 4%, except for the 1900s when the absolute migration total was significantly lower than in previous decades. For the 1840s, sub-county vital statistics are only readily available in the Registrar-Generals reports for the years 1841-6,² and the sixteen rural Registration Districts were combined then into eight groupings, so two sources of inaccuracy are introduced into the calculation of natural increase rates. It is possible that the implied over-estimation of natural increase in the 1840s affected the rural figures more than the urban. For the latter the data is more specific by area, and if the natural increase rate has been overestimated there, the true (higher) in-migration figure for the 1840s would exacerbate still further the apparent decline between the 1840s and the 1860s. If all the over-estimation lies in the 'declining districts' column -and it is adjusted accordingly to make the sums balance- then net out-migration from these districts would have been at around 41,000 in the 1840s, giving a migration rate of -13.4%. Using the unrevised N.I. figures, and repeating

¹see Appendix 3.2, Table A3.2, p.289

²PP 1842 XIX (423), PP 1843 XXI (516), PP 1844 XIX (540), PP 1845 XIX (727), PP 1847-8 XXV (967 and 996).

Table 6.5. Levels and rates of migration, Devon, 1841-1910

	Devon		Declining dists		Growth dists.		Growth	
	Net Mig.	M.R.	Net Mig.	M.R.	Net Mig.	M.R.	-Decline	8/2
-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-
A) Using uncorrected Civil Registration derived nat. inc. figures								
1841-50	-17,940	-3.37	-39,051	-12.78	18,537	8.15	-20,514	1.143
1851-60	-39,238	-6.91	-49,284	-16.35	10,230	3.85	-39,054	0.995
1861-70	-48,667	-8.32	-42,909	-15.08	-3,742	-1.25	-46,651	0.959
B) Using N.I. figures corrected for under-registration (1841-70)								
1841-50	-29,237	-5.49	-46,291	-15.15	11,617	5.11	-34,674	1.186
1851-60	-47,637	-8.39	-54,050	-17.93	6,580	2.47	-47,470	0.996
1861-70	-54,807	-9.37	-46,249	-16.26	-8,218	-2.74	-54,467	0.994
1871-80	-60,470	-10.05	-50,670	-18.43	-8,516	-2.61	-59,186	0.979
1881-90	-33,199	-5.51	-39,339	-15.5	5,329	1.53	-34,010	1.024
1891-00	-21,122	-3.34	-36,647	-15.06	16,306	4.19	-20,341	0.963
1901-10	-13,425	-2.03	-18,122	-7.97	5,573	1.28	-12,549	0.935

sources: calculated at population district level from Census parish data and R.D. natural increase figures.

this procedure, the 1840s 'declining' districts M.R. is likewise reduced from 12.78% to 11.9%. Thus it is possible that the sub-county figures for the 1840s can be compromised with the county total without significantly reducing the rural out-migration rate.

Columns 3 and 5 of Table 6.5 show how great the difference was between the county-wide migration rate and that for the 'declining', predominantly rural, districts alone. While for the whole of Devon the migration rate only reached 10% in the 1870s, for the depopulating districts themselves it did not fall below 12%, or possibly 15%, until the Edwardian period. Losses in the countryside were almost as heavy in the 1850s as those of the 1870s which are picked out at county level. The sharp reduction in the county-wide migration rate after 1880 emerges as a product of urban resurgence, for in the countryside population losses continued to run at a high level until 1900;¹ it is here that we find physical rationalisation most obviously at work.

¹It has been suggested by D.E.Baines, 'Labour supply and Labour Markets', Floud and McCloskey, Econ Hist of Britain, Vol.II, p.156, that PTO

Table 6.6. Migration Rates: 3 Agricultural Districts.

	1841-50	1851-60	1861-70	1871-80	1881-90	1891-00	1901-10
'Decl. Devon' M.R.	15.15	17.93	16.26	18.43	15.5	15.06	7.97
CULM MEASURES							
Initial Popn.	31,146	29,321	27,080	25,593	23,347	21,729	20,174
% decen. change	-5.86	-7.6	-5.5	-8.78	-6.9	-7.16	-2.88
Mig'n rate	-21.27	-21.33	-19.6	-20.43	-19.0	-16.66	-10.86
SOUTH HAMS							
Initial Popn.	38,212	36,463	33,718	33,954	32,419	31,462	29,245
% decen. change	-4.58	-7.53	0.7	-4.52	-2.95	-7.05	-0.09
Migration rate	-18.48	-18.7	-11.85	-17.35	-14.45	-15.99	-7.23
RED LANDS							
Initial Popn.	30,863	30,175	28,950	27,909	26,072	24,430	22,712
% decen. change	-2.23	-4.06	-3.59	-6.58	-6.3	-7.03	-0.89
Migration rate	-14.31	-14.55	-14.56	-16.87	-16.58	-14.63	-6.61

sources: migration rates calculated for individual districts in Appendix 3.2. Culm Measures: Districts 20,21,24; South Hams: Districts 8,10,11; Red Lands: Districts 33,34,35,38.

There were significant variations in the rate of change around the county depending on location, agricultural potential and particular local circumstances, and some of these are reflected in the figures shown in Table 6.6. The poor upland Culm Measures country of West Devon consistently suffered from higher rates of net out-migration than the better circumstanced South Hams and the fertile 'red lands' of the Exe basin. It is also noticeable that on the more intensively farmed 'red lands', where the Great Depression may have made more of an impact than elsewhere in Devon, there was a significant rise in the migration rate in the 1870s and 1880s, whereas on the Culm Measures the rate was if anything slightly lower than in the 1840s and 1850s. The mechanism of labour rationalisation operated most ruthlessly in this poorly endowed part of the county; in 1911 there were under 2 inhabitants per square mile, and the situation has worsened still further since then. Today, in the bare landscape which stretches between Dartmoor and the Atlantic coast, depleted ranks of farmers fight against a

this Edwardian decline in migration was itself the product of earlier migration, through a reduction in the numbers in the migration prone age groups in the residual population. That this was not the case in Devon is shown by the rise in agricultural employment (Table 4.11, p.115) and calculations of age specific migration rates (Table A3.4, part 3, p.292).

Table 6.7. Rural Devon in its context: Migration rates, 1841-1910

	-1- Devon	-2- 'declining' Devon	-3- Southern 'rural residue'	-4- Northern 'rural residue'	-5- S.Ireland net emigration
1841-50	3.37	12.78	7.6	6.6	
1851-60	6.91	16.35	13.2	9.1	
1861-70	8.32	15.08	11.1	9.9	16.9
1871-80	10.05	18.43	14.6	10.0	12.7
1881-90	5.51	15.5	12.8	12.9	16.3
1891-1900	3.34	15.06	10.9	8.9	11.8
1900-10	2.03	7.97	3.7	5.6	

sources: Table 6.5; A.Cairncross, 'Internal Migration in Victorian England', Manchester School of Econ. and Social Studies, XVII (1949); N.H.Carrier & J.R.Jeffery, External Migration: A study of the available statistics, (1953), p.14.

climate 'where all green things are crushed between the hammer of the west wind and the anvil of the yellow clay.'¹

Gross outmigration from these areas was undoubtedly higher still for even in rural parishes 40% or more of the population was born outside the place of residence in 1851, although mostly within a 10 mile radius. In the South Hams it was found that even Torquay, which attracted proportionately more migrants than anywhere else in Devon, lost numbers of people to rural parishes at this time.²

Moreover it would appear that losses ran at a higher level than the average for the rest of rural England if the evidence presented in Table 6.7 below is anything to go by. The 'Southern and Northern Rural Residues' are the Registration District based units used by Cairncross in his study of Victorian internal migration and, as the term implies, represent all that is left after the different types of growing urban R.D.s have been treated

¹Hoskins, Devon, p.311

²D.Bryant, 'Demographic Trends in South Devon in the mid 19th century' in K.Gregory and W.L.D.Ravenhill (eds.), Exeter Essays in Geography, (Exeter, 1971), pp.125-44. A similar proportion was found for the village of Exbourne, north of Dartmoor, in 1851 by I.D.Thornley, 'Aspects of 19th century Exbourne', T.D.A., CX (1978), p.181. In that year only 7.5% of the parishioners had been born more than 10 miles away, but by 1881 the proportion had risen to 12.8% -P.R.O. RG11/2226/18

separately.¹ This does not, of course, make the figures directly comparable to those for the 'declining' districts of Devon, but the apparent differential between the migration rates of the latter and that of the Southern Rural Residue is probably not without substance.² Perhaps more striking is the fact that rural Devon was apparently losing as many people, proportionately, as post-famine Ireland in the last four decades of the century.

Such a high level of net out-migration could conceivably have resulted from an equally high rate of natural increase of population³ but it appears that natural increase was at a lower rate in Devon and rural Devon than in England and Wales and the Southern Rural Residue respectively (see Table 6.8. overleaf). While the crude death rate in Devon was 94.7% of the national level, on average, the crude birth rate stood at only 88.4%.

This in turn suggests that reaction to economic change was taking place at a more fundamental level than that of migration. A low natural increase and a high level of out-migration is a combination which indicates a major adjustment by communities to a contraction in economic opportunities. Just as the Devon crude birth rate was lower than the national average, so was that of 'declining' Devon lower than the county average: the higher the migration rate, the lower the birth rate. This relationship continues if particularly heavily depopulated districts are considered alone. This suggests that since heavy out-migration, -being age-selective-⁴ must have had significant effects on the 'natural' age structure of the population (by reducing the proportion of child-bearing

¹A.Cairncross, 'Internal Migration', pp.67-87. The migration rates for southern and northern rural residues are calculated from his absolute data on population, natural increase and migration totals.

²It is also worthy of notice that despite a tendency to assume the contrary it would seem from these figures that there was a greater tendency to migrate from the rural south than from the rural north.

³following Hunt's suggested link between wages and fertility: Hunt, Regional Wage Variations in Britain, pp.236-7.

⁴In the Devon 'Rural Residue' in the 1880s 72% of all migrants were aged 15 to 35. T.A.Welton, England's Recent Progress, (1911), App.C., p.503.

Table 6.8. Natural increase, crude birth and death rates, 1841-1910

	Eng. & Wales			Devon			rural Devon			Southern R.R.		
	CBR	CDR	CRNI	CBR	CDR	CRNI	CBR	CDR	CRNI	CBR	CRD	CRNI
1841-50	32.6	22.0	10.6	30.4	20.5	9.9	29.2	17.9	11.3	31.5	19.7	11.8
1851-60	34.2	22.1	12.1	30.2	20.2	10.0	28.8	18.0	10.8	32.1	19.7	12.4
1861-70	35.4	22.6	12.8	31.7	20.5	11.2	30.8	19.0	11.8	32.3	19.2	13.1
1871-80	35.5	21.3	13.2	30.0	19.7	10.3	29.2	18.0	11.2	31.3	18.2	13.1
1881-90	32.3	19.3	13.0	29.1	18.7	10.4	28.2	17.2	11.0	29.3	16.7	12.6
1891-00	29.5	17.7	11.8	25.9	17.8	8.1	24.8	16.0	8.8	26.0	15.8	10.2
1901-10	27.1	15.3	11.8	23.1	15.4	7.7	21.4	14.1	7.3	22.7	13.4	9.3

CBR: crude birth rate; CDR: crude death rate; CRNI: crude rate of natural increase. Figures unadjusted for registration deficiencies 1841-70.
sources: Eng.& Wales- Mitchell & Deane, Hist. Stats, pp.29-37; Devon- Census reports as listed in Appendix 3.2; rural Devon- unweighted average of rural R.D.s; Southern Rural Residue- Cairncross, 'Internal Migration', Table VII, p.87.

women), the lower crude birth rates have more to do with the knock-on effects of migration than with an intrinsically lower birth rate.

This possibility can be examined by turning to one of the areas of highest net out-migration in the county, the South Molton Registration District, which included a number of isolated parishes and dispersed settlements running from mid Devon up to high Exmoor. Table 6.9 shows that in this remote part of Devon the crude birth rate was normally even lower

Table 6.9. South Molton R.D., Crude Birth Rates.
1851-60 1861-70 1871-80 1881-90 1891-00 1901-10

Eng. & Wales	34.2	35.4	35.5	32.3	29.5	27.1
Devon	30.2	31.7	30.0	29.1	25.9	23.1
rural Devon	28.8	30.8	29.2	28.2	24.8	21.4
S.M.R.D.	29.6	29.9	27.6	27.5	23.9	20.0

sources: as for Table 6.8.; S.Molton R.D.: Table A3.4, p.292

than the average for rural Devon. A more refined measure of fertility relates the number of births in each decade to the number of women aged 15-45 at the start of each decade. In 1851-60 this stood at 1.45 in England and Wales but still high as 1.43 in the South Molton R.D., so the district's 13.6% lower crude birth rate there was almost entirely due to the low proportion of child-bearing women in the population structure. By 1901-10, by the same measure, the national average fertility rate was 1.085, and

0.945 in the S.M.R.D.¹ Its crude birth rate was now 26.3% lower than that for England and Wales, but this faster reduction was almost wholly accounted for by a fall in the fertility rate rather than by any increasingly adverse changes in the age structure. Between 1851-60 and 1901-10 in England and Wales the crude birth rate fell by 20.8% and the fertility rate by 25.2%, and in South Molton while the crude birth rate fell by 32.4%, the fertility rate fell by 33.9% over the same half century.

Migration may have indirectly influenced the decline in fertility because it tended to remove more men than women from rural districts.² In the South Molton R.D. there was a ratio of 113 females to every 100 males in the 20-35 age group in 1901, yet in the nation as a whole this ratio was as high as 112:100 in the same year, so the sex imbalance can hardly be held to account for the fertility rate differential.³

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Thus, the nature of the migration appears to be that urban growth stood in increasingly stark contrast to high levels of rural depopulation, and that in the early stages of this exodus the feedback effects on age structure reduced the crude birth rate. This in turn was not enough to reduce the migration rate, but was further compounded by intrinsic falls in the fertility rate over the second half of the 19th century. However, the impulses behind this comprehensive rationalisation of population size are less easy to pin down in any rigorous fashion.

In a classical model, of course, the wage rate is the mechanism by which labour is transferred from areas of surplus to points of shortage, and this was certainly a relationship well understood by some contemporaries.⁴ Others tended to be sceptical, as does most modern opinion. Among the

¹ derived from age distribution and registered birth tables in the Census; see Table A3.4

² Welton, England's Recent Progress, App.C., pp.502-3

³ Census of England and Wales 1901, Summary Tables, Devon County Report

⁴ see chapter 7, pp.221-2, 228 for discussion of Canon Girdlestone's work at Halberton. Joseph Arch also saw migration as a means to raise wages.

Victorian statisticians and economists it is also possible to find the viewpoint of the country gentry, concerned at the all too evident depopulation of their own districts. A prime example is the address to the Devonshire Association by its President for 1902, the Reverend W. Harpley, who lived at Clayhanger, in the hills just to the west of Tiverton.¹ Of the eight reasons he put forward as the cause of depopulation in rural Devon, four were aspects of the increasing access of rural dwellers to knowledge of the outside world, and all of these had the effect of reducing the frictional element in the decision to migrate: 'the advance of education', 'cheap travelling', 'cheap postage', and the Press. They all helped to reduce the high barrier of inertia which militated against migration.

With respect to newspapers, for example, he said that their

'ever increasing circulation ... is answerable, to a large extent, for thinning the country districts (because) in them paragraphs are frequently found which excite the imagination of the reader and render him dissatisfied with his monotonous life.'²

It would also be difficult to argue that the spread of railways to rural areas did not in some way increase the ease with which migration could be undertaken, even if it was only by allowing the establishment of personal bridgeheads in distant cities by pioneering migrants known to other villagers. Harpley accepted that nothing could or should be done to reverse the advance of education and communication but argued that the other perceived causes of depopulation could be tackled by encouraging joint stock companies to farm the land with modern machinery. His solution to the problem is not of as much interest here as his observations on the causes. Chief among these he listed the poor condition of Devon's rural housing.³ The hopeless economics of rural house building, expressed succinctly in a

¹Revd. W. Harpley, Presidential Address, T.D.A., XXXIV (1902)

²ibid, p.50

³ibid, p.49

letter to a Barnstaple newspaper in 1873,¹ meant that for as long as there was no fundamental change in this financial structure, official reports would continue to paint a picture of general delapidation and disrepair. Even in the inter-war period, when council houses began to appear in the countryside, the quality of housing was seen as a contributory factor to continued rural out-migration.²

Speaking from his own knowledge of farm labourers, Harpley attached little importance to the absolute wage differential between town and country:

'They have argued that, all things considered, they are better off with their 14 or 15 shillings a week and concomitant advantages than their brother townsman who is earning 20 or 22 shillings a week.'³

Moreover, as Baines has pointed out,⁴ few migrants to the towns could have hoped to move straight into even averagely paid jobs on arrival, and it seems likely that in Plymouth at least the remuneration of the type of unskilled jobs most likely to be available to rural migrants was scarcely better than local agricultural labourers' wages.⁵ Environmental conditions in the towns were almost certainly worse than in the countryside. By the turn of the century the days may have gone when Plymouth was ranked with Warsaw as the most insanitary place in Europe⁶ but infant mortality rates and standardised death rates were still far higher in Devon's cities than they were in rural districts.⁷ Actual wage differentials could thus hardly

¹'It is impossible to build decent, habitable cottages for under £120, the ordinary interest on which is 2s.4d. per week' (which was about twice the average rural rent) J.G.Johnson Esq., Torrington, North Devon Journal, 23 Oct 1873

²Devon and Cornwall: A Preliminary Survey, pp.12-3

³Harpley, 'Presidential Address', p.51

⁴Baines, 'Labour supply and the labour market, 1860-1914', in Floud and McCloskey, Economic History of Britain, Vol.II, p.158

⁵see chapter 4.5, p.148

⁶Whitfield, Plymouth and Devonport in times of war and peace, p.404

⁷Standardised death rates per thousand population, 1901/10: Axminster, Honiton, South Molton R.D.s: 10.5, Plymouth and East Stonehouse: 18.3; Infant Mortality per thousand births: E.Stonehouse: 152, Plymouth: 141, Devonport: 116, Exeter: 141, Tavistock: 92, S.Molton: 82, Honiton: 78, Axminster: 76. Supplement to the 75th annual report of the Registrar-General, PP 1914-6 VIII (Cd8002), p.cix.

have been a major contributory factor to out-migration, although to the extent that perception of wage differentials may have differed from the actual differentials, they may still have mattered. Hunt speculates that younger people may have underestimated the extra cost of living in urban areas (and moved), while older people may have overestimated it (and stayed put).¹

The continued decline in the physical availability of employment in rural areas was probably of more direct importance to the level of migration than wage differentials at a time when the only alternative was the 'lesser eligibility' of able bodied pauperism, but Harpley mentions this only implicitly when he referred to the increase in size of farms.² The significance of changes in the employment structure was certainly not lost on the census enumerators of the mid 19th century, as the explanatory footnotes to the printed rural population tables testify. At Widworthy in East Devon, for example, depopulation was ascribed

'to the amalgamations of small farms, which has lessened the demand for labour and induced many to emigrate or to seek employment in adjoining parishes'.³

As Table 6.5 shows, the migration rate in Devon's 'declining' districts was higher in these mid century decades than it was towards the end of the century when Harpley was writing. Since the influence of improved communications and education in reducing the 'friction of distance' could not have been operating as strongly in those earlier decades it seems that the explicitly mentioned direct push factor of unemployment was the most important determinant of migration.

In those circumstances the apparently secondary importance of price and wage differentials is hardly surprising, for to give them priority would imply that migrants were in a position to take full account of the various

¹E.H.Hunt, Regional Wage Variations, p.105

²W.Harpley, Presidential Address, T.D.A., (1902), p.50

³Census of Great Britain 1851, PP 1852-3 LXXXV (1361). Numbers of the inhabitants Vol.I, Div.V, p.41

positive 'pull' factors of prospective destinations. Instead of this the overwhelming strength of the negative 'push' factor of unemployment would have denied most migrants the luxury of selection or choice. External opportunities were thus probably of much less importance than increasingly adverse conditions at home. This 'push' factor probably remained the prime impetus for migration down to 1900, compounded by poor housing, although the positive element of a widening awareness of the outside world must have increased during this time.

Because the locus of migration decision making has implications for the distribution of migrants by destination, it may be possible to infer back from such a study to help confirm or reject the suggestions made above. 'Push' factor induced migration may be expected to be characterised by movement to the nearest available source of work, and the aggregate volume of migration is less likely to be guided by wider trends in in-migration to the major growth centres than is movement induced by the ebb and flow of 'pull' factor opportunities. Classifying migrants by destination can only be achieved by making use of the birthplace evidence collected in the Census from 1851 onwards, and summarised at county level in the printed census reports. This allows us to go behind the net balance produced by deducting actual from 'natural increase' populations to discover the scale of the gross flows in each direction, even though some potentially hazardous assumptions have to be made in the process.

Reconstituting the distribution of the natives of Devon throughout England and Wales for each census year from the printed tables of 'birthplaces of the inhabitants' of each county is straightforward enough¹ and from these it can be seen, for example, that 15,915 people born in Devon were enumerated in Cornwall in 1881, and 15,351 in 1891. Because these figures show only the total of LIFETIME migrants in each year further

¹The disaggregation of the county boroughs in the 1911 Census effectively precludes the construction of a similar table for that year.

adaptation is needed to convert these measures of stock into measures of flow -the actual migration 'currents'. Before the number of Devonians moving to Cornwall between 1881 and 1891 can be ascertained we need to know the number of earlier migrants moving back to Devon in that decade, those lifetime migrants enumerated in 1881 who had died by 1891, and those who had died since moving to Cornwall after 1881. It is impossible to set any figure on the first of these missing elements as returning migrants appear in the census as not having moved from their native county in the first place. In many ways this is an important omission because 'moving back' was not an uncommon feature of 19th century migration. However, this significant part of the migration experience of individuals was still secondary to the establishment of flows in particular directions.

Steps can be taken to estimate mortality rates of current and lifetime migrants, although because of the skewed age distribution of migrants, these vary greatly from average mortality rates. Friedlander and Roshier, in a detailed analysis of the available data, built a model incorporating the complicated population variables and linkages which spring from these basic considerations.¹ Using published figures of the age distribution of lifetime migrants in 1911 and totals of net movement between selected counties during the 1851-1911 period, they were able, by a process of trial and error, to arrive at a constant age distribution of current migrants for inter-censal periods. Age-specific mortality rates then allowed for the computation of 'survivorship ratios' which show the percentage of lifetime migrants enumerated in one census surviving to be enumerated in the next.

Baines has warned that there is a dangerous degree of circularity in Friedlander and Roshier's argument, in that their constant age distribution of current migrants (which is necessary for the calculation of survivorship ratios) is the one which gives the closest fit (when run on their model) to

¹D.Friedlander and R.J.Roshier,'A Study of Internal Migration in England and Wales. Part One: Geographical patterns of internal migration 1851-1951', Population Studies, XIX (1965-6), pp.239-79

the known age distribution in 1911 using the same survivorship ratios.¹ However, Baines can only offer a much more arbitrary figure for average migrant mortality, which is indicative of our lack of precise information on the age structures of current and lifetime migrants. Friedlander and Roshier's tortuously developed estimates of 'survivorship ratios' are the best we have at present.²

Returning to the Devon and Cornwall example used above the use of the appropriate ratio for 1881-91 produces a flow of 2,094 migrants into Cornwall from Devon. The birthplace data can also be used to estimate gross inwards migration to Devon for each decade. With the net balance of migration from the county already calculated from other sources it is a matter of simple arithmetic to use the gross migration flows¹ in each direction to derive a figure for the level of emigration (which cannot be otherwise estimated from the purely internal England and Wales data). This does mean, of course, that the emigration figure will also include movement to Scotland, although this was probably numerically insignificant.³

This arithmetic, and Friedlander and Roshier's survivorship ratios produce the results shown in Tables 6.10 and 6.11. As noted earlier in this chapter gross in-migration to Devon rose significantly after the 1870s showing that even in areas of heavy out-migration there was still a bilateral flow, as the nation became increasingly integrated. This rising figure means, of course, that the much used migration balance figure - in column 1 of Table 6.10 overleaf - masks an increasingly much greater rise in

¹D.E.Baines, 'The use of published Census data in migration studies', in E.A.Wrigley (ed.), 19th Century Society, (1972), pp.311-35

²1851-61: 0.81, 1861-71: 0.818, 1871-81: 0.828, 1881-91: 0.833, 1891-1901: 0.846; Friedlander and Roshier, 'Internal Migration', p.249. Because these figures are averages, the aggregate Devon migration totals produced by them in Table 6.10 are probably more accurate than the detailed inter-county flows shown in Table 6.11.

³The 1851 and 1861 birthplace tables suggest that migration from Devon to the four northernmost counties in England amounted to roughly 400 people, and it is unlikely that more than this number would have gone even further north.

Table 6.10. Migration flows to and from Devon 1851-1901.

	-1- Net out- migration	-2- Gross internal mig'n	-3- Gross inwards mig'n	-4- Gross emigration	-5- Gross outwards mig'n
A) Using unaltered nat. inc. rates in column 1:					
1851-61	-39,157	-40,692	27,737	-26,202	-66,894
1861-71	-48,449	-51,632	25,391	-22,208	-73,840
1871-81	-59,360	-60,465	27,396	-26,291	-86,756
B) Using revised natural increase rates:					
1851-61	-47,549	-40,692	27,737	-34,594	-75,286
1861-71	-54,585	-51,632	25,391	-28,344	-79,976
1871-81	-59,360	-60,465	27,396	-26,291	-86,756
1881-91	-34,319	-44,693	34,858	-24,484	-69,177
1891-01	-21,237	-47,608	38,968	-12,597	-60,205
	-217,050		154,350		-356,872

sources: calculated from Table 6.5 and Census birthplace tables from volumes listed in Appendix 3.3. The net out-migration total differs slightly from that in Table 7.5 as it is calculated for the administrative county rather than for the county total used in this chapter (see page 174).

gross out-migration from Devon. The net out-migration rate from Devon in the 1870s was 10.05 per 1000; the gross rate was 14.39.

It is immediately apparent from Table 6.11 overleaf that direct emigration, and movement to London and its environs were consistently the most favoured routes taken by those leaving Devon for good. These destinations accounted for 60% of gross out-migrants in the 1850s, 55% in the 1870s, and 43% in the 1890s, when emigration fell off dramatically. Until then it would appear that the pattern of migration mapped out by C.T.Smith for the period up to 1861 was broadly unchanged; well trodden paths in search of prosperity were being followed.¹ Smith goes on to say that

'there were few parts of England which lay more than 50 miles from an industrial area, or from a growing port, or from London; and it was in those few isolated areas that emigration was most significant in 1861 -East Anglia, the Fenland, south Lincolnshire, Devon and Cornwall.'²

¹C.T.Smith, 'The movement of population in England and Wales in 1851 and 1861', Geographical Journal, CXVII (1951), pp.200-16

²ibid, p.210

Table 6.11. Destinations of migrants from Devon:

	1851-61	%	1861-71	%	1871-81	%	1881-91	%	1891-1901	%
Gross outmigration	75,286	100.0	79,976	100.0	86,756	100.0	69,177	100.0	60,205	100.0
Emigration	34,594	46.0	28,344	35.4	26,211	30.2	24,484	35.4	12,597	20.9
Internal out-mig.n	40,692	54.0	51,632	64.6	60,465	69.8	44,693	64.6	47,608	79.1
Cornwall	3,647	4.8	3,487	4.4	2,997	3.5	2,094	3.0	3,478	5.8
Somerset	7	0.01	3,966	5.0	3,126	3.6	3,500	5.1	4,122	6.8
Dorset	1,913	2.5	739	0.9	609	0.7	908	1.3	2,108	3.5
Wiltshire	347	0.5	493	0.6	544	0.6	708	1.0	922	1.5
Hampshire	2,612	3.5	2,952	3.7	2,482	2.9	3,714	5.4	3,619	6.0
other Sth.Midlands	645	0.9	1,096	1.4	1,159	1.3	1,130	1.6	1,709	2.8
Gloucs.	2,426	3.2	2,901	3.6	2,302	2.7	1,542	2.2	1,671	2.8
London	13,710	18.2	16,302	20.4	15,676	18.1	7,342	10.6	5,105	8.5
Middx, Kent, Surrey	3,686	4.9	5,411	6.8	5,762	6.6	6,894	10.0	8,225	13.7
Sussex, Berks.	880	1.2	1,527	1.9	2,030	2.3	1,493	2.2	2,324	3.9
Essex	623	0.8	998	1.2	1,723	2.0	2,228	3.2	2,994	5.0
Glamorgan	(included in Welsh total)									
rest of Wales	4,336	5.8	2,220	2.8	6,537	7.5	5,619	8.1	3,693	6.1
					1,089	1.3	1,514	2.2	1,038	1.7
West Midlands	1,778	2.4	1,545	1.9	2,020	2.3	1,184	1.7	2,237	3.7
North West	1,827	2.4	2,796	3.5	4,550	5.2	2,260	3.3	1,703	2.8
Yorkshire	1,073	1.4	1,904	2.4	3,044	3.5	757	1.1	1,008	1.7
Northern counties	398	0.5	2,072	2.6	2,583	3.0	677	1.0	473	0.8
North Midlands	521	0.7	919	1.1	1,686	1.9	828	1.2	827	1.4
Suffolk, Norfolk	284	0.4	308	0.4	548	0.6	301	0.4	352	0.6

sources: Census birthplace tables and Table 7.5. Gross out-migration and emigration totals are based on the revised natural increase figures. other South Midlands: Bucks., Oxon., Northants., Huntingdon, Beds., Cambs.; Wales includes Monmouthshire; West Midlands: Hereford, Salop, Staffs., Worcs., Warwicks.; North Western: Lancs., Cheshire; Northern Counties: Durham, Northumberland, Cumberland, Westmorland; North Midlands: Leics., Rutland., Lincs., Notts., Derby.

If the industrial areas drew their migrant labour from close quarters it is not surprising to find that most Devonian migrants were attracted either by the unique magnetic force of the metropolis or the prospect of a new life in the Great Dominions.¹ Brinley Thomas gives a net emigration rate of 25 per 10,000 per year for England and Wales in the 1880s² -when national emigration figures were at their highest- whereas the corresponding figure for Devon was 37.3 per 10,000, or nearly 50% higher. This does not necessarily mean that migrants from Devon were any more enterprising than those who tended to move only short distances, for the kind of opportunities available in the new lands overseas were less different than those in the northern industrial towns;

'emigration to rural Canada might leave a countryman in more familiar surroundings than migration to Manchester'.³

The view held by some farm labourers of East Devon that you had to go 'over the water' to reach Manchester⁴ may well be indicative of general ignorance of, and antipathy towards, the industrial heartland of Britain. The great exception was the Glamorgan coalfield, lying just 15 to 20 miles across the Bristol Channel. The North Devon farm labourer, wrote F.W.Knight M.P. (the owner of Exmoor),

'well knows that the great Welsh coalfield lies only a few hours sail from any of the little harbours that dot the coast from Bideford to Watchet, and that among the teeming gangs that work among its mines, docks and railroads, he can at a days notice get work at higher wages than at home, but attended with far greater expenses and less comfort; hundreds of labourers have gone there, and they go and return constantly. Many too have emigrated to America, and no parish is without its representative in Canada and the United States.'⁵

¹ On the other hand, very few of Devon's migrants moved to the adjacent counties of Cornwall, Somerset and Dorset. They numbered 10% or less of the total in each decade -the 1890s figure is distorted by boundary changes- presumably because employment opportunities were as scarce in the rest of the peninsula as they were in Devon.

² B.Thomas, Migration and Economic Growth, (Cambridge, 1973), p.124

³ S.Pollard, 'Labour in Great Britain' in P.Mathias and M.M.Postan (eds.), The Cambridge Economic History of Europe, Vol.VII.I (Camb., 1978), p.108

⁴ as discovered by Canon Girdlestone in the 1860s when he began to organise migration among Halberton farm labourers. See F.G.Heath, The English Peasantry, (1874), pp.148-9, 154-5

⁵ letter to W.C.Little, included in his Report on Devon to the Royal Comm., on Agriculture, PP 1882 XV (c3375), p.21

In most decades migration to Glamorgan approached the total moving to all industrial areas and the rest of the north, including Birmingham and beyond. The 1870s are an interesting decade. Table 6.11 shows that at this time, when gross out-migration was at its highest, there was also a significantly high degree of movement to the industrial north. Given what is known of the antipathy of Devonians towards this part of Britain, as mentioned above, it would seem that the trends displayed in this decade bear out the contention that 'push' factors from Devon were perhaps more important than 'pull' factors, or the attractive forces of actual and potential destinations.¹ A reasonable interpretation of the 1870s would be that forces of circumstance gave a significantly higher than usual number of migrants little option but to move to distant manufacturing areas, because labour demand in the traditionally popular areas was already sated.

Table 6.12. U.K. and Devonian emigration 1851-1901

	gross emigration of UK citizens	Index	gross emigration from Devon	Index
1851-61	1,827,000	100.0	26,202	100.0
1861-71	1,572,000	86.0	22,208	84.8
1871-81	1,678,000	91.8	26,291	100.3
1881-91	2,558,000	140.0	24,484	93.4
1891-1901	1,743,000	95.4	12,597	48.1

sources: U.K.: Mitchell & Deane, ch.1, table 17, pp.47-8
Devon: Table 6.10.

With reference to emigration, it seems from Table 6.12 that even given the substantial drawbacks involved in comparing these two sets of figures there was some difference between Devonian and national trends after 1861. On the surface it would appear that the number of Devonian emigrants was primarily either a response to slightly different demand patterns than those influencing the aggregate national figures -the 'pull' factor- or, more likely, a function of different local home conditions -the 'push' factor.

¹A similar explanation for migration from rural Warwickshire was given by M.K.Ashby, Joseph Ashby of Tysoe, (Cambridge, 1961), p.161

At one level it is patently obvious that over a long period of time migration currents will reflect the changing spatial balance of employment, but there is perhaps a distinction between this and the suggestion that the push factor of unemployment seems to have been of major direct importance in generating high rates of rural out-migration from Devon. It is possible that since the stimulus to migration appeared to come more from the 'push' than from the 'pull' side, thus acting upon those unable to find local employment, its qualitative effects on the remaining labour force were more in harmony with local economic needs than would have been the case if migration had been guided more by influences exogenous to the local or regional economic system. Thus, part of the process of aggregate labour transfer from Devon could have been that the county's labour force¹ was more optimally deployed¹ in the face of the changing structure of spatial specialisation across Britain, and that this made an effective contribution to Devon's economic 'viability'.

This in itself is not enough to say that migration was an effective agent of regional development. That the rate of migration was 'high' does not automatically establish a link with the spatial balance of economic activity. The level of outmigration and the fall in the fertility rate do suggest that Devonians responded flexibly to the changing economic environment of the Victorian period, but to measure or in any way assess the adequacy of that response requires that account be taken of the 'results' of all these changes. It is in this light that the focus now turns to the regional standard of living, for it is possible that a grasp of the important features of relative change and spatial differentials in this field -used as a proxy for economic performance- will help to identify how the various pressures and responses in the Devonian economy charted so far resolved themselves.

¹But the age distribution of current migration did have an adverse effects on the dependency ratio, as suggested by the figures on poor relief discussed in chapter 7.5, pp.249-50

CHAPTER 7

The Standard of Living

7.1. Measures of Progress

-1-

Wages may provide the most accessible measure of regional performance but not necessarily the best. Since at a fundamental level industrialisation is the raising the physical production of goods and services for every unit of resources employed, an index of progress would be provided by total factor productivity, or output per capita. This, of course, is one of the great unknowns at regional level, even at the end of the pre-war period. It is conceivable that had the original returns submitted by firms to the 1907 Census of Production survived they would have allowed some regional measure to be had of value added per employee in manufacturing.¹ But even this would have been a poor substitute for output per capita figures which could be used to assess the extent to which Devon had 'caught up' with the Industrial Revolution by the Edwardian period.

However, because the benefits of industrialisation could have diffused to Devon through autonomous price falls, a balance of payments deficit, or government transfers, and not just through internal increases in productivity, it would be more profitable to pay attention to measures and indicators of consumption rather than to regional output. Table 6.8 in the last chapter shows that crude death rates in Devon were roughly on a par with those of England and Wales as a whole, but when these are standardised for age structure between 1901 and 1910, Devon's mortality rate emerges at only 83.5% of the national average, having been at 90% between 1851 and 1860. The average rate of infant mortality in Devon was only 85.2% of the national average for the 1901-10 period.² Yet while the use of mortality

¹Only the national printed reports survive: PP 1912 CIX (Cd6320).

²Supplements to the Annual Reports of the Registrar General in 1865: PP 1865 XIII (3542), and in 1914: PP 1914-6 VIII (Cd8002)

rates in both historical and contemporary development studies implies at least some connection with the standard of living, at a less than very general level they are probably determined more by population density than by welfare standards.

Table 7.1. Relative Health and Education Employment in Devon

(employees in stated occupations per 1000 population)

	MEDICAL PROFESSION			TEACHING PROFESSION		
	Devon	G.B.	Dev/G.B.	Devon	G.B.	Dev/G.B.
1841	2.34	1.2	1.95	3.29	2.96	1.11
1881	3.43	2.42	1.42	7.99	6.38	1.25
1911	4.44	3.5	1.27	8.2	7.15	1.15

sources: Census Occupation abstracts listed in App 1.1 and Census of Scotland Occ. Abstracts 1881.

The relative devotion of resources to health care in Devon as shown in Table 7.1 seems to bear out the optimistic assessment of living standards in the county provided by the mortality figures, and the greater number of teachers 'per capita' also suggests that Devonians enjoyed benefits of prosperity throughout this period. These statistics do not, however, necessarily represent the availability of health care and education to the population as a whole. The difference in 'per capita' employment at the margin which creates the differential in Devon's favour may well have been accounted for by the provision of private facilities to middle and upper class consumers,¹ making the figures a poor proxy for average welfare standards. In any case, the links between all these 'results' and the process of development itself are extremely tenuous.

The analysis thus comes back to the directly material elements of the standard of living, and largely to what comparisons of real wages can reveal about the relative performance of the Devonian economy. Yet while real wage

¹in the same way that the high proportion of domestic servants in Devon was partly explained by the number of upper class families in the social structure; see chapter 4.5.,p.149

calculations may provide data on working class consumption standards, they are unlikely to reveal much about output per capita in the absence of information on the distribution of output. It was suggested in chapter 4.5 that the middle and upper class population may have been over-represented in Devon's social structure relative to the national average but it is difficult to measure this, let alone assess what difference it would have made to the level and distribution of county income.

Records of the income tax are one potential source of information but regional breakdowns of assessments and yields are either few in number, difficult to interpret meaningfully, or both. A number of returns collated by the Inland Revenue Office in the middle of the period reveal that in relation to its total population Devon contributed a disproportionately low share of national income tax revenue.¹ On the face of it this suggests that the wealthier members of Devonian society were not, in aggregate, as well off as the comparable national average but within this figure a smaller number of wealthy people could have been better off than the national average, or a larger number worse off. In any case the complicated operation of various exemptions and assessment procedures in the tax schedules prevent any direct conclusions being drawn from the crude tax yield figures.

Another approach might be to make a judgement using the proxy of consumption standards. An opportunity is provided by the early Motor Car Registers of the Edwardian period to compare Devonian and national consumption levels of what may be thought of as a luxury commodity in the early years of its diffusion. The message of Table 7.2. (overleaf) is that car ownership in 1911 was lower in Devon than the national average. Once again, however, interpreting this plain fact is problematic. The levels of

¹In 1871 Devon accounted for 2.64% of England and Wales' population, but contributed only 1.53% of Income Tax revenue, in 1881: 2.31% of population and 1.42% of tax revenue; PP 1871 XXXVII (221), pp.224-5, 1882 XXXVII (292), pp.246-7; population figures - Table 6.1, p.174

Table 7.2. Motor Car and Cycle Ownership in Devon and G.B. in 1911

(includes commercial vehicles)

	Popn. 000s	Vehicles	Vehicles/ 1000 popn	Index
Devon	700	1,837	2.65	56
G.B.	40,831	193,000	4.72	100

sources: DEVON: Motor Vehicles Registers, D.R.O. 2131 O/X
LR 6-12, 2808A LR 1; G.B.: Mitchell and Deane, (1962)
Transport 7, p.230

car ownership was probably as dependent on taste and the 'willingness to change' as it was on income.

Thus to incorporate any serious estimates of the level and significance of middle and upper class incomes in the study of relative living standards in Devon would be an extremely laborious, if not impossible task. Moreover, if one of the objects of such a study is to contribute to a more confident measure of output per capita, it may also be of questionable value. Considerations such as the level and source of investment funds, and the balance of investment income flows to and from the county would also be needed so the exercise soon becomes completely impractical. Thus the argument of this chapter relies mostly upon the evidence of real wages. Even if they are inadequate as a proxy for all incomes real wages can at least potentially reveal something of the living standards of less advantaged members of the community. They may be useful in tracing the extent to which the benefits of industrialisation percolated 'downwards' to the poor as they percolated outwards from the core even if they cannot be of direct use to the estimation of productivity.

7.2. Prices

-1-

Although Hunt was content to leave aside a detailed examination of regional price variations in his study of wages on the not unreasonable assumption that the commodities purchased by wage earners were more mobile than the wage earners themselves,¹ the possibility that spatial price variations significantly affected real wages cannot be ruled out. Even if price trends in Devon were similar to the national average their level and structure could have been different.

The cost of living indices used in this section were constructed from separate series calculated for the following basic commodities- bread, flour, mutton, bacon, potatoes, butter, cheese, tea, milk, sugar, salt, eggs, coal, candles, soap, clothing, footwear and rent. With the exception of rent, for which separate series were used for urban and rural rent, only one price series was constructed for each commodity. Where it was possible to identify a quality standard this was set at a fairly low level, the underlying aim being to study the trends in living standards of the large numbers of low income earners. In any case it was found by Parsons that there were no fundamental differences in the trends of price indices facing both low and high income groups between 1750 and 1850.²

Retail, rather than wholesale or contract price quotations were obtained for many commodities from the market reports printed in the local press, as used in chapter 3. Despite an increasing number of shops it seems that markets remained important to the pattern of retail distribution throughout this period: a 1911 'Prices Current' issued by one of Exeter's department stores states that butter and eggs were sold in the store at market prices.³

¹Hunt, Regional Wage Variations, p.78

²S.R.Parsons, 'The standard of living of the working class in the South-West of England, 1750-1850.', Exeter Univ. M.A. thesis, 1977, p.226

³Westcountry Studies Library, Exeter, pB/EXE/381.065 DEV

Time precluded the monitoring of a large number of markets for long unbroken periods so continual series were constructed for Exeter alone, and the 'county-wide' series of Table A4.1 were interpolated from Exeter prices using averages struck across a larger number of towns in 1842-3, 1858-64, 1880-5 and 1900-5.¹ In several cases there were no appreciable differences between Exeter prices and the Devon average anyway. A detailed check on weekly prices in sample years in Barnstaple and Exeter showed that there was remarkably little variation from week to week in the autumn months, so it was decided to base the series on price quotations taken from mid-October, before the hard winter months set in.

A large number of essential commodities were never traded at these markets, and sometimes even some of those that were failed to have their prices printed in newspaper market reports (bread in Exeter was one such important omission). The only systematic alternative is provided by the recorded tenders for contracts to supply workhouses. These survive in great quantity in the ledgers of Devon's Poor Law Unions² and allow the construction of long series for groceries, coal and other non-food items. But because the prices quoted in the accepted tenders relate to large purchases, and for quarterly or half-yearly periods, they are almost all lower than current retail prices, where the two can be compared. In Edwardian Exeter, for example, the unit price of soap was 40% higher if bought in a 21b. pack than if bought in a 1121b. barrel.³ It is also likely that the time periods involved mean that the trends constructed may smooth out short-term fluctuations in prices (particularly for some foodstuffs) that would have mattered greatly to individual consumers. Fortunately the circumstantial evidence available from other sources makes it possible to estimate the economies enjoyed by workhouse buyers, and thus to infer the level of retail prices, even if not the amplitude of their fluctuations.

¹ see Appendix 4.1

² Poor Law Union Minute Books consulted are listed in App. 4.1.

³ Prices Current, Devon and Somerset Stores, 1911.

The price series constructed from these sources are tabulated and depicted graphically in Appendix 4.2. Suffice it to say here that the major food items which were locally produced in the mid 19th century but increasingly imported by the early 1900s all reached a secular price peak in the 1870s. From this time onwards imports of grain, and later mutton, bacon, and butter began to rise, exerting a strong downwards influence on prices. In the case of bread and flour this also heralded a marked reduction in the amplitude of short-term price fluctuations: under the influence of a larger and steadier volume of imported grain by the 1890s.¹ Potatoes probably continued to be produced and consumed within the county,² and their prices apparently showed less of a tendency towards a diminution of short term fluctuations. Neither was there a strong downwards secular trend. Clothing, footwear, and housing are less well documented than foodstuffs but it seems that over the period as a whole there was no overall change in the cost of the former two items. It may well be that rural rents behaved in a similar fashion for much of the Victorian period, but, in common with what is known of the rest of the country, the same cannot be said for the price of urban housing.

Clearly, the constituent elements of the cost of living index for this period are subject to a number of limitations which reduce the validity of the price series. Nevertheless, the outline of the trends, and the match of the short term series with those for the nation as a whole,³ suggests that even if more satisfactory data were available it would probably alter only the detail of the picture and not the broader message.

However, the weighting together of the separate commodity series into cost of living indices introduces even more qualifying considerations. It is no easy task to construct budgets for 19th century working class households

¹see Fig. A4.1, pp.300-1

²as suggested by the town price evidence in Chapter 3, p.78

³see Fig. 3.6, p.71

even when drawing on material from across the nation, and it is correspondingly more difficult if one is limited to the surviving sources for just one county, but the evidence of regional variations in consumption patterns suggests that this must be attempted.¹ Changes in the standard dietary circulated by the Poor Law Commissioners in 1836 were approved by the Crediton P.L.U. Workhouse Committee on the grounds that

'the alterations, according to the prices of provisions in this county will not increase the cost and be more suitable to the habits of the people'.²

The limited information available on budgets, dietaries and spending patterns in 19th century Devon from Parliamentary Papers, the Exeter Corporation Guardians Minute Books dietaries, and miscellaneous information from newspapers is listed in Appendix 4.3. The methodological and statistical problems associated with constructing weights, and the cost of living indices are also discussed there. Three separate price series were compiled, using two sets of weights. Both of these are unfortunately somewhat arbitrary in origin, the effects of which are, however, mitigated to some extent by the inclusion of eighteen separate commodities. The problem of weight distortion away from the initial series as used in the base year leads to a wide divergence of the displayed trends according to which base year is selected, and as Appendix 4.3. shows, it is extremely difficult to resolve the problem satisfactorily.³ Since, however, this is a problem which also affects available national price indices it does not necessarily invalidate the kind of comparisons which were drawn in chapter 3 as long as its effects are kept in mind. It was found there that there was little appreciable difference in the timing of short-term cycles between Devon and either the Black Country, or the nation as a whole.⁴ On the

¹J.Rule, 'Regional variations of food consumption amongst agricultural labourers' in Minchinton, Agricultural Improvement: Medieval and Modern, p.137

²D.R.O. Crediton Guardians, Minute Book 1, p.71, 30 July 1836

³see p.315

⁴see Figs.3.6, 3.7, p.71

Table 7.3. Price Relatives, Devon, England and Wales, 1842-1912

		1842/3			1905/12			
	unit	-1- Devon	-2- Nat	-3- D/N	-4- Devon	-5- Nat	-6- D/N	-7- 6/3
Bread	d/4lb	6.0	5.24	1.14	5.3	5.4	0.98	0.86
Butter	d/lb	11.4	9.8	1.17	14.5	13.5	1.07	0.91
Mutton	d/lb	5.0	4.7	1.07	6.05	5.0	1.21	1.13
Potatoes	d/20lb	5.35	4.19	1.28	11.8	10.0	1.18	0.92
Cheese	d/lb	4.07	4.93	0.83	7.75	7.75	1.0	1.21
Sugar	d/lb	7.2	6.85	1.05	2.07	2.09	0.99	0.94
Tea	s/lb	4.2	4.3	0.98	1.25	1.4	0.89	0.91
Coal	s/ton	21.61	19.35	1.12	21.96	20.21	1.09	0.97

Nat/N:National, = England (1842/3), England and Wales (1905/12),

sources: 1842/3= PP 1843 XLV (554) pp.176-9 Prices of articles of consumption, N.Crafts, 'Regional Price Variations in England in 1843 -An aspect of the standard of living debate' Explorations in Economic History, XIX (1982), pp.51-70; 1905/12 = averages of price collections from 72 towns of two Board of Trade Enquiries into Working Class Rents, Housing, and Retail Prices, PP 1908 CVII (Cd.3864), 1913 LXVI (Cd.6955)

surface it would seem that the rates of change in the secular trends were also similar.

