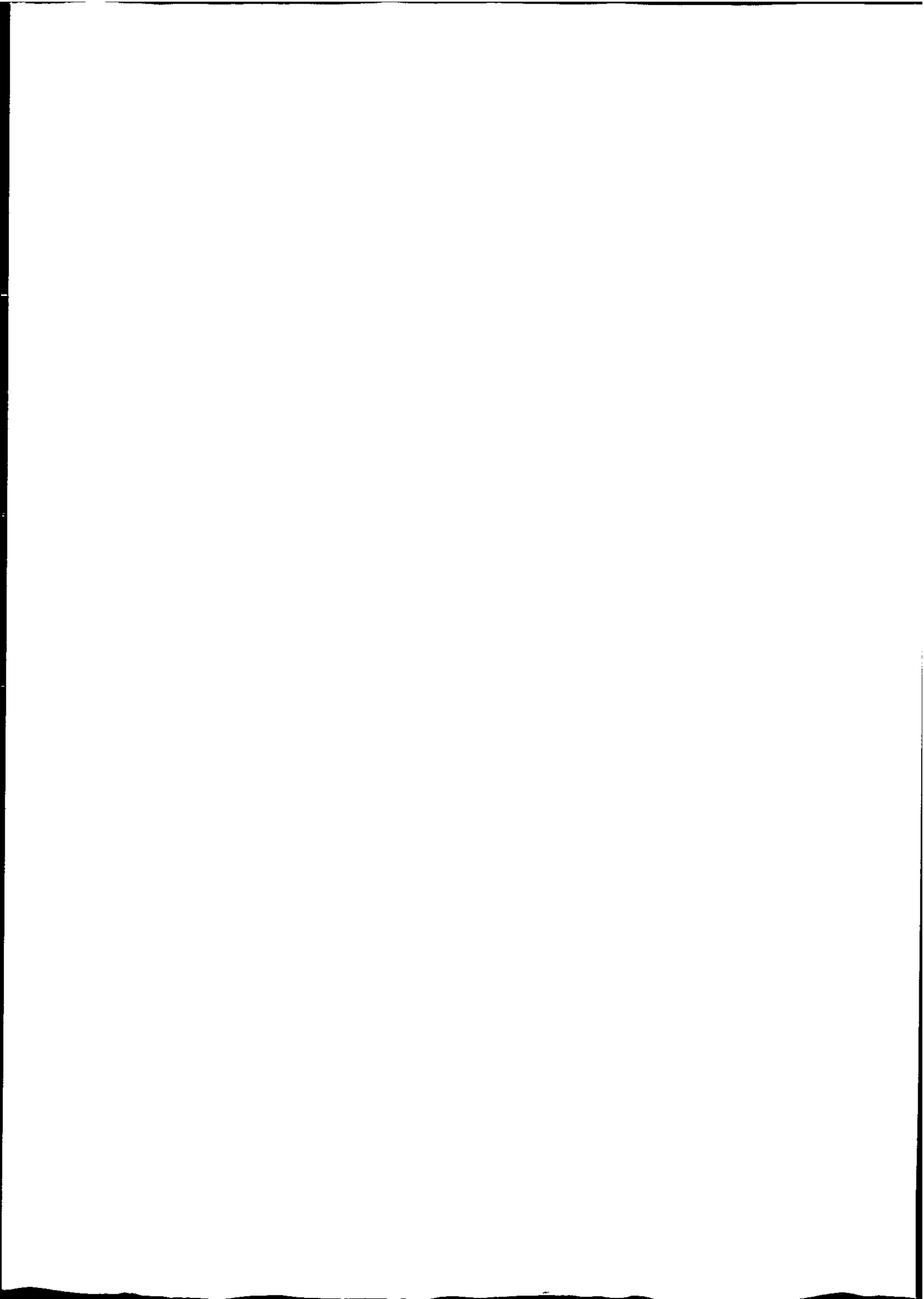


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MID-VICTORIAN PLYMOUTH:  
A SOCIAL GEOGRAPHY

V. F. T. POINTON

Ph. D. 1989

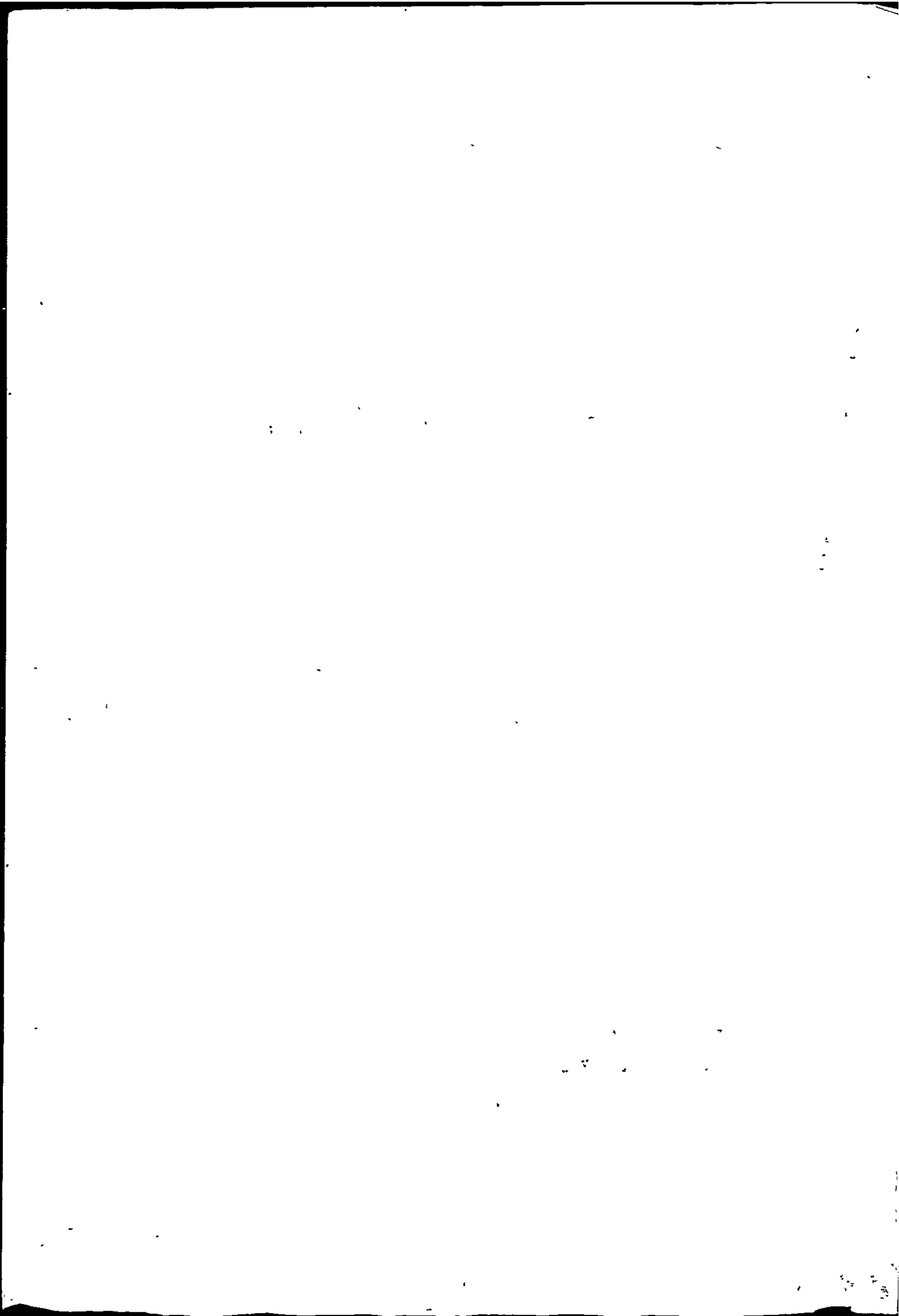


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MID-VICTORIAN PLYMOUTH: A SOCIAL GEOGRAPHY

Vivien Frances Turner Pointon BA MSc

A thesis submitted to  
the Council for National Academic Awards  
in partial fulfilment of the requirements for  
the Degree of Doctor of Philosophy

Sponsoring Establishment:  
Polytechnic South West  
Department of Geographical Sciences

May 1989

Abstract

MID-VICTORIAN PLYMOUTH: A SOCIAL GEOGRAPHY

by

Vivien Frances Turner Pointon BA MSc

In the 19th century, the two settlements of Plymouth and East Stonehouse grew and coalesced into one urban area. Natural population increase and in-migration both contributed to the rapid population growth which gave impetus to the urban expansion.

Analysis of the unpublished census manuscripts for 1851 and 1871 revealed clear patterns of distribution indicating segregation according to demographic, occupational and birthplace characteristics. There was severe overcrowding, population density was higher than that of mid-Victorian London and Liverpool, and the consequences for local public health and on the morphology of the urban area were substantial. Deprivation and poverty occurred not only in the older, cramped parts of Plymouth but also in newly-built housing areas, such as the demand for accommodation. This provided an impetus for suburbanisation.

Mid-Victorian Plymouth was a thriving, cosmopolitan trading port with a large fishing fleet and it was an important military and naval base. The town also served southwest Devon and southeast Cornwall as a market for local goods and produce. The local economy supported a wide-ranging employment structure, responding to infrastructural improvements, and provided a magnet for in-migrants primarily from rural Devon and Cornwall but also from many other parts of Britain and from Ireland. Women formed a greater than average section of the local population, the towns attracted country girls to work as domestic servants and, also, many women were temporarily deserted as their husbands' occupations took them away from home.

Principal component analyses show that, following a rapid phase of population growth in the 1840s and 1850s, the combined population of Plymouth and Stonehouse entered a period of slower growth when in-migration gave way to natural increase. The later phase is identified as a time of consolidation as in-migrants settled and the local economy prospered, the population became more integrated and homogeneous.

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## CHAPTER ONE: THE SOCIAL GEOGRAPHY OF MID-VICTORIAN PLYMOUTH:

### AN INTRODUCTION

#### 1.1 Mid-Victorian Plymouth: A suitable place for study

Historical geographers have contributed greatly to the understanding of the processes of growth and development which shaped the burgeoning towns and cities of Britain in the Victorian era. In recent years, case studies have revealed important new insights into the detailed mechanics of urban population growth, migration, residential segregation, and morphological change which occurred as towns rapidly shook off their pre-industrial character and contributed vitally to Britain's drive towards economic and industrial maturity. The list of individual towns already investigated is impressive, but while collectively these case studies have provided the foundations for general explanatory models, they have also revealed some intriguing differences.

Urban development in the 19th century was not a simple process and no two towns shared exactly the same experiences. The factors which influenced change seem to have operated with varying degrees of importance, and at different times, in towns which might justifiably be expected to have had comparable histories and displayed similar features. Moreover, the spotlight of research attention has been directed mainly towards towns and cities of the North and Midlands (Pearce & Mills, 1982), for example: Anderson on Preston (1971), Armstrong on York (1974), Lawton and Pooley on Merseyside (1976), Dennis on Huddersfield (1977), Shaw on Wolverhampton (1977), and Ward on Leeds (1980), while other important urban areas have been left in

the shadows. Studies of more British towns are needed, particularly of those in the South, in order to extend knowledge of Victorian urban experience.

A fundamental justification for undertaking this detailed study of Plymouth is simply to extend the depth of historical understanding of a hitherto neglected town. In addition, this study provides an analysis of the growth of a major 19th-century town. The investigation of the Victorian social geography of towns such as Plymouth enables the comparison of their structure and formative patterns to those prevailing elsewhere.

Nineteenth-century Plymouth has received very little attention to date from historical geographers (with the exception of Lattimore, 1958), and no work has drawn extensively on sources like the census and trade directories of the city, although there have been studies of specific aspects of the town's history by Walkowitz (1974) and Chiswell (1984). In consequence, little is known about the pattern of migration to Plymouth, its population growth, and its changing residential structure, and so it is impossible to say with any certainty whether the processes producing urban change elsewhere in Britain operated in the same way in this principal southwest town. A basic concern of this research, therefore, has been a careful, detailed reconstruction of the social geography of mid-19th century Plymouth, designed to promote comparison with the geographies of other towns and cities.

This research project has had three general aims: (1) to determine the underlying causes and consequences of Plymouth's population growth; (2) to examine the local operation of processes of change which have been identified elsewhere and which help to explain observed patterns (e.g. Ward, 1975; Lawton & Pooley, 1976; Pooley,

1978); and (3) to explore the spatial structure of mid-Victorian Plymouth and the changes in the distribution of social phenomena which occurred in response to the town's growth. Plymouth displays a number of atypical features as a study area which, though they may detract from its usefulness for drawing general conclusions, do, however, mean that established theories can be tested in a different context.

Plymouth today is an amalgam of the three towns of Plymouth, East Stonehouse and Devonport which were clearly distinct at the beginning of the 19th century (Plate 1A). During Victoria's reign, these towns physically (though not administratively) coalesced to form one large urban area which then expanded northward, enveloping other long-established independent settlements such as Stoke, Pennycross, and Compton Gifford. A glance at the published census data shows that Plymouth experienced quite spectacular population growth throughout the 19th century, and contemporary maps, as well as vestiges of the Victorian city which survived German bombing and post-war redevelopment, illustrate its physical expansion. The topography and location of Plymouth made it an important strategic base for a sizeable military and naval population, and also a significant dockyard; and while Plymouth was not as cosmopolitan as, say, London or Liverpool, the mix of its population was still quite exceptional. Plymouth was also an important fishing and emigration port and a central location for processing and exporting the mineral and agricultural produce of the Tamar valley and Dartmoor, while servicing the local rural communities with commerce and retailing.

Victorian Plymouth was relatively modest in size and remote from both London and the great industrial centres of the country, yet this thesis describes a town every bit as dynamic. The diverse internal structure of Plymouth distinguished it from other southwest towns,

Plate 1A: A plan of Plymouth, Stonehouse and Devonport, engraved by  
John Cooke in 1821.

1911

1911

1911

**REFERENCE.**  
**A PLYMOUTH**

- a 15th Street
- b 16th Street
- c 17th Street
- d 18th Street
- e 19th Street
- f 20th Street
- g 21st Street
- h 22nd Street
- i 23rd Street
- j 24th Street
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**Plan**  
**OF THE TOWNS & HARBOUR**  
**PLYMOUTH, STONEHOUSE,**  
**DOCK, MORICE TOWN,**  
**STOKE,**  
*and the Environs.*  
**IN THE COUNTY OF**  
**DEVON.**



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making it a fascinating subject for study. The documentary evidence is sometimes obscure, sometimes abundant. This thesis does not rely exclusively on statistical data but also uses a variety of contemporary sources, including some autobiographical information, which illuminate the rich and lively mosaic of Victorian urban life. A city is created by its inhabitants and it is with the people of Plymouth that this thesis is primarily concerned, and to whom it must be dedicated.

The starting point for a social geography of a 19th-century town, however, must be the census, and from this, the patterns of population growth in Plymouth are identified to form the exposition of this thesis. After a review of available sources and methods employed in their interpretation and analysis (Chapter Two), the vital characteristics of Plymouth's mid-Victorian population are examined in Chapter Three - it was necessary to establish this basic information before more complex questions could be investigated. The size and importance of the migrant population warranted separate treatment and, therefore, a whole chapter (Four) is devoted to the birthplace structure of the population. Chapter Five is concerned with the morphology of the town, and it will be seen that this both influenced and was influenced by the growing population; it was also inextricably linked with the local employment structure which is explored in Chapter Six. Women made an important contribution to the economy of 19th-century Plymouth and, more generally, to its overall social geography; in consequence an individual chapter (Seven) considers specifically female issues. Overcrowding and public health were common concerns in Victorian towns and cities and the impact, especially, of the 1849 cholera outbreak is discussed in Chapter Eight. Finally, the sometimes diverse threads of this complex social

geography are combined in principal component analysis (Chapter Nine) which concludes this thesis.

## 1.2 Previous studies of Victorian cities:

Over twenty years ago, Dyos (1966) noted a renaissance in the study of Victorian towns commencing with Chaloner's study of Crewe (1950) and Gill and Briggs' work on Birmingham (1952). Historians dominate the earlier post-war literature, but in the 1960s the concept of social space and social distance, an offspring of the human ecology school under Robert E Park in Chicago, came to the fore in urban historical analysis. By 1979, R J Dennis could report that 20 percent of entries in the Register of Research of the Institute of British Geographers' Historical Geography Research Group were concerned with 19th-century towns and cities.

Scholarly works using the Victorian censuses may be divided into two broad groups: those dealing with published data, mostly on a national scale (Law, 1967; Lawton, 1967, 1968), and those employing the unpublished manuscripts for locally-based studies. Although, sometimes, individual studies may belong equally to both groups, the division provides a useful guide to the development of research in this field. The release of the mid-19th century enumerators' books only after a hundred years has passed, and the application of computers for analysis, have meant that the latter group of texts, which draw heavily on the manuscript returns, necessarily date chiefly from the 1960s. Indeed, in the last twenty years there has

been a massive increase in small-scale investigation and there is now a very large collection of work - books, articles and theses - for the researcher to consult. Pearce and Mills (1982) compiled a useful "annotated bibliography of published work based substantially on the 19th century census enumerators' books" which has proved helpful in this study.

While a number of writers have studied general population trends (Lawton, 1955, 1962; Sheppard, 1962; Osborne, 1970; Bryant, 1971; Kuchemann, Boyce & Harrison, 1973), running through this wealth of work are certain specific themes growing from a handful of pioneering studies such as those of Booth on the classification of occupations, and Ravenstein on migration. Histories of demography (e.g. Grebenik, 1959) recognise William Farr, who was the compiler of abstracts in the General Register Office from 1837 to 1877, not only as the prime mover in establishing the British system of census-taking and the collection of vital statistics, but also as a substantial contributor to demographic methodology. These important Victorian authorities have provided the foundations for demographic study and have been followed by such outstanding contributors as Armstrong, Anderson, Redford, Lawton, Wrigley, Dyos, and Ward, to name but a few. A list of key publications by these authors is included amongst other references at the end of this thesis.

Ravenstein (1876, 1885, 1889) established a general theory of migration so comprehensive that little has since been added; in many ways, Lee's work (1966) is a good example of how later research has simply reworked these original laws in the light of subsequent work (for example: Stouffer, 1940, 1960). Grigg (1977) provides a review of Ravenstein's work and a useful bibliography showing how different studies have contributed to the understanding of each of the laws.

Literature on migration comprises overall studies of national trends (Redford, 1926; Cairncross, 1949; Smith, 1951; Friedlander & Roshier, 1965-6), and detailed examinations of specific villages, towns and cities or sub-regions (Shannon, 1935; Darby, 1943; Lawton, 1958). In addition, there are many works on particular migrant groups, such as the Irish (Lawton, 1959; Dillon, 1973; Pooley, 1977).

More recently, using the more detailed unpublished census manuscripts from the mid-19th century, authors have been able to study the mechanisms of migration in much greater detail and to relate population movement to other census variables such as occupation (Harrison, 1973; Sill, 1979), family status (Anderson, 1971), household structure (Constable, 1977), or general demographic characteristics (Dennis, 1977a). The social aspects of migration have also been discussed with regard to the perception and behaviour of migrants (Wolpert, 1965; Clark, 1976), and White (1980) attempted a synthesis between what he termed 'objective' and 'cognitive' philosophies. Specialised areas of research have emerged such as intra-urban residential mobility (Katz, 1976; Pritchard, 1976; Dennis, 1977b; Pooley, 1979) and residential segregation; especially noteworthy are the contributions of Ward (1975) and Cannadine (1977), and the debate in between Carter and Wheatley, Dennis, and Shaw (1980). Attempts have also been made to assess inter-censal migration by Friedlander and Roshier (1965), Baines (1972) and Dennis (1977b). Migration studies based on census data alone are many and varied yet other sources, such as birth registers (Gant, 1977) and rate books (Holmes, 1973), have provided valuable information on population movement.

The study of the 19th-century city is the concern of historians, sociologists and political scientists as well as geographers; Johnson

and Pooley (1982) distinguish the work of geographers from that of social and economic historians (Neale, 1972; Gauldie, 1974; Anderson, 1976; Kellett, 1978). Geographers have concentrated more on the spatial aspects of Victorian urban development, often using a smaller range of sources, though some historians have also adopted a spatial approach (Cannadine, 1977; Daunton, 1977).

The pioneering work of the Chicago social ecologists provided a basis for more detailed discussion of urban structure (Cannadine, 1977; Dennis, 1977a; Shaw, 1977; Carter & Wheatley, 1977, 1978; Ward, 1980); the significance of this work throughout the 1970s is underlined by the publication in 1982 of The structure of nineteenth-century cities, edited by Johnson and Pooley. In an extensive review of 19th-century urban research, they recognised that 20th-century urban models and techniques have been applied to Victorian cities in social area analyses based mainly on census enumerators' books (e.g. Cowlard, 1979). Dennis (1984) echoed this observation and suggested that such studies are more 'urban' than 'historical', therefore benefiting geographers and sociologists more than historians. Thus Daunton (1980), an historian, advised "Less time reading Sjoberg, Burgess et al. and more time reading about the cities being studied..." Johnson and Pooley (1982) sought to further "the cross-fertilization of ideas between scholars from different disciplines" and identified three themes in the study of the internal structure of British towns and cities: physical structure, the urban economy, and urban social structure.

Dennis (1984) recognised evolutionary aspects of models of contemporary urban structure (based on Burgess, 1925, Wirth, 1938, Shevky & Bell, 1955, and Sjoberg, 1960). The assumption of the transitional, evolving city is at the base of many substantial studies

such as Lawton & Pooley (1976) or Carter & Wheatley (1982). Dennis (1975, 1984) maintains that social area analysis produces too restricted a view of the social geography of Victorian cities. A model of urban growth based on economic criteria, chiefly friction of distance, spatial diffusion patterns and local multiplier effects, was propounded by Robson (1973), while Whitehand (1972, 1977) applied micro-economic theory to spatial and temporal patterns of urban development.

Increasingly complex techniques have been employed to analyse the available material, in particular, factor analysis (Goheen, 1970; Warnes, 1973; Lawton & Pooley, 1976; Shaw, 1977, 1979; Rowland, 1982) which superseded social area analysis, although sufficient census data for its use is available only from 1841 onwards. The interpretation and use of census data on occupations has proved one of the more contentious areas of investigation, notably with regard to the seminal work of Armstrong (1972a). The complexities of this debate are such that they warrant a fuller examination and are, therefore, discussed in Chapter Two of this thesis where the use and interpretation of various historical data sources for social geographic study are reviewed. It may be noted here, however, that several authors have made studies of particular occupational groups such as iron workers in Cleveland (B J D Harrison, 1979), nailers in the West Midlands (Hopkins, 1977), and dockworkers in Sheerness (Buck, 1981).

The range of studies based on 19th-century data is extensive, building a very detailed and multi-disciplinary picture of urban life in Victorian Britain. The census has been used more generally in conjunction with other contemporary sources by Tranter (1973a), Saito (1979), and others, while Gordon (1979) carried out a social area analysis using rate books. Significant work on the commercial and

retail structure of towns has been done by Scola (1975) and Wild and Shaw (1974, 1979), for example. Anderson (1971, 1976) and Laslett and Wall (1972) have contributed particularly to knowledge of family structure in the 19th century. Studies of urban physical morphology have been published by Conzen (1960), Carter (1965), Whitehand (1978), and Fox (1979). A comprehensive economic survey of British transport was made by Dyos and Aldcroft (1969), while Kellett (1969) investigated the impact of railways on Victorian cities. Dyos also considered the more aesthetic aspects of Victorian life culminating in the classic publication (in co-editorship with Wolff) of The Victorian City (1973).

In tandem with the development of theory and method and the extension of understanding of the processes that governed 19th-century population, an expanding gazetteer of towns and cities has been investigated individually and in great detail. Chief among these is Liverpool, its population and structure having been most thoroughly examined by Lawton and Pooley whose work provides an excellent standard for others to follow (notably, the SSRC Final Report (1976)).

Other places ably studied include London (Shannon, 1935), York (Armstrong, 1967), Chorley (Warnes, 1970), Preston (Anderson, 1971), Huddersfield (Dennis, 1977), and Wolverhampton (Shaw, 1977, 1979), and comparative studies have been made of Welsh towns (Carter, 1980), and Leicestershire towns (Royle, 1979-80), for example. Tillott (1968, 1969) has also provided a framework for the analysis of census enumerators' books which has since been used by Brown (1970), Stuart (1973), Breeze (1976), and Constable (1977), and Lawton (1978) provided a definitive guide to the use of census data.

Finally, it may be noted that there have been six local histories of Plymouth since the mid-19th century, those of Worth (1872) and

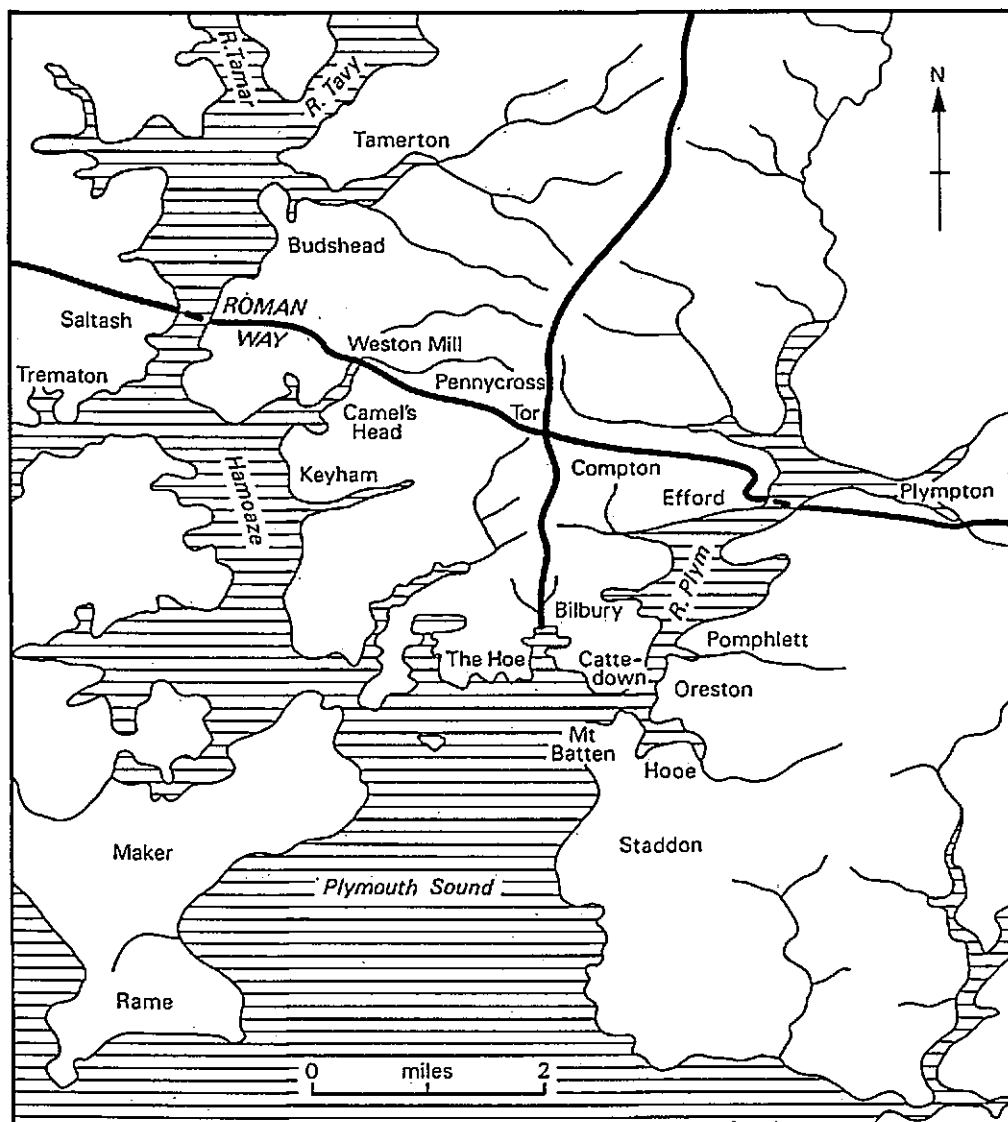
Jewitt (1873) may be regarded as contemporary accounts of the time, similarly, Whitfield's (1900) account of the town in war and peace. Bracken (1931) drew heavily on newspaper articles, Walling reworked the subject in 1950, and more recently, journalist Crispin Gill (1966, 1979) has published his two-volume history. This thesis is the first extensive analysis of the census data for Plymouth and, notwithstanding Lattimore's unpublished MA dissertation (Exeter, 1958), it is the most detailed geography of the mid-Victorian town yet to be written.

### 1.3 Plymouth's early growth

Plymouth is inextricably connected in public consciousness with Sir Francis Drake and the Spanish Armada, the Pilgrim Fathers and the Mayflower. The history of the city has been dominated by the sea, like that of other coastal cities such as Liverpool or Bristol. Plymouth is the first major port encountered in the western approaches and is geographically remote from much of the rest of Britain. It is more than two hundred miles west of London and 120 miles west of Bristol - even Exeter is 45 miles distant - and this relatively remote situation is reflected in the city's history.

The natural shelter of Plymouth Sound enclosed between two headlands, and the peninsula bounded to east and west by the River Plym and the Hamoaze, made the area a prime location for settlement and development as a port and military base (Figure 1.1). Yet these physical advantages became a constraint on the territorial expansion of the town in the 19th century as land for building became scarce,





**Figure 1.1:** The original coastline. The present day roads still closely follow the Bronze Age routes. Source: Gill, 1966.

and the hilly terrain, deeply dissected by streams and inlets, was not always suitable for development. All the ingenuity of contemporary technology was needed to overcome natural constraints and build on extremely difficult sites.

Plymouth's origins can be placed in Saxon times although there is evidence of Bronze Age activity in the area. Its role as a seaport was established in the mid-12th century with the export of Dartmoor tin and at the end of the 13th century Plymouth became a naval port. The young town was granted its charter in 1439. The construction of the Royal Dockyards on the eastern bank of the Tamar in the 1690s marks the beginning of Plymouth's modern geographical development. Between Plymouth town and Plymouth Dock (renamed Devonport in 1824) lay a slim promontory which was originally settled by the Saxons, from which time dates the name East Stonehouse. The land passed through the hands of various landowners and was linked to another settlement, across the Hamoaze in Cornwall, called West Stonehouse (hence the prefix 'East' which lasted, unlike its counterpart, into modern times).

During the 17th and 18th centuries the three towns of Plymouth, Stonehouse and Dock continued to grow, despite the hardships caused by the Civil War and the Napoleonic Wars. Defences, strengthened earlier with the building of the Royal Citadel on the east Hoe, were now augmented with a ring of forts outside the town, and barracks in Dock and East Stonehouse. Increasing trade brought the steady expansion of commercial life; the town was a gateway for the produce of the Tamar valley, and the fishing ports of west Devon and east Cornwall. Exports included tin, lead and woollen goods, and imports, coal and grain from elsewhere in England, wine, salt, sugar and iron ore from Europe, and later tobacco, coffee, cocoa, cotton and spices from the

West Indies. Marine brokers, insurance agents, bankers and other businessmen were able to establish prosperous enterprises. Economic growth was not, it must be said, so substantial as that experienced in the same time by Liverpool and Bristol, and successive wars interrupted Plymouth's commercial expansion. Trade was sufficient, though, to make Plymouth one of half a dozen or so principal ports in Britain, at a time when the nation was entering the most influential era in her history with the onset of the Industrial Revolution and in anticipation of imperialist power and influence.

By the beginning of the 19th century Plymouth was a firmly established port, military and naval base, regional market and commercial centre (Plate 1B); social and cultural life blossomed under the cosmopolitan influence of international communication. The three towns thrived independently, still physically and politically separate, and their combined population had reached over 43,000 by 1801.

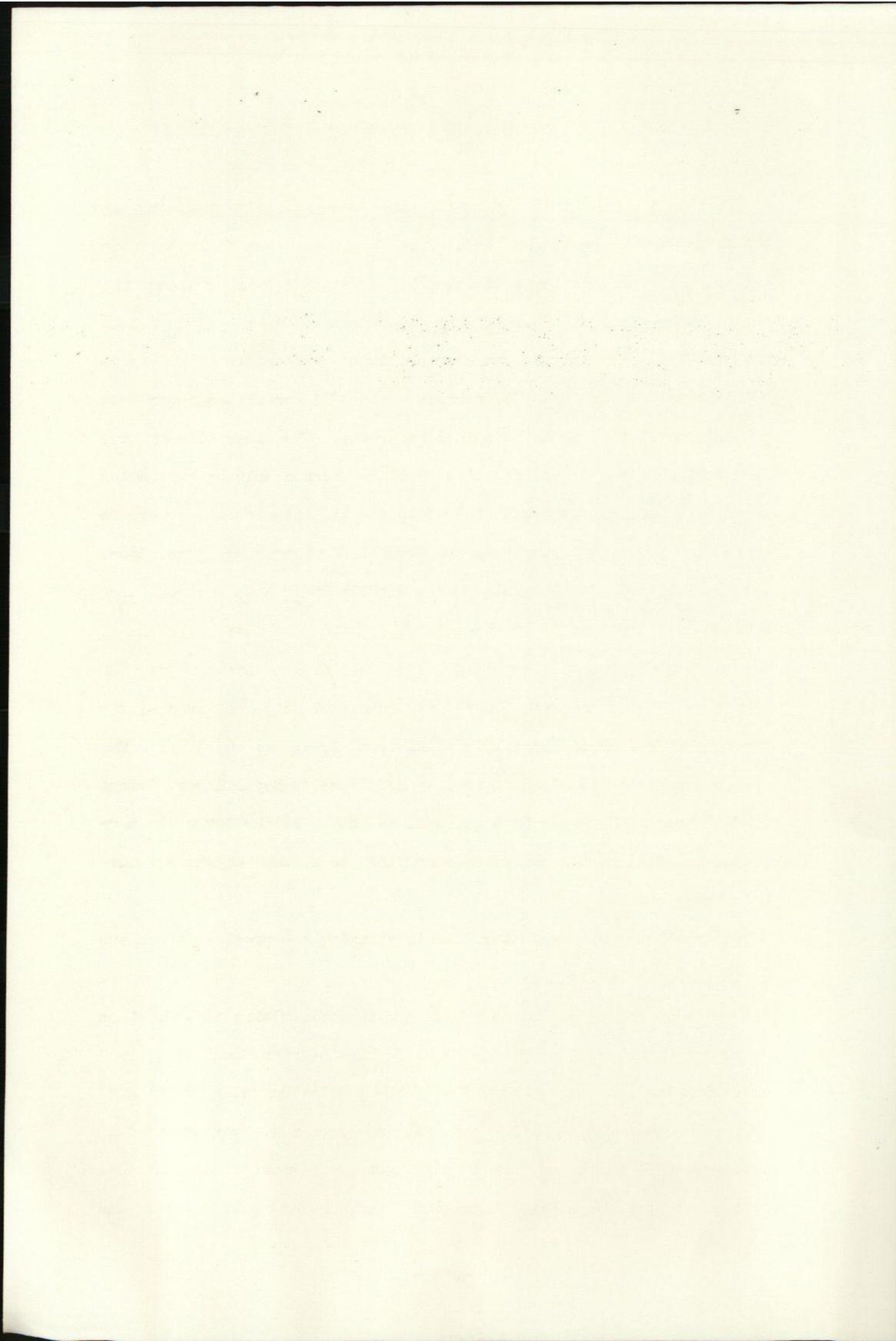
#### 1.4 An introduction to Plymouth's 19th-century social geography

Throughout the 19th century the three towns of Plymouth, East Stonehouse and Devonport all experienced rapid population growth, which together amounted to 347 percent between 1801 and 1901, and rising to 193,184 inhabitants. Much of this expansion was the product of in-migration, but there was also a substantial contribution from natural increase. Population growth was not steady, however, and there were four distinct peaks of growth as the economic fortunes of both town and nation fluctuated, occurring in the intercensal years

Plate 1B: The Barbican, Plymouth, c1865. The fishermen brought their catch ashore here. The decrepit premises of King's Eating and Boarding House were demolished soon after this photograph was taken by T F K Rives.







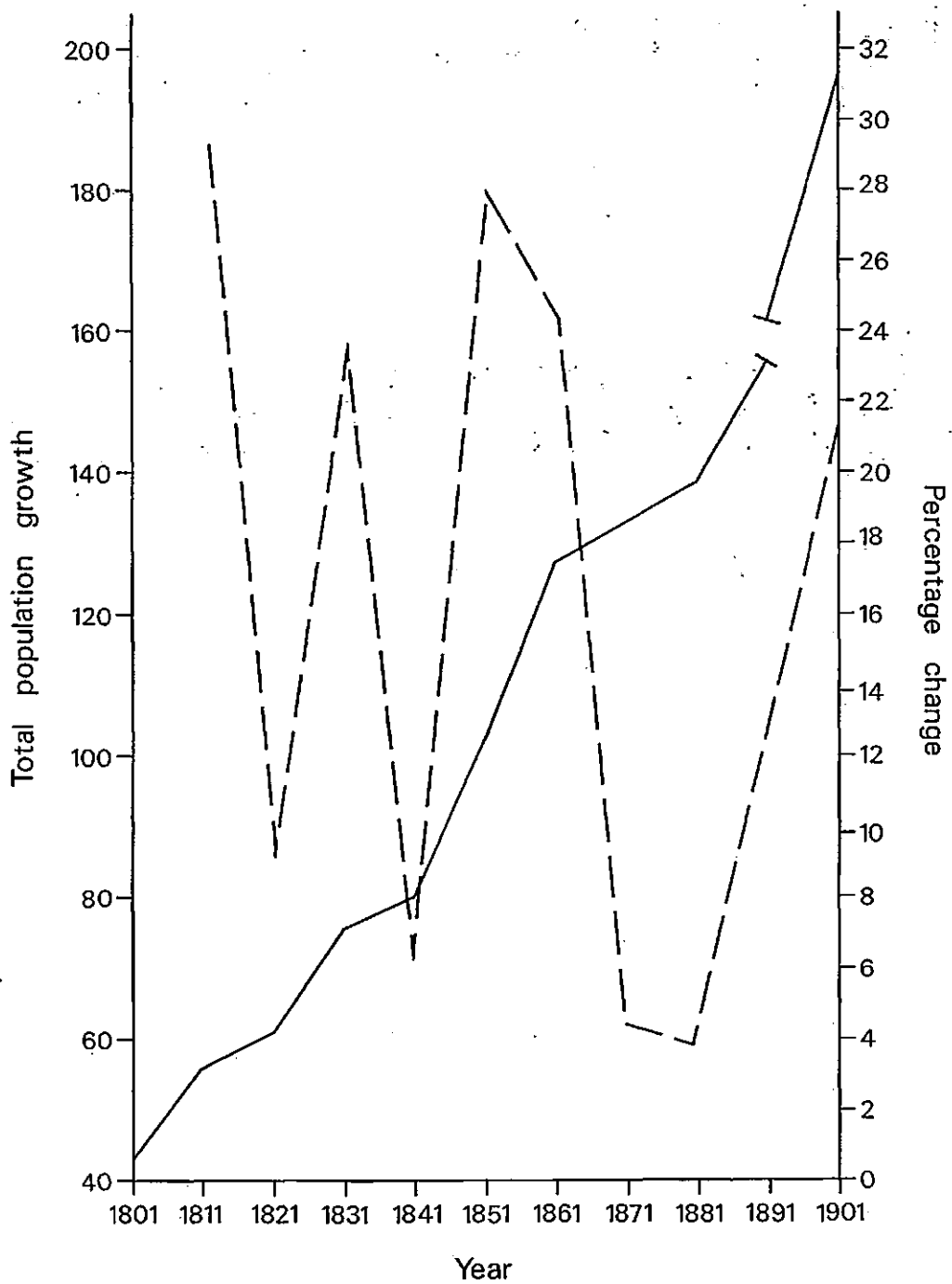
1801 to 1811, 1821 to 1831, 1841 to 1861, and 1881 to 1901 (Figure 1.2).

For this thesis detailed research has been concentrated on the third of these peaks and the decline in growth which followed, with extensive analysis of the 1851 and 1871 censuses. The reasons for this choice were the poor quality and sparsity of data prior to 1851 and the 100-year privacy rule prohibiting access to the census enumerators' books from 1891 onwards; the 1881 census books were not released until the project was well under way. The sheer size of the undertaking meant that attention could be focused only on two census years; the 1871 census was preferred to the 1861 census in order to extend the period of study over two decades, or nearly one generation. This period saw major extensions of the built-up area as several large estates were released to speculative building. Also the naval dockyards were growing rapidly with the Keyham Steam Yard in Devonport, built between 1844 and 1854, closely followed by the development of the commercial Great Western Docks at Millbay. The railway arrived in Plymouth in 1849 and Brunel's Royal Albert Bridge took it across the Tamar into Cornwall in 1859. By the 1870s the town centre had been partly redeveloped and the town was expanding into neighbouring rural parishes.

Two problems were encountered in identifying the precise dimensions of the area to be studied:

- (1) a total study population of 102,380 in 1851, rising to 132,867 in 1871, was regarded as too large to allow the in-depth work required, necessitating some circumscription of the population under study; and
- (2) the growing population of forces personnel, concentrated in Devonport with a strong naval contingent, introduced an atypical uniformity in population structure influencing both social and





- | — Boundary change between 1891 and 1901 censuses
- — Percentage change
- Total growth

**Figure 1.2:** The growth of Plymouth, East Stonehouse and Devonport, 1801-1901, and the percentage population change between censuses. Based on the published census data.

economic aspects of the District.

The choice lay between concentrating in-depth analysis on the impact of the forces in Devonport and the growth of the naval dockyard, or looking at the development of Plymouth proper - at that time a more distinct, separate town with a more diverse economic and social base, but which also contained several military establishments. It was decided to concentrate on Plymouth, including the small town of East Stonehouse which was becoming geographically contiguous with Plymouth by the mid-19th century.

The analysis of published census data revealed a fast-growing population and fluctuating pattern of migration, and examination of the census enumerators' books indicated changing patterns of distribution. Consequently, further investigation sought to determine reasons for different patterns of distribution within the towns, with particular regard to population density, and occupational and birthplace status. A study was made to establish the migrant field of the towns and the relationship between the origins and characteristics of in-migrants and the distance they travelled. More specific aspects investigated included evidence of intra-urban migration, the evolution of the urban morphology, the economic structure of the towns in terms of local employment opportunities, the effect of overcrowding and disease in relation to local health legislation and town improvement, and the contribution made by women to the local economy. Since this research project sought to investigate the hitherto neglected Plymouth censuses, it was perhaps inevitable that aspects of the towns' growth and their indigenous and migrant populations should demand more detailed examination. Finally, it was possible to proceed towards principal component analyses and thereby identify and summarise the major elements in the evolving social geography of mid-Victorian Plymouth and Stonehouse.

## CHAPTER TWO: SOURCES AND METHODOLOGY

### 2.0 Introduction

The present-day City of Plymouth encompasses the three once-distinct towns of Plymouth (based on the old settlement of Sutton, now preserved in the Barbican district), East Stonehouse, and Devonport (known as Dock prior to 1824), and also a number of former villages such as Plympton, Plymstock, Eggbuckland and St Budeaux. In the 19th century the three towns were contained within the Registration Districts of Plymouth, East Stonehouse, and Stoke Damerel which together comprised eight Registration Sub-districts (Figure 2.1), and while there was a minor boundary change between the 1861 and 1871 censuses, these divisions are broadly comparable throughout the mid-century study period. Plymouth District was divided into two Sub-districts: Charles the Martyr (sometimes locally referred to as Charlestown), and St Andrew, which contained the older part of the town. East Stonehouse was treated as a single Sub-district by the census authorities.\* The thesis study area thus contains two Registration Districts (the towns of Plymouth and East Stonehouse), or three Sub-districts comprising 51 enumeration districts in 1851 rising to 59 in 1871 following boundary changes (see Figure 2.2). Enumeration district boundaries were drawn from written descriptions in the census manuscript books using contemporary street maps.

\* The District of Stoke Damerel was more complex, combining three Sub-districts within the fortifications of Devonport (St Aubyn, Clowance and Morice) and a further two Sub-districts (Stoke and Tamar) beyond the fortified area.