The changing relative differences in actual commodity prices between Devon and the national average matters most to analyses of the changing relative standard of living within the county, but it is an area within which confident comparisons are virtually impossible to draw. The lack of precision over actual retail prices within Devon matters to some extent here, but is overshadowed by the absence of any national price averages for any length of time in the 19th century. One or two authorities did, however, attempt to compute national average prices for a few commodities at certain dates and these can be used to estimate absolute levels of variation between Devon and the nation as a whole. Even for the dates used in Table 7.3 it was not possible to hold the national unit constant. The 1842/3 prices were collected from Poor Law Unions in England alone, the 1905 and 1912 from the large towns and cities of England and Wales, with the exception of London in 1905.

These tentative figures suggest that the prices of several commodities in Devon appeared to fall to levels closer to the averages across the whole country between the 1840s and the 1900s. Only with regard to mutton and cheese did the differential appear to increase. Bread, butter, sugar and coal all became significantly cheaper relative to 'national average' prices. In 1856 an irate consumer had complained to his local newspaper that

'If the bakers of Newbury and Bath can sell their 4lb. loaves at 6.5d. we should like to be informed why the bakers of Exeter charge 8d. and 8.5d. There is something radically wrong here. If the fault rests with the millers why don't the bakers say so at once?'¹

By the turn of the century, however, the mean price of a 4lb. loaf of bread in the Co-op. Stores was only 4.9d. in Plymouth, compared to an average of 5.0d. in England and Wales, and 5.07d. in Great Britain.²

If there is any substance in the findings of Table 7.3 the contribution of overall price changes to the material standard of living in 19th century Devon was two-fold. Firstly the region shared in the significant cheapening of basic foodstuffs from the 1870s onwards which benefited the whole nation.³ Secondly, there was a downwards structural shift in actual prices in Devon vis-a-vis the national average, a positive effect of continuing changes in the structure of regional economic identities.

¹E.F.P., 2 Oct 1856, p.5

²Report on wholesale and retail prices in the U.K. in 1902, PP 1903 LXVIII (Cd.321), p.227

³According to the index numbers in Table A4.4 and depicted in Fig.A4.2, p.312, the cost of living in Devon was as high in 1913 as it had been in 1840, but this is an illusion generated by weight distortion, as discussed in Appendix 4.3.

7.3. Agricultural Wages

-1-

The rate of wages paid in agriculture has often been used as a proxy for general wages. Farm labourers constituted one of the largest groups of wage earners throughout this period and also one of the best documented. It could also be argued that agricultural wages occupy a special place in standard of living surveys insofar as agricultural labour was a 'residual' occupation in the changing occupational structure of an industrialising nation. It follows that the wages accepted in this least desirable of occupations thereby established a general minimum and can reveal something of the relationship between demand and supply in the labour market at a more general level. However, the suggestion made in chapter 4.3 that in Devon agricultural employment was not of a residual nature relative to other opportunities could mean that if there is any wider benefit to be drawn from the study of farm labourers wages in the county it is more likely to be with regard to the effects of external demand than to the identification of shortages or surpluses in the labour market.

The diverse range of official reports into various aspects of 19th century agriculture and labouring work and other sources are surveyed in Appendix 4.4. Values are included for the non-monetary perquisites that often accompanied farm labouring work, such as a cheap or rent-free cottage, allotment or potato ground, cider, milk, and firewood. Whether or not these benefits were ever measured in monetary terms by farmers and labourers, the attempt is made here because the concern of this chapter is with wage comparisons and there is evidence that the value of 'privileges' varied around the country. For example, in 1885 20.8% of Devonian male agricultural labourers were provided with potato ground and this was twice the rate for England and Wales as a whole.¹

¹PP 1886 LXX (c4848), pp.7-8

Privileges and wages probably also varied from farm to farm within the county. In the Barnstaple area the weekly cash wage of ordinary labourers was said to be 10 to 12 shillings per week in 1860 but on Lord Rolle's north Devon estates in 1865-6 8 shillings per week was the norm.¹ The average cash wage of 410 ordinary farm labourers scattered across Devon in 1907 was 14s.6d. but six years later a labourer at West Worlington in deepest mid-Devon claimed he had only 11s.8d. per week to maintain himself, his wife and seven children.² It does seem possible, however, to gather enough evidence to support the construction of a series based on general averages, and that this can be used with some confidence to infer trends and features acting in the market for male agricultural labour.

-2-

Components of the money wage series for ordinary male agricultural labourers are shown in Table A4.8 and depicted in Fig. A4.4. There was apparently a reasonably strong upwards trend in the weekly earnings of ordinary labourers in Devon between 1840 and the outbreak of World War One. A.L.Bowley's series for Devon agricultural labourers between 1860 and 1892,³ shown in Fig. A4.4 for comparative purposes, lies beneath the main series as his figures excluded payments in kind, but the trend is similar. Over the entire period the money wages of farm labourers virtually doubled. The fastest increases were registered in the 1870s (when they grew by 2% per annum) and in the decade after 1894 (rising by 1.5% per annum). The surge in the 1870s is unsurprising given the rising prices and generally buoyant conditions of those years: a north Devon farmer exhorted his fellows to increase labourers wages to the standard cash rate of 12s. per week in 1872⁴ but at that time such generosity was not expensive. More surprising is the

¹PP 1861 L (14); D.R.O. 96M/Box 2/6

²PP 1910 LXXXIV (Cd5460), Earnings and Hours of Labour Enquiry, V: Agriculture, pp480-1; E.F.P., 25 Oct 1913

³A.L.Bowley, 'The statistics of wages in the U.K. during the last 100 years; Part 1 -Agricultural Wages', J.R.S.S., LXI (1898), pp.702-22

⁴E.F.P., 10 Jan 1872

continued rise in cash wages when prices fell during the 1880s.

Before examining this increase it is necessary to consider possible sources of distortion in the trend of average weekly earnings of ordinary male agricultural labourers. For instance, if the value of privileges is overestimated the weekly earnings index will be artificially inflated. Table 7.4, therefore, separates the weekly cash wage element and shows that there was little difference in the trends after 1868. If anything, the disparity in 1881 suggests that the value of privileges got left behind in the 1870s when cash wages rose rapidly.

Table 7.4. Devon Labourers wages, including and excluding privileges

	(1868 = 100)	
	Cash wages	Total wages
1868:	100	100
1881:	130.3	124.9
1907:	158.5	159.4
1913:	162.6	163.5

sources: PP 1868/9 XIII (4202), pp.106-23; 1882 XV (c3375); 1910 XXXIV (Cd5460); 1914 LXXX (Cd7080)

In many places agricultural labourers were remunerated for piece or task work performed instead of receiving a weekly cash wage, and it is possible that piece rates increased at a different pace to weekly cash wages. The nature of piecework makes it difficult to measure, but it is possible to compare a few rates over the 50 year period after 1854 using information from the 1905 wages and earnings enquiry. Rates for hoeing, woodtying and hedging grew more slowly than weekly cash wages over this time, or by 47% between 1854 and 1904 compared with a 70% rise in cash wages.¹

Bonus payments at harvest time could also be counted as a specific task payment but, like piecework earnings, they are not included in the 'weekly earnings' total for want of information. It was stated in 1871 that

¹ PP 1905 XCVII (Cd2376), p.565

in the Barnstaple area extra wages were not always paid for harvest work but on many farms it appears to have been a regular feature.¹ The few references found to actual payments also seem to suggest that bonus payments, like piece rates, did not increase for much of the Victorian period. Harvesters in the Okehampton district were paid 30 to 40 shillings in 1872 and perhaps more around Tiverton.² There are also references to 66s. being paid to harvesters at Tavistock and 60s. at Payhembury, East Devon, in 1898 and 1900 respectively, but the average for the county as a whole was set at 20 - 40s. in 1908.³ In 1904 it was said that the adoption of reaping machinery had reduced harvest wages but that apart from this 'considerably more would be earned by piecework now than 50 years ago with less work'.⁴ This may have been more a reference to increased efficiency in the performance of tasks than to increases in payments per task.

Traditionally, there had not been a great deal of piecework offered on Devon's farms. There was, however, something of a productivity incentive as described at Whimble in east Devon in 1833: 'There is a customary day's work. When this is done, the labourer is at liberty to go'.⁵ Some of the comments which accompanied the 1870-2 Returns of the Average Weekly Earnings of Agricultural Labourers seem to bear out this state of affairs and although it appears that the amount of taskwork performed had increased by the turn of the century, labourers in the Barnstaple area derived less than 10% of their earnings in this way in 1898.⁶ On balance then, it may be that the apparent tendency of piecework rates to rise more slowly than weekly wage rates, combined with an increase in the availability of this work,

¹PP 1871 LVI (181), p.615

²PP 1873 LIII (358), p.705

³PP 1900 LXXXII (Cd346), p.596; W.H.R.Curtler, 'Agriculture in Devon' (c.1908), unpublished paper for V.C.H.Devon Vol.II; Inst. of Hist. Research, V.C.H. Papers Env. 440 p.13

⁴PP 1905 XCVII (Cd2376), p.565, 2nd Report by A.Wilson-Fox on Wages etc.

⁵Thos. Buller J.P., PP 1834 XXX (44) Ans. to Commrs. Rural Questions, App.B, Part 1, p.135a

⁶PP 1900 LXXXII (Cd346), First Report by A. Wilson-Fox, p.596

should lead to a downwards revision of the growth in total agricultural earnings. But the possibility that labourers were able to perform more tasks in a given time could well mean that actual piecework earnings rose relatively quickly, as suggested above. Thus if it could be confidently quantified, the complicating factor of taskwork may not significantly alter the trends in weekly earnings.

Table 7.5. Skill differentials in farm labouring work

(weekly earnings, Ordinary labourers = 100 throughout)

	1881	1892	1898	1907
Ordinary labourers	100	100	100	100
Horsemen	114	106.6	101.5	100.9
Shepherds	117.9	105	105.1	104.2
Cattlemen	112.1	106.6	105.6	106.1

sources: PP 1881 XVII (c2778), pp.733-5, 1893-4 XXXV (c6894-II), pp.241-55, 1900 LXXXII (Cd346), pp.168-74, 596, 728-9, 1910 XXXIV (Cd5460), pp.484-5, 488-9, 492-3, 496-7

As part of the productivity changes touched on above, it is most likely that within the agricultural labour force there was a shift towards more skilled employment, carrying higher wages, but the total earnings index is compiled for 'ordinary labourers', -who were increasingly clearly demarcated from those in more specialised farm employment- with the intention of avoiding any undue bias from this source. It is possible tentatively to measure the nominal difference between ordinary agricultural work, and the traditionally more skilled farm jobs. This is done in Table 7.5 above from which it seems that the nominal skill differential was decreasing towards the end of the period. To the extent that this narrowing reflected an increasing 'skill' component within the work of ordinary labourers, it would clearly be wrong to see it as an artificial bias in the wage series.

Summer wages on Devon farms, unlike in many parts of Britain, were, on average, hardly different to winter wages throughout the period, undoubtedly

reflecting the seasonally fairly constant labour demands of pastoral farming. The south-west peninsula therefore played little part in the seasonal migration flows which were particularly great before the harvest became a mechanised operation, and which, as a consequence, significantly complicated the operation and nature of the rural labour market in the granaries of England.¹

Failing to take account of a gradual reduction in the number of hours worked, from an average of around 66 per week in the 1840s to around 60 in the Edwardian period underestimates the increase in hourly earnings by around 9%. It has been decided, however, not to include this change as it is not always possible to make the same adjustments outside the agricultural sector.

Table 7.6. Daily agricultural wage rates for women and children

WOMEN				CHILDREN			
	d./day	Index	Males Index		d./day	Index	Males Index
1843	8.75	100	100	1860-1	5.82	100	100
1860-1	9.03	103.2	109.4	1892	9.0	154.6	142.9
1869	10.0	114.3	118.8				
1870	9.6	109.7	120.5				
1872	12.0	137.1	132.3				
1881	13.0	148.6	147.0				
1892	14.0	160.0	156.3				

sources: as listed in
Appendix 4.4, pp.319-20

There remains the question of agricultural work performed by members of labourers' families other than the male household heads. Increases in the measured standard of living may have been cancelled out by reduced earnings of wives and children down through the century. From what we can tell about daily wage rates (see Table 7.6) it would not appear that the increase in the pay of women and children lagged far behind that of ordinary male agricultural labourers, but these occurred simultaneously with the rapid

¹E.J.T.Collins,'Migrant labour in British agriculture in the 19th century', E.H.R., 2nd ser. XXIX (1976), passim; K.D.M.Snell, 'Agricultural Seasonal Unemployment, the Standard of Living, and Women's work in the South and East 1690-1860', E.H.R., 2nd ser., XXXIV (1981), pp.421-5

decrease in fieldwork performed by women and children. This was in many ways a symptom of increased prosperity among rural labouring families rather than a change which may have seriously dented the income of such households, as noted by a farmer in 1892 in commenting on changes in rural life,¹ but even in 1848 it was said that 'although women frequently work on the land ...their employment is far less prevalent than in neighbouring counties'.²

In some parts of the county rural industry provided employment opportunities for women in which rates of pay compared favourably with those in agriculture. In 1870, for example, women who wove wool at North Tawton (between Okehampton and Crediton) could earn between 6 and 8 shillings per week.³ But many of the mid 19th century rural industries which relied heavily on female labour declined drastically in the subsequent half century or so, and as chapter 4.4 showed, domestic service was the largest employer of non-farm labour in the Edwardian countryside. As this work was often incompatible with family commitments, the decline in alternative employment for women may have had a noticeable effect on the aggregate incomes of rural labouring families. Yet even in 1863, before this reduction had proceeded very far, only 14% of total family income was earned by wives and children in Smith's sample of labouring household budgets in Devon.⁴

-3-

Within the agricultural labouring sector, the complicating factors of privileges, piecework, seasonal variations, and womens employment do not appear seriously to affect the utility of the main series of money wages. This index is combined with the cost of living index constructed in Appendix

¹'The prosperity of a family is shown first by the girls ceasing to work at farm work, then the wives, and lastly the sons.' PP 1893-4 XXXV (Cd6894-II), Crediton P.L.U., p.253

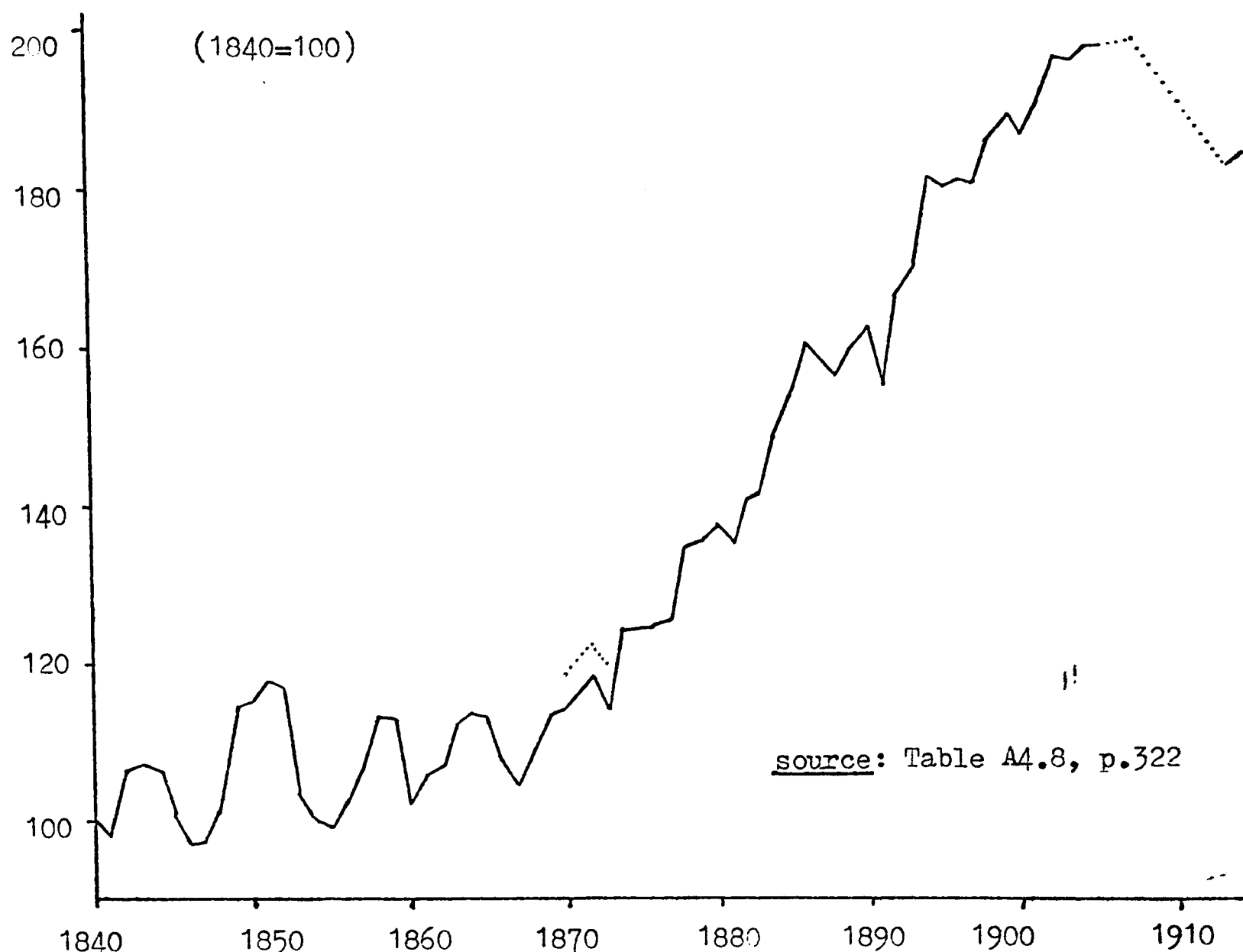
²H.Tanner, 'The farming of Devonshire', Jour. Royal Ag. Soc. Eng., IX (1848-9), p.491

³PP 1871 LVI (181), Av. rate of weekly earnings in agriculture, p.599

⁴PP 1864 XXVIII (3416), Appendix 6, p.304

Fig. 7.1 Adult Male Ordinary Agricultural Labourers'

Real Wages in Devon, 1840-1914



4.3 using the 'A' weights to produce a time series of estimates of real wage levels between 1840 and 1913, as depicted in Fig. 7.1. Discussion of the real wage trends can be conveniently organised into three parts: the short term fluctuations which were particularly pronounced in the early part of the period, the stagnation of real wages until the late 1860s, and the rapid rise which took place thereafter.

The short term increases in real wages during the 1840s, 1850s and 1860s correspond to periods of low prices and may simply be a statistical illusion brought about by the failure of the agricultural wage data to take account of compensatory year to year changes in money wage rates. It is realistic to suppose that employers would have sought to reduce wages whenever possible, and a cheapening of foodstuffs would have provided them with a good opportunity to do so. 'No-one has dropt [sic] wages in this

neighbourhood yet' wrote a small landowner living on the fringe of Dartmoor in February 1850,

'but it is all very natural that wages should be dropt, if the labourer can live for about half what he has hitherto required ... I have no doubt that wages will come back to the old standard of 1s.2d. and 1s.4d. instead of 1s.6d. (per day)'.¹

The survival of a number of parish road surveyors' account books from this time allows judgements to be made about changes in the usual daily rates paid to rural road labourers. It appears that these rates declined between 1848 and 1851 as prices fell and rose again in the early 1850s with prices.² There is also circumstantial evidence of a similar ebb and flow in wage levels in the towns.³ Yet none of the time series of wage rates used for the agricultural money wage index show any sign of short term changes in response to price fluctuations at this or any other time before World War One.

The absence of money wage drift in agriculture may suggest that the fluctuations in real wages were actual. It is likely, however, that the effective cost of the family budget would have changed rather less than the price trends of CLI 1 as attempts were made to substitute cheap for expensive goods, thus dampening down the nominal fluctuations shown in Fig.7.1. Unfortunately, the opportunity for this flexibility must have been limited during the 1840s and 1850s when the prices of all basic commodities generally moved in the same direction at the same time, although in country areas it was probably possible to substitute wood and peat for coal when the latter was expensive. There are, then, grounds for believing the real wage series to be a reasonable guide to the existence of short term fluctuations during the first part of this period.

Underlying these cycles there seems to have been little upwards movement in the secular trend before the late 1860s. It is also fairly

¹Letter quoted in C.Torr, Small Talk at Wreyland, Vol.II, (1921), p.11

²see Table 7.7, p.223

³E.F.P., 9 Oct. 1851, p.5 (Tiverton); 23 Oct. 1851, p.4 (Ashburton)

clear, both from mathematical exercises that compare wage levels with the cost of subsistence dietaries and from general observations made by contemporaries, that the mid-century wages of ordinary agricultural labourers in Devon kept them and their families in abject poverty. Their wages, in common with those of most of the predominantly agricultural south of England, apparently got left behind at subsistence level when those in the north increased from the 18th century onwards under the steadily increasing pressure of industrial development.¹

The miserable existence of farm labourers described by Marshall in his tour of the West of England in the 1790s seemed scarcely to have altered by the mid 19th century. At Stratton, just over the border in north Cornwall, wages were still 7 shillings per week for agricultural labourers in 1847, and had not increased for two generations.² Poverty meant malnutrition and poor housing conditions, which led to reduced physical energy and productivity, which in turn reinforced poverty. The traditional poverty trap of rural life operated in the 1850s much as it had done for centuries. To the farmers, especially those with experience of other regions, labourers were simply lazy. 'The labourers here (West Devon) are very slothful; two Cornish men are equal to four here' was perhaps a typical comment, but there were others with a more perceptive outlook:

'for the most part the men do not get sufficient food of a good quality to enable them to do such a day's work as is done in other parts'.³

Canon Girdlestone, on arriving in the east Devon village of Halberton from a previous living in Lancashire, was appalled by the squalid existence of farm labourers in his new parish and within a short space of time began

¹E.W.Gilboy, Wages in 18th Century England, (1934), pp.219-27, 242

²W.Marshall, The Rural Economy of the West of England, (1796), pp.107-8; W.J.Rowe, The Industrial Revolution in Cornwall, (1953), p.238

³Respectively, a farmer at Pyworthy and the vicar of Holsworthy, both in west Devon PP 1868-9 XIII (4202), p.400. In his report in the same volume Portman observed that 'whereas in Lancashire a man would get 2s6d a day, and in Devon 1s8d a day, the former would do for 7d. the same as the latter for 1s8d': report H, p.48

attempting to remedy the situation by attacking what he saw as its root cause, an over abundance of labour.¹ The unemployed and underemployed labour surplus, relative to the nature and strength of demand, had a great deal to do with the emergence of the North - South disparity in the 18th century, noted by Caird and others at a later date.² As Pollard has suggested, this economic relationship was overlain by reinforcing practices of social control, which worked to keep wages down.³ When the Halberton farmers realised what Girdlestone was trying to do they attempted to impede outmigration by doing the utmost in their capacity as magistrates to sue for breach of contract⁴ By then, however, the economic pressures were becoming too great even for the deadweight of rural custom to resist.

Given that the migration of labour away from rural Devon appears to have begun as early as the 1820s,⁵ it could well be that, as Jones suggests,⁶ the forces of custom were able to hold wages in check until the 1868-73 boom. It is also possible that there was little upwards pressure on real wages before that date simply because there was a great deal of 'slack' in the rural labour market. The growing impact of migration on the labour market may be assessed in part by a comparison of agricultural and road labourers wages in mid-Victorian Devon. Although farm labourers are often thought to have been the most 'residual' group of rural employees, it seems that parish road mending was even less desirable an occupation, undertaken by old men no longer fit enough for farm work and the lowest of the rural poor. As already mentioned, the wages of road labourers drawn from a sample of parishes fell in line with prices over the late 1840s, and it also

¹Heath, The English Peasantry, p.162 et seq.

²Caird, English agriculture in 1850-1, pp.512-3

³Pollard, 'Labour in Great Britain', Camb. Ec. Hist Europe, (1978), p.147

⁴Western Times, 11 June 1872; the local farmers also sought to oppose Girdlestone by boycotting the church in favour of the chapel, but the non-conformist minister told them they had better go back, Heath, op cit, p.168 et seq.

⁵see chapter 2, p.24

⁶E.L.Jones, 'The Agricultural Labour market in England, 1793-1872', E.H.R., 2nd ser., XVII (1964), pp.337-8

Table 7.7. Real wages of road labourers, Devon, 1830-73

ROAD LABOURERS			ROAD LABOURERS		
Money Wages (d./day)	Real Wages (Index)	(Ag.Lab Real Wages) (Index)	Money Wages (d./day)	Real Wages (Index)	(Ag.Lab R.W.) (Index)
1830:	13.5		1852:	13.0	110.2
1840:	13.0	100.0	1853:	14.5	107.4
1843:	13.5	110.4	1855:	16.6	116.8
1845:	13.6	103.8	1859:	17.0	133.8
1847:	14.5	106.9	1860:	17.5	124.0
1850:	13.0	111.8	1863:	17.5	130.4
1851:	12.5	108.1	1873:	24.0	156.1
		117.6			115.2

sources: Money wages- Parish surveyors account books listed in Appendix 4.4, part 3); Real wages- money wage index deflated by C.L.I.1, Table A4.4., p.311. Ag. Lab. Real Wages- from Table A4.8.

appears that, at around 14d. per day (or 7s. on the bold assumption of a full working week) they were generally lower than farm labourers' wages. The comparisons made for sample years between 1830 and 1873 in Table 7.7 above show that there were still quite dramatic short term fluctuations in road labourers' real wages despite the suggestion of price and wage movement correlations made earlier. While these fluctuations may undermine specific year to year comparisons with real farm wages there is a strong impression that real wage rates rose from the 1850s onwards. That road menders wages did not drop when prices fell in the late 1850s may be in substantive contrast to the late 1840s, and not just an artificial upswing. This in turn may be an indication of the effects of the gathering pace of rural depopulation, in reducing the 'slack' in rural labour markets.

Among farm workers it appears that by the 1860s real wages were fluctuating around a level 10% higher than during the early 1840s, a tentative sign that progress was being made. The effects of this were recalled by a Devonian clergyman several decades later:

'in 1856 one man in the village [in South Devon] occasionally killed a sheep, and one would get once a week beef, if a joint was ordered. Before I left it in 1873, three butchers came through the place every week with their loaded vans, and apparently did a good trade.'¹

¹Rev.Treasurer Hawker, 'The Devon Farm Labourer', T.D.A., XIV (1884), p.334

The change in trend around 1870 is dramatic and cannot be explained by the increasing weight distortions in the cost of living index. If an 1876 base had been adopted for this index¹ the effect on the real wage index would have been to raise the early 1870s level by about 6%, as indicated by the short term curve between 1870-2 on Fig.7.2. Although this would raise the relative growth between 1840 and 1870, the increase thereafter would also be accelerated, and the differential would remain.

The boom which appears to have formed the turning point was marked in many parts of Britain by a brief flowering of agricultural trades unionism.² While Devon was not in the forefront of this movement it is clear from newspaper accounts of the time that groups of farm labourers were able to organise collectively to successfully raise wages.³ As mentioned before, there appears to be clear evidence that average agricultural money wages carried on rising in Devon even after the boom ended and the 'Great Depression' set in. At least they appear not to have fallen when the cost of living fell during the 1880s. Thus, the surge in real wages was maintained until the turn of the century, with only brief checks when prices rose, as in 1891. After 1904 there are no more time series data available, but 'benchmark' wage estimates in 1907 and 1913 suggest that the Edwardian period saw something of an erosion of real wages, in keeping with what is known of general conditions in Britain at this time.⁴

Even in 1913 however, real wages were much higher than they had been 50 years earlier, and the changes had been noted by contemporaries for several decades. Some of the comments by mid-Devon farmers to the assistant Commissioner reporting to the Royal Commission on Labour show a full awareness of the changing circumstances of labouring life:

¹ see discussion on weight distortion in Appendix 4.3, p.316

² as described by Ashby in Joseph Ashby of Tysoe, 1859-1919, pp.58-63

³ at Modbury in the South Hams, for example, E.F.P., 8 May 1872

⁴ H.Phelps-Brown and M.H.Browne, A Century of Pay, (1968), pp.159,169

'His wages are higher than they used to be; his privileges remain much the same; cottages are gradually improving without any increase in rent; town shops are increasingly sending carts around with materials at a cheap rate; bread and clothing are cheaper; and newspapers and railways have come within the reach of the labourers.'

'Instead of drinking excessively at the village revel the labourer now goes to the seaside'

'The prosperity of a family is shown by the girls first ceasing to work at farm work, then the wives, and lastly the sons.'¹

A labourer at Sandford was of the opinion that as 'there are no barley puddings now, things must be better'² but several bemoaned the diminution of casual work, or strapping, a development that was probably part and parcel of the 'tightening up' of the labour market. There can be little doubt that grinding poverty continued to be the lot of many rural inhabitants -the state of housing appeared to have changed little by the Edwardian period, for example-³ but in a relative sense conditions had undoubtedly improved since the 1850s and 1860s. 'The farm labourer today', wrote a Devonian farmer in 1905, perhaps sensing an opportunity to remind him to be grateful to his employers,

'with his cash wage of 15 to 18 shillings per week, cheap necessities and humble luxuries, much free entertainment and excitement at hand, with a good free education for his children, hardly realises his privileges over those of his grandfathers'⁴

Where it is possible to compare real wage trends with experience in other parts of the country, Devon appears in a favourable light, primarily because in many places wages did fall after the early 1870s boom, although often from higher levels than had obtained in Devon. Ashby and King collected data from their local neighbourhood of south Warwickshire and found that from an average of 14.98s. per week in 1873 -up by 4s. on the 1870 rate- they fell to 13.7s. within a decade, and to 13.1s. by 1892.⁵ Near Spalding in Lincolnshire, farmers who had paid between 16s.6d. and 18s.6d.

¹PP 1893-4 XXXV (Cd6894-II), p.253 for all quotations

²ibid

³as found by a report to a Diocesan conference: E.F.P., 25 Oct 1913

⁴T.S.Amery, T.D.A. XXXVII (1905) p.117

⁵J.Ashby and Bolton King, 'Statistics of some Midland villages', Economic Journal, III (1893), pp.1-22

in 1872-4 were paying 3-4s. per week less by 1880 and less still during the later 1880s. Fenland wages remained high, in the 15s.-16s.6d. bracket, over the mid 1870s but slumped towards 12 and 13 shillings per week by the early 1890s.¹

In the Vale of Gloucester, however, which was largely given over to dairying, and close to Bristol, there seems to have been no decline from early 1870s levels by 1877-8. It is possible that wages remained stable, or may have risen slightly by 1891-2.² Closer still to Devon though, farm wages in Dorset fell back from the 10s.9d. reached in the second half of the 1870s to the pre-boom figure of 10s. per week in the decade centred on 1890.³

When an attempt is made to broaden the scope of this spatial comparison by relating Devon's agricultural wages to a national average, the results are inevitably tentative, but they tend to support the conclusions drawn from the particular cases mentioned above. It was decided to carry out this exercise for weekly earnings at current prices rather than incorporate the additional problems that a comparison of real wages would entail. The 'England' series in Table 7.8 is based on a combination of data on earnings assimilated by Bowley for 1867-70 and 1898 and by Orwin and Felton thereafter, with Bowley's general average of nominal weekly agricultural wages. Because there is a slight difference between the 'England' figure and the earnings averages for England and Wales, and for Great Britain, the latter are also shown. The difference, however, seems of little consequence.

Hunt found that over the country as a whole the percentage by which the region of highest agricultural pay exceeded the region of lowest pay declined from 44% of the British average in 1867-70 to 28% in 1907.⁴ Fig.7.2

¹S.R.Haresign, 'Agricultural Change and Rural Society in the Lincolnshire Fens and the Isle of Axholme 1870-1914', Univ. East Anglia Ph.D thesis 1980, p.400

²C.A.Miller, 'Farming, Farm Work and Farm Workers in Victorian Gloucestershire' Univ. Bristol Ph.D 1980, Appendix 5/1

³P.J.Perry, 'Working-class isolation and Mobility in Rural Dorset 1837-1936', Transactions of the Inst. British Geographers, XLVI (1969), p.133

⁴Hunt, Regional Wage Variations, (1973), p.58

Fig. 7.2¹⁾ Devon Agricultural Labourers' Weekly Earnings
relative to the England average

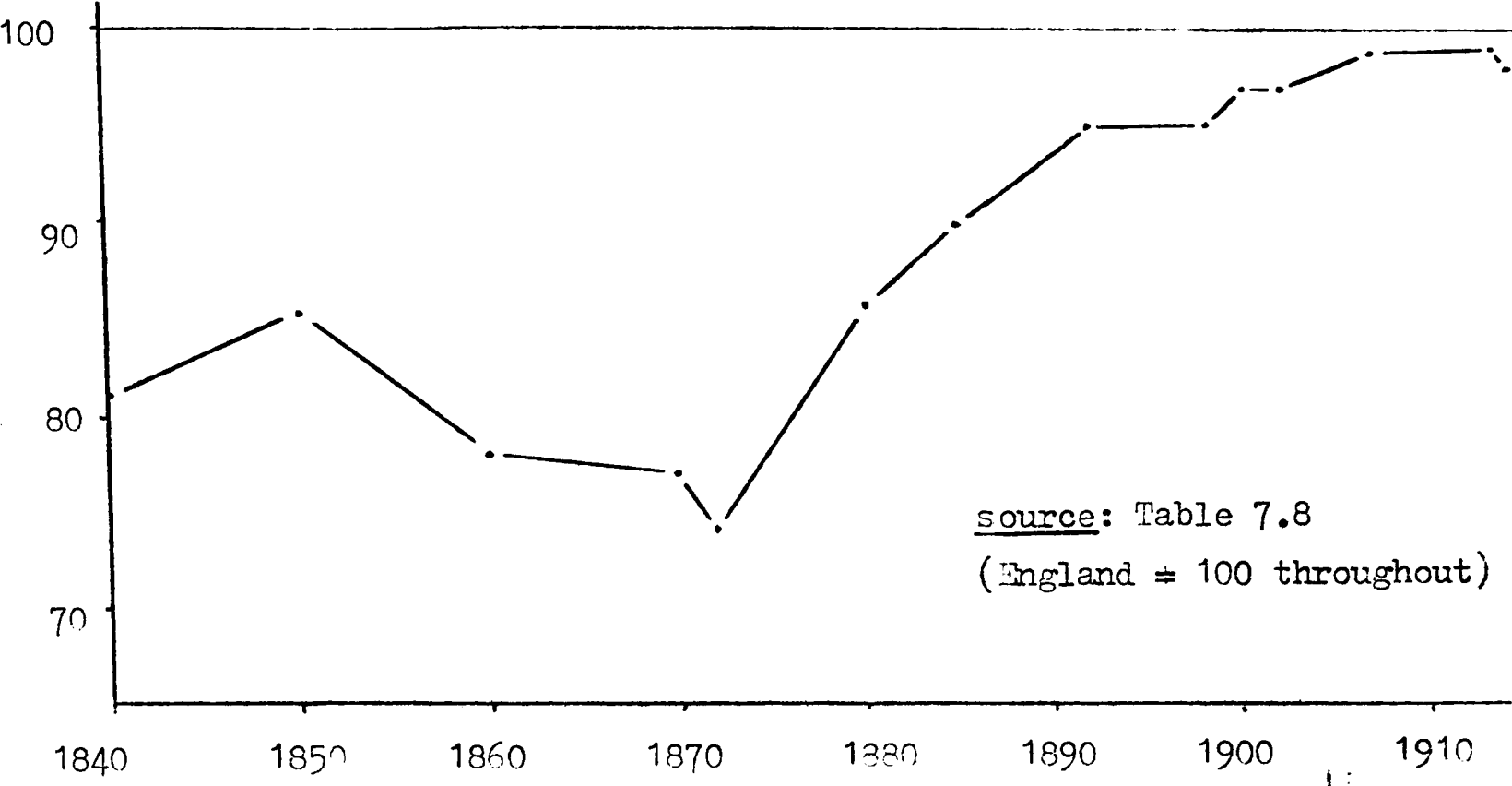


Table 7.8 Weekly Earnings of Adult Male Agricultural Labourers, Devon and

<u>England, 1840-1914</u> (shillings)				
(1)	(2)	(3)	(4)	(5)
Devon	England	(1)/(2)		
1840	9.5	11.7	81	
1850	9.8	11.5	85	
1860	10.6	13.6	78	
1870	11.6	15.1	77	
1867-70	11.42	15.1	76	14.6 - 78% 14.3 - 80%
1872	12.7	17.1	74	
1880	14.1	16.4	86	
1886	14.35	15.8	91	
1892	15.0	15.8	95	15.8 - 95%
1898	16.3	17.2	95	17.0 - 96% 17.2 - 95%
1900	16.7	17.2	97	
1907	17.75	17.94	99	17.9 - 99% 18.2 - 98%
1913	17.9	18.1	99	
1914	19.3	19.7	98	

Notes and sources: Col. (1): Appendix 4.4, Table A4.8; (2): A.L.Bowley, Wages in the U.K. in the 19th Century, (1900), endtable, C.S.Orwin and B.I.Felton, 'A Century of Wages and earnings in Agriculture', Jour. Royal Agricultural Society of England, XCII (1931), pp.245-7, Hunt, Regional Wage Variations, p.62, Wages and Conditions in Agriculture, PP 1919 IX (Cmd.25);
(3): Devon wages as a percentage of the average for England;
(4): Devon wages as a percentage of the average for England and Wales;
(5): Devon wages as a percentage of the average for Great Britain

shows this process at work at a more specific level. The earnings gap between Devon and the national average closed rapidly in the two decades after 1872, and virtual parity was reached by the eve of World War One. If there is any substance to the tentative findings of Table 7.3 with regard to the changing relative price differentials the rise in real wages in Devon would have been even more dramatic.

-4-

The discussion of migration in the last chapter seems to supply a straightforward explanation of this transformation of the position of the Devon farm labourer. Girdlestone's policy of sending trainloads of farm labourers from east Devon to become policemen in Lancashire during the 1860s and 1870s is said to have led directly to the raising of wages in his neighbourhood and others were also aware of the effects of migration.¹ As we have seen, the migration rate from rural Devon was high throughout the second half of the 19th century and although the base data are not strictly comparable, it seems that it was higher than that of the southern and northern English 'rural residues'. The map of relative population losses around the county, and the migration rates of large areas of remote north and west Devon show that depopulation tended to be at its fastest where non-agricultural opportunities were most limited.²

Neither is it without significance that these observations support the figures shown in the last column of Table 7.9 with respect to some of the regional differences in money wages of agricultural labourers around the county. In the Barnstaple-Bideford area and north-west Devon it seems that wages grew noticeably faster than the average for the whole county over the seventy years to 1903, and the migration rate calculated for the roughly contiguous 'Culm Measures' group of parishes in Table 6.6 is around 21%

¹A land agent in east Devon remarked, almost wistfully, to the Royal Commission on the Depression in Agriculture in 1881 that he no longer saw men sitting around on street corners: PP 1881 XVII (c3096), p.721

²see chapter 6, p.186; Table A3.2, p.290

Table 7.9. Regional differences in money wages in agriculture in Devon

	1833-40	1860s	1881	1894-8	1901-3	% change 1833-1903
Barn. /Bideford	95	100	102	100	104	100
N.W.Devon	85	80	98	97	90	97
mid Devon	96	90	99	100	90	70
South Hams	107	110	106	105	100	72.5
Plymouth district	108	114	116	120	110	88
Exeter district	101	(88)	90	97	95	74
east Devon	90	84	88	100	90	85
DEVON	100	100	100	100	100	85

sources: as listed in Appendix 4.4. Exeter district figure for the 1860s is based on very few observations.

higher than the 1840-1911 average for rural Devon. But the correlation breaks down if it is pursued for the south Hams ('average' migration, but slow wages growth) suggesting that other forces such as variations in agricultural and non-agricultural labour demand must also be considered.

It was the close availability of alternative work which kept agricultural wages high in the Plymouth area, for example, and it is not surprising to find that farmers in the district were eager to impress upon their men the false prosperity, squalor and poverty of that city, no doubt in an attempt to dissuade them from moving.¹ Many mid-century commentators refer to the operation of similar forces in several districts, and the following example (from 1874) is typical of many:

'Both at North and South Molton and the districts lying around them, agricultural labourers' wages have recently risen under the operation of causes which never fail to produce a beneficial effect in the rural districts. The new Devon and Somerset line from Taunton to Barnstaple, then in process of completion, passed across the north of Devon, and necessarily created a demand for the best and strongest of the agricultural labourers. In the neighbourhood of North Molton, too, iron and copper mines had been opened; so farmers in these districts were compelled to give their men 12 and 13 shillings per week.'²

It is not necessary to find a direct relationship between migration rates and wage increases for it to be clear that the availability of alternative work and a declining supply of labour in the countryside exerted

¹H.R.Haggard, Rural England, (1902), Vol.II, p.185

²F.G.Heath, The English Peasantry, (1874), pp.124-5

upwards pressure on agricultural wage rates after 1870. What at first sight is surprising is that the changing circumstances, particularly the continued rise in money wages during the 'Great Depression' should be accepted with such relative equanimity by the county's farmers. Remarks to the 1881 Royal Commission expressed some concern that 'they have copied those higher up and lived too extravagantly' and that partly as a consequence 'they take less interest in their work and their employer's welfare'.¹ Labour was said by some to be 'scarcely equal to demand',² yet apart from these perennial grumbles there were no serious and sustained complaints from the employers about the rising cost of farm labour.

Rew's report on agriculture in north Devon in 1895 is notable for the fact that at the well attended public meetings he organised for the region's farmers, at which they were invited to air their grievances, the high price of labour did not figure in discussion. Instead, attention was confined to the level of rents, the Law of Distress, the 1883 Agricultural Holdings Act; the incidence of local taxation and the conditions of sale of foreign meat.³ It is too much to surmise that Devon's farmers were of the collective and magnanimous opinion that labourers were at last beginning to receive the just rewards they had always deserved. The explanation must be sought in more strictly economic territory.

Part of the explanation must lie in the relatively pastoral nature of Devon's agriculture. Not only did this make the county less vulnerable to the 'Great Depression', it must also have meant that labour accounted for a smaller percentage of total costs than elsewhere. In his submission on the state of Devon's agriculture in 1881 W.C.Little provided a few farm accounts in which labour costs were only 8% of the total and he went on to contrast this with the 30% which was more typical of the arable districts of England.⁴

¹PP 1882 XV (c3375), p.153

²PP 1895 XVI (c7728), p.26

³R.H.Rew, Report on North Devon, PP 1895 XVI (c7728), pp.25-6

⁴PP 1882 XV (c3375), App. C (e) -II (South west counties)

Undoubtedly, too, the mildness of the Depression¹ must have been of some importance. If they were not faced with the severity of the problems confronting farmers in East Anglia and the Midlands Devon's agriculturalists were probably less squeezed by the adverse movements of costs and prices. The adaptability of the county's farmers which impressed observers such as Rew and Little² probably extended beyond versatility in choosing an appropriate product mix to making efficient use of available labour and increasing overall productivity on the farm. An early intimation of this kind of positive response was given by one farmer in a description of the state of farming in his district in 1859 when he remarked that the developing 'evil' of a deficiency in labour supply had been counteracted by the introduction of machinery, implying that higher wages had been thus accommodated.³

It is also worth remembering here that the conclusion of the last chapter went some way towards challenging the view that in a depopulating community the residual labour force is of a poor quality. Quantitatively, the rationalisation of the farming sector proceeded relatively swiftly: between 1851 and 1901 the Devonian agricultural labour force diminished at a rate 15% faster than the whole of England and Wales,⁴ yet at the same time the proportion of the local workforce employed in agriculture remained substantially greater than the national average. It appears that a healthy, if inevitably diminishing demand permitted the productivity changes which allowed supply to dovetail adequately in the market for rural labour, instead of a straight contraction of labour supply raising wages in the face of strong complaint from farmers about falling quality and structural shortages.

¹see chapter 4.3, pp.120-1

²*ibid*, p.119

³J.Mortimer, 'The agriculture of north Devon', Jour. Bath and West of Eng. Soc., VIII (1860), p.94; my parentheses.

⁴Table 4.11, p.115

7.4. Urban Wages

-1-

The spotlight that focussed on agriculture becomes a more widely scanning but inevitably lower intensity floodlight when attention is turned to urban wages. Once more, it is a range of official reports and enquiries into living conditions, hours of work and earnings that provide much of the data, but mostly in the form of observations for single years after 1890. It is also possible to draw on newspaper reports, surviving company wage books, council committee minutes and contemporary industrial descriptions to construct wage series but often it is not always certain whether these data are strictly comparable.¹ Given the contribution of tourism export earnings it would be interesting to know more of pay and conditions in this industry, but its very nature, in common with much of the service sector means that there is no information on the wages and other incomes earned within it. Unfortunately then, this survey of wages in the non-agricultural sector must be confined to a relatively limited cross-section of employment, building on the records of the construction trades as they seem to provide the best opportunity for elucidating trends over a long period of time.

The figures in Table A4.9 form an index of an unweighted average of hourly rates paid to bricklayers, masons, carpenters, joiners, plumbers, plasterers and painters in Exeter and Plymouth between 1872 and 1913, taken from annual reports of the local building trades unions and presented in Board of Trade papers in 1900, 1910 and 1914.² Although the figures form a coherent series it is questionable whether or not the standard negotiated rates accurately reflected actual earnings in these trades. According to H.Llewellyn Smith's report on Standard Time Rates in 1900,

¹The material is summarised in App.4.5

²PP 1900 LXXXII (Cd317), Standard Time Rates pp.470-9; 1910 LXXXIV (Cd5459), pp.77-9; 1914 LXXX (Cd7194), pp.946-7, and see App. 4.5, Table A4.9, p.326

'individual workmen, may, and do receive more than the standard rate of wages ruling for their trade in the locality. On the other hand, workmen who have not yet mastered their craft will not demand or receive the standard wage.'¹

Masons went on strike at the Victoria Hall, Exeter, in 1869, where it appears that no fixed rates were paid; the sub-contractor explained that the men earned 'what they were worth'.² There is not enough direct systematic information available on actual wages paid to circumvent this problem so it must be assumed that the spread of actual earnings around the standard rate was roughly constant through time. Therefore, even if the series cannot be used as a guide to actual earnings at any one date, it may still reflect what Bowley called the kinetic trends through time.³ In fact it is possible to combine this series with the non-systematic actual building wage quotations that do survive, with mutually reinforcing results. The figures presented in the Report on Standard Time Rates in 1893 provide enough information to roughly assess the nature of the winter-summer differential in building wages, and it seems that they ranged by 5% on either side of the average for the whole year.⁴

Most of the evidence relates to Exeter alone, though there is some from Plymouth, before the end of the period. It would seem that craftsmen were earning upwards of 17s. per week in 1840 in Exeter while labourers earned around 12s. in a full week.⁵ For the sake of convenience it has been decided to express wages in terms of shillings per week instead of on a daily or hourly basis, so the figures cannot take account of short term seasonal or cyclical unemployment in the construction industry. Table A4.10, which shows the wage series constructed for building craftsmen and labourers, indicates that labourers' pay rose twice as rapidly over the first three decades of the period than that of craftsmen. The bricklayer's

¹PP 1900 LXXXII (Cd317), General report, p.ix

²Western Times, 18 and 22 June 1869

³Bowley, Wages in the U.K., p.2

⁴Report on Standard Time Rates, PP 1894 LXXXIii (c7567)

⁵D.R.O. Exeter City Archives; City Treasurers Vouchers, Boxes 2, 12, 19

official wage rose from 25 shillings, at a weekly rate, in 1835-42 to just 26.6 shillings in the latter half of the 1860s. This increase of 6.5% occurred over a period when urban labourers' wages rose by 12-13% and agricultural labourers' wages rose by 17%.¹ Since prices tended to rise at the same time, the mid-Victorian period may well have been a time of static or deteriorating real wages for urban craftsmen, at least in Exeter. If these figures are deflated by the B weighted cost of living index (C.L.I.3) index² craftsmen's real wages in 1870 were just 2.2% higher than in 1840, whereas building and agricultural labourers' wages rose by 10.6% over the same 30 years.

Small wonder then, that there were signs of militancy among skilled building craftsmen in the 1860s. A dispute between masons, and sub-contractors in 1869 has already been mentioned, and in 1866, journeymen carpenters in Exeter belonging to the Amalgamated Society of Operative Carpenters went on strike for an extra three shillings per week.³ It is not known whether or not they were successful. It is, however, interesting to note that if their claim had been met in full their real wages would have shown more or less parallel growth with those of building labourers over the 1840-70 period.

The second part of the building craftsmen wage index in Table A4.10 incorporates the annual series in Table A4.9 mentioned above, and shows that by the turn of the century the labourers/craftsmen gap had been largely made up. Construction wages in Barnstaple, Bideford, Tiverton and a few other towns are documented in the late 19th century and Edwardian period, and this allows the averages to be stated with greater confidence. In 1913 it seems that builders' labourers earned around 21 shillings in a full week on average, and craftsmen 10 shillings more. These figures are between 70 and 75% higher than the levels noted for 1840. The bias introduced by weight

¹R.Newton, Victorian Exeter, (1968), App. II pp.343-4; Tables A4.10,A4.8

²from Table A4.4, p.311

³E.F.P., 11 Apr. 1866, p.5

distortion in the price deflators which are used to convert these series into estimates of real wage growth probably means that the suggested real wage growth of 62-68% over the whole period underestimates the true increase. Since the same underestimation must have occurred in assessing agricultural wages there is still a valid basis for comparison. Despite the ambiguity in the stated wages for building craftsmen and their labourers, it appears that their wages grew appreciably slower than those of farm workers. While there is little doubt that at any one time a gap remained between the average earnings of agricultural and urban unskilled labourers, the real wages of the former were nearly double their 1840 level in 1903-4 whereas those of the latter had risen by around 73%.¹ The differential narrowed slightly by 1913, due to the greater resilience of urban wages in the face of price increases.

The construction industry may have been exceptional. Certainly it is not renowned for having featured prominently among the growth sectors of the economy in a national sense, and the difficulty of achieving productivity growth in the sector could well have meant that wage growth was lower than in other urban industries. Therefore it is necessary to look at a broader range of urban wages before attempting to explain the differential between urban and agricultural wages in general.

-2-

It is rarely possible to obtain direct wage information for the firms and industries which were identified in chapter 4 as having been successful in developing prosperous outlets in the Victorian period but there are suggestions that their employees may well have enjoyed some of the fruits of this prosperity. Brannams, the Barnstaple pottery that successfully sought out high quality markets, was paying its skilled throwers between 15 and 18 shillings per week in 1880. By 1906 throwers wages had doubled to between 30

¹see Tables A4.8, A4.10, the latter deflated by CLI3 index, Table A4.4.

and 40 shillings per week.¹ In the Devonport Dockyard, another operation sustained by 'external demand', the Amalgamated Society of Engineers (A.S.E.) had negotiated hourly rates of pay for turners, fitters and smiths that, at 9.5d per hour, were 36% above the average for other engineering workers in Exeter, Newton Abbot and Dartmouth in 1913.² Turners, fitters and smiths' rates in the rest of Plymouth and Devonport were 17% higher than the average for the other towns, no doubt because of the influence of high pay in the Dockyard. Even in the low paid lacemaking trade of east Devon it appears that the revival of external demand towards the end of the period improved wages and conditions over those of the hard mid-century decades.³

There is also a positive relationship between demand and earnings in the extractive industries. It was said of the Lee Moor clay labourers, who earned 18-20 shillings per week and were provided with a garden, that 'it is certain there is no other community on Dartmoor better circumstanced'.⁴ Quarrymen employed by the expanding Teign Valley Granite Company were paid 3s. per day in 1887, and 3s.11d. in 1906,⁵ an increase of almost a third, which was much greater than the index for building craftsmen and labourers. The newly opened Owlacombe Beam and Union Mine on Dartmoor was paying miners the sum of 26s. per week in 1851 during a tin mining boom,⁶ High wages could also be earned mining copper for Devon Great Consols in its heyday. 19s6d was said to be the average weekly wage of a 'tributer' in 1846, or nearly double the average ordinary agricultural labourer's weekly earnings.⁷

Conditions were different three decades later, when the Tamar Valley copper boom had come to an end. A strike in 1878 failed to prevent a cut in

¹ Brannam, A Family Business, pp.10,25; E.Edgcumb-Edwards, 'Industries of Devon. III-Potteries', V.C.H. Devon Vol.II manuscript, I.H.R., Envs 438/9, p.11

² PP 1914 LXXX (Cd7131), Annual Abstract of Labour Statistics, pp.974-5

³ Edgcumb-Edwards, 'Industries: IV -Lace' p.12; see also PP 1888 LXXX (124), Report on the Honiton Lace Trade, pp.493-506

⁴ Crossing's Dartmoor Worker, ed. B.Le Mesurier, (1966), p.80

⁵ Edgcumb-Edwards, 'Industries VIII', p.4

⁶ D.R.O. 924B/B9/9

⁷ Goodridge, 'Devon Great Consols', p.239

pay from 14s.9d. to 13s.7d. and in the following year, when the miners claimed the average wage to have fallen to 12s6d per week, a further 10% cut was imposed following another strike.¹ Here then is the other side of the coin of demand-linked wages, suggesting that changes in external conditions could lead to drastic reductions in the standard of living of certain groups.

The evidence that high wages were paid in successful productive activities in Victorian Devon needs to be followed with the equally strong evidence that the wages of other manufacturing workers did not necessarily leave those in the 'traditional' building trades behind. The weekly pay of a sample of seven skilled men employed by Parkins Iron Foundry in Exeter rose by only 9.6% between 1877 and 1903, compared with a 27% rise for building craftsmen.² In 1903 ironfounders at Parkins earnt just over 29 shillings per week, no more than the city's carpenters in a full week. The wage books of Garton and King's, an ironfounders firm described in an earlier chapter as developing strongly in specialist external markets, also survive for the 1890s and 1900s. They show that the average pay of all employees in the Exeter works fell from 21s. per week in 1892 to 17.9s. in 1897 before recovering in the years up to 1905.³ It would also seem that the low pay of labourers in the Bonhay foundry in 1872 -they were earning 12s. per week and seeking a rise to 15s- was generalised throughout the city:

'The labourers of the well known firm of Messrs. Taylor and Bodley waited on their employers this morning to ask for an advance of wages, and with their usual liberality they have agreed to the demand if all the foundry masters do the same'³

Despite the relatively high pay of engineers and shipwrights in Devonport, Naval Dockyard labourers were being paid less in the early 1890s than night sweepers employed by the Plymouth Corporation. The pay of the

¹Goodridge, 'Devon Great Consols', pp.250-1

²Company wage books, D.R.O. 68/18/5/1 & 2

³D.R.O. 2783B/A5 & 6

⁴Western Times, 11 June 1872

sweepers rose from 18 to 20 shillings per week in 1890, while Dockyard labourers were paid between 15 and 17s. per week in 1890 and 1891.¹ Their wages suffered in comparison with those of other labouring work just as much in 1913 as they had done 50 years previously.² In Tiverton, adult workers at John Heathcoat's machine lace factory -which had been moved from Nottinghamshire in the wake of Luddite riots in 1816- were paid little more in the 1860s and 1870s than was being earnt by farm labourers in the surrounding mid-Devon countryside.³

Thus the growth in the wages of Devon's building craftsmen and labourers may have exceeded that of other industries in the county instead of being exceptionally low. On the eve of World War One carpenters pay was often comparable with that of engineers.⁴ It is difficult to say much about wages in other industries, but the Annual Abstract of Labour Statistics does show that in Plymouth, Devon's main industrial centre, the rate of pay of skilled artisans in printing, shoemaking and electrical engineering were no higher than those in the shipyard and engineering trades in 1913.⁵

Reference has already been made to the 'residual' nature of much work in the service sector. The Plymouth night sweepers who had earned little more than local agricultural workers in 1890⁶ were apparently no better off in the Edwardian period when it was found that scavengers in the Plymouth area earnt only 14s. per week, compared to an average for England and Wales of 21s. The Plymouth Trades Council managed to persuade the Devonport Corporation to raise the wage to 20s. but apparently this type of action was

¹Plymouth Corporation, Special Cttee. Minutes 1885-99 p.114; D.R.O. (Plymouth Office) P5/X2; PP 1892 XXXVII (c6795-IV) Royal Comm. Labour, Minutes of Evidence, Group A.

²PP 1864 XXXVIII (49), Accounts of Labour Charts for Dockyards, 1862-3, pp.428-88; PP 1914-6 LXI (Cd7635), Rates of Wages, p.912

³W.P.Authers, 'Juvenile Wage Rates in Tiverton in 1864 and 1877', Devon and Cornwall Notes and Queries, XXXIV (1981), p.335

⁴In Newton Abbot in 1913 for example, carpenters could earn 33s. per week (official rates) and turners, fitters and smiths 30s. PP 1914 LXXX (Cd7131) pp.946-7, 974-5

⁵ibid, pp.974-5, 982.

⁶see chapter 4.5, p.148

seldom successful. Local authorities were said to behave little differently towards their employees than commercial employers of labour.¹

A perhaps typical example of the failure of collective action to raise wages is that of the coal lumpers of Dartmouth. Cargo vessels and passenger ships bound for Cape Town and Natal bunkered with coal in the sheltered estuary of the Dart. Six to eight strong gangs of 'lumpers' would sit waiting on the quayside for the first sight of a ship. The irregular nature of the work meant earnings could vary between nothing and 27s. per week, and the standard rate of 2d per ton of coal per man remained unchanged between 1900 and 1913. A strike by the Dock and General Workers Union failed to increase it before World War One.² Along with the arduous, monotonous and low paid work of the clay lumpers who transferred clay from barge to ship by hand at Teignmouth,³ the work of Dartmouth's coal lumpers show that in 1913 there were still groups of people undertaking low productivity work in a labour intensive fashion in the service sector of Devon's economy. It is likely that low incomes also prevailed among many of the self-employed groups whose wages do not appear in the statistics save for the odd glimpse. For example, a small Sidmouth fisherman admitted in 1907 that if he could be assured of only 15s. per week on dry land he would give up his trade.⁴

There were also wide regional variations in wage levels within the county. particularly between town and country in craft occupations. In the 1840s Exeter plasterers earned 3s4d per day and building labourers 2s4d, but plasterers at a house at Nymet Rowland in mid Devon were paid only 2s per day in 1846.⁵ Thatchers, at 13s6d per week in 1868, earned less at Thorverton than did council scavengers just six miles away in Exeter.⁶

¹ H.B. Williams, History of the Plymouth and District Trades Council, (Plymouth, 1952), p.10

² Freeman, Dartmouth - A new history of the Port, p.125

³ Bulley, 'The Devon ball clay trade', p.200

⁴ Reynolds, A Poor Man's House, p.110

⁵ Hoskins, Two Thousand Years in Exeter, p.99; Newton, Victorian Exeter, App.II pp.343-4; D.R.O. 1107M/E2

⁶ PP 1868-9 XIII (4202), p.375; Newton, op cit, pp.343-4

Table 7.10 Regional Wage Differentials in Devon, 1900-13

(Exeter = 100 in all cases)

CARPENTERS, 1900 (Exeter = 7.5d./hr.)

Plymouth & Devonport:	107	Newton Abbot:	80	Barnstaple:	73
Torquay:	100	Dartmouth:	80	Brixham:	73
Exeter:	100	Tavistock:	80	Tiverton:	73
Bideford:	80	Dawlish:	80		

BRICKLAYERS' LABOURERS, 1900 (Exeter = 5d./hr.)

Plymouth:	110	Torquay:	90	Barnstaple:	75
Exeter:	100	Brixham:	80		
Dartmouth:	90	Tiverton:	80		

POLICE CONSTABLES, 1911-3

Devonport:	29.75s	106	Barnstaple:	25.75s	92
Plymouth:	29.29s	104	Devon County:	25.38s	90
Exeter	28.13s	100	Tiverton:	24.75s	88

sources: Report on Standard Time Rates PP 1900 LXXXII (Cd317),pp.375-7
16th Annual Abstract of Statistics, PP 1914 LXXX (Cd7080), pp.397-9

Later in the century, while the A.S.E. had obtained 32 s. per week for turners, fitters and smiths in Plymouth and Devonport between 1894 and 1898, the fitter employed on the remote Torrington and Marland Railway was paid only 20s. per week and the carpenter just 15s.¹

There were also significant differences in the rate of pay for similar jobs between the towns. The relatively high wages of engineers in Plymouth and Devonport has already been mentioned but one of the widest regional differentials was that which existed between Barnstaple and Plymouth gas stokers' pay. In 1913 Plymouth and Devonport stokers were paid 5s. to 5s3d. per eight hour shift (or 7.5 to 7.9d. per hour). In Barnstaple stokers were paid 3s8d. to 4s. for a twelve hour shift, which at 3.67 to 4d. per hour was

¹1900 LXXII (Cd317), Standard Time Rates, p.482; Messenger, North Devon Clay, p.99

roughly half the Plymouth level.¹ In 1893 Appledore shipwrights were earning 4.75d. per hour while those in Devonport earned 7d. to 7.5d. per hour, over 50% more.² Differentials are shown for other trades in Table 7.10 above.

Here too is further evidence of the prominence of Plymouth within the county's economy and a reminder that the influences acting upon wage determination clearly operated with differing force across Devon. Because these regional figures are static rather than dynamic they probably do not compromise the conclusion emerging from the preceding pages that male non-agricultural workers in Devon did not experience as fast a growth in money or real earnings as agricultural labourers between 1840 and 1913. Section 7.3. of this chapter showed that the fortunes of the latter group improved significantly relative to the national average over this period.[†] The task now is to attempt a similar comparison between the county as a whole and the national average.

¹PP 1914 LXXX (Cd7080), p.1036

²PP 1894 LXXXIii (c5767), p.790

7.5 Devon and National Wage Levels

-1-

This exercise is fraught with many difficulties, one of the most problematic being the absence of a satisfactory body of data on the wages of female labour, both in Devon and in the nation as a whole. While a female wage average (based on an assumption as to what proportion of the male average this may have been) could be weighted in to an estimate of average wages this in itself could be little more than a guess, and no substitute for composite indices which include female wage elements. The effects of this omission are spread disproportionately between occupations, given the high level of female employment in the service sectors of the economy. In that this was even more the case with regard to Devon's occupational distribution compared to Britain as a whole¹ and that rates of pay were generally lower in services than in industry it is possible that womens' earnings were a smaller percentage of those of the average male in Devon than they were at national level.

Even constructing a composite index of male wages is a dangerous operation, since there are few occupations for which series can be compiled over periods long enough to allow useful comparisons to be made. However, much of the short term data on wages in a wider range of trades has already been worked into the main series for craftsmen and labourers, a process described in more detail in Appendices 4.5. and 4.6. For present purposes it was decided to combine these indices with those for agricultural labourers and clerical workers. Weights are assigned according to rough shares of male employment, and the results are shown in Table 7.11 overleaf. The information on clerical wages -included as a separate element in an attempt to acknowledge the importance of the service sector- is much more

¹Table A1.3, p.268

Table 7.11. Composite Money Wage Index, Devon Males, 1840-1913

	URBAN LABOURERS		URBAN CRAFTSMEN		URBAN CLERICAL		AG. LABS.		DEVON AVERAGE
	Index	weight	Index	weight	Index	weight	Index	weight	Index
	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-
1840	100	.31	100	.21	100	.1	100	.38	100
1850	104.2	.33	102.7	.2	101	.09	103.5	.38	103.3
1860	108.3	.35	108.1	.22	111.2	.11	111.1	.32	109.5
1870	116.7	.37	108.1	.24	119.0	.13	121.8	.26	116.3
1880	136.2	.38	133.5	.25	136.0	.12	148.5	.25	138.6
1890	140.8	.4	143.8	.26	143.0	.13	156.8	.21	145.2
1900	158.3	.42	163.2	.27	154.0	.13	175.6	.18	162.2
1907	170.8	.41	167.6	.27	153.0	.14	186.8	.18	170.3
1913	175.0	.41	171.9	.27	156.0	.14	188.4	.18	173.9

sources: Tables A4.8 (Agric. labourers), A4.10 (others). Clerical workers: interpolation between 1840, 1866, 1898, 1909, 1913 based on trends for urban labourers. Sources listed in App. 4.5

sparse than that which was used for the other three indices, amounting to little more than observed changes in the rates of pay of Post Office clerks in Exeter.¹ If anything, the points made earlier concerning the remuneration of other service occupations such as street sweeping and coal lumping at different dates may suggest that an increase of 56% in 'clerical wages' between 1840 and 1913 is not an overly generous assessment of trends in the service sector. The same may be true of using the building craftsmen and labourers index to represent the whole 'productive sector' of the economy. Angle-iron smiths in the Devonport Dockyard, aristocrats of labour if ever there were any in Devon, earned 53% more per week in 1913 than they did in 1863, less than the 60-67% rise suggested for building craftsmen over the same period.²

¹See App.4.5, pp.328-9. Williamson's survey of nominal annual earnings in England suggests that at national level the pay of 'messengers and porters' rose by even less than this over a comparable period. J.G.Williamson, 'The structure of pay in Britain', Research in Econ. Hist., VII (1982), p.31

²see Table A4.10, p.326; these considerations indicate that the money wage series for Devon, being built around the construction industry, contains an upwards bias.

As ever, the weighting is also fairly arbitrary, especially insofar as it was necessary to differentiate between skilled and unskilled trades, for the census employment data cannot be easily reconstituted in this way from its 'horizontal' or occupational presentation. However, because these two series do not differ significantly from each other the arbitrary weighting ratio of 1.5:1 between labourers and craftsmen is not of especial importance to the outcome.

Having constructed a county-wide average series, the next stage is to obtain a suitable index for the nation as a whole, and to attempt a calculation of the relative wage level in Devon as a percentage of the national average in order to link the two series. The index offered by Phelps-Brown and Browne provides annual figures for average money wages in Great Britain from 1860 onwards¹ but only lists the wages of those skilled occupations (and agricultural labour) collated by Wood and Bowley.² The Phelps-Brown money wage estimates were created by projecting backwards to 1860 on their index a composite average wage calculated for 1905, which included an allowance for female wages.³

Fortunately a more detailed, and better substantiated set of figures of national money wages has now been provided by Williamson, one of the principal advantages of which is that it includes figures for the service sector.⁴ The series presented for males in England and Wales by Williamson includes high wage occupations for which no comparable series has been constructed for Devon. Therefore only the following components of his series are used: sectors 1L -6L (agricultural labourers, general non-agricultural labourers, messengers and porters, government low wage service sector employees, police and miners) and sectors 2H -6H (skilled shipbuilders,

¹E.H.Phelps-Brown and M.H.Browne, A Century of Pay, (1968), App.3

²ibid, App. 2., pp.398-9; G.H.Wood, J.R.S.S., LXXII (1909), pp.102-3; A.L.Bowley, Wages and Incomes in the U.K. since 1860, (1937), p.6

³Phelps-Brown and Browne, App.1.4, pp.351-2

⁴Williamson, 'The structure of pay in Britain', App. Tables 1,2,4 pp.31-3,48

those employed in the engineering, building, textiles and printing trades.¹

Column 2 of Table 7.12 overleaf shows the composite wage index weighted according to employment shares. The Devon series is expressed as a proportion of the England and Wales series according to a linking calculation made for 1860. Arriving at a money wage average for Devon in that year was perhaps the most difficult of all of the stages of estimation involved. Wage quotations are available for 1860 in a number of occupations but, as described in detail in the appendices to this chapter, the relationship between surviving wage information and the actual distribution of occupations leaves a great deal to be desired. The process of building a set of weights which attempts to bridge that gap is the subject of Appendix 4.6 and only the results are discussed here.

Average male weekly earnings in Devon were estimated at 13.74s. in 1860, compared to 19.35s. in England and Wales (the figure derived from Williamson's wage data for 1861) implying that Devon ranked no higher than 71% of the national average. The difference in timing would appear to have been of little consequence: Phelps-Brown and Browne's index shows no growth in money wages between 1860 and 1861 and it is probably safe to assume the same for Williamson's figures. If messengers and porters are left out of the England and Wales series (they are included in Williamson's low income occupations although they earned as much as 31.6s. per week), the national average falls to 18.6s., consequently raising Devon's proportion to 73.9%. A further difference is made if it is assumed that general labourers are overweighted in the Devon index (at 38%) and/or underweighted in Williamson's (at 19%). If in the latter series general labourers are weighted up to 35% of the total, with corresponding deductions assigned equally between the skilled trades, the England and Wales average now becomes 18.2s., of which the Devon figure is only 75.5%.

¹Williamson, 'Structure of Pay', App.Table 2, p.33

Table 7.12. Devon, England & Wales Average Money Wages, 1851-1913

(England and Wales 1860 = 100)

	Devon	Eng.& Wales	Devon % of Eng.& Wales
1851:	70.5	89.0	79.2
1860:	74.6	100.0	74.6
1870:	79.2	111.5	71.0
1880:	94.4	120.5	78.3
1890:	98.9	136.4	72.5
1898-1900:	119.5	149.3	74.0
1907:	116.0	157.0	73.9
1913:	118.5	162.0	73.1

sources: Eng.& Wales: Williamson,'The structure of pay', App. Tables 1,2, sectors 1L-6L, 2H-6H. 1860 weights: ag. labs: 0.381, gen.labs: 0.35, messengers/porters: 0.025, govt. low wage: 0.005, police: 0.009, miners: 0.09, shipbuilders: 0.08, engineers: 0.013, builders: 0.08, textiles: 0.029, printers: 0.01;
Devon: Column 9, Table 7.11, deflated to 1860 = 74.6 by % differential in county-national wages in that year (see text, and Appendix 4.6)

In Table 7.12 messengers and porters are included in the England and Wales total since there is little justification in artificially adjusting the national occupational structure towards that of Devon simply because Devon may not have provided that kind of employment. However, the higher weight of 35% assigned to the wages of general labourers in 1860 is retained on the grounds that the Census employment data probably included unskilled labourers in their occupational categories, thereby over-weighting the importance of skilled workers with regard to wages. This may or may not represent a legitimate exclusion of the occupational structural element in the Devonian-national wage differential but it makes little difference to the outcome of the calculation. Average national wages are estimated at 18.41s. per week in 1861, making Devon's average weekly wage 74.6% of the national. Thus even with further potential upwards biases in its favour, the Devon index comes to only three-quarters of the national average.

Table 7.12 also indicates that there was no sign of any fundamental change in this relationship throughout the Victorian and Edwardian period, leaving aside the apparent fluctuations from decade to decade before 1890.

It would in any case be dangerous to attach significance to these fluctuations given the crude basis of the data. A tentative 'county-wide' calculation for 1913 produced the figure of 23.3s. per week for average male earnings in Devon, or 77.1% of the English and Welsh average.¹ Although higher than the 73.1% figure shown for that year in Table 7.12 it is arguably not enough to alter the substance of this section. In marked contrast to the agricultural sector alone it seems that average money wages in Devon failed to get much closer to the national level before 1913, and may even have drifted further away.

The experimentation with different weights shows that this shortfall was not merely a result of Devon's occupational structure being weighted towards the less productive sectors, but more particularly to do with the failure of wages within the quantifiable sectors to attain anything like national levels. The wages of skilled craftsmen in Plymouth and Devonport may have come closer to the national rates, but the county average was pulled down by the lower wages earned in other towns. For example, the 37s6d wage of building craftsmen in Plymouth represented 92.8% of the national average in 1913, while the Barnstaple rate of 28s. was no more than 69.3% of the national level.² In the engineering trades, the 38s6d earned in Plymouth on the eve of World War One was no more than 85% of the national average. The 30s per week of similar workers in Newton Abbot was only 67%.³

The problems encountered in setting up acceptable price indices hardly make a comparison of real wages worthwhile, but the observation made earlier that the second half of the century seemed to witness relative downwards adjustments in the prices of key commodities in Devon may to some extent have mitigated the position shown in Table 7.12. If so it means that most, if not all, of any relative increase in average male real wages in Devon was

¹ derived in the same way as for 1860 -for which, see App. 4.6. Sources listed in Appendices 4.4 and 4.5.

² Williamson, 'Structure of Pay', App. Table 4, p.48; PP 1914 LXXX (Cd7131) pp.946-7

³ Williamson, 'Structure of Pay', App. Table 4, p.48; PP 1914 LXXX, pp.974-5.

the product of changes in the efficiency with which basic commodities could be supplied to the county, the 'price effect' component of changes in living standards,¹ rather than the product of more than a marginal decrease in the money wage 'gap'.

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Given that the distribution of incomes around the mean was usually skewed it would be useful to have some measure of variance to supplement the raw averages. The quantity and nature of the data on wages make it impossible to compute standard deviations. Nevertheless, a regional comparison of the official statistics of pauperism provides a partial measure of one aspect of the distribution of income, to the extent that these figures register the proportion of population falling below a rigorously defined minimum subsistence level.

Detailed annual returns were submitted to Parliament on the numbers of people obtaining relief and the cost of supporting them in each Poor Law Union. While the figures are in no way representative of the absolute levels of poverty, as Rowntree showed in York at the turn of the century,² they are not without comparative value. Table 7.13 overleaf shows that across the nation as a whole the Victorian period witnessed a decline in the number of paupers as a percentage of total population. Furthermore, crude calculations of the standard of deviation of county pauperism levels around the unweighted national mean in 1851 and 1892 show a slight tendency towards a narrowing of the diversity shown around the country.³

¹Floud makes the same point with regard to the effect of international price changes on living standards in Britain as a whole during this period. Floud & McCloskey, Economic History of Britain, vol.II,p.18

²B.S.Rowntree, Poverty: A Study of Town Life, (1901), passim.

³1851: unweighted national mean (i) = 54.6 (paupers/1000 popn.)
 crude standard deviation (ii) = 15.05
 (ii)/(i) = 0.276 :PP 1852-3 LXXXIV (58)
 1892: unweighted national mean (i) = 29.18
 crude standard deviation (ii) = 7.54
 (ii)/(i) = 0.258 :PP 1892 LXVIII (78B,B1)

Table 7.13. Relative Poor Relief, Devon, England & Wales

A) % OF POPULATION IN RECEIPT OF RELIEF

	1852	1860	1870	1880	1890	1900	1910
Devon	6.63	5.35	5.68	4.43	3.92	3.45	2.83
Eng. & Wales	4.92	4.11	5.17	3.56	2.61	2.33	2.27
Dev./Eng & Wales	1.35	1.3	1.1	1.24	1.5	1.48	1.25

B) THE RELATIVE BURDEN IN DEVON, 1813-1900

Devon percentage of Eng & Wales...	1813	1831	1840- 41	1851- 52	1859- 60	1869- 70	1889- 90	1899- 1900
i) poor expenditure:	3.86	4.00	4.03	3.43	3.66	3.21	2.98	2.52
ii) population:	3.67	3.53	3.35	3.16	2.92	2.65	2.14	2.06
ration of i) to ii):	1.05	1.13	1.20	1.09	1.25	1.21	1.39	1.22

sources: PP 1830-1 XI (52),1835 XLVII (444), 1843 XLV (144), 1852-3 LXXXIV (c35), 1860 LVIII (383.B), 1870 LVIII (280.B), 1880 LXI (66.B), 1890 LXIII (94.B), 1900 LXXIII (136); Population figures refer to the closest Census date, Table 6.1, p.174

In Devon, however, the figures of both the number of paupers and the cost of supporting them appeared to move further away from the national average in this period. Table 7.13 part B) shows that the relatively high level of relief in Devon was not in continuation of an historically high level, but had grown up over the first half of the 19th century. The possibility that this may in some way be linked to the degree of economic development in Devon is perhaps strengthened by the observation that the highest rates of pauperism in England and Wales were to be found in the predominantly rural and non-industrial counties, while the lowest were to be found in industrial counties such as Glamorgan, Lancashire and the West Riding of Yorkshire.¹

Closer examination of the statistics suggests a more direct explanation. When the figures of the total number of paupers are divided into 'able bodied' and 'non-able bodied' categories, in Table 7.14, overleaf, it appears that the differential between Devonian and national

¹PP 1892 LXVIII (78 B & B1)

Table 7.14 Able bodied and non-able bodied poor relieved, as % of popn.

	ABLE BODIED			NON-ABLE BODIED		
	Devon	E.& W.	1/2	Devon	E.& W.	3/4
	-1-	-2-		-3-	-4-	
1856:	0.65	0.66	0.99	5.32	3.96	1.35
1870:	1.65	2.07	0.8	4.03	3.1	1.3
1880:	1.06	1.21	0.88	3.37	2.35	1.43
1890:	0.86	0.76	1.14	3.06	1.85	1.65
1900:	0.64	0.58	1.1	2.81	1.75	1.61

source: as for Table 7.13, and PP 1856 XLIX (84)

rates of pauperism is found almost wholly in the latter and more important category.¹ Thus the problem of pauperism was mostly a problem of supporting a relatively high number of the non-able bodied poor, which consisted disproportionately of the elderly.²

This in turn had much to do with the 'top heavy' age structure of Devon relative to the national average. If rates of pauperism among the elderly population are considered alone (those aged 65 and over), the level of poverty in Devon was just 7% higher than it was in the whole of England and Wales in 1892.³ The differential in age related pauperism rates was also about 7% for those aged under 65 in the same year. Therefore the high level of pauperism in Devon was mostly due to the large proportion of the local population structure accounted for by the group which was most prone to pauperism. The burden of poverty was thus largely a structural problem caused by the heavy net out-migration from the county of younger and economically active Devonians. In 1891 Devon's activity rate was little different to the national average⁴ but the figures on age specific poverty suggest that this crude division of the population conceals a significantly

¹showing that the principle of 'less eligibility' did deter the able bodied from seeking relief.

²An 1892 return breaking down pauperism by age showed that 34.7% of the poor were aged 65 and over in Devon, yet they accounted for only 7.3% of county population in 1891: PP 1892 LXVIII (265), p.628

³Eng.& Wales: 274.24 /1000, Devon 293.57 /1000: PP 1892 LXVIII (265), p.625

⁴In 1891 42.9% of the Devonian population was recorded as being in employment against 43.9% in the whole of Britain: Table A1.1, p.266

greater differential in the real dependency ratio, by not providing information on part-time employment and underemployment.¹

Apart from these structural effects, the 7% higher rate of 'age-specific' pauperism in Devon over the national average lends general support to the wage comparisons. A shortfall of more than 25% in average wages in 1890² and a 7% higher pauperism rate even suggests, on the face of it, that among the working classes resources were not distributed as unequally within Devon as they were at national level. It would be dangerous to press this far the juxtaposition of two such totally different measures of welfare standards, but both show that 'national economic unity' had not been fully achieved by 1914.

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It remains to be seen whether the real wage gap reflects a productivity differential. Hunt, for one, suggested that in general there was a positive relationship between wages and productivity,³ which, for Devon, would imply a low overall level of economic efficiency throughout the Victorian period. On the supply side of the labour market this relationship between wages and productivity is theoretically maintained by assuming that out-migration eliminates unemployment in any one area, thereby forcing wages up to the ceiling set by productivity levels. The relationship breaks down, however, if migration turns out to be less influenced by spatial wage gradients than neo-classical theory assumes, and if 'slack' remains in the labour market.

Any realistic appraisal of wage determination in Devon must include this qualification, in view of the conclusions drawn in the last chapter with regard to migration. Notwithstanding the apparently high rates of net

¹It is possible that old men continued to accept very low wages for road labouring work in north west Devon in the late 19th century because the migration of younger family members had deprived them of other means of support: App.4.4, p.324

²see Table 7.12

³Hunt, Regional Wage Variations, pp.217-8

out-migration, particularly from the rural areas, it was suggested that 'push' factors such as unemployment and poor housing were of greater importance than 'pull' factors such as higher wages in the prospective destinations possibly because the county was located at some distance from the great centres of labour demand. Given the weight of inertia and other difficulties connected with long distance travel, especially for the low paid, this is hardly surprising. It is logical to assume that if 'push' factors were more important than 'pull' factors, the decision to migrate was not taken until the potential migrant's circumstances were particularly hard. If migration was related to wages at all, it ceased to operate at a point short of inter-regional parity.

Furthermore the discussion of service sector employment in chapter 4.5 suggested that a relative labour surplus may have been an important feature of Devonian economic life during the second half of the 19th century. This does not necessarily contradict the connection between unemployment and migration put forward in chapter 6, as the labour surplus could well have taken the form of underemployment and the acceptance of low wages rather than unemployment. Devon's labour surplus could have allowed productivity to run at a level higher than that reflected in the going rate of wages, a situation somewhat analagous to that portrayed for the economy as a whole by Sir Arthur Lewis. Despite a substantial increase in output and income per head during the industrial revolution, real wages grew only slowly before 1870, supporting the view that an unlimited supply of labour in the early stages of capitalist development keeps wages low, to the benefit of profits and accumulation.¹ But, if cheap labour in Devon had been exploited to deliver the benefit of high productivity to entrepreneurs, there would have been clearer evidence of a capital inflow to the county than was detected in Chapter 5. The realisation of high productive efficiency depended on

¹W.A.Lewis, Growth and Fluctuations 1870-1913, (1978), p.109

conditions other than cheap labour, and it would appear that external capital was attracted only when there were other resource advantages present, such as in ball clay and copper mining.

Given the relatively limited locational advantages of a peripheral region such as Devon it would seem more realistic to suppose that low wages attracted low, not high, productivity work, a conclusion apparently endorsed by the findings of chapter 4. This would certainly appear to have been the case with Vincent and Duncan's collar factory in Bideford from the 1870s. Operating in a corner of the clothing industry where a technical solution to low manual productivity had yet to be found, it was evidently cost-effective for them to move from high wage Manchester to the south-west of England.¹ Thus Devon fits well into Hunt's outline of a spatial polarisation of low and high productivity work between the advanced and peripheral regions in the late 19th century, a polarisation which would itself have helped reinforce the spatial disequilibrium in wage levels.²

¹H.Strong, Industries of North Devon, (1889), pp.74-85

²Hunt, Regional Wage Variations, (1973), p.217

CHAPTER 8

Conclusions

-1-

If, as the preceding chapter suggests, there was neither convergence between Devonian and national wage rates nor convergence between Devonian and national productivity levels, let alone the achievement of parity, it would appear that the findings lend support to the 'pessimistic' school of thought on the potential for regional development. Some suggestions may be made to explain why this was so.

As signalled in chapter 3, the establishment of a monolithic national economy was not completed in this period. Ample evidence attests the survival of purely local markets for the production and consumption of some basic commodities. This is not surprising, for while the extension and continuing improvements of railway transport significantly reduced real transport costs, they were obviously not eliminated. Even in 1914, large tracts of the Devonian countryside were five miles or more from the nearest halt or station and could be reached only with difficulty by the carrier's cart.

It is, then, probable that part of the perceived high internal retention of demand and income noted in the chapters on employment and capital is explained by the residuary production price thresholds set by the structure of transport costs, and not entirely by the resilience or competitiveness of local suppliers in the face of increasingly efficiently produced imports. There was no clean break between those trades, particularly in the tertiary sector, which benefited from the 'automatic multiplier' and those exposed to the full force of competition from producers located in more cost-advantageous regions.

Coupled with the general climate of expansion nationally, the result of all this appears to have been that industrial change in Devon proceeded

not entirely by the replacement of the old by the new, but partly also by superimposition, because external economic pressure was not great enough to force all traditional activities out of existence. That some traditional coasting trades survived alongside the development of efficient large scale port activities at Plymouth is a case in point.¹ It was not only in the periphery that traditional activities survived, but it is plausible that the friction of distance between the 'core' and Devon allowed them to constitute a relatively high proportion of total output in Devon. This would partly account for a lower average productivity level, while maintaining employment in the county at a level higher than would have pertained in the absence of regional barriers.

It could also be argued that an apparent low equilibrium¹ was also maintained because there was not enough net migration from the county. In neo-classical terms, the failure to achieve inter-regional equilibrium might be explained by Devon's economy responding insufficiently to the changing economic climate. As a mechanism of adjustment migration seemingly ceased to operate before wage parity was reached, for reasons of migrants' failure to perceive a real gain, the weakness of the 'pull factor' -in which the friction of distance was also important- and also the forces of inertia. Migration was, therefore, endogenously determined. Instead of acting to reduce regional differentials it may even have helped to consolidate them, through its impact on age-specific poverty levels.² It was part of the structural problem of low productivity and not a potential source of exogenous stimulus. As Hunt and Baines have observed, supply side changes in the market for labour were rarely able to raise wages unaided.³

¹see chapter 3, p.69

²see chapter 7.5, pp.249-51

³E.H.Hunt, 'How mobile was labour in 19th century Britain?' in J.H.Porter (ed.), Provincial Labour History, E.P.E.H. VI (1972), p.51; Baines, 'Labour supply and the labour market' in Floud & McCloskey, Economic History of Britain, Vol. II, pp.158-9

The case of agriculture, however, shows that where there were also opportunities on the demand side, the consequences of a reduction in labour supply could be more positive. The size of the rural labour force in Devon declined much more quickly than in the nation as a whole, and began to force changes in the organisation of farming from at least the 1860s onwards.¹ While there was also a matching decline in aggregate labour demand the net effect on wages was not the continued maintenance of a low equilibrium, but rather an erosion of the county-national differential which stood in stark contrast to what is known of wages in the rest of Devon. Vague hints were also found in chapter 7 that wages may well have risen faster than the county average in other trades and firms responding directly to external demand. The Devonport Dockyard is a case in point.

In general, however, despite the striking efforts made to supply specialist markets, the range of Devon's resource advantages limited the potential for the direct development of the county's economy through the export demand channel, and this in turn was probably not always pursued to the full, because of the residual effect of distance. Even when it came to the exploitation of potential demand for manufactures in the periphery, the exporters of the 'core' were not always as interested as they might have been. When the annual Bath and West Of England Agricultural Society show was held in Devon, the organisers were usually disappointed with the attendance of agricultural machine manufacturers from outside the South-west. At Plymouth in 1873 for example,

'many of the makers from the north and east were conspicuous by their absence; a fact not to be wondered at when we consider the great expense attending the conveyance of heavy machinery'.²

Likewise at Exeter, six years later, it was suggested that the 'somewhat remote site' discouraged the usually plentiful exhibitors.³ The Bristol and

¹see chapter 7.3, p.231

²J.Coleman, 'Notes on the Implements at Plymouth', Jour. Bath & West of England Agric. Society, 3rd Ser. V (1873), p.16

³J.A.Clarke, 'The Implements at Exeter', Jour. Bath and West of England Agric. Society, 3rd Ser. XI (1879), p.1

Exeter Railway did not begin to carry a rapidly growing volume of freight until at least half a decade after its opening¹ suggesting that here, if not elsewhere in Britain, railways were built ahead of demand.

Only in Plymouth does it appear that locational advantages were strong enough to concentrate these limited external impulses, generating what was in all probability a rapid rate of growth by Devonian standards. Crucial to this achievement, such as it was, is the likelihood that the city's economic base was sufficiently diverse and large for much of the direct external stimulus to be retained as derived demand within the area. This may in fact be no more than an optimistic interpretation of the same feature that has already been observed in connection with other examples of local demand linkages: the quasi-protective effect of transport costs between core and periphery. The tentative grounds for a more positive view of the source and results of the operation of the local multiplier in Plymouth's case is the suggestion drawn from chapter 7 that wages were, on the whole, higher there than elsewhere in Devon; the multiplier effect of external demand in the city was apparently strong enough to do more than merely prop up employment levels.

It is possible that there was a break in the vertical profile of growth poles below which the failure to reach 'critical mass' meant that the effects of external demand were dissipated rather than concentrated, and that within Devon Plymouth was the only town to cross this threshold. Thus as well as the limits set by the range of resources on offer and the friction of distance, a further component of the failure of external demand to make substantive inroads on the wage differential lay in the unsuitability of Devon's spatial structure for maximising the multiplier effect of what initial stimulus there was, over and above the residual protective windbreak afforded by transport costs. Outside the export sectors the broad tail of the county's economy was sustained by secondary and

¹chapter 3, pp.49-50

internal demand which, far from being of sufficient strength to induce upward pressure on wages, was itself part of the low level equilibrium which maintained a certain volume and variety of employment at the price of lower than average returns to labour.

-2-

Speculation on relative economic differentials should not obscure the fact that Victorian Devon witnessed an absolute increase in the standard of living. In May 1847, when the price of the 4lb. loaf of bread rose to over 7d. in Exeter there had been widespread rioting in the streets and markets of the city and in other towns around the county, which came as a profound shock to local 'respectable society'.¹ It had been the most significant disturbance in the city since the outbreak of cholera in the crowded West Quarter fifteen years earlier.² Even in the middle of the 19th century the daily life of Devon's poor could be disrupted by something approaching a crisis of subsistence. Although poverty persisted in the quiet backwaters of the county throughout the century, significant improvements were registered in real wages, standards of education, environmental health and infant and general mortality rates in Devon. Living standards also benefited from increasing provision of public utilities and other municipal social overhead capital.

Investigation of this, the other aspect of regional development is as important as explaining the persistence of spatial welfare differentials. In so doing, much of the same ground is covered. With regard to the response of Devon's economy to the changing environment of industrialisation, for example, the previous section emphasised the lag in the adjustment process but it must be remembered that this was a problem which appeared only at the

¹E.F.P., 20 May 1847. Similar outbreaks also occurred in 1854 and as late as 1867.

²The disease also swept the city in 1849, and Plymouth was also particularly badly affected: M.Braysay & V.Pointon, 'Local politics and Public Health in mid 19th century Plymouth', Medical History, XXVII (1983), p.171

margin. Generally, as the structure of national demand matured through time, a succession of the county's resource advantages was exploited, in much the same way as was discovered in a survey of economic growth in the Pacific North-West region of the United States.¹ As the woollen cloth industry gave way to that of Yorkshire in the late 18th century, agriculture and mining assumed greater importance. Within those sectors the rise of dairying over arable, and barytes and clay over copper, sustained the external demand impetus into the present century. The rise in importance of tourism, and the development of distributive and other commercial activities in Plymouth occurred at the same time. It may have been the inconspicuous nature of these latter trades which prompted a visitor in 1910 -in all probability from a more industrialised part of Britain- to write that

'at the present time Plymouth does not stand high on the list of commercial towns, and wonder is often expressed how such a large population -about 120,000- is, on the whole, so well-to-do.'²

Outside the export base sectors there was a rationalisation of economic activity, accompanied by an outflow of both capital and labour, which bears out the broad outlines of neo-classical theory. In this respect the general pattern of Devon's response and specialised contribution to the further economic integration of the Victorian period does not offer a new or radically different explanation of regional development.

There are, however, signs that the pace of change in the periphery actually quickened in the 1870s and 1880s. It was then that the rise in real wages accelerated. Coastal shipping cargoes also increased.³ After 1881 there was a relative regeneration in employment and population in Devon's towns, including a marked rise in the level of gross in-migration to the

¹R.L.Pfister, 'External trade and regional growth: a case study of the Pacific North-west', Economic Development and Cultural Change, XI (1963), pp.184-251

²Plymouth. A Handbook of the 42nd Annual Co-operative Congress, (Plymouth, 1910), p.68.

³Fig.3.3, p.63

county.¹ While it is quite possible that this purported upturn can be accounted for by internal forces peculiar to Devon it is interesting to speculate whether it can be linked with the onset of the 'Great Depression'. The suggestion was made in the previous section that the actual volume of external demand may have lagged behind the apparent potential pushed forward by mid-century infrastructural improvements, in which case it is possible that a deceleration in the growth of traditional markets, particularly overseas, led to a greater core 'interest' in peripheral regions within Britain after 1873. This subtle shift could have amounted to a second, consolidatory, phase of the process of regional development (the first being the spatial deepening of national market 'unity' by transport improvements), determining the onset of the convergent phase of Williamson's 'inverted U' hypothesis in his typology of development in backward regions.²

The further consideration of this theory would provide a useful organising theme for comparative studies of the Devon experience with other peripheral regions in the Victorian economy, but it is impossible to do more here than to mention one or two possibilities drawn from secondary reading. In Victorian Lincolnshire, for example, it would appear that economic growth relied upon export demand for the iron ore reserves of the Scunthorpe area, the agricultural machinery produced in Lincoln, Grantham and Gainsborough, and the port facilities and fishing industry of Grimsby. The spread of railways re-oriented the county's economy away from the mostly agricultural south and towards the East Midlands, moreover, the pace of change apparently quickened in the last quarter of the century.³ Oxford, by contrast, is said to have been still a 'pre-industrial city' in 1914, external stimulus to the city's economy being absent until the rise of

¹chapter 6, Table 6.4, p.181

²Williamson, 'Regional Inequality and the progress of national development', discussed in chapter 1, p.6

³N.R.Wright, Lincolnshire Towns and Industry 1700-1914, (Lincoln, 1982), passim; R.J.Olney, Rural Society and County Government in 19th Century Lincolnshire, (Lincoln, 1979), pp.169-72.

Morris Motors after the First World War.¹

A wider spatial and empirical basis for comparison may well tend to support the suggestion here that responses varied, and that the growth of external demand for a region's output was more closely linked to individual circumstances than to any second phase in a generalised theory of development. In Shropshire and North Wales, for instance, the exhaustion of key raw materials contributed to the relative decline at this time of regions which, a century earlier, had been part of the core itself.²

Yet even in declining areas living standards rose during the Victorian period. Appropriate structural shifts in the composition of the peripheral economy may account for this in part, but it is also important to stress the deeper significance of the strengthening of inter-regional economic ties which is implicit in these spatial adjustments. Nor is political unity without relevance here, for although it was found in chapter 4.2 that no special role can be attached to government action in stimulating activity in Devon relative to the national average, there was, all the same, an external contribution to municipal spending within the county which ameliorated the standard of living.

The contribution of the secular downswing in prices was another important source of economic growth in the periphery. The long standing articulation of the national economy enabled the the whole country to profit from this, and compared to the national average, the further development of transport links probably also brought the benefit of a structural fall in commodity prices in Devon.³ Herein lies the trigger of the mechanism of regional change identified in earlier chapters. The translation of the price fall into a real benefit to living standards would have been achieved

¹R.C.Whiting, The View from Cowley, (Oxford, 1983), chapter 1.