## Registration Districts and Sub-districts in mid-19th century Plymouth

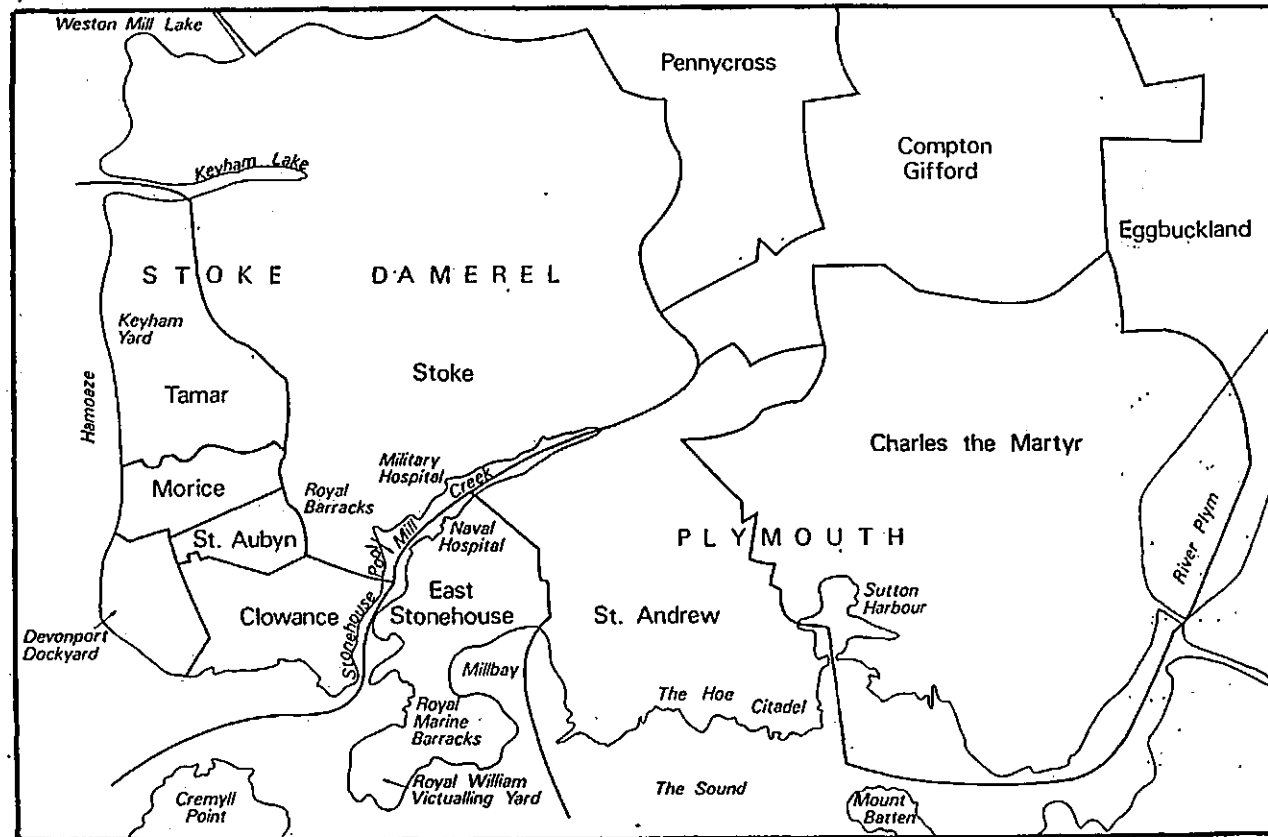
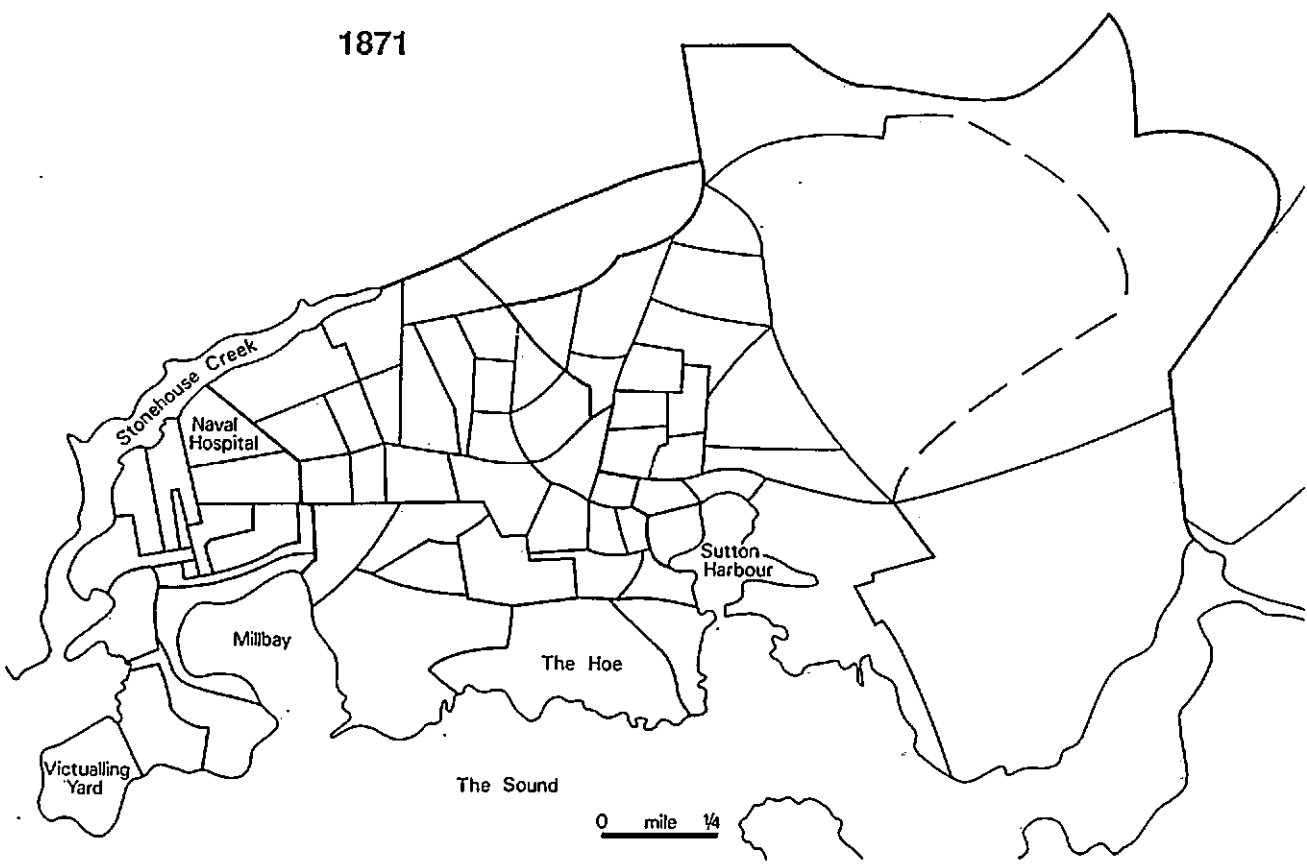
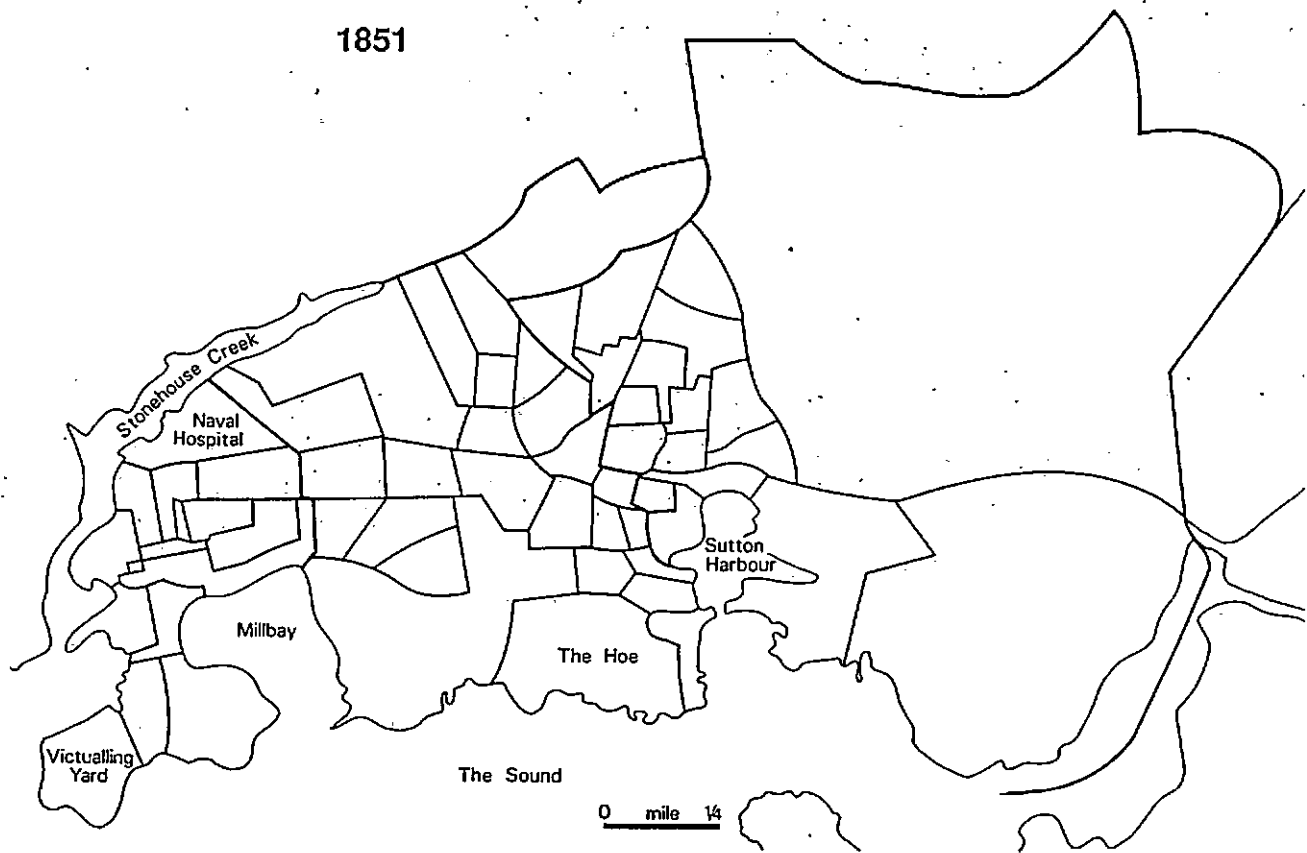


Figure 2.1: Plymouth Registration District was divided into two Sub-districts (Charles the Martyr and St Andrew); East Stonehouse Registration District was not sub-divided. Beyond lay Stoke Damerel Registration District and the parishes of Pennycross, Compton Gifford and Eggbuckland.



**Figure 2.2:** The enumeration districts of Plymouth and East Stonehouse in 1851 and 1871. (A large area to the north east comprised mostly open land; the broken line across this area in 1871 follows an imprecisely described boundary.)

The principal data source is the census and there are a number of authoritative works on its use (Armstrong, 1966, 1968; Dyos & Baker, 1968; Wrigley, 1972; Lawton, 1978). Standard approaches to census analysis are now fairly well established, thereby providing the advantage of comparability between studies. Familiar techniques, used across the disciplines of demography, geography, economics, history and sociology, differ only in the emphasis put on their results. Since this study sought to determine the population characteristics and attendant processes prevailing in mid-Victorian Plymouth, accepted methods of census analysis were employed.

In addition to the manuscript census returns for the years 1851 and 1871, reference has been made in this study to the published abstracts for other census years in order to set these two census years into perspective. All other data sources may be regarded as supplementary to the census providing additional information to explain particular questions arising from the census analysis. The various data sources and the way in which they were employed will be reviewed; in addition to the census, these include directories, published reports, rate books, newspapers, maps, photographs, and contemporary accounts.

#### 2.1.0 Review of sources

The documentary sources available to the historical geographer researching Victorian society have been identified and summarised by Pooley (1980, 1982) and are listed in Table 2.1. Examples of all of these sources have been used in this research project, but in addition, several important contemporary accounts have been studied,

TABLE 2.1: DOCUMENTARY SOURCES FOR SOCIO-HISTORICAL ANALYSIS (adapted from Pooley, 1980, 1982)

SOURCE	TEMPORAL COVERAGE	SPATIAL COVERAGE	USAGE PROBLEMS	CONTENTS AND USE	PLYMOUTH SOURCES
Published census	decennial from 1801	complete by various administrative units	classifications and spatial units change	population totals (inc. age, sex, occupation, origin by 1841); population structure, migration, etc.	various abstracts from 1801 to 1901
Unpublished census enumerators' books	1841, 1851, 1861, 1871, 1881	almost complete; individual data by enumeration district	legibility, coding & classification, size of data set	individuals' age, sex, marital status, address, occupation, birthplace; population analysis: social, economic, etc.; density, migration, etc.	extensive analysis of 1851 & 1871 books, reference made to 1841 & 1861 books
Registrar Generals' reports	quarterly & annually from 1838	complete by registration districts & sub-districts	classifications change	births, marriages and deaths by age, sex & cause; mortality, fertility, health	various
Medical Officers' of Health reports	usually annually from c.1848	most towns; data for various small areas	interpretation of descriptive & statistical material	mortality data for small areas; health, housing, living conditions	Odgers and Rawlinson reports
Parliamentary Papers	throughout 19th century	various	location of relevant local material, and interpretation of descriptive material	health, agriculture, industry, migration, housing, living conditions, etc.	various
Ratebooks	various	some survive for most towns; individual properties by street	legibility, inaccurate entries, size of data set	housing quality, tenure, occupational structure, residential mobility	books for 1869 & 1871 have survived
Directories	various	most counties and towns; individual data by street	incomplete/selective enumeration	occupational, commercial & industrial structure, residential mobility	many available for Plymouth & Devon, see Bibliography
Newspapers & magazines	throughout 19th century	complete (local & national)	location of relevant material, size of data set	almost any topic	listed in text
Maps	various	various	interpretation, assessment of accuracy	land use, settlement, infrastructure, urban & industrial development	good series available, see Bibliography

together with a fine collection of local photographs which provide invaluable qualitative detail. Indeed, there is a rich supply of 19th century source material relating to Plymouth and its very abundance creates the need for selectivity; Pooley's (1980) warning that there is a problem in "assessing and interpreting the vast available array of subjective contemporary descriptive material" proved especially relevant in this study.

The Victorians collected data at a variety of spatial scales which sometimes limits their use and makes comparisons difficult with regard to population information, but this is not an insuperable difficulty. However, crucial to the ultimate value of any historical research is the reliability of the evidence upon which it is based; most difficulties generally arise from lack of knowledge about the accuracy of 19th-century documentary sources, and it is errors in the original data which have caused most debate (Dunlop, 1916; Derrick, 1927; Glass, 1951; Teitelbaum, 1960; Robertson, 1969; Tillott, 1972).

Hollingsworth (1968) identifies the inherent problem: "Historical demography... deals with unique sources which can never be improved".

It is a pertinent warning; there is a limit to the extent of statistical and mathematical application which may be employed. It would be wrong to assume the data to be perfect - human error and oversight are inevitable drawbacks - or to rely upon means of correcting imperfect data. Yet with these reservations in mind, instructive and important indications of population structure and change can be obtained. Sometimes apparent discrepancies can be checked against other information, though the authenticity and reliability of the latter may be even more doubtful than the census.

But the deficiencies in 19th-century documentary sources should not be allowed to overshadow their value; individually they may be



imperfect, collectively their wide range of information enable the discovery of a comprehensive and detailed history.

#### 2.1.1 The census

"The usual conception seems to be that a rather seedy stranger drops a curiously complicated paper... containing certain foolish, certain other impertinent, and other again unintelligible and futile questions... your inmost family details unsympathetically perused..." (Baines, 1900)

Censuses provide a regular time-series of broadly comparable data and are, therefore, a sure foundation upon which to construct the pattern of change in a community. As the principal data source for the 19th century, the census has attracted a good deal of comment and discussion, and numerous writers have sought to clarify its uses and analysis, problems and limitations. Baines' address to the Royal Statistical Society in 1900 was much concerned with the practical aspects of census-taking, recommending the establishment of a permanent census staff; his paper was timely in that it followed a century's experience of the census.

Fifty years later A J Taylor reviewed the history of census-taking in the United Kingdom in the British Medical Journal, noting that the modern census was first proposed in Parliament in 1753; he suggests that it was finally accepted in 1800 in the light of Malthus' Essay on the Principles of Population (1798). Further impetus came with the foundation of the Statistical Society of London in 1834 (later the Royal Statistical Society) "whose criticism and advice from 1840 onwards largely influenced the form and scope of the census" (Taylor,

1951). While the early censuses were not ineffectual, it was in the 1830s, when the system of civil registration was established and linked to the census, that it became possible

"...to observe more closely the trend of vital statistics, to trace the connexion between housing, sanitary and industrial conditions and the incidence of disease..." (Taylor, 1951)

This point is reiterated by Lawton (1978) who identifies four distinct phases in the study of population in British history: (1) the period before the first census of 1801; (2) the first four censuses 1801-1831; (3) the time immediately following the creation of the Registrar General's Office in 1837 and the first 'modern-style' census of 1841; (4) the latter half of the 19th century from the 1851 census (Figure 2.3) with "more precisely formulated questions" and the adaptation of Registration Districts and Sub-districts as the basic areal framework (the census was not substantially altered again until 1911).

Thus it has been the 1841 census which has marked a starting-point for detailed demographic analysis. It was the first to be administered by the Registrar General's Office using a standard printed household schedule; the details were then consolidated in enumerators' books and tabulations abstracted in published reports. The range of information collected was extended considerably on occupations and birthplaces.

"This enumeration paved the way for the even more ambitious mid-century survey, which afforded evidence on marital status and the incidence of physical disabilities, included a more detailed survey of age groups and birthplaces, and presented, together with a systematic census of occupations, information about the size of businesses and the area of farms." (Taylor, 1951)

Parish or Township of <i>Charles the Martyr</i>		Ecclesiastical District of <i>Sutton on Plymouth</i>		City or Borough of <i>Plymouth</i>		Town of		Village of		
No. of House	Name of Street, Place, or Road, and Name or No. of House	Name and Surname of each Person who abode in the house, on the Night of the 30th March, 1851	Relation to Head of Family	Condition	Age of		Rank, Profession, or Occupation	Where Born		Whether Blind, or Deaf, or Dumb
					Males	Females				
		<i>Emma Weston</i>	<i>Daunt</i>	<i>Widow</i>	<i>52</i>		<i>Widow of an Accountant</i>	<i>Devon - Plymouth</i>		
		<i>Emma do</i>	<i>Grand Daughter</i>		<i>6</i>			<i>do do</i>		
		<i>Mary F do</i>	<i>do</i>		<i>4</i>			<i>do do</i>		
<i>1230</i>	<i>Willow Street</i>	<i>Edward Bosch</i>	<i>Head</i>	<i>Mar</i>	<i>30</i>		<i>Librarian? (later employed in ...)</i>	<i>Devon - Devonport</i>		
		<i>Julia do</i>	<i>Wife</i>	<i>Mar</i>	<i>22</i>			<i>do do</i>		
<i>730i</i>	<i>Willow Street</i>	<i>William Northcott</i>	<i>Head</i>	<i>Mar</i>	<i>26</i>		<i>Labourer</i>	<i>Devon - Exmouth</i>		
		<i>Elija do</i>	<i>Wife</i>	<i>Mar</i>	<i>22</i>			<i>Devon - Herrington</i>		
		<i>Mary J do</i>	<i>Daunt</i>		<i>2</i>		<i>Schooler</i>	<i>do - Plymouth</i>		
		<i>Alice do</i>	<i>do</i>		<i>1</i>			<i>do do</i>		
		<i>Eliza J. Williams</i>	<i>Widow</i>	<i>U</i>	<i>77</i>		<i>Perdunant</i>	<i>Devon - Brixton</i>		
<i>8</i>		<i>Mary Ann Myles</i>	<i>Wife</i>	<i>Mar</i>	<i>20</i>		<i>Wife of a Miller</i>	<i>Devon - Plymouth</i>		
		<i>Susan do</i>	<i>Daunt</i>		<i>9</i>			<i>do do</i>		
<i>9</i>		<i>Henry Batten</i>	<i>Head</i>	<i>Mar</i>	<i>62</i>		<i>Superannuated Papermaker H. &amp; Part</i>	<i>do - Exmouth</i>		
		<i>Anna do</i>	<i>Wife</i>	<i>Mar</i>	<i>58</i>		<i>do</i>	<i>do - Exmouth</i>		
<i>10</i>		<i>John Lopez</i>	<i>Head</i>	<i>Mar</i>	<i>30</i>		<i>Green Grocer</i>	<i>do - Exmouth</i>		
		<i>Sarah do</i>	<i>Wife</i>	<i>Mar</i>	<i>27</i>			<i>do - Exmouth</i>		
		<i>John L do</i>	<i>Son</i>	<i>U</i>	<i>15</i>		<i>Carpenter (App.)</i>	<i>do - Exmouth</i>		
		<i>William H do</i>	<i>do</i>		<i>12</i>		<i>Tailor (App.)</i>	<i>do do</i>		
		<i>Mary J do</i>	<i>Daunt</i>		<i>11</i>		<i>Schooler</i>	<i>do do</i>		
		<i>Emma J do</i>	<i>do</i>		<i>8</i>		<i>do</i>	<i>do do</i>		
Total of Houses		I 2 U B		Total of Persons		7 17				

Figure 2.3: A page from an 1851 census enumerator's book for Plymouth.

The published abstracts of the 1851 census included recapitulatory tables of the five previous censuses and, together with the unique censuses of education and religion, it provides a most complete picture of the population at an important time of change in British history. In 1861 the census summary tables and a commentary on the results were combined in a General Report, confirming the pattern for the publication of results for the remainder of the century.

The value of the census in 19th-century research is, perhaps, best reflected by the numerous works concerned with its history, scope and use. A large number of papers recount the historical evolution of the census, its contents and the use of manuscript data (Hector, 1953; Beresford, 1963; Tillott, 1968; Drake, 1972; Barke, 1973), though the chief authority must be the Guide to Census Reports, Great Britain 1801-1966 (HMSO, 1977). Wrigley's Nineteenth Century Society (editor, 1972) discusses various aspects of the census in great depth from Drake's opening chapter on its development and execution, 1801-1891, to Armstrong's classic contribution: 'The use of information about occupation' (Chapter 6). More recently, Lawton's interpretative guide to the census (1978) extensively examines its uses and applications, noting that "studies involving census data have become one of the academic growth areas of the 1960s and 1970s".

Isobel Robertson (1969) expressed concern about the defects of the published census such as changes in classification and areal unit and the omission of certain topics, noting the increasing demands made of the data by social scientists. Successive changes in classifications and conventions have particularly affected the longitudinal analysis of occupational data, and it may be true to say that, despite the exceptional work done by Armstrong (1967, 1972a), the issue is still not resolved. Many writers have pointed to specific deficiencies in

past censuses (Sargant, 1865; Dunlop, 1916; Derrick, 1927; Tillott, 1972), but the underlying problem of all statistical abstraction and analysis is that it is always open to interpretation and this must be the primary caution to all who attempt statistical research.

Allegations of inaccuracy in the censuses are common: Derrick (1927) considered errors in ages, probably the voluntary statistic most prone to vanity, which may upset census survival calculations and also the study of mortality which is dependant upon reliable data. Glass (1973) cautions that since there were no post-censal surveys in Victorian times, "direct tests of completeness of enumeration are not available", neither can any "balancing equation" be employed due to the unreliability of comparable sources. There were three points at which error could occur in the compilation of the enumerators' books: in the distribution of schedules, in the completion of schedules (usually by the householder), and in the transcription of information to the enumerators' books (Armstrong, 1978). One Plymouth enumerator - failing to discover the birthplace of an inhabitant - wrote: "(Doesn't say) cannot tell, will not give me any satisfaction, very sorry". Tillott (1972) maintains that the extent of such error is slight; the enumerators' books were checked first by the District Registrar and then by the census office clerks, but the errors were kept to a minimum due to the quality and professionalism of the enumerators. He does observe, however, that the census "can never be regarded as coming within the first order of evidence since it is a recension of prime documents".

However, Rushton (1979) suggests that apparent errors and anomalies may actually provide revealing local information. He notes that the rigidity of classification systems and terms tended to suppress the spectrum of variation to be found in any population, citing the

household delimitation based on payment of rent as hiding relationships - familial or occupational - between households. Because the majority of census schedules were completed by the householders themselves, despite detailed instructions, "there was still considerable room for the inhabitants to introduce variations". Yet Rushton concurs that, by 1871, the accuracy of data becomes much more reliable, a consequence of both the experience of the census-takers and the improved literacy of the people.

It may be concluded that there are no certain statistics; however, as more census manuscripts become available, better estimates of population processes become possible.

#### 2.1.2 Official reports

The study of 19th-century population dynamics is much enhanced by the introduction of civil registration, the national collection of vital statistics, from 1837. The Registrar-General's reports were published quarterly for Registration Districts and Sub-districts and thus provide an extremely useful source of data on births, marriages and deaths, greatly facilitating investigations into fertility, mortality and public health. These reports are contained within the volumes of Parliamentary Papers. In addition, the Parliamentary Papers cover a huge range of subjects, for example, emigration, education, public health, housing and agriculture.

Copious information is also held in record offices, from official extra-Parliamentary reports to private letters. Two local reports, concerned with the consequences of Plymouth's exceptional overcrowding

and high mortality, proved to be of key importance in this study: Odgers (1847) and Rawlinson (1852). The public health debate in Plymouth was a long drawn-out and sometimes acrimonious affair, and had far-reaching consequences for the town; letters and papers relating to this debate are held in the Public Record Office and provide a detailed insight into the period.

The Rev W T Odgers was Secretary of the Plymouth branch of the Health of Towns Association and a Unitarian minister; he coordinated a two-year survey and published the findings - A report on the sanitary conditions of Plymouth - in November 1847. Robert Rawlinson was employed by the General Board of Health following the 1849 cholera epidemic as a kind of roving inspector. He had presided over similar inquiries in Birmingham (1849) and Bradford (1851) before the commencement of the Plymouth inquiry. The Rawlinson report - Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage and supply of water, and the sanitary condition of the inhabitants of the Borough of Plymouth - was presented at the end of the year and contains invaluable detailed evidence about the physical fabric of the town's housing stock and the living standards of its inhabitants.

### 2.1.3 Rate books

The rate books for only two years (1869 and 1871) of the study period remain for Plymouth (Figure 2.4) - many such records having been lost in the Second World War. This is not an uncommon problem, despite the 1925 Rating and Valuation Act which required local authorities to

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*J. Andrews* - WARD.

No.	Parties Assessed.	In what capacity.	For what Premises.	Rateable Value.	Sums Assessed.	Total Amount Received.
<i>Squire Terrace</i>						
1356	Collins & Sons	Owner	House	20	10	10
1357	Harriet Williams	Occupier	"	23	11 6	11 6
1358	Henry Russell	"	"	25	12 6	12 6
<i>Trafalgar Place</i>						
1359	Residence of Harriet Williams	Occupier	House	30	15	15
1360	Robert Spurland	"	"	28	14	14
1361	George Silasman	"	"	16	8	8
1362	George Spurland	"	"	17	8 6	8 6
<i>Union Street</i>						
1363	Charles Sear	Agent	House	55	17 6	17 6
1364	"	"	"	40	20 0	20 0
1365	Henry Francis	Owner	"	50	15	15
1366	"	"	"	34	17	17
1367	Joseph Underhill	Occupier	"	54	17 12	17 12
1368	John Underhill	"	"	40	15 7 1/2	15 7 1/2
1369	John Underhill	"	"	38	19	19
1370	John Underhill	"	"	50	15	15
1371	Thomas Underhill	"	"	50	15	15
1372	Thomas Underhill	"	"	28	14	14
1373	Thomas Underhill	"	"	40	10 0	10 0
1374	Henry Underhill	"	"	60	10 0	10 0
1375	William Underhill	"	"	15	12 6	12 6
1376	Richard Underhill	Owner	"	56	18 0	18 0
1377	John Underhill	Occupier	"	56	18 0	18 0
1378	Thomas Underhill	Owner	"	20	10	10
1379	John Underhill	"	"	56	18 0	18 0
1380	John Underhill	Occupier	"	30	15	15
1381	John Underhill	"	"	38	19	19
1382	John Underhill	"	"	40	10 0	10 0
1383	Elizabeth Underhill	Occupier	"	30	15	15
1384	James Underhill	Owner	"	125	12 6	12 6
1385	William Underhill	Occupier	"	40	10	10
1386	James Underhill	"	"	55	17 6	17 6
				1387	31 16 17 1/2	

Figure 2.4: A page from an 1871 rate book for Plymouth.



preserve the books, though Plymouth appears to have been particularly unfortunate. Holmes (1973), for example, in his study of Ramsgate, located all 298 volumes for the period 1803-1932.

From 1837, following the Parochial Assessment Act, rate books listed the names of both owners and occupiers for individual properties. This legal requirement ensured accuracy in their compilation, although the records were not required to be very detailed: the only distinction drawn between types of commercial premises was that of 'office', 'house and shop' and 'lock-up shop', which limits their use (Davies, Giggs & Herbert, 1968). For studies of commercial structure, then, the rate books by themselves tend to be of only limited value; their principal use lies in the assessment of land values, although Fox (1979) used those for Stirling to determine socio-economic status and housing quality, and Gordon (1979) carried out similar work on Edinburgh.

The sparsity of such data for Plymouth precluded longitudinal comparisons (the details for 1869 and 1871 were found to be virtually identical), and studies of ownership and migration (Holmes, 1973) or dynamic processes of land use change (Davies, et al, 1968) using rate books were not possible. The Plymouth books were used, however, to identify the central business district of the town by averaging values for streets or groups of streets (Chapter Five).

#### 2.1.4 Directories

The use of directories in geographical research has been discussed by a number of authorities: Norton (1950), Oliver (1964), Davies, Giggs &

Herbert (1968), and Shaw (1978, 1982a), for example. While 19th-century directories are available for most towns and counties, problems arise from their selective classifications, which are often difficult to compare, and their incomplete enumeration. Nevertheless, they represent a valuable and continuous source of residential, occupational, commercial and industrial information, and have been used extensively in the investigation of the economic life of 19th-century Plymouth.

While directories first appeared in the 17th century, the majority date from the beginning of the 19th century, when Post Office directories were published to ensure the correct delivery of letters. Lists of the inhabitants of a particular locality became standard in annual publications, and specialist publishers, employing skilled agents to collect information, came into existence. By 1850, directories had become fairly common and uniform; Kelly, Pigot and William White provided a systematic coverage of the country at reasonably frequent intervals, comprising lists of classified trades, street indexes, alphabetical lists of inhabitants and other miscellaneous information on transport, religion, education and civic matters, plus advertisements. From this time the number and quality of directories increased markedly, spurred not only by the expansion of trade and commerce and the growth of urban areas but also by the spread of literacy (Morgan, 1979).

Deficiencies and omissions arise from varying methods of compilation: the use of agents or field workers provided the most complete data, but sometimes circulars were delivered as an alternative. Norton (1950) notes Samuel Rowe who in 1814 employed 'an intelligent person' to collect names from door to door for his Plymouth directory. The incidence of omissions was most frequent in

the food trades, and tended to be concentrated in the newer suburbs where rapid change overtook accurate data collection; even the most professional directory compilers could spend two or three years on survey work. There was also the problem of public cooperation, as encountered in the compilation of the Eyre Brothers' 1880 Post Office Directory for Plymouth:

"In 1880 the people of Plymouth having been 'pestered beyond enduring in the matter of directories', were 'naturally short in their replies to our agents' enquiries'." (Norton, 1950)

Davies, Giggs & Herbert (1968) also note problems of omission, and suggest that, further, double-entry listing can result in "a 5 or 10 per cent error in the numbers of commercial premises attributed to settlements". This arose because of the multiplicity of businesses carried on by certain traders (Shaw, 1978).

Shaw (1982a) says that a "general mistrust" of directories has resulted in little work being done to investigate their availability, reliability and use, and this has deflected interest away from the study of commercial and industrial patterns. Yet trade directories are an important source of 19th-century data and they supply information on the location of work activity which is not found elsewhere. Shaw also suggests that the reliability of directories may be assessed according to whether they were produced by local or national firms, the latter being more accurate. Both locally and nationally produced directories were used in this study (see Bibliography for the complete list), for example, the greatest use was made of Kelly's Post Office Directory for 1856, one of several national publications, while the locally-published Brindley's Plymouth, Devonport and Stonehouse Directory (1830) provided valuable information about the study area in the early part of the century.

Oliver (1964) suggested three ways of using directory information: for mapping different kinds of establishment, to determine the distribution of those engaged in different kinds of employment, and to discover the origins of categories of workers. For this study, Kelly's Directory of Devon for 1856 was analysed using a micro-computer data management package to generate lists of specific occupational groups from the alphabetical lists of traders for Plymouth and Stonehouse; their locations were then mapped, in line with the first two of Oliver's uses of directory data. Since this was the only Plymouth directory to be examined in such detail, the results are only an indication of distribution at one point in time; no attempt was made to compare these distribution patterns with those of previous or subsequent data sources, although this could certainly prove a valuable future line of research. Reference was made, however, to a number of Plymouth and Devon directories of different dates to discover the development of certain types of industry and the histories of particular businesses and families. The Plymouth directories were used as an explanatory supplement to the principal data source for the study, the 1851 and 1871 censuses.

#### 2.1.5 Newspapers

Plymouth's first newspaper was established in the early 18th century and, though it was short-lived, the town has had at least one regularly published paper since the latter part of that century. The Plymouth, Stonehouse and Devonport Herald commenced in 1820 but in 1873 this weekly newspaper was described as "now simply a small

advertising paper" (Jewitt). Earlier editions, however, do contain useful accounts of local events, for example, the opening of Millbay railway station and the course of the 1849 cholera epidemic. Curiously, this paper was omitted by West (1983) in his otherwise comprehensive list of Plymouth newspapers (Table 2.2). The Western Morning News is listed; it first appeared on 3 January 1860 and is the oldest daily newspaper west of Bristol (Bracken, 1931). Mildren (1985) observes that Brunel's railway bridge across the Tamar had been opened in the previous year and this, particularly, ensured the commercial success of this regional newspaper. A magazine, The West Country Lantern was established in March 1872 and published weekly; one volume contains detailed descriptions of some of the town's main streets which yield valuable additional information.

There were a number of other, shorter-lived, publications, but they tend merely to duplicate information contained in the Herald, the Morning News, and the Lantern. The Plymouth and Devonport Weekly Journal, however, was used also in this thesis to gather further information on the impact of the 1849 cholera outbreak in Plymouth. The scope and detail of qualitative information in local newspapers is extensive, providing reports of council meetings, civic developments, shipping movements, and social comment; in addition, advertisements provide a record of local economic activity.

#### 2.1.6 Maps and photographs

Plymouth is fortunate in having an abundance of both maps and photographs for the 19th century. The present-day city centre is much

TABLE 2.2: Newspapers published in Plymouth in the mid-19th century

Royal Devonport Chronicle and Plymouth Chronicle (with Western Weekly News)	1827-63
Devonport and Stonehouse Herald	1831-76
Plymouth and Devonport Weekly Journal (with Western Daily News)	1831-63
West of England Conservative as Western Courier	1836-52 1852-54
Plymouth Times	1842-48
Emigrants' Penny Magazine	1850-51
Plymouth Mail	1852-61
Rendle's Prices Current	1854-55
Daily Western Mercury as Western Daily Mercury	1860 1860-1921
Western Morning News	1869-
Western Weekly News	1861-1939
Mid-Devon Advertiser	1863-1981
Western Counties Daily Herald	1868-69
Western Daily Standard	1870
Thunderbolt	1871-72
Weekly Times	1873
as West of England Advertiser	1873-74
as Bristol and West of England Advertiser	1874-76
Western Counties Herald and Plymouth Advertiser	1874-76
Plymouth Evening Mercury	1877
Weekly Mercury	1879-1921

"as" indicates change of title

"with" indicates amalgamation with another newspaper

Source: Town Records by John West, Phillimore, 1983.

changed and such visual documentation is, consequently, the only way of knowing what the Victorian town looked like. But Harley (1972) emphasises the need to assess the information contained in early maps with regard to their original purpose, cartographic method and accuracy. Nevertheless, they provide an important source of evidence for morphological change.

The Plymouth directories list a number of local engravers and lithographers in the later 19th century, chief among them was William H Maddock, a Plymothian born in 1825, who produced and published a series of maps of the area. For example, in 1848 he issued "A new map

of Plymouth, Devonport, Stonehouse, Stoke and Moricetown... With railways and recent improvements", and in 1877 another map of Plymouth, Stonehouse and Devonport was published which was then regularly revised. By the 1890s the firm appears to have been taken over by W H Foster who produced further revisions of the Maddock maps. William Wood, a Devonport publisher, also made a continuing contribution to the mapping of Victorian Plymouth, commencing in the 1850s with a map which identified the Municipal Divisions and forty-one important buildings. In addition, a particularly clear and useful map of the three towns was published by John Tallis & Company, of London and New York, drawn and engraved by J Rapkin and illustrated by H Bibby in the 1850s.

These and numerous other maps (some taken from directories) have been used extensively to identify particular streets, often a confusing task as street names were either changed or inaccurately recorded. Specific objectives for this thesis included the mapping of enumeration districts noted earlier, the physical growth of the urban area, the extent of water supply and drainage, street improvements, and the location of the retailing district. But maps have been used in this study mainly to reconstruct the morphology of a town centre since obliterated and, in this respect, the Ordnance Surveys of 1855-6 (1:500) and 1892 (1:2500) provide the most detailed and reliable record.

The value of photographs lies in the knowledge they provide of buildings long since demolished; in Plymouth they record a heritage sadly lost: the grandeur of John Foulston's architecture, the patchwork development of evolving building styles, and the complex pattern of winding, sloping thoroughfares. They are an exceptional

resource for the historian, the Victorian city was the "first to come under the camera's eye" (Martin & Francis, 1973). Gilman (1973), however, highlighted one key problem encountered in using photographic evidence when he noted that few collections are properly catalogued and this hampers systematic use.

An excellent collection of photographs is held in the Plymouth Museum and Art Gallery, and several selections have been published (Cluer, 1974, 1975; WEH, 1982; Foot, 1983). John Blake, a Daguerrotype Artist, was working in Plymouth as early as 1852, but it is, perhaps, to Louis Duprez and Richard Rugg Monk that most credit should be accorded for the factual record they made of mid-Victorian Plymouth, and with superb artistry. Some photographers whose work is used in this thesis remain anonymous, but other artists include A T Abrahams, Francis Frith and T F K Rives.

Photographs can, of course, present a misleading image and photographers have always been prone to "bias and distortion"; Miller (1983) suggests that "critical interpretation" may be inhibited by the "absence of supporting evidence" to explain a photograph. Another problem is that high days and holidays were more likely to be recorded than everyday life; many things were not photographed simply because they were so common. In Victorian times, though, the camera was a very new tool and its users were keen to test its applications; in consequence, their lenses were focused on many and varied subjects. The contribution of photographs should not be underestimated as source material in historical geography (Miller, 1983) and in this study they have represented a most important form of documentary evidence. Alongside Ordnance Survey plans, for example, contemporary photographs provided information on individual houses which could then be related to census data on population density and multiple occupancy.



### 2.1.7 Contemporary accounts

The value of contemporary accounts in studies of Victorian cities has been ably demonstrated by Lawton and Pooley (1975) in their analysis of the diary of David Brindley, which yielded details of the realities of everyday life that escaped official record. The histories of Plymouth, already referred to, by Jewitt (1873) and Worth (first edition, 1872; updated, 1890) are important contemporary accounts in many respects; both provide authoritative information on the development of Victorian Plymouth. For the student of Plymouth, three principal reminiscence-style accounts and two shorter items together supply valuable local description and explanation throughout the 19th century. As Victorian times slip out of living memory, these memoirs keep them vividly close.

(i) The memoirs of Thomas Pitts (held in the West Devon Record Office 688/1), born 1816, are much concerned with council business; he not only witnessed events in mid-19th century Plymouth but also had a hand in shaping them as a Town Councillor from 1842 to 1845 and 1859 to 1898 and an Alderman from 1874. His privileged viewpoint reveals much of the political mechanisms of the time and may be supported by the contemporary newspaper reports.

(ii) W F Collier was a friend and colleague of Pitts and in consequence their reminiscences are complementary on some points. Collier was born in 1824, in Old Town Street, and was Town Councillor for Vintry Ward from 1848 to 1854, a period which coincided with the public health debate (Chapter Eight). His address to the Devonshire Association in July 1892, "Some sixty years' reminiscences of Plymouth", actually goes back to the 1760s by drawing on the memories of his elder relatives.

(iii) 'Cora Pearl' was born Emma Crouch in Stonehouse in 1837, educated in France, and became a notorious Parisian courtesan. Two autobiographies - both written in French - are attributed to her. The first book (1886), which received a disappointed reaction because she did not 'name names', tells little of the town she left in 1850. The second, finally published in 1983 and allegedly discovered by William Blatchford in a private library, is much more frank and contains an evocative description of the Union Street area. Doubt has been cast upon the authenticity of both books; particularly the latter which is considered to have only a fifty-percent chance of being genuine (Alexis Lykiard, interviewed by Norman Lebrecht in The Sunday Times, 27 March 1983). But the account is used, nevertheless, in the discussion of prostitution in Plymouth (Chapter Seven) because, despite Lykiard's reservations, the author's detailed local knowledge tends to lend it credibility.

(iv) Emma Gifford Hardy's Some Recollections (1979), written in 1910-11, has a special poignancy. Only the first nineteen years of her life, from 1840 to 1859, were spent in Plymouth, her family then moved to north Cornwall where, at the age of thirty, she met the writer Thomas Hardy; they were married in London in 1874. After her death in 1912, Hardy discovered her manuscript and was moved to revisit her childhood haunts, very remorseful for the failure of their marriage in later years; several of his poems relate the sadness of this pilgrimage. In this study the recollections of Gifford Hardy, an attorney's daughter, provide the commonplace detail about everyday life in Victorian Plymouth.

(v) Walter Stephens, whose childhood memories were published in 1943, spoke from markedly different experience. He was born in 1858, educated at George Street Day School, and resident at his family's

bakery in East Street, subsequently entering the business with his brothers in the later years of the century. Highways and Byeways of Plymouth comprises lists of shops, street by street, and many names of local people; with the wisdom of age he also saw the traditions and change in context with the bygone age. It was, doubtless, with some sadness that these detailed memories were recorded during the Second World War when most of the streets of his formative years were razed in the Blitz.

#### 2.2.0 The analysis of census material

The methodology for census analysis has its origins in the 1960s when detailed work on the census manuscripts really got underway as the 1851 and 1861 enumerators' books were made available to public scrutiny. Subsequent contributions to methodology have chiefly involved revisions of this primary work, particularly as computers were developed as an increasingly efficient tool making extensive analysis of much larger data sets possible. As testament to this: when Dyos and Baker said in 1966 that "only within the last two years" had computers come "within the range of social scientists" (Dyos, 1968); computation methods were still cumbersome and researchers were only just beginning to understand the scope of work made possible.

Today, in contrast, attempting to analyse census data on a large scale without using a computer is unthinkable and the danger is, perhaps, that too much emphasis or reliance may be put upon its advantages, overlooking the revealing anomalies and qualitative information buried within the manuscripts (Rushton, 1979).

Ironically, after twenty years of increasing sophistication in coding and classification schemes, and sometimes heated debate as to the best approach, it is now being recommended that verbatim transcriptions onto computer be made of manuscript data (Schurer, 1985) to promote greater comparability between studies and wider access for census users.

Perhaps the most significant advance of the last twenty years has been the application of quantitative methods in historical research. The work of Dyos and Baker (1968), Armstrong (1967), and Floud (1973) who provided historians with a comprehensive introduction to quantitative methods, was not only pioneering but also missionary. Armstrong (1978) anticipates "more sophisticated statistical techniques" being developed for census analysis while the basic statistical tools "may well continue to be simple measures of averages, dispersion, and proportions", and tests of reliability of sample fractions. But in addition, researchers may be "impelled towards using more advanced statistical techniques, such as multiple correlation, factor and principal components analysis".

The need for a standardised approach to census analysis has concerned researchers for some years. Anderson (1972) noted that this would permit better comparison between censuses and studies and extend understanding of 19th-century society. In particular, Anderson recommended standardisation in the classification of data, though any such grouping must be done in the light of the nature of the information and its presentation at source. In 1973 a conference at Liverpool broached the subject as part of the Social Geography of Nineteenth-Century Merseyside Project, and in 1984 the ESRC Cambridge Group and the Local Population Studies Society proposed ways in which computer-handling of census data might be standardised in order to

promote comparability.

With the exception of Beresford (1963), no methodology designed for the systematic exploitation of the census enumerators' books was published until 1966 when Armstrong's chapter: 'Social Structure from the early census returns' appeared (in Wrigley, 1966). Armstrong's work has provided the basis for discussion, revision and improvement in technique ever since; the common aim has been to standardise techniques. In the same year, Armstrong addressed the Urban History Group Conference at Leicester (Dyos, 1968) on the interpretation of the census enumerators's books and made a pertinent distinction between the method of analysis and the presentation of results: it is the latter, he argued, which should be comparable. Census comparability is improved from 1851 because the form of the questionnaire remained more or less unchanged until 1911; it is the differences in classifications used by the census authorities in the abstracts which lessen comparability (Armstrong, 1968; Lawton, 1978).

The means of analysis employed is determined by the nature of information required, different disciplines use different approaches. The simple count method amplifies information derived from published abstracts for smaller areal units, an approach attractive to local historians. Larger-scale analyses seek to measure the relationships between variables (for example, Lawton's study of Liverpool, 1955), or concentrate on specific parts of the data (Laslett's work on the household and family composition, 1972) and, therefore, requires more sophisticated techniques.

Schurer (1985) notes that there is "little common ground" in data handling and analysis in the wide range of census research projects being undertaken, and puts forward three reasons for this:

(1) there is actually a good deal of variation in form between census

books, due to the idiosyncrasies of enumerators and checking clerks;

- (2) much of the research concentrates on particular questions and local issues often in isolation from other studies;
- (3) the range of computers and software available "ensures that there is no single optimal method of collecting and analysing census data".

Thus he too advocates "the adoption of a series of common or standard methods and techniques".

After twenty years' intensive work on census manuscripts, it seems there is still room for methodological improvement. Essentially there are two key issues involved in the debate:

- (1) the need to code data prior to computation is an inheritance of the demands of early programs, but software has since been developed which removes this need. If verbatim transcription is adopted it will no longer be necessary to be selective at this stage of research and census data, once on computer, will be available for analysis to all disciplines and interested parties. Although the analytical work upon which the results presented in this thesis is based was undertaken before such an approach became feasible, it is, nevertheless, worth noting that such refinements are now in prospect and their progress will be watched with considerable interest in the years ahead.

- (2) the classification of census information remains a contentious issue because it implicitly involves the modification of data; it is at this stage of analysis that different studies may become non-comparable. The debate is most heated with regard to occupational data as analysis often involves the socio-economic categorisation of individuals; the implications of this will be discussed in more detail in Section 2.3.

### 2.2.1 Sampling

Three factors need to be considered in the choice of sampling method:

- (1) the areal unit;
- (2) the sampling fraction; and
- (3) the sampling unit.

(1) The enumeration district presents the most convenient areal unit for large-scale census studies and is used as the basis for analysis in this study. Taylor (1973), addressing the problem of topographical indexing at the Liverpool conference, considered geo-coding aimed at identifying streets or parts of street, and questioned whether the enumeration district is an adequate areal unit because it is not of uniform size, it can mask differences in density, and its boundaries often changed from census to census. Pooley (1973) also noted that the enumeration district is problematic in that it can obscure areal variation, streets or courts are more likely to be homogeneous, though Pooley advocated that "a street framework is best confined to studies dealing with 100 per cent data". A problem in using other areal units, particularly in smaller-scale projects, is the exact identification of properties which is dependant on map coverage and confused in earlier census years before house-numbering was properly organised.

Three factors thus have a bearing on the appropriateness of the enumeration district: the regularity of the enumeration district system; the uniformity of the population density; and the nature of the study, whether sample or 100%, small- or large-scale (Pooley, 1973). The enumeration district is best for large-scale sample studies, despite irregular shapes and lack of comparability between

censuses, and its use in this study, therefore, seems to be justified. Moreover, Plymouth's enumeration districts often enclosed blocks of reasonably homogeneous housing, much of which was constructed in the 19th century; local knowledge suggests that very few districts contained such diverse elements as to obscure areal variation to any great extent.

(2) The sampling fraction used for this study involved taking every tenth household, omitting any institutional schedule and taking the next 'normal' household to appear in the census. Armstrong also used this method of sampling in his study of York (1967).

Floud & Schofield (1968) criticise this method as not actually being ten percent but an unknown proportion of 'normal' households; the sample is thus biased on two counts: some households (those appearing in the source immediately after institutions) have a double chance of selection, and there will be an over-representation of normal households in those districts where there are several institutions (Armstrong, 1978). The choice of sampling method is determined by the nature of questions being asked of the data source. Floud & Schofield's alternative of taking every 'nth' person may be judged by some authors to be more representative but it precludes analysis of households. Armstrong (1978) suggests that renumbering the census schedules after excluding all institutions might be more practicable but would add considerably to the workload. Further, it should be remembered that many institutions are treated separately outside the main body of schedules (ships, for example), so the replacement procedure (substituting bona fide households for institutions) is unlikely to be common. Armstrong also points out that including institutional data in the main household sample, to



ensure a full ten percent, would "distort conclusions concerning household size and composition".

Anderson (1972) highlighted another drawback of the ten percent sample in that only small numbers of specific groups (certain age or migrant groups, for example) were caught in the systematic 'trawl net'; investigation of specific groups, therefore, requires a different sampling method. But in large-scale studies of general population characteristics the basic ten percent sampling method is usually deemed appropriate.

The problem inevitably arises as to how representative any sample is of the whole population, and this can be greatly influenced by the means of selection. The size of the sample is important in attaining a representative sample, especially when separate estimates are to be made for subdivisions of the population; in this study there were 1390 households (comprising vital details of 5947 inhabitants) in the sample of the 1851 census, and 1991 households (7864 inhabitants) for 1871. The age distributions of the sample populations from the 1851 and 1871 census manuscripts were statistically compared to the data on ages for the whole population of Plymouth and Stonehouse from the published census abstracts, and the samples were judged to be sufficiently representative of the whole population.

(3) The obvious sampling unit in large-scale demographic studies is the household, which may be regarded as synonymous with the census schedule and has been used here. The 1851 census report used the term 'family' to mean 'household' rather than the modern sociological usage (prefixed 'nuclear') meaning husband, wife and children. Determination of a separate household was thus confused. For example, enumerators had great difficulty deciding when a lodger was part of a

family or separately accountable. Tillott (1972) discussed the difficulty of identifying 'households' and the problem it caused for the administrators of the 1851 and 1861 censuses. Though their aim was to secure uniformity in the returns, in practice this was not achieved because the Census Office failed to recognise the complexity and variety of possible living arrangements (Tillott, 1972). While detailed instructions were given to the enumerators, they were ambiguous and, in the event, it was left to their discretion, inevitably causing some variation in the schedules.

Seeking to clarify the situation for analytical purposes, Anderson (1972) coined the term 'co-residing group' which may be roughly equated with the 'census family' or 'household', and advised that the term 'head', referring to the head of household as it appears in the manuscripts, should be used as the cut-off point between schedules. However, Anderson (1973) also suggests that if the household is taken as the sampling unit and the head regarded as the principal indicator of population characteristics, individual information is lost for lodgers and other non-related inhabitants. Also, when studying the whole population, there is a need to find a means of sampling institutions also, rather than omitting them. His ideal is a system which permits the study of both household and institution without using too many variables, but this is difficult to achieve without considerable circumscription of the information transcribed from the census manuscripts.

In this study, the sampling method employed (described below) permitted analysis both of the household as a unit and of individuals, but institutions (the majority of which were military or naval) were omitted from the computer file to be examined separately. Data were abstracted from the census manuscripts on the basis of one household

comprising one case in the computer file and, within each case, space was allocated for up to ten individuals. A household was identified as all those persons listed under one schedule number in the manuscripts.

In conclusion, Schofield (1972) says that "sampling should reinforce rather than replace the fundamental methods of historical research"; provided adequate measures have been taken to ensure a representative sample, it is the analytical process and the interpretation of results which will determine that the execution of a research project is successful.

#### 2.2.2 Processing

240 characters were allocated to each household in transcribing the census data for computer analysis, permitting details of up to ten members of the household to be recorded. The information recorded, in sequence by column, was as follows:

- 1-2 The year of the census.
- 3-7 A five-digit code identifying Registration Sub-district and enumeration district.
- 8-10 The schedule number.
- 11-25 The address of the household; this was transcribed verbatim, though occasionally it had to be abbreviated.
- 26-39 The surname and first name (sometimes abbreviated) of the head of household.

These five pieces of information were used for the identification of locations; names and addresses usually providing a quick and easy means of checking the data. Tillott (1972) notes that addresses were

difficult for enumerators to determine at a time before house-numbering was taken in hand, overcrowded courts being particularly problematic, but this was not a special problem in Plymouth.

The next set of data recorded details about the head of household:

- 41-42 Age; this was not coded at the transcription stage, but a re-code function was included in the computer parameters file.
- 43 Sex.
- 44 Marital status.
- 45-51 Occupation; this was coded according to the 1871 census classification of occupations, a linked sequence of codes comprising class, order, sub-order and actual occupation.
- 52-57 Birthplace; coded according to county and parish if born in Devon or Cornwall, or county and grid reference if born elsewhere in England and Wales; a separate set of codes was employed for all other birthplaces including Scotland, Ireland, islands in the British seas, and foreign countries.

Two variables then recorded household details:

- 58-59 Size of household.
- 60 Type of household. Ten possible household types were allowed for (based on Laslett, 1972): solitary; co-resident relatives; simple conjugal unit, man and wife, with or without children, or single-parent family; extended family, upwards; extended family, downwards; extended family, laterally; extended family, combination; multiple family (two or more conjugal units), secondary units downwards; multiple family, all units on one level; other multiple families, unrelated.

The remainder of the first line of data recorded details of the wife of the head of household; if the head was female, or if there was no wife present in the household, these columns remained blank. Sometimes it was clear that the head of household was temporarily absent - at sea, for example - in such cases the wife's details were coded as if she were the head of household.

- 61-62 Age.
- 63-64 Number of children.
- 65-66 Relationship to head of household.\*
- 67-73 Occupation.
- 74-79 Birthplace.

The remaining two lines were each divided into four sets of twenty columns, allowing for eight more household members coded as follows:

1-2 Age.  
3 Sex.  
4 Condition.  
5-6 Relationship to head of household.\*  
7-13 Occupation.  
14-19 Birthplace.  
20 Column left blank.

Occasionally 'U.K.' or 'N.K.' were used by the enumerators where information was not known; this practice occurred in the 1871 Plymouth census where, for example, the full identity of the customers of prostitutes was protected - names and birthplaces being omitted while the occupation usually indicated a member of the armed forces.

The data were analysed using SPSS, the Statistical Package for the Social Sciences, a set of computer programs originally designed at Stanford University, USA, in the late 1960s. When required a RECODE instruction was used in the parameters file to group ages into five-year intervals, and a SUBFILE structure enabled the data file to be disaggregated by enumeration district. Once the data had been checked and any errors corrected, two system files were created for each of the sampled census years (1851 and 1871).

\* Relationship to head of household is most complicated by changes in terminology in the intervening years, the suffix '-in-law' being used then rather than the prefix 'step-'. Attempts at hiding illegitimacy occasionally occurred, a daughter's child being assigned to a mother who was clearly too old to bear children. Tillott (1972) notes inconsistencies with regard to 'lodger' and 'visitor' and suggests that on occasion a person described as a visitor may, strictly speaking, have been a lodger. He suggests visitors may be excluded from calculations of household size. Visitors were not excluded from the Plymouth study sample, however, as the coding method enabled determination of household size both including and excluding visitors. In 1851, 3.4% of the sample population were visitors, affecting 15% of households, but only marginally altering average household size.

### 2.2.3 Analysis

The primary analysis of the census material was undertaken in three stages:

- (1) using the published abstracts to produce, inter alia, standard population age pyramids for the three Registration Sub-districts, census survival ratios, bar charts of occupational orders, and maps of England and Wales showing the origins of migrants;
- (2) using the summary pages for enumeration districts in the manuscript books to calculate population, house and household densities, and sex ratios;
- (3) using the samples taken from the manuscript books for detailed analysis of the 1851 and 1871 populations.

Simple frequency distributions were produced for every variable, and then selected crosstabulations were made for certain variables. Because of the almost complete transcription of information for sample households, the amount of information which could be extracted from the data files was extensive, and the sample sizes were sufficient to ensure that the number of specific incidences was rarely too small to be reliably informative.

The results generated permitted a series of choropleth maps to be drawn illustrating, for example, the distribution of migrant groups and the distribution of occupational classes within Plymouth and Stonehouse. Ratios of age and fertility were calculated and their distribution per enumeration district also mapped.

Secondary analysis involved the extraction of twenty-nine key indicator variables for each enumeration district to permit further social analysis for the two census years; these are listed in Table 2.3. From this basis it was possible to carry out principal component

TABLE 2.3: Variables used in the principal component analyses

Family status:

sex ratio (whole population)  
age ratio (sample population)  
fertility ratio (sample)  
mean age of head of household (sample)  
percentage of heads of household widowed (sample)  
nuclear families as percentage of households (sample)  
solitary households as percentage of households (sample)  
number of servants per household (sample)  
number of lodgers per household (sample)  
female heads of household per household (sample)

Socio-economic status:

population density (whole population)  
population per inhabited house (whole population)  
population per household (whole population)  
number of households per inhabited house (whole population)  
percentage of sample population in employment  
women in work as percentage of sample population  
percentage employed in professional occupations (sample)  
\*percentage employed in the armed forces (sample)  
\*percentage employed in conveyance (sample)  
\*percentage employed in art and mechanic production (sample)  
\*percentage employed in textiles and dress (sample)  
\*percentage labourers and unemployed (sample)

Migrant status:

percentage of sample born in Plymouth and East Stonehouse  
percentage of sample born in the rest of Devon  
percentage of sample born in Cornwall  
percentage of sample born in seaboard counties  
percentage of sample born in Ireland

Miscellaneous:

uninhabited houses as percentage of housing stock  
houses under construction as percentage of housing stock

\* Occupational orders containing five percent or more of the total employed and showing a non-random pattern of distribution.

analyses, the results of which are presented in Chapter Nine on the social geography of Plymouth. Further analysis was also made of birthplace data to investigate the pattern of migration to Plymouth from the thirty-three Superintendent Registrar Districts of Devon and Cornwall; this involved the extraction of fifteen variables (listed in Chapter Four) for a multiple regression exercise designed to identify the principal influences upon the migration pattern.

### 2.3 The interpretation of census returns on occupations

Census data on occupations are conventionally classified for analysis either by industry or social status, but every attempt at classification has proved controversial. The nature of collection and presentation, and changes in methods of collation employed from census to census, have hindered analysis of occupational data, and a number of writers have suggested ways in which such problems may be overcome (Booth, 1886; Armstrong, 1972; Royle, 1977).

The occupational census has always presented problems, forming "the most laborious, the most costly, and... perhaps the least satisfactory part of the Census" (1881 General Report). In 1841 local overseers were required only to supervise the filling in of household forms, the job of classification was given to specially trained staff. By 1851 the accumulated experience of the earlier censuses gave rise to "the first scientific attempt to analyse the information" (Bellamy, 1978); 17 classes and 91 sub-classes, renamed orders and sub-orders in 1861, were identified, establishing the system used in subsequent censuses. Effectively, the system distinguished between "those who are



unproductive and those who create products. It is by the nature of these products that people are classified into occupations" (Farr, Appendix to 1861 Census Report). Farr's scheme was 'industrial' rather than truly 'occupational' (Wilkinson, 1952), but caused confusion by failing to define the term 'product' (Welton, 1869). Thus the classification of 19th-century occupations proved contentious even at the time of enumeration: Welton (1869) proposed a substantially different system which differentiated between productive and service occupations.

One major problem in the analysis of occupational returns is that, while the essence of the 1851 classification survived the remainder of the century and beyond, some important changes and modifications were subsequently introduced which have restricted direct comparisons between censuses from 1851 to 1911 (Bellamy, 1978). Such changes have affected especially the classification of wives, students, clerks, and retired people.

A second major problem concerns the wide range of occupations listed, many now defunct, and changes in the nomenclature of certain occupations which became necessary as industrial mechanization increased (Bellamy, 1953). The extent of change in types and nomenclature of occupations is well-illustrated by the need for a new dictionary of occupations in 1881 - the original dictionary having become obsolete. Moreover, large numbers of workers were classed as general labourers, since no other indication was given as to their actual work, confusing both skilled and common labour particularly in building, manufacturing and transport industries (Booth, 1886). However, improving educational standards in the second half of the century, in conjunction with more comprehensive census schedules, eventually reduced the numbers in undefined occupations.

Tillott (1972) held that more problems arise from classifying data than from interpreting it, despite difficulties of identifying industry or place of work, or distinguishing between masters, journeymen and apprentices (not always properly recorded in the census). It was also more difficult in the 19th century to distinguish clearly between manufacture and distribution, tool makers and dealers, for example, were grouped together in the census abstracts. Notwithstanding these problems, Bellamy (1953) was confident that there is sufficient comparability between the censuses for using occupation data for studies of long-term employment trends, and for studies of employment structures of local areas.

In this study, difficulties in analysing the occupational returns were mainly caused by changes in the abstraction and presentation of the 1871 data.

(a) in the 1871 published abstracts, figures were not given for individual occupations by Registration District, as they had been in 1851 and 1861, instead, these data were published for counties and principal towns and combined Plymouth and Devonport; in 1871 data for Registration Districts were abstracted only for classes and orders;

(b) those occupations allocated by the census authorities to each category and sub-category differed between the censuses, hence the published tables were not directly comparable;

(c) in the 1871 abstracts only the occupations of people aged 20 years or over were allocated to the six classes and eighteen orders, which were then divided into sub-orders (see Table 2.4).

In order to overcome these problems for this study, the individual occupations given in the 1851 and 1861 censuses were reordered according to the 1871 scheme, permitting a reasonable comparison between census years. Thus the data were not coded according to the

TABLE 2.4: The 1871 Census Classification of Occupations

I PROFESSIONAL CLASS

1. Persons engaged in the General or Local Government of the Country:
  1. Officers of National Government
  2. Officers of Local Government
  3. Officers of East India and Colonial Government
2. Persons engaged in the Defence of the Country:
  1. Army
  2. Navy
3. Persons engaged in the Learned Professions or in Literature, Art, and Science (with their immediate Subordinates):
  1. Clergymen, Ministers, and Others connected with Religion
  2. Lawyers and Law Stationers
  3. Physicians, Surgeons, and Druggists
  4. Authors, Literary Persons, and Students
  5. Artists
  6. Musicians
  7. Actors
  8. Teachers
  9. Scientific Persons

II DOMESTIC CLASS

4. Wives and Women engaged generally in Household Duties but assisting in certain cases in the Husbands' Business:
  1. Wives and others mainly engaged in Household Duties
  2. Wives assisting generally in their Husbands' Business
5. Persons engaged in Entertaining, and performing Personal Offices for Men:
  1. Engaged in Board and Lodging
  2. Attendants (Domestic Servants, &c.)

III COMMERCIAL CLASS

6. Persons who Buy or Sell, Keep or Lend Money, Houses, or Goods of Various Kinds:
  1. Merchantile Persons
  2. Other General Dealers
7. Persons engaged in the Conveyance of Men, Animals, Goods and Messages:
  1. Carriers on Railways
  2. " on Roads
  3. " on Canals and Rivers
  4. " on Seas and Rivers
  5. Engaged in Storage
  6. Messengers and Porters

IV AGRICULTURAL CLASS

8. Persons possessing or working the Land, and engaged in growing Grain, Fruits, Grasses, Animals, and other Products:
  1. Agriculturists
  2. Arboriculturists
  3. Horticulturists
9. Persons engaged about Animals:
  1. Persons engaged about Animals

V INDUSTRIAL CLASS

10. Persons engaged in Art and Mechanic Productions, in which Matters of various kinds are used in combination:
  1. Workers and Dealers in Books
  2. " " Musical Instruments
  3. " " Prints and Pictures
  4. " " Carving and Figures

5. " " Tackle for Sports and Games
6. " " Designs, Medals, and Bells
7. " " Watches and Philosophical Instruments
8. " " Surgical Instruments
9. " " Arms
10. " " Machines and Tools
11. " " Carriages
12. " " Harness
13. " " Ships
14. " " Houses and Buildings
15. " " Furniture
16. " " Chemicals
11. Persons working and dealing in Textile Fabrics and in Dress:
  1. Workers and Dealers in Wool and Worsted
  2. " " Silk
  3. " " Cotton and Flax
  4. " " Mixed Materials
  5. " " Dress
  6. " " Hemp and other Fibrous Materials
12. Persons working and dealing in Food and Drinks:
  1. Workers and Dealers in Animal Food
  2. " " Vegetable Food
  3. " " Drinks and Stimulants
13. Persons working and dealing in Animal Substances:
  1. Workers and Dealers in Grease, Gut, Bones, Horn, Ivory, and Whalebone
  2. " " Skins, Feathers, and Quills
  3. " " Hair
14. Persons working and dealing in Vegetable Substances:
  1. Workers and Dealers in Gums and Resins
  2. " " Wood
  3. " " Bark
  4. " " Cans, Rush, and Straw
  5. " " Paper
15. Persons working and dealing in Minerals:
  1. Miners
  2. Workers and Dealers in Coal
  3. " " Stone, Clay
  4. " " Earthenware
  5. " " Glass
  6. " " Salt
  7. " " Water
  8. " " Gold, Silver, and Precious Stones
  9. " " Copper
  10. " " Tin and Quicksilver
  11. " " Zinc
  12. " " Lead and Antimony
  13. " " Brass and other Mixed Metals
  14. " " Iron and Steel

VI INDEFINITE AND NON-PRODUCTIVE CLASS

16. Labourers and Others - Branch of labour undefined:
  1. General Labourers
  2. Other Persons of Indefinite Occupations
17. Persons of Rank or Property not returned under any Office or Occupation:
  1. Persons of Rank or Property not returned under any Office or Occupation
18. Scholars and Children not engaged in any directly Productive Occupations:
  1. Scholars and Children not engaged in any directly Productive Occupation

classification devised by Armstrong, based on that of Booth (1886), and neither was any social class allocation attempted.

Armstrong's pioneering and, in retrospect, brave work on the classification of occupations has received a good deal of strong criticism, and despite a rigorous defence, he has since admitted to certain weaknesses in his interpretation and use of census occupational data. He used the Registrar-General's 1951 classification "with slight modification" to categorise heads of household in his study of York in 1851, although it was "dependent in part on the fact that employers stated how many men they employed".\* The five social classes were fundamentally defined in terms of social status, for they were based on general standing within the community. However, he regarded them as "groups of persons having similar standards of life and... similar incomes with which to maintain such standards" (Armstrong, 1966). But essentially, the social classification scheme recommended by Armstrong is a system of grouping households according to the stated occupation of the head, a stratification technique which he regarded as necessary to "trace the economic contours of a society and the bases on which these rest" (Armstrong, 1972).

There have been two main areas of criticism of Armstrong's work:

(1) A particular drawback of the five-class scheme is the combination of skilled manual and routine non-manual occupations in Class III - further swelled by inclusion of petty traders. The lack of detailed information in the census schedules prevents more precise

\* The occupations from the enumerators' books for 1841 and 1851 were measured against the Registrar-General's systems of 1921 and 1951, and Armstrong found little difference (except with regard to clerks and domestic servants, each of which dropped a class), but opted for the 1951 system as the better one, although some occupations had disappeared in the intervening years.

classification, though Armstrong held that it is possible to sub-divide this group without implying social status by identifying different industries or distinguishing between manual and non-manual workers, for example. Royle (1977) posited a different five-class structure which abandoned the partly-skilled category (IV) as being inapplicable in the 19th century, and divided class III into routine non-manual and commercial (III) and skilled manual (IV). There remains, however, the obvious proposition that this was simply the largest group in society and might be recognised as such; attempts to sub-divide it into smaller groups may be spurious and misleading.

(2) Armstrong acknowledged that it was anachronistic to apply a scheme devised for 1951 to data for 1851 in view of the major social changes that occurred in the intervening century, but argued that changes in the class structure were mostly structural, resulting from the shifting distribution of the occupied population among the various groups rather than changes in the hierarchical ordering of the occupations themselves. Harris (in Dyos, 1968), however, was adamant that changes in the nature of occupations made use of 20th-century schemes on 19th-century data wholly inappropriate, and asked why a more contemporary scheme could not have been chosen. In his alternative scheme, Royle (1977) sought to stratify populations by reference to their 19th-century lifestyle, and maintained "its greater flexibility enables much more meaningful comparisons to be made between different towns". Holmes and Armstrong (1978), however, queried Royle's use of servants as an indicator of social status, citing recent research which suggested that rateable values may be better (Holmes, 1977), though this presumes the availability of rate books.

Criticising Armstrong (in Dyos, 1968), Hennock suggested it was inadvisable to use "a highly refined system of stratification if your

raw material isn't sufficiently well structured". Moreover, doubt has been cast upon the descriptions of occupations in census manuscripts, and it has been pointed out that occupation alone is simply not sufficient to determine social status, whole household income and wage levels, for example, should also be taken into account. Holmes and Armstrong (1978) noted that the assignation of occupations to lower classes partly based on subjective decisions had implications for study comparability. It may be argued that it is just this need for subjective decisions in any classification scheme which brings all attempts at classification into doubt.

In light of the difficulties discussed above, no attempt was made in this study to assign occupations to social classes or socio-economic groups. Instead, analysis was based on the system of occupational classification used by the census authorities in the mid-19th century, with minor modifications to compensate for changes in classification occurring between the 1851 and 1871 censuses. An Armstrong-style allocation of Plymouth inhabitants or households to notional social classes was considered, but the term social class describes conflict groups related to the authority structure of association, and is dependent upon the technical, political, and social conditions of a society, and the generation of class-consciousness within it. Further, as Neale (1968) has argued, social stratification depends not only upon occupation, but also on source and size of income, education, or size of assets, plus values, social customs, and language (thus involving perceptual and behavioural elements). Indeed, social class remains as much a matter of perception as of socio-economic exactitude. Armstrong's approach is, at best, a rather inexact and unsatisfactory method of social class allocation; in fact, his scheme is more of an

occupation-summarising procedure.

The census data sampled for Plymouth contained occupation information, thus it may be argued that a further variable assigning a notional code to those data would have been superfluous. Therefore, it was decided that, since this study seeks to examine the social geography of mid-Victorian Plymouth as distinct from the socio-economic status of mid-Victorian Plymothians, the classification system prevailing at that time was more appropriate as it reflects the perception of the time, and no preconceptions regarding social class were applied.

Banks draws attention to the inherent and seemingly insurmountable problem which still besets analysts of occupational data:

"The use of either form of classification implies an inference from whatever is recorded on a census schedule about an individual's occupation and the nature of his employment to a conception, regarded as more socially fundamental, of a structured order of divisions within communities which is not directly investigated by those who make a census."  
(Banks, 1978)

The arbitrary assignation of every man to a distinct group, whether based on his skill, earning power, or education, can never be satisfactorily achieved, for cultural cross-fertilisation and perceptual differentiation will always blur the edges of such groups. Further, the criteria for definition are constantly changing; thus to impose 20th-century value judgements upon 19th-century occupations will always be prone to error. In studying Victorian economic life, the only valid cultural perception is that pertaining at the time; modification and interpretation of the census occupational returns for this study, therefore, have been kept to an absolute minimum.

## 2.4 Conclusion

This chapter has reviewed the sources available for studying the 19th-century geography of Plymouth and Stonehouse, and the methods employed in this research. The primary data source is unquestionably the census and its use in this study has been described. As successive sets of census manuscripts have been released to public scrutiny, and work on these books has accrued, methods of analysis have been developed and refined since the first pioneering steps in the 1960s.

Caution must always prevail in demographic analysis: the information derived from the census manuscripts is "a glimpse of a moving picture. It is not at all easy to infer demographic trends from it" (Armstrong, 1968). Each stage of statistical abstraction removes interpretation one stage further from the original data.

"When we attempt to probe more deeply... we are likely to move into areas where the evidence of the census enumerators' books is suggestive, but not conclusive." (Armstrong, 1968)

Further, all data sources are imperfect and any inference must contain an element of doubt; at best only indications and trends can be inferred. It is necessary, therefore, to remain aware of the general limitations of census analysis (Eversley, 1966) and, indeed, of all other 19th-century sources.



CHAPTER THREE: POPULATION CHARACTERISTICS AND GROWTH MECHANISMS IN  
MID-VICTORIAN PLYMOUTH

3.0 Introduction

Throughout the 19th century the populations of Plymouth and Stonehouse exhibited an extraordinary rate of growth; this was illustrated in the opening chapter of this thesis. This chapter will quantify the population growth and its components, natural and migrational change, it will also establish the characteristics of the population and identify patterns of distribution within the two towns. Clearly, explanations for population growth cannot be simply demographic, economic factors, for example, will have had an influence; wider-reaching explanations, therefore, will be considered in subsequent chapters.

It might be assumed that, as the largest urban centre in Devon and Cornwall, the growth of Plymouth's population was primarily due to in-migration, but analysis of the census abstracts revealed a more complex pattern of demographic change. Certainly in-migration was the major component in population growth during the first half of the 19th century, but when natural increase was subtracted from the total increase in population - the remaining change being attributed to migration - a net out-migration from the area was found between 1861 and 1881. The growth rate did fall markedly in this period but the population total continued to grow, apparently dependent upon natural increase. (There is evidence to suggest that the out-movement was substantially the result of suburbanisation and urban overspill.) In effect, while the balance between in-migration and out-migration erred in favour of out-movement, in-migration was still occurring and it may

be assumed that the age structure of the immigrants was predominantly youthful and so will have contributed to population growth through natural increase. The origins, distribution and characteristics of the migrant population will be discussed fully in the next chapter.

### 3.1.1 Plymouth's population growth

In the early years of the 19th century the wheels of population growth were already in motion. Rickman's Statement of progress (1831) reported on the expansion of principal towns and cities, including Plymouth, Stonehouse and Devonport combined. Of the nine ports he considered, the three towns were ranked fourth according to cumulative growth between 1801 and 1831 (Table 3.1). Rickman also noted that, excluding seamen (Naval and Merchant), the sex ratios of these ports showed an excess of females. In the first half of the century Liverpool's population grew five-fold (Lawton, 1955) and that of greater Manchester expanded at almost the same rate (Rodgers, 1961-2).

TABLE 3.1: The growth of principal ports, 1801-1831 (percentages)

	1801-11	1811-21	1821-31	Cumulative growth
Liverpool (inc. Toxteth)	26	31	44	101
Aberdeen	28	27	30	85
Dundee	13	3	48	64
Plymouth, Stonehouse & Devonport	30	9	23	62
London (metropolis)	17	21	20	58
Bristol	20	15	18	53
Newcastle (inc. Gateshead)	-	29	23	52
Hull (inc. Sculcoates)	-	29	18	47
Portsmouth (+ Portsea & Gosport)	21	7	11	39

Source: John Rickman (1831) Statement of progress.

While Plymouth could not match such phenomenal population increase, the growth of the southwest port was, nevertheless, extraordinary.

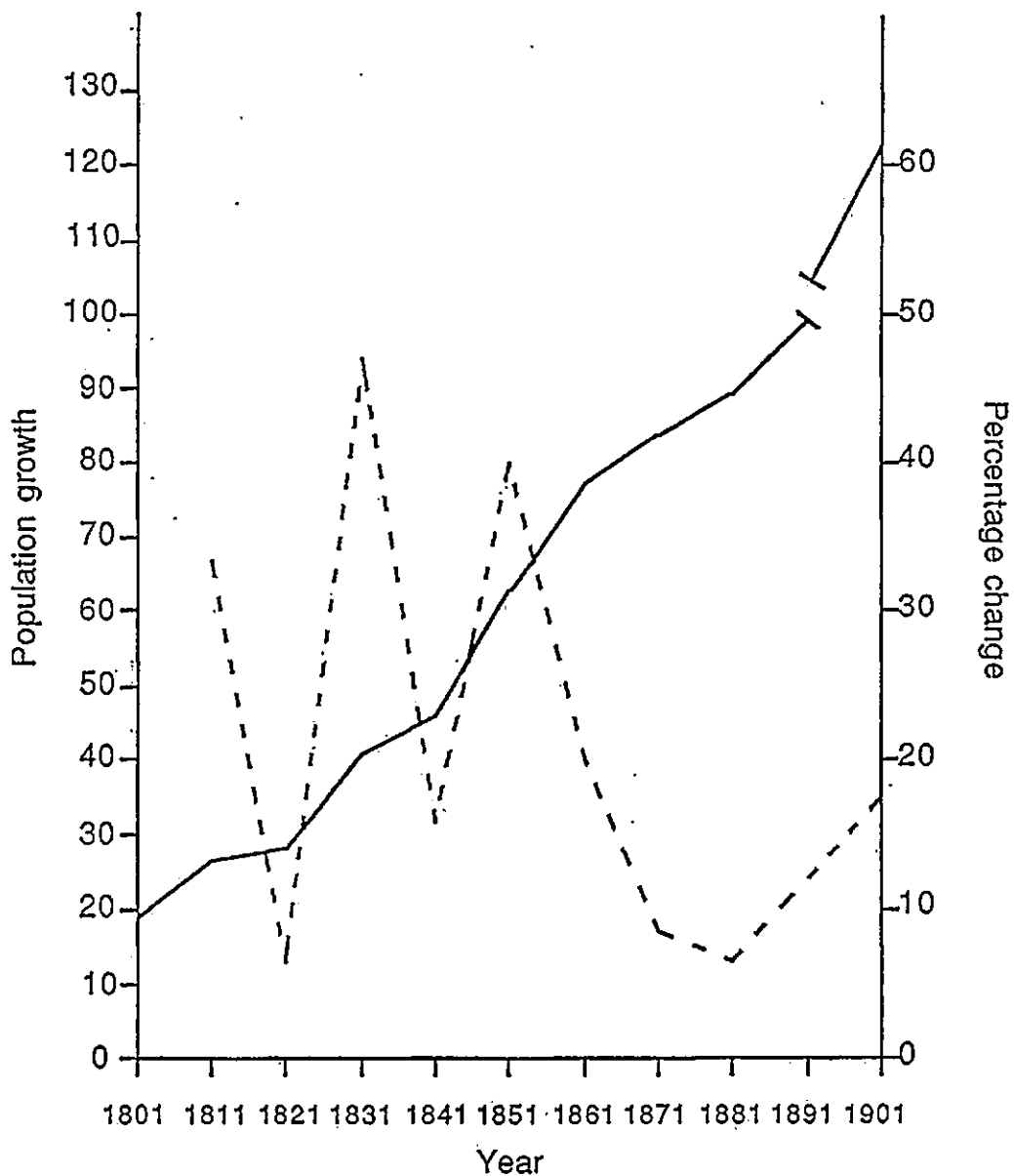
The population of Plymouth and Stonehouse together grew by 38.9% in the 1840s, and by 19.8% in the following decade (Table 3.2 and Figure 3.1); only in the 1820s had the population grown faster. In 1851 the census authorities computed the rate of growth of 220 'representative' towns and found that during the first half of the century (1801-1851) in 26 sea-ports (excluding London) the rate of growth was 196 percent; by comparison, that of Plymouth and Stonehouse was 230 percent. Brief reference to the published abstracts of population totals further shows that Plymouth's population was unique in the southwest for its exceptional growth rate and consequent density of population by 1851. In his return of births and deaths in 1851, the Registrar stated that within a decade Plymouth's population had increased by an amount which almost equalled the total number of residents in 1801. It was estimated that the average annual increase from immigration alone was

TABLE 3.2: Population change, 1801-1901 (showing decadal percentages)

Census	PLYMOUTH		EAST STONEHOUSE		WHOLE AREA	
	pop.	% change	pop.	% change	pop.	% change
1801	16040	-	3407	-	19447	-
1811	20803	29.7	5174	51.9	25977	33.6
1821	21591	3.8	6043	16.8	27634	6.4
1831	31080	43.9	9571	58.4	40651	47.1
1841	36520	17.5	9712	1.5	46232	13.7
1851	52221	43.0	11979	23.3	64200	38.9
1861	62599	19.9	14343	19.7	76942	19.8
1871	68833	10.0	14585	1.7	83418	8.4
1881	73863	7.3	15041	3.1	88904	6.6
1891	84253	14.1	15401	2.4	99654	12.1
<hr/>						
1891*	88931	-	-	-	104332	-
1901	107636	21.0	15111	-1.9	122747	17.7

\* Revised figures following boundary changes under Divided Parishes Acts of 1890s.

Source: Published census data.



- +— Boundary change between 1891 and 1901 censuses
- - - Percentage change
- Total growth

**Figure 3.1:** The growth of Plymouth and East Stonehouse, 1801-1901, and the percentage population change between censuses. Based on the published census data.

greater than one thousand.

While the Registration Districts of Plymouth and East Stonehouse continued to experience rapid population growth in the mid-19th century, individually they saw growth at different rates. The population growth rate of Stonehouse was less than that of Plymouth, though the increase in both Districts declined throughout the study period. The growth of the two towns in the mid-19th century was not so dynamic as that of, say, Cardiff or Leicester, whose populations doubled between 1851 and 1871, and 1851 and 1881 respectively (Lewis, 1979; Simmons, 1965-66), but the populations of Plymouth and Stonehouse, and also of Devonport, were expanding faster than any other major town in the southwest. The population of Bridgewater grew by 17 percent between 1851 and 1871, Salisbury grew by over ten percent in the same period, and Exeter by only 5.6 percent, while the population of Bath actually decreased by some three percent, compared to the thirty percent increase in the three towns' population.

One of the chief characteristics which sets Plymouth apart from other urban areas is the presence of the armed forces. For historical population analysis their presence has two implications: on the one hand it means that population was attracted (both the forces personnel who were ordered there and those who provided services and functions for them) and on the other hand, it tends to distort the overall figures. When forces personnel are subtracted from the total population (Table 3.3) the growth rate of the Stonehouse population, particularly, is diminished.

When distinguishing between the growth of the female and male populations, the most significant point to note is that the growth in the male population of Stonehouse peaked ten years after female population growth, especially when forces personnel are subtracted.

TABLE 3.3: Population change excluding forces personnel, 1851-1871\*

	Census	Forces	Revised Pop	% change
PLYMOUTH	1851	2371	49850	39.4
	1861	2376	60223	20.8
	1871	2469	66364	10.2
EAST STONEHOUSE	1851	983	10996	16.9
	1861	1869	12474	13.4
	1871	1964	12621	1.2

\* Showing percentage population change during the previous decade.  
Source: Published census data, forces data taken from published abstracts of occupations.

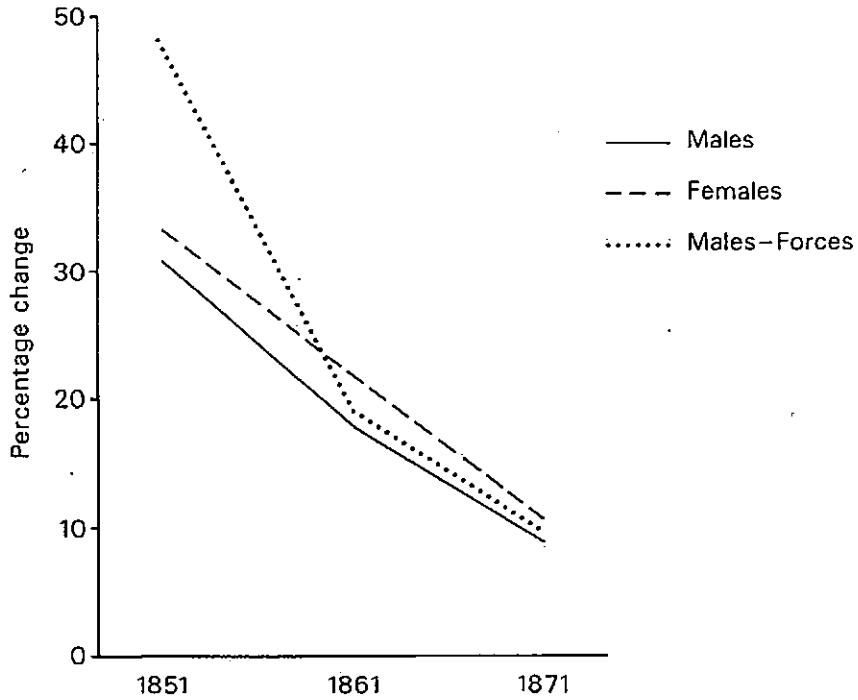
Table 3.4 and Figure 3.2 demonstrate that while both Plymouth and Stonehouse male populations, and their growth rates, were affected by the forces presence, the effect was much sharper in Stonehouse, especially in the decade prior to 1851. The evidence again suggests that the pattern of growth in these two towns differed: while the rate for males and females declined in Plymouth, the male population growth rate in Stonehouse continued to increase up to 1861 and then declined so sharply that there was actually a net decrease. Since this pattern is not altered by the subtraction of forces personnel, other explanations must be sought. It should be noted that the numbers of

TABLE 3.4: Population change by sex, 1851-1871

Census	Males inc. forces	% change	Males exc. forces	% change	Females	% change
PLYMOUTH						
1851	24605	30.8	22234	47.8	27616	33.4
1861	29010	17.9	26635	19.8	33589	21.6
1871	31640	9.1	29171	9.5	37193	10.7
EAST STONEHOUSE						
1851	5168	24.7	4185	9.0	6811	22.4
1861	6865	27.5	4996	19.4	7478	9.8
1871	6844	-0.3	4880	-2.3	7741	3.5

\* Showing percentage population change during the previous decade.  
Source: Published census data.

a) PLYMOUTH



b) EAST STONEHOUSE

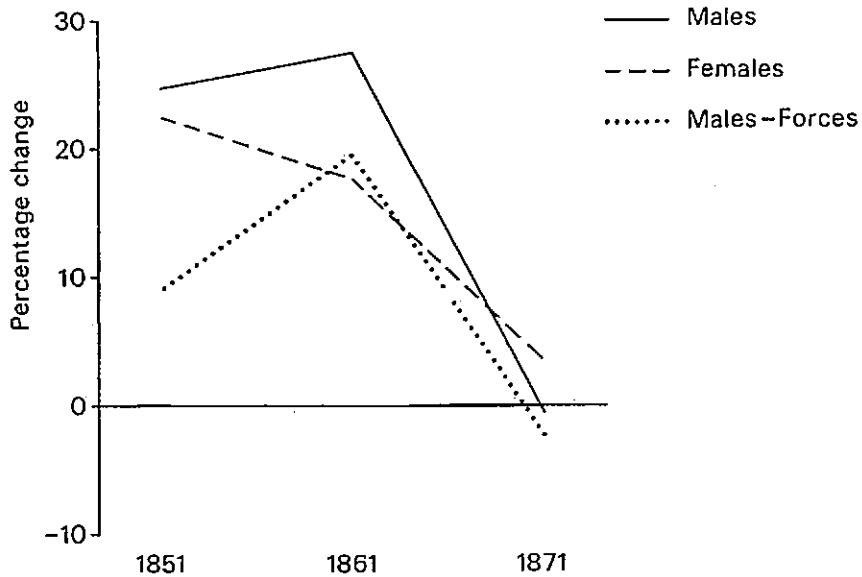


Figure 3.2: Percentage population change by sex in Plymouth and Stonehouse, 1851-1871, showing the effect of the armed forces' presence on population structure. Based on the published census data.

men enumerated in Stonehouse, excluding forces personnel, were quite small, ranging between only four and five thousand throughout the study period. The net decrease in the 1871 census was just 116.

Changes in local employment opportunities would seem to offer a partial explanation of these trends. In the 1850s there were several large-scale building projects in progress, but as these projects were completed, the workforce moved elsewhere. The construction of Millbay Docks, for example, provided short-term employment for large numbers of men in the Stonehouse area. A large proportion of Plymouth residents were sea-faring, therefore it is possible that there will have been large temporary fluctuations in the resident population. The fishing industry was overwhelmingly concentrated in Plymouth District and provided employment for nearly 600 men in 1861. So it is possible that an above average number of sea-faring residents were present on census night in 1861, or an above average number were absent on census night in 1871. Only those seamen on shore or in port on census night, or who arrived during the following day, were returned (Bellamy, 1978).