²B.Trinder, The Industrial Revolution in Shropshire, (1973), ch.XIII;
A.H.Dodd, The Industrial Revolution in North Wales, (Cardiff, 1971),
pp.128, 169, 202, 277, 302

³Table 7.3, p.210; chapter 3, pp.72-3

through an increase in the percentage of regional consumption accounted for by imported produce. This was the fundamental element in the balance of payments deficit which in the long term forced adjustments in the size and structure of Devon's economy.

National economic integration must have ensured that the motor of continuous economic growth, the macro-economic expansion of demand and the achievement of at least some rationalisation in the periphery, set a lower limit to incomes in the least developed region, an ever rising floor to the regional scatter of material welfare standards. Deriving from the extension of core influence into the periphery, this would appear to have been the main impact of the spread effects of industrialisation. On this interpretation it is likely that the greater distances, the absence of the physical infrastructure, and the less well developed inter-regional trade links in parts of France, Spain and Italy prevented the establishment of a rising minimum in those countries, allowing much deeper regional economic backwardness to persist as their core economies developed.¹ That this had clearly been overcome in Britain is worth stressing as a feature of the maturity of the Victorian economy.

Thus the range of British regional incomes per head -or any other suitable indicator- may be conceived as being contained within a band which moved gradually upwards through time. The most advanced region delimited the upper bound, and the most backward, the lower. A rapidly developing region would thus have moved upwards within that band faster than the band's overall rate of growth. Over a long period of time the continued expansion of the national economy dragged the most backward regions away from pre-industrial levels of poverty through the action of the 'spillover' effects listed by the optimistic school of regional development prospects. At the

¹see, for example, J.R.Lasuen, 'Regional income inequalities and the problems of growth in Spain', Regional Science Association Papers, VIII (1962), pp.69-88.

same time, the evidence of Devon suggests that during the mature phase of industrialisation there was no inherent tendency in the system towards narrowing the width of the band, no inexorable convergence of regional incomes or productivity.¹

Of first importance in explaining this was the relatively unchanging regional 'allocation' of demand. To the extent that the location of economic activity was increasingly dependent upon market accessibility and external economies of scale, the late Victorian period would have seen a reinforcement of this spatial structure of demand. Here are to be found the self consolidating agglomeration effects of the 'leading edge' industrial regions which form part of Myrdal's theory of cumulative causation. A situation in which there was enough outwards growth to pull up the rearguard but not enough to close the gap between best and least advantaged is analagous in many ways to the history of the vertical distribution of income and wealth in this period. Supple has depicted the 19th century as a time of growth in average incomes without any redistribution to narrow the gulf between rich and poor.² One of the failings of free market industrialisation was its apparent inability to pull up the broad 'tail' which lagged behind the dynamic leading edge, and this would appear to have had a spatial as well as a cross-sectional welfare dimension. There were indeed signs of maturity, but these observations suggest that in terms of the spatial diffusion of industrialisation the economy was not fully developed by 1914.

This, then, appears on the evidence from Devon to have been the nature of peripheral development in 19th century Britain. The reasons put forward above to explain why Devon lagged behind the 'core' in terms of output and income per head suggest the likely sources of any progress that has been

¹a conclusion also proposed by Hunt, Regional Wage Variations, p.356.

²Supple, 'Income and Demand, 1860-1914' in Floud and McCloskey (eds.), Economic History of Britain, Vol II, p.128

made since 1914.¹ The development of mechanised road transport and its contribution towards smoothing the map of transport costs in space was of some significance, and its place in the changing economic geography of Britain in the inter-war period may hitherto have been less than fully appreciated. More important still has been the changing spatial distribution of labour demand and its impact on the internal economic structure of peripheral areas. The exceptional circumstances of the wartime economy probably had a profound impact on existing spatial arrangements and further study of the topic would be a worthwhile complement to the research investment directed into another important element of post-1914 economic geography: the effects of active regional policy. The difference between the post-war and the pre-war environment suggests that if there was any discontinuity it came in 1914 and not before. Until that date there was no fundamental change in the relationship between economic core and economic periphery that had evolved in the early decades of the British industrial revolution.

¹In 1981 G.D.P. per capita in the South-west region was 95.3% of the U.K. average: Central Statistical Office, Regional Trends (1984), reported in The Times, 23 Mar 1984, p.5.

AGGREGATE EMPLOYMENT IN DEVON, 1841-1910

As mentioned in chapter 4.1 the employment data is taken from Lee's British Regional Employment Statistics, but Table A1.1 also includes figures on employment in sub groups taken directly from the following Census volumes:

- 1841: Census of Great Britain, Occupations Abstract, PP 1844 XXVII (587), pp.25-9;
- 1851: C.G.B., Ages, Civil Condition, Occupations, 1852-3 LXXXVIIIi (1691-I), Div.V, pp.356-7;
- 1861: 1863 LIIIIi (3221), Div.V, Tables 13 and 14, pp.365-72;
- 1871: 1873 LXXIi (c872), Div.V, Tables 13 and 14, pp.249-53;
- 1881: 1883 LXXX (c3722), Div.V, Table 10, pp.190-205;
- 1891: 1893-4 CVI (c7058), Div.V, Table 7, pp.195-210;
- 1901: 1902 CXVIII (Cd1271), Table 32, pp.76-81;
- 1911: Vol.IX, Occupations and Industries, 1913 LXXIX (Cd7019), pp.86-98.

These sub-groups are distinguished from Lee's industrial orders by not being preceded with a Standard Industrial Classification number.¹ Row 4 in Table A1.1 covers employment in coal and petroleum products industries, of which there was none in 19th century Devon, so the line has been omitted. Row 16 (*) also includes employment in the glass and cement industries.

Unless stated otherwise, all tables in this appendix use 'Series A' statistics, subsequently overestimating the size of the manufacturing sector. Table A1.4 displays the effect on the distribution of employment of converting the 1911 data to a 'Series B' classification.²

¹For a list of the component employment categories subsumed in the S.I.C. see Lee, Employment Statistics, pp.18-24

²detailed in ibid, pp.30-8

Table Al.1 Aggregate Employment in Devon by sector, 1841-1911

S.I.C. category	1841	1851	1861	1871	1881	1891	1901	1911
1 Agric, for., fish.	56,153	81,207	66,667	57,319	51,739	49,435	43,542	45,701
2 Mining and quarrying	2,233	4,655	6,455	4,715	4,030	3,359	3,542	4,141
3 Food, drink, tobacco	6,326	10,080	11,497	11,737	11,323	13,905	14,581	17,410
5 Chemicals, allied indus.	523	847	830	869	826	808	1,080	1,465
6 Metal manufacture	3,881	5,247	5,444	4,649	4,257	4,059	4,003	3,557
7 Mech. engineering	257	618	1,198	1,177	2,085	2,041	3,745	4,567
8 Instrument engineering	252	401	428	474	522	519	446	456
9 Electrical engineering					17	99	420	1,114
10 Ships & marine engin.	1,952	1,744	2,992	2,236	2,656	2,629	3,502	5,184
11 Vehicles	972	1,265	1,306	1,423	1,438	1,576	1,672	1,995
12 Other metal goods	545	822	901	821	939	1,053	1,431	1,762
13 Textiles	8,380	14,216	11,928	10,607	8,476	7,193	7,370	7,654
14 Leather, fur	1,357	1,646	1,692	1,649	1,602	1,755	1,626	1,598
15 Clothing and footwear	17,557	31,421	32,299	27,892	26,177	24,903	22,446	22,092
Lacemaking		6,003	5,263	4,658	3,428	1,644	1,870	1,700
Boots and shoe making	6,717	6,900	8,436	6,364	5,227	4,385	2,811	2,229
16 Bricks, pottery *	254	740	814	731	879	1,021	1,255	1,325
17 Timber, furniture	2,903	3,886	4,373	3,574	3,576	3,672	3,903	4,331
18 Paper, print, publishing	948	1,527	1,973	2,240	2,710	3,323	3,815	4,457
19 Other manufacturing	102	135	170	155	200	228	301	424
20 Construction	12,567	16,556	17,565	18,751	20,015	20,015	25,780	22,463
21 Gas, electricity, water	35	78	166	254	298	463	756	1,161
22 Transport, communic'ns	4,170	9,166	11,254	11,406	14,242	17,692	18,807	20,257
23 Distributive trades	966	1,517	1,513	2,103	2,437	2,721	2,657	4,262
24 Insurance, banking	167	142	313	549	793	1,288	1,839	2,738
25 Prof., scien. services	4,852	8,485	7,595	9,398	10,937	12,207	13,066	14,446
26 Misc. services	46,548	40,369	50,858	57,083	56,075	59,472	59,639	66,123
Domestic service	41,405	37,366	39,366	46,481	51,268	53,402	52,373	55,198
27 Public Admin, Defence	5,283	9,147	18,931	19,159	14,617	19,370	21,987	33,424
Defence		6,982	16,229	17,078	12,437	15,813	17,420	26,913
Not classified	12,188	9,521	10,090	20,357	15,066	18,594	18,911	17,037
Total employment	191,374	255,448	269,152	271,328	257,932	273,400	282,122	311,144
Total population	533,460	572,330	589,385	606,102	608,400	636,225	662,196	699,703
Activity rate, Devon	35.8%	44.6%	45.6%	44.7%	42.4%	42.9%	42.6%	44.4%
Activity rate, G.B.	37.1%	44.9%	45.4%	44.9%	42.8%	43.9%	44.0%	44.7%

Table A1.2 Comparative Distribution of Employment

SIC	% distribution of employment						Location Quotients			
	1841		1871		1911		1841	1851	1871	1911
	Devon	G.B.	Devon	G.B.	Devon	G.B.				
1	29.3	22.2	21.1	15.2	14.7	7.8	1.32	1.45	1.39	1.88
2	1.2	3.4	1.7	4.6	1.3	6.7	0.35	0.44	0.37	0.19
3	3.3	3.5	4.3	4.4	5.6	6.2	0.94	0.91	0.98	0.9
5	0.3	0.35	0.3	0.6	0.5	1.0	0.86	0.6	0.5	0.5
6	2.0	2.4	1.7	3.7	1.1	3.2	0.83	0.68	0.46	0.34
7	0.1	0.5	0.4	1.4	1.5	2.8	0.2	0.25	0.29	0.54
8	0.1	0.2	0.2	0.2	0.1	0.2	0.5	1.0	1.0	0.5
9					0.35	0.6				0.58
10	1.0	0.4	0.8	0.5	1.6	0.8	2.5	2.33	1.6	2.0
11	0.5	0.6	0.5	0.5	0.6	1.0	0.83	1.0	1.0	0.6
12	0.3	1.2	0.3	1.2	0.6	1.8	0.25	0.3	0.25	0.33
13	4.3	12.6	3.9	11.0	2.5	8.3	0.34	0.41	0.35	0.3
14	0.7	0.7	0.6	0.61	0.5	0.6	1.0	1.0	0.88	0.83
15	9.2	7.9	10.3	8.3	7.1	6.8	1.16	1.28	1.24	1.04
16	0.1	0.8	0.3	1.0	0.4	1.0	0.13	0.3	0.3	0.4
17	1.5	1.6	1.3	1.7	1.4	1.7	0.94	0.75	0.76	0.82
18	0.5	0.7	0.8	1.2	1.4	2.2	0.71	0.75	0.67	0.64
19	0.05	0.3	0.05	0.3	0.1	0.5	0.17	5.0	0.17	0.2
20	6.6	5.4	6.9	6.2	7.2	6.3	1.22	1.2	1.11	1.14
21	0.01	0.03	0.09	0.2	0.7	0.5	0.33	0.43	0.45	0.8
22	2.2	2.5	4.2	5.2	6.5	8.1	0.88	0.8	0.81	0.8
23	0.5	0.7	0.77	1.0	0.7	1.2	0.71	0.66	0.77	0.58
24	0.06	0.09	0.2	0.2	0.8	1.0	0.67	0.83	1.0	0.8
25	2.5	2.3	3.5	2.9	4.6	4.0	1.09	1.18	1.21	1.15
26	24.3	19.4	21.0	16.8	21.2	15.8	1.25	1.07	1.25	1.34
27	2.8	1.3	7.0	2.1	10.7	3.0	2.15	2.4	3.33	3.57
NC	6.4	8.8	7.5	8.7	5.4	6.5	0.73	0.74	0.86	0.83

The LOCATION QUOTIENT expresses the relationship of each industrial order in Devon to it's national counterpart in terms of its importance within the employment structure. As explained in chapter 4.1 the location quotient is used to construct 'export employment' figures.

Table A1.3 Male and Female Employment in Devon

SIC	1841		1871		1911	
	Male	Female	Male	Female	Male	Female
1 Agric, for.,fish.	53,761	2,482	55,178	2,141	44,572	1,129
2 Mining, quarries	2,191	42	4,423	292	4,097	44
3 Food, drink, etc.	5,535	791	9,643	2,094	13,231	4,179
5 Chemicals etc.	504	19	817	52	1,262	203
6 Metals	3,864	17	4,612	37	3,535	22
7 Mech. engin.	252	5	1,169	8	4,557	10
8 Instrument engin.	248	4	469	5	442	14
9 Electrical engin.					1,113	1
10 Ships, marine engin.	1,947	5	2,233	3	5,170	14
11 Vehicles	968	4	1,417	6	1,986	9
12 Other metals	511	34	755	66	1,507	255
13 Textiles	3,749	4,631	3,163	7,444	2,438	5,216
14 Leather	1,327	30	1,556	93	1,365	233
15 Clothing	10,403	7,154	9,376	18,516	6,460	15,623
16 Bricks, pottery etc.	240	14	630	101	1,121	204
17 Timber	2,804	99	3,508	66	3,932	399
18 Paper	828	120	1,672	568	3,166	1,291
19 Other manufactures	76	26	109	46	326	98
20 Construction	12,520	47	18,717	34	22,454	9
21 Utilities	35	-	252	2	1,160	1
22 Transport	4,120	50	11,216	190	20,038	219
23 Distribution	497	469	1,068	1,035	2,545	1,717
24 Insurance, finance	166	1	549	-	2,703	35
25 Profess.services etc.	3,050	1,802	5,115	4,283	6,554	7,892
26 Misc. services	14,921	31,627	7,907	49,176	15,349	50,774
27 Admin., Defence	5,240	43	18,979	180	32,517	907
Not classified	10,454	1,734	18,911	1,446	15,703	1,334

TOTAL EMPLOYMENT IN DEVON

	Males	Females	F % of total			Males	Females	F % of tot.	
			Devon	G.B.				Devon	G.B.
1841	140,121	51,250	26.8	26.2	1881	172,935	84,997	33.0	30.5
1851	174,081	81,367	31.9	30.1	1891	183,467	89,933	32.9	31.0
1861	183,384	85,768	31.9	30.8	1901	197,594	84,528	30.0	29.1
1871	183,444	87,884	32.4	30.7	1911	219,303	91,841	29.5	29.3

FEMALE EMPLOYMENT: SELECTED SECTORAL SHARES, DEVON AND G.B.

SIC	1841		1871		1911	
	Devon	G.B.	Devon	G.B.	Devon	G.B.
1 Agric. etc.	4.8	4.5	2.4	3.7	1.2	1.1
3 Food, drink	1.5	1.6	2.4	2.1	4.6	5.8
13 Textiles	9.0	19.1	8.5	19.9	5.7	16.2
15 Clothing	13.9	10.9	21.1	16.3	17.0	15.3
23 Distribution	0.9	1.2	1.2	1.3	1.9	1.5
25 Prof. serv	3.5	2.6	4.9	4.1	8.6	7.1
26 Misc. serv	61.7	55.2	56.0	46.0	55.3	39.8

Table A1.4 Employment Re-classification in 1911

SIC	Series A		Series B		Transfers
	Numbers	% of total	No.s	%	
1 Agric. etc.	45,701	14.7	49,455	15.6	+not occ.
2 Mining	4,141	1.3	2,439	0.77	- 16, 23
3 Food, drink	17,410	5.6	4,415	1.4	- 23
5 Chemicals	1,465	0.5	730	0.23	- 23
6 Metals	3,577	1.1	562	0.18	- 12
9 Electrical engin.	1,114	0.35	891	0.28	- 21
12 Other metals	1,762	0.6	3,321	1.0	+ 20, 6, -23
13 Textiles	7,654	2.5	3,586	1.1	- 19, 23
14 Leather	1,598	0.5	1,113	0.35	- 19, 23
15 Clothing	22,092	7.1	20,268	6.4	- 23
16 Bricks	1,325	0.4	1,336	0.42	+ 2, -23
17 Timber	4,331	1.4	3,648	1.15	- 23
18 Paper	4,457	1.4	3,533	1.12	- 23, 24
19 Other manuf.	424	0.1	685	0.21	+ 13, 14, -23
20 Construction	22,463	7.2	22,447	7.12	- 12
21 Utilities	1,161	0.4	1,113	0.35	+ 9, - 27
22 Transport	20,257	6.5	23,301	7.4	+ 27
23 Distribution	4,262	0.7	28,967	9.2	+ 1-19
24 Financial	2,738	0.8	3,334	1.1	+ 18, NC
27 Admin, defence	33,424	10.7	30,651	9.7	+ 21, -22
Not Classified	17,037	5.4	16,517	5.2	- 23, 24
Total employment	311,144		315,083		
Activity Rate	44.4%		45.0%		

'Transfers' = SIC numbers from which (+) or to which (-) employment is re-classified. For example, most sectors lose employment to 'Distribution' (- 23), and 'Distribution' shows gains from most sectors (+ 1-19).

MANUFACTURING EMPLOYMENT 1911

	Series A		Series B		A - B as % of A
	Numbers	%	Numbers	%	
G.B.	7,116,354	38.9	5,759,446	31.4	19.1
Devon	79,391	25.5	51,106	16.2	35.6

Table A1.5 Employment Change, 1841-1911

SIC	absolute change 1841-1911 (%)	contrib'n to county emp. growth	actual/ expected growth (%)	differential shift
	-1-	-2-	-3-	-4-
1 Agriculture	81.4	-8.73	86.6	-7,083
2 Mining, quarrying	185.4	1.59	35.3	-7,582
3 Food, drink, tobacco	275.2	9.25	59.2	-12,006
5 Chemicals, allied	280.1	0.79	39.5	-2,243
6 Metals	91.7	-0.27	25.7	-10,298
7 Mech. engineering	1777.0	3.6	111.5	470
8 Instrument engin.	181.0	0.17	74.5	-156
9 Elec. engin. (1881+)	6552.9	0.93	145.8	350
10 Ships, marine engin.	265.6	2.7	46.3	-6,001
11 Vehicles	205.2	0.85	41.5	-2,807
12 Other metals	323.3	1.02	81.4	-402
13 Textiles	91.3	-0.61	52.2	-7,011
14 Leather	117.8	0.2	48.7	-1,686
15 Clothing	125.8	3.79	55.2	-17,938
16 Bricks, pottery	521.7	0.89	154.2	466
17 Timber, furniture	149.2	1.19	50.7	-4,202
18 Paper, printing	470.1	2.93	55.8	-3,525
19 Other manuf.	415.7	0.27	77.8	-121
20 Construction	178.7	8.26	57.5	-16,620
21 Utilities	3317.1	0.94	72.9	-432
22 Transport	485.8	13.43	56.8	-15,438
23 Distribution	441.2	2.75	99.1	-37
24 Insurance, etc.	1639.5	2.15	57.8	-1,996
25 Professions	297.7	8.01	64.6	-7,922
26 Misc. services	142.1	16.34	65.5	-34,886
27 Public admin, Defence	632.7	23.5	100.0	141
Not Classified	139.7	4.05	71.0	-6,973

The calculation of differential shift is explained in chapter 4.1, p.88
Column 4 translates the difference between county and G.B. employment change
(column 3) into a figure for the differential shift for each industrial
order.

Sum of column 4, = Regional Differential Shift 1841-1911, = -165,940
Proportional Shift 1841-1911 = -31,963

Total Shift, 1841-1911
(expected - actual aggregate county employment) = -197,903

RAILWAY TRAFFIC 1849-1903

1) RAILWAY COMPANY FREIGHT STATISTICS

The concentration on network extension, guage controversies, 'great power' rivalries, engineers, engines and gradients in the railway literature is due as much to the nature of the source material as it is to the interests of railway enthusiasts. Most of the Board of Trade Railway Department papers from the early decades were concerned with line authorisation and safety regulations¹ and Parliamentary concern with the monopolistic tendencies of railway companies has left a vast scattering of information on rates and charges but little of relevance to studies of commodity flows.² Such matters were of less direct concern to transport operators than turnover and profitability.

Figures on the tonnage and receipts from freight traffic were collected from each railway company by the Railway Department and abstract tables were published annually from 1847. The presentation of these statistics attracted criticism from many quarters until the outbreak of World War One³ and the quality of the material varies from year to year. Before 1855 there was no breakdown of the receipts total into their constituent parts nor any indication of the tonnages carried. Moreover, many companies had no incentive to provide accurate information, although the detailed station by station traffic books kept by the Bristol and Exeter Railway⁴ suggests that this company sought to meet its obligations fastidiously.

¹P.R.O. MT1, MT6, BT22

²The chronology of Parliamentary interest and legislation is summarised succinctly by T.Barker and C.Savage, An Economic History of Transport in Britain, 3rd edn (1974)

³for example, W.M.Acworth and G.Paish, 'British Railways: their accounts and statistics', J.R.S.S., LXXV (1912)

⁴P.R.O. RAIL 75/121

Table A2.1 Railway freight statistics 1849-1875

A) BRISTOL AND EXETER RAILWAY COMPANY

	-1- tons	-2- £	-3- tons	-4- £	-5- heads	-6- heads	-7- heads	-8- £	-9- £	-10- miles
1853									83,863	92
1854									101,552	111
1855		84,981		24,681					105,202	123
1856	212,902	87,341	141,168	21,430	12,853	118,420	3,276	3,679	114,344	
1857	219,156	83,445	183,508	22,160	16,078	108,985	2,403	5,573	111,009	125
1858	219,126	81,923	167,611	22,365	18,458	110,632	1,954	5,393	109,681	
1859	243,885	89,695	164,638	21,124	23,173	142,431	3,400	7,109	117,928	
1860	291,579	91,791	176,274	22,631	21,614	145,019	2,215	6,707	121,129	
1861	303,035	92,417	197,639	24,327	21,835	128,030	2,090	5,965	122,709	113
1862	301,274	91,894	168,012	20,638	23,273	107,804	1,084	5,673	118,205	121
1863	287,454	88,284	167,389	19,289	22,939	104,442	1,339	5,398	112,971	121
1864	295,012	88,683	158,683	17,701	24,567	106,606	1,286	5,656	112,040	121
1865	325,498	97,386	174,768	17,905	21,587	102,755	2,931	5,430	120,721	121
1866	339,894	103,160	207,337	20,128	14,071	99,155	1,305	4,814	128,102	121
1867	340,698	102,691	246,913	24,016	19,673	86,126	801	5,192	131,899	134
1868	350,869	103,356	247,797	28,903				6,236	138,495	135
1869		108,220		28,910				5,515	142,645	
1870	398,059	115,346	270,995	32,865				6,134	154,345	
1871	436,090	124,097	275,800	33,592				6,225	163,914	153
1872	449,028	128,549	292,809	40,787				7,718	177,054	159
1873	481,080	142,443	331,589	46,289				7,432	196,164	195
1874	530,359	154,227	336,802	41,662				8,032	203,921	204
1875	508,867	147,374	372,635	43,917				8,916	200,207	204

Key: 1: General Merchandise tonnage, 2: receipts, 3:Minerals tonnage, 4: receipts, 5: cattle numbers,
6: sheep numbers, 7: pig numbers, 8: total livestock receipts, 9: total goods receipts, 10: open track

Table A2.1 CONTINUED

B) SOUTH DEVON RAILWAY COMPANY

	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-
1853										
1854									24,384	56
1855									28,068	56
1856	78,406	23,191	37,022	3,465	2,115	3,671	62	306	26,340	56
1857	82,382	24,218	36,124	3,364	2,617	4,542	77	371	27,953	56
1858	84,996	24,648	39,421	3,595				512	28,555	56
1859	105,007	24,557	47,808	3,615		10,253 total		638	28,810	56
1860	131,818	28,679	70,859	4,048	5,190	5,617	106	776	33,503	72
1861	151,888	34,645	68,164	5,877	5,320	9,188	196	940	41,462	74
1862	170,526	38,100	62,988	5,531	5,956	7,929	420	848	44,479	77
1863	168,048	39,886	66,288	5,544	6,475	16,600	907	958	46,388	77
1864	181,010	40,388	65,736	5,745	8,484	16,299	372	1,183	47,316	77
1865	206,379	42,897	85,702	5,989	9,797	15,616	839	1,272	50,158	77
1866	214,590	52,166	101,044	6,943	9,522	19,344	2,353	1,458	56,741	81
1867	212,905	42,421	133,428	7,550	18,673	1,735	284	802	60,518	100
1868	204,886	51,585	135,428	17,243	7,156	14,960	750	1,025	60,689	112
1869		50,845		11,447				1,250	64,282	112
1870		54,371		13,409				1,258	65,512	112
1871	267,742	61,856	148,149	15,350				1,354	71,075	112
1872	283,744	63,777	162,159	14,502				1,770	78,128	112
1873	313,586	70,180	162,890	17,038				1,837	82,652	121
1874	313,677	72,810	163,217	18,473				1,925	90,578	122
1875	329,215	75,332	169,648	17,704				2,116	92,630	122
				17,907				2,298	95,537	122

C) NORTH DEVON RAILWAY COMPANY

1856	31,397	5,465	3,186	263	1,283	12,216	306	531	6,259	35
1857	34,220	5,795	3,818	412	923	9,345	238	306	7,024	35
1858	24,064	4,611	27,345	1,965	1,783	12,139	66	324	6,718	35
1859	26,070	5,132	21,154	1,823	1,300	20,024	134	472	7,427	35
1860	35,877	6,331	23,209	2,091	1,269	22,509	217	438	8,860	40
1861	38,311	6,829	28,388	2,364	2,068	27,522	143	596	9,789	40

The relevant Railway Returns are in the following volumes of Parliamentary Papers:

1847 LXIII (706), 1847-8 LXIII (937), 1849 LI (418), 1850 LIII (10 & 602), 1851 LI (12 & 313), 1852-3 XCVII (252 & 906), 1854 LXII (1739 & 1790 & 1844), 1854-5 XLVIII (1932 & 2002), 1856 LIV (2082 & 2147), 1857i XXXVII (2258), 1857-8 LI (2308 & 2422), 1859i XXV (2472 & 2513), 1859 XXVII (2561), 1860 LXI (2730), 1861 LVII (2871), 1862 LIII (398), 1863 LXII (492), 1864 LIII (20), 1865 XLIX (456), 1866 LXIII (483), 1867 LXII (509 & 516), 1867-8 LXII (484), 1868-9 LIV (286), 1870 LIX (c.229), 1871 LX (c.448), 1872 LII (c.651), 1873 LVII (c.751), 1874 LIX (c.928 & c.1091), 1875 LXVII (c.1332), 1876 LXV (c.1609).

Table A2.2 Freight Traffic on the B.E.R., January-June, 1853

(see map overleaf)

GENERAL MERCHANDISE, into Devon, 10,993 tons;

from: Bristol	5,109	47.1	to: Exeter	5,618	51.1
Bridwater	4,443	40.9	Crediton	2,054	18.7
Taunton	1,007	9.3	Tiverton	1,839	16.7
Weston-s-mare	129	1.2	Cullompton	887	8.1
Highbridge	108	1.0	Hele	429	3.9
others	62	0.5	Tiverton Junc.	166	1.5

GENERAL MERCHANDISE, from Devon, 2,707 tons;

from: Exeter	1,735	64.1	to: Bristol	1,550	57.9
Tiverton	371	13.7	Taunton	539	20.1
Cullompton	303	11.2	Bridgwater	251	9.4
Tiverton Junc.	235	8.7	Wellington	222	8.3
Hele	63	2.3	Highbridge	115	4.3

MINERALS, into Devon, 19,909 tons;

from: Bridgwater	17,635	88.6	to: Tiverton	6,296	31.6
Nailsea	1,118	5.6	Exeter	6,166	31.0
Taunton	800	4.0	Hele	2,582	13.0
Bristol	280	1.4	Tiverton Junc.	2,457	12.3
Yatton	74	0.4	Cullompton	2,110	10.6
			Crediton	298	1.5

LIVESTOCK, from Devon, 14,929 heads; (into Devon: 220 heads)

from: Exeter	9,546	63.9	to: Bristol	13,352	89.4
Tiverton Junc.	2,621	17.6	Taunton	737	4.9
Tiverton	1,800	12.1	Highbridge	530	3.6
Hele	962	6.4	Bridgwater	310	2.1

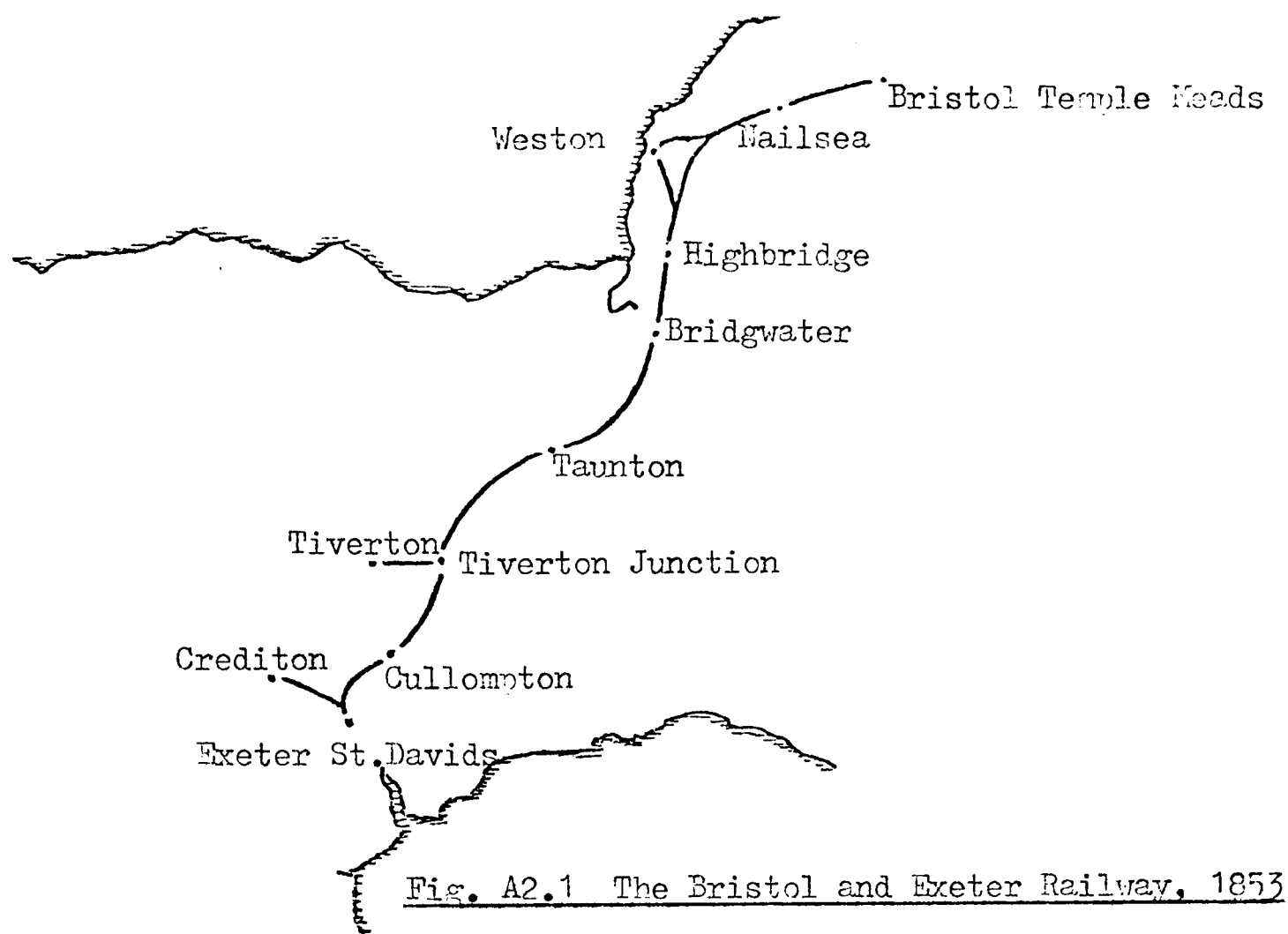
TRAFFIC CARRIED FOR OTHER COMPANIES:

	Livestock	Merchandise
G.W.R.	7,053 heads	15,461 tons
G.W.R. to S.D.R.	9	1,467
S.D.R.	149	9,450
S.D.R. to G.W.R.	111	856

NET TRADE BALANCE:

Merchandise:	- 8,286 tons
Minerals:	-19,909 tons
Livestock:	+14,709 heads

source: P.R.O. RAIL 75/121 .



ii) G.W.R. FREIGHT TRAFFIC IN DEVON IN 1903

The following table has been compiled from a statistical digest issued by the Great Western Railway's General Manager's office at Paddington to all station managers in the inter-war period, and is now held by the Public Record Office (P.R.O. RAIL 266/44-54). While it is unfortunate that the original internal company records from which it was produced no longer exist the printed digest does at least show the aggregate freight business of each station on the G.W.R. network every ten years from 1903 onwards. In this table the traffic of each major station, groups of minor main line stations, and branch lines is shown separately. Locations may be found from the map shown in Fig 3.2, p.53.

KEY to Table A2.3: (all units tons unless otherwise stated)

Freight forwarded from stations,		Freight received at stations,	
Column 1:	Coal and coke 'charged'	Column 4:	Coal and coke 'charged'
"	2: Other minerals	"	5: Other minerals
"	3: General Merchandise	"	6: General merchandise
Column 7: Coal and coke 'not charged', forwarded and received			
Column 8: Total goods tonnage (Cols. 1-7)			
Column 9: Total receipts f (i.e. excl. Col.7)			
Column 10: Livestock wagons (forwarded and recieved)			
Column 11: Total tonnage of goods carted from station by G.W.R.			

Table A2.3. G.W.R. Devon freight traffic, 1903

		-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-
MAIN LINE (westwards)												
1	Tiv.Junc'n	48	-	1,625	992	501	4,453	1,243	8,862	3,724	213	955
2	Cullompton-											
	Stoke Canon	31	725	16,301	21,604	8,761	26,275	5,850	79,537	30,894	498	13,216
3	Exeter St.D.	339	4,162	29,092	10,713	10,654	42,984	5,155	103,099	64,151	2,603	31,650
4	Exminster-											
	Teignmouth:	6,600	5,502	17,540	9,922	30,155	12,738	4,366	86,823	23,364	253	7,356
5	Newton Abbot	338	63,341	14,449	15,337	8,675	21,307	6,546	129,993	37,604	1,033	9,100
6	Totnes	87	1,891	6,986	1,877	3,231	11,315	608	25,995	13,851	514	5,085
7	Rattery-Laira	171	27,180	3,151	21,243	18,592	8,989	1,712	81,038	17,317	541	2,545
	Plymouth											
8	Mill Bay	12,441	29,476	113,173	1,712	28,333	53,916	302	239,353	117,289	1,457	41,994
9	Sutton Hbr.	17,646	6,349	13,975	1,725	22,253	5,721	239	67,908	15,083	3	2,717
BRANCH LINES (westwards)												
10	Barnstaple	31	1,648	12,592	5,400	10,379	31,388	5,087	66,525	32,846	2,044	10,671
11	(Barnstaple	12	1,120	6,369	877	3,113	11,290	322	23,103	14,191	576	5,172)
12	Hemyock	-	288	1,329	1,575	1,014	5,727	2,199	12,132	4,672	238	1,107
13	Dulverton	159	15,231	15,521	6,644	9,779	28,204	10,887	86,425	28,914	1,190	7,358
14	(Tiverton	159	1,044	9,283	5,686	7,569	18,333	8,911	50,985	20,947	986	6,283)
15	Heathfield	5	20,465	2,960	2,693	3,987	4,617	1,372	36,099	7,087	47	1,554
16	Moretonh'st'd	50	11,795	8,079	8,796	20,099	9,423	9,823	68,065	16,562	205	3,439
17	Kingswear	77,385	10,976	8,844	66,359	7,436	45,778	4,096	220,874	72,032	476	22,412
18	Brixham	-	39	1,931	6,409	607	5,629	1,259	15,874	7,443	-	2,807
19	Ashburton	23	1,200	9,226	14,762	2,863	17,444	2,672	48,288	22,270	103	6,839
20	Kingsbridge	-	258	4,038	1,524	2,223	7,992	1,723	17,758	9,217	376	2,936
21	Launceston	22	9,433	5,933	13,631	17,762	9,876	1,586	58,243	13,362	539	3,194
22	Princeton	-	5,710	369	4,700	2,165	3,327	508	16,779	4,769	19	1,316
23	Yealmlpton	10	22,071	551	4,279	4,488	870	131	32,400	4,607	158	483

2: includes Cullompton, Hele, Silvertown and Stoke Canon stations; 4: includes Exminster, Starcross, Dawlish, Teignmouth; 7: includes Rattery, Brent, Wrangaton, Ivybridge, Cornwood, Plympton, Laira; 10: includes Barnstaple, Swimbridge, South Molton, Filleigh, Bishops Nympton, East Anstey, Dulverton; 11: Barnstaple alone; 14: Tiverton station alone.

SHIPPING VOLUME CALLING AT DEVONIAN PORTS

The sources for coastal trade flows in the 19th century are of a much less systematic nature than for the previous century, when most harbours are covered by Exchequer Port Books. Where ownership of a harbour was vested in a civic authority of Harbour Commissioners freight movements can often be pieced together from records of harbour or wharfage dues, but such material survives only for Exeter and Teignmouth in 19th century Devon.¹ Some bilateral trades can be traced in port records at the receiving end, and the account books of some individual coasters survive,² but neither can be used for more than illustrative purposes. Thus the official Navigation and Shipping Returns, which recorded annually the number and tonnage of steam and sailing ships calling at each Customs Port -administrative units covering a number of creeks and outports- in the coastal, colonial and foreign trades form the backbone of quantitative work in this area.

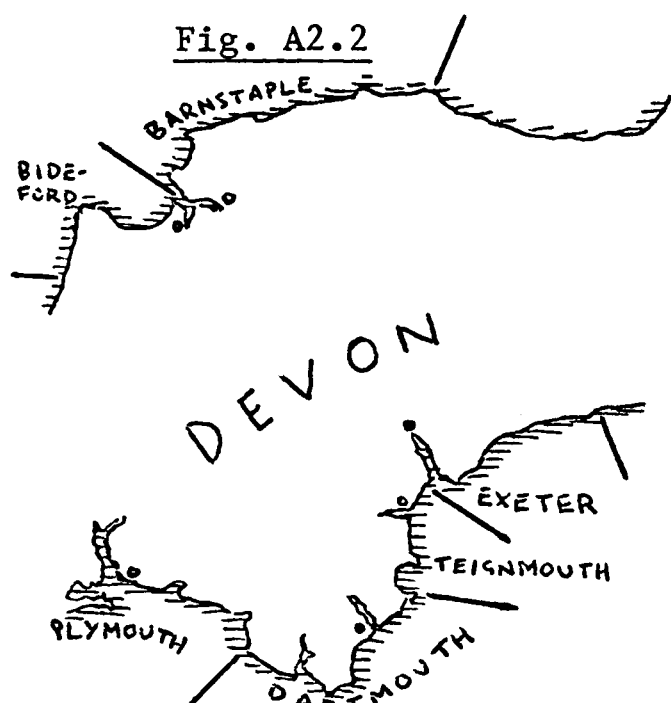
Their accuracy as a measure of actual cargo volumes is compromised by changes in the regulations governing the registration of ships. Traditionally the 'net register tonnage' of a vessel was an estimate of its cubic capacity derived from a measure of its length and breadth, but it was not until 1855 that new depth regulations were rigorously enforced. Further adjustments were made in 1867 and 1883 to allow for equipment and crew living space on steamers, but although all these changes would have tended to reduce the tonnage of vessels calling at ports, the changes they entailed were too small to have had any noticeable effect on Devon's shipping.³

¹As used by Clark, 'Estuarine ports of the Exe and Teign', thesis

²for example, P.H.Stanier, 'The copper ore trade of South West England in the 19th century' Jour.Transport History, New ser. V (1979); R.Pearse, 'The Batten Castle' in S.Fisher (ed.), Westcountry Maritime and Social History, E.P.E.H. 13, (1980), pp.127-36

³see Table A2.4; Farr, North Devon Shipbuilding, pp.5-6 deals with the measurement of shipping tonnage.

The greatest variation between actual carrying capacity and registered tonnage was to be found on collier brigs, which could carry perhaps 40% more than their register tonnage.¹ This explains the excess of coastwise coal imports to some Devon ports over the total tonnage of vessels entering the harbours. Between 1867 and 1876 398,690 tons of shipping entered the Exeter Customs Port, but coal imports amounted to 481,796 tons.² From year to year, however, the trends show a close correspondence, suggesting the utility of the shipping tonnage figures as proxies for the volume of coastal trade.



CUSTOMS PORTS

Before 1853, when Teignmouth gained Customs Port status, it lay wholly within the Exeter Customs Port. Because of falling trade levels, Bideford was united with Barnstaple for administrative purposes in 1882.

The Navigation and Shipping Returns used are to be found in the following volumes of Parliamentary Papers:

1842 XXXIX (409), 1843 LII (216), 1845 XLVII (206), 1846 XLV (155), 1851 LII (155), 1852 XLIX (218), 1852-3 XCVIII (299), 1854 LX (134), 1854-5 XLVI (197), 1856 LI (122), 1857*i* XXXIX (34), 1857-8 LII (260), 1859*ii* XXVII (25), 1860 LX (334), 1861 LVIII (261), 1862 LIV (302), 1863 LXIII (290), 1864 LV (337), 1865 L (331), 1866 LXV (302), 1867 LXIII (355), 1867-8 LXIII (316), 1868-9 LV (257), 1870 LX (349), 1871 LXI (282), 1872 LVI (615), 1873 LXIII (759), 1874 LXIV (1030), 1875 LXXIII (C1253), 1876 LXXII (C1570), 1877 LXXX (C1788), 1878 LXXI (C1999), 1878-9 LXVIII (C2254), 1880 LXXI (C2518), 1881 LXXXVII (C2860), 1882 LXVIII (C3180), 1883 LXX (C3540), 1884 LXXVIII (C3976), 1884-5 LXXV (C4365), 1886 LXIV (C4827), 1887 LXXX (C5067), 1888 XCVII (C5399), 1889 LXXV (C5731), 1890 LXXII (C6040), 1890-1 LXXXII (C6380), 1892 LXXVII (C6663), 1893-4 LXXXVIII (C7005), 1894 LXXXIV (C7402), 1895 XCV (C7696), 1896 LXXXIII (C8089), 1897 LXXXVII (C8491), 1898 XCI*ii* (C8884), 1899 XCVI (C9315), 1900 LXXXVIII (Cd214), 1901 LXXV (Cd604), 1902 C (Cd1113), 1903 LXXI (Cd1612), 1904 XCI (Cd2122), 1905 LXXX (Cd2556), 1906 CXVII (Cd3093), 1907 LXXXIV (Cd3545), 1908 CIV (Cd4256), 1909 LXXXIV (Cd4789), 1910 LXXXVII (Cd5292), 1911 LXXIX (Cd5840), 1912-3 LXXXV (Cd6398), 1913 LXI (Cd7021), 1914 LXXXII (Cd7616).

¹J.Armstrong and P.S.Bagwell, 'Coastal Shipping', in Aldcroft and Freeman, Transport in the Industrial Revolution, p.146

²Coal import figures taken from Parliamentary Papers listed and tabulated in summary form in Table A2.5 and depicted in Fig.3.3, p.63

Table A2.4. Shipping tonnages calling at Devon ports 1840-1913

	COASTING TRADE				FOREIGN TRADE		Coasting trade as %	
	Entering tonnage	tons/ ship	Clearing tonnage	tons/ ship	Entering tonnage	Clearing tonnage	of E.& W. total In Out	
1841	485,308	81.2	198,269	60.2	64,509	71,114	5.4	2.0
1842	519,402	83.4	201,459	61.1	65,444	53,474		
1844	500,752	80.6	287,910	82.7	84,402	68,897		
1845	511,340	77.3	282,569	82.6	78,465	68,296	4.9	2.6
1850	560,144	90.3	355,073	100.2	87,702	77,918	5.4	3.1
1851	577,988	90.3	358,092	100.5	101,361	82,514		
1852	611,521	90.6	325,577	96.0	88,662	71,121		
1853	699,433	93.3	355,407	103.5	99,027	79,547		
1854	625,847	89.1	329,109	93.4	98,188	75,134		
1855	603,754	84.8	313,098	91.8	95,978	75,969	6.0	2.9
1856	570,795	82.0	282,399	83.6	94,423	67,570		
1857	587,456	85.1	314,160	94.1	103,456	71,464		
1858	596,553	89.7	325,211	98.2	112,096	72,072		
1859	640,269	91.2	333,198	97.4	99,127	69,665		
1860	655,736	93.9	324,031	108.2	128,870	71,604	5.8	2.7
1861	676,152	93.4	335,554	112.6	123,846	74,765		
1862	652,233	92.6	344,311	113.1	132,564	70,592		
1863	648,066	93.7	332,935	114.2	117,284	66,715		
1864	664,362	93.7	326,178	114.0	110,700	60,140		
1865	681,798	96.4	324,280	111.1	124,430	72,860	5.7	2.6
1866	675,945	101.7	339,671	117.0	138,560	70,105		
1867	693,738	102.7	353,905	122.1	143,140	66,935		
1868	660,321	103.8	362,330	125.4	132,467	68,042		
1869	718,232	105.8	388,859	137.1	132,710	73,033		
1870	724,067	103.9	386,038	127.7	141,994	72,439	6.3	3.1
1871	698,919	102.2	376,748	121.8	164,564	81,120		
1872	707,137	109.7	376,558	127.5	160,959	110,131		
1873	739,049	110.2	449,013	145.7	156,560*	41,548*		
1874	698,566	111.6	445,111	143.3	147,972	38,192		
1875	765,805	112.8	442,253	142.6	185,391	29,882	5.5	3.3
1876	765,404	108.0	454,021	151.3	200,266	38,171		
1877	779,266	110.0	469,882	157.8	217,856	40,181		
1878	775,725	110.8	477,283	160.9	261,204	31,099		
1879	801,535	111.8	466,069	167.0	207,635	48,399		
1880	793,210	111.6	479,780	165.9	226,344	53,955	5.1	3.1
1881	865,161	119.0	505,255	170.2	205,639	64,968		
1882	855,433	125.9	556,036	170.1	239,036	52,839		
1883	895,034	126.4	548,822	163.7	253,445	48,114		
1884	919,565	125.2	523,949	157.0	222,771	57,734		
1885	923,027	125.8	526,346	158.5	264,485	48,921	5.6	3.2
1886	895,720	123.6	480,745	155.5	215,196	51,225		
1887	895,670	124.0	498,038	148.0	228,067	55,540		
1888	909,399	121.8	556,243	139.7	244,293	56,999		
1889	957,760	126.3	598,910	137.5	233,350	58,727		
1890	949,827	134.6	562,054	143.5	216,417	63,005	5.4	3.2
1891	927,379	132.0	553,702	139.1	211,873	64,906		
1892	986,576	130.2	610,307	135.7	219,637	56,141		
1893	998,719	138.4	643,242	151.5	218,870	66,231		
1894	1,040,440	143.6	625,026	153.7	232,616	72,770		

Table A2.4 CONTINUED

1895	1,003,047	142.1	627,763	157.9	235,043	90,102	5.4	3.3
1896	1,020,945	141.8	650,429	153.4	270,582	76,465		
1897	1,014,441	152.4	630,256	162.4	286,530	61,351		
1898	1,036,546	159.1	693,235	165.1	251,152	52,822		
1899	1,040,318	161.1	660,681	165.9	253,805	42,979		
1900	990,633	164.4	619,199	162.1	253,941	47,595	5.5	3.2
1901	1,049,142	160.2	704,279	151.3	233,202	47,606		
1902	1,137,942	164.0	713,866	155.2	235,844	52,001		
1903	1,105,382	171.9	719,814	164.1	292,688	59,947		
1904	1,166,602	173.0	749,144	156.3	348,081	67,939		
1905	1,156,317	175.5	771,297	172.3	337,063	64,225	6.0	3.7
1906	1,153,026	173.0	765,992	175.1	390,381	74,849		
1907	1,125,320	176.0	591,327*	143.1	309,090	86,406		
1908	1,123,543	173.4	571,062	143.8	322,261	85,975		
1909	1,119,449	180.7	575,060	147.1	305,244	84,957		
1910	1,132,457	188.7	605,006	147.9	303,813	99,304	5.7	2.9
1911	1,133,480	195.9	594,944	155.4	319,396	102,447		
1912	1,128,837	205.2	587,856	165.8				
1913	1,105,748	203.0	597,672	168.2				

* indicates years in which classification of shipping in these categories was altered to take more precise account of shipping entering and clearing ports in ballast.

Table A2.5 Coastwise coal imports to Devon, 1867-96

1867	536,071	1877	526,033	1887	725,668
1868	493,330	1878	556,838	1888	728,668
1869	546,617	1879	619,858	1889	826,996
1870	561,526	1880	582,308	1890	803,164
1871	540,001	1881	645,404	1891	803,103
1872	563,673	1882	651,046	1892	821,298
1873	599,757	1883	684,851	1893	741,167
1874	521,312	1884	704,690	1894	845,717
1875	624,726	1885	712,582	1895	781,543
1876	580,562	1886	713,722	1896	820,338

The 'quantities of coal received coastways' at each customs port were collected and published annually between 1867 and 1896 and are to be found in the following volumes of House of Commons Papers:

PP 1867-8 LXIV (338), 1868-9 LVI (2539), 1870 LXI (253), 1871 LXII (233), 1872 LIV (307), 1873 LXI (1709), 1874 LXII (194), 1875 LXXI (287), 1876 (261), 1877 LXXVI (262), 1878 LXVIII (240), 1878-9 LXV (209), 1880 LXVII (215), 1881 LXXXIII (191), 1882 LXIV (193), 1883 LXIV (175), 1884 LXXII (138), 1884-5 LXXI (134), 1886i LX (121), 1887 LXXV (130), 1888 XCI (176), 1889 LXX (96), 1890 LXVII (143), 1890-1 LXXVII (164), 1892i LXXII (116), 1893-4 LXXXI (225), 1894 LXXVII (282), 1895 LXXXVIII (450), 1897 LXXIX (90 & 90-1).

Table A2.6. Coastal and Overseas Trade by Customs Ports, 1841-1910

C.P.	COASTAL: SAIL				COASTAL: STEAM				FOREIGN AND COLONIAL			
	Ships	tonnage	ships	Clearing	ships	tonnage	ships	Clearing	ships	tonnage	ships	Clearing
1841												
Barnstaple	853	32,494	390	13,764	75	6,380	73	6,105	7	1,267	-	-
Bideford	547	25,806	222	8,542	48	5,588	50	5,818	19	3,453	13	3,000
Dartmouth	843	51,996	492	21,417	147	22,162	32	3,553	58	4,882	169	14,692
Exeter	1,079	89,136	624	37,486	45	5,445	44	5,218	86	8,112	51	7,417
Plymouth	1,875	131,217	1,163	67,774	467	115,085	201	26,592	450	46,575	403	46,025
DEVON	5,197	330,648	2,891	148,983	782	154,660	400	47,286	620	64,509	636	71,114
1860												
Barnstaple	862	34,549	174	6,446	104	11,043	117	12,186	6	1,590	-	-
Bideford	811	34,783	132	6,065	103	7,014	103	7,014	14	4,352	7	2,266
Dartmouth	614	37,611	258	10,429	86	3,786	88	3,748	56	5,954	59	5,433
Exeter	539	56,299	161	8,416	-	-	-	-	72	10,393	17	3,119
Plymouth	2,735	222,294	1,312	82,023	547	195,836	505	176,293	739	98,592	431	57,791
Teignmouth	569	49,457	124	8,251	17	3,064	21	3,160	70	7,989	32	2,995
DEVON	6,130	434,993	2,161	121,630	857	220,743	834	202,401	957	128,870	546	71,604
1890												
Barnstaple	2,206	108,011	648	34,085	95	5,423	57	3,531	13	2,986	-	-
Dartmouth	489	27,330	151	7,309	415	85,182	210	11,371	28	3,153	13	9,892
Exeter	576	36,245	235	16,238	28	5,161	7	289	79	14,788	3	417
Plymouth	1,696	158,745	1,365	99,482	1,136	437,573	816	319,528	623	191,268	333	46,219
Teignmouth	259	29,102	330	33,979	155	57,055	98	36,242	26	4,222	44	6,477
DEVON	5,226	359,433	2,729	191,093	1,829	590,394	1,188	370,961	769	216,417	393	63,005
1910												
Barnstaple	1,329	61,619	1,035	50,499	659	53,908	180	8,466	18	3,091	16	2,036
Dartmouth	432	22,107	258	10,237	335	97,074	103	5,062	18	1,619	1	17
Exeter	305	22,699	103	6,824	148	10,069	12	1,181	68	10,072	-	-
Plymouth	715	48,180	989	50,590	1,610	721,481	836	390,153	606	277,796	330	84,086
Teignmouth	284	21,834	342	27,983	184	73,486	234	54,011	47	11,235	89	13,165
DEVON	3,065	176,439	2,727	146,133	2,936	956,018	1,365	458,873	757	303,813	436	99,304

'DISTRICT' POPULATION IN DEVON, 1801-1911

The decennial population totals for each parish were taken from the following census volumes, and reconstituted into the district groupings shown in Fig. A3.1.

- 1801-51: Census of Great Britain 1851, Numbers of the inhabitants, Vol.1, Division V, PP 1852-3 LXXXV (1361), pp.40-57
 1861: Census of England and Wales (C.E.W.) Vol.1, Numbers and Distribution of the people, PP 1862 L (3056), Div.V, pp.397-407
 1871: C.E.W. Vol.2, Area, houses, inhabitants, 1872 LXVIIi (c676-I), Div.V, Table 3, pp.230-41
 1881: C.E.W. Vol.2, Area, houses, population, 1883 LXXIX (c3563), pp.261-70
 1891: C.E.W. Vol.2, Area, houses, population, 1893-4 CV (c6948-I), pp.405-17
 1901: C.E.W., Devon County Report, 1902 CXVIII (Cd1271), Table 11, pp.21-6
 1911: C.E.W., Vol.1, Administrative Areas. Devon. 1912 CXI (Cd6258), Table 10, pp.107-16.

It is thought that in the early decades of the 19th century there may have been a significant degree of inaccuracy in the recorded totals for several parishes¹ but the occasional errors of addition in the printed tables have been eliminated. In some cases the population as recorded in the census does not accurately reflect the 'normal' local population. In Exbourne in 1841, for example, 'the apparent increase of population is attributed to an influx of persons attending the village feast'² but isolated instances such as these do not adversely affect the population aggregates at district level.

Various different methods have been used by demographers to divide rural from urban populations but as described in chapter 6 the main criteria for the construction of population districts has been simply to separate growing parishes from declining parishes. Bowley suggested that administrative districts with a population density of under 30 per 100 acres in the 1911 census should be considered rural³ and by this criteria 32 of the 34 'declining' population districts are rural anyway. 24 of them had densities of less than 20 people to every 100 acres in 1911.

¹Wrigley and Schofield, Population History, pp. 629-37

²PP1852-3 LXXXV (1361), Numbers of the inhabitants, p.51

³A.L.Bowley, 'Rural populations in England and Wales', J.R.S.S. LXXVII, (1914), p.598

Despite the division of Devon into over 440 parishes there were still a few places where the census figures and/or location of parish boundaries stood in the way of the desired division of the county into districts. In almost all of these cases, however, there was enough evidence to allow for interpolation where necessary. The rural parish of East Budleigh was separated from the small but growing coastal resort of Budleigh Salterton in this way, using more specific population figures for 1841, 1901 and 1911. Tiverton and Crediton have been separated from their large rural parishes, Newton Poppleford from Aylesbeare, and Ivybridge from its constituent parishes of Ugborough and Ermington.

POPULATION DISTRICTS:

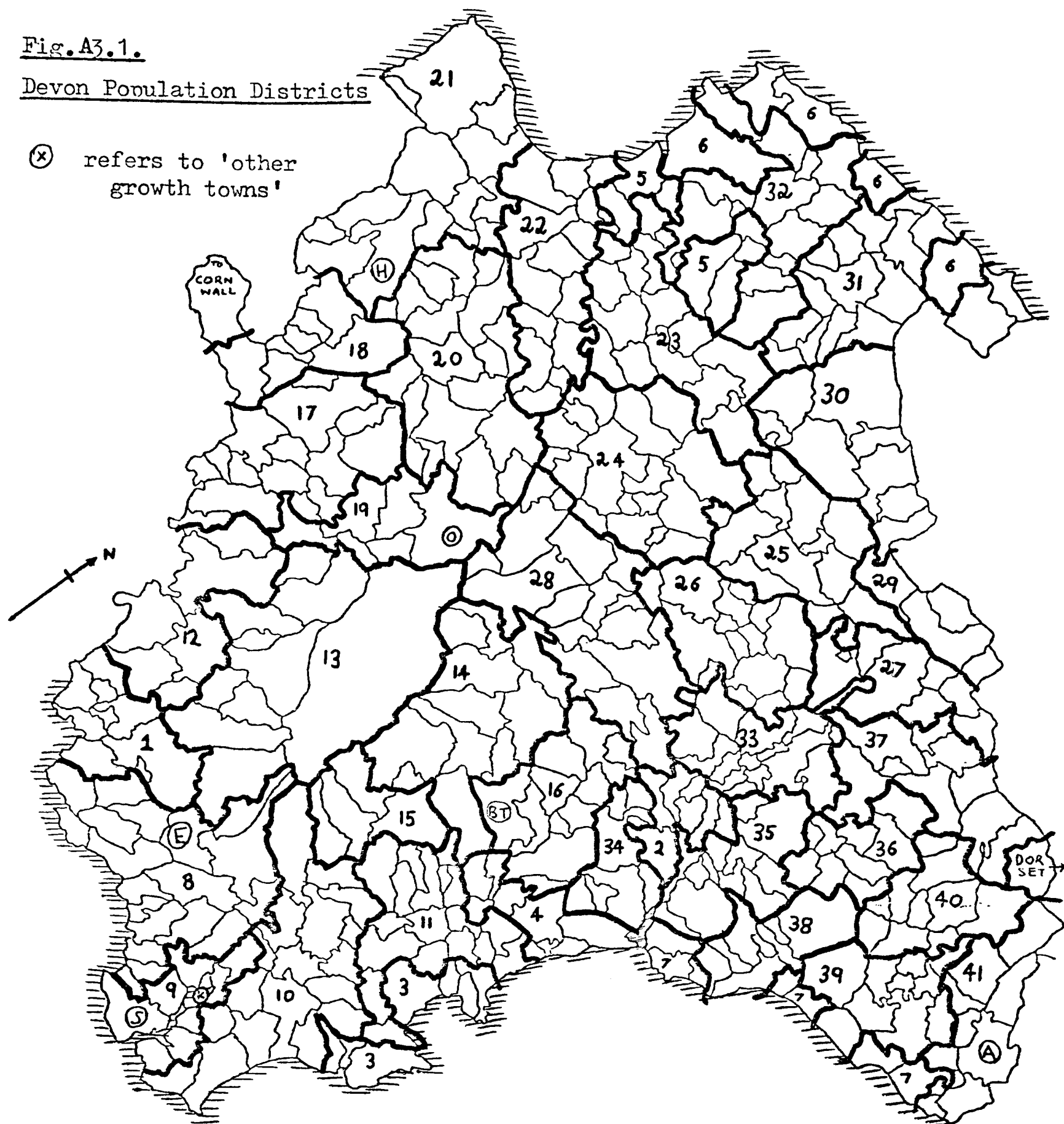
- 1 GREATER PLYMOUTH: Plymouth, East Stonehouse, Stoke Damerel (Devonport), St.Budeaux, Egg Buckland, Plympton St.Mary, Plympton Earl, Plymstock, Compton Gifford, Weston Peverel.
- 2 GREATER EXETER: City parishes of Exeter, St.Leonard, St.Thomas, Alphington, Pinhoe, Heavitree, Exminster.
- 3 TORBAY: St.Marychurch, Tormohun, Cockington, Paignton, Brixham, Kingswear, Dartmouth, Townstall.
- 4 TEIGN ESTUARY: Dawlish, Teignmouth (West and East), Shaldon, Bishops-teignton, Kingsteignton, Teigngrace, Highweek and Wolborough (Newton Abt)
- 5 TAW/TORRIDGE ESTUARIES: Landcross, Bideford, Northam, Instow, Pilton, Barnstaple, Tawstock, Bishops Nympton.
- 6 NORTH DEVON COAST: Braunton, Mortehoe, Ilfracombe, Combe Martin, Lynton.
- 7 EAST DEVON COAST: Exmouth (Withycombe and Littleham), Budleigh Salterton, Sidmouth, Salcombe Regis, Beer, Seaton, Axmouth.
- 8 WEST SOUTH HAMS: Wembury, Brixton, Yealmpton, Neton Ferrers, Revelstoke, Holbeton, Ringmore, Kingston, Modbury, Ugborough, North Huish, Loddiswell, Aveton Gifford, Bigbury, Thurlestone, South Milton, South Huish, Harford
- 9 KINGSBRIDGE ESTUARY: West Alvington, Churchstow, Buckland Tout-Saints, Woodleigh, Charleton, South Pool. East Portlemouth.
- 10 CENTRAL SOUTH HAMS: South Brent, Diptford, Harberton, Rattery, Dartington, Totnes, Ashprington, Moreleigh, Halwell, East Allington, Blackawton, Cornworthy, Dittisham, Stoke Fleming, Slapton, Sherford, Stokenham, Chivelstone.
- 11 EAST SOUTH HAMS: Churston Ferrers, Stoke Gabriel, Berry Pomeroy, Littlehempston, Marldon, Ipplepen, Torbryan, Broadhempston, Staverton, Woodland, Denbury, Bickington, West Ogwell, East Ogwell, Abbotskerswell, Kingkerswell, Coffinswell, Combeinteignhead, Stokeinteignhead.
- 12 TAMAR: Tavistock, Tamerton Foliot, Bickleigh, Buckland Monachorum, Lamer-ton, Bere Ferrers.
- 13 WEST DARTMOOR: Cornwood, Shaugh Prior, Meavy, Sheepstor, Walkhampton, Dartmoor (most of Lydford parish), Whitchurch, Sampford Spiney, Peter Tavy, Mary Tavy.
- 14 EAST DARTMOOR: Gidleigh, Throwleigh, Drewsteignton, Chagford, Moreton-hampstead, North Bovey, Manaton, Lustleigh, Ilsington, Widecombe-in-the-Moor, Buckland-in-the-Moor.
- 15 ASHBURTON: Ashburton, Buckfastleigh, Holne, Dean Prior.

- 16 TEIGN VALLEY: Dunsford, Holcombe Burnell, Bridford, Christow, Hennock, Ideford, Chudleigh, Ashton, Trusham, Doddiscombsleigh.
- 17 BRADSTONE: Sydenham Damerel, Milton Abbott, Dunterton, Bradstone, Kelly, Marystow, Coryton, Lewtrenchard, Thrushelton, Bratton Clovelly, Germans-week, Broadwoodwidge, Stowford, Lifton, Virginstow.
- 18 WERRINGTON: Werrington, St.Giles-on-the-Heath, Northcott, Luffincott, Tetcott, Ashwater, Clawton.
- 19 NORTH DARTMOOR: Brentor, Lydford, Bridestow, Sourton, Belstone
- 20 HALWILL: Halwill, Beaworthy, Northlew, Ashbury, Inwardleigh, Jacobstowe, Hatherleigh, Sheepwash, Black Torrington, Buckland Filleigh, Shebbear, Thornbury, Bradford, Milton Damerel, Newton St.Petrock, Cookbury, Hollacombe.
- 21 HARTLAND: Bridgerule, Pyworthy, Bulkworthy, Pancrasweek, Bradworthy, Sutcombe, Abbots Bickington, West and East Putford, Woolfardisworthy, Clovelly, Hartland, Welcombe.
- 22 PARKHAM: Parkham, Alwington, Abbotsham, Littleham, Monkleigh, Buckland Brewer, Frithelstock, Little Torrington, Langtree, Peters marland, Merton, Huish, Petrockstow, Meeth.
- 23 TORRINGTON: Weare Gifford, Westleigh, Great Torrington, St.Giles-in-the-wood, Roborough, High Bickington, Atherington, Yarnscombe, Huntshaw, Alverdiscott, Horwood, Newton Tracey, Beaford, Chittlehampton, Satterleigh, Warkleigh, Kings Nympton.
- 24 WINKLEIGH: Burrington, Ashreigny, Dolton, Dowland, Iddesleigh,¹ Monkokehampton, Broadwoodkelly, Bondleigh, Winkleigh, Brushford, Coldridge, Nymet Rowland, Wembworthy, Eggesford, Chulmleigh, Chawleigh, Lapford.
- 25 WITHERIDGE: Mariansleigh, Rose Ash, Romansleigh, Meshaw, Cheldon, East and West Worlington, Thelbridge, Knowstone, Creacombe, Rackenford, Stoodleigh, Loxbeare, Templeton, Witheridge.
- 26 MORCHARD BISHOP: Morchard Bishop, Down St.Mary, Washford Pyne, Puddington, Cruwys Morchard, Cadeleigh, Cadbury, Stockleigh Pomeroy, Cheriton Fitzpaine, Poughill, Woolfardisworthy, Kennerleigh, Stockleigh English, Upton Hellions, Sandford.
- 27 WASHFIELD: Rural Tiverton, Washfield, Calverleigh, Huntsham, Hockworthy, Uplowman, Holcombe Rogus.
- 28 TAWTON: Exbourne, Honeychurch, Sampford Coutenay, North and South tawton, Spreyton, Hittisleigh, Cheriton Bishop, Colebrooke, Clannaborough, Zeal Monachorum, Bow, Rural Crediton, Tedburn, Whitestone.
- 29 BAMPION: Clayhangar, Bampton, Morebath, Oakford.
- 30 SOUTH MOLTON: East and West Anstey, Molland, Bishops Nympton, Twitchen, North and South Molton, George Nympton
- 31 EXMOOR: Filleigh, High Bray, Challacombe, Parracombe, Countisbury, Brendon, West and East Buckland, Charles, Stoke Rivers, Bratton Fleming, Loxhore, Arlington, Kentisbury, Trentishoe, Martinhoe.
- 32 MARWOOD: Swimbridge, Fremington, Ashford, Heanton Punchardon, Georgeham, Berrynarbor, East and West Down, Shirwell, Goodleigh, Landkey, Marwood, Bittadon.
- 33 EXE VALE: Crediton, Tiverton, Netherexè, Butterleigh, Bickleigh, Silverton, Bradninch, Rewe, Upexe, Huxham, Stoke Canon, Brampford Speke, Upton Pyne, Newton St.Cyres, Shobrooke, Thorverton.
- 34 KENTON: Kenton, Kenn, Powderhem, Shillingford, Ashcombe, Mamhead, Ide, Dunchideock.
- 35 WOODBURY: Lympstone, Woodbury, Farringdon, Aylesbeare, Rockbeare, Poltimore, Topsham, Broad Clyst, Clyst Honiton, Sowton, Clyst St.Mary, Clyst St. George.
- 36 WHIMPLE: Whimple, Talaton, Payhembury, Broadhembury, Kentisbeare, Plymtree, Clyst Hydon, Clyst St.Laurence, Feniton.
- 37 CULM VALLEY: Cullompton, Willand, Halberton, Sampford Peverell, Burlescombe, Uffculme, Culmstock, Hemyock, Clayhidon.
- 38 LOWER OTTER VALLEY: East Budleigh, Otterton, Bicton, Colaton Raleigh, Newton Poppleford, Harpford, Venn Ottery, Ottery St.Mary.

Fig. A3.1.

Devon Population Districts

⊗ refers to 'other growth towns'



39 SIDBURY: Sidbury, Farway, Branscombe, Northleigh, Southleigh, Offwell, Cotleigh, Widworthy, Shute, Colyton..

40 UPPER OTTER VALLEY: Gittisham, Buckerell, Honiton, Awliscombe, Monkton, Upottery, Combe Raleigh, Luppitt, Dunkeswell, Sheldon.

41 DORSET BORDER: Musbury, Combpyne-Rousdon, Uplyme, Kilmington, Hawkchurch, Chardstock, Membury, Dalwood, Stockland, Yarcombe.

Table A3.1. Devon population by district, 1801-1911

District	Acreage	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891	1901	1911
Gtr. Plymouth	24,734	48,678	62,412	74,343	83,368	89,332	112,944	138,291	145,220	151,740	171,205	204,853	220,687
Gtr. Exeter	18,794	22,546	24,705	30,658	37,710	42,585	45,454	46,590	48,986	52,165	56,256	59,432	64,562
Torbay	17,727	10,891	12,388	14,322	16,856	20,905	27,385	33,601	42,286	48,954	55,636	57,636	66,089
Teign estuary	19,986	8,083	9,900	12,623	14,853	15,348	17,581	19,980	22,741	25,930	27,231	28,957	31,207
Taw/Torridge	21,466	11,889	12,866	15,785	19,686	22,429	24,072	23,256	26,115	26,185	29,221	30,610	31,511
North Devon Coast	31,280	4,688	4,875	6,625	7,409	8,758	8,928	8,893	9,775	11,305	13,495	14,642	15,674
East Devon Coast	17,293	6,471	7,725	10,171	11,297	12,793	13,902	14,024	15,012	16,127	18,440	20,120	23,699
GROWTH DISTRICTS:	151,284	113,246	134,871	164,167	191,679	212,150	250,266	284,635	310,135	332,406	371,585	416,250	453,429
Kingsbridge	509	1,725	2,184	2,315	2,624	2,793	2,981	2,768	2,803	2,786	2,888	3,025	3,049
Salcombe	4,890	1,056	1,353	1,552	1,604	1,951	2,354	2,388	2,492	2,434	2,160	2,354	2,648
Ermington (Ivybr'ge)	5,818	1,013	1,218	1,513	1,618	1,759	1,569	1,933	2,162	2,439	2,471	2,583	2,746
Bovey Tracey	7,262	1,431	1,385	1,685	1,697	1,823	2,086	2,080	2,133	2,170	2,422	2,658	2,809
Axminster	7,637	2,154	2,387	2,742	2,719	2,860	2,746	2,896	2,852	2,836	2,809	2,933	3,009
Okehampton	9,552	1,500	1,554	2,023	2,055	2,194	2,165	1,929	2,470	2,292	2,469	3,223	4,107
Holsworthy	8,836	1,045	1,206	1,440	1,628	1,857	1,833	1,724	1,645	1,716	1,920	2,076	2,220
OTHER GROWTH TOWNS:	44,504	9,924	11,287	13,270	13,945	15,237	15,734	15,718	16,557	16,673	17,179	18,772	20,588
West South Hams	54,593	10,480	11,433	13,298	13,573	14,254	13,202	12,075	11,813	11,668	10,971	10,227	10,475
Kingsbridge Est.	14,317	2,355	2,597	2,934	3,161	3,552	3,447	2,929	3,060	2,673	2,579	2,327	1,980
Central Sth Hams	65,128	10,652	11,538	13,010	13,544	13,582	12,957	11,949	12,451	11,773	11,476	10,460	10,401
East Sth Hams	40,933	9,096	9,389	9,943	10,405	10,376	10,304	9,694	9,690	8,978	9,015	8,558	8,344
Tamar	26,471	3,761	4,488	6,002	5,886	6,524	8,009	7,419	6,177	5,886	5,892	6,098	6,277
West Dartmoor	106,432	3,449	4,801	5,676	6,190	7,416	8,062	9,030	8,220	8,066	7,521	8,458	8,609
East Dartmoor	62,098	7,226	7,330	8,654	9,461	9,528	8,946	7,801	7,955	7,309	7,128	6,716	7,053
Ashburton	21,226	5,459	5,768	6,614	7,532	7,363	6,938	6,376	6,318	6,306	6,337	5,941	5,686
Teign Valley	30,942	4,993	5,261	5,971	6,635	6,899	7,303	7,063	6,404	5,603	5,458	5,077	5,274
Bradstone	51,941	4,964	5,774	6,774	7,903	9,169	8,415	7,657	7,320	6,622	5,946	5,103	4,848
Werrington	25,943	2,015	2,292	2,673	2,940	3,238	3,013	2,815	2,857	2,652	2,502	2,379	2,190
North Dartmoor	15,483	1,498	1,754	1,829	2,112	2,517	2,277	1,900	1,749	1,661	1,563	1,438	1,491
Halwill	69,414	6,803	7,500	8,861	9,989	10,856	10,230	9,437	8,859	8,047	7,672	7,097	6,874

Table A3.1 CONTINUED

	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891	1901	1911
Hartland	5,787	6,592	7,698	8,243	8,813	8,165	7,254	6,871	6,647	6,358	5,896	5,764
Parkham	6,060	6,387	7,572	8,140	8,412	7,937	7,825	7,453	6,713	6,293	5,773	5,718
Torrington	8,880	9,217	10,643	11,998	12,666	12,297	11,701	11,637	10,766	10,190	9,319	8,716
Winkleigh	8,801	8,692	9,945	10,809	11,477	10,926	10,389	9,863	8,653	7,699	7,181	6,955
Witheridge	3,845	4,052	4,593	5,142	5,838	5,488	5,300	5,178	4,339	4,174	3,921	3,820
Morcharde Bishop	6,848	7,111	7,836	8,267	8,438	8,403	7,763	7,065	6,206	5,770	5,304	4,951
Washfield	3,517	3,919	4,250	4,602	4,652	4,520	4,856	4,785	4,545	4,444	3,907	3,830
Tawton	9,382	10,244	11,498	12,501	12,730	12,200	11,182	11,422	10,209	9,866	8,568	8,392
Bampton	2,405	2,552	2,864	3,166	3,450	3,530	3,304	3,215	3,037	2,847	2,714	2,650
South Molton	6,431	6,381	7,525	8,240	9,255	9,334	8,479	8,418	7,424	6,830	5,992	5,793
Exmoor	3,537	3,693	4,197	4,483	5,029	4,921	4,717	4,624	4,244	4,064	3,832	3,913
Marwood	6,571	7,033	8,433	9,453	9,947	9,673	9,112	8,603	7,783	7,623	7,207	7,111
Exe Vale	13,654	16,366	18,847	20,690	21,117	22,433	20,516	20,034	19,956	19,845	18,884	18,147
Kenton	3,903	4,188	4,923	4,985	5,327	4,909	4,577	4,342	4,324	4,109	3,926	3,827
Woodbury	8,718	9,181	10,232	10,957	12,079	11,878	11,820	11,159	10,314	10,091	9,408	9,643
Whimble	4,154	4,141	4,640	5,237	5,217	5,039	4,972	4,695	4,260	4,192	3,942	4,121
Culm Valley	11,488	11,397	12,426	13,152	13,336	12,869	11,701	11,001	10,272	10,115	9,631	9,680
Lower Otter Valley	5,420	6,038	7,317	8,147	8,622	8,741	8,622	8,369	7,819	6,925	6,268	6,396
Sidbury	5,500	5,796	6,703	7,176	7,810	7,807	7,400	7,399	6,434	5,810	5,374	5,554
Upper Otter Valley	5,891	6,264	7,148	7,438	8,137	7,717	7,304	7,249	6,803	6,484	6,159	5,975
Dorset Border	6,055	6,339	7,264	7,642	7,973	7,653	7,479	7,427	6,658	6,161	5,662	5,820

DECLINING

DISTRICTS:

1,438,471 215,228 232,548 266,756 288,976 305,478 301,465 284,450 274,942 253,692 243,255 227,321 225,371

DEVON:

1,634,259 338,398 378,706 444,193 494,150 532,865 567,465 584,803 601,634 602,771 632,019 662,343 699,388

DISTRICT MIGRATION RATES

The methodology used here was outlined in chapter 6 and the natural increase figures are taken from the same Census volumes as used in Appendix

3.1. For the 1840s the following reports of the Registrar-General were used:

1840-1: 4th report, PP 1842 XIX (423), 1841: 1843 XXI (516), 1842: 1844 XIX (540), 1843: 1846 XIX (727), 1844: 1847-8 XXV (996), 1846: 1849 XXI (1113).

1851-61: 1862 L (3056), Div.V, Table E, p.432;

1861-71: 1872 LXVIIi (c676-I), Table 9, p.268;

1871-81: 1883 LXXIX (c3563), Table 10, p.306;

1881-91: 1893-4 CV (c6948-I), Table 12, p.489;

1891-1901: 1902 CXVIII (Cd1271), Table 22, p.60;

1901-11: Supp. to 75th annual report of the Registrar-General, 1914-6 VIII (Cd8002), Table 1, p.cix.

The natural increase rates derived from Registration Districts were applied to the population districts as follows:

Exeter: Greater Exeter; Plymouth, Devonport, Plympton St.Mary: Greater Plymouth;

Axminster R.D.: Axminster, East Devon Coast, Sidbury, Dorset Border;

Honiton R.D.: Upper Otter Valley, Lower Otter, Culm Valley, Whimble;

St.Thomas R.D.: Teign Vale, Kenton, Woodbury;

Newton Abbott R.D.: Ashburton, Bovey Tracey, Torbay, Teign Estuary;

Totnes R.D.: Central and East South Hams;

Kingsbridge R.D.: West South Hams, Kingsbridge Estuary, Kingsbridge, Salcombe, Ermington;

Tavistock R.D.: Tamar, West Dartmoor;

Okehampton R.D.: East and North Dartmoor, Okehampton, Halwill;

Crediton R.D.: Morchard Bishop, Tawton, Exe Vale;

Tiverton R.D.: Washfield, Bampton, Tiverton;

South Molton R.D.: Witheridge, Winkleigh, South Molton, Exmoor;

Barnstaple R.D.: Taw/Torridge, Marwood, North Devon Coast;

Torrington R.D.: Parkham, Torrington;

Holsworthy R.D.: Bradstone, Werrington, Hartland, Holsworthy.

The natural increase rates for 1841-70 were also scaled up with Wrigley and Schofield's inflation ratios (see chapter 6, pp.174-5), to produce alternative estimates of decennial migration rates from rural districts but these are shown only at aggregate level. Some Registration Districts are included for comparative purposes in Table A3.2, and they too are calculated on the basis of unrevised natural increase rates.

Table A3.2. District Migration Rates in Devon

(net migrants/1,000 popn./year; all negative except where indicated by +)

District	1841-50	1851-60	1861-70	1871-80	1881-90	1891-00	1901-10
Gtr.Plymouth	+13.6	+10.4	5.3	5.2	+1.7	+10.5	3.1
Gtr.Exeter	+4.4	1.2	1.0	0.0	0.0	1.0	+3.6
Torbay	+19.5	+11.3	+11.7	+5.0	+4.4	1.7	+11.2
Teign Estuary	+2.3	+2.0	+2.4	+2.9	3.9	+1.2	+4.0
Taw/Torridge	4.3	13.5	+1.0	9.2	+0.7	4.2	3.5
North Devon Coast	9.7	10.5	1.5	+5.3	+7.2	0.4	+0.6
East Devon Coast	1.4	8.0	3.9	2.2	+4.0	+2.0	+9.5
West South Hams	18.8	19.5	13.4	13.2	15.4	14.4	3.9
Kingsbridge Est.	14.4	26.0	6.8	24.6	13.0	17.4	21.2
Central S.Hams	16.0	16.8	7.5	18.7	15.2	18.5	8.2
East S.Hams	12.1	14.9	11.7	20.6	12.3	14.7	10.1
Tamar	+6.7	21.9	29.9	15.2	9.9	3.9	2.4
West Dartmoor	5.8	2.5	22.0	12.3	16.8	+4.5	3.6
East Dartmoor	19.6	24.1	11.6	19.6	13.7	14.3	2.7
Ashburton	17.7	19.5	12.0	11.0	8.4	11.3	7.7
Teign Valley	3.1	11.1	18.1	21.8	12.4	13.3	1.7
Bradstone	21.3	21.2	17.6	22.5	23.7	26.0	14.8
Werrington	20.1	18.8	11.8	20.1	19.2	16.7	17.8
North Dartmoor	24.1	27.9	21.7	16.4	17.2	16.5	4.0
Halwill	19.3	19.1	19.7	20.7	15.9	16.0	10.9
Hartland	20.5	23.4	18.5	16.2	17.9	19.0	12.1
Parkham	17.3	13.3	16.1	20.9	16.3	16.4	8.7
Torrington	14.5	16.7	11.8	18.5	15.4	16.7	14.2
Winkleigh	16.4	17.3	17.0	23.2	22.8	15.4	9.9
Witheridge	17.6	15.9	14.3	27.1	15.5	14.7	9.3
Morchard B'p	12.0	18.7	19.9	23.0	17.5	18.5	12.1
Washfield	11.1	1.2	11.1	14.0	13.0	20.9	9.4
Tawton	15.8	19.4	8.8	21.5	13.8	23.6	7.5
Bampton	6.0	15.0	12.3	14.5	17.0	13.5	9.8
South Molton	10.8	21.6	12.7	22.7	19.7	20.9	10.1
Exmoor	13.8	16.6	13.9	19.1	16.0	14.4	4.7
Marwood	14.4	15.9	17.0	19.0	12.9	14.4	7.7
Exe Vale	4.2	18.6	12.8	10.5	11.1	14.6	10.2
Kenton	16.8	14.6	13.9	9.7	14.8	10.8	8.1
Woodbury	10.6	8.3	14.4	16.8	12.0	13.1	3.1
Whimble	13.5	11.4	18.8	22.3	13.1	12.9	2.2
Culm Valley	13.6	19.2	17.3	19.6	13.1	11.8	6.3
Lower Otter	8.7	11.5	16.1	19.6	23.0	16.5	4.7
Sidbury	10.1	14.1	10.9	22.7	31.7	16.7	9.5
Upper Otter	15.3	15.4	13.9	19.1	16.2	16.9	9.8
Dorset Border	14.1	11.2	11.6	20.0	17.2	15.0	3.9
Kingsbridge R.D.	12.2	20.3	9.7	16.9	14.9	16.6	
Crediton R.D.	9.7	17.8	15.2	17.5	16.1	18.5	
South Molton R.D.	13.6	17.5	13.9	23.1	19.1	19.2	
Holsworthy R.D.	24.7	21.8	17.8	17.7	13.9	15.2	
Honiton R.D.	10.4	14.7	15.1	18.2	14.4	8.1	

The presentation of the statistics in 1911 makes it less easy to calculate Migration rates at Rural District Council level.

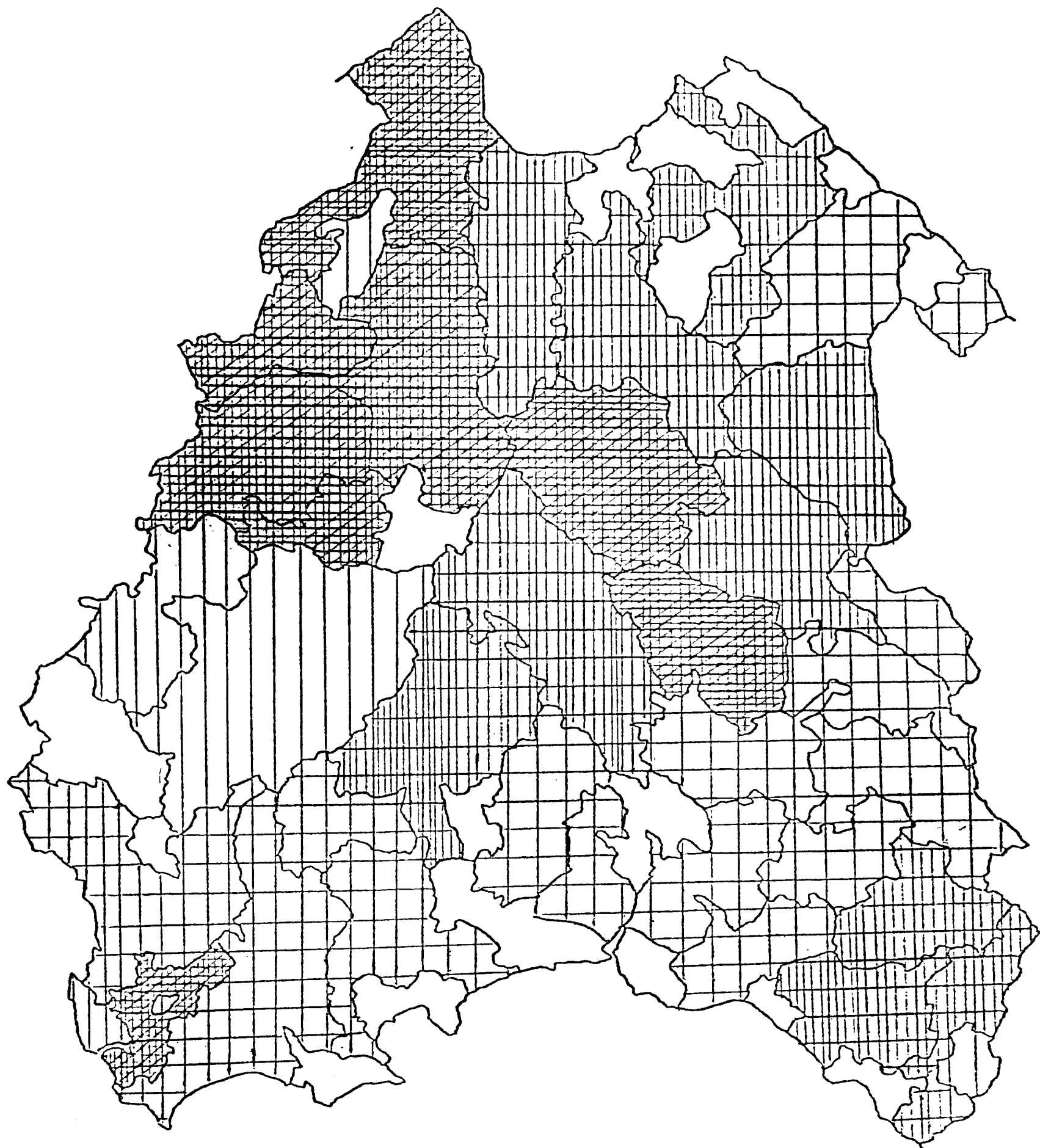
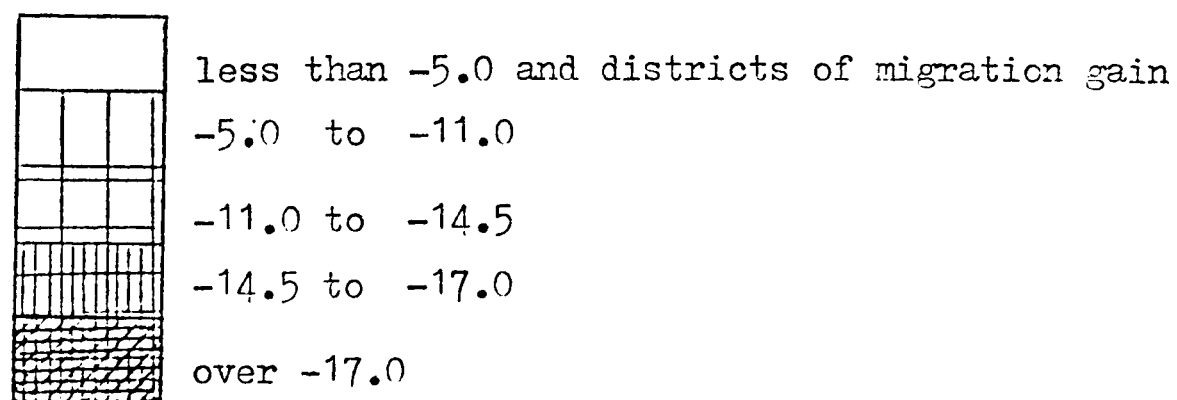


Fig. A3.2 District Migration Rates, 1841-1910

unweighted average of decennial migration rates for each population district, as shown in Table A5.2.



POPULATION AGE STRUCTURE IN DEVON

These figures for the age and sex structure of the population are taken from the printed census volumes for 1851 and 1901 listed below. Additional information is presented for the South Molton Registration District (Rural and Urban District in 1911) in Table A3.4 to exemplify the effects on age structure of heavy depopulation.

- 1851: Census G.B., Ages, Civil Condition, Occupations, 1852 LXXXVIIIi (1691-I), pp.327-8;
 1861: Vol.II, Ages, Civil Condition, Occupations, 1863 LIIIIi (3221), Div.V, Table 2, p.342;
 1871: Vol.III, 1873 LXXII (c872), Div.V, Table 2, p.222;
 1881: Vol.III, 1883 LXXX (c3722), Div.V, Table 2, p.166;
 1891: Vol.III, 1893-4 CVI (c7058), Div.V, Table 2, p.166;
 1901: Devon County Report, 1902 CXVIII (Cd1271), Table 23, p.61, Summary Tables, 1903 LXXXIV (Cd1523), Table XXV, p.139;
 1911: Vol.VII, Ages and Conjugal Condition, 1912-3 CXIII (Cd6610), Table 8, pp.41-2.

Table A3.3 Comparative age and sex structure

1851	DEVON REGISTRATION COUNTY				ENGLAND AND WALES			
	M 000s	F 000s	Pop'n 000s	% of total	M 000s	F 000s	Pop'n 000s	% of total
0-5	35.77	35.57	71.33	12.5	1,176.8	1,171.4	2,348.1	13.1
5-10	33.69	33.25	66.94	11.7	1,050.2	1,042.1	2,092.4	11.7
10-15	30.08	29.63	59.71	10.4	964.0	949.4	1,913.4	10.7
15-20	27.19	28.46	55.65	9.7	873.2	883.9	1,757.2	9.8
20-25	22.5	27.38	49.88	8.7	795.5	871.2	1,666.6	9.3
25-30	19.5	24.17	43.67	7.6	699.3	771.1	1,470.5	8.2
30-35	17.32	20.88	38.2	6.7	617.9	658.2	1,276.1	7.1
35-40	15.49	18.07	33.56	5.9	532.7	555.9	1,088.6	6.1
40-45	14.12	16.18	30.3	5.3	474.2	494.4	968.6	5.4
45-50	12.24	14.0	26.22	4.6	392.9	406.1	799.0	4.5
50-55	11.14	12.7	23.85	4.2	346.1	362.7	708.8	4.0
55-60	9.09	10.21	19.3	3.4	254.9	271.4	526.3	2.9
60-65	8.65	10.22	18.86	3.3	227.2	254.1	481.3	2.7
65-70	6.15	7.59	13.74	2.4	151.6	175.9	327.5	1.8
70-75	4.54	5.6	10.14	1.8	114.7	135.4	250.2	1.4
75-80	2.68	3.48	6.16	1.1	65.0	81.1	146.1	0.8
80+	1.92	2.91	4.83	0.9	44.9	62.1	107.0	0.6
Total	272.1	300.3	572.3		8,781.2	9,146.4	17,927.6	

Table A3.3 CONTINUED

1901	DEVON ADMINISTRATIVE COUNTY				ENGLAND AND WALES			
	M 000s	F 000s	Pop'n 000s	% of total	M 000s	F 000s	Pop'n 000s	% of total
0-5	33.14	33.31	66.45	10.0	1,855.4	1,861.3	3,716.7	11.4
5-10	33.67	33.57	67.2	10.2	1,739.0	1,748.3	3,487.3	10.7
10-15	33.0	32.96	65.96	10.0	1,671.0	1,670.8	3,341.7	10.3
15-20	32.89	32.35	65.24	9.9	1,607.5	1,638.6	3,246.1	10.0
20-25	28.08	32.22	60.29	9.1	1,472.6	1,648.3	3,120.9	9.6
25-30	24.42	29.26	53.69	8.1	1,328.3	1,496.2	2,824.5	8.7
30-35	21.4	25.79	47.18	7.1	1,157.7	1,273.7	2,431.3	7.5
35-40	19.97	23.45	43.42	6.6	1,034.5	1,110.9	2,145.4	6.6
40-45	17.84	20.56	38.4	5.8	897.5	953.1	1,850.6	5.7
45-50	15.18	18.02	33.2	5.0	760.0	813.2	1,573.2	4.8
50-55	12.83	15.94	28.76	4.3	636.3	692.7	1,329.0	4.1
55-60	11.08	13.6	24.66	3.7	497.5	555.1	1,052.6	3.2
60-65	9.58	12.25	21.82	3.3	410.4	480.2	890.7	2.7
65-70	7.39	9.58	16.96	2.6	282.4	347.3	629.7	1.9
70-75	5.67	7.6	13.27	2.0	195.5	250.9	446.3	1.4
75-80	3.77	5.07	8.84	1.3	113.1	151.4	264.5	0.8
80+	2.64	4.18	6.82	1.0	70.1	107.2	177.3	0.6
Total	312.54	349.7	662.2		15,728.6	16,779.2	32,527.8	

Table A3.4 Demographic features of South Molton R.D.

1) CRUDE FERTILITY RATE

	1851-60	1861-70	1871-80	1881-90	1891-00	1901-10
Crude Birth rate	29.55	29.86	27.62	27.45	23.89	19.98
Births	6,077	5,833	5,241	4,574	3,689	2,759
Women 15-45	4,252	3,848	3,639	3,344	3,112	2,919
Fertility rate	1.43	1.52	1.44	1.37	1.19	0.95

2) AGE COHORT CHANGE, 1851-1901

	0-5	5-15	15-30	30-45	45-60	60-80	80+	Total
1851	2,603	4,773	5,219	3,408	2,458	1,929	176	20,566
1901	1,464	3,030	3,396	2,377	1,918	1,442	185	13,812
1901/1851 (%)	56.2	63.5	65.1	69.7	78.0	74.8	105.1	67.2

3) AGE STRUCTURE AND MIGRATION

	Popn.	Index	Males 15-65	Index	net out migr'n	mig. rate	Pop. aged 15-35	5/7
	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
1851	20,566	100.0	6,008	100.0			6,462	
1861	19,209	93.4	5,312	88.4	3,911	19.02	5,629	60.5
1871	18,975	92.3	5,340	88.9	2,572	13.39	5,620	45.7
1881	16,818	81.8	4,629	77.0	4,224	22.26	5,054	75.2
1891	15,440	75.1	4,246	70.7	3,331	19.81	4,617	65.9
1901	13,812	67.2	4,012	66.8	2,966	19.21	4,268	64.2
1911	13,650	66.4	4,346	72.3	1,095	7.93	4,344	25.7

SOURCES FOR THE COST OF LIVING IN VICTORIAN DEVON

Two main sources were used to obtain a range of price quotations for various common articles of consumption -newspaper market reports and Poor Law Union Contract Price Tenders.

A) NEWSPAPERS.

The local and provincial newspapers of Victorian Devon, as shown by the advertisements they carried and their local news coverage, were the newspapers of the farmers, the gentry and those in the professions. Their columns are full of accounts of balls, hunt meetings, shooting parties, Magistrates Court proceedings, and profuse praise of local gestures of aristocratic 'munificence'. Towards the end of the century the content became more functional, with reports of the deliberations of the local Poor Law Guardians and the Rural District Council but the heavy coating of Victorian morality remained. Local markets were reported in greatly varying detail, and individual newspapers fluctuate in the quality of their coverage from decade to decade. A common feature throughout, however, was the weekly list of prices current in the London markets for grains, provisions, groceries and meat at Mark Lane, Leadenhall and elsewhere. The Bristol cattle, corn and general markets, and those of Bradford (wool), and Liverpool also appeared fairly regularly, most notably in the north Devon press, a reflection of the importance of external markets for local agricultural produce.