It was concluded that a variety of factors governed the patterns of growth and change experienced in the two towns in the mid-19th century, and that an adequate assessment of these factors required the more detailed investigation of the data which follows.



### 3.1.2 Age structure

From 1851 onwards the ages of the people are recorded in the census published data in quinquennial age groups by sex and Sub-district, thereby making it possible to gain a detailed picture of the age structure of the population.\* A series of pyramids illustrate the age distribution of each Sub-district population in the study area for each census year, together with comparable pyramids showing the age structures of the southwest counties+ population (Figure 3.3).

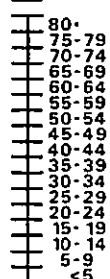
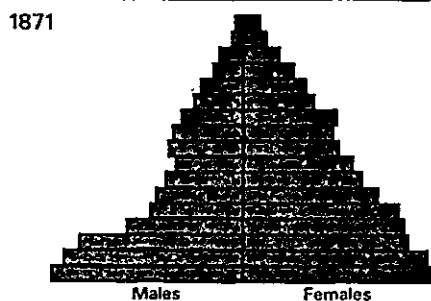
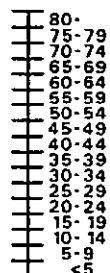
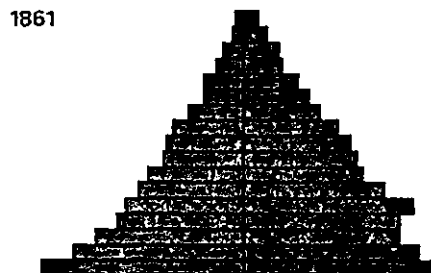
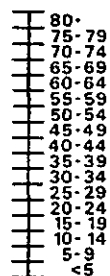
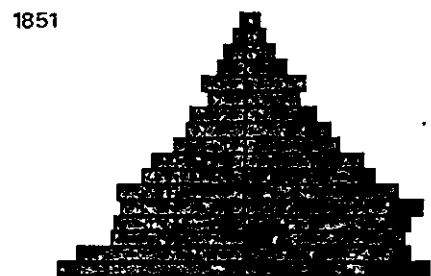
Ravenstein (1885, 1889), in his Laws of Migration, stated that migrants are generally young adults and that women tend to migrate to an area first; thus most migrants will be young adults aged 20-34 and age structure pyramids for areas experiencing in-migration may be expected to 'bulge' around this age group. Although Ravenstein's Laws represent a fairly accurate summary of the structure of ages in mid-Victorian Plymouth and Stonehouse, there are anomalies to the theoretical pattern and these demand further examination.

Charles the Martyr appears to have been receiving female in-migration throughout the study period, however, it was common in Plymouth for the male head of household to be absent for long periods (principally forces personnel) and this could have affected the recorded age structure. By contrast, in St Andrew the pyramids are more evenly balanced, though the younger age groups are noticeably larger indicating greater in-migration. East Stonehouse appears to have been attracting rather more women than men in 1851, but the age

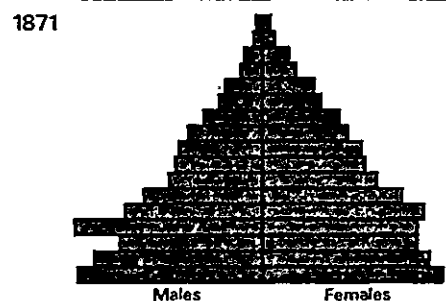
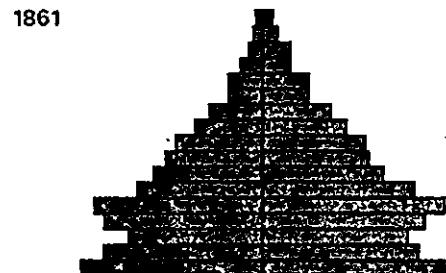
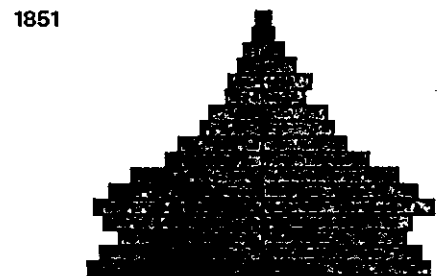
\* Sub-district population by age group (male or female) is expressed as a percentage of the total population of that Sub-district (male and female).

+ Southwest counties = Cornwall, Devon, Dorset, Somerset & Wiltshire.

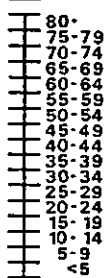
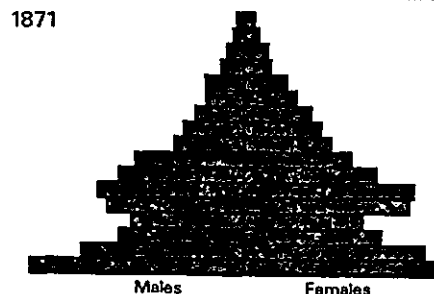
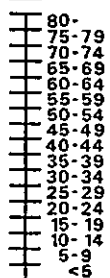
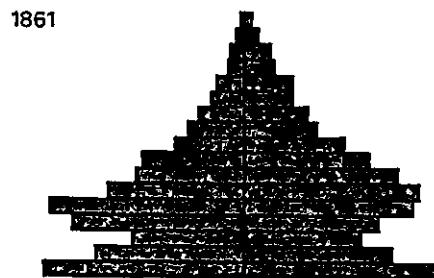
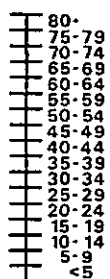
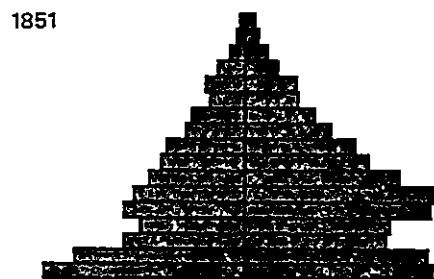
PLYMOUTH: Charles the Martyr



PLYMOUTH: St. Andrew



EAST STONEHOUSE



SOUTH WEST COUNTIES

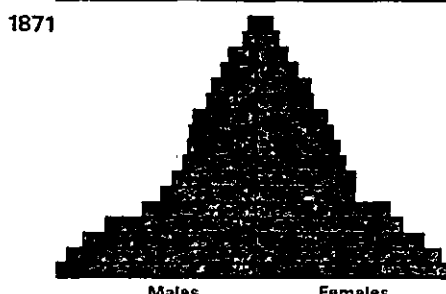
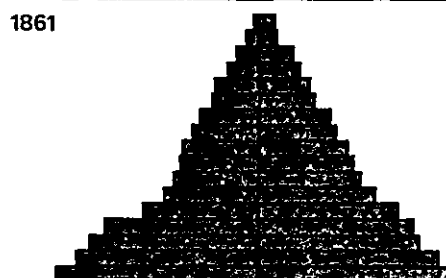
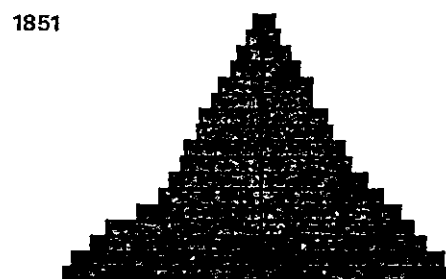


Figure 3.3: Age pyramids for the Registration Districts of Plymouth: Charles the Martyr, Plymouth: St Andrew, and East Stonehouse, and the southwest counties comprising Cornwall, Devon, Dorset, Gloucestershire, Somerset and Wiltshire. Based on the published census data.

structure was more balanced in 1861 and 1871; the considerably larger numbers of young men in 1861 can be attributed to military barracks, accounting for over thirteen percent of the male population in Stonehouse (compared to about four percent in Charles and St Andrew).\*

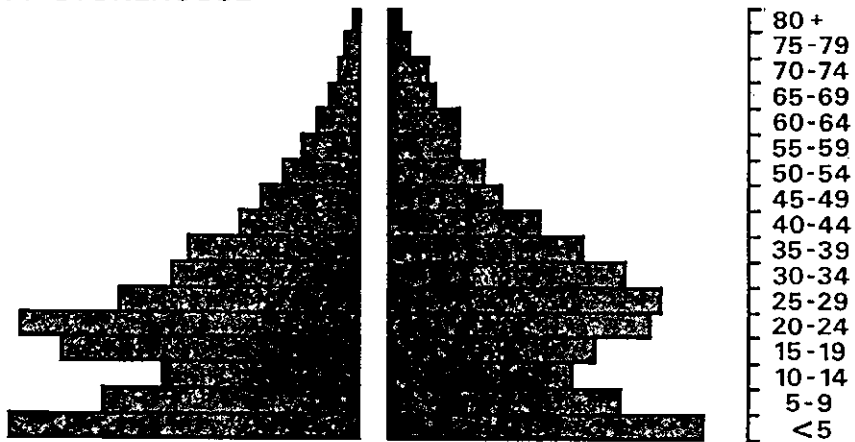
The problem of large institutions exaggerating the percentages of people in certain age groups and thus distorting age structure pyramids emphasises a basic flaw in this method of analysis. The impact of an exceptionally large number of people in a few age groups will extend through all the age groups when each group is expressed as a percentage of the whole population.

One solution to this problem is to express population by age group as percentages of total population, separately for each sex, on the assumption that most of the forces personnel were male and that this would improve the accuracy of the female side of the pyramids. This approach is demonstrated for Stonehouse in Figure 3.4: comparison with the similarly-revised pyramid for the southwest counties readily shows the excess number of young men in Stonehouse, where some 35 percent of the male population in 1861 were aged between 15 and 29 years against 25 percent of the southwest male population. This excess reflects the inclusion of the Marine Barracks in these data. It can also be seen, by comparison with the conventional pyramid for East Stonehouse (Figure 3.3), that the basic shape of the pyramid is not altered although the young male adult segments are emphasised while the young female adult segments decrease slightly.

\* The published data do not permit the separation of particular occupational group according to age at this scale, thus it may only be inferred that these young men were in the forces. Also, it is likely that the number of men in barracks fluctuated considerably dependent upon their duties.

Revised Age Structure, 1861

EAST STONEHOUSE



SOUTHWEST COUNTIES

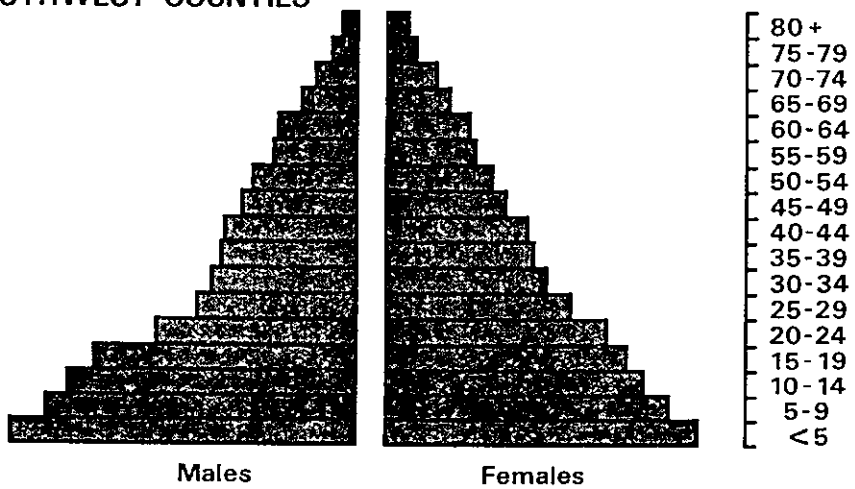


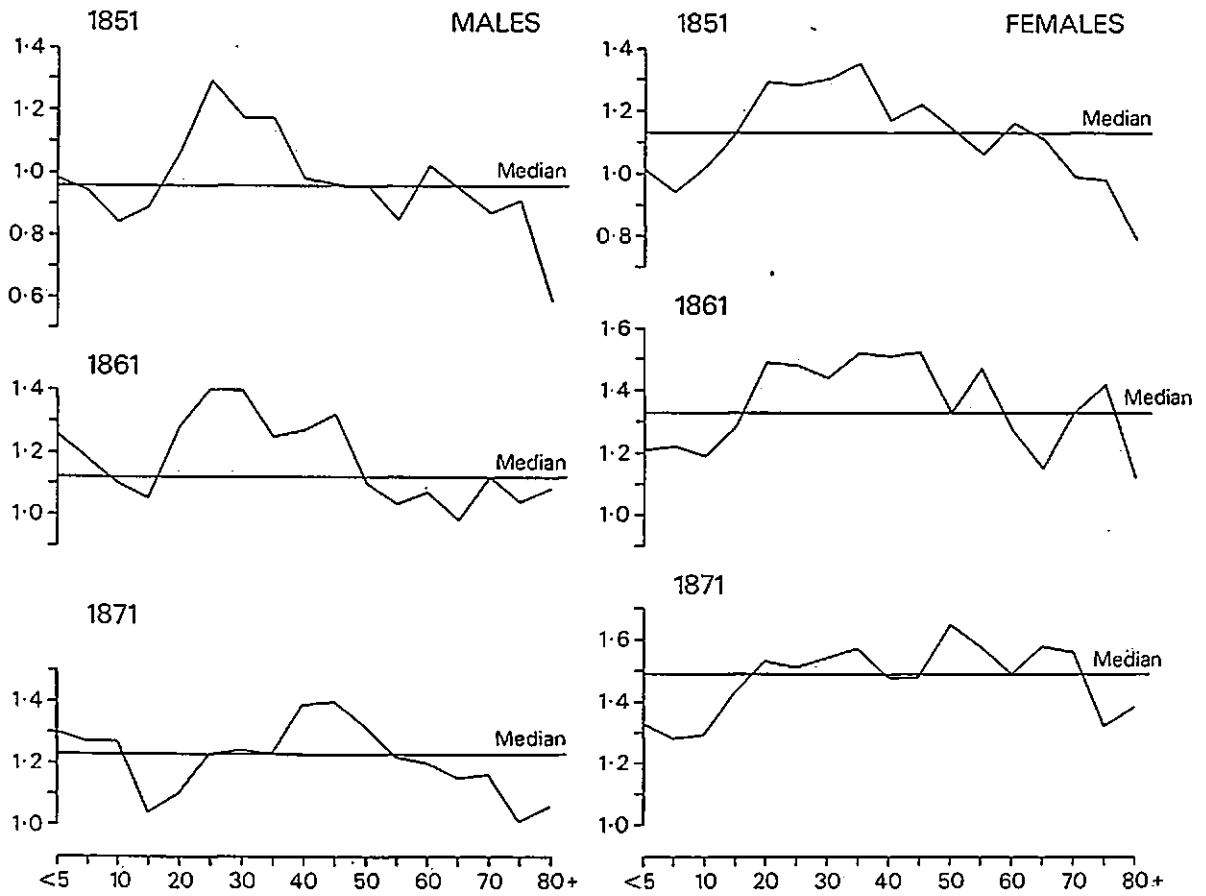
Figure 3.4: Revised age structure pyramids using the published census data for 1861. The age structure of the population is calculated for males and females independently.

Another approach to the problem of identifying the character of the age structure of Plymouth and Stonehouse was the use of so-called deviation graphs. For this method the population of a Sub-district by age group is expressed as a percentage of the population of, in this instance, the southwest counties by age group; in effect, a ratio is calculated for each age group, male and female, in the Sub-district. In order to evaluate the scale of deviation of study area age groups from those of the southwest counties, the median percentage was calculated for each Sub-district in each census year. When the graph falls below the median percentage it may be inferred that there is a smaller number of people in that age group than might be expected, and when the graph rises above the median percentage that there is a greater number of people than expected.

This method proved to be a more sensitive indicator of local age structure: the graph will always rise in the young adult age groups in a Sub-district receiving in-migration, and fall in the older adult age groups; also the graph will always fall in the young adult age groups in a Sub-district experiencing out-migration, and rise in the older adult age groups. Indeed, the resultant graphs (Figures 3.5-3.7) illustrate the changing age structure, by sex, for the three Sub-districts far more clearly than the standard age pyramids.

In Charles the Martyr (Figure 3.5) the noticeable peak in the 25-39 years age group in 1851 is carried over to the 35-49 years age group in 1861 when there was a new peak for the 20-34 years age group. In 1871 both of these peaks move on in the graph, but there is no noticeable new peak in the younger adult age group, perhaps indicating a cessation of in-migration. The graphs for St Andrew (Figure 3.6) are far more dramatic and suggest most clearly the influence of continuing in-migration. The pattern revealed in East Stonehouse

Age structure deviation : Charles the Martyr



**Figure 3.5:** Local population by age group is expressed as a percentage of the southwest counties' population by age group. The age groups are indicated on the x axis and the y axis measures the percentage values; the median percentage is also illustrated. Based on the published census data.

### Age structure deviation: St Andrew

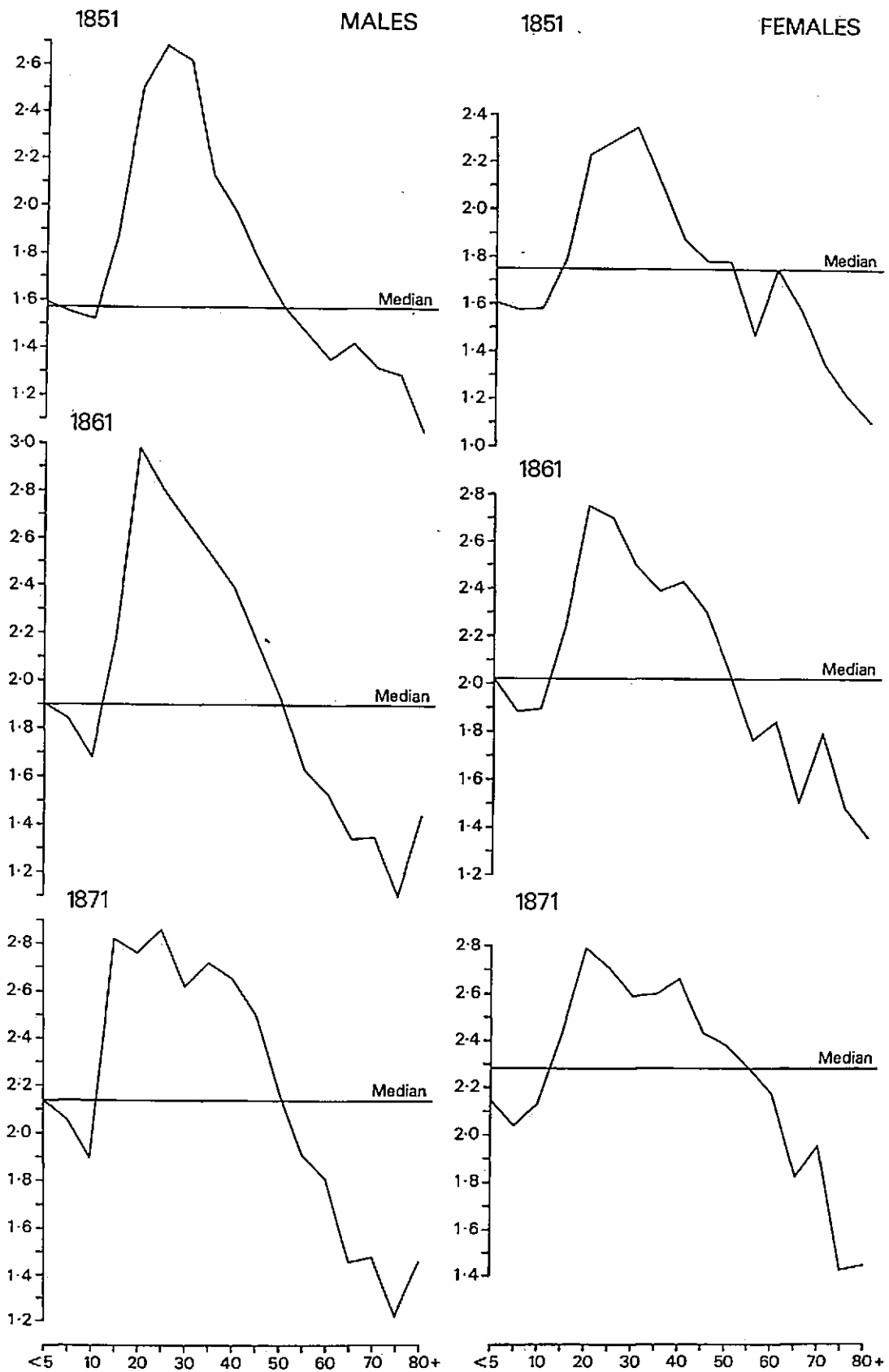
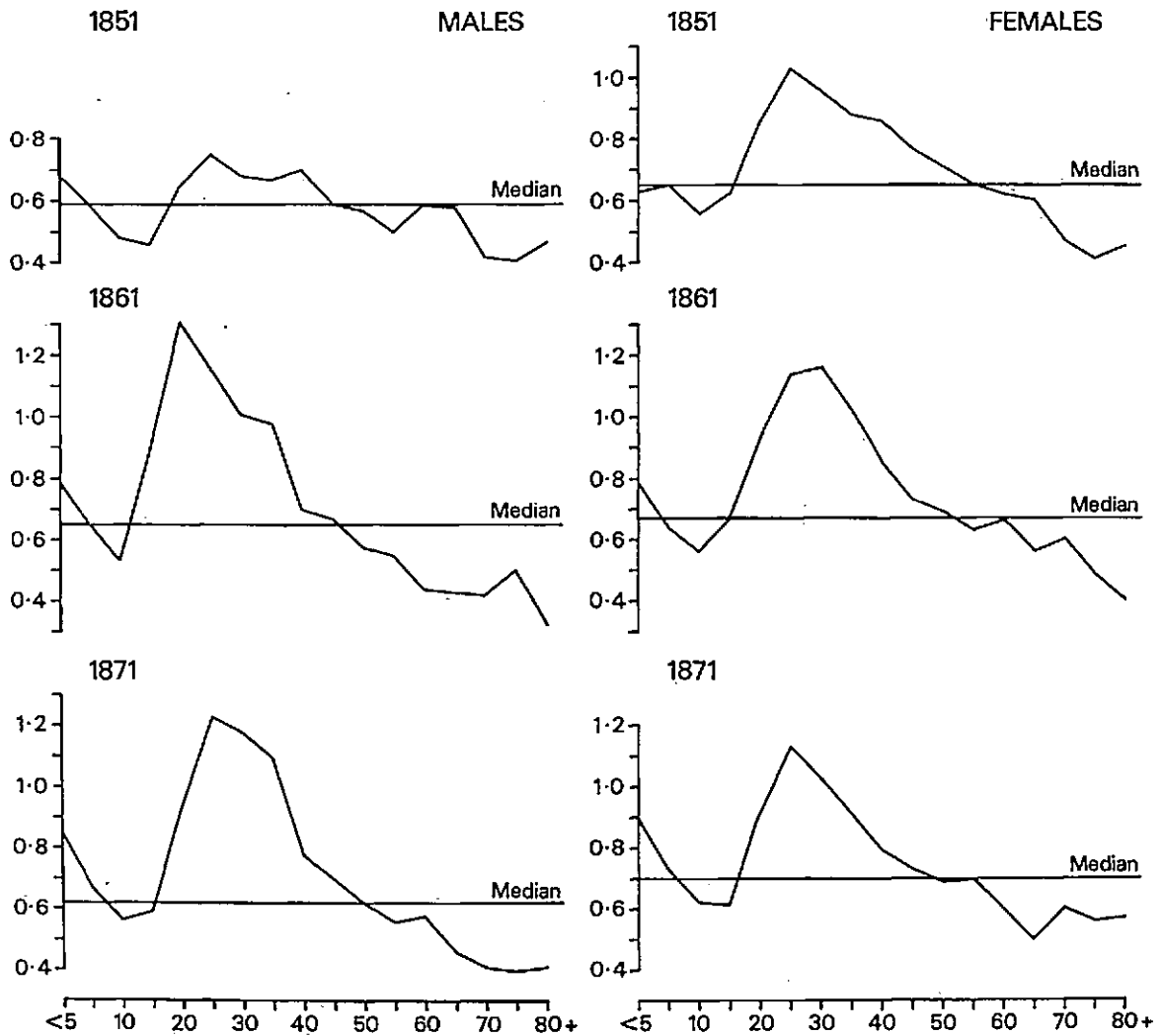


Figure 3.6: Local population by age group is expressed as a percentage of the southwest counties' population by age group. The age groups are indicated on the x axis and the y axis measures the percentage values; the median percentage is also illustrated. Based on the published census data.

**Age structure deviation : East Stonehouse**



**Figure 3.7:** Local population by age group is expressed as a percentage of the southwest counties' population by age group. The age groups are indicated on the x axis and the y axis measures the percentage values; the median percentage is also illustrated. Based on the published census data.



(Figure 3.7) is different again: the 1851 graphs suggest an initial in-movement of women, only in the later census years are young men seen to be moving into the Sub-district; as noted earlier, this was very largely due to the expansion of the barracks.

The analysis of age structure in the study area has made particular reference to migration as a governing factor. There would seem to be indications of continuing in-migration despite evidence of net out-migration towards the end of the study period, although the graphs for Charles the Martyr in 1871 do clearly suggest that this was no longer a receiving Sub-district. The distribution of migrants is examined in greater detail in Chapter Four with regard to their origins and destinations within the two towns.

### 3.2.1 The components of population growth

The numbers of births and deaths in Plymouth were tabulated in the published census data at the Registration District level for the periods 1851 to 1860, 1861 to 1870, and each decade thereafter. Similar information was not included for earlier years but can be obtained in part from the Registrar General's Annual Reports. In addition, Sargant (1865) included vital data for Plymouth (but not East Stonehouse) in the 1840s and 1850s in his account of inconsistencies in the 1861 census. This information was used to provide a general indication of the contribution to overall population growth made by natural change and then, by separating natural change from migrational change, to identify which of the two components

TABLE 3.5: Natural and migrational change, 1851-1871

Census	Total Pop	Births*	Deaths*	Natural change	Migrational change	Total change
PLYMOUTH						
1841	36520	-	-	-	-	-
1851	52221	14004	11013	+2991	+12710	+15701
1861	62559	18707	13559	+5148	+5190	+10338
1871	68833	22493	15182	+7311	-1037	+6274
1881	73863	22042	16146	+5896	-866	+5030
EAST STONEHOUSE						
1851	11979	-	-	-	-	-
1861	14343	4677	3562	+1115	+1249	+2364
1871	14585	5847	3967	+1880	-1638	+242
1881	15041	5870	4197	+1673	-1217	+456

\* Births and deaths given for the preceding decade.

caused the growth rate to fluctuate.\*

In the 1840s Plymouth's rapid growth was clearly due to migration (Table 3.5), migrational change accounted for four times more growth than natural change, yet by the following decade the two components of population change were contributing equally to overall growth. During the 1860s the flow of migration was reversed and growth became dependent upon natural increase in both Plymouth and East Stonehouse. Both Registration Districts subsequently continued to experience an apparent net out-migration: Plymouth to 1881 and Stonehouse to 1901.

It has already been noted that these trends may be partly explained by changes in the local job market. Overall population totals in Plymouth were almost certainly affected by the major construction projects, described more fully in Chapter Five, when the Breakwater, the railway station and Millbay Docks were completed, and large

$$* P_j - (B_{ij} - D_{ij}) - P_i = M_{ij}$$

where: P = population                      B = births  
D = deaths                                      M = migrants  
i = first census year                      j = second census year

numbers of labourers moved away. Also, a footnote in the published abstracts records that a series of strikes in St Andrew Sub-district, for more pay and shorter hours, caused a recession between 1861 and 1871, and thus, in all probability, a consequent loss of employment and some out-migration. The number of people employed in professional and industrial occupations fell between 1861 and 1871, although there was an increase in the number of commercially-occupied people.

Different parts of the two towns were differently able to accommodate physical expansion and thus in-migration; East Stonehouse, already crowded, was clearly limited (see Chapter Five). There is circumstantial evidence to suggest that the direction of flow of migrants in Plymouth reversed because of intra-urban and suburban movement. The nature of building beyond the town boundary indicates that the better-off inhabitants were moving away from the centre of town as its commerce expanded. People were moving into better housing and adjacent parishes were showing exceptional population growth, indicative of early suburbanisation (this is discussed in detail in Chapter Four). Out-migration was, in all likelihood, as much a response to overcrowding within the town boundaries as an indication of an economically-determined movement away from the two towns.

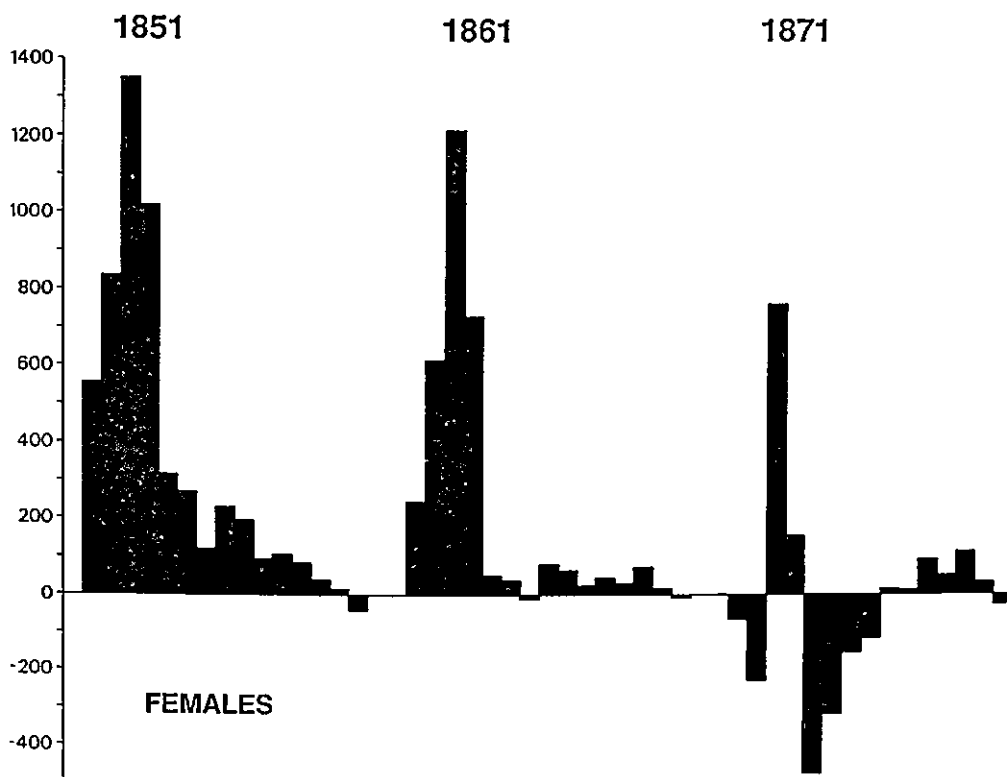
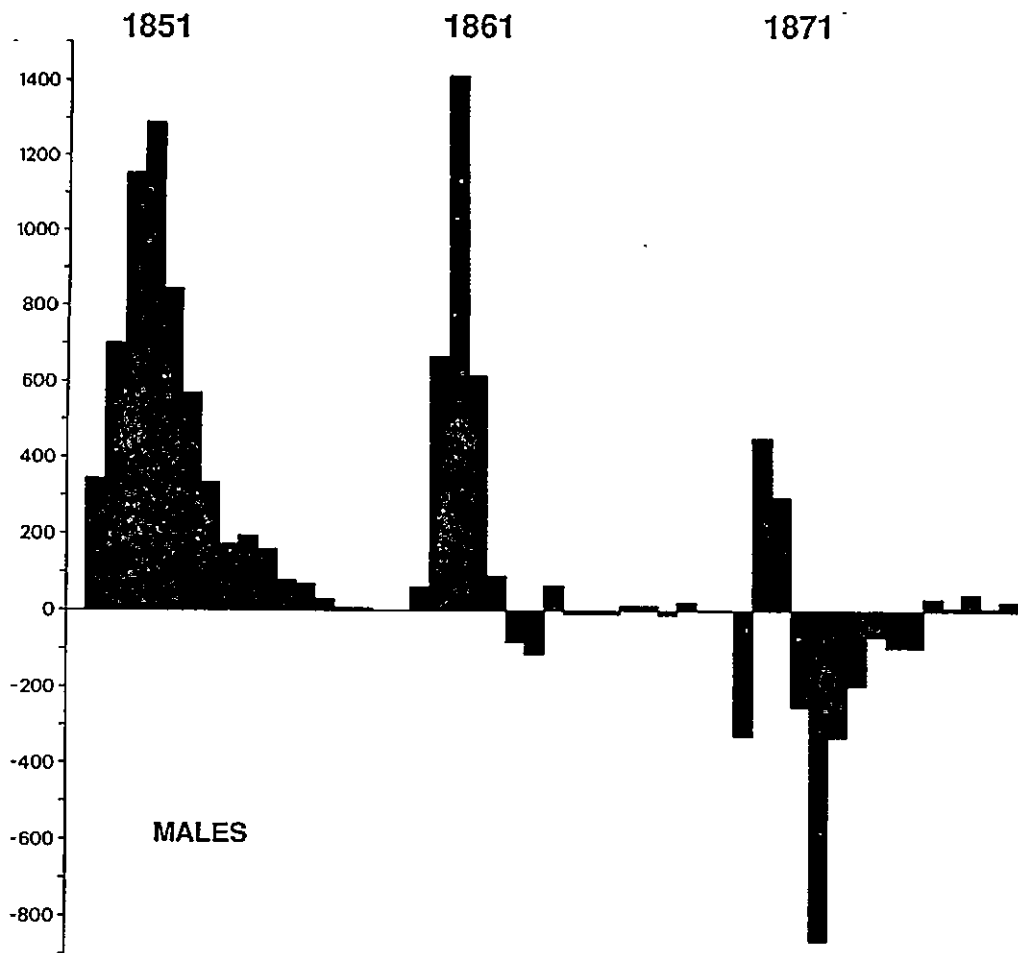
A much more complex situation existed in mid-19th century Plymouth with regard to population growth and change than might at first be inferred from the overall population totals. The initial assumption that population growth and decline stemmed solely from migration is clearly too simplistic. Of course, the situation that pertained in mid-Victorian Plymouth was not unique, in other cities too, prior to 1850, migration was the principal component of urban growth, but "after the middle of the nineteenth century natural increase became increasingly important, migration less so" (Grigg, 1980).

Three-quarters of London's growth, 1841-1911, was due to natural increase (Lawton, 1972), and similar proportions have been found in Hull after 1851 (Brown, 1969) and Bristol after 1861 (Shannon & Grebenik, 1943). Grigg says that in 1851, 48 percent of the population of sixty-one English towns were migrants (London contained 38.8%), but "there was considerable variation from town to town." The published census data for 1851 revealed that 58 percent of Plymouth Borough inhabitants were not locally born. The character of Plymouth's migrant population is examined in greater detail in the next chapter.

### 3.2.2 Census Survival Rates

In order to establish an indication of the ages of migrants in Plymouth's population, census survival ratios were calculated (Hamilton & Henderson, 1944). The ratios are, in effect, a comparison between the expected population by age group and the actual population, positive or negative differences being attributed to in- or out-migration, respectively (Appendix A). The national survival ratios were calculated for 1851, 1861 and 1871, and then applied to the population of the whole study area (Plymouth and East Stonehouse combined). The larger areal unit was preferred because it was found that, at District or Sub-district levels, the population figures by age group were too small to ensure meaningful results.

Figure 3.8 illustrates the results of this exercise. Quite clearly the statistics suggest considerable net in-migration of young adults, both male and female, in 1851 and 1861, but in 1871 the flow of



**Figure 3.8:** Estimated net migration by age group to Plymouth and Stonehouse based on the calculation of census survival rates.

migration is reversed and there is sizeable net out-migration. This technique does not permit calculation of actual migrant totals by age group as it is only a comparison with the expected age structure. But, on the other hand, it does demonstrate which age groups were most likely to migrate in a given census interval, and gives an impression of the relative strength of the migration flows.

There is clear evidence of in-migration by men aged 15-39 in the 1840s and there is similarly strong female immigration in the smaller 15-29 year-old age bracket. The 1850s saw a change in the shape of estimated in-migration within the narrower age band of 15-29 year-old males, especially the 20-24 year bracket (helped by an additional 900 forces personnel following the marine barracks extension), but there is also the first suggestion of out-migration, notably among men aged 35-44. By 1871 a quite different pattern emerges: while immigration of males aged 15-24 and females aged 20-29 continued, there was a clear out-migration of men aged 25-59 and women of 30-45.

This statistical exercise further confirms the evidence already presented to show that the 1840s and 1850s were periods of net in-migration and the 1860s one of net out-migration and, in addition, it indicates the sex and ages of the migrants.

### 3.3.1 The spatial pattern of population characteristics

Analysis of the published census abstracts for Plymouth and Stonehouse has revealed a population growing rapidly through both natural increase and in-migration. A more detailed knowledge of this population may be obtained from the manuscript census which permits

analysis at the enumeration district level to discover the spatial pattern of population characteristics such as the mean age of heads of household, and ratios of age, sex and fertility (see Tables 3.6-7). This section will also consider the distribution of single-person and nuclear family units, servants and lodgers, widowed heads of household and the marital status of the population.

Age ratios were calculated for the study area enumeration districts from the sample census data and mapped (Figure 3.9). It can be seen that there were marked differences between different parts of the two towns, and also that the distribution of the population according to age changed between 1851 and 1871. Overall figures suggest that the population was very slightly older in 1871: the ratio for the study area as a whole in 1851 was 0.60, in 1871 it was 0.62.

The Durnford Street area (the southern part of Stonehouse) went against this trend (its age ratio falling from 2.00 to 0.78); while the sample did not include the Marine Barracks, its immediate proximity may be regarded as influential. The area to the west of the Hoe, with a very low ratio in 1851, was at that time sparsely populated being largely open ground; in the intervening years it was built up with good-class housing and the much older age ratios for this group of enumeration districts in 1871 reflect this. Indeed, as subsequent discussion will reveal, an older population is one characteristic of 'better-off' districts, and the enumeration districts having older age ratios generally coincide with indicators of affluence such as the distribution of servants.

By comparison, enumeration districts containing poorer inhabitants, often those born outside Plymouth (for example, Irish migrants - see Chapter Four) tended to live in demographically "younger" enumeration

TABLE 3.6: 1851 Population characteristics by enumeration district

Enumeration District	Mean age HOH	Age ratio	Sex ratio	Fertility Ratio	
Charles	01	49.1	0.43	0.62	0.24
	02	43.6	1.08	0.98	0.54
	03	40.9	0.57	0.83	0.55
	04	42.6	0.69	0.94	0.47
	05	39.7	0.32	0.97	0.75
	06	42.7	0.46	0.87	0.55
	07	42.4	0.77	0.84	0.42
	08	40.7	0.33	0.75	0.36
	09	46.7	1.00	0.62	0.27
	10	41.7	1.00	0.55	0.36
	11	48.2	0.81	0.73	0.36
	12	45.7	0.42	0.80	0.37
	13	45.8	0.78	0.67	0.41
	14	51.3	1.53	0.73	0.21
	15	44.2	0.84	0.67	0.44
	16	45.8	1.29	0.68	0.19
	17	46.2	0.52	0.56	0.24
	18	37.5	0.27	0.81	0.60
St Andrew	01	43.9	0.54	0.99	0.61
	02	45.3	0.53	0.64	0.36
	03	47.4	0.68	0.62	0.21
	04	38.4	0.52	0.89	0.33
	05	43.5	0.41	0.84	0.65
	06	46.3	1.15	0.72	0.32
	07	41.3	0.57	0.75	0.18
	08	41.3	0.45	0.88	0.55
	09	45.0	0.60	0.61	0.35
	10	42.0	0.64	0.70	0.29
	11	45.0	0.57	0.62	0.44
	12	43.1	0.36	0.75	0.59
	13	45.5	0.91	0.86	0.33
	14	43.7	0.66	0.85	0.58
	15	41.3	1.17	0.81	0.38
	16	40.8	0.52	0.69	0.33
	17	41.4	0.40	0.49	0.47
	18	41.2	0.44	0.81	0.54
	19	45.4	0.67	0.80	0.65
	20	43.2	0.46	0.92	0.52
	21	45.9	1.14	0.89	0.30
	22	53.4	1.42	0.76	0.29
	23	38.6	0.31	0.88	0.65
	24	45.9	0.57	0.88	0.66
	25	42.4	0.34	0.73	0.35
Stonehouse	01	51.9	2.00	0.55	0.14
	02	45.0	0.82	0.72	0.35
	03	43.4	0.72	0.59	0.38
	04	42.0	0.46	0.77	0.50
	05	39.5	0.38	0.73	0.63
	06	36.7	0.48	0.69	0.46
	07	42.4	0.38	0.79	0.62
	08	42.3	0.52	0.66	0.51
Whole area		43.2	0.60	0.86	0.43
				0.77	



TABLE 3.7: 1871 Population characteristics by enumeration district

Enumeration District	Mean age HOH	Age ratio	Sex ratio	Fertility Ratio	
Charles	01	38.4	0.09	0.91	0.73
	02	40.5	0.40	0.90	0.57
	03	47.6	1.22	0.86	0.56
	04	49.0	0.53	0.90	0.59
	05	43.0	0.40	0.90	0.71
	06	50.6	1.05	0.60	0.50
	07	40.8	0.41	0.61	0.44
	08	43.8	0.67	0.54	0.35
	09	41.3	0.57	0.88	0.67
	10	46.3	0.79	0.84	0.59
	11	45.8	0.56	0.72	0.73
	12	44.2	0.87	0.73	0.44
	13	50.6	1.40	0.72	0.44
	14	45.8	0.67	0.85	0.81
	15	46.5	1.03	0.71	0.45
	16	44.9	0.92	0.76	0.36
	17	41.6	0.70	0.80	0.52
	18	42.6	0.87	0.73	0.53
	19	48.7	1.32	0.51	0.26
	20	44.8	0.77	0.79	0.50
St Andrew	01	39.9	0.41	0.87	0.57
	02	40.5	0.33	0.82	0.67
	03	40.5	0.55	0.90	0.48
	04	43.1	0.47	0.76	0.50
	05	45.0	0.72	0.80	0.46
	06	39.4	0.35	0.75	0.83
	07	40.8	0.64	0.79	0.48
	08	41.9	0.36	0.79	0.92
	09	45.2	0.67	0.70	0.38
	10	44.0	0.58	0.80	0.64
	11	44.9	0.65	0.86	0.76
	12	40.4	0.68	0.76	0.43
	13	42.8	0.44	0.90	0.54
	14	40.3	0.44	0.80	0.73
	15	38.4	0.16	0.86	0.72
	16	41.6	0.54	0.86	0.49
	17	53.6	1.50	0.65	0.28
	18	52.5	21.00+	0.50	0.02
	19	47.3	1.00	0.77	0.25
	20	52.5	1.47	0.68	0.16
	21	43.0	0.41	0.80	0.49
	22	44.9	1.39	0.75	0.36
	23	44.8	0.55	0.77	0.88
	24	50.7	2.43	0.66	0.15
	25	50.7	2.29	0.35"	0.08
	26	45.0	0.75	0.88	0.39
	27	35.3	0.42	0.90	0.61
	28	44.7	0.50	0.82	0.70
	29	46.2	1.05	0.84	0.29
	30	40.2	0.65	0.94	0.52
	31	37.9	0.26	0.84	0.77

/continued over

Enumeration District	Mean age HOH	Age ratio	Sex ratio	Fertility Ratio
Stonehouse 01	37.1	0.40	0.79	0.59
02	39.7	0.34	0.67	0.53
03	46.2	0.78	0.65	0.41
04	42.2	0.87	0.75	0.41
05	41.9	0.59	0.79	0.49
06	39.7	0.45	0.76	0.51
07	39.4	0.37	0.84	0.86
08	42.8	0.69	0.80	0.62
Whole area	43.3	0.62	0.86 0.76	0.52

Age ratio: calculated from sample data

$$\text{formula: } R = \frac{\text{population aged 50 or more years}}{\text{population aged less than 10 years}}$$

Sex ratio: calculated from total population, whole area figures:

(i) including and (ii) excluding forces personnel

$$\text{formula: } R = \frac{\text{males}}{\text{females}}$$

Fertility ratio: calculated from sample data

$$\text{formula: } R = \frac{\text{children aged 0 to 4 years}}{\text{women aged 15 to 44 years}}$$

+ Sampling idiosyncrasy: only one child aged under ten was caught in the sample of this enumeration district.

" Data include a 'Ladies' School'.

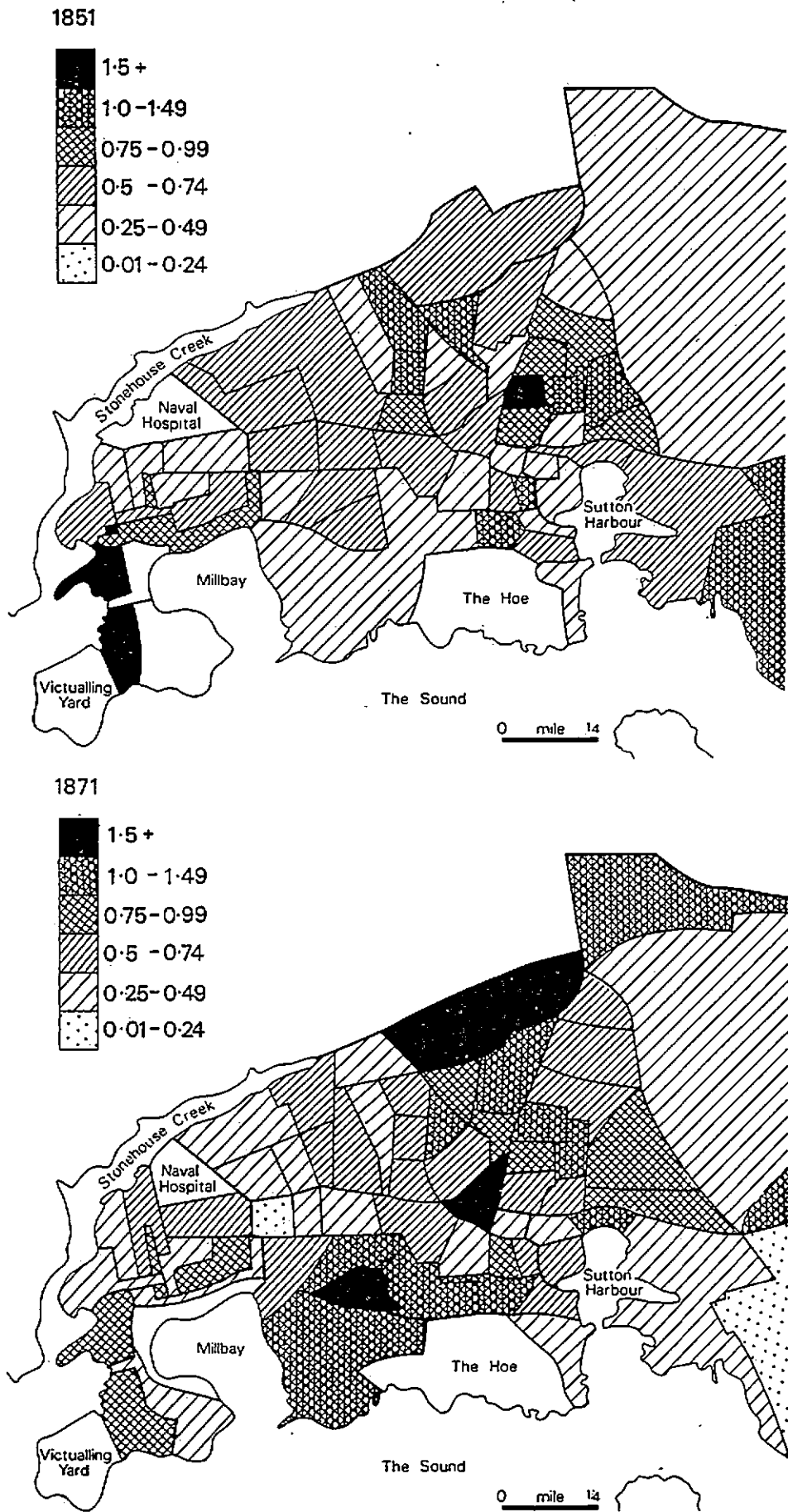


Figure 3.9: The age ratios of Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.

districts. Age ratios decreased slightly in another group of districts, to the northwest of Plymouth town, which included the Barley estate, vacated by the Elliot family in the early 1860s and virtually built up by 1871. Two enumeration districts had particularly low ratios in 1871: the Cattedown/Prince Rock area which was a mixture of industry and very poor-class housing (indicative of the pressure for accommodation elsewhere in the town), and an area to the west of Plymouth, on its border with Stonehouse, which, as will be seen in the next chapter, was the location for some of the worst of the Irish ghettos.

It may be concluded that the age ratio of an enumeration district was related to its affluence - the poorer inhabitants generally being also the younger inhabitants - and that there was no direct connection with the age of housing.

The distribution maps of the mean age of heads of household (Figure 3.10) show a broadly similar pattern to those of age ratios, thus it may be assumed that the same influences applied. Again the study area data suggest a very slightly older population in the later census (the average age of household heads, calculated from the sample data, was 43.2 in 1851 and 43.3 in 1871).

Sex ratios were calculated for the whole population from the enumeration district summary tables in the enumerators' books and, therefore, include the smaller institutions, unlike the ten percent sample survey. The whole area figures given in Tables 3.6-7 show the ratios for the population including and excluding the military and naval institutions, the latter being calculated from the sample data. Overall, there were noticeably more women than men living in Plymouth and Stonehouse and sex ratios are examined in greater detail,

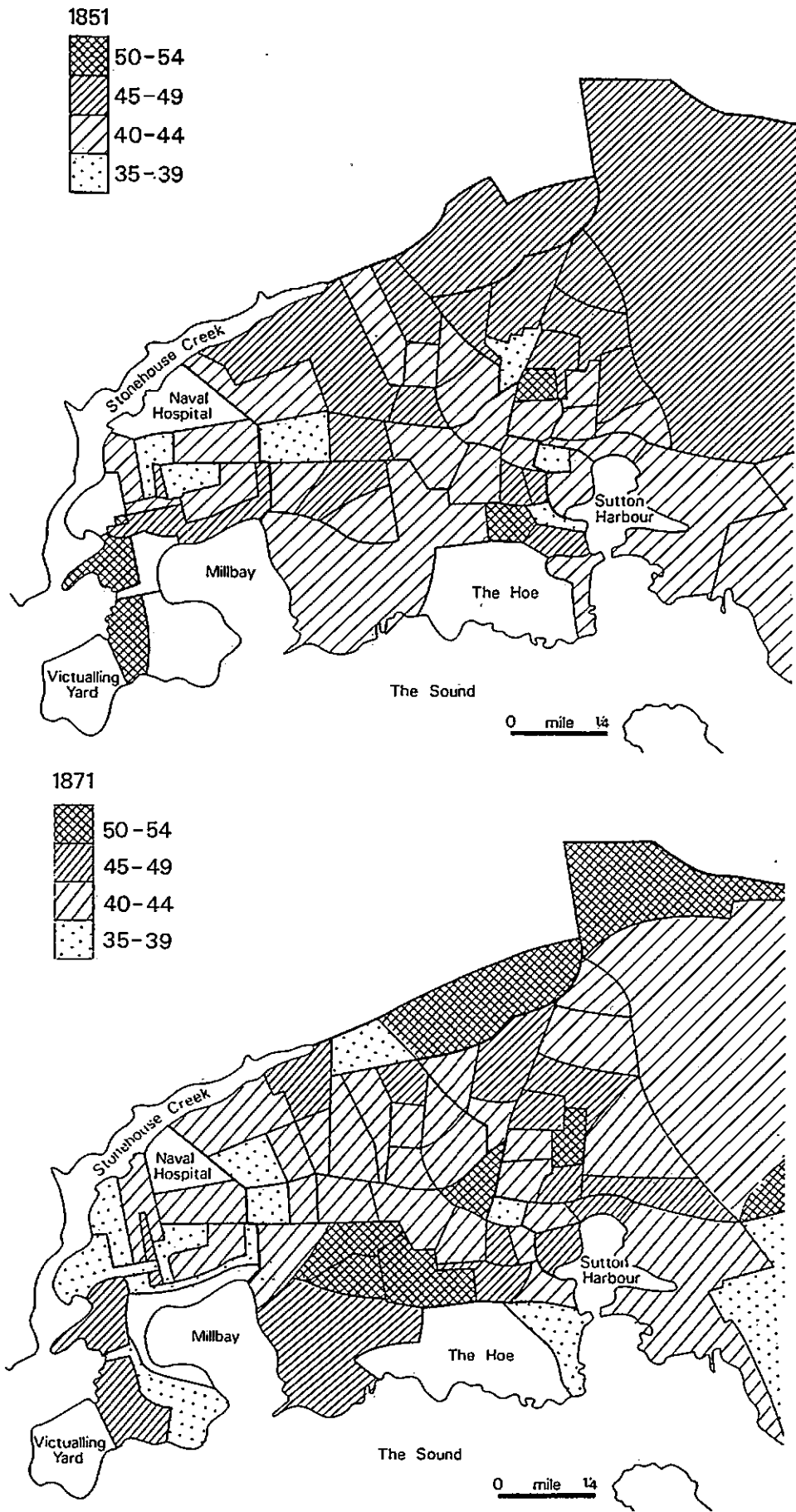


Figure 3.10: The mean age of heads of household in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.

therefore, in Chapter Seven on the role of women in the mid-19th century towns. The distribution pattern (Figure 3.11) suggests that the higher-class areas contained more females, reflecting the greater number of domestic servants in these enumeration districts. Durnford Street, the Barley estate and the area west of the Hoe may again be picked out. The distribution of servants (Figure 3.12) is considered here to be a good indicator of affluence (Royle, 1977), and the maps for this distribution in 1851 and 1871 very clearly demonstrate how those who could afford to do so were moving out of the town centre in mid-Victorian times; the movement to the north is quite striking.

Durnford Street and the Barley estate both contained more equal numbers of men and women in 1871, demonstrating a change in status. Interestingly, the Hoe area also had comparatively fewer women at that census; as will be seen below, this part of Plymouth became a principal district for lodging houses. In 1851 it was more sparsely populated and, therefore, like the Barley estate at that time, contained a few very large houses which were subsequently surrounded in the tide of building that ensued. The enumeration district on the northern boundary of Plymouth (in St Andrew Sub-district) conforms to this pattern, becoming a last refuge for well-off inhabitants seeking to avoid the clamour for accommodation which led to overcrowding in more central areas of the towns.

Enumeration districts containing large numbers of lodgers are shown in Figure 3.13, where it can be seen that their distribution altered considerably between 1851 and 1871. Two areas stand out at the earlier date: two enumeration districts to the east of the Hoe and an area west of the Barley estate, bordering the Naval Hospital. These were densely populated districts, with poor housing conditions, which

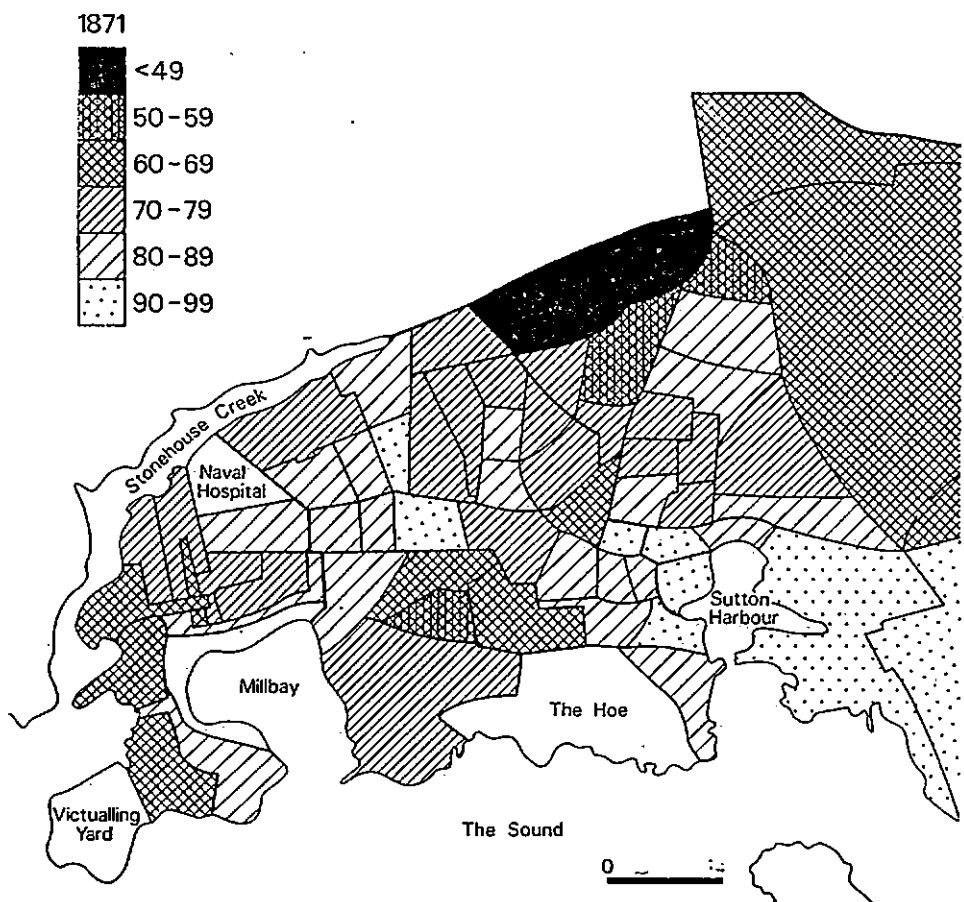
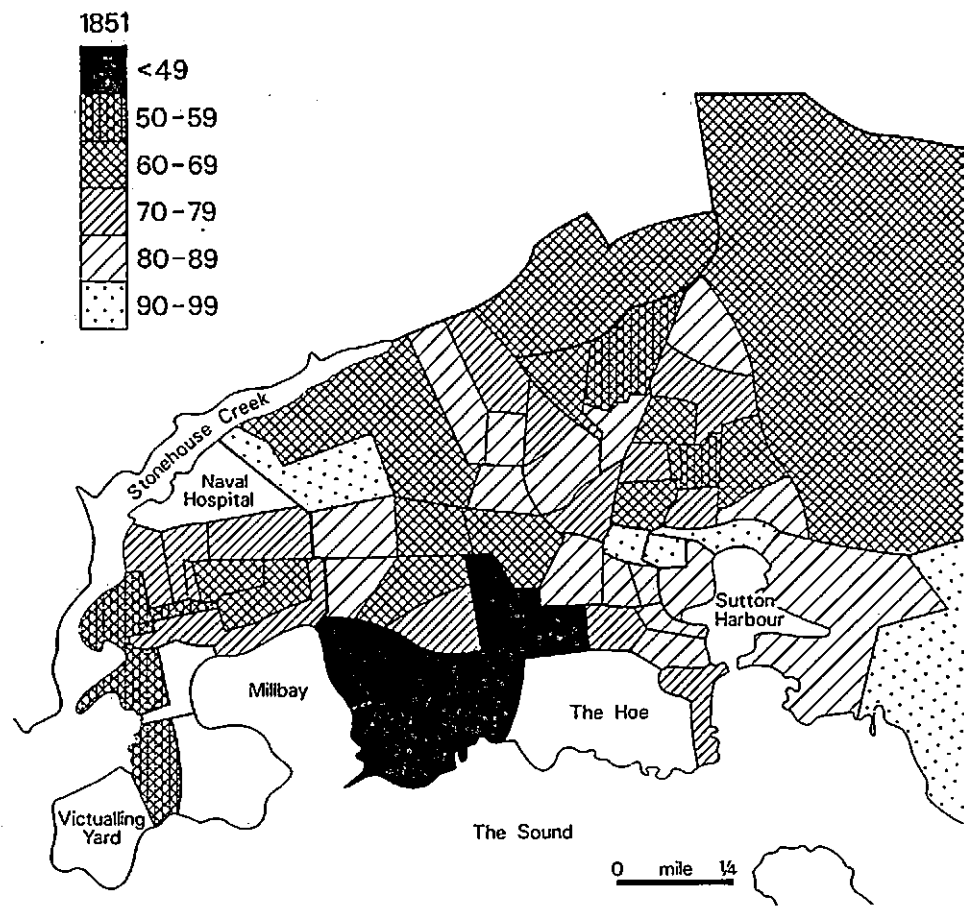


Figure 3.11: The sex ratios of Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on manuscript census data, the figures indicate the number of men per 100 women.

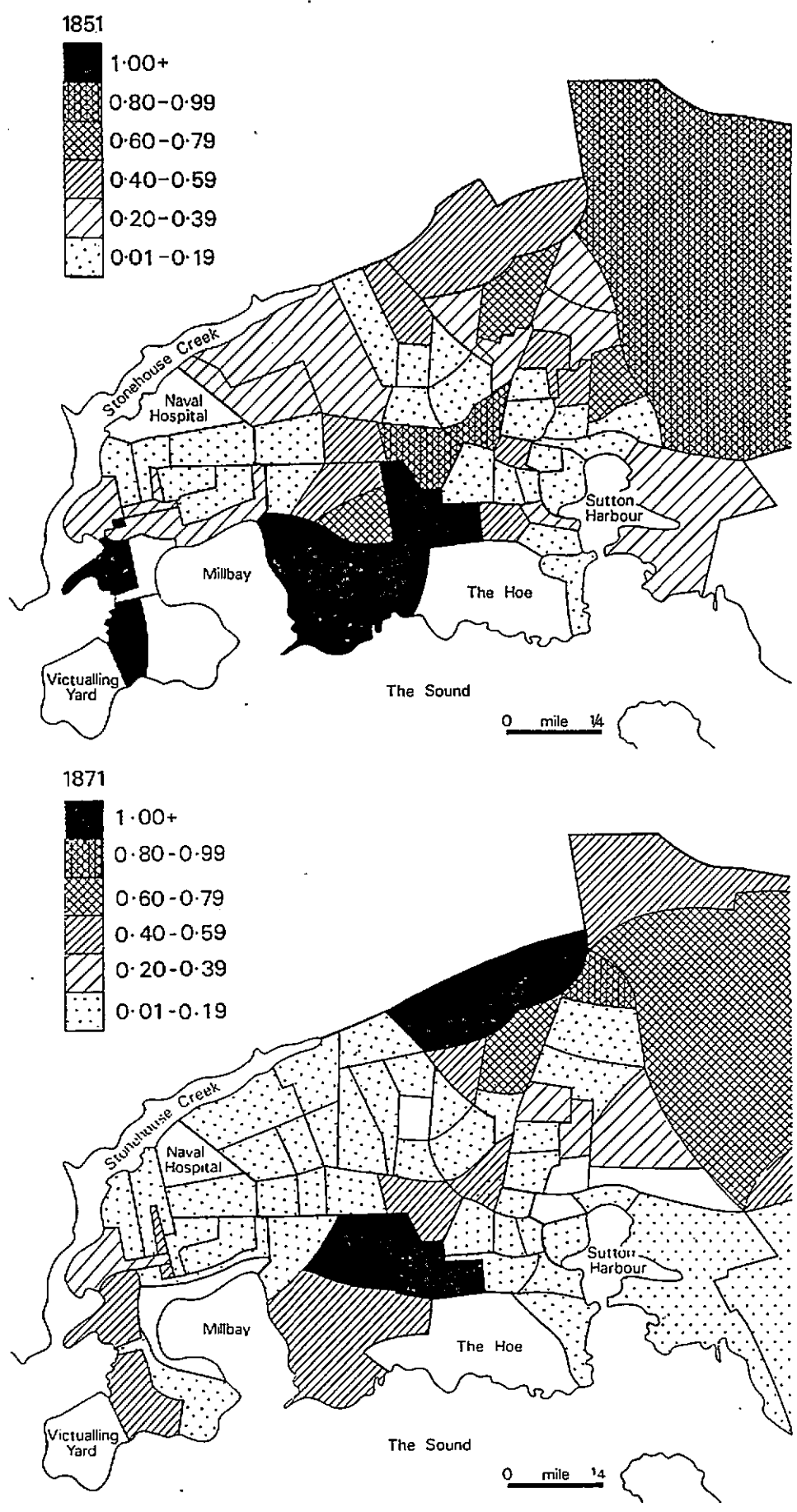
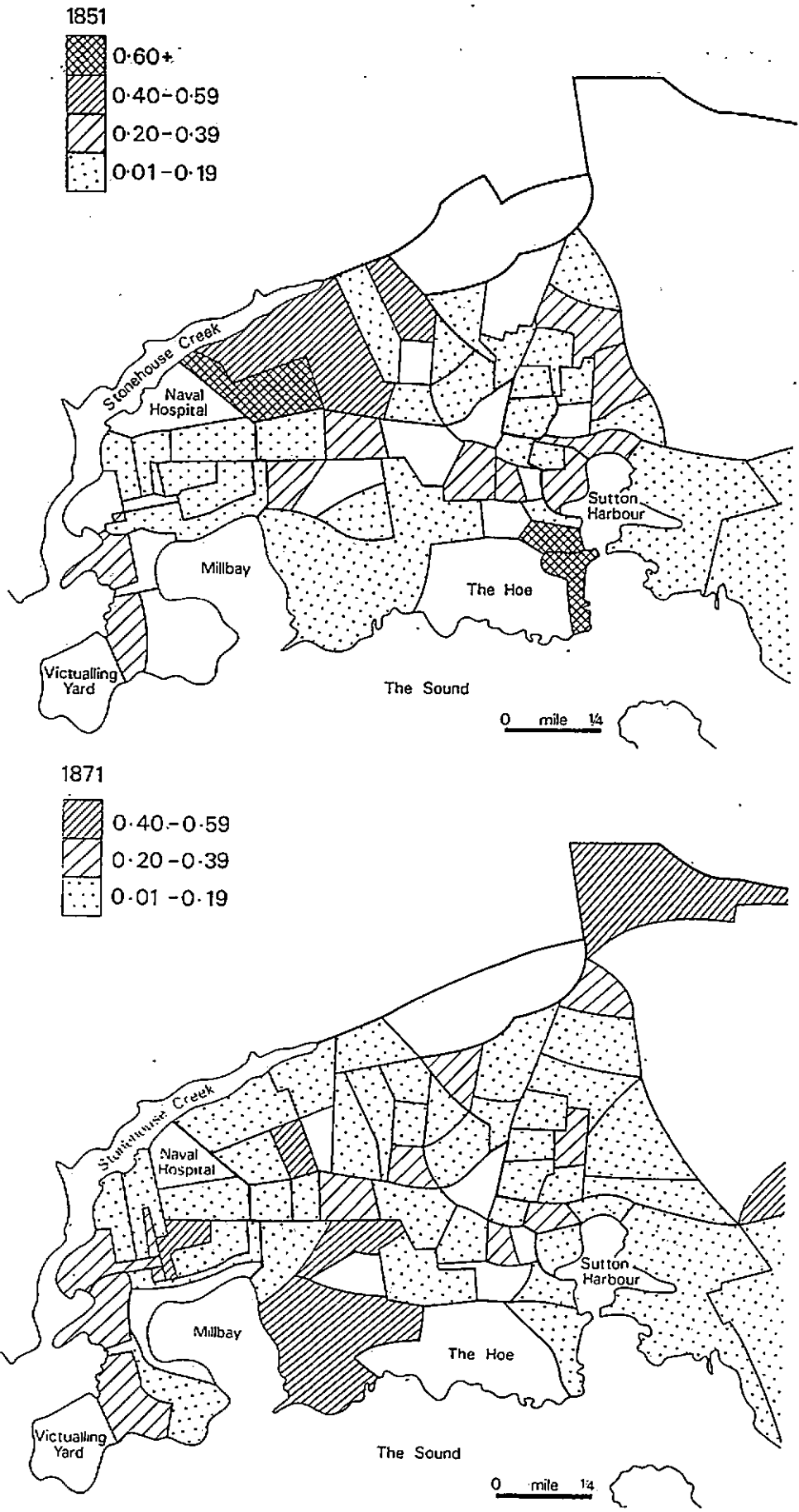


Figure 3.12: The distribution of the number of servants per household in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.





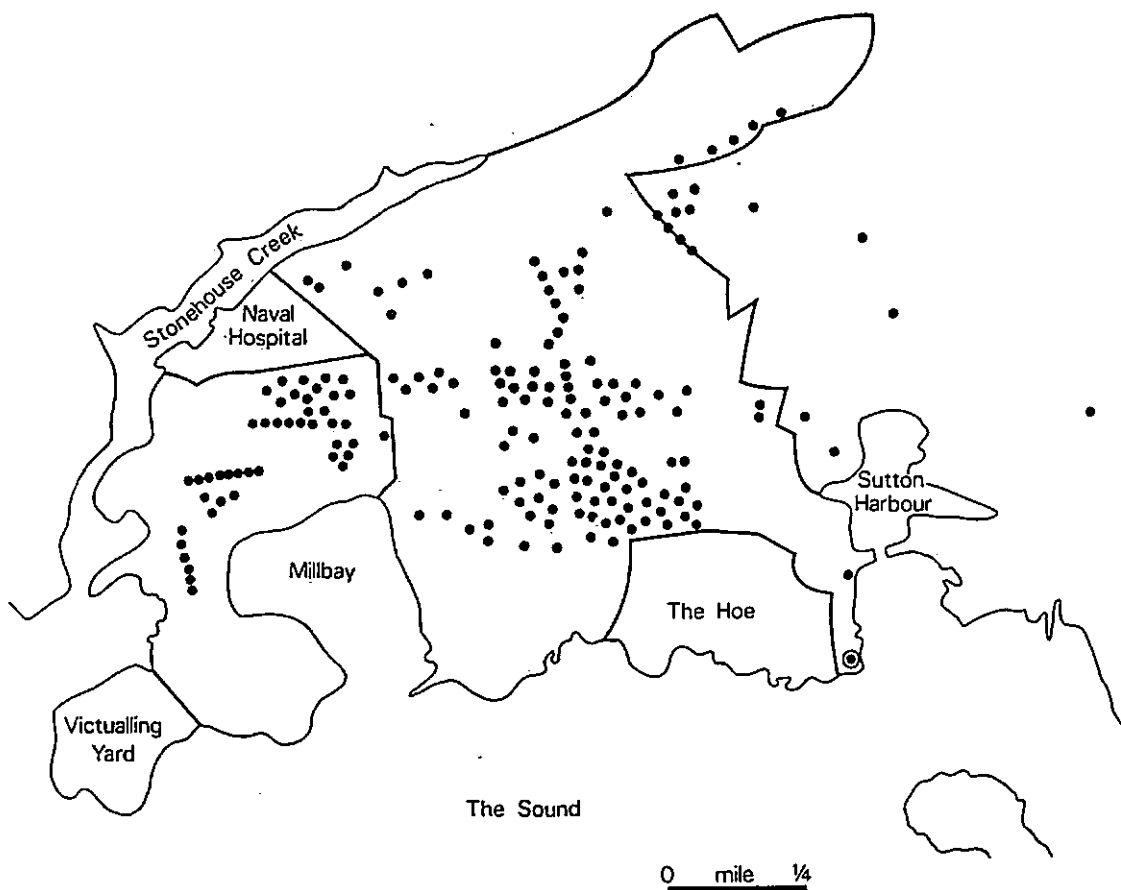
**Figure 3.13:** The distribution of the number of lodgers per household in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.

may explain the change which occurred over the next twenty years. Lodging houses listed in the 1856 Kelly's Post Office Directory were also mapped (Figure 3.14) and the clustering in the centre of St Andrew and northeast Stonehouse foreshadows the distribution of lodgers recorded in the sample from the 1871 census.

A distinction should be drawn between the map based on directory data which identifies registered lodging houses, that is, businesses, and the maps based on data from the censuses which show ordinary family homes wherein a room was let to a paying guest. Further, any distribution of lodgers drawn from census material should be viewed with caution: Armstrong (1968) points to confusion on the part of enumerators as to the delimitation of a given household and whether or not lodgers formed a separate household; in consequence any census-based count of lodgers will be understated. Two examples of lodging houses from the enumerators' books, neither in districts showing high lodging rates, indicate the tentative nature of this analysis. Number 30 Lower Street, in Charles the Martyr, kept by Elizabeth Higgins in 1851, housed 27 lodgers including local people and others from all over England, plus one each from Holland and Sweden; and in 1871, Numbers 19, 20 and 21 Lower Street were described as common lodging houses and contained a total of 172 inhabitants.

Fertility ratios, also calculated from data on ages of the sample populations, may be expected to mirror elements of both age and sex ratios in their distribution. Additionally, though, their distribution (Figure 3.15) is closely related to that of the inhabitants' family characteristics, thus explaining the different patterns which emerge. The maps of fertility ratios display a very complex distribution: districts with very high ratios border on

⊙Emigrants home



**Figure 3.14:** The location of lodging houses in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

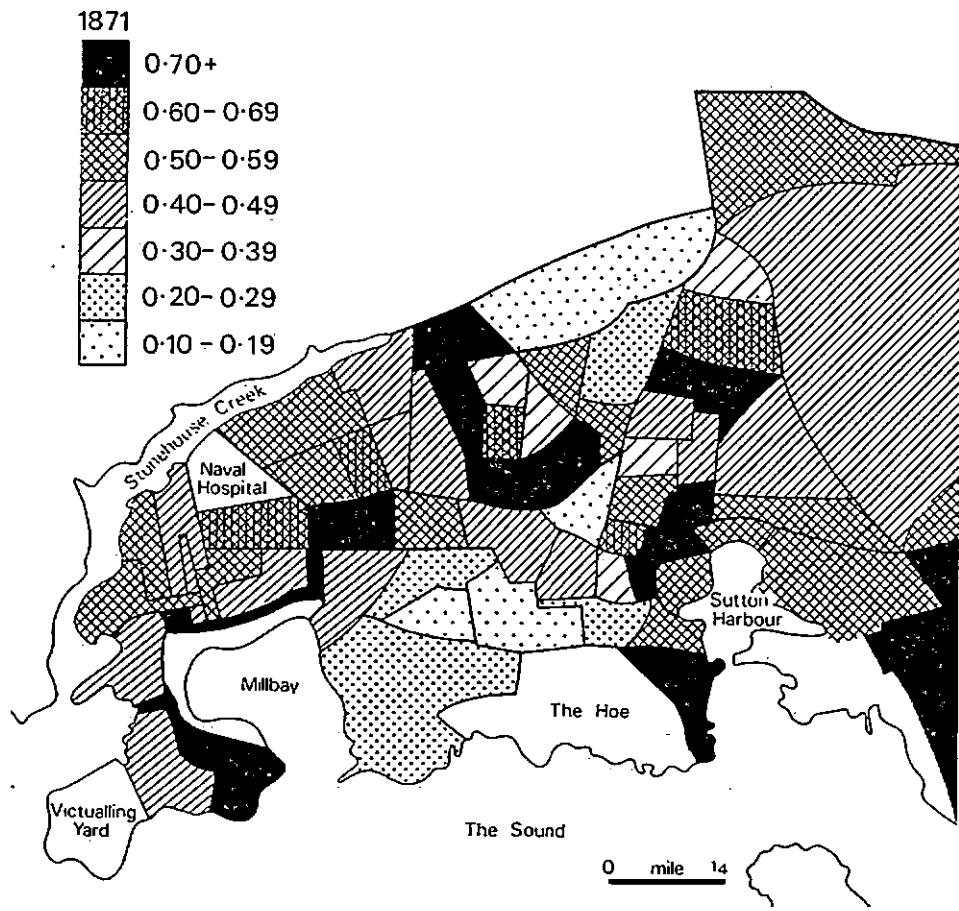
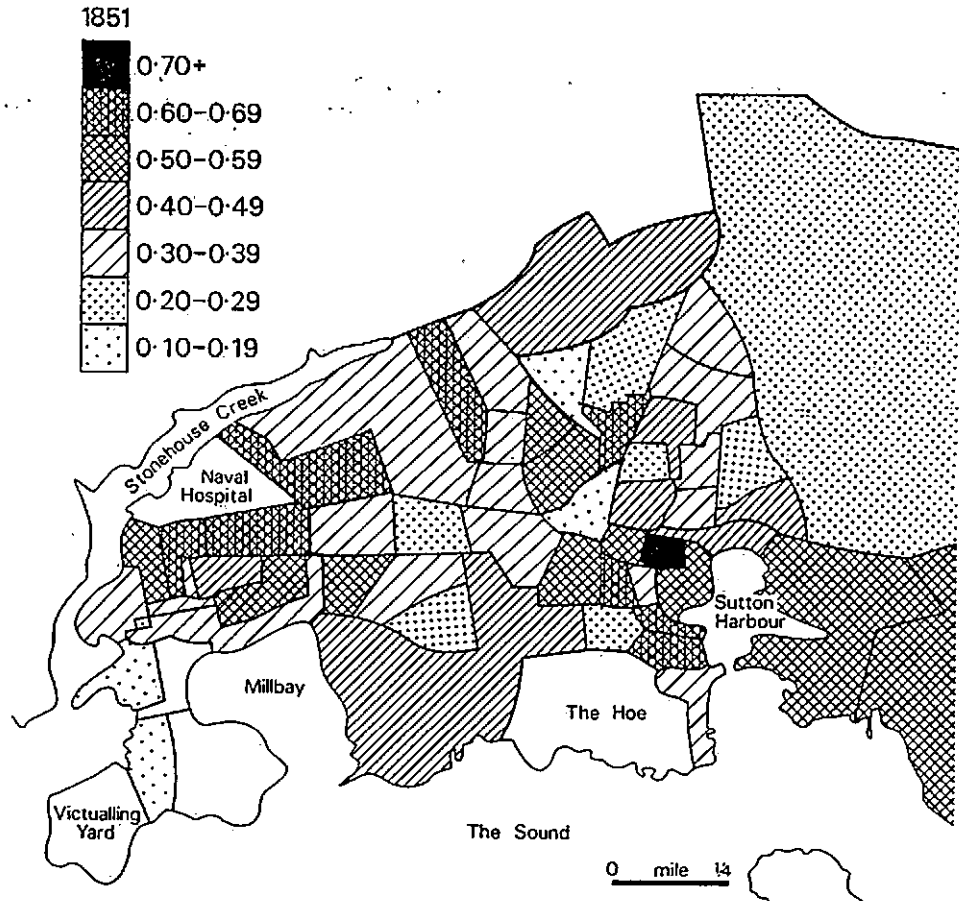


Figure 3.15: The fertility ratios of Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.

districts with apparently very low ratios. While tentative conclusions may be drawn as to the implications of such patterns for the social geography of the two towns, it is clear that there will have been a wide range of factors involved in determining the pattern.

Fertility ratios are noticeably lower in enumeration districts containing better-off inhabitants with more servants. The reasons for this are complex combining social and cultural elements: domestic servants were generally unmarried young women, and better-off families were also better educated and so probably more aware of means and advantages of family limitation. Areas of high fertility, therefore, may be identified as characteristically poor and young with comparatively equal numbers of men and women. It may be inferred that such enumeration districts also contained a higher proportion of nuclear family units.

The majority of households comprised nuclear family units in both census samples (over 70 percent), and this is reflected in the distribution maps (Figure 3.16). An element of change can be seen between 1851 and 1871, particularly in the central part of St Andrew which was developing as the main commercial area and contained rather fewer families in 1871. The median nuclear family household size was four at both censuses, and five in extended households. The proportion of nuclear families increased by just over one percent between 1851 and 1871, and of single-person households by two percent; extended families decreased accordingly.

The overall fertility ratio rose between 1851 and 1871, from 0.43 to 0.52 (and the distribution maps reflect this). The wave of in-migration between 1841 and 1861 brought large numbers of young adults to the two towns and higher fertility in 1871, therefore, suggests a period of 'settling down' as the new inhabitants became

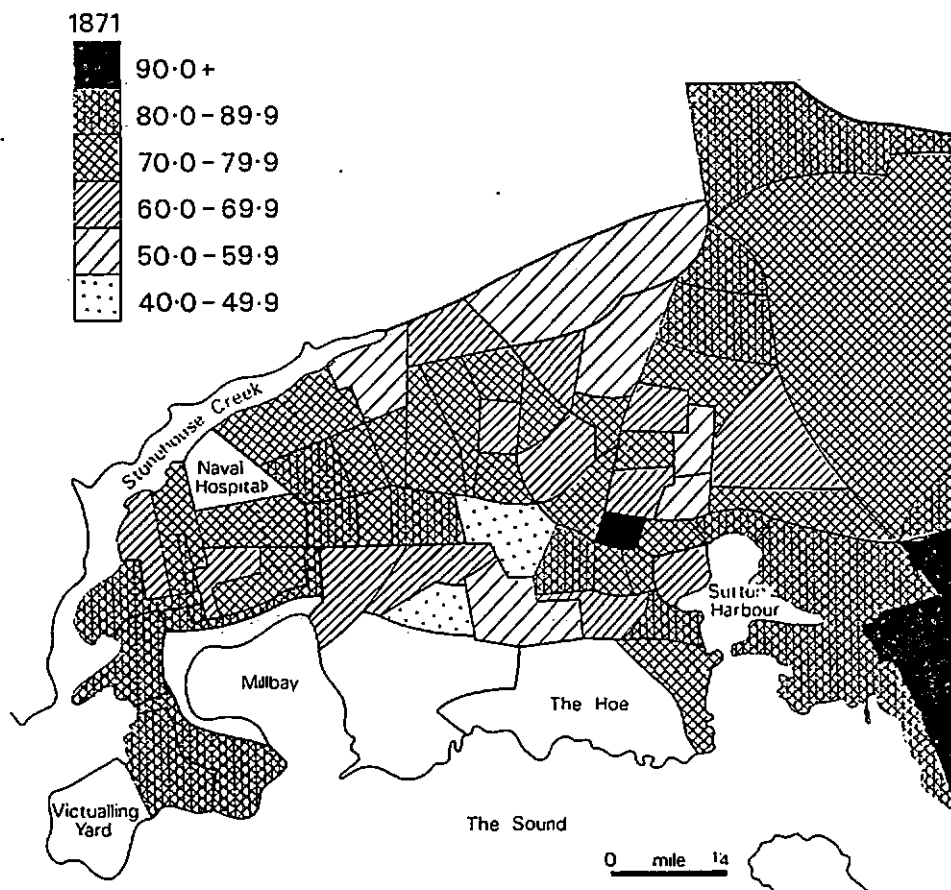
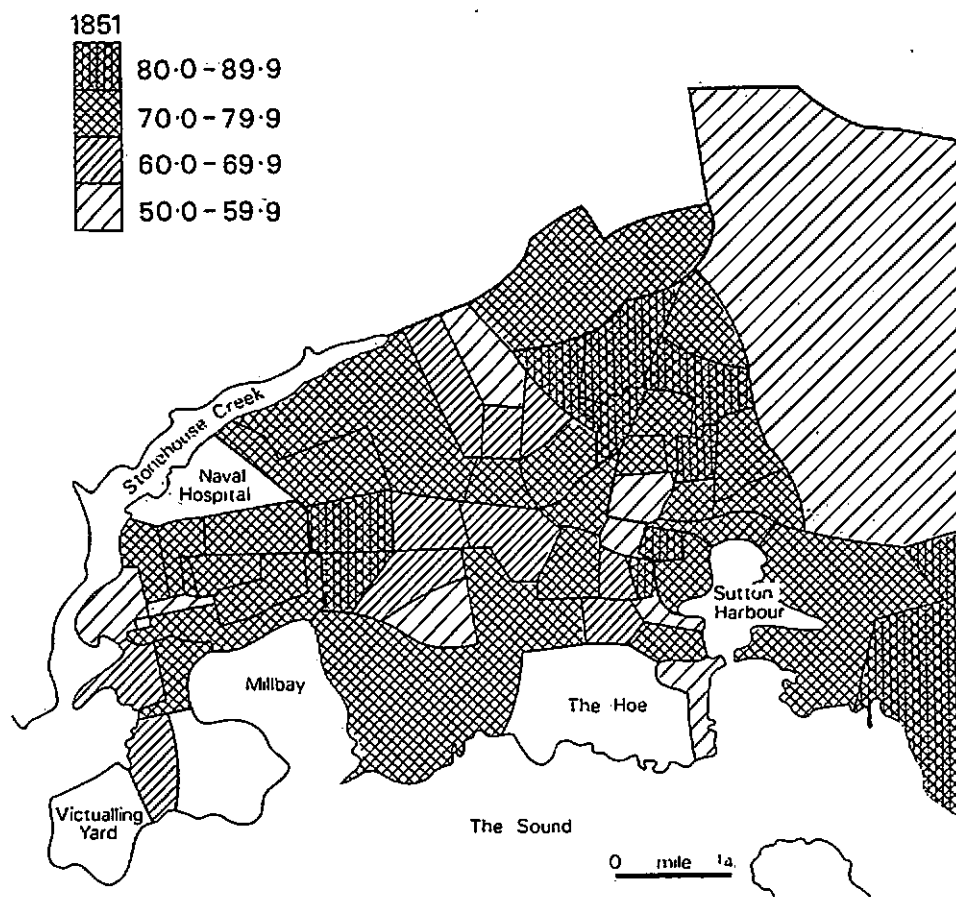


Figure 3.16: The distribution of households comprising nuclear family units in Plymouth and Stonehouse in 1851 and 1871. Figures are in percentages and are based on the sample population data.

TABLE 3.8: Marriages registered in Plymouth and East Stonehouse

Decade	Marriages	Census	Population	Percentage*
1851-60	8777	1861	76902	11.4
1861-70	9938	1871	83418	11.9
1871-80	9213	1881	88904	10.4

\* Calculated using population at following census.

Source: Published census abstracts.

established. Marriage statistics (Table 3.8) support this as a proportionally larger number of couples were married in Plymouth and Stonehouse in the 1860s than in the previous decade, but proportionally rather fewer in the following decade when in-migration was effectively matched by out-migration. The change in the size of the married population, expressed as a percentage of total population, emphasises this point more clearly (Table 3.9). The proportion of married people rose by two percent in the 1850s and then remained steady for the next two decades.

The marital status of the Plymouth and Stonehouse population differed significantly from that of the population of Great Britain. As Table 3.10 shows, there were some three percent more married women living locally compared to the national population in 1851, again reflecting the significance of the armed forces in the two towns as services' men were working away from home. This distinction is

TABLE 3.9: The married population of Plymouth and East Stonehouse

Census	Married	Population	Percentage
1851	21156	64200	33.0
1861	26969	76942	35.1
1871	29425	83418	35.3
1881	31325	88904	35.2

Source: Published census abstracts.

TABLE 3.10: The married population

	1851		1861		1871	
	No.	%	No.	%	No.	%
Great Britain:*						
(1000's)						
males	3391	49.5	n.a.		n.a.	
females	3462	50.5	n.a.		n.a.	
total	6853		n.a.		n.a.	
SW Counties:+						
males	291271	49.1	308223	49.3	313391	49.2
females	301667	50.9	317455	50.7	324218	50.8
total	592938		625678		637609	
Whole population:						
Plymouth:						
males	7982	47.4	10571	48.3	11545	48.0
females	8850	52.6	11329	51.7	12524	52.0
total	16832		21900		24069	
Stonehouse:						
males	1854	42.9	2336	44.3	2497	45.3
females	2470	57.1	2933	55.7	3012	54.7
total	4324		5269		5509	
Plym & St'hs:						
males	9836	46.5	12907	47.5	14042	47.5
females	11320	53.5	14262	52.5	15536	52.5
total	21156		27169		29578	
Sample population:						
Plym & St'hs:						
males	994	46.3	n.a.		1309	45.4
females	1153	53.7	n.a.		1573	54.6
total	2147		n.a.		2882	

\* Source: Willich (1858)

+ aged 20 & over in 1851, 15 & over in 1861 & 1871

Source: Published census abstracts unless otherwise stated.



emphasised when Plymouth and Stonehouse districts are separated: there were fourteen percent more married women than men in Stonehouse in 1851 where there were more forces personnel, compared to a one percent difference in Great Britain (Willich, 1858) and a two percent difference in the southwest counties. This imbalance was recorded again in the two following censuses.