Most of these are held in the British Museum Newspaper Library at Colindale but those marked 'E' in the list below were consulted at the Devon and Exeter Institution Library, Cathedral Close, Exeter. The Exeter Flying Post at the Westcountry Studies Library at Exeter is fully indexed for the period up to 1885. The market reports supplied most price quotations for bread, wheat, flour, bacon, mutton, butter, cheese, potatoes and eggs.

County and North Devon Advertiser, 1836-45	Western Morning News, 1862-4
Bideford Weekly Gazette, 1880	Exeter and Plymouth Gazette E
Barnstaple and Bideford Times, 1855	Western Times, 1890-1904 E
Barnstaple Times, and Bideford and North Devon Chronicle, 1859	
Devonport Independant and Plymouth and Stonehouse Gazette, 1858-9	
Devonport Telegraph and Plymouth Chronicle, 1860-4	
Kingsbridge Gazette, 1857-64, 1873, 1880-5, 1900-5	
North Devon Journal, 1856-64, 1873, 1880-8, 1900-5	
South Devon Advertiser and Agricultural Times, 1880	
South Molton Gazette, and Devon and Somerset Chronicle, 1880	
Tavistock Gazette, 1858-64, 1880-4	Devonshire Chronicle, 1835-40 E
Tiverton Gazette and East Devon Herald, 1858, 1881-5, 1900-5	
Torquay and Torr Directory and General Advertiser, 1858	
Western Weekly News, 1880-5, 1900-5	Devon Weekly Times, 1887-9 E
Weekly Mercury [Plymouth], 1880-5, 1902	Western Daily Mercury, 1902-8
Exeter Flying Post, 1830-86, 1911-4	E

B) POOR LAW UNION MINUTE BOOKS

It was thought possible that tabulated local price information could have been among the many items of information sent by individual P.L.U.s to the Poor Law Board and the Local Government Board on a regular basis throughout the period, but an inspection of a sample of the relevant volumes at the P.R.O. (MH 12) found that the correspondence was concerned almost wholly with sanitation, health, education, rates and the appointment of Guardians. For price data it was necessary to turn to the Union Minute Books at local level.

Although surviving on a somewhat more systematic basis than newspaper market reports, their coverage of the Victorian period is far from complete. The volumes used are those which cover the same short periods of time for which it was possible to obtain the widest possible coverage of markets in the press: 1858-64, 1880-5, 1900-5, and also those few in which detailed lists of accepted tenders were recorded in the late 1830s. All are held at the Devon Record Office. They were the main sources for milk, sugar, tea, salt, soap, coal and clothing prices.

Exeter: Court Books of the Corporation of the Poor, Vols 19-22 (1840-57)
 Minute Books of the Court of the Corp. Poor, Vols 1-22 (1857-1914)
 Totnes, Vol 2 (1838-40), 11-13 (1858-64), 20-2 (1880-5), 29-30 (1900-5)
 Okehampton, Vol 4 (1838-40), 15-17 (1858-64), 24-6 (1880-5), 32-3 (1900-5)
 Barnstaple, Vols 2 (1858-9), 7-8 (1880-5), 22-5 (1901-5)
 Plympton St. Mary, Vol 1 (1838-9), 7-9 (1858-64), 10 (1880-5), 14-5 (1900-5)

Torrington, Vol 2 (1838-40), 6-8 (1858-64), 11-2 (1880-5), 16-7 (1900-5)
Crediton, Vol 3 (1838-41), 11-2 (1858-64), 21-2 (1880-5), 30-1 (1900-5)
St.Thomas, Vols 2, 8, 13, 18; Axminster, Vols 2, 9, 13, 19
Holsworthy, Vols 1 (1837-9), 2-3 (General Ledgers 1890s)

Markets monitored in newspapers: 1858-64: Exeter, North Tawton, Barnstaple, Kingsbridge, Totnes, Plymouth, Tavistock, South Molton, Axminster, Bideford, Crediton, Torrington, Holsworthy, Okehampton;
1880-5: Exeter, Barnstaple, Kingsbridge, Totnes, Newton Abbot, Plymouth, Tavistock, South Molton, Tiverton, Honiton, Bideford, Crediton, Torrington, Holsworthy, Okehampton;
1900-5: Exeter, North Tawton, Barnstaple, Kingsbridge, Totnes, Newton Abbot, Plymouth, Tavistock, South Molton, Tiverton, Honiton, Axminster, Crediton, Torrington, Holsworthy, Okehampton, Hatherleigh

C) MISCELLANEOUS SOURCES

These sources are useful for consolidatory purposes and the Parliamentary Papers in particular were useful for tracing the level of house rent, an area which is otherwise sparsely documented.

i) Parliamentary Papers

1843 XII (510) Report on the Employment of women and children in agriculture, p.115
1843 XLV (554) Prices of various articles of consumption, pp.176-9, supplies data for Axminster, Barnstaple, Bideford, Crediton, East Stonehouse [Plymouth], Newton Abbot, Okehampton, Plympton St.Mary, South Molton, Tavistock, St.Thomas, Tiverton, Torrington, Totnes P.L.U.s
1868-9 XIII (4202) Portman's report on Hampshire, Devon and Cornwall to the Report on the Employment of Women, Children and Young Persons in agriculture, pp.106-23
1893-4 XXXV (c6894-II) Royal Commission on Labour: The Agricultural labourer, Report by C.M.Chapman on the Crediton P.L.U., App II, p.254
1908 CVII (Cd3864) Report on Working Class Rents, Housing and living standards, pp. 372-3, [for Plymouth and Devonport]
1913 LXVI (Cd6955) Second Report on Working Class Rents etc., p.683

ii) Churchwardens and other Accounts at the D.R.O. Occasionally useful, but mostly tended not to state the quantities of commodities purchased.

Farway 1857-99, DRO PW1,V
Shobrooke 1800-1929, PW81,V
Stokenham 1828-40, PW1-2,V
Okehampton 1896-7, PW14B,B

Lapford 1786-1843, PW2,V
Winkleigh 1816-1915, PW47,V
Swimbridge 1841-1938, PW2,V

Whitestone Overseers of the Poor 1836-91, P055-6,V
North Lew Overseers 1823-46, P02,V

James Partridge of Nymet Rowland, Household accounts 1817-77, DRO 1107M/E1-3
Prices Current, Devon and Somerset Stores 1911, Westcountry Studies Library
pB/EXE/381.065 DEV

iii) Secondary Sources

S.R.Parsons, 'The standard of living of the working class in the South-west of England during the Industrial Revolution 1750-1850. With special reference to the county of Devon', Exeter M.A. thesis, 1977, passim;
R.Newton, 'Victorian Exeter', Exeter Ph.D thesis, 1966, statistical appendices, Vol 111.
W.H.R.Curtler, 'Agriculture in Devon' I.H.R. VCH Collection Env.440, p.13
W.G.Hoskins, Two Thousand Years in Exeter, (1960), ch.IX.

iv) Miscellaneous sources for rent quotations

Plymouth Corporation Housing of the Working Classes Cttee, Minutes 1903-13, DRO (Plymouth Office) P5/HW2-3
North Devon Journal 23 Oct 1873; Exeter Flying Post 25 Dec 1845, 15 Sept 1880, 25 May 1900, 14 Dec 1907, 25 Oct 1913, 7 Mar 1914; Western Times 26 Mar 1889, 18 Mar 1890, 6 Apr 1900; Devon Weekly Times 20 July 1900
H.R.Haggard, Rural England, (1902), vol.II, pp.175-81

COMMODITY PRICE TRENDS IN DEVON

The price trends of each commodity monitored in Exeter throughout the period formed the basis for interpolating a county average. Both the newspaper market reports and PLU contract price tenders allowed averages to be calculated across a wide number of towns in the years 1842-3, 1858-64, 1880-5 and 1900-5 and this formed the spatial structure for the analysis in chapters 2 and 3. The miscellaneous sources were used to consolidate the trends thus derived. It should be remembered that beneath these county averages lay a diversity and local independence that in some cases remained throughout the period, although it is unlikely that local prices would have differed significantly from the major cycles and trends. The commodities were documented with the following number of individual price quotations:

Bread:	397	Potatoes:	229	Sugar:	202	Soap:	224	Rent:	138
Flour:	184	Butter:	281	Milk:	100	Candles:	123	Eggs:	80
Mutton:	391	Coal:	247	Salt:	150	Clothes:	182		
Bacon:	200	Tea:	198	Cheese:	41	Shoes:	208		

GUIDE TO TABLE A4.1 (overleaf):

Column	Commodity	Unit	Price (1840)	Column	Commodity	Unit	Price (1840)
1	Bread	4lb.	7d.	11	Salt	cwt	2.65s.
2	Flour	280lb.	45s.	12	Eggs	dozen	8.5d
3	Mutton	11b.	6d.	13	Coal	ton	24.5s.
4	Bacon	11b.	8d.	14	Candles	11b	6.25d.
5	Potatoes	20lb.	6d.	15	Soap	11b	5.6d.
6	Butter	11b.	12d.	16.	Clothes	-	-
7	Cheese	11b.	3.5d.	17	Shoes	-	-
8	Tea	11b.	3.6s.	18	Rural Rent	-	-
9	Milk	1qt.	1d.	19	Urban Rent	-	-
10	Sugar	11b.	6d.				

TABLE A4.1. COMMODITY PRICE INDICES IN DEVON 1840-1913

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1840	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1841	102.8	111.1	100.0	100.0	86.6	96.7	114.3	105.5	100.0	96.7	103.8	107.7	95.2	92.0	98.1	100.0	98.7	100.0	100.3
1842	86.4	82.2	95.8	100.0	90.0	95.3	116.3	116.2	100.0	96.7	107.7	114.3	88.4	98.7	98.1	98.1	94.8	100.0	100.6
1843	83.6	83.3	83.3	100.0	90.0	95.3	116.3	116.0	100.0	96.7	103.8	104.0	88.2	80.0	94.4	100.0	94.8	100.0	101.0
1844	85.7	77.8	83.3	100.0	103.3	93.3	114.3	111.1	100.0	96.7	100.0	100.0	93.9	78.7	87.0	100.0	94.8	102.0	101.3
1845	97.1	100.0	100.0	100.0	143.3	93.3	114.3	106.1	100.0	93.3	92.3	114.3	84.7	78.7	83.2	101.9	94.8	103.0	101.6
1846	100.0	104.4	108.3	100.0	213.3	96.7	120.0	101.6	100.0	93.3	84.6	137.1	77.6	104.0	94.4	98.1	94.8	104.0	102.0
1847	102.8	91.1	108.3	100.0	133.3	100.0	105.7	97.2	100.0	67.8	76.9	141.6	92.2	94.0	94.4	98.1	94.8	105.0	102.3
1848	89.3	90.0	108.3	97.5	233.3	93.3	85.7	99.4	100.0	70.5	76.9	130.7	83.5	86.7	88.0	99.1	94.8	106.0	102.6
1849	78.6	61.1	87.5	80.0	123.3	86.7	85.7	97.2	100.0	75.0	76.9	106.3	80.0	76.0	80.6	98.1	94.8	107.0	103.0
1850	78.6	62.2	91.7	80.0	110.0	78.3	85.7	95.0	100.0	72.3	76.9	113.4	75.2	75.4	75.9	96.0	94.8	108.0	103.4
1851	81.4	57.8	87.5	77.5	100.0	81.7	100.0	99.4	100.0	69.7	76.9	113.4	70.4	74.5	75.9	92.3	94.8	110.0	104.8
1852	85.7	70.0	91.7	80.0	200.0	76.7	100.0	96.1	100.0	60.7	67.3	113.4	69.4	80.0	75.9	92.3	94.8	111.0	106.2
1853	94.3	115.5	108.3	107.5	150.0	93.3	166.7	95.0	100.0	64.3	76.9	100.0	89.5	102.1	72.2	84.6	90.0	113.0	107.6
1854	117.1	102.2	108.3	112.5	150.0	86.7	128.6	85.5	100.0	65.2	83.5	130.7	107.8	124.0	74.1	78.8	83.7	115.0	109.0
1855	111.7	127.8	108.3	107.5	150.0	110.0	128.6	92.5	100.0	76.0	70.4	130.7	105.4	115.2	74.1	71.1	83.7	117.0	110.0
1856	107.1	108.9	108.3	107.5	133.5	103.3	142.9	81.1	100.0	82.2	68.8	141.6	100.7	101.3	68.5	76.9	84.2	118.0	111.5
1857	91.7	86.7	104.2	107.5	150.0	113.3	142.9	81.1	100.0	98.2	67.3	121.4	87.7	114.1	72.7	81.5	94.8	119.0	112.7
1858	83.3	64.4	106.7	106.3	127.5	108.3	142.9	80.0	100.0	77.7	63.5	141.6	82.9	108.0	67.6	82.7	94.8	120.0	114.0
1859	80.0	67.8	109.3	93.8	131.8	109.0	142.9	85.5	100.0	75.0	60.8	170.1	82.3	107.0	67.4	90.4	96.7	124.0	115.5
1860	102.8	101.1	111.5	103.9	224.7	119.3	142.9	92.5	100.0	80.3	65.4	154.5	79.2	108.0	71.3	96.2	97.5	126.0	117.0
1861	106.1	92.2	112.5	112.5	148.2	116.2	142.9	90.3	100.0	73.2	67.3	141.6	79.0	112.0	68.5	101.9	97.5	128.0	118.2
1862	107.3	80.0	111.0	96.1	167.8	102.8	142.9	85.5	100.0	71.5	67.3	141.6	84.6	96.0	65.7	119.2	97.5	130.0	120.7
1863	86.0	64.4	111.8	87.5	149.8	100.0	142.9	78.6	100.0	67.8	60.8	141.6	80.6	88.0	60.2	148.1	97.5	130.0	121.8
1864	76.1	58.1	124.3	86.9	102.3	125.0	140.0	67.2	100.0	75.8	57.7	141.6	87.7	85.3	59.7	173.1	97.5	131.0	122.9
1865	77.1	70.0	130.0	87.5	150.0	123.3	137.9	60.3	100.0	63.3	57.7	141.6	92.5	88.0	61.2	169.2	82.9	132.0	124.0
1866	91.4	94.4	133.3	90.0	123.3	129.2	130.0	53.3	100.0	63.3	57.7	130.8	93.9	94.4	61.2	165.4	88.2	132.0	125.0
1867	107.1	118.9	125.0	90.0	183.3	106.7	124.0	55.5	100.0	60.5	57.7	141.6	93.9	85.3	57.9	150.0	88.2	133.0	126.0
1868	114.3	77.8	116.7	87.5	193.3	120.0	114.3	55.5	100.0	64.3	65.4	154.6	91.5	89.6	57.9	123.1	88.2	133.0	127.0
1869	91.4	70.6	125.0	90.0	186.7	136.7	108.6	55.5	100.0	67.8	57.7	130.8	87.4	89.6	57.9	124.1	88.2	135.0	128.0
1870	87.1	75.0	129.2	90.0	183.3	153.3	102.8	53.3	100.0	59.8	57.7	141.6	87.4	86.7	56.5	127.3	94.8	136.0	129.0
1871	98.6	90.0	150.0	92.5	183.3	110.0	97.1	53.3	100.0	55.3	57.7	141.6	88.4	86.7	54.5	115.4	96.1	139.0	130.0
1872	103.6	97.2	150.0	97.5	180.0	114.2	88.6	52.8	100.0	57.7	67.3	170.1	97.9	90.6	58.2	120.0	104.2	142.0	131.0
1873	117.1	101.1	150.0	99.0	177.5	115.8	91.4	50.0	100.0	50.8	96.2	178.9	110.2	85.3	57.9	121.2	112.6	144.0	132.2
1874	100.0	70.0	141.7	96.9	133.3	140.0	94.3	50.0	100.0	42.3	88.5	154.6	109.8	82.7	51.7	119.2	114.5	146.0	133.4
1875	94.3	75.5	141.7	95.0	190.0	136.7	97.1	47.2	100.0	40.2	73.8	170.1	105.3	84.8	52.8	125.0	114.5	148.0	134.6

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1876	98.6	73.3	145.8	92.5	176.7	136.7	100.0	48.6	100.0	40.2	73.8	200.0	90.0	90.6	49.5	125.0	102.7	149.0	135.8
1877	92.9	98.9	150.0	90.0	246.7	123.3	102.8	50.8	100.0	49.2	73.8	154.6	84.1	85.3	47.2	123.1	101.4	150.0	136.8
1878	89.3	66.7	150.0	88.8	233.3	116.7	105.7	48.6	100.0	51.8	60.7	147.9	77.6	80.0	45.2	115.4	102.7	150.0	137.9
1879	92.9	77.8	150.0	86.3	233.3	130.0	108.6	46.1	100.0	48.7	67.3	154.6	75.9	77.3	42.6	107.7	98.7	150.0	138.5
1880	88.6	70.0	151.3	84.4	165.8	143.1	111.4	45.3	100.0	53.5	65.4	212.3	73.1	78.7	42.6	101.5	98.1	150.0	139.5
1881	98.1	84.0	149.5	87.5	153.0	133.1	114.3	43.9	100.0	54.0	71.5	170.1	69.7	80.0	45.2	109.6	102.7	150.0	140.0
1882	90.4	72.0	146.8	90.0	249.8	134.9	114.3	46.1	100.0	50.0	67.3	212.3	70.1	84.0	48.9	107.7	102.7	150.0	141.5
1883	87.6	67.8	152.2	70.0	152.0	131.6	114.3	45.5	100.0	50.0	67.3	212.3	72.1	85.3	49.1	117.3	102.7	150.0	143.0
1884	70.0	57.1	135.5	61.3	134.0	134.8	114.3	46.1	95.0	44.2	57.7	242.7	70.1	81.3	49.2	119.2	102.7	150.0	144.5
1885	71.4	50.4	123.0	62.5	163.0	128.0	114.3	44.4	90.0	36.3	63.8	242.7	73.5	80.0	39.6	115.4	102.7	150.0	145.8
1886	72.8	55.0	118.3	53.8	163.3	96.7	114.3	44.4	90.0	31.7	63.1	170.1	72.1	80.0	34.7	105.8	102.7	150.0	147.0
1887	77.1	52.2	111.7	53.8	216.7	116.7	114.3	41.7	90.0	29.7	59.6	161.8	73.5	80.0	31.9	115.4	102.7	150.0	148.0
1888	85.7	64.4	106.7	53.8	140.0	113.3	114.3	41.7	90.0	34.0	57.7	170.1	72.9	80.0	34.1	115.4	90.8	150.0	149.0
1889	77.1	55.6	113.3	53.8	160.0	120.0	114.3	42.8	90.0	34.8	99.2	189.0	76.2	80.0	37.5	107.7	90.8	150.0	150.5
1890	78.6	57.2	116.7	53.8	173.3	113.3	114.3	41.7	90.0	33.0	110.8	178.9	83.2	80.0	35.6	107.7	88.5	150.0	152.0
1891	96.9	68.9	113.3	53.8	173.3	116.7	114.3	40.6	90.0	35.3	88.5	170.1	87.1	80.0	36.6	105.8	86.9	150.0	153.6
1892	73.1	51.1	106.7	71.3	120.0	126.7	114.3	34.2	90.0	32.3	67.3	154.6	84.1	80.0	38.9	105.8	86.9	150.0	155.2
1893	71.4	46.7	100.0	76.3	150.0	130.8	114.3	32.5	90.0	34.7	71.2	154.6	84.1	76.8	39.8	103.8	86.9	150.0	156.3
1894	62.9	38.3	103.3	63.8	166.7	93.3	114.3	31.4	90.0	31.0	67.3	130.7	81.2	75.2	35.3	103.8	86.9	150.0	157.4
1895	62.9	43.3	100.0	62.5	166.7	100.0	114.3	30.0	90.0	24.2	73.8	189.0	78.2	73.6	36.6	103.8	86.9	150.0	158.5
1896	65.7	48.9	96.7	61.3	166.7	90.0	114.3	32.5	90.0	28.3	60.0	200.0	75.8	72.0	33.9	103.8	86.9	150.0	159.6
1897	74.3	67.8	106.7	61.3	150.0	96.7	114.3	30.7	90.0	23.5	60.8	141.6	73.9	68.0	29.2	101.9	86.9	150.0	160.7
1898	78.6	58.9	103.3	61.3	133.3	106.7	114.3	27.8	90.0	25.7	57.7	154.6	74.2	64.0	29.2	101.9	86.9	150.0	161.8
1899	77.1	48.9	110.0	60.0	116.7	119.2	114.3	29.7	90.0	27.3	63.8	189.0	82.0	64.0	29.4	100.0	86.9	150.0	163.0
1900	71.7	51.8	104.0	60.0	148.8	131.4	114.3	34.7	90.0	27.5	82.3	189.0	110.2	62.4	41.2	100.0	86.9	150.0	164.1
1901	72.9	50.2	103.0	58.8	136.3	124.6	114.3	32.5	90.0	27.8	83.1	169.8	95.2	59.2	43.3	100.0	85.3	150.0	165.2
1902	69.7	50.7	101.5	62.5	157.0	107.3	114.3	32.5	90.0	24.8	76.9	161.8	85.5	56.0	39.4	100.0	83.7	150.0	166.3
1903	73.1	51.1	104.7	65.0	182.8	117.0	114.3	31.4	90.0	28.3	76.9	165.8	84.6	56.0	39.8	98.1	82.1	151.0	167.4
1904	77.1	53.3	100.8	61.5	186.7	107.9	114.3	32.2	90.0	28.8	74.2	189.0	82.6	56.0	37.4	97.1	83.7	152.0	168.6
1905	72.3	53.1	105.5	62.5	160.0	116.3	114.3	30.0	90.0	33.7	67.3	148.0	80.7	56.0	36.1	95.1	85.3	153.0	169.8
1906	65.7	47.8	103.3	63.8	161.7	116.7	114.3	26.7	90.0	29.8	60.8	154.6	83.3	56.0	36.7	92.3	87.7	154.0	171.0
1907	71.4	53.3	103.3	65.0	163.3	116.7	117.1	28.9	90.0	30.5	80.0	149.5	101.2	56.0	42.2	93.0	89.3	155.0	172.0
1908	74.3	57.8	103.3	63.8	166.7	120.8	120.0	28.9	90.0	30.0	73.8	141.6	100.7	56.0	39.4	94.0	90.8	155.0	172.0
1909	74.3	63.3	100.0	60.0	173.3	120.0	122.9	32.5	90.0	27.8	73.8	141.6	92.2	56.0	38.1	95.0	93.2	156.0	172.1
1910	75.7	57.8	96.7	71.3	176.7	123.3	122.9	32.5	90.0	34.8	73.8	143.4	95.6	56.0	43.1	96.0	94.8	157.0	172.1
1911	72.9	55.8	91.7	65.0	183.3	123.3	125.7	30.0	90.0	28.3	70.0	212.3	93.9	56.0	43.8	97.0	94.8	158.0	172.2
1912	78.6	60.0	96.7	65.0	241.7	125.0	128.6	32.5	90.0	35.2	76.9	243.3	107.5	56.0	46.3	98.0	94.8	159.0	172.3
1913	78.6	60.0	100.0	75.5	241.7	120.8	128.6	32.5	90.0	27.8	76.9	243.3	109.5	56.0	44.4	99.0	94.8	160.0	172.4

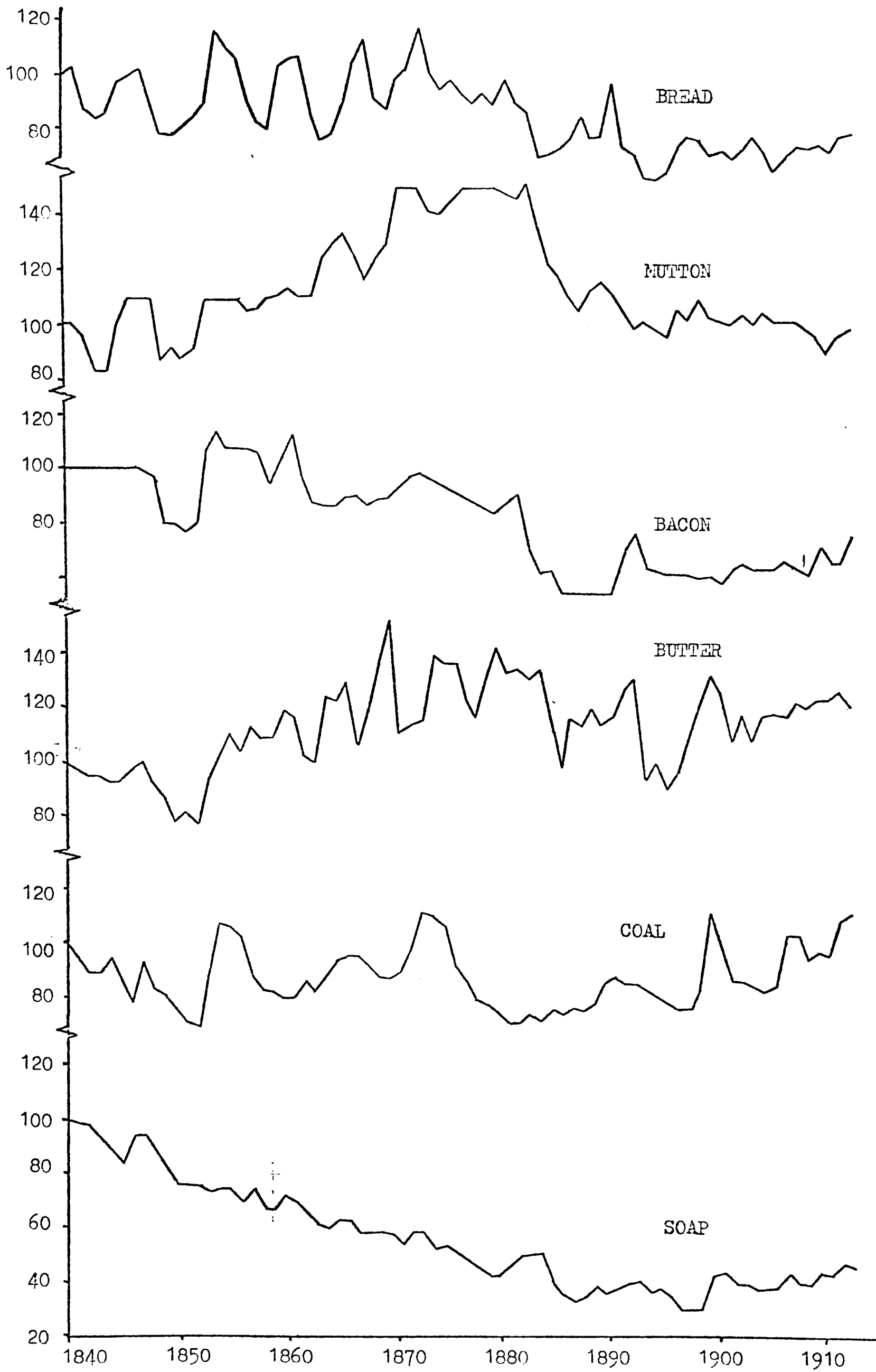


Fig. A4.1. Commodity price trends in Devon (1840 = 100)

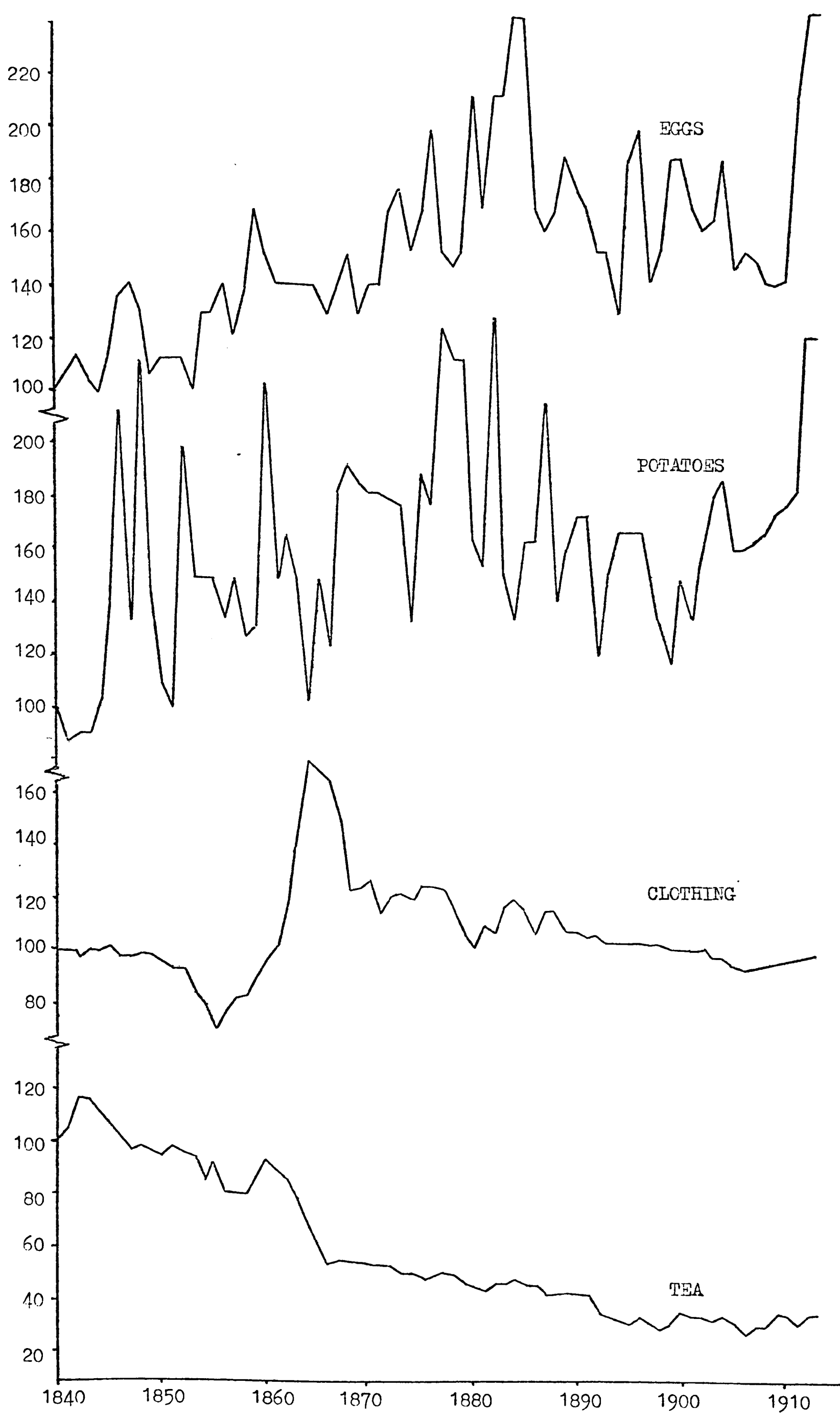


Fig. A1.1 continued

Coverage of commodities through time may be comprehensive in Table A4.1 but the somewhat arbitrary series of figures used for some items, such as cheese, milk, shoes, and rent, shows that the cost of living survey is far from perfect. Much of the interpolation is artificial for want of more individual price quotations, and this is particularly the case with rent, but it is doubtful whether the addition of more material would alter more than the detail of the long term trends portrayed.

Bread is better documented than other items. It was less important an item of purchase than it was an item of consumption because of the widespread practice of baking at home, or communally in the baker's oven. Flour prices are therefore included as a separate series in the cost of living index although the trends are little different to those of bread. The price of sacks of 'seconds' flour was reported from Exeter market throughout the period, but the Market Inspectors apparently only showed an interest in bread prices in and just after the dearth year of 1847, and so for most of the period the Exeter bread price used is that paid by the Corporation of the Poor. But it was possible to use other material to scale this up to a retail equivalent and to establish that the short term trends were virtually identical to those shown by available retail time series.¹ The most striking feature of the trends shown in Fig.A4.1 is the dampening of the strong five to seven year cycles between the first half of period and the 1890s. It is probably no coincidence that this came in the wake of a marked fall in the underlying trend of prices, for both features are to be associated with the rise of large scale trans-Atlantic grain shipments and the growth of 'factory' milling -exogenous benefits to the county's standard of living.

Potatoes showed no such tendency towards a downward shift in trend prices, and short term fluctuations were much greater than for flour and

¹For example, the price of bread in the Plymouth Co-op, 1888-1902: PP 1903 LXVIII (321), p.227

bread. Prices were invariably quoted in market reports but the unit of measurement varied more than for any other product. However, it was possible to relate stones, strikes, scores, bags and gallons of potatoes to a common standard quantity, although it is impossible to eliminate the residual extent by which the annual fluctuations are affected by physical variations in the weight of potatoes when represented by volume measures such as the peck or gallon. If the evidence of one farmer's sales are anything to go by it would seem that fluctuations occurred more in the retail than the wholesale market.¹ With many consumers also being producers, on allotments, it is conceivable that in years when the domestic 'crop' failed, it was the additional pressure on marketed potatoes which drove prices to great heights.

As far as meat is concerned, prices were collected for bacon and mutton, referred to as 'butcher's meat' by the Exeter Corporation. Bacon was consistently more expensive in the first half of the period but where pigs were kept as part of the domestic economy their meat could be cheaper than that of sheep. It was calculated in 1892 that bacon from a labourer's own pig 'cost' 5.5d per pound whereas Crediton butchers were selling it for 7d per pound.² The impact of imports on prices is fairly clear from the trends depicted in Fig.A4.1, and butter may also be mentioned here.

In contrast to the meat and dairy products, groceries fell in price over most of the period after 1840, and there was very little variation in actual prices around the county at any one time, possibly because they were not produced and consumed within small localities, and had relatively high value-bulk ratios in transport. Although P.L.U. contract prices were the only source of price data for tea and sugar there seems little reason to be sceptical of the smoothness of the trends depicted in Fig.A4.1 and these stand in marked contrast to the sharp annual fluctuations displayed by

¹Reported by R.H.Rew in his report on North Devon to the Royal Comm. on the Depression in Agriculture PP 1895 XVI (c7728), p.10

²C.M.Chapman, Report on Crediton Union to the R.C.Labour, PP 1893-4 (c6894-II), p.252

locally produced eggs and potatoes. Coal prices also changed less from year to year than these basic foodstuffs, although there were distinct peaks in 1854, 1873 and 1900.

Clothing and shoes are often left out of cost of living indices for want of information, and that which can be found among the lists of workhouse supply prices in Devon is difficult to assimilate into a coherent series as the garments and materials bought varied so much from time to time. This problem is not as acute for footwear, as a number of P.L.U.s bought a standard range of shoes and boots throughout the period. Mens' nailed boots are used as the basis for the index in Table A4.1. It was hoped to include a value for made up suits in the clothes index, so as to reflect the cost of finished clothes, but the contract tenders can only feasibly be used to combine corduroy cloth and calico for any length of time. These materials did seem to follow the traceable short term cloth price trends tolerably well, and highlight the effects of the 1860s 'cotton famine'. It seems, however, that by the Edwardian period finished suits were substantially more expensive vis-a-vis cloth than they had been as late as the 1870s, which may reflect the difficulty of increasing productivity in the labour intensive clothing industry.

For other manufactured goods there were not even the partial time series of information available for clothing and footwear. It is, however, worth noting here that there may have been a drastic fall in the local prices of finished iron goods in the late 19th century if bedsteads are anything to go by. The Exeter Corporation of the Poor bought them for 25s. in 1842 and 24s. in 1874, but basic bedsteads were on sale in the Devon and Somerset Stores in Exeter for only 9s.11d. in 1911.¹ Biases due to quality variations are likely to have underestimated the true price fall, as bedsteads bought for a workhouse were unlikely to have been of a better standard than those on sale in a department store.

¹D.R.O. ECA, Court Book 19, Minute Book No.7; pB/EXE/381.065 DEV

The largest remaining item of expenditure was housing. There are no systematic series of figures which allow the construction of comprehensive indices for urban and rural rents, so one of the difficulties here was to maintain a standard unit quality. What is clear is that there was a greater -and rising- rent differential between town and country than there was for the price of any other commodity. As late as the turn of the century it was being stated that only one or two shillings rent per week could be commanded for rural cottages. This was hardly greater than the rents reported by Portman to the Commission on the employment of women in agriculture.¹

However, a larger number of references to varying standards of urban accomodation shows that there was a significant rise in rents in the towns, and they seem to have been at nearly double their mid 19th century level by the outbreak of World War One. Housing problems were most acute in rapidly growing Plymouth. The cheapest accomodation to be had from the Corporation cost 4s. per week, and according to Parliamentary enquiries of 1905 and 1912 this would normally purchase just two rooms in a sub-let house.² The 1912 report goes on to say that

'housing conditions in Plymouth and Devonport, while differing from those obtaining in most English towns, present some features similar to those found in Central London and Dublin. The majority of working class people occupy parts of large houses of from 6 to 12 rooms, which have been subdivided into tenements containing one to three rooms. As these houses were not originally intended for the occupation of more than one family, the result is that the sanitary convenience and wash-house accomodation is shared by all the tenants. Built as a rule in rows, three stories in height, the houses are entered direct from the pavement. Many of the rooms on the "drawing room" (first) floor are of considerable size, and command a much higher rent than so called "tenement" rooms, which, being situated over the scullery in a back addition, are frequently small. In many cases only a small paved yard is provided at the rear'³

The existence of conditions such as these suggest that the urban rent index may underestimate the true rise, given the increasing importance of Plymouth in the urban total. It must be remembered, however, that there was

¹Haggard, Rural England, Vol.II, p.181; PP 1868-9 XIII (4202)

²DRO (P), P5/HW2-3; PP 1908 CVII (Cd3864), pp.372-3, PP 1913 LXVI, p.682

³PP 1913 LXVI (Cd6955), p.682

a greater rate element in the total by the end of the period. As this represents the availability of municipal services, it effectively inflates the quality standard of the housing rented.

COMPOSITE PRICE INDICES, 1840-1913

The sources used to compile regional budgets are listed under Table A4.2. Some of the most useful evidence is provided by Dr. Edward Smith, the Medical Officer of the Privy Council, who reported on 'The food of the poor labouring classes in England' in 1863. He collected budgets from several labourers' families in Devon, which show the expected dominance of bread among the foodstuffs consumed -12.25 lb. per adult per week- but potato consumption was surprisingly low, at 2.8 lb of potatoes per adult per week.¹ The survey was undertaken in late spring and summer when potatoes were scarce and more bread was likely to be eaten, and it seems that the usual practice was to grow rather than to buy them anyway: 'when potatoes must be purchased there is a universal belief that they are a dearer article of food than bread'.²

The time of the year also explains why, at 3 lb. per head, more green vegetables were consumed than potatoes. Cheese consumption was negligible, but the 0.73 lb. of meat was little different to the 0.88 lb suggested as the adult weekly consumption by Parsons in his standard of living survey, based on Eden's dietary surveys made sixty or seventy years earlier.³ Parsons used a daily dietary for a family of four of a quartern loaf of bread (4lb.5oz), 1lb. of cheese, 3lb. of potatoes and half a pound of the cheapest available meat to compile his cost of living index for agricultural and road labourers' families.

Allowing for the probable substitution of bread for potatoes in Smith's survey, the imputed levels of 7lb. of bread and 5.25lb. of potatoes per person per week in the dietary used by Parsons are perhaps not too

¹PP 1864 XXVIII (3416) 6th Report of the Medical Officer of the Privy Council, Appendix 6;

²ibid, p.243;

³Parsons, thesis, pp.9-24, 223.

dissimilar from the 1863 survey results. The latter also suggest that small quantities of milk (2.9 pints per head per week), tea (0.33oz.), sugar (1oz.), and butter (0.13lb) were consumed, whereas the previous figures omit reference to these commodities. Rent accounted for 12% of outgoings in the labouring households surveyed by Smith, a similar figure to the 11.2% calculated from the aggregate of 8 labouring families' budgets in the Crediton area in 1892.¹ The classification of individual items in these budgets from 1892 does not lend itself to a detailed breakdown of expenditure on each commodity, but it can show the proportions of outgoings devoted to certain types of food. Bread accounted for 33.5% of the weekly expenditure of Crediton labourers in 1892, and meat for a surprisingly high 24.9%. If the physical quantities of 1863 are multiplied by their approximate price in that year the proportions appear to have been over 50% and 10% respectively, suggesting, on the face of it, a marked improvement in the well being of farm labourers over the intervening 29 years.

Given the distorting elements in the 1863 survey it has been decided to postulate a set of weights for rural labourers -the 'A' weights in Table A4.2 below- that lie closer to the figures suggested by the 1892 survey. The weighting of bread and flour is reduced to allow a percentage to be included for potatoes, which are assumed to be grown rather than bought by the 1892 survey. They are included because the subsequent agricultural wage calculations add a monetary value in lieu of 'privileges' which often included potato ground. The weights are expressed in terms of expenditure proportions rather than physical quantities mainly because for several goods -clothing, for example- one is on safer ground using a price trend, as represented by an index, than attempting to calculate retail prices to use with a set of physical quantity weights. Under the rural A weights, food is assumed to account for 65% of expenditure, bread and flour for 31% alone.

¹pp 1893-4 XXXV (C.6894-II) p.253. With regard to budgets Chapman found 'the Devonshire man to be very chary of giving information on the subject'

Table A4.2. Commodity weights in the Devon cost of living index

	Series A	Series B		Series A	Series B
Bread	0.2	0.17	Salt	0.011	0.01
Flour	0.11	0.06	Eggs	0.015	0.01
Mutton	0.07	0.08	Butter	0.04	0.051
Bacon	0.03	0.07	Soap	0.02	0.013
Potatoes	0.065	0.05	Coal	0.07	0.06
Cheese	0.022	0.024	Candles	0.02	0.02
Milk	0.03	0.04	Clothing	0.08	0.07
Tea	0.035	0.04	Shoes	0.04	0.06
Sugar	0.022	0.032	Rent	0.12	0.14

sources: PP 1864 XXVIII (3416): 6th Report of the Medical Officer of the Privy Council, App. 6;
S.R.Parsons, thesis, pp.9-24;
PP 1893/4 (c6894-II) Royal Commission on Labour, report by C.M.Chapman pp.252-3; Western Times 8 July 1890;
DRO. Court Book Exeter Corp.Poor Vol.19 (1843), Minute Book 2 (1859) p.108
PP 1905 XCVII (Cd2376), Wages and Earnings of Agricultural labourers, App. VIII pp.578-89;
D.J.Oddy, 'Working Class diets in late 19th century Britain' E.H.R. 2nd ser. XXIII (1970)

65% may possibly have been an optimistically low percentage of expenditure to assign to food in this rural budget, but the non-food elements in the index did not experience a long-term secular downswing in prices, with the exception of soap, so the composite index CLII does not overestimate the eventual fall in the price trend.

The 'B' weights, for urban dwellers, vary these arbitrary figures in an attempt to provide an alternative which may more reasonably reflect the experience of workers in the county's towns. There is even less solid data to go on than for rural labourers, but the budget of an Exeter artisan earning 26s. per week in 1890 provides an interesting comparison with the Crediton labourers who earned an average of 13s. per week two years later.

It is not suggested that the A and B weights reflect any average budget for urban and rural wage earners, but since there are 18 different commodities involved, adjustments to individual weights do not significantly alter the resultant cost of living index. For example, it was thought that allocating 12% of the total expenditure of rural wage earning families to clothing and shoes (Table A4.2, 'A' weights) would have seriously

Table A4.3. Examples of relative urban and rural spending patterns

	Exeter artisan Income: 26s/week 1890	8 Farm labourers Av. income: 13s/week 1892
Food:	60.0	74.1
Rent:	15.4	11.2
Clothing:	11.5	2.0
Fuel:	5.8	10.5
All other:	7.3	2.2

sources: URBAN: Western Times 8 July 1890;
RURAL: PP 1893-4 XXXV (c6894-II) p.253

overestimated expenditure on these items in rural Devon, but when the rural cost of living index was recalculated with clothing and shoes expenditure halved to 6% of the total, the effect was negligible.

A more intractable problem is posed by the significant changes which must have taken place in consumption patterns during the long period between 1840 and 1913, such as the rise of processed food.¹ Whether there is any justification for using two parallel fixed sets of weights to cover a period as long as this is bound up with the purely statistical problems associated with weighting exercises, and is discussed after setting out the composite indices themselves (see Table A4.4).

In Table A4.4 each index is set at 100 in 1840. Fig. A4.2, shows the course of CLI1 and CLI3 over the ensuing 73 year period; the inclusion of CLI2 would have unduly crowded the graph. In Fig.A4.3 the rural index CLI1 is compared with the price of bread alone, which has on occasion been used as a proxy for overall price changes. While the overall price series reflects the cyclical variation in the price of bread, the general upwards secular trend between 1850 and 1875 is accounted for by commodities other than bread.