The distribution of single-person households (Figure 3.17) shows a pattern of intensification rather than change between 1851 and 1871. These maps do not display any similarity with those illustrating the distribution of widowed heads of household (Figure 3.18), however, which might have been expected. It should be noted that both cases involved very small numbers of people (148 solitary household units and 263 widowed heads of household in 1851), and so the sample may not be representative. However, some aspects of the distribution of widowed heads do merit attention. It is known that the character of the Barley estate changed completely from open land to housing estate between the two censuses, as did the area to the west of the Hoe, and the northern-most enumeration district in St Andrew; the population composition of all three areas altered markedly in mid-Victorian times and these maps emphasise that change.

Table 3.11 shows that there were proportionally more widows than widowers in the study area compared to the southwest counties as a whole. This probably reflects, inter alia, the propensity of women to migrate more frequently than men (at a time when the flow of migration was to urban areas), the increased chances of the husband dying in a sea-faring town, in addition to the comparative longevity of women over men. While the whole population totals for Plymouth and Stonehouse show similar proportions of single men and women to those of the southwest counties, the sample populations for 1851 and 1871

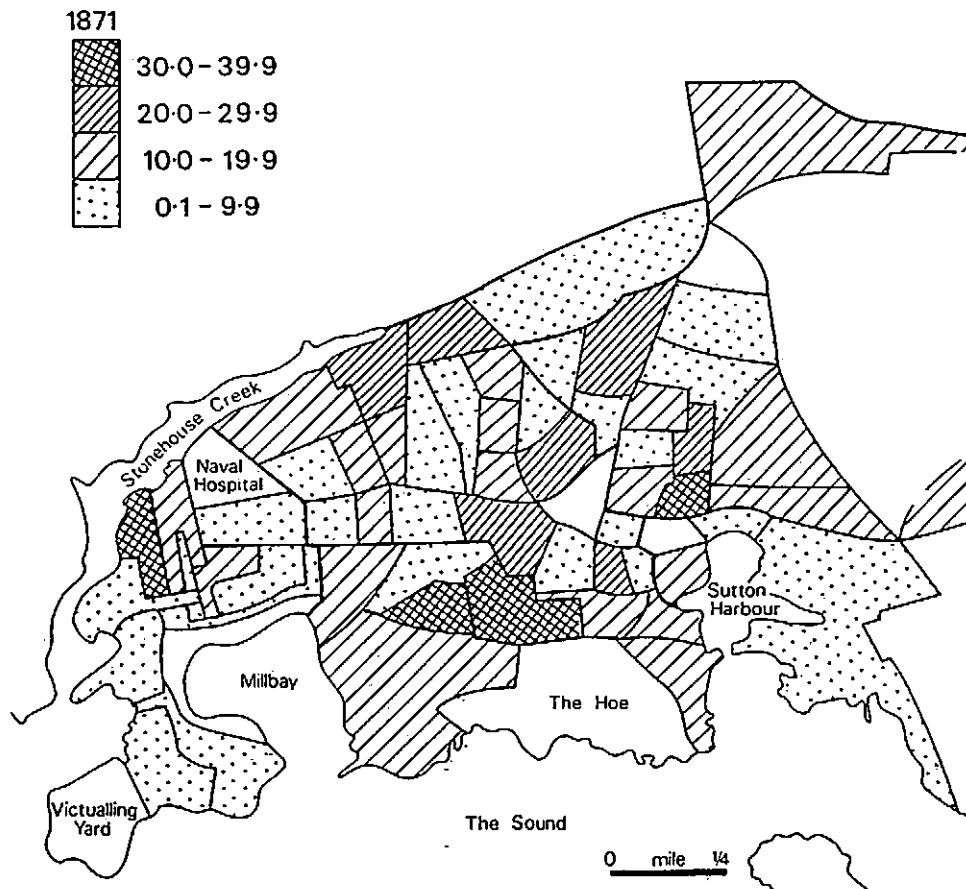
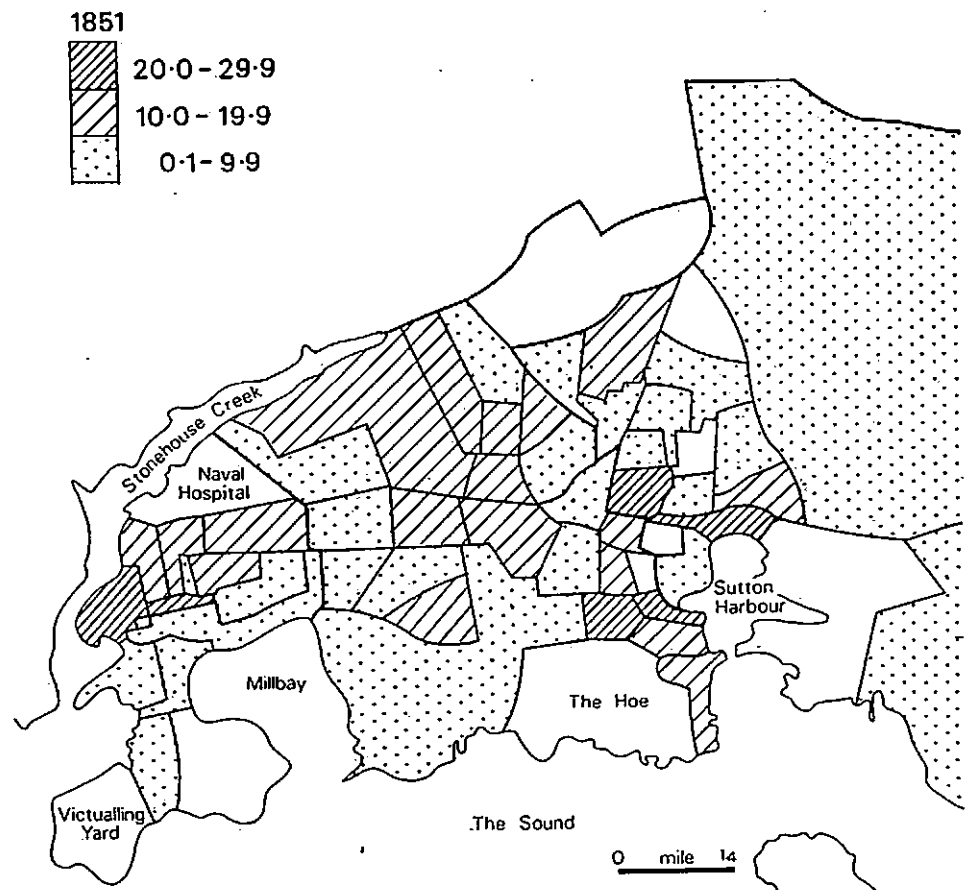


Figure 3.17: The distribution of single-person households in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.

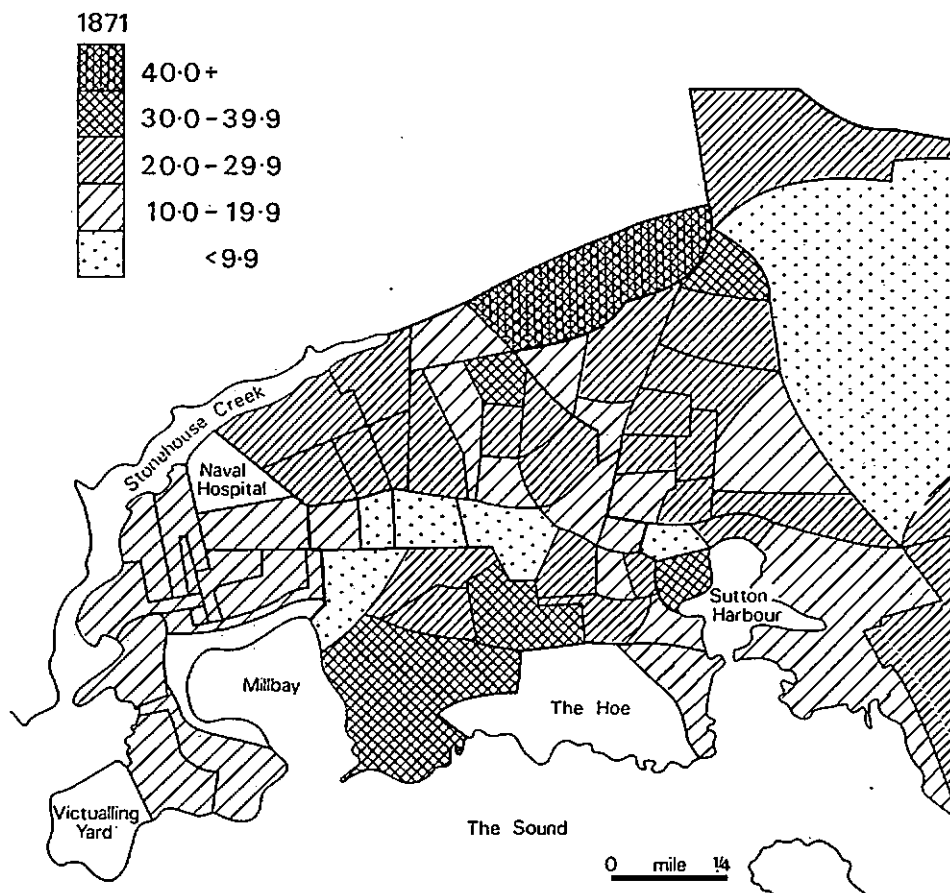
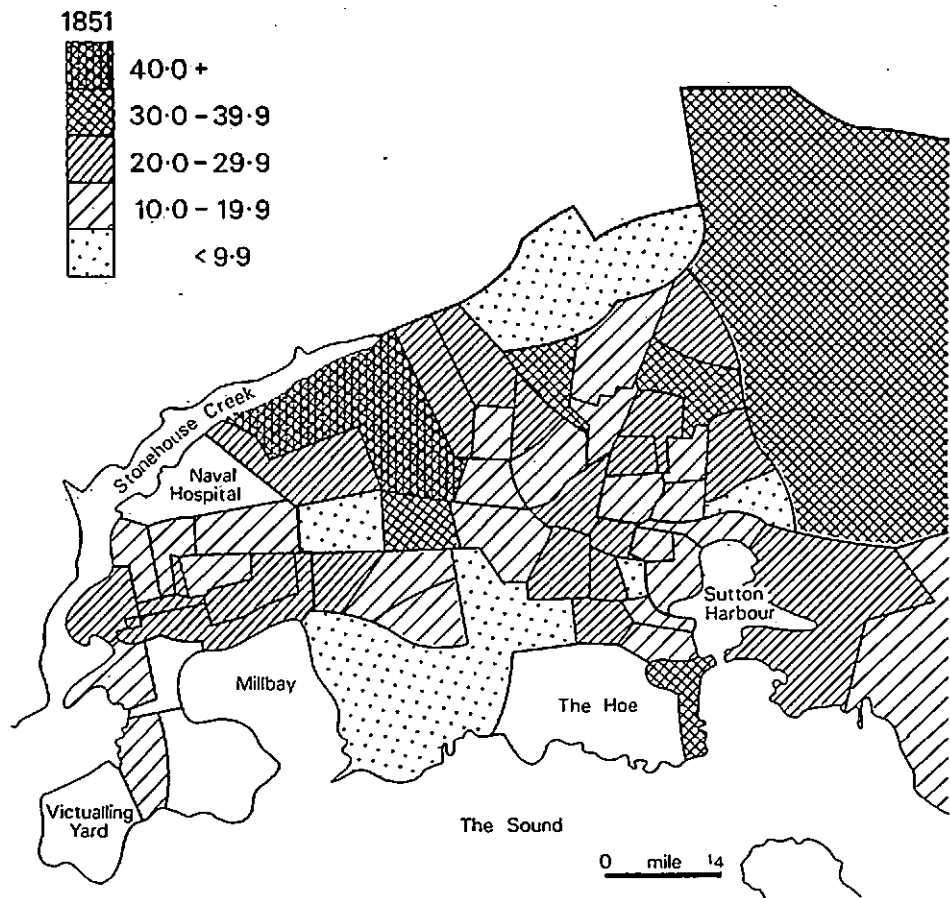


Figure 3.18: The distribution of the number of widowed heads of household in Plymouth and Stonehouse enumeration districts in 1851 and 1871; expressed as percentages of the total number of heads of household per enumeration district. Based on the sample population data.

TABLE 3.11: The single and widowed populations

	1851		1861		1871	
	No.	%	No.	%	No.	%
<b>SINGLE PEOPLE:</b>						
Whole population:						
Plym & St'hs:						
males	6169	48.6	9851	48.1	9562	46.6
females	6527	51.4	10646	51.9	10955	53.4
total	12696		20497		20517	
SW Counties:						
males	542817	49.0	537564	48.9	548780	48.7
females	564113	51.0	562909	51.1	578989	51.3
total	1106930		1100473		1127769	
Sample population:						
Plym & St'hs:						
males	1525	44.8	n.a.		1945	43.9
females	1879	55.2	n.a.		2489	56.1
total	3404		n.a.		4434	
 <b>WIDOWED PEOPLE:</b>						
Whole population:						
Plym & St'hs:						
males	900	22.1	1065	21.7	1157	20.9
females	3178	77.9	3832	78.3	4386	79.1
total	4078		4897		5543	
SW Counties:						
males	32005	30.9	33404	30.5	33914	29.4
females	71418	69.1	76159	69.5	81485	70.6
total	103423		109563		115399	
Sample population:						
Plym & St'hs:						
males	86	21.7	n.a.		102	19.0
females	310	78.3	n.a.		435	81.0
total	396		n.a.		537	

Source: Published census abstracts and census enumerators' books.

did not. Again this apparent anomaly is attributable to the presence of large numbers of single men stationed in military and naval institutions. The wider implications of the greater than average number of women living alone - married, widowed and single - will be considered in Chapter Seven.

### 3.3.2 Population density

Rapid population growth and an inadequate supply of housing together produced the most striking feature of 19th-century Plymouth, the density of its population; all three towns were dreadfully overcrowded. Throughout the study period (1851-71) there were, on average, just under ten people to a house (Table 3.12) at a time when the national average was five and London and Liverpool averaged seven. The mean masks a considerable range in Plymouth, in one enumeration district in 1851 there were over 17 people to a house, and in two

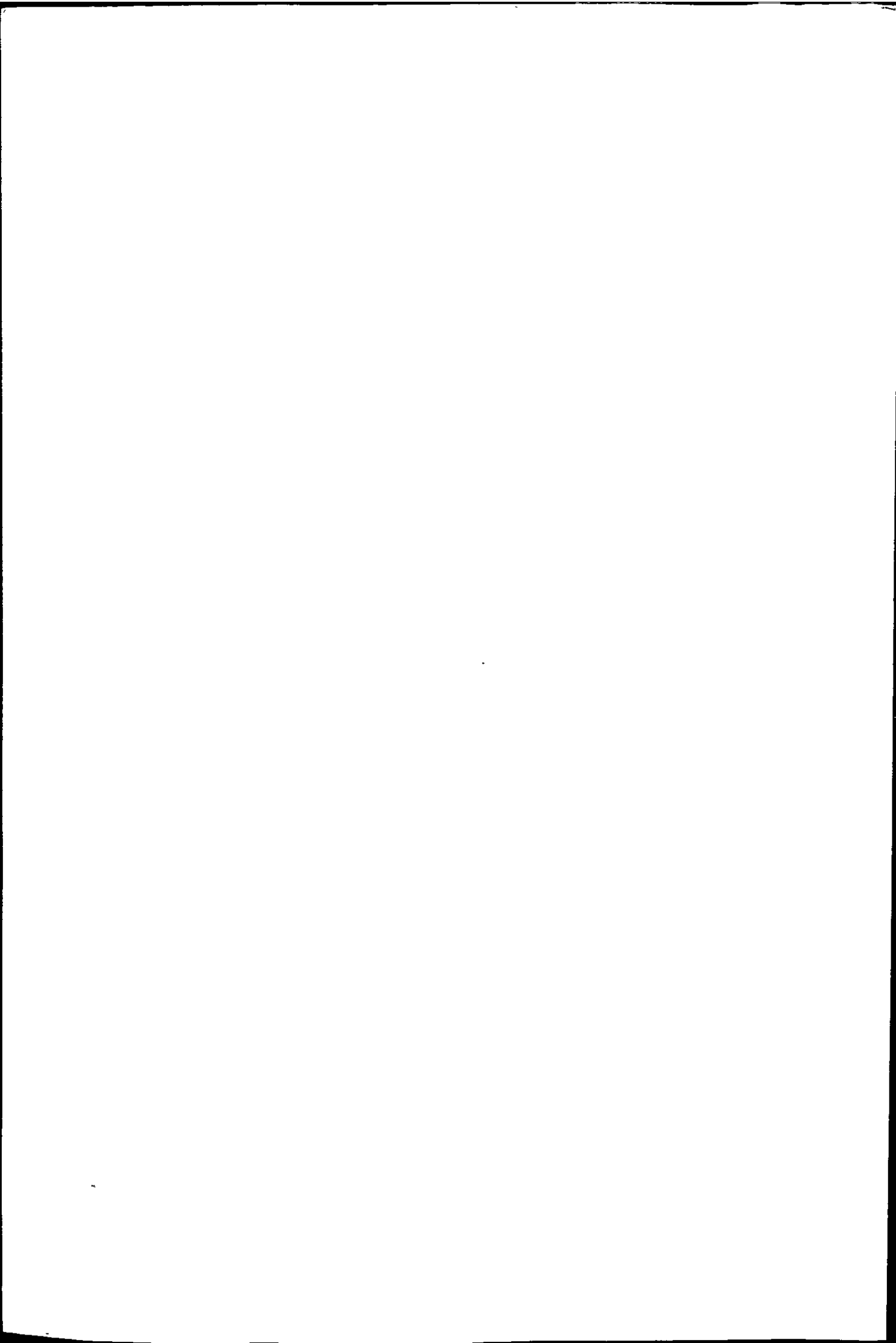
TABLE 3.12: Population and housing in Plymouth and East Stonehouse\*

	Year	Population <sup>+</sup>	% change	Houses	Pop/House
Charles	1851	18387	41.9	2012	9.14
	1861	22462	22.2	2421	9.28
	1871	24502	9.1	2927	8.37
St Andrew	1851	29739	32.6	3159	9.41
	1861	36406	22.4	3663	9.94
	1871	40118	10.2	4362	9.20
Stonehouse	1851	11302	25.6	1172	9.64
	1861	12725	12.6	1245	10.22
	1871	13015	2.3	1340	9.71

\* Showing percentage change calculated over preceding decade.

+ Excluding forces personnel and others in institutions, etc.

Source: Published census abstracts.

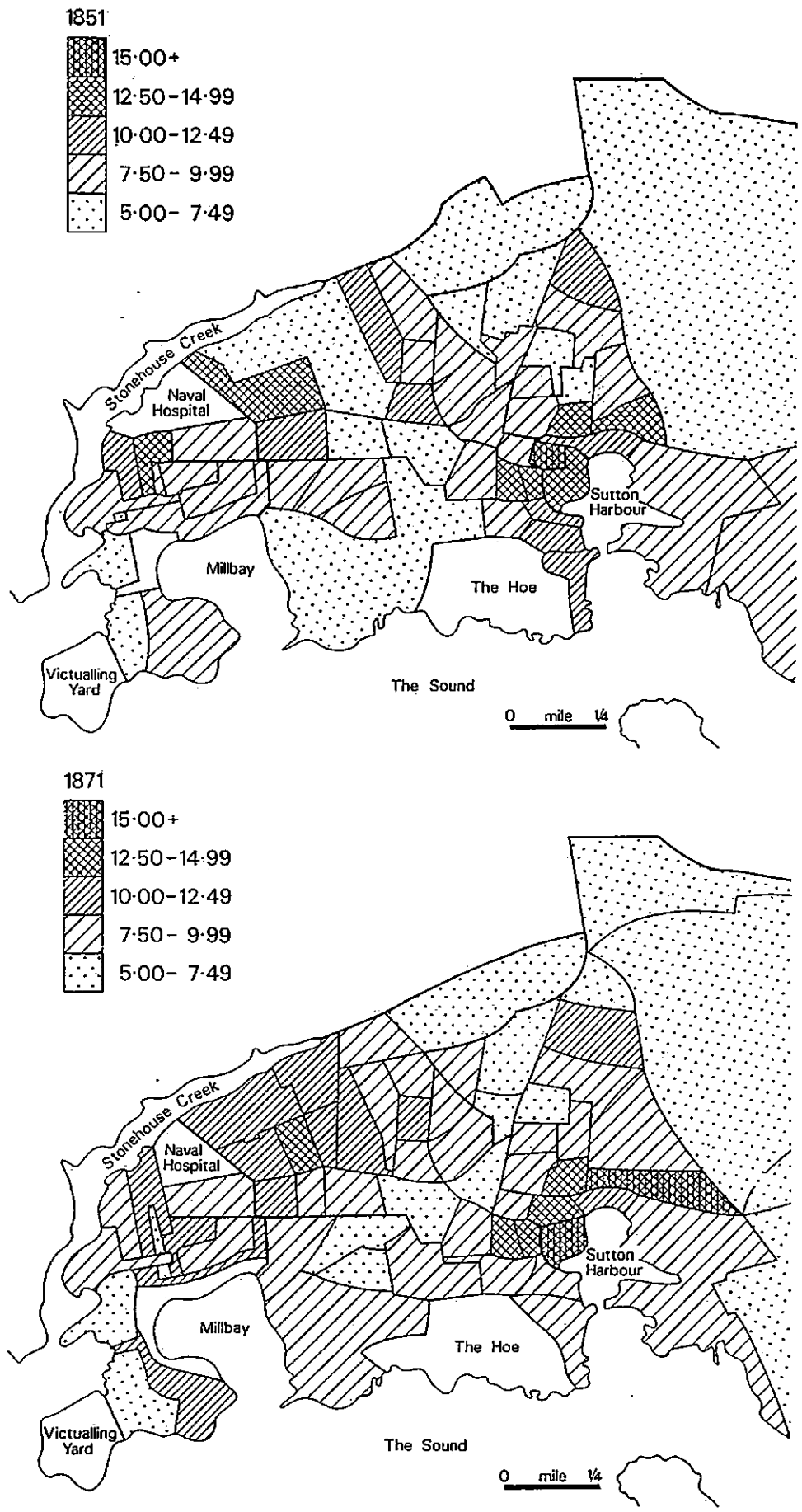


enumeration districts in 1871 there were some 16 people per house (Figure 3.19 and Table 3.13). Some of the worst examples of overcrowding frequently quoted, include Castle Dyke Lane (in the Barbican) averaging 24 people to a house in 1850, while the western end of the King Street area (near Union Street) had 825 people living in 67 houses, 57 of which had no water laid on (Gill, 1979). Similar occupancy rates prevailed in neighbouring Devonport (Chiswell, 1984).

Analysis of the enumeration district summary pages in the enumerators' books for 1851 and 1871 reveals a sectoral pattern in density wherein the older parts of Plymouth and Stonehouse exhibited the most severe overcrowding with over 300 people per acre in three enumeration districts for at least part of the study period (Figure 3.20).\* The spreading distribution and increasing density of the population also illustrate the processes of physical growth and coalescence of the two towns as old estates and open land were released for building. Whole new streets appeared rapidly: the Barley Estate can be seen clearly in the choropleth maps as one thinly populated enumeration district just below the northern end of Stonehouse Creek in 1851 and split into several, more densely populated districts in 1871.

Measuring the number of separate households per inhabited house (Figure 3.21) also demonstrates the spreading distribution of the population and its increasing density. Well over half of the enumeration districts had averages of two or more households per inhabited house. Some extreme examples of gross overcrowding, from the Plymouth enumerators' books, include No. 16 Catte Street with 43

\* The acreage of each enumeration district was measured using the method of squares (Monkhouse & Wilkinson, 1971); the number of people per acre was calculated using the manuscript census data.



**Figure 3.19:** The size of the population per house in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the published census data.



TABLE 3.13: Population density by enumeration district

E.D.	Pop.	Acres	Pop. Density	Houses	Pop./ House	H'holds	Pop./ H'hold	H'hold/ House
1851								
Charles the Martyr								
01	575	598.9	1.0	99	5.8	101	5.4	1.1
02	860	212.7	4.0	114	7.5	179	4.8	1.6
03	871	61.4	14.2	104	8.4	180	4.8	1.7
04	1273	7.8	163.8	105	12.1	308	4.1	2.9
05	1362	4.2	325.8	79	17.2	301	4.5	3.8
06	1419	8.1	174.3	98	14.5	339	4.2	3.5
07	1586	8.1	196.0	109	14.5	398	4.0	3.7
08	1406	6.8	208.0	101	13.9	314	4.5	3.1
09	734	11.7	62.6	85	8.6	173	4.2	2.0
10	569	6.5	87.1	97	5.9	145	3.9	1.5
11	801	18.8	42.6	90	8.9	188	4.3	2.1
12	718	12.4	58.1	70	10.3	136	5.3	1.9
13	1217	8.1	150.4	188	6.5	266	4.6	1.4
14	868	5.3	162.9	114	7.6	225	3.9	2.0
15	1105	8.0	139.0	126	8.8	287	3.9	2.3
16	1043	13.6	76.9	158	6.6	248	4.2	1.6
17	881	22.3	39.4	145	6.1	207	4.3	1.4
18	1056	7.5	140.1	128	8.3	261	4.1	2.0
1851								
St Andrew								
01	1880	23.2	81.1	145	13.0	384	4.9	2.7
02	727	55.9	13.0	104	7.0	167	4.4	1.6
03	838	12.9	64.9	124	6.7	204	4.1	1.7
04	1699	14.9	114.1	152	11.2	359	4.7	2.4
05	1291	14.6	88.6	104	12.4	321	4.0	3.1
06	999	15.4	64.7	107	9.3	189	5.3	1.8
07	948	10.5	90.5	109	8.7	187	5.1	1.7
08	1170	11.1	105.2	126	9.3	264	4.4	2.1
09	755	12.7	59.3	97	7.8	170	4.4	1.8
10	759	14.7	51.6	88	8.6	152	5.0	1.7
11	238	57.1	4.2	36	6.6	39	6.1	1.1
12	1490	7.5	200.0	174	8.6	385	3.9	2.2
13	1866	7.6	244.6	175	10.7	484	3.9	2.8
14	1751	14.3	122.1	190	9.2	397	4.4	2.1
15	1460	6.9	211.9	150	9.7	383	3.8	2.6
16	1151	18.9	60.9	189	6.1	252	4.6	1.3
17	1809	78.6	23.0	279	6.5	289	6.3	1.0
18	1540	10.2	150.5	156	9.9	339	4.5	2.2
19	1489	4.2	356.2	106	14.1	374	4.0	3.5
20	906	4.9	184.2	98	9.2	182	5.0	1.9
21	887	3.1	288.0	68	13.0	231	3.8	3.4
22	639	7.3	87.4	76	8.4	147	4.4	1.9
23	615	4.0	153.8	60	10.3	135	4.6	2.3
24	1512	7.9	192.9	145	10.4	347	4.4	2.4
25	1140	8.0	142.5	98	11.6	263	4.3	2.7

/continued over

E.D.	Pop.	Acres	Pop. Density	Houses	Pop./ House	H'holds	Pop./ H'hold	H'hold/ House
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1851

East Stonehouse

01	848	42.2	20.1	129	6.6	150	5.7	1.2
02	1146	25.7	44.6	126	9.1	285	4.0	2.3
03	1402	12.6	110.9	144	9.7	323	4.3	2.2
04	1643	9.6	171.0	150	11.0	410	4.0	2.7
05	1900	8.6	220.9	141	13.5	487	3.9	3.5
06	1439	5.8	250.3	144	10.0	393	3.7	2.7
07	1735	16.0	108.2	198	8.8	459	3.8	2.3
08	1079	12.6	85.7	139	7.8	287	3.8	2.1

1871

Charles the Martyr

01	571	225.2	2.5	114	5.0	114	5.0	1.0
02	1810	73.5	24.6	225	8.0	435	4.2	1.9
03	1216	6.0	202.0	105	11.6	303	4.0	2.9
04	1211	7.4	163.7	101	13.2	350	3.8	3.5
05	1335	5.3	244.1	74	16.4	306	4.0	4.1
06	746	252.8	3.0	112	6.6	170	4.4	1.5
07	952	285.0	3.3	170	5.6	192	5.0	1.1
08	969	12.4	78.1	190	5.1	203	4.8	1.1
09	2519	21.6	116.6	249	10.1	574	4.4	2.3
10	1594	16.4	97.4	100	15.9	401	4.0	4.0
11	1338	6.3	212.4	102	13.1	372	3.6	3.7
12	1002	29.7	33.8	114	8.8	247	4.1	2.2
13	1172	7.7	152.6	155	7.6	270	4.3	1.7
14	1263	15.8	80.1	148	8.5	322	3.9	2.2
15	1356	8.6	157.7	210	6.5	374	3.6	1.8
16	1178	5.7	206.7	148	8.0	309	3.8	2.1
17	1023	9.3	110.2	122	8.4	282	3.6	2.3
18	1184	9.5	125.0	156	7.6	290	4.1	1.9
19	1218	22.3	54.5	197	6.2	292	4.2	1.5
20	952	6.0	158.1	134	7.1	268	3.6	2.0

1871

St Andrew

01	2001	11.3	176.9	171	11.7	502	4.0	2.9
02	1625	8.0	202.1	114	14.5	393	4.1	3.5
03	1313	5.9	221.4	109	12.1	341	3.9	3.1
04	1987	23.0	83.1	175	11.8	529	3.8	3.0
05	1239	15.5	80.0	112	11.1	337	3.7	3.0
06	1255	12.5	100.4	152	8.3	308	4.1	2.0
07	1822	19.6	92.8	155	11.8	486	3.8	3.1
08	1191	11.0	108.0	120	9.9	334	3.6	2.8
09	1041	9.3	112.2	129	8.1	262	4.0	2.0
10	1646	6.9	238.9	154	10.7	459	3.6	3.0

/continued over

E.D.	Pop.	Acres	Pop. Density	Houses	Pop./ House	H'holds	Pop./ H'hold	H'hold/ House
1871								
St Andrew								
11	1353	6.3	214.8	155	8.7	375	3.6	2.4
12	1148	14.6	78.5	180	6.4	247	4.7	1.4
13	1921	11.7	163.9	202	9.5	473	4.1	2.3
14	1634	6.6	248.2	180	9.1	404	4.1	2.2
15	1233	7.8	157.9	117	10.5	310	4.0	2.7
16	1371	16.2	84.5	166	8.3	360	3.8	2.2
17	766	12.8	59.8	112	6.8	135	5.7	1.2
18	1075	13.4	80.1	150	7.2	213	5.1	1.4
19	1205	58.4	20.6	135	8.9	250	4.8	1.9
20	1569	18.1	86.6	198	7.9	276	5.7	1.4
21	1106	12.1	91.5	126	8.8	282	3.9	2.2
22	1532	8.5	181.1	178	8.6	411	3.7	2.3
23	1544	14.3	108.1	189	8.2	397	3.9	2.1
24	777	9.1	85.9	105	7.4	132	5.9	1.3
25	728	50.6	14.4	125	5.8	136	5.4	1.1
26	1235	4.3	285.9	88	14.0	306	4.0	3.5
27	709	4.0	175.5	76	9.3	166	4.3	2.2
28	1198	3.7	325.5	81	14.8	300	4.0	3.7
29	1098	8.8	124.4	122	9.0	285	3.9	3.3
30	1084	6.6	163.8	134	8.1	258	4.2	1.9
31	1250	13.5	92.5	151	8.3	325	3.9	2.2
1871								
East Stonehouse								
01	1323	10.8	122.5	145	9.1	385	3.4	2.7
02	1357	13.4	101.1	143	9.5	331	4.1	2.3
03	1351	58.3	23.2	187	7.2	331	4.1	1.8
04	1433	13.9	102.9	159	9.0	375	3.8	2.4
05	2139	12.3	174.3	185	11.6	593	3.6	3.2
06	1665	8.7	190.7	153	10.9	429	3.9	2.8
07	2023	32.2	62.8	174	11.6	543	3.7	3.1
08	1905	13.2	144.4	192	9.9	565	3.4	2.9

Source: Published census abstracts and enumerators' books.

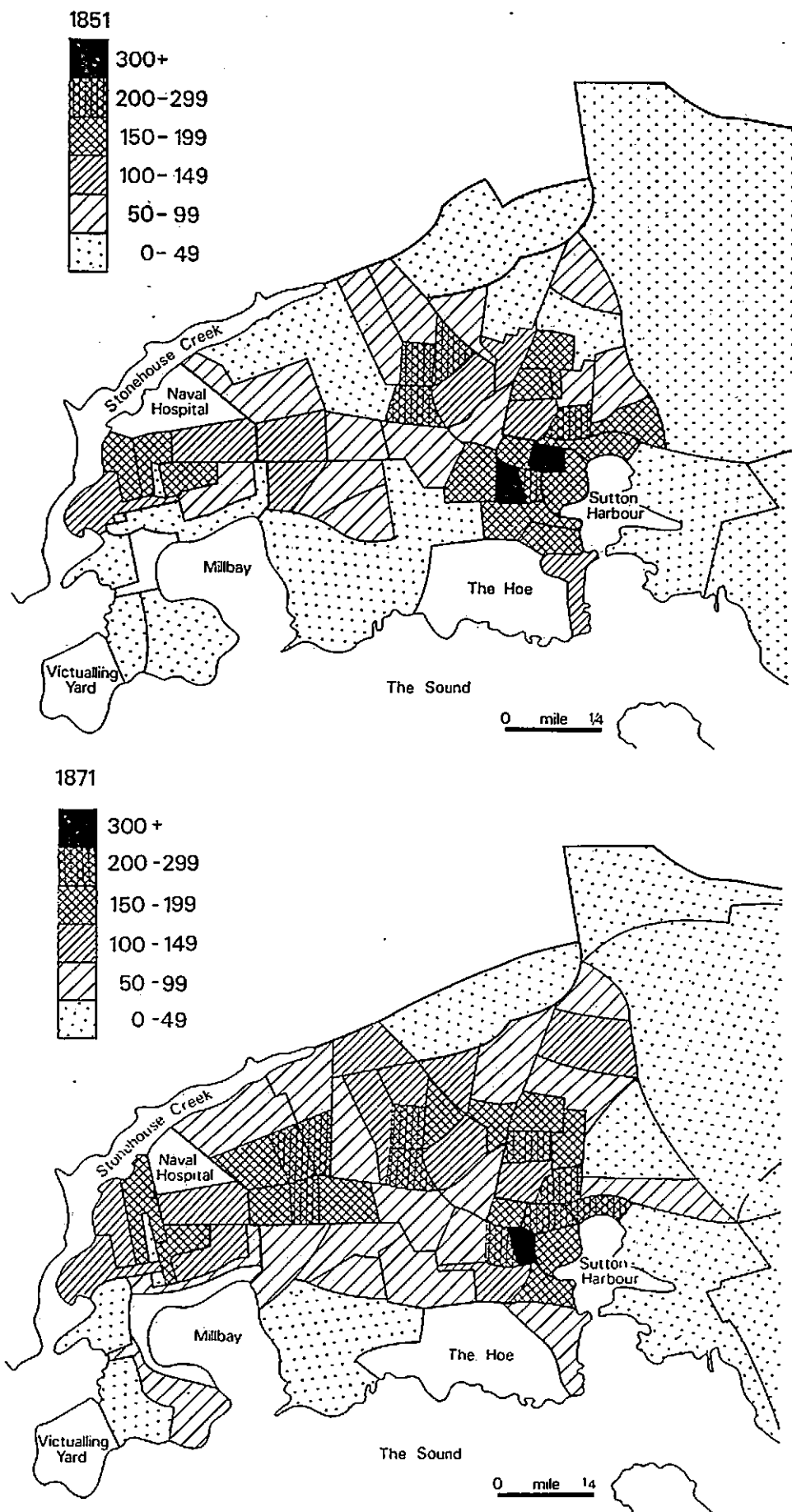


Figure 3.20: The population density of Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the manuscript census data.

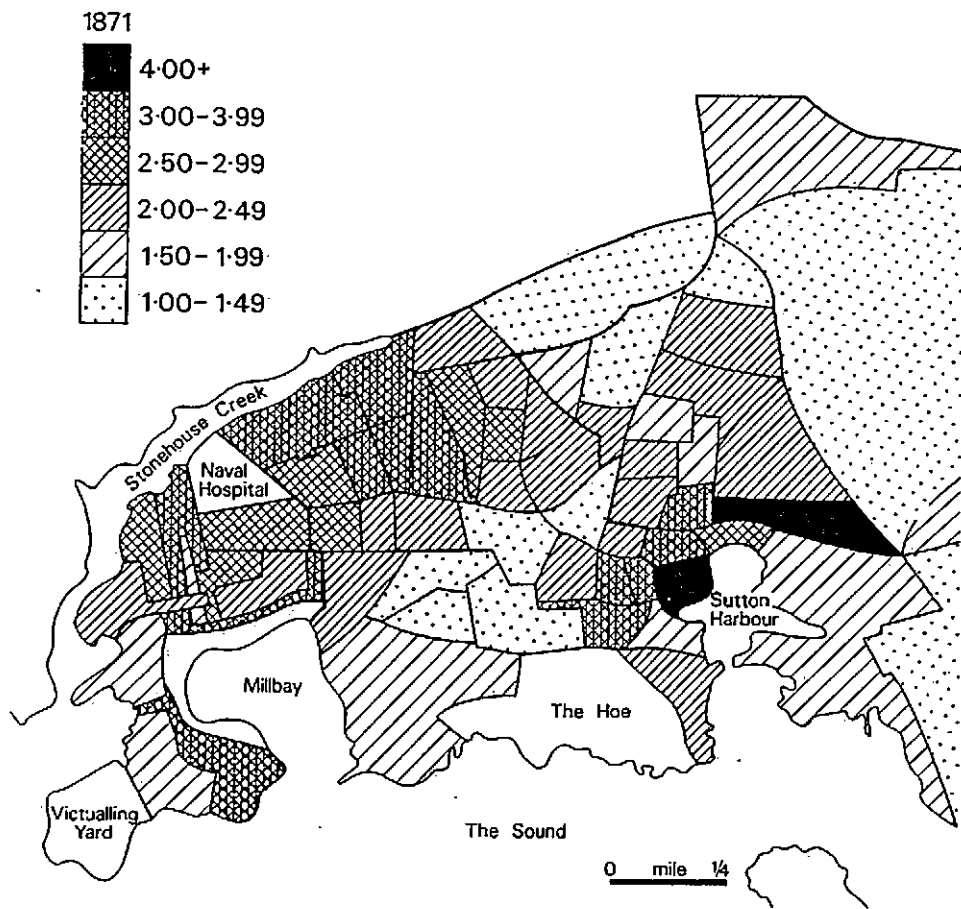
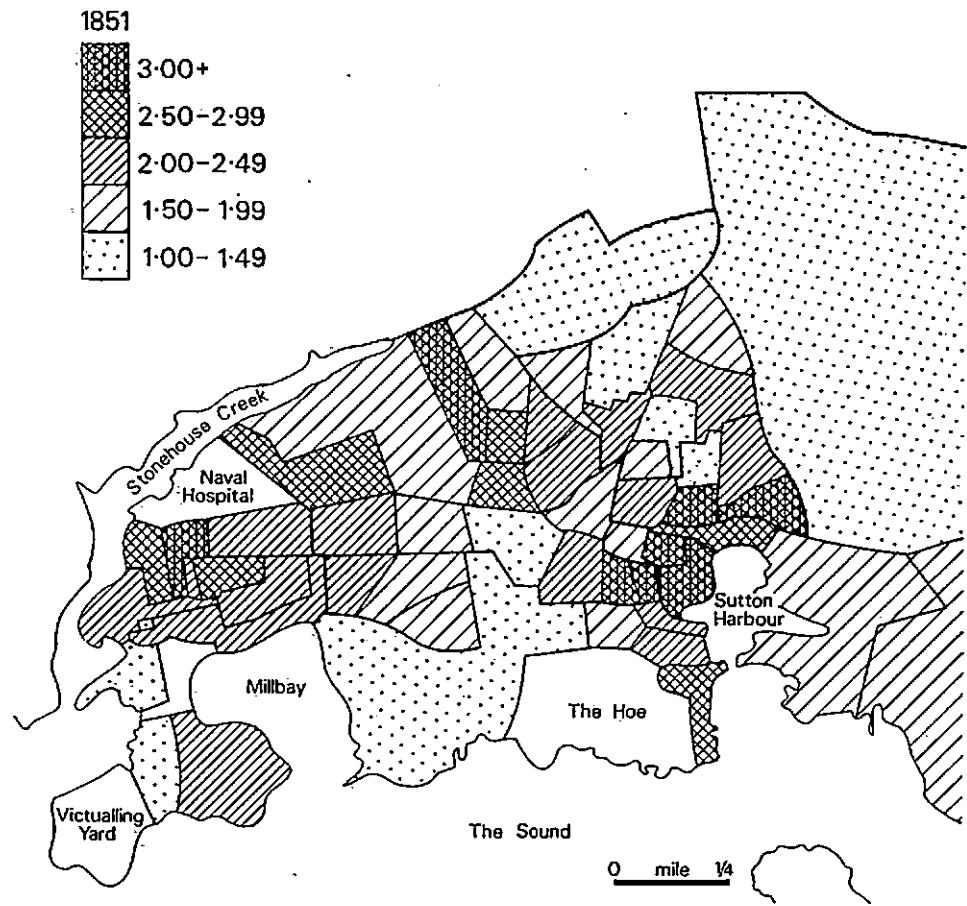


Figure 3.21: The distribution of the number of households per inhabited house in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the manuscript census data.

inhabitants in 9 households in 1851, and, in the same enumeration district, Nos. 36 and 37 Looe Street with 29 people in 7 households and 49 people in 11 households respectively. In 1871 there were 76 inhabitants in 22 households at No. 17 Vauxhall Street, and 128 people in 36 households at No. 32 High Street. But, of course, these bare statistics can be misleading, the census does not indicate the size of the house. In fact, maps and photographic evidence (Plate 3A) shows these to be often three- and four-storey buildings, also; despite quite narrow fronts, the houses were deep, running back to clustered courts (1894 Ordnance Survey).

Examples of overcrowding could be found even in the newer districts. As soon as it was developed, the Barley estate contained dwellings that were occupied by three or even four households. Although these houses seem to have been built as single family dwellings, pressure on housing was such that multiple occupancy was practically inevitable. The 1871 enumerators' schedules indicate that Harwell and Well Streets were still under construction, some of the chiefly medium-sized, three-storey dwellings had yet to be inhabited, yet the finished dwellings were already affording accommodation for several families (Table 3.14).

By contrast, however, the distribution maps showing population per

TABLE 3.14: The Barley estate: Harwell Street schedules

No.1a	1 household	No.8	uninhabited
No.2b	4 households	No.10	uninhabited
No.1	5 households	No.11	uninhabited
No.2	7 households	No.12	building
No.3	uninhabited	No.13	building
No.4	4 households	No.14	building
No.5	4 households	No.15	uninhabited
No.6	3 households	No.16	4 households
No.7	1 household	No.17	4 households

Source: Census enumerators' books.