¹W.H.Fraser, The Coming of the Mass Market, (1981), p.38

TABLE A4.4. COMPOSITE PRICE INDICES IN DEVON, 1840-1913

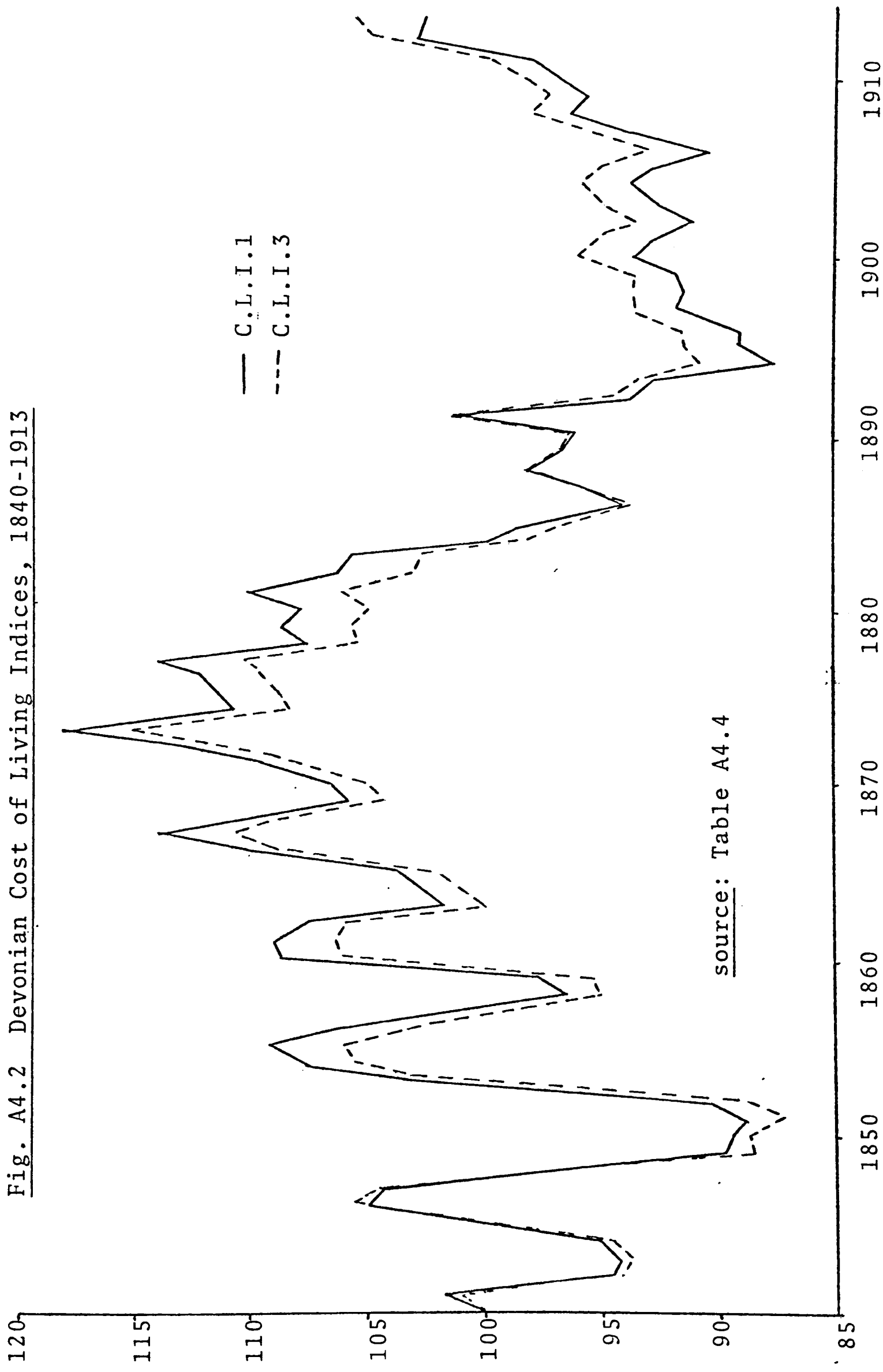
	CLI 1	CLI 2	CLI 3		CLI 1	CLI 2	CLI 3
1840	100.0	100.0	100.0	1877	114.0	112.4	110.4
1841	101.7	101.8	101.3	1878	107.8	106.3	105.3
1842	94.6	94.7	94.4	1879	108.9	107.5	105.8
1843	94.0	94.1	93.7	1880	108.1	106.8	105.0
1844	95.0	95.0	94.5	1881	110.1	108.9	106.2
1845	100.9	100.8	100.7	1882	106.5	105.5	103.2
1846	105.0	104.7	105.7	1883	106.0	105.1	102.9
1847	104.4	104.0	104.6	1884	100.1	99.5	98.3
1848	99.6	99.2	99.0	1885	97.5	97.0	96.4
1849	89.6	89.2	88.6	1886	94.1	93.8	94.1
1850	89.4	89.5	88.8	1887	96.0	96.6	96.7
1851	88.9	88.2	87.0	1888	98.3	98.2	98.4
1852	90.7	90.1	88.9	1889	97.0	97.0	97.4
1853	103.8	103.1	102.1	1890	96.4	96.6	96.7
1854	107.9	107.1	105.7	1891	101.1	101.5	101.2
1855	109.3	108.5	106.2	1892	94.0	94.6	94.5
1856	105.8	105.1	103.1	1893	92.8	93.5	93.7
1857	100.5	99.8	98.6	1894	87.5	88.4	90.9
1858	96.5	95.8	95.2	1895	89.0	90.0	91.4
1859	97.8	96.8	95.4	1896	89.3	90.4	91.6
1860	108.6	107.5	106.1	1897	91.8	93.1	93.6
1861	109.0	107.8	106.5	1898	91.7	93.1	93.7
1862	107.6	106.5	105.3	1899	91.9	93.2	93.7
1863	101.6	100.7	100.0	1900	93.9	95.6	96.2
1864	102.8	101.8	100.9	1901	92.7	94.5	94.8
1865	103.9	102.9	102.1	1902	91.3	93.3	93.6
1866	110.1	109.2	108.3	1903	92.8	94.8	95.0
1867	114.3	113.5	110.8	1904	93.7	95.7	96.0
1868	109.5	108.8	107.8	1905	92.7	94.7	95.2
1869	105.8	105.0	103.9	1906	90.5	92.5	92.8
1870	106.7	105.8	105.2	1907	94.0	96.0	96.1
1871	109.4	108.4	107.1	1908	96.3	98.4	97.9
1872	113.0	111.7	110.4	1909	95.7	97.6	97.4
1873	118.1	116.7	115.2	1910	97.0	99.5	98.6
1874	110.9	109.4	108.4	1911	98.1	99.8	99.8
1875	111.5	109.9	108.8	1912	102.7	104.3	104.7
1876	112.3	110.7	109.4	1913	102.6	104.1	105.7

source: Individual commodity price indices in Table A4.1, deflated by weights shown in Table A4.2.

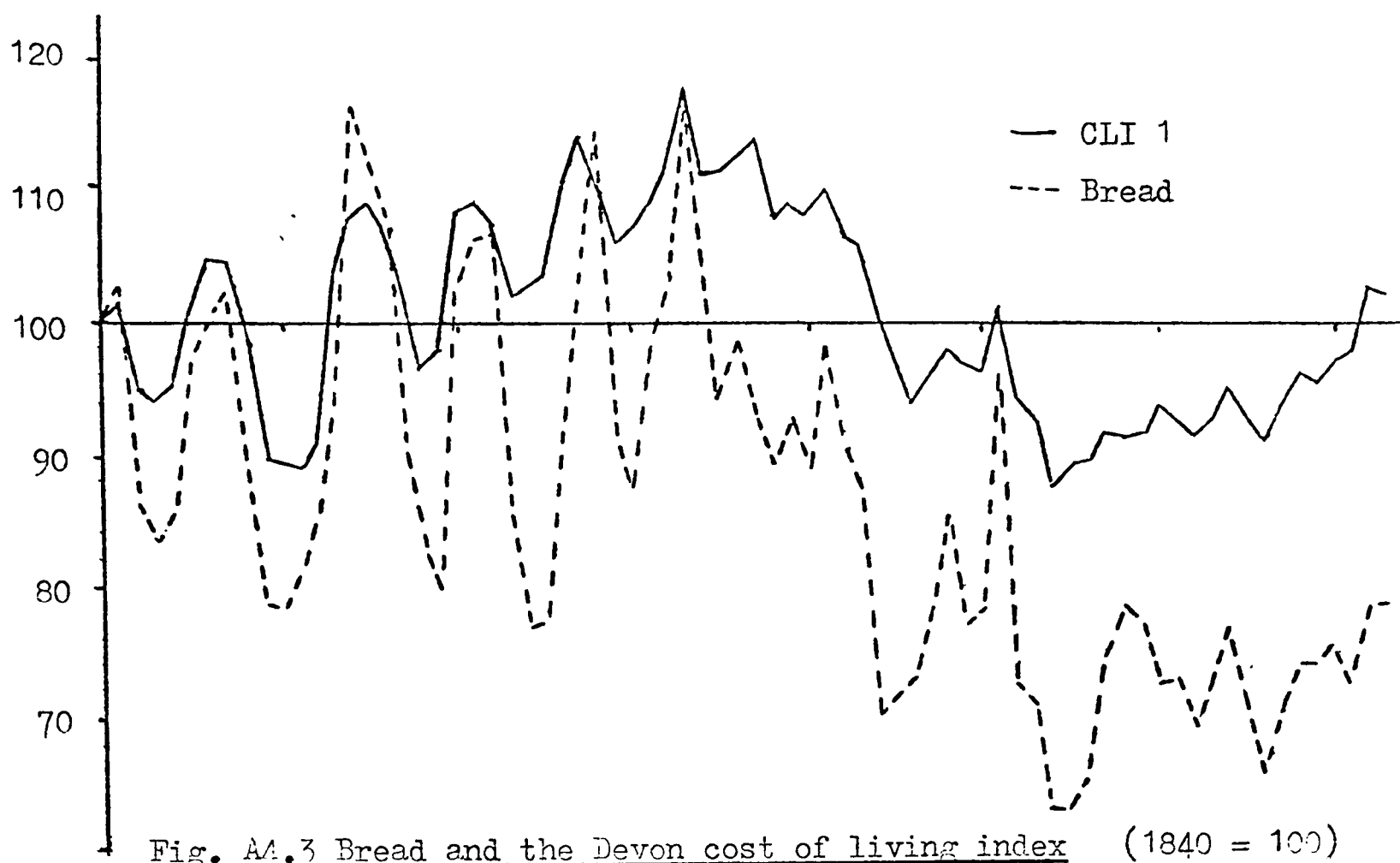
CLI 1: A weights, rural rent
 CLI 2: A weights, urban rent
 CLI 3: B weights, urban rent

Depicted in Fig.A4.2 overleaf

Fig. A4.2 Devonian Cost of Living Indices, 1840-1913



source: Table A4.4



If the series' using 'A' weights are considered alone, the use of the urban, instead of the rural, rent index does not lead to a large gap in the imputed rural and urban price trends. The rural index reaches a peak in 1873 at 118.1 (urban = 114.84), a low point of 86.71 in 1894 (urban = 87.6) and is back up to 102.6 by 1913 (urban = 101.1). However, because the more basic necessities of life rose more rapidly in price during the upswing than other items in the cost of living index, and fell more slowly thereafter, the poorer sections of the community would have faced higher rises in their cost of living, and consequently lower increases in their real wages (which were in any case minimal in the countryside before 1870).

The distortion introduced by using an unchanging set of weights over the long 1840-1913 period must now be considered. Because the prices of the separate commodities did not move in the same direction and since it is rational to have expected consumers to adjust their expenditure patterns in response to relative price changes over a seventy year period, the index based in 1840 -while plotting the changing cost of an unchanging basket of

Table A4.5. Initial and end year based comparative price indices

A) COMPOSITE INDEX COMPARISON:

	1840=100	1913=100	(-re-aligned to 1840=100)
1840:	100.0	121.1	100.0
1873:	118.1	124.6	102.9
1895:	89.0	86.1	71.1
1913:	102.6	100.0	82.6

B) COMMODITY WEIGHT DISTORTION

	1840 = 100	1913	1913 = 100	1840
Bread	0.2	0.153	0.2	0.21
Flour	0.11	0.064	0.11	0.151
Mutton	0.07	0.068	0.07	0.058
Bacon	0.03	0.022	0.03	0.033
Potatoes	0.065	0.136	0.065	0.025
Butter	0.04	0.047	0.04	0.027
Cheese	0.022	0.028	0.022	0.014
Tea	0.035	0.011	0.035	0.089
Milk	0.03	0.026	0.03	0.028
Sugar	0.022	0.006	0.022	0.065
Salt	0.011	0.008	0.011	0.012
Eggs	0.015	0.036	0.015	0.005
Coal	0.07	0.073	0.07	0.053
Candles	0.02	0.011	0.02	0.03
Soap	0.02	0.009	0.02	0.037
Clothing	0.08	0.077	0.08	0.067
Footwear	0.04	0.037	0.04	0.035
Rent	0.12	0.187	0.12	0.062

source: calculated from indices in Table A4.1

commodities- will have become increasingly unrepresentative of what consumers actually bought. To polarise this index number problem a comparison can be made between the index as used until now -based in 1840- and a price index rebased to 1913. The main features of this exercise are shown in Table A4.5. Part A) of the table shows that while the 1840 based index almost returns to 100 by 1913, the 1913 based index (re-aligned to 1840=100 for comparative purposes) reaches only 80.6 in 1913. This divergence takes place because the further one moves away from the base year the greater is the distortion of actual expenditure percentages away from the 'A' weights distribution.

The impact of this is clarified by part B) of Table A4.5. If the basket of goods is such that expenditure proportions in 1840 match those of the 'A' weights then by 1913 the same quantity of bread takes up 15.3% of expenditure, the same quantity of flour 6.4%, the rent of the same standard of housing 18.7%. If 1913 is taken as the base year then in 1840 the same quantity of tea takes up a ridiculously high 8.9% of expenditure, more than bacon, cheese and potatoes put together. Simple arithmetic shows that the 1840 based index overstresses the items which increased in price, and understresses those which fell in price, and thus as a whole overestimates the true trend of price changes, which is characteristic of a Laspeyres index (base year = initial year of period). The 1913 based index (a Paasche index) overstresses the goods like tea, flour and soap which fell rapidly in price, and thus underestimates the true cost of living trend.¹ The most meaningful representation of composite price trends would lie somewhere between the two.

Coupling price elasticity parameters to the year by year prices and the original commodity weights would eliminate undue distortion from the index but would require information that is impossible to assimilate for long periods of the 19th century. An experiment was made with chained indices, with the entire series rebased at 5 year intervals but this involves a somewhat arbitrary selection of rebasing dates; the choice of one year as opposed to the preceding or succeeding year can produce a different cost-of-living index, and tell a quite different story.

It could well be that the safest approach is to attempt a qualitative resolution of the problem by making judgements about the relative accuracy of the initial weights at different dates. If any distortion is to be accepted it should be distortion away from an 1840 rather than a 1913 base because the derived de facto 1840 weights away from a 1913 base indicate too

¹A simple introduction to Paasche and Laspeyres indices is provided by R.G.D.Allen, Index Numbers in Theory and Practice, (1975);

prosperous a structure of construction for the 1840s (see Table A4.5 part B) column 4). If there is any time during this period when price elasticities of demand were low (and thus 'legitimate' budget distortion high) it was likely to have been earlier rather than later, while real wages were still close to subsistence level. It is less risky to underestimate the importance of groceries in 1913 than it is to overestimate them in 1840. On balance, therefore, the most accurate plotting of Devon price trends between 1840 and, say, 1876 -in the middle of the period- would be nearer the 1840 base derived figure (1840 =100, 1876 =112.3), than a figure derived from an 1876 base (where if 1840 =100, 1876 =98.3): maybe at around 108, implying an 1873 peak of 112-3.

From 1873 onwards the 1840 and 1913 based trends match each other more closely: the fall in prices from 1873 to 1913 (using 1840 based weights) was from 100 to 86.9, and using 1913 based weights, from 100 to 80.2. A straightforward compromise estimate between these would suggest a figure of 83.6 in 1913, which, when combined with the figure suggested above of 112 for 1873, produces a 1913 index number of 94.1 when 1840 = 100. Since the original 1840 base derived figure for 1913 was 102.6 (using 'A' weights and rural rent) this revised estimate is 9.2% below the original figure. At relevant points in the real wage analysis the effects of these qualifying factors are studied, but for the sake of clarity the main real wage series use the 1840 based 'A' and 'B' weighted series.

AGRICULTURAL AND RURAL ROAD LABOURERS' WAGES

1) THE SOURCES

Traditionally the poorest paid group of male workers, agricultural labourers are also among the best documented as far as 19th century wages are concerned. A series of Parliamentary enquiries, accounts and reports provide material which yields useful estimates of wage rates throughout the Victorian period, albeit at dates set by the irregular chronology of Parliamentary interest. Much of this data was collected by the local farmers, gentry and clergy, who would probably have tended to overestimate the level of wages paid, and on the rare occasions that labourers were allowed to speak for themselves their claims sometimes differed significantly from those put forward by their masters. Even towards the end of the period, when wage rate information was presented in a more systematic manner by the Board of Trade Labour Department the method of collection at Rural District Council level could still be rudimentary, as the following deliberations at Tiverton in 1904 show:

' LABOURERS' WAGES.

The Board of Trade Labour Dept. wrote enquiring the rate of wages paid to agricultural labourers in the district. In a previous return labourers' wages were put at 11s., and it was suggested that the sum might not be the same now.

The Chairman (Rev. J.Fowler): I don't know whether you think wages are going up?

Voices: They are going up undoubtedly.

Mr.Leach said he did not believe farmers in the district paid as low as 11s. now.

Mr.Palfreman: More like 12s.

The Chairman: I think we ought to say wages are gone up a shilling a week during the past year. My own impression is that they are gone up 1s.6d. per week.

Mr. Trott said carters were paid 13s. per week.

The Chairman: Carters are stated on the return as being paid 13 - 14s. per week.

Mr.Palfreman: They work longer hours than labourers.

The Chairman: Are they getting more than that?

Mr.Westcott: In special cases they are paid more.

Mr.Southey: You cannot get an able bodied labourer for less than half a crown a day in Willand.

The Chairman: I cannot get them at that.

Mr. Leach remarked that he paid a man 15s. per week, but did not provide a cottage as well. It was resolved that the sum of 11s. in the returns be altered to 12s. The figures 13-14s. for carters were allowed to stand.¹

But one of the main purposes of constructing an agricultural wage series for Devon is to enable a comparison to be made with national trends, the figures for which are generally subject to the same reservations. Besides, when Snell constructed agricultural wage series for the South Midlands and East Anglia from settlement examinations -thought to be a fairly accurate source- the constructed levels and trends agreed closely with the series compiled by Bowley from more 'traditional' sources.²

Furthermore, while the official data is subject to reservations it can be supplemented by direct documentary evidence in the form of farm and estate accounts, letters, and other contemporary agricultural surveys, newspaper adverts and reports. This provides a fair amount of information for certain years, but only farm accounts allow the construction of time series. Unfortunately the latter are particularly thin on the ground for Victorian Devon, but a few apparently were available to the statisticians who compiled the Reports on the Wages and Earnings of Agricultural Labourers in 1900 and 1905. These show the weekly wages paid to ordinary agricultural labourers between 1840 and 1904 on seven farms in the south and east of Devon: near Tavistock, Totnes, Newton Abbott, Plympton St. Mary, Broadhempston, Honiton and Payhembury. These series are combined into an unweighted average, which is shown in Table A4.6. The trends on each individual farm are roughly the same as the average for the whole; most importantly, on none of them did actual wage levels fall at any time during this period.

¹ Minutes of Tiverton Rural District Council meeting, Tiverton Gazette and East Devon Herald, 8 Mar 1904.

² Snell, 'Agricultural Seasonal Unemployment', p.418

2) AGRICULTURAL LABOURERS WAGE SERIES

TABLE A4.6. Weekly Earnings on seven Devon farms, 1842-1904

(shillings per week, including privileges)

1842:	9.0	1859:	10.4	1875:	12.43	1890:	14.14
1843:	9.0	1860:	10.5	1876:	12.86	1891:	14.14
1845:	9.0	1861:	10.93	1877:	13.0	1892:	14.14
1846:	10.0	1862:	11.07	1878:	13.0	1893:	14.14
1847:	10.0	1863:	11.21	1879:	13.14	1894:	14.53
1848:	10.0	1864:	11.28	1880:	13.14	1895:	14.53
1849:	10.0	1865:	11.28	1881:	13.14	1896:	14.55
1850:	10.0	1866:	11.43	1882:	13.29	1897:	14.55
1851:	10.0	1867:	11.57	1883:	13.29	1898:	15.21
1852:	10.0	1868:	11.57	1884:	13.29	1899:	15.21
1853:	10.07	1869:	11.57	1885:	13.29	1900:	15.43
1854:	10.24	1870:	11.57	1886:	13.43	1901:	15.64
1855:	10.24	1871:	11.57	1887:	13.43	1902:	15.71
1856:	10.24	1872:	12.0	1888:	13.57	1903:	15.79
1857:	10.24	1873:	12.43	1889:	13.71	1904:	15.86
1858:	10.24	1874:	12.43				

sources: First report by A.Wilson-Fox on the Wages and Earnings of Agricultural Labourers in the U.K. PP 1900 LXXXII (Cd.346), App.VIII, p.251;
Second report by A.Wilson-Fox, PP 1905 XCVII (Cd.2376), App.V, p.565

TABLE A4.7. Estimates of Weekly Earnings, Devon, 1833-1914

wages observations			wages observations			wages observ'ns		
1833	9.37	22	1870	11.04	7	1898	16.3	4
1837-44	9.5	4a	1872	12.69	8	1901	16.83	6
1850	9.83	3a	1880	12.9	4	1902	17.08	15a
1860	11.17	8	1881	14.2	16	1907	17.75	(921)
1861	10.33	9	1894	15.0	3	1913	17.9	4
1868	11.37	15	1895	15.92	8	1914	19.3	16
1869	11.2	4	1896	15.41	11			

Single observations not shown. a: Observations are contemporarily calculated averages. 1907: contemporary average of 921 returns.

sources: i) Parliamentary Papers:

- 1834 XXX (44) Poor Law Comm. Answers to Rural Questions Appendix B, (Part 1),pp.
- 1843 XII (510) Comm. Employment of Women and Children in Agriculture Report on Wiltshire, Dorset, Devon and Somerset, by A.Austin, pp.1-55
- 1861 L (14) Return of Average Rate of Weekly Earnings of Agricultural Labourers, pp.583-637
- 1868/9 XIII (4202) Comm. Employment of Children, Report of the Hon. H.B.Portman on Hampshire, Devon and Cornwall, pp.106-23
- 1868/9 L (371) Return of Average Weekly Earnings, Ag.Labs, pp.643-64
- Similar Returns in 1871 LVI (181) pp.593-623,
- 1873 LIII (358) pp.699-731

1881 XVI (c2778), 1882 XV (c3375) Appendix C (c) II & III, pp.150-7, 167-73
Royal.Comm. Depression in Agriculture: Report of W.Little on Devon, Cornwall, Dorset and Somerset
 1893/4 XXXV (c6894-II) Royal.Comm. Labour, The Agricultural Labourer, Vol.I, Part II, Report of C.M.Chapman on the Crediton Union, pp.241-55
 1894 XVIIii (c7400-II) Royal.Comm. Agriculture, pp.102-12, 1895 XVI (c7728), R.H.Rew's Report on North Devon, pp.1-71;
 1900 LXXXII (Cd346) First Report of A.Wilson-Fox, pp.596, 728-9
 1905 XCVII (Cd2376) Second Report
 1910 XXXIV (Cd5460) Earnings and Hours of Labour Enquiry, V-Agriculture, pp.451-534
 1911 LXXXIX (Cd.5849) Standard Time Rates, p.104
 1914 LXXX (Cd.7080) Wages and Hours of Labour, p.170
 1914/6 LXI (Cd.7635) Wages and Hours of Labour, p.949
 1919 IX (Cmd.25) Wages and Conditions in Agriculture, Report on Devonshire by A.H.D.Cochrane, p.278;

ii) Farm Accounts, Newspapers:

D.R.O. 96M/Box 2/6, Rolle, north Devon Estate, 1865-6
 58/9 Box 33, Kennaway, Widecombe, 1871-2
 Z17/3/32, Chulmleigh, Meeth, Ashwater, 1875;

E.F.P. 10 Jan 1839 p.3, 25 Dec 1845 p.2, 7 Nov 1866, 3 Apr 1867, 10 Jan 1872 p.3, 8 May 1872 p.2, 25 Oct 1913;
Western Times 24 Nov 1871, 11 Jun 1872, 27 Feb 1900, 6 Mar 1900;
Tiverton Gazette 8 Mar 1904;

iii) Contemporary and other Secondary Sources:

Peel Papers B.M.Add.MSS 40536 fo.64, 40587 fo.180, quoted in W.G.Hoskins and H.P.R.Finberg, Devonshire Studies, (1952), p.428
 H.Tanner, 'The farming of Devonshire', Jour.Royal Agric. Society England IX (1848-9), p.491
 E.E.Spender and T.W.P.Isaac, 'The Labourer', Jour.Bath and West of England Society VI (1858), pp.135, 170-2, J.B.W.E.S. II (1854), pp.15-6
 J.Mortimer, 'Agriculture in North Devon' J.B.W.E.S., VIII (1860), pp.94-5
 J.Caird, English Agriculture in 1850/1, (1852), p.55
 F.G.Heath, The English Peasantry, (1874), pp.124-5
 H.R.Haggard, Rural England, (1902), Vol.I, p.188
 W.H.R.Curtler, 'Agriculture' Inst. of Hist. Research VCH Collection (Devon Vol.II), Env.440, p.13
 T.S.Amery, T.D.A. XXXVII (1905), pp.116-7
 A.D.Hall, A Pilgrimage of British Farming, (1913), pp.361, 368

Fig. A4.4 Devon Agricultural Labourers' Weekly Earnings

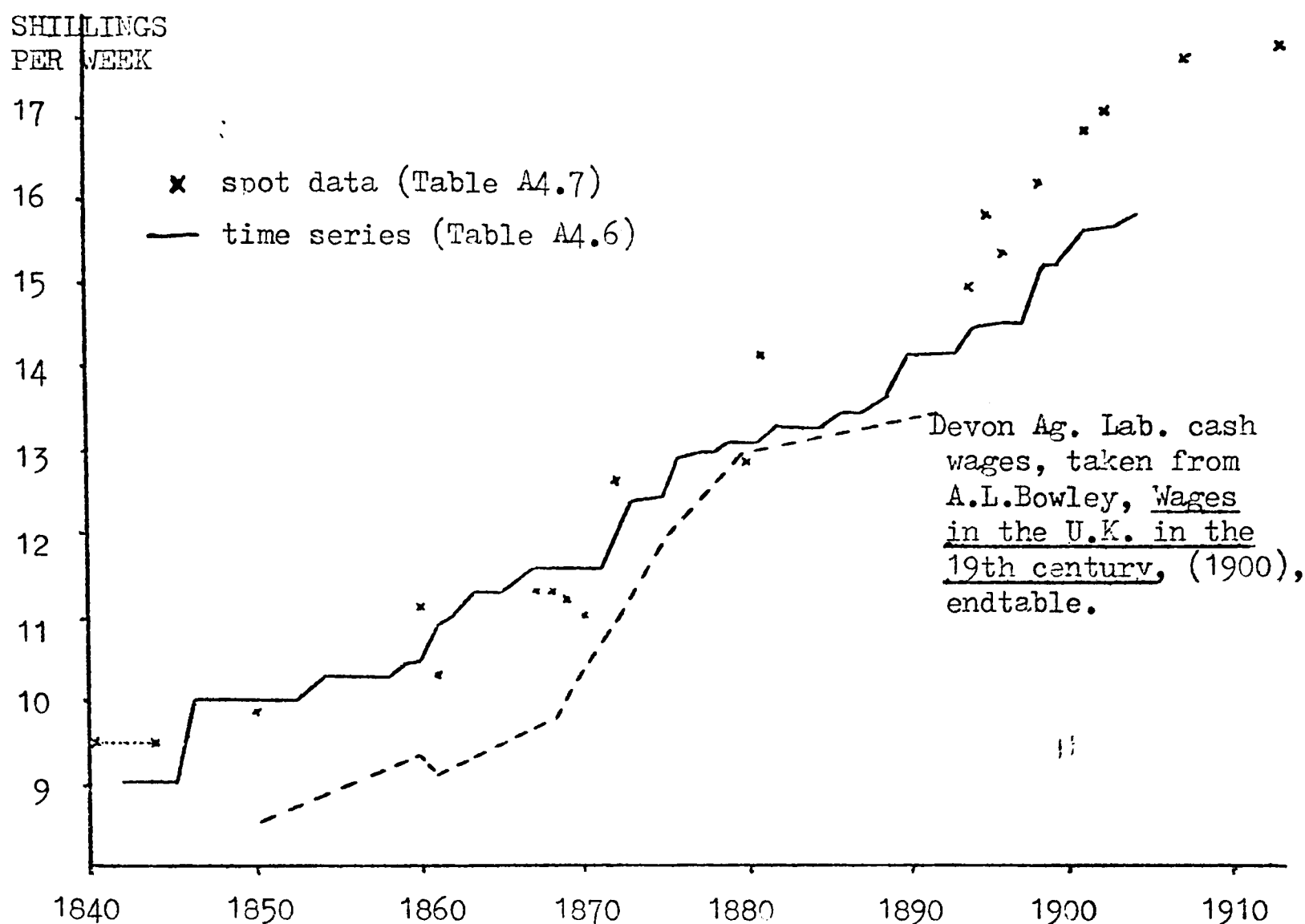


Fig.A4.4 combines the time series figures with the more broadly based 'benchmark' data which survives for a few well documented years, as summarised in Table A4.7, and a mutually reinforcing degree of concurrence is observed, particularly before 1870. The consistently higher level of the 'benchmark' year averages after that date can probably be explained by the absence of time series data from the northern part of the county, for as Table 7.9 showed, wages apparently rose faster there than the county average. This being the case it was decided to rely primarily on the county wide averages, using the time series only as a basis for interpolation after 1870. The results appear in Table A4.8 overleaf, and are depicted in Fig. 7.1.

Converting the weekly wage figures to estimates of weekly earnings by adding in a monetary value for 'privileges' did not prove too difficult. Because most of the Parliamentary enquiries were concerned with either the total labour cost to farmers, or the material welfare of labourers (but

Table A4.8. Money and Real Earnings of Agricultural Labourers 1840-1913

	-1-	-2-	-3-		-1-	-2-	-3-
1840:	9.5	100.0	100.0	1874:	13.13	138.2	124.7
1841:	9.55	100.2	98.5	1875:	13.21	139.1	124.7
1842:	9.56	100.5	106.2	1876:	13.35	140.5	125.1
1843:	9.58	100.6	107.0	1877:	13.59	143.0	125.4
1844:	9.61	100.8	106.1	1878:	13.81	145.4	134.9
1845:	9.65	101.5	100.6	1879:	14.01	147.5	135.4
1846:	9.7	102.1	97.3	1880:	14.11	148.5	137.4
1847:	9.71	102.2	104.4	1881:	14.2	149.5	135.8
1848:	9.75	102.6	103.0	1882:	14.24	149.9	140.8
1849:	9.8	103.2	115.2	1883:	14.26	150.1	141.7
1850:	9.83	103.5	115.7	1884:	14.28	150.3	156.0
1851:	9.93	104.5	117.6	1885:	14.3	150.5	154.3
1852:	10.02	105.5	116.3	1886:	14.35	151.1	160.6
1853:	10.12	106.5	102.6	1887:	14.47	152.3	158.7
1854:	10.24	107.8	99.9	1888:	14.62	153.9	156.5
1855:	10.24	107.8	98.6	1889:	14.78	155.6	160.4
1856:	10.3	108.4	102.4	1890:	14.9	156.8	162.7
1857:	10.3	108.4	107.8	1891:	14.95	157.4	155.7
1858:	10.4	109.5	113.5	1892:	15.0	157.9	168.0
1859:	10.49	110.4	112.9	1893:	15.02	158.1	170.5
1860:	10.58	111.1	102.3	1894:	15.12	159.2	181.9
1861:	10.78	113.5	106.1	1895:	15.27	160.7	180.5
1862:	10.92	114.9	106.8	1896:	15.41	162.2	181.7
1863:	11.05	116.3	112.7	1897:	15.8	166.3	181.2
1864:	11.1	116.8	113.7	1898:	16.3	171.6	187.2
1865:	11.14	117.3	112.9	1899:	16.51	173.8	189.1
1866:	11.26	118.5	107.6	1900:	16.68	175.6	187.1
1867:	11.35	119.5	104.5	1901:	16.87	177.6	191.6
1868:	11.37	119.7	109.3	1902:	17.08	179.8	196.9
1869:	11.4	120.0	113.4	1903:	17.34	182.5	196.7
1870:	11.57	121.8	114.2	1904:	17.62	185.5	197.9
1871:	12.1	127.4	116.4	1907:	17.75	186.8	198.8
1872:	12.69	133.6	118.2	1913:	17.9	188.4	183.6
1873:	12.93	136.1	115.2				

Column 1: Weekly earnings of ordinary male agricultural labourers in shillings

Column 2: Index of Column 1, 1840 = 100.0

Column 3: Column 2 deflated by CLI 2 Index from Table A4.4 to give real wage index for ordinary male agricultural labourers

rarely both at the same time) investigators usually made direct reference to the level and nature of 'privileges' given in each locality. An attempt was usually made to estimate their monetary value so it has been possible to assign an element to cover these non-monetary earnings to all available wage quotations for individual years, although none reached the value implied in the following case from the Tiverton area in 1872:

'6s. per week was offered in lieu of the allowance of grist, corn, cider, potato ground, firewood, run for pigs, and cottage at low rent and refused'¹

The series for agricultural labouring earnings in England, England and Wales, and Great Britain in Table 7.8 is based on the table assimilated by Bowley grafted onto another table constructed by Orwin and Felton.² Additional information was taken from Hunt's summary and this was particularly useful in converting the predominantly 'cash wages' orientation of Bowley, Orwin and Felton into a 'weekly earnings' series.³ In order to overcome possible errors in the computation of the value of privileges, a comparison was made of the 1914 levels of cash wages alone in Devon and England as a whole. The figures were drawn from the detailed county reports on Wages and Conditions in Agriculture.⁴ The Devon average of 14.82 shillings amounted to 95% of the English average of 15.64 shillings, which suggests that when the likely higher level of privileges relative to cash wages in the county are taken into account, this figure agrees well with the main series shown in Table 7.8. It follows, therefore, that even if the figures given in Table A4.8 for money earnings in Devon in the early part of the period are over-optimistic -they are certainly not biased downwards- this serves only to underestimate the rate of relative and absolute growth in the later decades.

3) ROAD LABOURERS WAGES.

A reasonable number of parish road surveyors' account books survive for many parts of rural Devon, and to the extent by which parish rates were disbursed on road labour they give an indication of wage levels. Of the eighty or so parishes whose calendars were searched, highway surveyors books

¹PP 1873 LIII (358), p.721

²Bowley, Wages in the U.K. in the 19th Century, endtable; Orwin and Felton, 'A Century of Wages and Earnings in Agriculture', Tables IX, p.245, X, XI, p.247

³Hunt, Regional Wage Variations, Table 1.3, p.62.

⁴PP 1919 IX (Cmd.25)

survive in thirteen for the post 1840 period; they are much more numerous for the late 18th and early 19th century. In many parishes payment was made on a piecework basis, so it was decided to concentrate on those parishes where work was paid for at daily rates. The sources are listed below and the results are tabulated in Table 7.7, p.223.

After the 1860s, coverage falls off dramatically, and only a few indications are available of rates of pay in the last part of the century. It would appear, from the payments made to individuals in isolated parishes in north-west Devon covered by the Bideford District Road Surveyors account books, that daily wage rates hardly rose at all between the early 1880s and the turn of the century. No doubt this was the result of a combination of the isolation of the district and the relatively high proportion of elderly people in the population, which may have created a reservoir of old men seeking casual employment to fend off the Poor Law.

D.R.O. Surveyor of Highways Account Books:

Woodbury (1889-92)	PS1,V	Northam (1837)	PS2, V
Loddiswell (1842-3)	PS3, B	Chagford (1838-45)	PS5-11, B
Ashwater (1844-60)	PS6-15, B	Challacombe (1845-6)	PS1, V
South Molton (1863-4)	PS2, B	Cheriton Bishop (1830-95)	PS2-6, V
Chivelstone (1839-56)	PS1, V	Kentisbeare (1840-50)	PS3, OB
Rackenford (1852-64)	PS1-3	Bishops Tawton (1844-64)	PS9-12, 19-27, V, 13-18, B;

D.R.O. 3721A District Surveyors Account Books:

Abbotsham (1879-80)	S10/11	Monkleigh (1879-80)	S29
Newton St.Petrock (1879-1902)	S30-1	Hartland (1883-1912)	S23-5;

E.F.P., 28 Sept. 1912; PP 1895 XVI (C.7728), p.26.

1) CONSTRUCTION WORKERS.

The sources available to document rates of pay and wages of non-agricultural workers in 19th century Devon are more miscellaneous in character than those used for the farming sector. Materials relating to the building trades are more numerous than for any other urban occupational group so it was decided to use indices constructed for this group as a basis for making the most of the sparse documentation on other trades.

There is little information on wages in the building trades to be found among the Parliamentary Papers until the Board of Trade Labour Department was set up in the early 1890s, but that body was able to draw on the records of Building Trades' Unions and employers agreements reaching back to the 1870s in Exeter and Plymouth. In the decades before World War One this coverage broadened to include other parts of the county. While Victorian Devon is not thought of as a stronghold of trades unionism in general, it would seem that the building trades were fairly well organised from an early date.

The Board of Trade Labour Dept. statistics, while accessible, well presented and thorough, are the official negotiated hourly rates and as discussed in Chapter 7 this is likely to have led to variations in actual rates of pay. However, because outlays on building repairs figure prominently in the budgets of a range of institutions and households for which accounts survive, it is possible in some circumstances to monitor the changes in actual rates paid. These records are supplemented with newspaper reports, although these were mostly concerned with the onset or termination of disputes which result in the settlement of new official rates or the retention of old ones.

Table A4.9 Building Craftsmen Wages, Plymouth and Exeter, 1872-1913

Index (1872 = 100) of unweighted average official hourly rates of pay of Exeter and Plymouth bricklayers, masons, carpenters and joiners, plumbers, plasterers and painters

1872	100.0	1880	125.5	1888	130.4	1896	138.8
1873	106.3	1881	125.5	1889	131.4	1897	138.8
1874	106.3	1882	125.5	1890	130.4	1898	145.9
1875	108.3	1883	125.5	1891	130.4	1899	150.8
1876	108.3	1884	128.9	1892	132.9	1900	150.8
1877	119.0	1885	127.5	1893	135.8	1906	153.9
1878	125.5	1886	127.5	1894	138.8	1913	158.8
1879	125.5	1887	132.0	1895	138.8		

sources: PP 1900 LXXXII (Cd.317) Standard Time Rates of Labour, pp.470-9
 PP 1910 LXXXIV (Cd.5086) Earnings and Hours Enquiry, III: Building and Woodworking, pp.77-9
 PP 1914 LXXX (Cd.7080) 16th Ann. Abstract Labour Statistics, pp.946-7

Table A4.10 Building Workers Wages, Devon Towns, 1840-1913

	-1-	-2-	-3-	-4-
1840	12.0	100.0	18.5	100.0
1850	12.5	104.2	19.0	102.7
1860	13.0	108.3	20.0	108.1
1870	14.0	116.7	20.0	108.1
1877	16.2	135.0	24.2	130.8
1893	17.0	141.7	27.2	147.0
1900	19.0	158.3	30.2	163.2
1903/4	19.8	165.0	30.8	166.5
1907	20.5	170.8	31.0	167.6
1913	21.0	175.0	31.8	171.9

Column 1: Average weekly earnings, shillings, labourers; Col.2: Index
 Column 3: Average weekly earnings, shillings, craftsmen; Col.4: Index

sources: as for Table A4.9 and additionally...

PP 1868-9 XIII (4202), p.375, (rural craftsmen)
 PP 1894 LXXXIii (c.7567) Standard Time Rates, pp.586-7
 PP 1908 CVII (Cd.3864) Enquiry into Working Class Housing, Rents, Retail Prices, p.746 and Second Report: 1913 LXVI (Cd.6955), pp.682-7

D.R.O. Exeter City Archives, City Treasurers Vouchers Boxes 1, 2, 12, 19, 23, 26, 34, 37; Sanitary Cttee. Minutes Book, 28 Mar 1900
 Kennaway's Household accounts (Exeter) 58/9 Box 14, 141/11, 64/12/21/4 & 11, 425A/PW4
 1107M/E2 Winkleigh Churchwardens PW47, V.

E.F.P. 21 Apr 1853, 11 Apr 1866, 2 Oct 1897
Western Times 12 Jun 1858, 18 Jun 1869, 22 Jun 1869, 11 Jun 1872, 8 Jul 1890, 10 May 1898

W.F.Gardiner, Barnstaple 1837-97, (1897), p.123;
 Parsons, thesis, (1977), pp.181-92;
 Newton, thesis, (1966), Vol.III Appendices;

These figures result from splicing wage rates for individual years with short term series, in much the same way as with agricultural wages in Appendix 4.4, although the documentation is more sparse. The evidence of the non-official sources suggests that the official rates were at premium levels, so the figures for weekly earnings in Table A4.10 are set at levels below those implied by the official sources. Because this cannot be precisely quantified it would be dangerous to use the figures for earnings in individual years in isolation, but they probably do give a fair guide to trends through time. This is in any case the main use to which these series are put in Chapter 7.

2) NON-BUILDING URBAN WORKERS.

At best there are some trades for which reasonable estimates can be made of changes in wages between the isolated years for which statistics survive, and at worst there are many key occupations for which there are no means of assessing the standard of living at all, especially in the service sector. As with the building workers, the closest approach to any systematic data is not made until the 1890s, with the Royal Commission on Labour and when the Board of Trade Labour Dept. began collecting and publishing a wide range of wage information. It has been noted in Section 1) above that most of this data was itself derived from institutional sources, so coverage is sparse in those trades and regions where such organisation was weak.

In Plymouth and Exeter, where the most skilled trades were organised by the late Victorian period, it is possible to trace changes in the official pay rates of engineers, fitters, smiths and shipwrights without great difficulty between 1890 and 1913. In the case of the Devonport Dockyard it is possible to link this data to the actual weekly rates of pay of various grades of labour in the Accounts of Labour Charts for Dockyards and Steam Factories in 1862-3.¹ References to other trades in official

¹pp 1864 XXXVIII (49), pp.408-28,488

papers are less easy to piece together into series such as appear in Table A4.11, but they can be compared with one another in a few years. A number of these are shown in Table A4.12.

The assigning of index numbers to some of the series in Table A4.11 is very difficult indeed. Post Office and clerical workers are covered by only four quotations, and it would be rash to suppose that they can all be safely linked with each other to give a fair indexation of pay in this part of the service sector. However, the 32% rise in the pay of Post Office clerks between 1866 and 1909¹ seems roughly comparable with the increase shown for the wages of policemen in Exeter, another tertiary occupation. Both compare unfavourably with the wage increases of building labourers and craftsmen in Table A4.10, which supports the suggestion made in chapter 4.5 that pay and performance in the service sector of Devon's economy lagged behind that of the primary and secondary sectors.²

The (unweighted) 'Newton index' is supplied in Table A4.11 for illustrative purposes as it combines wage rates of bricklayers, carpenters, skilled general labourers, masons and police constables over the 1840-1913 period.³ The phasing is not entirely the same as for the other columns in Table A4.11 but over the period as a whole it seems that the composite wage growth for this group was comparable to that of the less arbitrarily defined groups, or 70 to 75% higher than in 1840.

¹Exeter Gazette, 19 Feb. 1869; E.F.P., 3 April 1909

²see pp.148-9

³Newton, Victorian Exeter, Appendix II, pp.343-4

Table A4.11 Non-Building Urban Wages, Devon, 1840-1913

	(shillings per week)								
	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-
1840	12.3	100.0				100.0			100.0
1850			24.3				16.0	100.0	
1862	13.6	110.0	27.9				17.0		
1860-70						115.0			119.0
1872					12.0				
1877				26.6	14.0				
1890	16.0	129.7		27.4	14.0			143.0	
1893	17.5	141.8		27.7	16.0		21.5	134.0	
1900			36.3	29.1	16.0	152.0	22.5	141.0	143.0
1903/4				29.1			22.5	141.0	
1909						153.0			
1913	21.0	170.1	42.8				24.0	150.0	175.0

Column 1: Devonport Dockyard labourers, Col.2: Index of -1-,
Column 3: Angle-iron smiths, Devonport Dockyard,
Column 4: Skilled foundrymen, Parkins & Son, Exeter,
Column 5: Foundry labourers, Exeter,
Column 6: Clerical workers, Exeter, (1840, 1866, 1898, 1909)
Column 7: Exeter police constables, Col.8: Index of -7- (1850 =100)
Column 9: 'Newton' index. 1890 and 1900 figure: average for whole decade

Table A4.12 Wages in Various Occupations, Devon, 1864-1913

(shillings per week unless stated otherwise)

TURNERS, FITTERS, SMITHS, (Devonport)		(Hourly rates across Devon)	
		1913	
		Devonport Dockyard: 9.5d.	
1893:	32.0	Plymouth general: 8.2d.	
1900:	34.0	Exeter -railway: 7.1d.	
1905:	36.0	Exeter general: 6.2d.	
1913:	38.0	Dartmouth: 7.9d.	
		Newton Abbott: 6.7d.	
PRINTING COMPOSITORS, (Plymouth)		HEATHCOATS LACE FACTORY (Tiverton)	
1880-90:	24.0	1890-3:	27.0
1900-5:	30.0	1864:	11.0 (Over 21 yr. olds)
		1877:	13.75 ditto
TRAMWAY OPERATORS,			
1905 Exeter Motormen: 22.5, conductors: 18.0;			
1913 Plymouth Motormen: 27.0, conductors: 26.0			
GAS STOKERS,			
1900 Plymouth and Devonport: 5s/8hr. shift; Exeter: 4s5d/12hr. shift			
1913 Plymouth and Devonport: 5-5s3d/8hrs.; Barnstaple: 3s8d/12hrs.			
POTTERY THROWERS, (Barnstaple)		QUARRY LABOURERS, (Bovey Tracey)	
1880: 15.0 -18.0;		1887: 3s / day	
1908: 30.0 -40.0		1906: 3s11d / day	

sources:

i) Parliamentary Papers

Royal Comm. Labour: 1892 XXXVIiv (c6795-IX) Answers to Schedules of Questions-Group C,
1892 XXXVIIi (c6795-IV) Minutes of Evidence, Group A,
1892 XXXVIIiii (c6795-VIII) Answers to Schedules of Questions -Group B,
1892 XXXVIIii (c6795-V) Minutes of evidence - Group B,

1864 XXXVIII (49) Accounts of Labour Charts for Dockyards and Steam Factories, pp.408-28, 488
1892 LXVIII (c6715) Return of Wages of police, Roads, Gas and Water workers, pp.779-81
1900 LXXXII (Cd.317) Standard Time Rates of Labour, pp.410-99,
1908 CVII (Cd.3864) Inquiry into Working Class Rents, Housing, Retail Prices, p.746
1910 LXXXIV (Cd.5196) Earnings and Hours Enquiry, IV: The Public Utilities.

The annual series of Abstracts of Labour Statistics are also spasmodically useful, on the occasions changes in officially negotiated rates were notified from Devon:

1900 LXXXIII (Cd.119),
1905 LXXVI (Cd.2491), (Cd.2674),
1908 XCVIII (Cd.4413), (Cd.4255),
1910 LXXXIV (Cd.5324), CX (Cd.5041), (Cd.5458)
1912/3 XCII (Cd.6471), CVII (Cd.6228),
1914 LXXX (Cd.7080), (Cd.7080),
1914/6 LXI (Cd.7635), (Cd.7735);

ii) Council and Company records, (all at D.R.O.)

D.R.O. 68/18/5/1 & 2: Wage Books of F.Parkin and Son Iron manufacturers of Exeter, 1877-1903,
2783B/A5 & 6: Ditto, Garton and King Ltd., 1890-1908,
ECA G1, G1: Exeter Water Authority, wages and sundry supplies, 1869-74,
ECA Workmens Wages Cttee Minutes 1914,
ECA Tramways Cttee Minutes, 1905-8,
924B/B9/9: Owlacombe Beam and Union Mines, 1851,
58/9 Box 33: Mark Kennaway's domestic accounts, 1857-72,
337B add/548: Shop accounts, Sidmouth, 1870;

iii) Newspaper and other secondary sources. Newspapers reported strikes and their terms of settlement, and occasional advertisements for domestic servants was one of the only available sources for this important area of employment.

E.F.P. 13 Mar 1845 p.1, 16 Apr 1846 p.2, 8 Mar 1849 p.8, 1 July 1852 p.4
16 Feb 1870 p.7, 18 Jan 1871 p.5, 8 May 1872 p.5, 30 Jan 1884 p.8, 3 Apr 1909, 2 May 1914,
Western Times 10 and 17 Mar 1871, 12 and 23 Feb 1900, 4 May 1900
Exeter and Plymouth Gazette 19 Feb 1869, 27 Jan, 20 Apr, 1 Jun 1888
Evening Post 1 Jan 1901;

E.Edgcumb-Edwards, 'Industries of Devon' (1908): III-Potteries, IV-Lace, VIII-Miscell. unpub. paper for V.C.H.Devon Vol.II, I.H.R. VCH Collection, Envs 438/9,

W.P.Authers,'Juvenile wage rates in Tiverton in 1864 and 1877' Devon and Cornwall Notes and Queries,XXIV (1981), p.325,
J.H.Porter,'Radical Shoemakers', Devon Historian, XXVI, (1983), pp.3-4;
P.Brannam, A Family Business, (1982), pp.10, 25;
M.J.Messenger, North Devon Clay, (1982),p.99;
W.G.Hoskins, Two Thousand Years in Exeter, (1960), ch.IX;
Parsons, thesis, (1977), Newton, thesis, (1966).