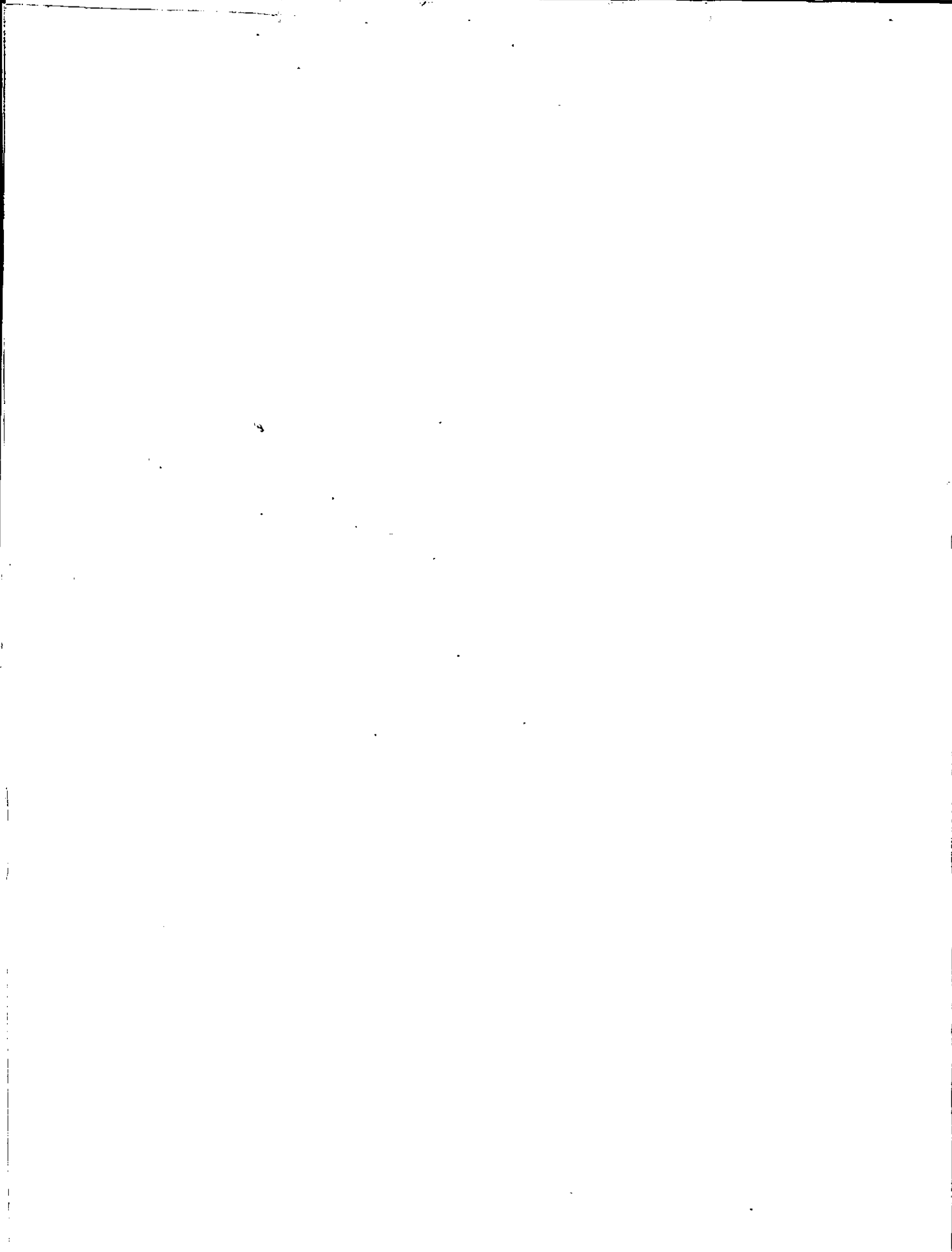


Plate 3A: High Street c1880, looking south towards Notte Street. A man leans on the corner of Lower Lane, just to the right of this photograph, one of the more overcrowded and insanitary streets in 19th-century Plymouth.









household (Figure 3.22) display a markedly different spatial pattern. Larger households often contained domestic servants and, more commonly, extended families, as opposed to the simple nuclear family units of the poorer households. These maps, therefore, may be more indicative of social status than of the density of population. Thus the lowest values of population per household were to be found in the more peripheral, sometimes comparatively rural, areas or else in the new housing areas. It is thought that lower density houses were also more characteristic of the 'better off' local inhabitants (notwithstanding the very rich with a house full of servants). Subsequent analysis revealed that the most densely populated households were often lodging houses which tended to cluster together.

#### 3.4 Conclusion

This chapter has established the nature of population growth in mid-Victorian Plymouth and Stonehouse as expansion due to in-migration subsided and natural increase became the dominant component of growth. It has been suggested that the apparent trend in the latter half of the 19th century towards out-migration was mainly due to suburban development beyond the town boundaries; further evidence to support this will be presented in Chapter Five. Yet it has been shown that a potential motive for such local population movement may be found in the increasing pressure placed upon available building land and consequent overcrowding. It is this density of population which stands as the dominant feature of Plymouth's Victorian social geography.

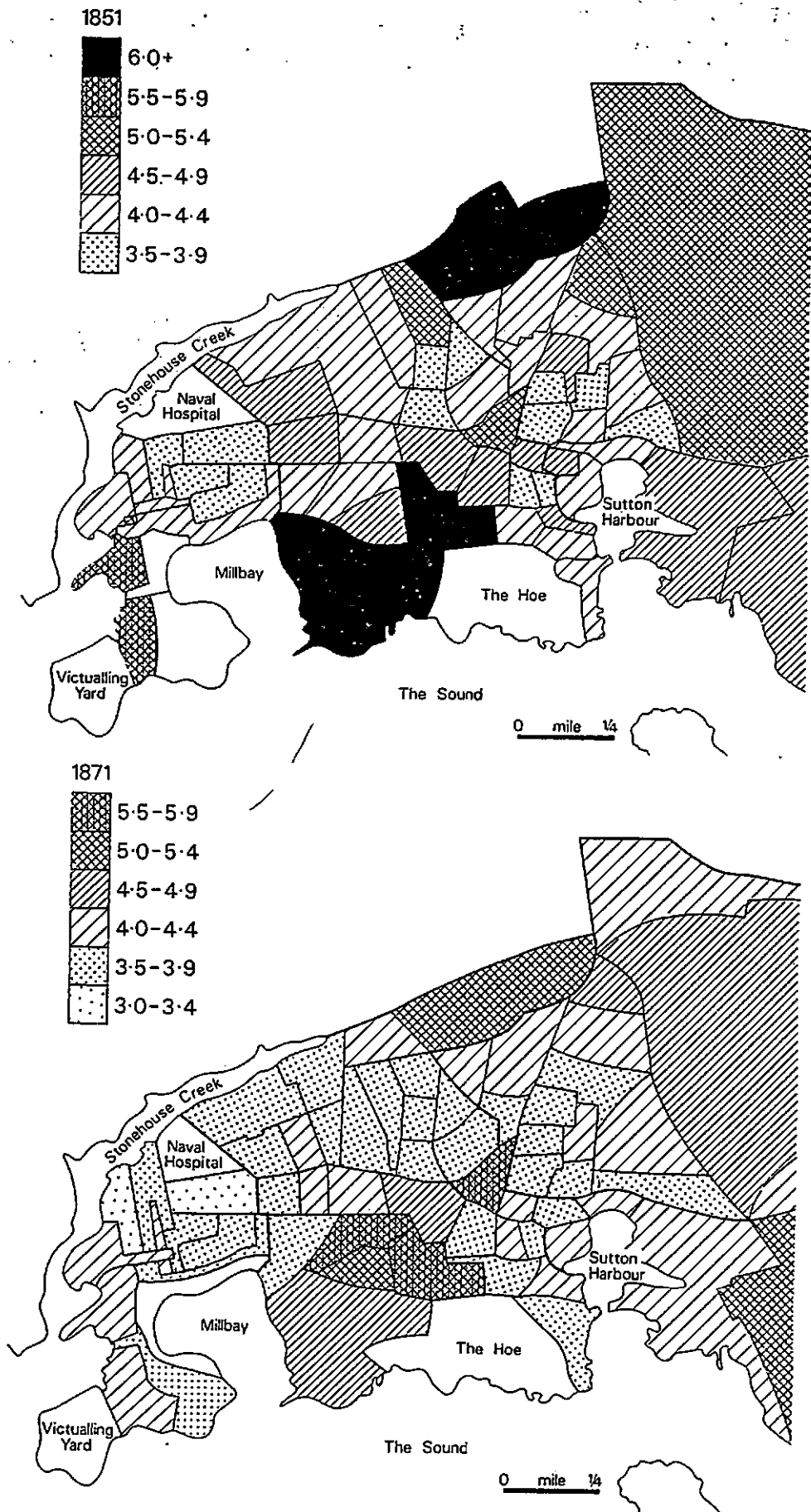


Figure 3.22: The size of the population per household in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the manuscript census data.

The characteristics of the population may be seen as changing in response to its spread and density in the two towns, and it is possible to detect a sequential movement by different categories of inhabitant which is closely connected with their relative affluence. Certain areas have been identified as particularly indicative of this process of change. Although an investigation of the distribution of wealth is not attempted in this study, it may be inferred that the prosperity of the towns' inhabitants exhibited an overall decrease as the more affluent moved away from increasingly cramped and dilapidated living conditions. Clearly, the distribution of wealth and the prosperity of the population could be a worthwhile subject for research.

Evidence has been presented which indicates similarities in the distribution of some demographic characteristics and dissimilarities in the distribution of others. Subsequent chapters will submit further evidence of patterns which may be recognised as the social geography of mid-Victorian Plymouth is investigated. The most significant variables will be identified in the final chapter where the results of a principal components analysis are presented.

Important factors in shaping the demography of mid-Victorian Plymouth, undoubtedly, were the presence of forces personnel and the local fishing industry. The nature of these occupations had ramifications for the population as a whole and women in particular. Thus while the population of Plymouth and Stonehouse shared some characteristics with other Victorian towns and cities, important local factors made these towns, the focal point of urban life in the southwest peninsula, somewhat atypical. But one feature to emerge with unequivocal clarity is that, for Plymouth, the mid-19th century was an era of intense, rapid and wholly unprecedented change.

## CHAPTER FOUR: THE ORIGINS OF PLYMOUTH'S MID-VICTORIAN POPULATION

### 4.0 Introduction

Migration undoubtedly played a key role in shaping the social geography of 19th-century Plymouth and Stonehouse, nearly three-fifths of the study area population was not born locally. Analysis of the population age structure has revealed a preponderance of young adults indicating that the newcomers augmented the towns' already vigorous rate of natural increase. Migrants will have introduced new skills, experiences and aspirations, and while it is hard to measure exactly their contribution to the development of the local economy and cultural life, unquestionably they made Plymouth not only the most cosmopolitan town in the southwest but also one of the most economically buoyant and culturally diverse.

Two very important questions arise: who were the migrants, and where did they come from? Such questions immediately pose problems since census evidence does not provide direct information about migration; unlike modern censuses, specific questions about population movement were not asked in Victorian times. In Chapter Three a variety of methods was employed to estimate the volume of migration and demographic characteristics of the population as a whole. The unpublished census manuscripts enable a more detailed examination of the extant migrant population, but do not permit accurate estimation of the precise history of, or motive for, migration. However, it is possible to reconstruct the pattern and character of migration from information on birthplaces and cross-tabulate this with other vital information such as age and occupation.

The main thrust of the analysis of birthplace data in this chapter seeks to determine:

(1) the size and character of migration to Plymouth from different origins, together with the age-sex, occupational and familial attributes of the component groups; and

(2) the role of the various migrant groups in shaping the social structure of the towns, with regard to their spatial residential patterns.

Ravenstein's 'laws of migration' (1876, 1885, 1889) present a comprehensive set of statements about migration streams (Table 4.1).

This chapter does not seek to prove the 'laws', rather their relevance

TABLE 4.1: Ravenstein's 'laws of migration'

1. Most migrants move only a short distance.
2. The volume of migration increases with the development of industry and commerce.
3. The direction of migration is mainly from agricultural to industrial areas (rural-urban).
4. Most long-distance migration is to the major industrial and commercial centres.
5. Migration proceeds step by step.
6. Each migration stream or flow has a counter-stream.
7. Migrants are generally adults - families rarely migrate over long distances.
8. A majority of migrants are females, but males comprise a majority of international migrants.
9. Migrants are more likely to have rural rather than urban origins.
10. The major causes of migration are economic.

Source: P White & R Woods, The geographical impact of migration, 1980.

is, at least, implicit in all migration study. Thus it follows that migrants to mid-Victorian Plymouth and Stonehouse would be, notably, the commercial, entrepreneurial, industrial and construction workers attracted to the expanding towns. There would also be migrants who were 'obliged' to move there: for example, unemployed farmworkers seeking new work and forces personnel stationed at barracks and naval bases. Furthermore, more migrants may be expected to have moved to Plymouth from elsewhere in the south west than the rest of Britain.

#### 4.1.1 The general pattern of migrant origins

The published census abstracts for 1851 and 1861 revealed that the principal birthplaces of the inhabitants of Plymouth and Stonehouse were, in order, Devon (which includes the natives of the two towns), Cornwall, Ireland, London, and Somerset (Table 4.2). Some 70 percent of the population was born in Devon, roughly half of them actually in the two towns as subsequent analysis of the enumerators' books showed. The Cornish inhabitants accounted for around ten percent of the total population, or some 7,000 people. Somerset was the most frequent birthplace of the other southwest counties providing nearly two percent of the Plymouth population. The third highest single contributor was Ireland providing some 2,200 inhabitants in 1851 rising to 2,600 in 1861, or about 3.5 percent.

There was a sizeable in-migration from other seaboard and dock areas: London, which was the fourth largest single contributor of Plymouth inhabitants, provided an increasing proportion of the population; Gloucestershire (including Bristol), Hampshire (Portsmouth



TABLE 4.2: Summary of Birthplaces, 1851 and 1861

Region/County	1851		1861		1851		1861	
	Plym.	Stone.	Plym.	Stone.	Total	Percent	Total	Percent
Devon	38415	8000	45607	9292	46415	72.3	54899	71.4
Cornwall	5180	1599	6061	1583	6779	10.6	7644	9.9
SW Counties:	1422	631	1653	1058	2053	3.2	2711	3.5
Somerset	747	384	845	702	1131	1.8	1547	2.0
Gloucester	320	95	408	148	415	0.6	556	0.7
Dorset	199	95	264	126	294	0.5	390	0.5
Wiltshire	156	57	136	82	213	0.3	218	0.3
London	1215	228	1477	324	1443	2.2	1801	2.3
SE Counties:	1087	291	1429	382	1378	2.1	1811	2.4
Hampshire	560	160	508	211	720	1.1	719	0.9
Kent	360	96	431	115	456	0.7	546	0.7
Sussex	167	35	490	56	202	0.3	546	0.7
East Anglia	289	58	335	86	347	0.5	342	0.4
East Midlands	134	28	155	80	162	0.3	235	0.3
North	96	28	153	38	124	0.2	191	0.2
Northwest	194	53	412	176	247	0.4	588	0.8
West Midlands	276	94	386	167	270	0.4	553	0.7
Yorkshire	157	39	274	75	196	0.3	349	0.5
Remaining Cos	394	76	407	98	470	0.7	505	0.7
Wales:	283	121	386	172	404	0.6	558	0.7
Glamorgan	47	20	76	20	67	0.1	96	0.1
Pembroke	50	58	91	37	108	0.2	128	0.2
Ireland	1792	424	2014	600	2216	3.5	2614	3.4
Scotland	259	120	437	137	379	0.6	574	0.7
Islands	276	54	500	76	330	0.5	576	0.7
Abroad/At Sea	752	134	928	108	886	1.4	1036	1.3
TOTAL POP.	52221	11979	62599	14343	64200		76942	

East Anglia: Essex, Norfolk, Suffolk;

East Midlands: Derbyshire, Leicestershire, Lincolnshire,  
Nottinghamshire, Rutland;

Northwest: Cheshire, Lancashire;

North: County Durham, Cumberland, Northumberland, Westmoreland;

West Midlands: Herefordshire, Shropshire, Staffordshire, Warwickshire,  
Worcestershire;

Remaining Counties: Bedfordshire, Berkshire, Buckinghamshire,  
Cambridgeshire, Hertfordshire, Huntingdonshire,  
Middlesex, Northamptonshire, Oxfordshire, Surrey.

Source: Published census data.

and Southampton), and Kent (Chatham and Sheerness) together accounted for over two percent of the population; inhabitants born in the northwest counties of Lancashire (Liverpool) and Cheshire more than doubled between 1851 and 1861; and there were sizeable increases from Yorkshire, Glamorgan and Pembroke. These increases undoubtedly reflect the availability of work following the construction of Millbay Docks. The number of inhabitants from Sussex increased sharply between the two censuses, this may be attributed to the fishing industry: almost all of them were men living in Plymouth Registration District where the fishing fleet was based.

An unexpected element came from the so-called Islands in the British Seas, which comprised the Channel Islands and the Isle of Man. The increasing number of these migrants came mainly from the Channel Islands - their relative proximity to the southwest peninsula perhaps being the significant factor (there was, of course, a weekly packet to Plymouth). The number of people from the West Midlands (Herefordshire, Shropshire, Staffordshire, Warwickshire and Worcestershire) also doubled between 1851 and 1861, suggesting that Plymouth exerted an attraction for potential migrants from counties other than those with a seaboard location.

Some interesting differences, indicative of different influences at work, emerge when the composition of the populations in the two towns is studied more closely. Noticeably less of the Stonehouse population was Devon-born than that of Plymouth, yet there were more Cornish inhabitants. The proportion of Somerset-born people living in Stonehouse was over twice as high as Plymouth. These kinds of differences did not substantially alter in 1861, apart from both towns apparently containing a rising proportion of migrants from outside Devon, and a larger number of birthplaces providing five or more per

thousand of their populations.

A broad outline of the birthplace structure of Plymouth's population has been established, despite the difficulty of comparing data due to changes in presentation between censuses (Chapter Two). The published figures must be interpreted with a degree of caution: the birthplace totals do not take into account the size of communities from which in-migrants were drawn. For example, that Rutland contributed only two people to the study area in 1851 while Lancashire contributed 201 reflects far more the size of those counties' populations (respectively, 24,272 and 2,067,301) than their emigrants' differing preferences. So the numbers of people from each county were weighted according to the size of the sending population (Appendix B), and the top twelve sending counties for the two Registration Districts of Plymouth and East Stonehouse in 1851 and 1861 are given overleaf in Table 4.3, showing also the number of immigrants and the weighted values.

While the data for individual Registration Districts were not published for the 1871 census, a general impression of the birthplace structure, following statistical revision, can be gained from the combined figures for Plymouth and Devonport (East Stonehouse was excluded). It can be seen from Table 4.4 that the principal sending counties remained the same and in broadly similar proportions.

TABLE 4.3: Ranked lists of weighted birthplace values, 1851 and 1871

		National Ratio	Population	Weighting	Value/1000	
<b>PLYMOUTH</b>						
1851:	1	Devon	3.16	38415	12156.65	679.57
	2	Cornwall	1.98	5180	2616.16	146.25
	3	Islands	0.80	276	345.00	19.29
	4	Somerset	2.48	747	301.21	16.84
	5	Hampshire	2.24	560	250.00	13.98
	6	Dorset	1.03	199	193.20	10.80
	7	Kent	2.71	360	132.84	7.43
	8	Gloucester	2.56	320	125.00	6.99
	9	Ireland	15.68	1792	114.29	6.39
	10	Wiltshire	1.42	156	109.86	6.14
	11	Oxford	0.95	100	105.26	5.88
	12	Pembroke	0.53	50	94.34	5.27
1861:	1	Devon	2.91	45607	15672.51	673.94
	2	Cornwall	1.84	6061	3294.02	141.65
	3	Islands	0.71	500	704.23	30.28
	4	Somerset	2.22	845	380.63	16.37
	5	Dorset	0.94	264	280.85	12.08
	6	Sussex	1.81	490	270.72	11.64
	7	Hampshire	2.28	580	222.81	9.58
	8	Pembroke	0.48	91	189.58	8.15
	9	Gloucester	2.42	408	168.60	7.25
	10	Kent	2.71	431	159.04	6.84
	11	Ireland	13.91	2014	144.79	6.23
	12	Wiltshire	1.24	136	109.68	4.72
<b>EAST STONEHOUSE</b>						
1851:	1	Devon	3.16	8000	2531.65	583.57
	2	Cornwall	1.98	1599	807.58	186.15
	3	Somerset	2.48	384	154.84	35.69
	4	Pembroke	0.53	58	109.43	25.22
	5	Dorset	1.03	95	92.23	21.26
	6	Hampshire	2.24	160	71.43	16.47
	7	Islands	0.80	54	67.50	15.56
	8	Wiltshire	1.42	57	40.14	9.25
	9	Gloucester	2.56	95	37.11	8.55
	10	Kent	2.71	96	35.42	8.16
	11	Cardigan	0.39	12	30.77	7.09
	12	Ireland	15.68	424	27.04	6.23
1861:	1	Devon	2.91	9292	3193.13	574.44
	2	Cornwall	1.84	1583	860.33	154.76
	3	Somerset	2.22	702	316.22	56.88
	4	Dorset	0.94	126	134.04	24.11
	5	Islands	0.71	76	107.04	19.25
	6	Hampshire	2.28	211	92.54	16.65
	7	Pembroke	0.48	37	77.08	13.87
	8=	Wiltshire	1.24	82	66.13	11.90
	8=	Hereford	0.62	41	66.13	11.90
	10	Gloucester	2.42	148	61.16	11.00
	11	Ireland	13.91	600	43.14	7.76
	12	Kent	2.71	115	42.44	7.63

TABLE 4.4: Ranked list of weighted birthplaces values, 1871

	National Ratio	Population	Weighting	Value/1000	
PLYMOUTH AND DEVONPORT.					
1871: 1	Devon	2.65	82592	31166.79	647.97
2	Cornwall	1.60	12686	7928.75	164.84
3	Islands	0.64	700	1093.75	22.74
4	Hampshire	2.32	1888	813.79	16.92
5	Somerset	2.04	1477	724.02	15.05
6	Dorset	0.86	541	629.07	13.08
7	Pembroke	0.41	240	585.37	12.17
8	Kent	2.77	1162	419.49	8.72
9	Ireland	12.40	4093	330.08	6.86
10	Gloucester	2.35	689	293.19	6.10
11	Sussex	1.84	502	272.83	5.67
12	London	14.33	3617	252.41	5.25

#### 4.1.2 Principal origins and spatial patterns of in-migrants

A simple percentage breakdown of the principal birthplace groups living in mid-19th century Plymouth and Stonehouse suggested that groups likely to have been prompted to migrate for different reasons tended to come from characteristically different areas. Thus rural out-migrants and commercial and entrepreneurial workers came mostly from elsewhere in Devon, Cornwall, and the other counties of the southwest peninsula. Forces personnel and specific groups of skilled workers whose choice of place of residence was, in part, dictated by the nature of their occupation, tended to come from further afield. A good example are the dock workers who frequently recorded other ports such as Sheerness, Chatham, Portsmouth, Pembroke or Liverpool as their birthplace in the census. This general pattern of origins provided a framework upon which more detailed analysis could be based to determine the precise nature of the in-migration process and the contribution of migrants to Plymouth's pattern of growth.

Whatever process of statistical adjustment was employed, Devon still provided the largest proportion of the study area's population, over half in every instance (Table 4.3), although many of these people were natives of Plymouth and Stonehouse and were, therefore, not migrants. The number of Devon-born inhabitants per thousand fell between 1851 and 1861 reflecting the increased number of inhabitants from other counties in the latter census year following a decade of in-migration. Curiously, Stonehouse contained about ten percent fewer Devon-born people than Plymouth, although by this time the two towns were becoming geographically contiguous and such distinctions were perhaps no longer particularly relevant.

Only in 1851 did the published census abstracts distinguish between locally-born inhabitants and those born elsewhere, and then only for the Plymouth District, preventing comparison over time at this level of analysis, but the figures are, nevertheless, revealing. Nearly 42 percent of the population were born in Plymouth, in other words, almost three out of every five inhabitants were migrants. The abstracts also noted the numbers of people aged under twenty years and twenty years and upwards, showing that over sixty percent of Plymouth-born inhabitants were aged under twenty compared to only 26 percent of the migrant contingent. These data confirm the indication, already discussed in Chapter Three, that migrants were predominantly young adults who established families after settling in the town.

The ten percent sample survey of the 1851 and 1871 census enumerators' books permitted differentiation between those born locally and those born elsewhere in Devon. In the 1851 sample some sixty percent of Devon-born inhabitants were born in Plymouth or Stonehouse; this figure is higher than that obtained from the published data because the sample excluded the military and naval

institutions, which will have contained few local men. An even greater proportion of the 1871 sample were native, nearly seven percent more, suggesting a more settled population. Overall, the locally-born contingent rose from just under half the total population of the two towns to just over half in the twenty-year period.

More importantly, the sample survey also permitted analysis at enumeration district level and thus revealed the distribution of the various migrant groups within the two towns. In both census years there was a very clear distribution pattern of Devon-born inhabitants in the study area (Figure 4.1), with a heavy concentration to the east of Plymouth and comparatively fewer Devonians living in the west of the area, particularly in Stonehouse. Generally, these inhabitants were living in what were essentially the older parts of the town, but some enumeration districts to the north containing newly-developed housing also had over eighty percent Devon-born inhabitants. To the west of Millbay less than sixty percent of the population was born in Devon; these districts included a large proportion of personnel associated with the marine barracks.

Once the native inhabitants of Plymouth and Stonehouse had been separated out and their distribution mapped (Figure 4.2), their concentration around Sutton Harbour was revealed, in the oldest working area of the town. But again some can be seen to have moved out to the newly-developed part of Plymouth, especially in 1851, and in 1871 onto the Barley estate which was built during the 1860s. Parts of northern Stonehouse also contained over forty percent locally-born inhabitants.

The distribution of those inhabitants born elsewhere in Devon (Figure 4.3) changed markedly between the two census years. In 1851 there was a notable concentration of these people (over 40 percent) in

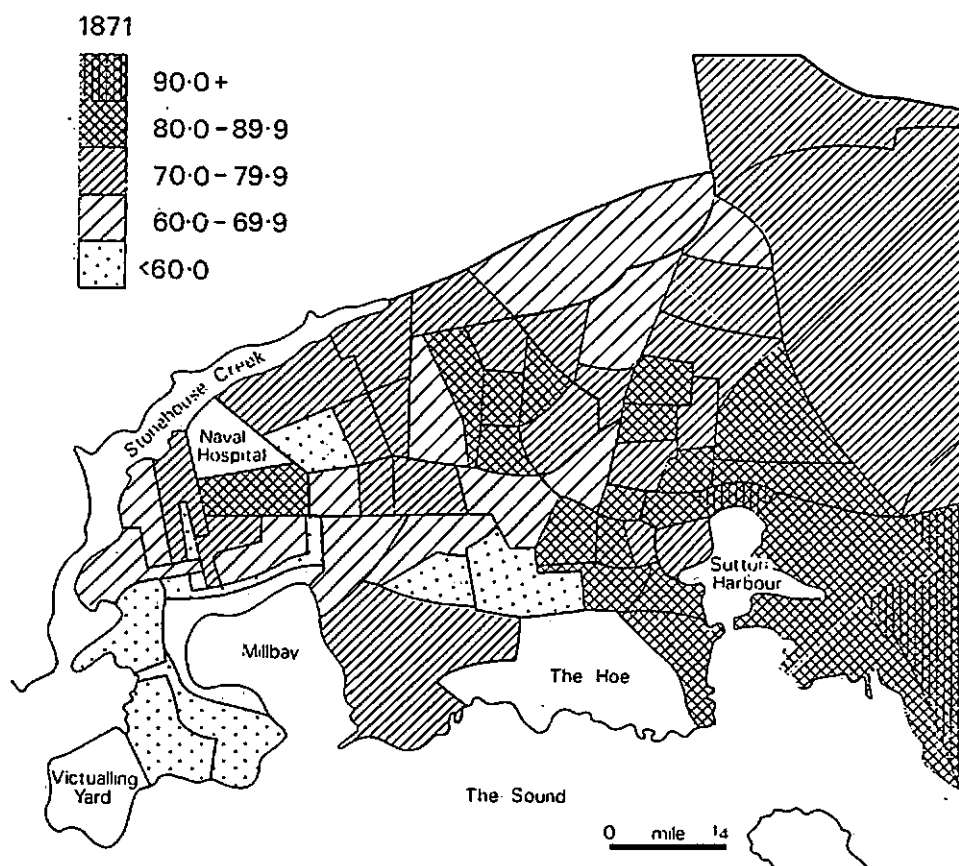
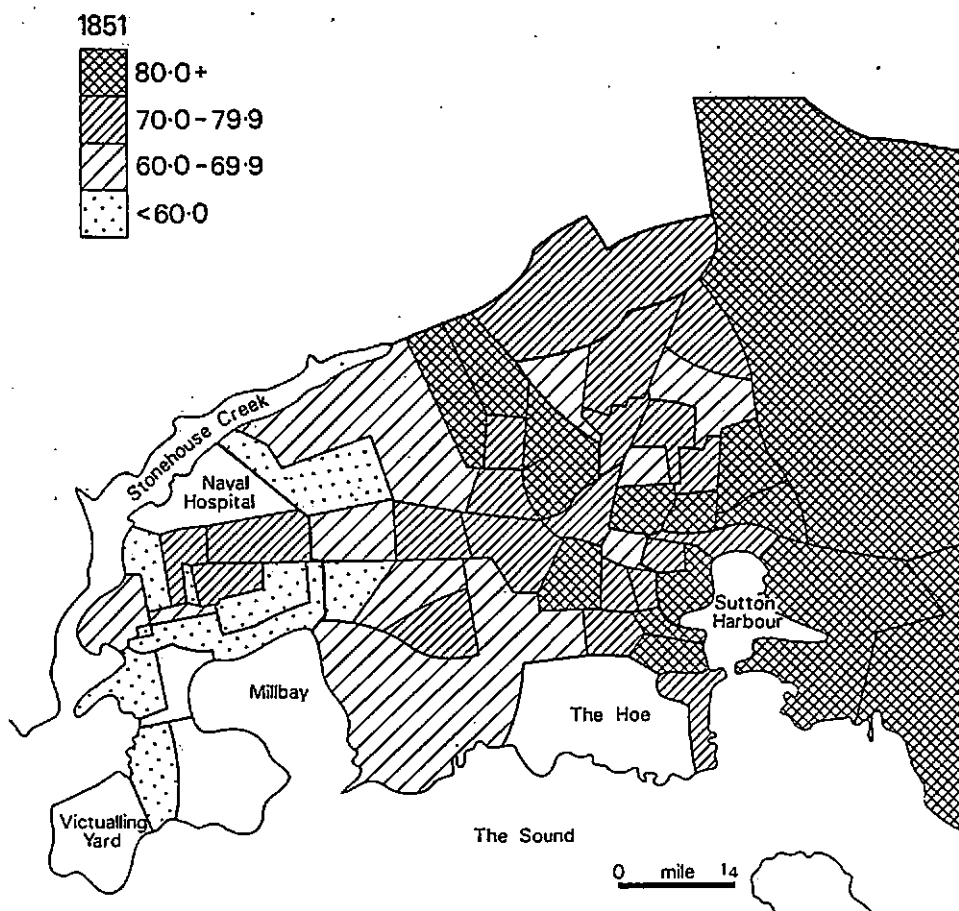


Figure 4.1: The distribution of people born in Devon and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages and are based on the sample population data.



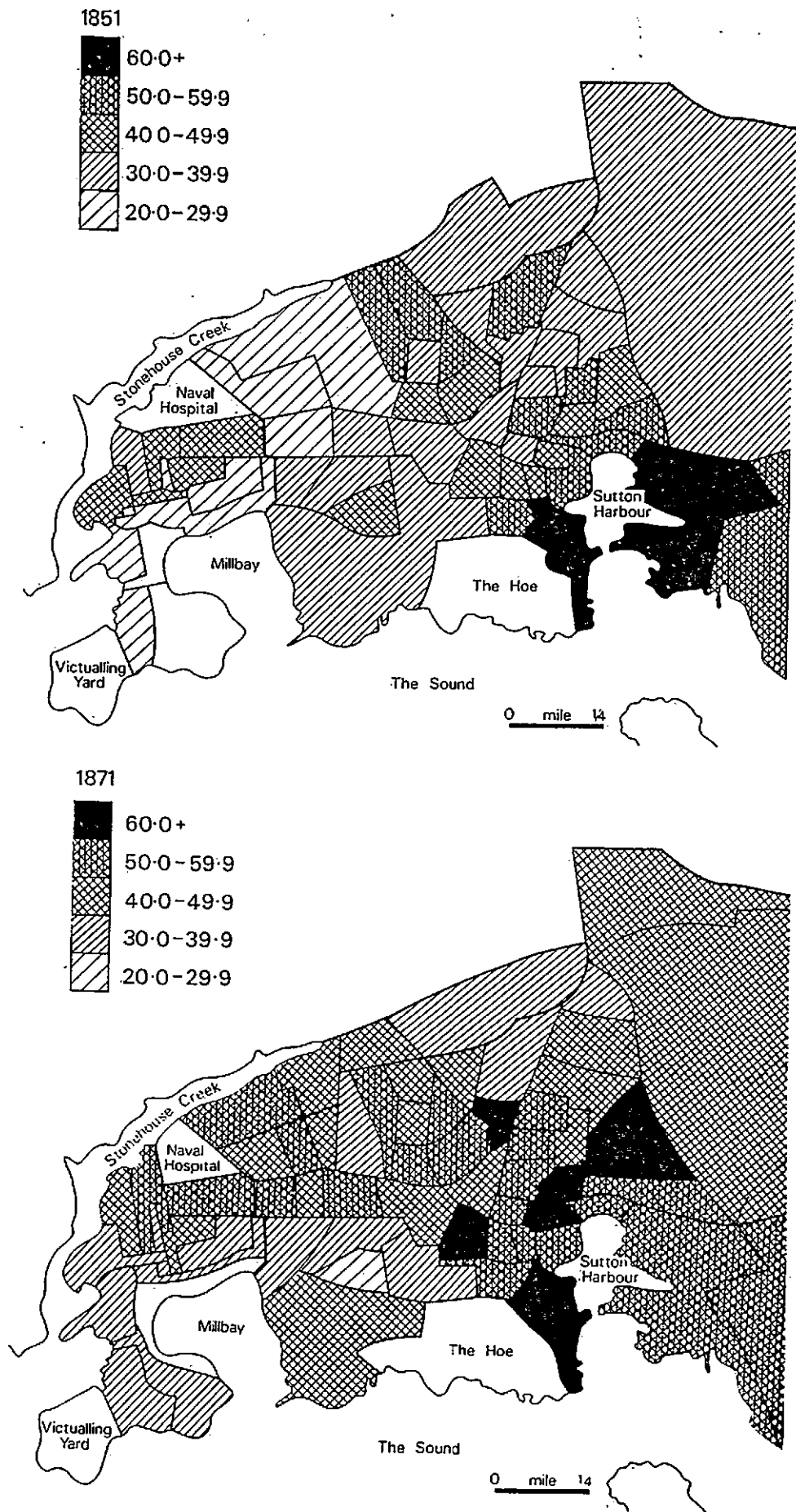
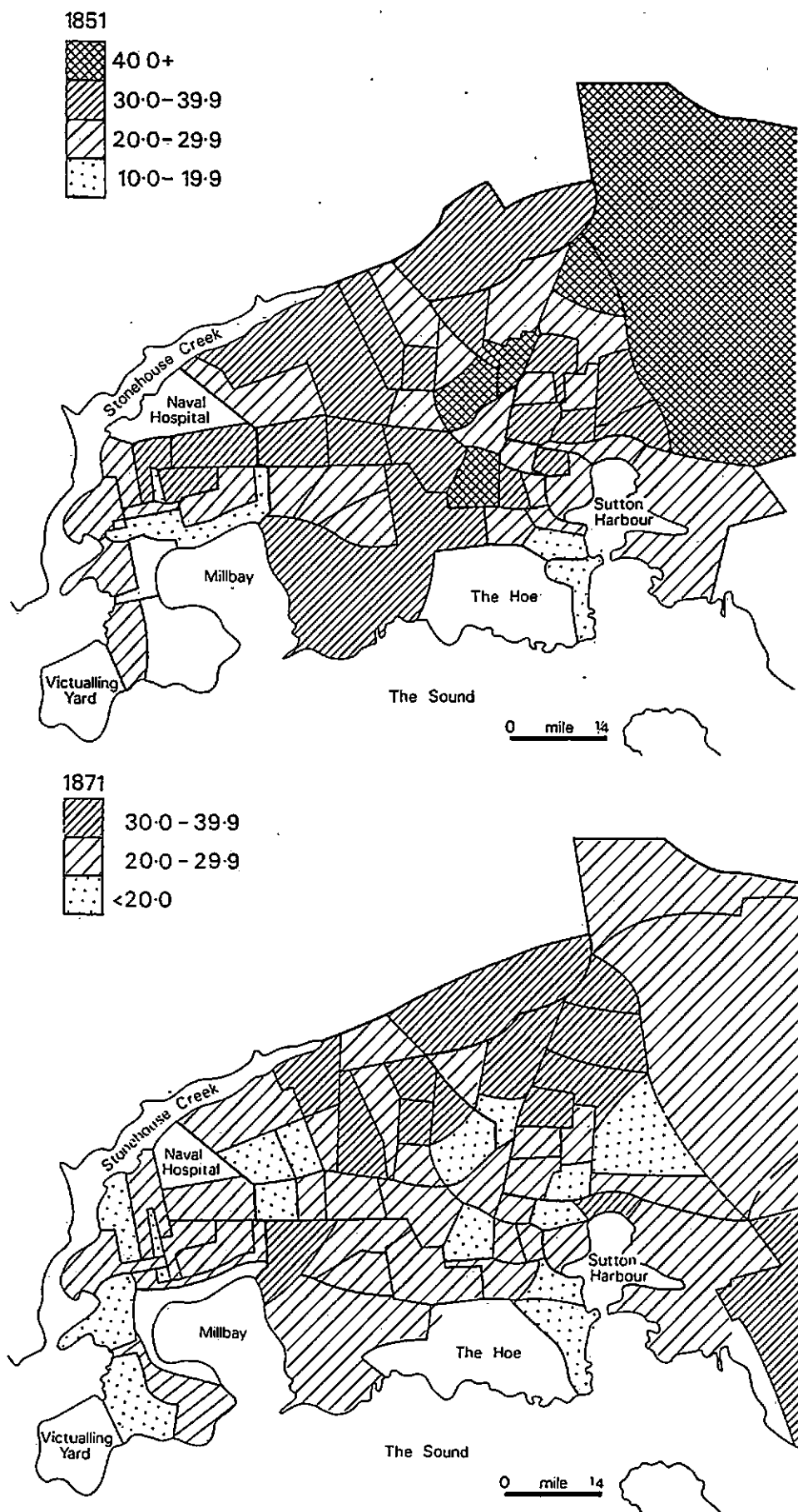


Figure 4.2: The distribution of the sample population born in Plymouth and Stonehouse and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.



**Figure 4.3:** The distribution of the sample population born in Devon (excluding Plymouth and Stonehouse) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.

the outer areas of the town, to the northeast and northwest of Sutton harbour; but twenty years later their distribution was much more even and did not exceed 37 percent in any enumeration district.

Cornwall ranked second in the lists of birthplaces, though again the number of Cornish-born inhabitants per thousand fell in the 1850s, most notably in Stonehouse (by more than a third). The location of the towns, adjacent to the Cornish border, meant that Plymouth was much more accessible for short distance migrants from east Cornwall than, say, from north Devon.

The Cornish inhabitants of Plymouth and Stonehouse appear, especially in 1871, to have assembled in certain enumeration districts (Figure 4.4), not necessarily forming ghettos as such but gathering in relatively close proximity. This may be as much a reflection of housing availability as of deliberate congregation, but also, of course, it will have been usual for friends and relatives already living in the two towns to assist newcomers in finding accommodation.

The two choropleth maps show that there were also proportionally fewer Cornish inhabitants living in Plymouth and Stonehouse in 1871 than in 1851, there was a one percent decrease over the twenty years. This general trend was also evident from the published census data.

While statistical weighting made no difference to the rank order of Devon and Cornwall in the birthplace lists, it did increase the rank order of migrants from the other southwest counties of Somerset, Dorset, Gloucestershire and Wiltshire, and also the Channel Islands (which may here be regarded as a proximate 'county'). The numbers per thousand of the population from these counties rose in nearly every case between 1851 and 1861.

In total, 137 inhabitants born in these four counties were picked

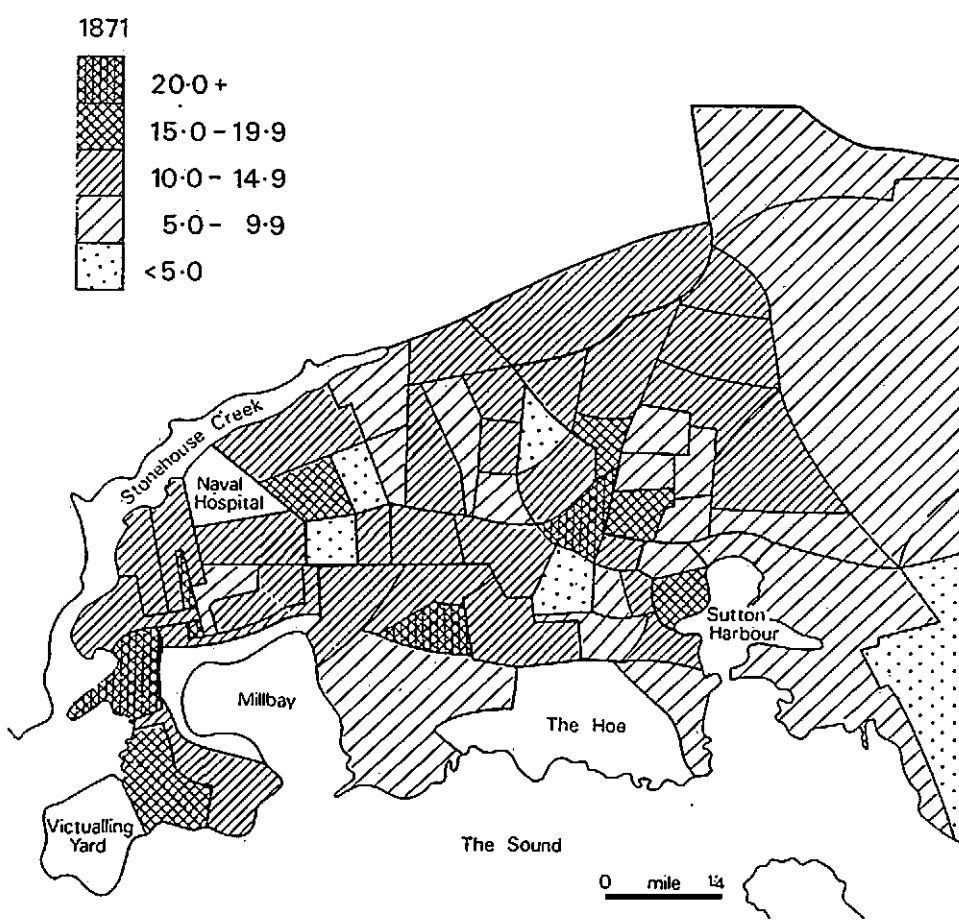
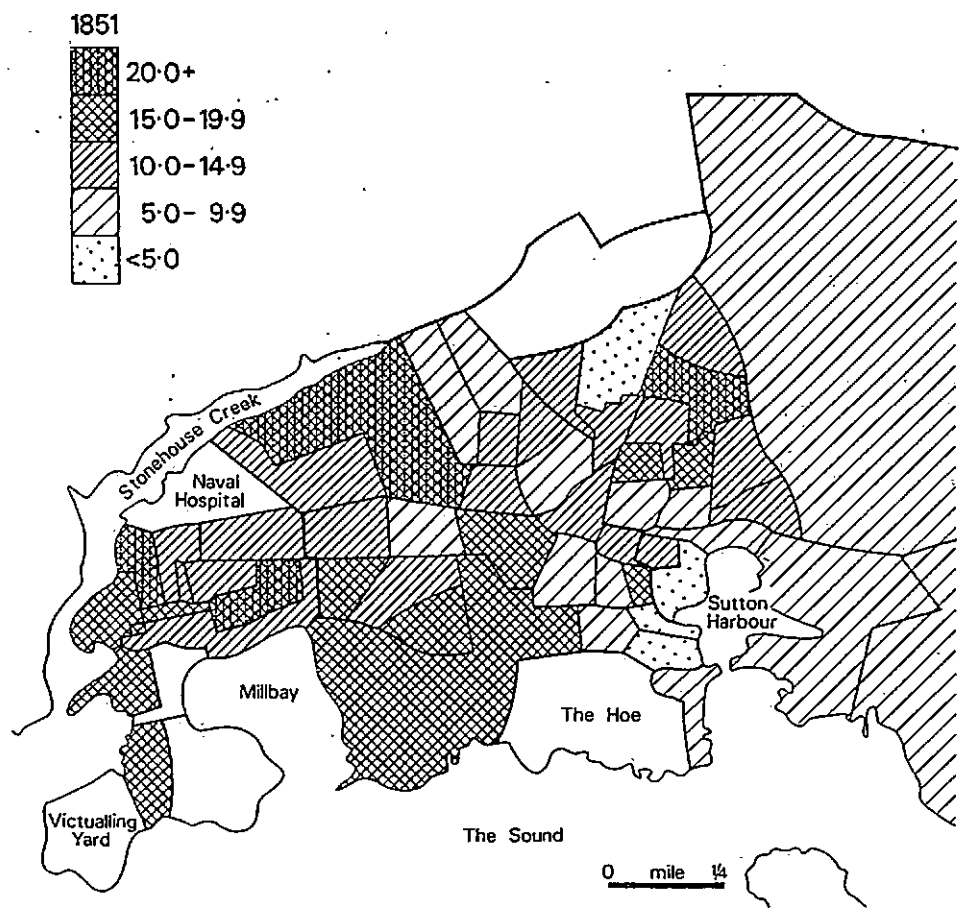


Figure 4.4: The distribution of the sample population born in Cornwall and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.

up in the sample survey for 1851, 2.3% of the whole sample. This proportion rose to 2.6% in the 1871 sample (206 people). Their distribution was fairly evenly spread throughout the towns of Plymouth and Stonehouse (Figure 4.5).