COMPARATIVE WAGES IN 1860

The occupational distribution of the wage information which has survived does not lend itself to the easy quantification of 'average county wages' even if male workers alone are considered. In adapting the information available to the occupational structure of Devon in 1861 in order to make a comparison with average national wages as calculated by Williamson,¹ weights have to be used which incorporate a number of assumptions about wages in unquantified trades. Agriculture is straightforward enough, but the 66% of male employment which has to be distributed between industry, defence, services, and 'not classified' must be manipulated in such a way as to lend representative value to the wage information which survives. This covers general labourers in the larger towns and countryside, Heathcoats textile operatives, Exeter constables and clerical workers, rural craftsmen and Devonport engineers and shipwrights.

The major assumption which needs to be made is that wages in the main missing occupations can be in some way represented by wages in trades for which there is information. Thus it is assumed that the majority of those employed in defence -mainly naval ratings in Plymouth barracks- earned no more than urban labourers, that all those who were 'not classified' were general labourers, and that the wages of clerical workers and constables represent other service sectors. An exception is made with transport and utilities, which are included with industry for the purposes of wage comparison. Another problem is to divide the trades and industries into their 'craft' and 'unskilled labourer' components, and this was done by assuming that the latter outweighed the former by a ratio of two to one. These adjustments give a total weight to 'general labour' of 39.0% and a weight of 18.8% to 'skilled craftsmen', and these sums were apportioned

¹J.G.Williamson, 'The structure of pay in Britain'

between the separate wage quotations as shown in Table A4.13 below.

The biases probably work in an upwards direction with regard to comparative assessments of Devon's performance vis-a-vis the national average. Rural non-agricultural labourers, for example, are represented by road labourers alone, and weighted at a mere 4.3% of the workforce, which may well be too low.

Table A4.13 Average Male Wages in Devon, 1860

	s./week	weight
Agricultural labourers	10.58	0.34
GENERAL LABOURERS		
Exeter	14.0	0.041
Devonport	13.4	0.082
Urban average	13.0	0.195
Rural road labourers	9.0	0.043
Heathcoats textiles	11.0	0.029
SKILLED TRADES		
Average urban craftsman	19.7	0.08
Devonport engineers	25.0	0.033
Devonport shipwrights	27.0	0.026
Rural craftsmen	16.5	0.049
SERVICES		
Clerical	16.0	0.064
Police constables	16.5	0.018
AVERAGE WAGE	13.74s.	

BIBLIOGRAPHY

(A) MANUSCRIPT SOURCES

Public Record Office, (Kew):

Railway archives, RAIL 75/121: Bristol and Exeter Rly.Traffic, 1853
RAIL 253/193-7, Coal and coke rates books, Plymouth and Torquay
RAIL 266 (G.W.R. statistics), /44-54 Traffic returns, 1903 onwards
/112 Exeter St.Davids passenger numbers, 1885-1926
RAIL 1066/350-6 Evidence from Rly. companies to 1871-6 Parliamentary
Enquiries into mergers in the South-west
RAIL 1110/283-4 L.S.W.R. annual accounts and meetings
MT 1, 6, 7/1A, BT22: Railway Dept. correspondence [mostly on technical
and engineering matters]
CUST 64/190, Freight arrivals, 1894-8, Exeter Customs Port
Poor Law archives: MH 12/2095-2704: Correspondence between Devon P.L.U.s
and the central Poor Law Authorities, 1834-1900, (after 1900, MH 48),
[mostly dealing with health, education, sanitation, rates, appointment
of Guardians]

House of Lords Record Office:

House of Commons Cttee. Minutes of Evidence, 1836 Vol.2 (Bristol and
Exeter Railway)
HC Evidence, 1844 Vol.37 (South Devon Railway)
HL Evidence, 1846 Vol.37 (Taw Vale Railway)
HC Evidence, 1856 Vol.33 (L.S.W.R., Yeovil-Exeter section)

Institute of Historical Research:

unpublished manuscripts for Victoria County History of Devonshire Vol.II:
W.H.R.Curtler, 'Agriculture' (1908), V.C.H.Devon collection, Env.440
E.Edgcumb-Edwards, 'Devon Industries', V.C.H.Devon collection, Envs. 438/9

Devon Record Office, (Exeter):

Poor Law Union Minute Books:

Exeter: Court Books of the Corporation of the Poor, Vols 19-22 (1840-
57), Minute Books of the Court of the Corp. Poor, Vols 1-22 (1857-
1914)
Totnes, Vol 2 (1838-40), 11-13 (1858-64), 20-2 (1880-5), 29-30 (1900-5)
Okehampton, Vol 4 (1838-40), 15-17 (1858-64), 24-6 (1880-5), 32-3
(1900-5)
Barnstaple, Vols 2 (1858-9), 7-8 (1880-5), 22-5 (1901-5)
Plympton St.Mary, Vol 11 (1838-9), 7-9 (1858-64), 10 (1880-5), 14-5
(1900-5)
Torrington, Vol 2 (1838-40), 6-8 (1858-64), 11-2 (1880-5), 16-7 (1900-5)
Crediton, Vol 3 (1838-41), 11-2 (1858-64), 21-2 (1880-5), 30-1 (1900-5)
St.Thomas, Vols 2, 8, 13, 18; Axminster, Vols 2, 9, 13, 19
Holsworthy, Vols 1 (1837-9), 2-3 (General Ledgers 1890s)

Churchwardens and Surveyor of Highways Accounts:

Farway 1857-99, DRO PW1,V	Lapford 1786-1843, PW2,V
Shobrooke 1800-1929, PW81,V	Winkleigh 1816-1915, PW47,V
Stokenham 1828-40, PW1-2,V	Swimbridge 1841-1938, PW2,V

Okehampton 1896-7, PW14B,B Cheriton Bishop, PW11-16, B
Whitestone Overseers of the Poor 1836-91, P055-6,V
North Lew Overseers 1823-46, P02,V

Woodbury (1889-92) PS1,V	Northam (1837) PS2, V
Loddiswell (1842-3) PS3, B	Chagford (1838-45) PS5-11, B
Ashwater (1844-60) PS6-15, B	Challacombe (1845-6) PS1, V
South Molton (1863-4) PS2, B	Cheriton Bishop (1830-95)
Chivelstone (1839-56) PS1, V	PS2-6, V,
Kentisbeare (1840-50) PS3, OB	Bishops Tawton (1844-64) PS9-12
Rackenford (1852-64) PS1-3	19-27, V, 13-18, B;

3721A District Surveyors Account Books:

Abbotsham (1879-80) S10/11	Monkleigh (1879-80) S29
Newton St.Petrock (1879-1902) S30-1	Hartland (1883-1912) S23-5;

Exeter City Archives, City Treasurers Vouchers Boxes 1, 2, 12, 19, 23, 26, 34, 37; Sanitary Cttee. Minutes Book, 28 Mar 1900
ECA G1, G1: Exeter Water Authority, wages and sundry supplies, 1869-74
ECA Workmens Wages Cttee Minutes 1914,
ECA Tramways Cttee Minutes, 1905-8,

2131 O/X LR6-12, 2808A LR1, Motor car Registers, 1904-14

Private Household and other accounts:

58/9 (Kennaway), Box 14, 141/11, Box 33: Widecombe estate, 1857-72
1107M/E1-3 Partridge of Nymet Rowland, 1817-77
337B add/548: Shop accounts, Sidmouth, 1870;
337 add1B/ME124 R.Farrant, shop account, 1842-7
Z17/3/32 Chulmleigh, Meeth, Ashwater farm accounts, 1875
96M/Box2/6 Rolle north Devon estate accounts, 1865/6

68/18/5/1 & 2: Wage Books of F.Parkin and Son Iron manufacturers of Exeter, 1877-1903,
2783B/A5 & 6: Ditto, Garton and King Ltd., 1890-1908,
D7/101/5, 930/11: assorted leases, G. and C.Finch, Wine Merchants
924B/B9/9: Owlacombe Beam and Union Mines, 1851,

Misc. Railway prospectii: 1292M/Rlys4, 961M/54, 924M/B1/2, 50/11/128-9, 53/6 Box 69, 64/12/21/4 and 11

West Devon Record Office, (Plymouth):

Plymouth Corporation Cttee. Minutes:

Housing of the Working Classes, 1893-1914, P5/HW1-3, Markets, 1836-1914, Special, 1885-99: P5/X2;
Local Board of Health, Works Cttee., P5/W51-3;
Millbay Docks, building estimates, 59/2-8

Westcountry Studies Library:

'Prices Current catalogue, Devon and Somerset Stores, 1911, pB/EXE/381.065 DEV

(B) PRINTED SOURCES

(1) PRIMARY SOURCES - Newspapers:

British Library Newspaper Library, (Colindale):

County and North Devon Advertiser, 1836-45 Western Morning News, 1862-4
Barnstaple and Bideford Times, 1855 Bideford Weekly Gazette, 1880
Barnstaple Times, and Bideford and North Devon Chronicle, 1859
Devonport Independant and Plymouth and Stonehouse Gazette, 1858-9
Devonport Telegraph and Plymouth Chronicle, 1860-4
Kingsbridge Gazette, 1857-64, 1873, 1880-5, 1900-5
North Devon Journal, 1856-64, 1873, 1880-8, 1900-5
South Devon Advertiser and Agricultural Times, 1880
South Molton Gazette, and Devon and Somerset Chronicle, 1880
Tavistock Gazette, 1858-64, 1880-4
Tiverton Gazette and East Devon Herald, 1858, 1881-5, 1900-5
Torquay and Torr Directory and General Advertiser, 1858
Western Weekly News, 1880-5, 1900-5
Weekly Mercury [Plymouth], 1880-5, 1902 Western Daily Mercury, 1902-8

Devon and Exeter Institution:

Western Times, 1890-1904; Devon Weekly Times, 1887-9;
Devonshire Chronicle, 1835-40; Exeter and Plymouth Gazette
Exeter Flying Post, 1830-86, 1911-4.

(1) PRIMARY SOURCES - Parliamentary Papers

A) Annual and other periodic returns used:

Census Reports:

Census of Great Britain, 1841, Occupations Abstract, PP 1844 XXVII (587),
Census of Great Britain, 1851, Numbers of the inhabitants, Vol.1, Division
V, 1852-3 LXXXV (1361), pp.40-57; Ages, Civil Condition and Occupations,
1852-3 LXXXVIIIi (1691-I), Div.V, pp.327-8, 356-7
Census of England and Wales, 1861, Vol.1, Numbers and Distribution of the
people, PP 1862 L (3056), Div.V, pp.397-407, 432; Occupations etc.,
1863 LIIIIi (3221), Div.V, pp.365-72
Census of England and Wales, 1871, Vol.2, Area, houses, inhabitants, 1872
LXVIIi (c676-I), Div.V, Table 3, pp.230-41, 268; Occupations etc., 1873
LXXII (c872), Div. V, pp.249-53
Census of England and Wales, 1881, Vol.2, Area, houses, population, 1883
LXXIX (c3563), pp.261-70, 306; Occupations etc., 1883 LXXX (c3722),
Div.V, pp.166, 190-205
Census of England and Wales, 1891, Vol.2, Area, houses, population, 1893-4
CV (c6948-I), pp.405-17, 489; Occupations etc., 1893-4 CVI (c7058),
Div.V, pp.166, 195-210,
Census England and Wales, 1901, Devon County Report, 1902 CXVIII (Cd1271),
Table 11, pp.21-6, 60-1, 76-81; Summary Tables, 1903 LXXXIV (Cd1523),
p.139
Census of England and Wales, 1911, Vol.1, Administrative Areas. Devon. 1912
CXI (Cd6258), Table 10, pp.107-16; Vol.VII, Ages and Conjugal Condition,
1912-3 CXIII (Cd6610), pp.41-2; Vol.IX, Occupations and Industries, 1913
LXXIX (Cd7019), pp.86-98

Registrar-General's Reports:

1840-1: 4th report, PP 1842 XIX (423), 1841: 1843 XXI (516), 1842: 1844 XIX (540), 1843: 1846 XIX (727), 1844: 1847-8 XXV (996), 1846: 1849 XXI (1113).

Supplement to the 25th Annual Report, 1865 XIII (3542)

Supplement to the 75th Annual Report, 1914-6 VIII (Cd8002), Table 1, p.cix.

Annual Abstracts of Labour and Wages and Hours of Labour reports:

1900 LXXXIII (Cd.119), 1905 LXXVI (Cd.2491), (Cd.2674), 1908 XCVIII (Cd.4413), (Cd.4255), 1910 LXXXIV (Cd.5324), CX (Cd.5041), (Cd.5458), 1912/3 XCII (Cd.6471), CVII (Cd.6228), 1914 LXXX (Cd.7080), (Cd.7080), 1914/6 LXI (Cd.7635), (Cd.7735);

Poor Relief:

1830-1 XI (52), 1835 XLVII (444), 1843 XLV (144), 1852-3 LXXXIV (c35), 1856 XLIX (84), 1860 LVIII (383.B), 1870 LVIII (280.B), 1880 LXI (66.B), 1890 LXIII (94.B), 1900 LXXIII (136)

Agricultural Statistics:

1870 LXVIII (c223), 1871 LXIX (c460), 1880 LXXVI (c2727), 1886 LXX (c4848), 1890-1 XCI (c6524), 1896 XCII (c8073), LXVII (c8243), 1911 C (c5585), 1912-3 LXXIX (Cd6021), 1914 XCVIII (Cd7325),

Railway Returns:

1847 LXIII (706), 1847-8 LXIII (937), 1849 LI (418), 1850 LIII (10 & 602), 1851 LI (12 & 313), 1852-3 XCVII (252 & 906), 1854 LXII (1739 & 1790 & 1844), 1854-5 XLVIII (1932 & 2002), 1856 LIV (2082 & 2147), 1857ii XXXVII (2258), 1857-8 LI (2308 & 2422), 1859i XXV (2472 & 2513), 1859 XXVII (2561), 1860 LXI (2730), 1861 LVII (2871), 1862 LIII (398), 1863 LXII (492), 1864 LIII (20), 1865 XLIX (456), 1866 LXIII (483), 1867 LXII (509 & 516), 1867-8 LXII (484), 1868-9 LIV (286), 1870 LIX (c.229), 1871 LX (c.448), 1872 LII (c.651), 1873 LVII (c.751), 1874 LIX (c.928 & c.1091), 1875 LXVII (c.1332), 1876 LXV (c.1609).

Navigation and Shipping Returns:

1842 XXXIX (409), 1843 LII (216), 1845 XLVII (206), 1846 XLV (155), 1851 LII (155), 1852 XLIX (218), 1852-3 XCVIII (299), 1854 LX (134), 1854-5 XLVI (197), 1856 LI (122), 1857ii XXXIX (34), 1857-8 LII (260), 1859ii XXVII (25), 1860 LX (334), 1861 LVIII (261), 1862 LIV (302), 1863 LXIII (290), 1864 LV (337), 1865 L (331), 1866 LXV (302), 1867 LXIII (355), 1867-8 LXIII (316), 1868-9 LV (257), 1870 LX (349), 1871 LXI (282), 1872 LVI (615), 1873 LXIII (759), 1874 LXIV (1030), 1875 LXXIII (C1253), 1876 LXXII (C1570), 1877 LXXX (C1788), 1878 LXXI (C1999), 1878-9 LXVIII (C2254), 1880 LXXI (C2518), 1881 LXXXVII (C2860), 1882 LXVIII (C3180), 1883 LXX (C3540), 1884 LXXVIII (C3976), 1884-5 LXXV (C4365), 1886 LXIV (C4827), 1887 LXXX (C5067), 1888 XCVII (C5399), 1889 LXXV (C5731), 1890 LXXII (C6040), 1890-1 LXXXII (C6380), 1892 LXXVII (C6663), 1893-4 LXXXVIII (C7005), 1894 LXXXIV (C7402), 1895 XCV (C7696), 1896 LXXXIII (C8089), 1897 LXXXVII (C8491), 1898 XCIII (C8884), 1899 XCVI (C9315), 1900 LXXXVIII (Cd214), 1901 LXXV (Cd604), 1902 C (Cd1113), 1903 LXXI (Cd1612), 1904 XCI (Cd2122), 1905 LXXX (Cd2556), 1906 CXVII (Cd3093), 1907 LXXXIV (Cd3545), 1908 CIV (Cd4256), 1909 LXXXIV (Cd4789), 1910 LXXXVII (Cd5292), 1911 LXXIX (Cd5840), 1912-3 LXXXV (Cd6398), 1913 LXI

(Cd7021), 1914 LXXXII (Cd7616).

Coastwise Coal Imports:

1867-8 LXIV (338), 1868-9 LVI (2539), 1870 LXI (253), 1871 LXII (233), 1872 LIV (307), 1873 LXI (1709), 1874 LXII (194), 1875 LXXI (287), 1876 (261), 1877 LXXVI (262), 1878 LXVIII (240), 1878-9 LXV (209), 1880 LXVII (215), 1881 LXXXIII (191), 1882 LXIV (193), 1883 LXIV (175), 1884 LXXII (138), 1884-5 LXXI (134), 1886i LX (121), 1887 LXXV (130), 1888 XCI (176), 1889 LXX (96), 1890 LXVII (143), 1890-1 LXXVII (164), 1892i LXXII (116), 1893-4 LXXXI (225), 1894 LXXVII (282), 1895 LXXXVIII (450), 1897 LXXIX (90 & 90-1).

B) Other returns and reports of Committees and Commissions:

Poor Law Commission Answers to Rural Questions, 1834 XXX (44), Appendix B, (Part 1), pp.125-36
Factory Returns, 1839 XLII (41), 1850 XLII (745)
Reports from Assistant Hand Loom Weavers Commissioners, 1840 XXIII (43-I)
Report on the Employment of Women, Children and Young Persons in Agriculture 1843 XII (510), Report on Wiltshire, Dorset, Devon and Somerset, by A.Austin, pp.1-55, 115
Prices of various articles of consumption, 1843 XLV (554), pp.176-9,
Report of the Railway Dept. of the Board of Trade on Schemes for extending Railway Communication in Cornwall and Devonshire, 1845 XXXIX (89)
Return of the Average Rate of Weekly Earnings of Agricultural Labourers, 1861 L (14), pp.583-637, 1868-9 L (371), pp.643-64, 1871 LVI (181), pp.593-623, 1873 LIII (358), pp.699-731
Accounts of Labour Charts for Dockyards and Steam Factories, 1864 XXXVIII (49) pp.408-28, 488
Report of the Select Committee on Trade in Animals, 1866 XVI (427)
Local Taxation Returns, 1867-8 LIX (497), 1914 LXVIII (425)
Report on the Employment of Women, Children and Young Persons in agriculture
Report of the Hon.H.B.Portman on Hampshire, Devon and Cornwall, 1868-9 XIII (4202), pp.106-23, 375
Abstract of County Treasurers Accounts, 1868-9 LII (248)
Navy Shipbuilding and Dockyard Transactions for 1867-8, 1870 XLVI (307)
Report on the Inland Revenue, 1871 XXXVII (221), pp.224-5; 1881 XXIX (c2979); 1882 XXXVII (292)
Royal Commission into the Depression in Agriculture, Report of W.Little on Devon, Cornwall, Dorset and Somerset, 1881 XVI (c2778), 1882 XV (c3375) Appendix C (c) II & III, pp.150-7, 167-73
Royal Commission on Labour, Minutes of Evidence, Group A, 1892 XXXVII (c6795-IV); Minutes of evidence - Group B, 1892 XXXVII (c6795-V); Answers to Schedules of Questions -Group B, 1892 XXXVII (c6795-VIII); Answers to Schedules of Questions-Group C, 1892 XXXVII (c6795-IX); The Agricultural Labourer, 1893-4 XXXV (c6894-II), Vol.I, Part II, Report of C.M.Chapman on the Crediton Union, pp.241-55
Return of the Wages of Policemen, Road, Gas and Water workers, 1892 LXVIII (c6715), pp.779-81
Royal Commission on Agriculture, 1894 XVII (c7400-II), pp.102-12; R.H.Rew's Report on North Devon, 1895 XVI (c7728), pp.1-71; 1896 XVI (c8125), pp.488-99
Standard Time Rates of Labour, 1894 LXXXii (c7567), pp.586-7; 1900 LXXXII (Cd317), pp.410-99; 1911 LXXXIX (Cd5849), p.104
First Report of A.Wilson-Fox on the Wages of Agricultural Labourers, 1900 LXXXII (Cd346), pp.596, 728-9; Second Report, 1905 XCVII (Cd2376)

Enquiry into Working Class Housing, Rents, Retail Prices, 1908 CVII
 (Cd3864), pp.372-3, 746; Second Enquiry, 1913 LXVI (Cd.6955), pp.682-7
Earnings and Hours of Labour Enquiry, III: Building and Woodworking, 1910
LXXXIV (Cd5086), pp.77-9; IV: The Public Utilities, 1910 LXXXIV
 (Cd.5196), V-Agriculture, 1910 XXXIV (Cd5460), pp.451-534
Navy (Dockyard Expenses Account), 1914 LIII (134)
Wages and Conditions in Agriculture, Report on Devonshire by A.H.D.Cochrane,
1919 IX (Cmd.25), p.278.

(1) PRIMARY SOURCES - Contemporary publications

(place of publication London unless otherwise stated)

- W.M.Acworth and G.Paish, 'British Railways -their accounts and statistics',
J.R.S.S., LXXV (1912)
 T.S.Amery, contribution to the 22nd report of the Committee on Devon
 Folklore', T.D.A., XXXVII (1905)
 J.Ashby and B.King, 'Statistics of some Midland Villages', Economic Journal,
 III (1893)
 J.Caird, English Agriculture in 1850-1, (1852)
 W.Chapple, A Review of Risdon's Survey of Devon, (Exeter, 1785)
 S.Colepresse, 'A Georgicall Account of Devon and Cornwall in answer to some
 questions concerning agriculture', ed. R.G.F.Stanes, T.D.A., XCVI (1964)
 W.F.Collier, 'The trade of Plymouth', Annual Report and Transactions of the
Plymouth Institution, VI (1876-8)
 P.G.Craigie, 'The cost of English local government', J.R.S.S., XL (1877)
Crossing's Dartmoor Worker ed. B.Le Mesurier, (reprint, Newton Abbot, 1966)
 D.Defoe, A Tour thro' the whole island of Great Britain 1722-4 (new edn,
 1927)
Devon Hearth Tax Return, Lady Day 1674, ed. T.L.Stoate, (Almondsbury, 1982)
 M.Dunsford, Historical Memoirs of the town and parish of Tiverton, (Exeter,
 1790)
Early Tours in Devon and Cornwall, ed. R.P.Chope, (2nd edn., Newton Abbot,
 1967)
 R.Evans, Home Scenes, or Tavistock and it's vicinity, (1846)
 W.H.Gamlen, 'Agriculture in North East Devon 50 to 60 years ago', T.D.A., XII
 (1880)
 W.F.Gardiner, Barnstaple: 1837-1897, (Barnstaple, 1897)
 J.B.Gribble, Memorials of Barnstaple, (Barnstaple, 1830)
 H.R.Haggard, Rural England, (2 vols, 1902)
 A.D.Hall, A Pilgrimage of British Farming, 1910-2, (1913)
 Revd.W.Harpley, Presidential address to the Devonshire Association, T.D.A.,
 XXXIV (1902)
 Revd.T.Hawker, 'The Devonshire Farm Labourer Now and Eighty Years ago',
T.D.A., XIV (1882)
 F.G.Heath, The English Peasantry, (1874)
 J.C.Inglis, 'Harbour accomodation in the West', Annual Report and Trans. of
the Plymouth Institution, IX (1884-5)
Kelly's Directory of Devon, (1902, 1914)
 D. and S.Lysons, Magna Brittanica; VI: Devonshire, (1822)
 W.Marshall, The Rural Economy of the West of England, (1796)
 J.Mortimer, 'The agriculture of north Devon', Journal of the Bath and West
of England Society, VIII (1860)
Murray's Handbook for Devon and Cornwall, (1859)
Pigott's National and Commercial Directory, (Manchester, 1828), (1844)
Plymouth: A Handbook of the 42nd Annual Co-operative Congress, (Plymouth,
 1910)

- F.Punchard, 'Farming in Devon and Cornwall', Journal of the Royal Agricultural Society of England, 3rd. Ser. I (1890)
- S.Reynolds, A Poor Man's House, (Oxford reprint, 1982)
- T.Risdon, Survey of the County of Devon, 1810 Edition introduced by J.T. (Barnstaple, 1970)
- H.Strong, Industries of North Devon 1889, ed. B.D.Hughes, (Newton Abbot, 1971)
- H.Tanner, 'The farming of Devonshire', Jour. Royal Ag. Soc. England, IX (1848-9)
- C.Vancouver, General View of the Agriculture of Devon, (1808)
- White's History, Gazetteer and Directory of Devonshire, (Sheffield and London, 1850, 1878, 1890)
- H.F.Whitfield, Plymouth and Devonport in times of war and peace, (Plymouth, 1900)

(2) SECONDARY SOURCES

- D.Aldcroft and M.Freeman (eds.), Transport in the Industrial Revolution, (Manchester, 1983)
- D.Alexander, Retailing in England in the Industrial Revolution, (1970)
- B.W.E.Alford, 'The economic development of 19th century Bristol: an enigma?', in P.McGrath and J.Cannon (eds.), Essays in Bristol and Gloucestershire History, (Bristol, 1976)
- R.G.D.Allen, Index Numbers in Theory and Practice, (1975)
- N.L.Armstrong, 'The Development of banking in the south-western counties in the 19th century with particular reference to Devon and Cornwall', London Univ. Ph.D thesis, 1937
- M.K.Ashby, Joseph Ashby of Tysoe, (Cambridge, 1961)
- M.Atkinson and C.J.Schmitz, 'Kelly Iron Mine, near Bovey Tracey' D.H., XI (1975)
- W.P.Authers, 'Juvenile wage rates in Tiverton in 1864 and 1877', Devon and Cornwall Notes and Queries, XXXIV (1981)
- D.E.Baines, 'The use of published census data in migration studies' in E.A.Wrigley (ed.), 19th Century Society, (Cambridge, 1972)
- D.E.Baines, 'Labour supply and the labour market, 1860-1914', in Floud and McCloskey, The Economic History of Britain, vol.II
- T.Barker and C.Savage, An Economic History of Transport in Britain, 3rd. edn. (1974)
- G.Barnsby, 'The standard of living in the Black Country during the 19th century', E.H.R., 2nd ser., XXIV (1974)
- R.A.Barron, Finch Brothers Foundry, (Okehampton, 1983)
- J.R.Bellerby, 'The distribution of farm income in the U.K., 1867-1938', Proceedings of the Agricultural Economics Society, X (1953)
- J.R.Blunden, 'Agricultural Enterprise on the red loams and culm measures of Devon -an analytical survey', Exeter Univ. Ph.D thesis, 1965
- F.Booker, Industrial Archaeology of the Tamar Valley, (Newton Abbot, 1971)
- G.H.Borts and J.L.Stein, Economic Growth in a Free Market, (New York, 1964)
- M.Bouquet, 'Passengers from Torquay: emigration to North America, 1849-59' in S.Fisher (ed.), Ports and Shipping in the South-west, E.P.E.H. IV, (Exeter, 1970)
- M.Bouquet, Westcountry Sail, (Newton Abbot, 1971)
- A.L.Bowley, 'The statistics of wages in the U.K. during the last 100 years; Part One -Agricultural Wages', J.R.S.S., LXI (1898)
- A.L.Bowley, Wages in the U.K. in the 19th century, (Cambridge, 1900)
- P.Brannam, A Family Business, (Exeter, 1982)
- M.Brayshay, 'Government assisted emigration from Plymouth in the 19th century', T.D.A., CXII (1980)
- M.Brayshay and V.Pointon, 'Local politics and public health in mid 19th

- century Plymouth', Medical History, XXVII (1983)
- M.Brayshay and V.Pointon, 'Migration and the social geography of mid 19th century Plymouth', D.H., XXVIII (1984)
- H.W.Broude, 'The significance of regional studies for the elaboration of national economic history', J.E.H., XX (1960)
- A.J.Brown and E.M.Burrows, Regional Economic Problems, (1977)
- D.Bryant, 'Demographic trends in South Devon in the mid 19th century' in K.Gregory and W.L.D.Ravenhill (eds.), Exeter Essays in Geography, (Exeter, 1971)
- J.A.Bulley, 'The beginnings of the Devon ball clay trade', T.D.A., LXXXVII (1955)
- J.A.Bulley, 'Teignmouth as a seaside resort', T.D.A., LXXXVIII (1956)
- A.Cairncross, 'Internal migration in Victorian England', Manchester School of Economic Social Studies, XVIII (1949)
- C.W.Chalklin and M.A.Havinden (eds.), Rural Change and Urban Growth, (1974)
- W.Christaller, Central Places in Southern Germany, (New Jersey, 1966)
- R.Church (ed.), The Dynamics of Victorian Business, (1980)
- E.A.G.Clark, 'The Estuarine Ports of the Exe and Teign, with special reference to the period 1660-1860: A study in Historical Geography', London Univ. Ph.D., 1957
- E.A.G.Clark, The Ports of the Exe Estuary, 1660-1860, (Exeter, 1960)
- D.C.Coleman, 'Growth and Decay during the Industrial Revolution: the case of East Anglia', Scandinavian Economic History Review, X (1962)
- E.J.T.Collins, 'Migrant labour in British agriculture in the 19th century', E.H.R., 2nd ser., XXIX (1976)
- R.M.L.Cook, T.A.P.Greaves, C.C.Kilvington, 'Eylesbarrow (1814-52); A Study of a Dartmoor tin mine', T.D.A., CVI (1974)
- J.Cornwell, Earth to Earth, (1982)
- J.Cossins, Reminiscences of Exeter 50 Years Since, (Exeter, 1878)
- N.F.R.Crafts, 'British Economic Growth, 1700-1831: A Review of the evidence', E.H.R., 2nd ser., XXXVI (1983)
- N.F.R.Crafts, 'Regional Price variations in England in 1843 -An aspect of the standard of living debate', Explorations in Economic History, XIX (1982)
- R.S.Craig, 'Shipowning in the South West in its National Context, 1800-1914', in S.Fisher and W.Minchinton (ed.), Transport and Shipping in the West country, E.P.E.H. VII, (Exeter, 1973)
- P.Deane and W.A.Cole, British Economic Growth, 2nd edn., (Cambridge, 1969)
- E.R.Delderfield, Exmouth Milestones, (Exmouth, 1948)
- A.H.Dodd, The Industrial Revolution in North Wales, 3rd. edn., (Cardiff, 1971)
- E.M.Durrance and D.J.C.Laming (eds.), The Geology of Devon, (Exeter, 1982)
- M.R.Eisenstadt, 'The Garton and King Iron Foundry 1860-1900', Exeter Univ. Dept. of Economic History, undergraduate extended essay, 1979
- F.V.Emery, 'Contact between North Devon and South Wales in the 1840s', Devon and Cornwall Notes and Queries, XXVII (1957)
- G.Farr, Shipbuilding in North Devon, National Maritime Museum Monographs No.22, (Greenwich, 1976)
- R.Floud and D.N.McCloskey (eds.), The Economic History of Britain since 1700, 2 vols, (Cambridge, 1981)
- G.P.Finch, 'George Brooke of Whimble, 1785-c.1850', D.H., XXVIII (1984)
- W.H.Fraser, The Coming of the Mass Market, (1981)
- R.Freeman, Dartmouth -A New History of the Port and its People, (Dartmouth, 1983)
- D.Friedlander and R.J.Roshier, 'A study of internal migration in England and Wales. Part 1: Geographical patterns of internal migration 1851-1951', Population Studies, XIX (1965-6)
- J.Friedmann, 'A generalised theory of polarized development' in N.M.Hansen (ed.), Growth Centers in Regional Economic Development, (New York, 1972)
- G.E.Fussell, 'High Farming in South West England, 1840-80', Economic Geography, XXIV (1948)

- G.E.Fussell, 'Four centuries of farming systems in Devon, 1500-1900', T.D.A., LXXXIII (1951)
- H.L.Gauthier, 'Geography, Transportation and Regional Development', Economic Geography, XLVI (1970)
- E.W.Gilboy, Wages in 18th Century England, (Harvard, 1934)
- M.Goaman, Old Bideford and District, (Bristol, 1968)
- J.C.Goodridge, 'Devon Great Consols -a study of Victorian mining enterprise, 1844-1903', T.D.A., XCVI (1964)
- J.C.Goodridge, 'The historical geography of the copper mining industry in Devon and Cornwall from 1800 to 1900', London Univ. Ph.D. thesis, 1967
- J.D.Gould, Economic Growth in History -survey and analysis, (1972)
- A.Grant, 'Some Barnstaple Sailing Ships of the mid 19th century', T.D.A., CIII (1971)
- B.Greenhill, The Merchant Schooners, (1951)
- C.M.Hadfield, The Canals of South West England, (Newton Abbot, 1967)
- P.Haggett, Geography -A Modern Synthesis, 3rd. edn., (New York, 1979)
- F.E.I.Hamilton (ed.), Contemporary Industrialisation, (1978)
- N.M.Hansen (ed.), Growth Centers in Regional Economic Development, (New York, 1972)
- S.R.Haresign, 'Agricultural Change and rural society in the Lincolnshire Fenlands and the Isle of Axholme, 1870-1914', Univ. of East Anglia Ph.D. thesis, 1980
- H.Harris and M.Ellis, The Bude Canal, (Newton Abbot, 1972)
- R.M.Hartwell, 'The Services Revolution', in C.Cipolla (ed.), The Fontana Economic History of Europe, Vol.III (1973)
- G.R.Hawke, Railways and Economic Growth in England and Wales, 1840-1870, (Oxford, 1970)
- T.Hayter, The Creation of World Poverty, (1981)
- C.E.Hicks, 'Early banking in Brixham', T.D.A., LXXXIII (1951)
- R.W.Hidy, The house of Baring in American Trade and Finance, (Cambridge, 1949)
- A.O.Hirschman, The Strategy of Economic Development, (New Haven, 1959)
- J.E.Horsley, 'Shipping of the Port of Dartmouth in the 19th century', in S.Fisher (ed.), The South-west and the Sea, E.P.E.H. I, (Exeter, 1968)
- W.G.Hoskins, Devon, 2nd edn. (Newton Abbot, 1972)
- W.G.Hoskins, Industry, Trade and People in Exeter, 1688-1800, (Manchester, 1935)
- W.G.Hoskins, Two Thousand Years in Exeter, (Chichester, 1960)
- W.G.Hoskins and H.P.R.Finberg, Devonshire Studies, (1952)
- B.S.Hoyle and D.A.Pinder (eds.), Cityport Industrialisation and Regional Development, (Oxford, 1981)
- E.H.Hunt, 'Labour productivity in English Agriculture, 1850-1914', E.H.R., 2nd ser., XX (1967)
- E.H.Hunt, 'How mobile was labour in 19th century Britain?' in J.Porter (ed.) Provincial Labour History, E.P.E.H. VI, (Exeter, 1972)
- E.H.Hunt, Regional Wage Variations in Britain, 1850-1914, (Oxford, 1973)
- W.Isard, 'Notes on the use of regional science methods in economic history', J.E.H., XX (1960)
- E.L.Jones, 'The Agricultural Labour Market in England, 1793-1872', E.H.R., 2nd ser. XVII (1964)
- R.Jones, A Book of Newton Abbot, (Bradford-on-Avon, 1981)
- J.Kanefsky, 'Railway competition and turnpike roads in east Devon', T.D.A., CIX (1977)
- P.A.Kennedy, 'Devon Register of Motor cars and Cycles, 1903-5', in S.Fisher and W.Minchinton (ed.), Transport and Shipping in the Westcountry, E.P.E.H. VII (1973)
- J.Langton, Geographical Change and Industrial Revolution, (Cambridge, 1979)
- M.I.Lattimore, 'A study of Plymouth -A Survey of its Physical, Historical and Economic Geography', Exeter Univ. M.A. thesis, 1958

- R.Lawton,'Population changes in England and Wales in the later 19th century: and analysis of trends by registration districts', Transactions of the Institute of British Geographers, XLIV (1968)
- C.H.Lee, British Regional Employment Statistics, 1841-1971, (Cambridge, 1979)
- C.H.Lee, Regional Economic Growth in the U.K. since the 1880s, (Maidenhead, 1971)
- C.H.Lee,'Regional Growth and Structural Change in Great Britain', E.H.R., 2nd ser., XXXIV (1981)
- C.H.Lee,'Regional Structural Change in the long run -Great Britain 1841-71' in S.Pollard (ed.), Region und Industrielisierung, (Göttingen, 1980)
- R.Lethbridge,'The Bideford and Okehampton Railway of 1831', T.D.A., XXXIV (1902)
- W.A.Lewis, Growth and Fluctuations, (1978)
- A.Losch, The Economics of Location, (1967)
- G.H.Lowe,'The Bodley Ironfoundry 1860/1940', Exeter Univ. Dept. of Economic History, u/grad extended essay, 1969
- A.Jewell,'Some cultivation techniques in the South-west of England' in W.Minchinton (ed.), Agricultural Improvement: Medieval and Modern, E.P.E.H. XIV, (Exeter, 1981)
- E.W.Martin, The Shearers and the Shorn, (1965)
- P.Mathias, The First Industrial Nation, (1969)
- F.B.May,'The development of Ilfracombe as a resort in the 19th century' Univ. Wales (Bangor) M.A. thesis, 1978
- G.McCrone, Regional Policy in Britain, (1969)
- E.T.McDermott, History of the Great Western Railway, revised by C.R.Clinker, (Newton Abbot, 1973)
- F.Mendels,'Proto-Industrialisation: the first phase of the Industrialisation process', J.E.H., XXXII (1972)
- M.J.Messenger,'Bulkamore Iron Mine', D.H., XIV (1977)
- M.J.Messenger, North Devon Clay, (Truro, 1982)
- I.D.Merry, The Shipping and Trade of the River Tamar, National Maritime Museum Monographs and Reports, No. 46, 2 vols., (Greenwich, 1980)
- J.R.Meyer,'Regional Economics: a Survey', American Economic Review, LIII (1963)
- C.A.Miller,'Farming, farm Work and Farm Workers in Victorian Gloucestershire', (Bristol Univ. Ph.D. thesis, 1980)
- W.E.Minchinton (ed.), Capital Formation in South-west England, E.P.E.H. IX, (Exeter, 1978), Introduction
- G.E.Mingay (ed.), The Victorian Countryside, 2 Vols. (1981)
- B.R.Mitchell and P.Deane, Abstract of British Historical Statistics, (Cambridge, 1962)
- M.A.Morgan,'Devon and Cornwall -A Study in changing space relationships', (Cambridge Univ. Ph.D. thesis, 1956-7)
- M.A.Morgan, Historical Sources in Geography, (1979)
- M.A.Morgan,'South West England' in J.Mitchell (ed.), Great Britain. Geographical Essays, (Cambridge, 1962)
- D.F.Murch,'Trading Vessels of Salcombe Haven, 1820-90', in S.Fisher (ed.), Ports and Shipping in the South-west, E.P.E.H. IV, (Exeter, 1971)
- G.Myrdal, Economic Theory and Under-developed Regions, (New York, 1957)
- R.S.Neale,'The standard of living 1780-1844: a regional and class study', E.H.R., 2nd ser., XIX (1966)
- L.Needleman (ed.), Regional Analysis, (1968)
- R.Newton,'Victorian Exeter', (Exeter Univ. Ph.D. thesis, 1966)
- R.Newton, Victorian Exeter, (Leicester, 1968)
- D.C.North,'Location Theory and Regional Economic Growth', Journal of Political Economy, LXIII (1955)
- A.M.Northway,'The Devon Fishing Industry, 1760-1860', (Exeter Univ., M.A. thesis, 1969)
- P.K.O'Brien and C.Keydar, Economic Growth in Britain and France, 1780-1914,

- (1978)
- D.J.Oddy, 'Working Class Diets in late 19th century Britain', E.H.R., 2nd ser., XXIII (1970)
- B.Ohlin, Inter-regional and International Trade, (Cambridge, Mass., 1933)
- C.S.Orwin and B.I.Felton, 'A Century of Wages and Earnings in Agriculture', Jour. Royal Agric. Soc. England, XCII (1931)
- J.Parry-Lewis, Building Cycles and Britain's Growth, (1965)
- E.D.Parsons, 'Growing Up in Shamwick', D.H., XIX (1979)
- S.R.Parsons, 'The standard of living of the Working Class in the South-west of England during the industrial Revolution 1750-1850, with special reference to the county of Devon', (Exeter Univ., M.A. thesis, 1977)
- E.Pawson, Transport and Economy -the Turnpike Roads of 18th Century Britain, (1977)
- A.T.Peacock and J.Wiseman, The Growth of Public Expenditure in the U.K., 2nd edn. (1967)
- R.Pearse, 'The "Batten Castle" -the Account Book of a Small Home Trade Sailing Vessel, 1852-66', in S.Fisher (ed.), Westcountry Maritime and Social History; Some Essays, E.P.E.H. XIII, (Exeter, 1980)
- H.S.Perloff, E.S.Dunn, E.E.Lampard, R.F.Muth, Regions, Resources, and Economic Growth, (Baltimore, 1960)
- F.Perroux, 'Economic Spaces: Theory and Applications', Quarterly Journal of Economics, LXIV (1950)
- P.J.Perry, A Geography of 19th Century Britain, (1975)
- P.J.Perry, 'Working Class Isolation and Mobility in rural Dorset 1837-1936: a Study of Marriage Distances', Trans. Inst. of British Geographers, XLVI (1969)
- R.L.Pfister, 'External trade and regional growth: a case study of the Pacific North-west', Economic Development and Cultural Change, XI (1963)
- E.H.Phelps-Brown and M.H.Browne, A Century of Pay, (1968)
- F.Pilkington, Ashburton -the Dartmoor town, (Ashburton, 1978)
- S.Pollard, 'Industrialisation and the European Economy', E.H.R., 2nd ser., XXVI (1973)
- S.Pollard, 'Labour in Great Britain' in P.Mathias and M.M.Postan (eds.), Cambridge Economic History of Europe, Vol.VII, part I, (Cambridge, 1978)
- S.Pollard, Peaceful Conquest -the Industrialisation of Europe, 1760-1970, (Oxford, 1981)
- S.Pollard (ed.), Region und Industrielisierung, (Göttingen, 1980), Introd'n
- J.H.Porter, 'Peter Kropotkin on Devon agriculture', D.H., XVII (1978)
- L.S.Pressnell, Country banking in the Industrial Revolution, (Oxford, 1956)
- G.H.Radford, 'Plymouth China', T.D.A., XLIX (1912)
- E.G.Ravenstein, 'The Laws of Migration', J.R.S.S., XLVIII (1885), LII (1889)
- S.A.Resnick, 'The decline of rural industry under export expansion', J.E.H., XXX (1970)
- E.S.Richards, 'Structural Change in a Regional Economy -Sutherland and the Industrial revolution', E.H.R., XXVI (1973)
- H.W.Richardson, Elements of Regional Economics, (1969)
- H.W.Richardson, Regional Economics, (1969)
- R.C.Riley and J.L.Smith, 'Industrialisation in Naval Ports: the Portsmouth case', in B.S.Hoyle and D.A.Pinder (eds.), Cityport Industrialisation and Regional Development, (Oxford, 1981)
- E.A.Robinson (ed.), Backward Areas in Advanced Countries (1969)
- L.T.C.Rolt, The Potter's Field, (Newton Abbot, 1974)
- W.W.Rostow, The Stages of Economic Growth, (Cambridge, 1960)
- W.J.Rowe, The Industrial Revolution in Cornwall, (Liverpool, 1953)
- P.M.G.Russell, 'Notes on the Brixham fisheries', T.D.A., LXXXIII (1951)
- J.Rule, 'Regional Variations of Food Consumption amongst Agricultural Labourers, 1790-1860', in W.Minchinton (ed.), Agricultural Improvement - Medieval and Modern, E.P.E.H. XIV, (Exeter, 1981)
- J.Satterly, 'Memories of Ashburton in Late Victorian Days', T.D.A., LXXXIV (1952)

- J.Saville, Rural Depopulation in England and Wales, (1957)
- C.J.Schmitz, 'Capital Formation and Technological Change in South-west England metal mining in the 19th century' in W.Minchinton (ed.), Capital Formation in South-west England, E.P.E.H. IX, (Exeter, 1978)
- C.J.Schmitz, 'The early growth of the Devon barytes industry. 1835-75', CVI (1974)
- C.J.Schmitz, 'The development and decline of the Devon barytes industry, 1875-1958', T.D.A., CIX (1977)
- G.Sheldon, Trackway to Turnpike, (Oxford, 1928)
- A.H.Shorter, 'The Historical Geography of the Paper-making Industry in Devon, 1684-1950', T.D.A., LXXXII (1950)
- A.H.Shorter, W.L.D.Ravenhill, K.J.Gregory (eds.), South-west England, (1969)
- J.Simmons, 'Railway Competition in Devon and Cornwall', Journal of Transport History, IV (1959/60)
- J.M.Slader, Days of Renown -the story of mining on Exmoor, (Bracknell, 1965)
- D.M.Smith, Industrial Location, (New York, 1971)
- L.Smith, Devon Newspapers -a finding list, (Exeter, 1973)
- C.T.Smith, 'The movement of population in England and Wales in 1851 and 1861', Geographical Journal, CXVII (1951)
- K.D.M.Snell, 'Agricultural Seasonal Unemployment, the Standard of Living, and Women's Work in the South and East, 1690-1860', E.H.R., 2nd ser., XXXIV (1981)
- R.G.F.Stanes, 'Devon Agriculture in the mid 18th century: the evidence of the Milles enquiries' in M.A.Havinden and C.M.King (eds.), The South-west and the Sea, E.P.E.H. II, (Exeter, 1969)
- P.H.Stanier, 'The Copper Ore Trade of South-west England in the 19th century', Jour. Transport Hist., New Ser., V (1979)
- W.B.Stephens, 'An anatomy of illiteracy in mid-Victorian Devon' in J.Porter (ed.), Education and labour in the South-west, E.P.E.H. X, (Exeter, 1975)
- B.E.Supple, 'Income and Demand, 1860-1914', in R.Floud and D.N.McCloskey (eds.), The Economic History of Britain, 2 vols., (Cambridge, 1981)
- Survey Committee of the University College of the South West, Devon and Cornwall -A Preliminary Survey, (Exeter, 1947)
- D.Taylor, 'The English Dairy Industry, 1860-1930', E.H.R., 2nd ser., XXIX (1976)
- B.Thomas, Migration and Economic Growth, (Cambridge, 1973)
- D.St.John Thomas, A Regional History of the Railways of Great Britain. Vol.1 -The West Country, (Newton Abbot, 1966)
- I.Thornley, 'Aspects of 19th century Exbourne', T.D.A., CX (1978)
- W.H.Thornton, 'Concerning some old habits and decaying industries formerly prevalent in Devon', T.D.A., XXXIX (1907)
- C.Torr, Small Talk at Wreyland, 3 vols (Cambridge, 1918-23)
- B.Trinder, The Industrial Revolution in Shropshire, (1973)
- H.J.Trump, Westcountry Harbour, (Teignmouth, 1976)
- D.G.Tucker, 'The early years of hydroelectricity for public supply in Devon', D.H., XV (1977)
- T.A.Welton, England's Recent Progress, (1911)
- R.C.Whiting, The View from Cowley, (Oxford, 1983)
- H.B.Williams, History of the Plymouth and District Trades Council, (Plymouth, 1952)
- J.G.Williamson, 'Regional Inequalities and the Process of National Development: a description of the patterns', Economic Development and Cultural Change, XIII (1965)
- J.G.Williamson, 'The Structure of Pay in Britain, 1710-1911', Research in Economic History, VII (1982)
- G.H.Wood, 'Real wages and the Standard of Comfort since 1850', J.R.S.S., LXXII (1909)
- N.R.Wright, Lincolnshire Towns and Industry, (Lincoln, 1982)
- E.A.Wrigley (ed.), An Introduction to English Historical Demography, (1966)
- E.A.Wrigley and R.Schofield, The Population History of England, (1981)