Migration to Plymouth from seaboard counties, which included London (see Appendix B for full list), certainly occurred and can be seen quite clearly in the choropleth maps of England and Wales (4.6a-e). Those counties most involved in this trend were Gloucestershire, Hampshire, Kent and Pembroke; the number per thousand born in seaboard counties was in every case higher in Stonehouse than in Plymouth, reflecting that town's closer proximity to Millbay Docks. But it must be noted that in some cases, for example Cardigan's appearance in the 1851 Stonehouse list, the number of non-natives is so small as to be accounted for by the migration of only two or three families. On the other hand, Sussex first appears in the 1861 list for Plymouth with quite substantial numbers of people and, as suggested above, the significance of this influx is attributable to the many small fishing ports existing in this coastal county in the 19th century.

The distribution of migrants from these 29 counties (Figure 4.7) implies that there was an increase in the proportion of such inhabitants in the two towns between 1851 and 1871, the samples produced percentages of 5.1 and 7.1 respectively. Most striking is the increase in people born in seaboard counties living around Millbay, a clear reflection of the effect of the dock construction in the 1850s. One enumeration district in particular (split into two parts by Millbay Barracks and located to the west and north of Millbay) contained 20.3% such inhabitants by 1871 and over a third of these (17 out of 45 in the sample) were from Kent. However, a direct

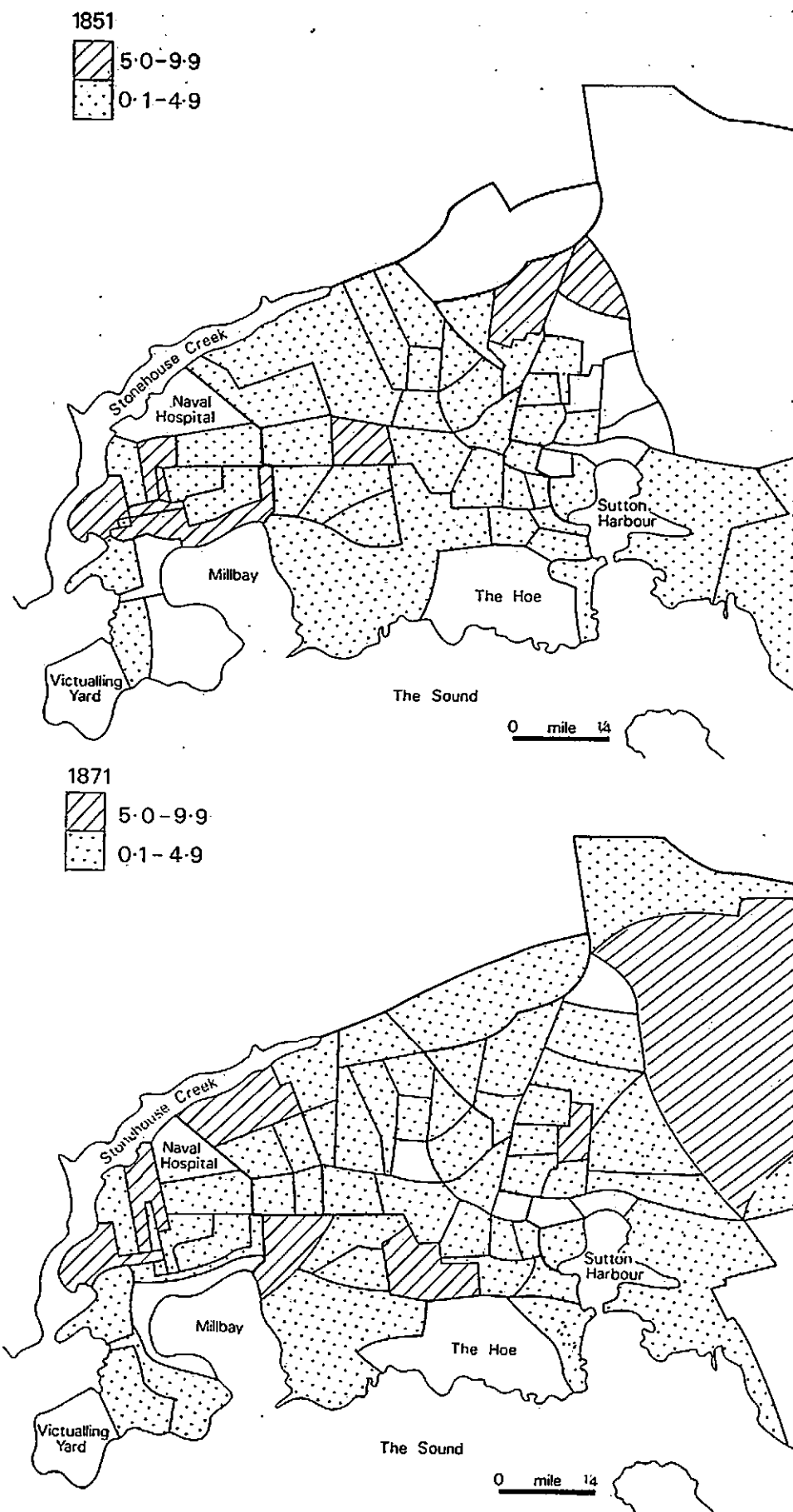


Figure 4.5: The distribution of the sample population born in the southwest counties of Somerset, Gloucestershire, Wiltshire and Dorset and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.

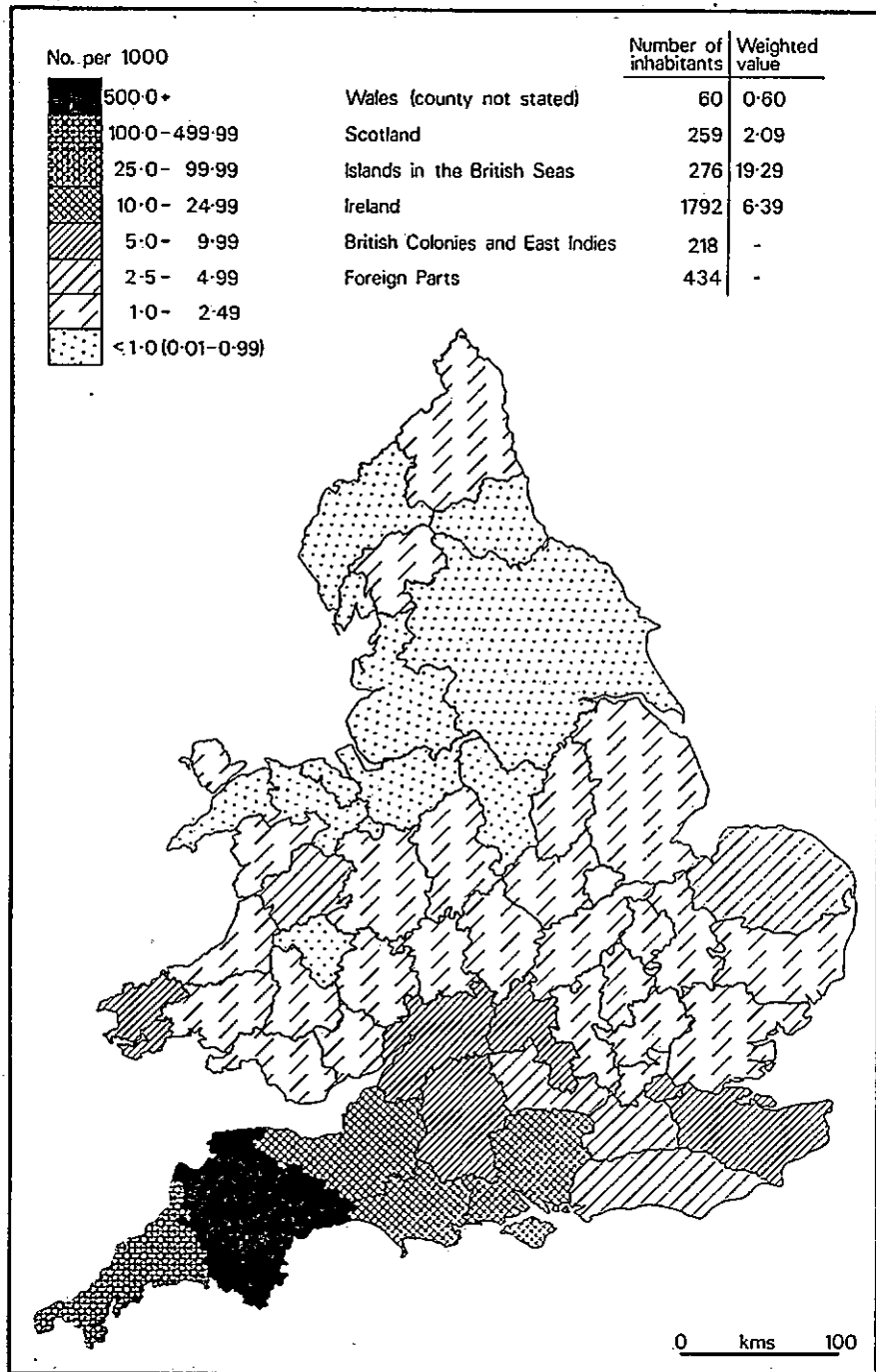


Figure 4.6: (a) Origin of migrants to Plymouth by county, 1851. Based on the published census data.

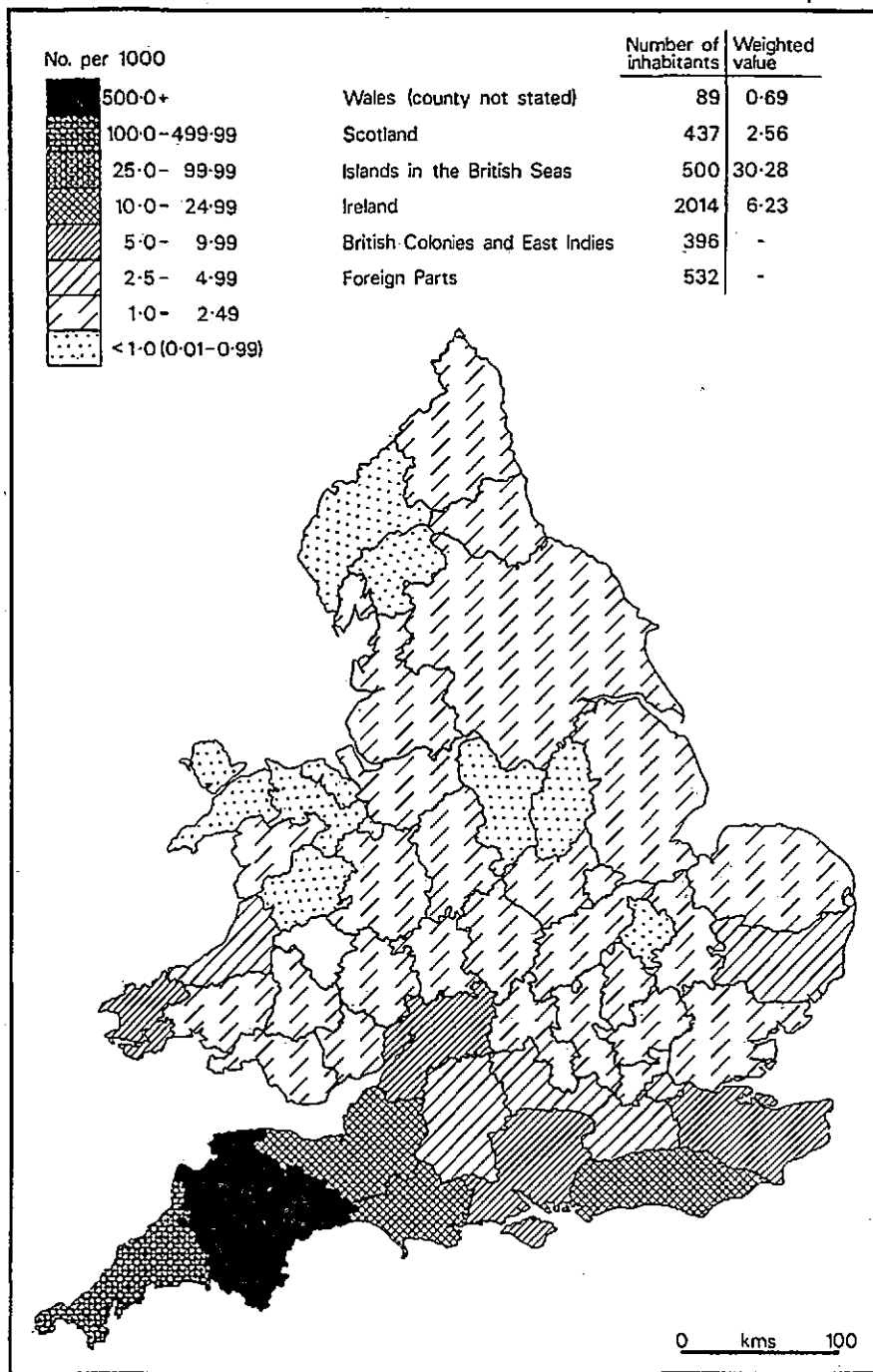


Figure 4.6: (b) Origin of migrants to Plymouth by county, 1861. Based on the published census data.



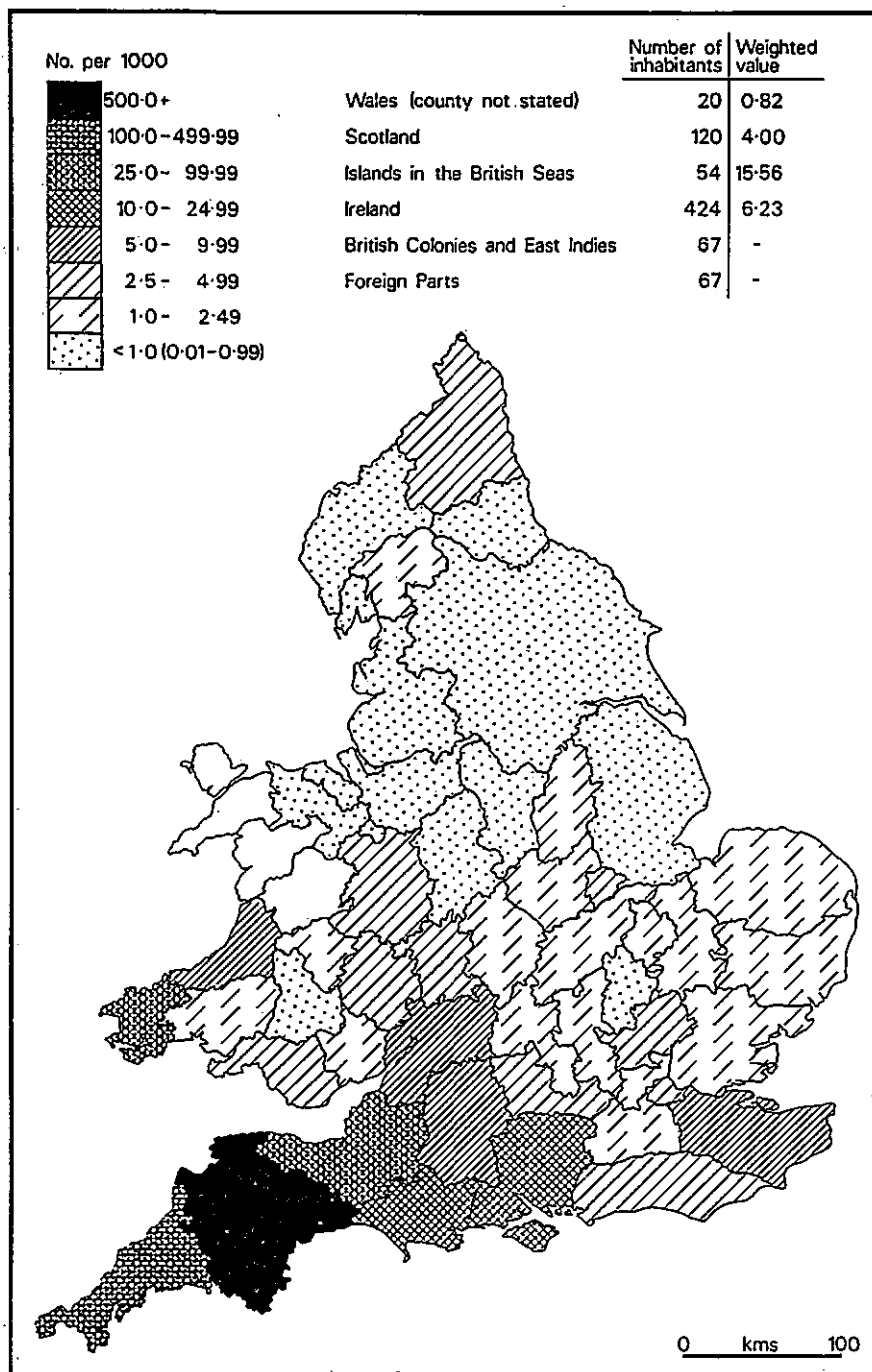


Figure 4.6: (c) Origin of migrants to East Stonehouse by county, 1851. Based on the published census data.

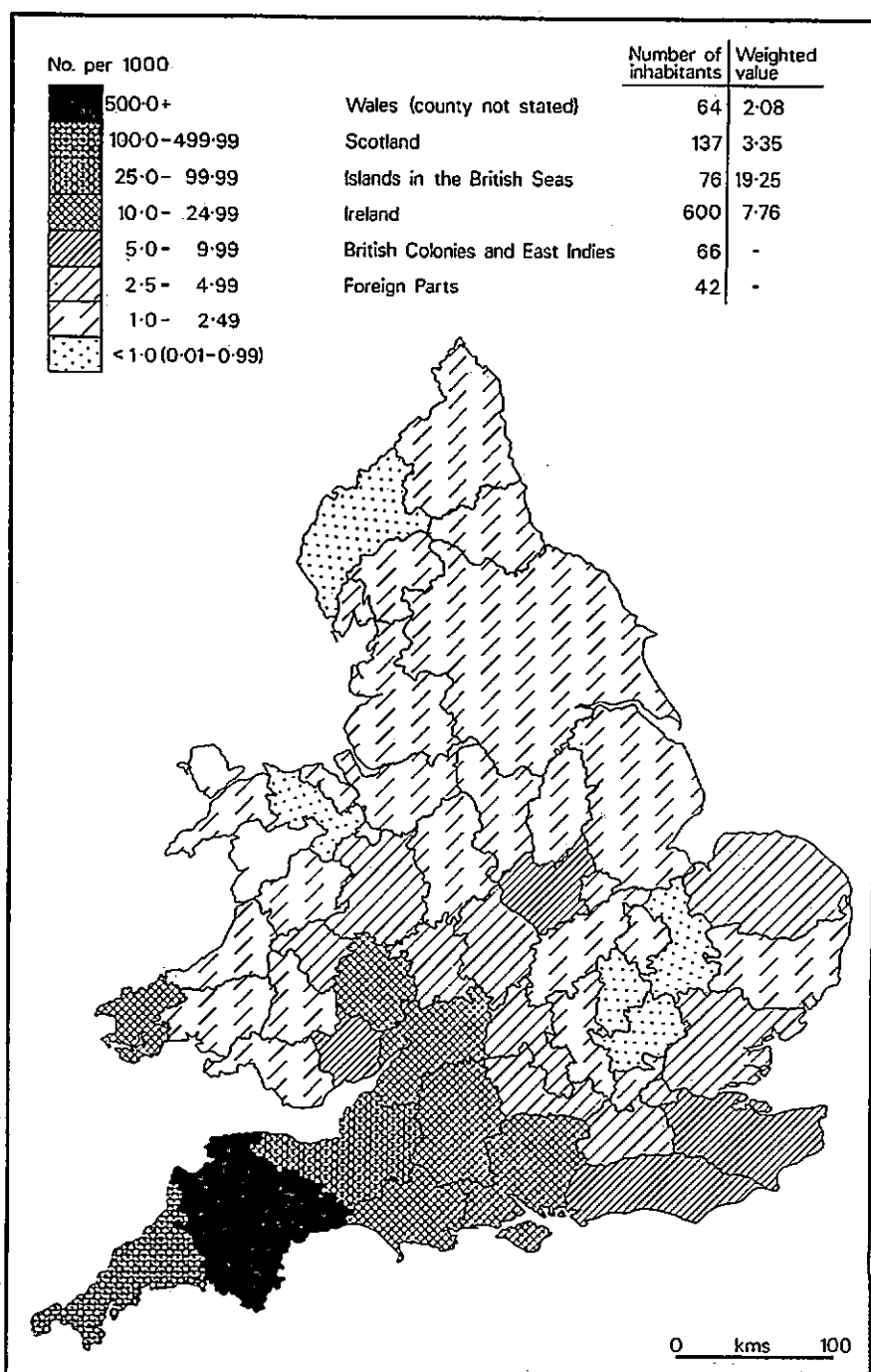


Figure 4.6: (d) Origin of migrants to East Stonehouse by county, 1861. Based on the published census data.

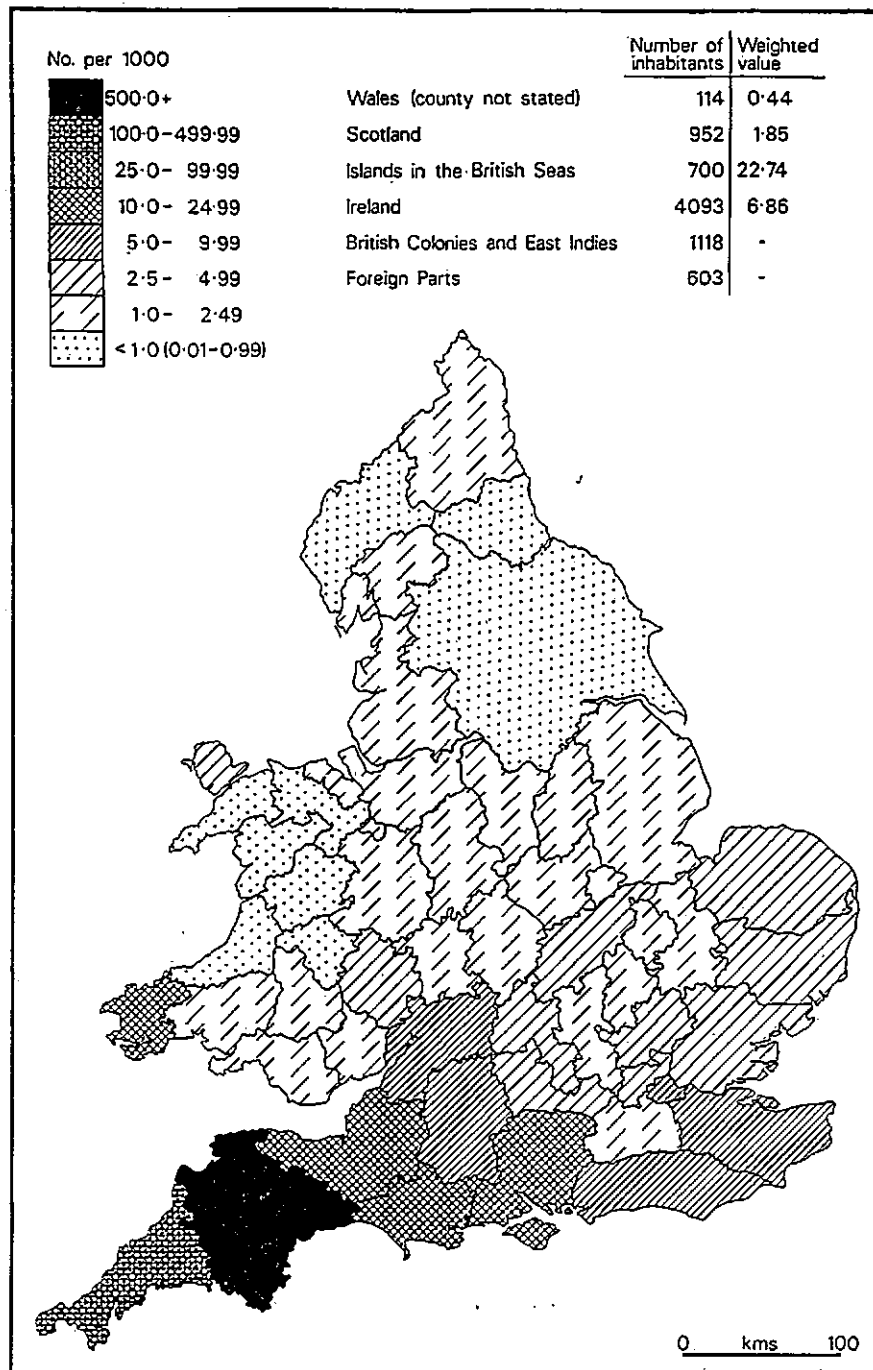


Figure 4.6: (e) Origin of migrants to Plymouth and Devonport (Stoke Damerel) by county, 1871.  
Based on the published census data.

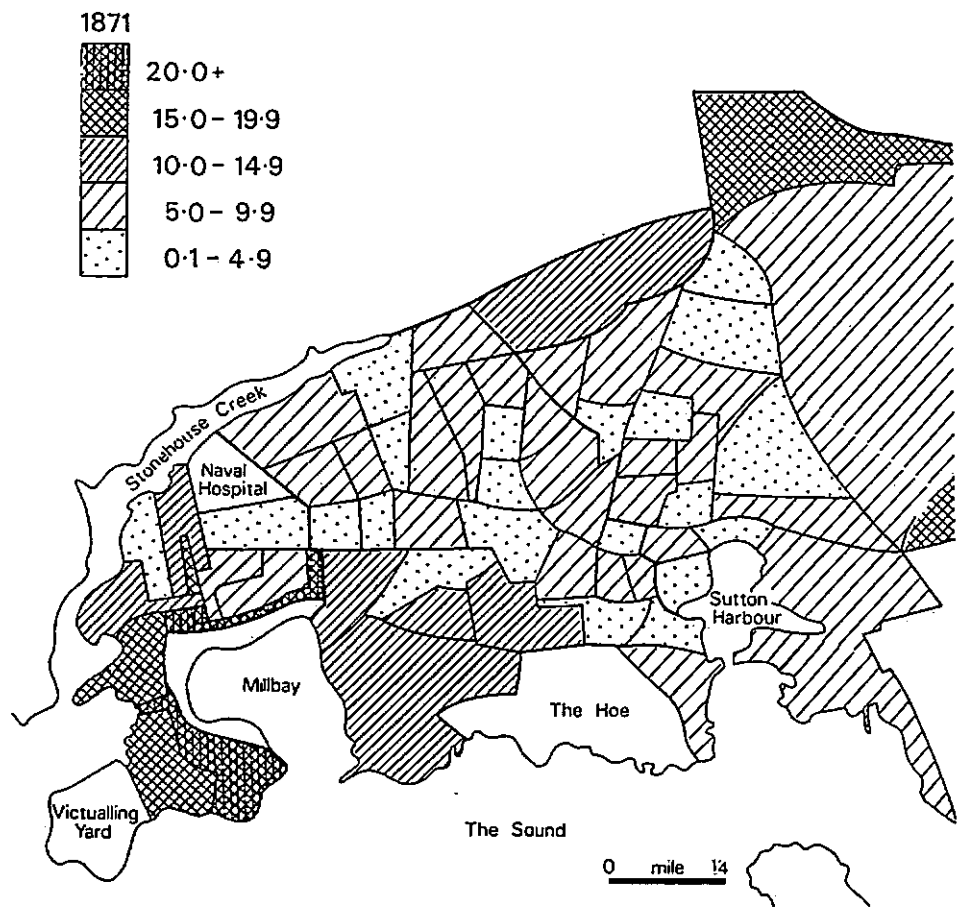
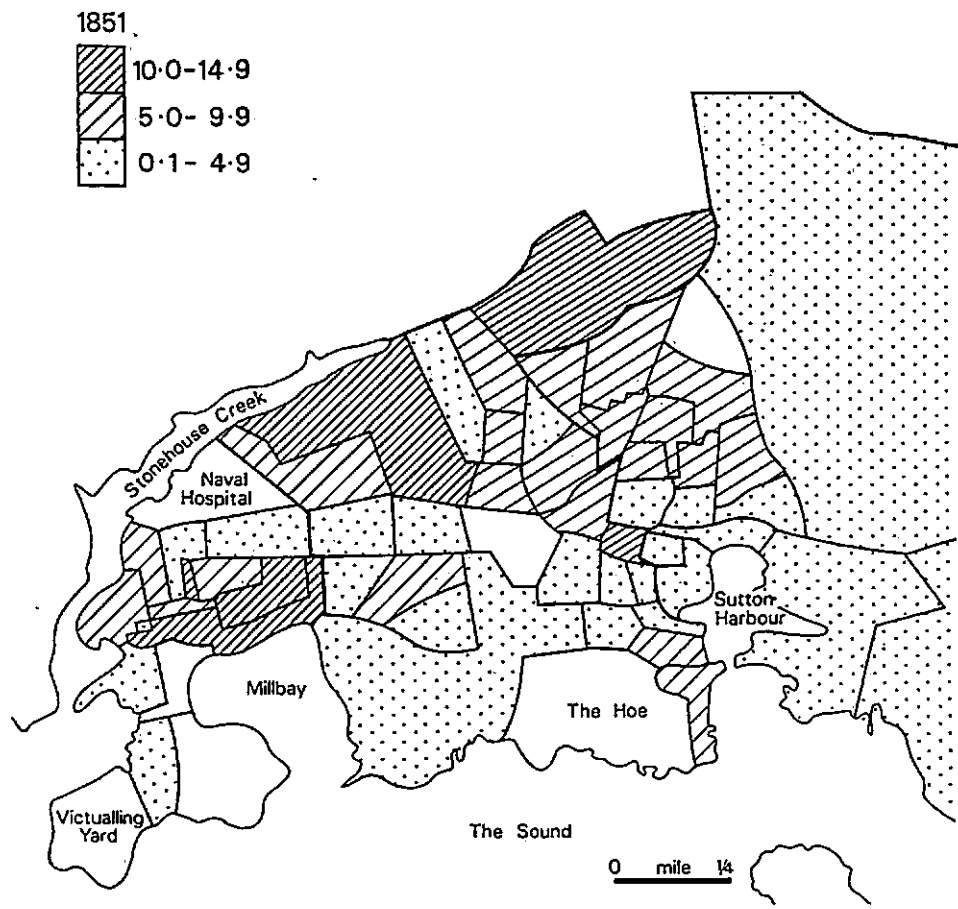


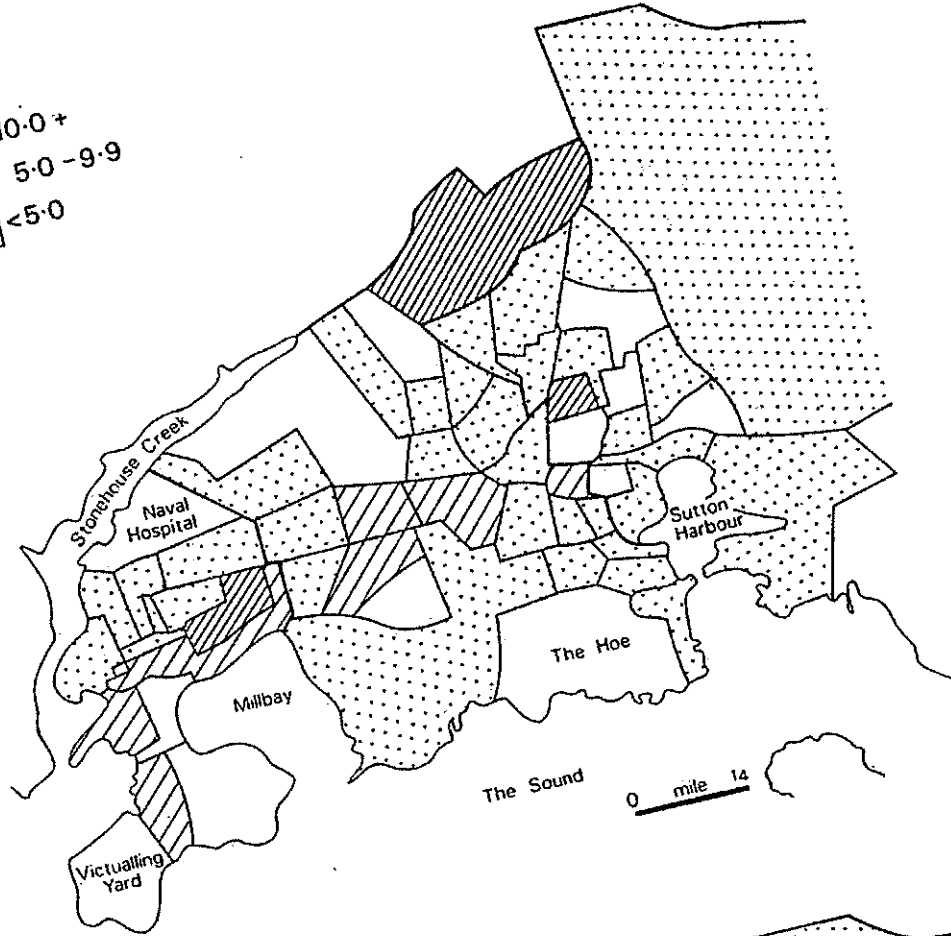
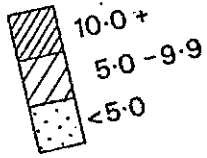
Figure 4.7: The distribution of the sample population born in seaboard counties and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.

connection with the Kent docks was not found, these immigrants seem, instead, to have come from the Kent side of London. It may be that the recently-extended barracks in Stonehouse may have had a greater influence than the docks in this district.

Migrants born in inland counties, while the numbers caught in the sample were relatively small, seem to have gravitated towards the newer and better parts of the two towns of Plymouth and Stonehouse (Figure 4.8), concentrating particularly in the northern part of Plymouth, the central area (the eastern end of Union Street), and southern parts of Stonehouse around the marine barracks in the Durnford Street area.

When the number of inhabitants born in Ireland was weighted, their group still appeared in the top twelve of all the ranked lists, with a weighted value of over six per thousand (Table 4.3 above). This represents a sizeable share of Irish immigration which went largely to the North, the Midlands and London. The population of Ireland decreased by nearly three million between the 1840s and 1860s, and while a third of these starved or perished from disease following the famine of the mid-1840s (Jordan, 1973), many more emigrated. By 1871 there were well over half a million Irish living in England and Wales and over a third of these lived in Lancashire (13 percent in Liverpool alone); a further one hundred thousand plus lived in Scotland (over 14 percent of the population). In fact, the general trend indicated a falling off of Irish immigration in the mid-19th century (Table 4.5). Seeking to explain this trend, with reference to the Irish-born in London, Shannon (1935) proposed that the increased attraction of America not only reduced immigration, but also increased the re-emigration of Irish-born. But while data on other towns indicates

1851



1871

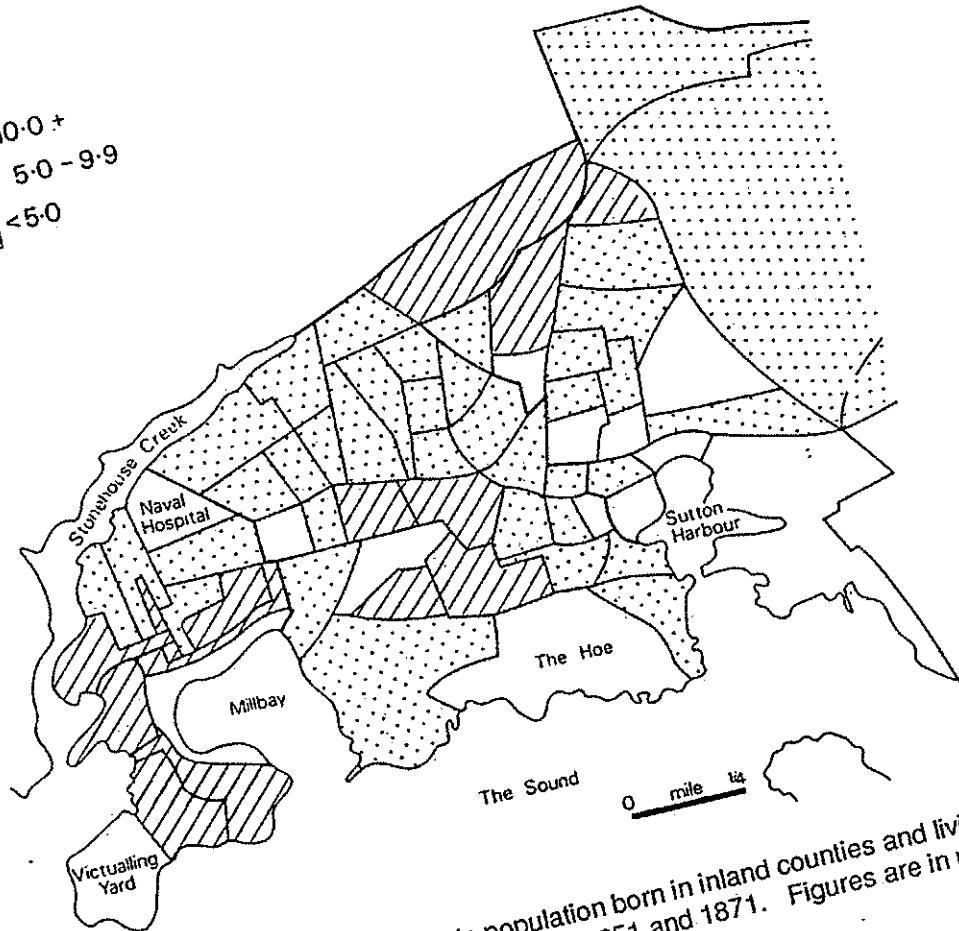
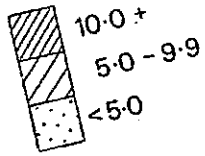


Figure 4.8: The distribution of the sample population born in inland counties and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.

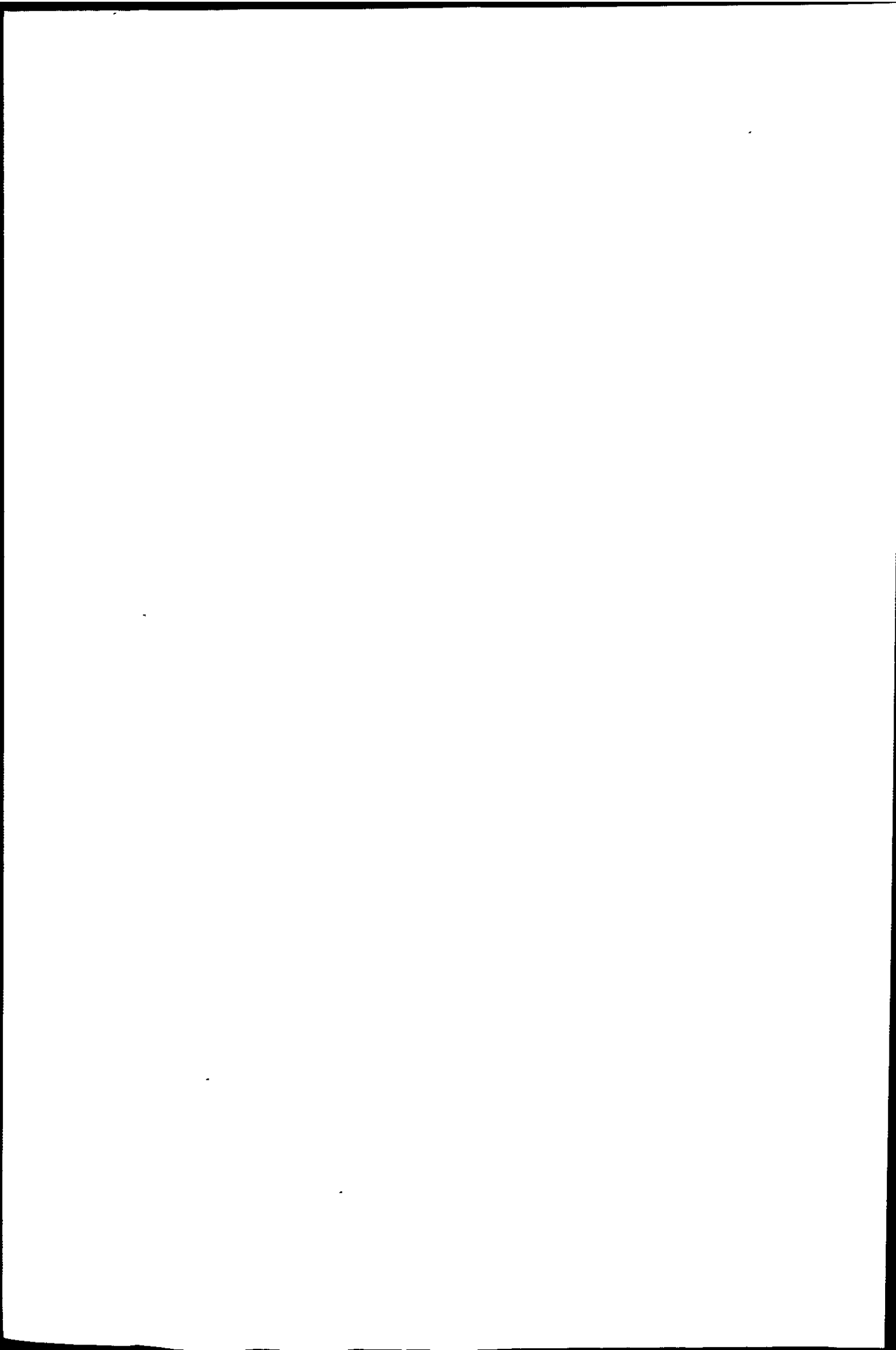


TABLE 4.5: Percentage of Irish-born in various towns, 1851-1871

Town	1851	1861	1871	Source	
Plymouth	3.4	3.2	)3.5	Published census	
Stoke Damerel	2.5	4.4		)	Published census
East Stonehouse	3.5	4.2		n.a.	Published census
Birmingham	4.0	n.a.	9.0	Pooley, 1977	
Bradford	9.2	n.a.	6.2	Richardson, 1968	
Bristol	3.5	n.a.	2.1	Pooley, 1977	
Cardiff	10.8	n.a.	8.7	Williams, 1979	
Exeter	0.9	0.9	0.9	Published census	
Leeds	7.7	7.6	n.a.	Dillon, 1973	
Liverpool	22.3	18.9	15.6	Lawton & Pooley, 1976	
London	4.6	3.8	2.8	Shannon, 1935	
Manchester	13.1	n.a.	9.0	Pooley, 1977	
England & Wales	2.9	3.0	2.5	Lawton & Pooley, 1976	

some reversal in the flow of Irish migration, this does not appear to have been the case in Plymouth. However, Ravenstein (1885) noted the percentages of Irish-born living in several towns in 1881, including Plymouth where the total was 1.9%, as well as Bradford (4.3%), Leeds (3.1%), Liverpool (12.8%), and London (2.2%), which seems to suggest that the trend towards outflow from Plymouth commenced a little later than elsewhere.

There were nearly 5000 Irish people living in Devon in 1851, 36.3% of them lived in Plymouth alone (44.9% in the three towns of Plymouth, Stonehouse and Devonport combined). Plymouth was an important gateway for Irish migrants but it was not uncommon for them to find a permanent home at their immediate port of disembarkation (Ravenstein, 1885). There were regular, twice-weekly steam packets to Plymouth from Cork and Dublin (Figure 4.9), and with the added impetus of government-assisted emigration to the colonies, the town was also an important emigration port. In the late 1840s there was a substantial increase in the number of Irish migrants passing through the port -



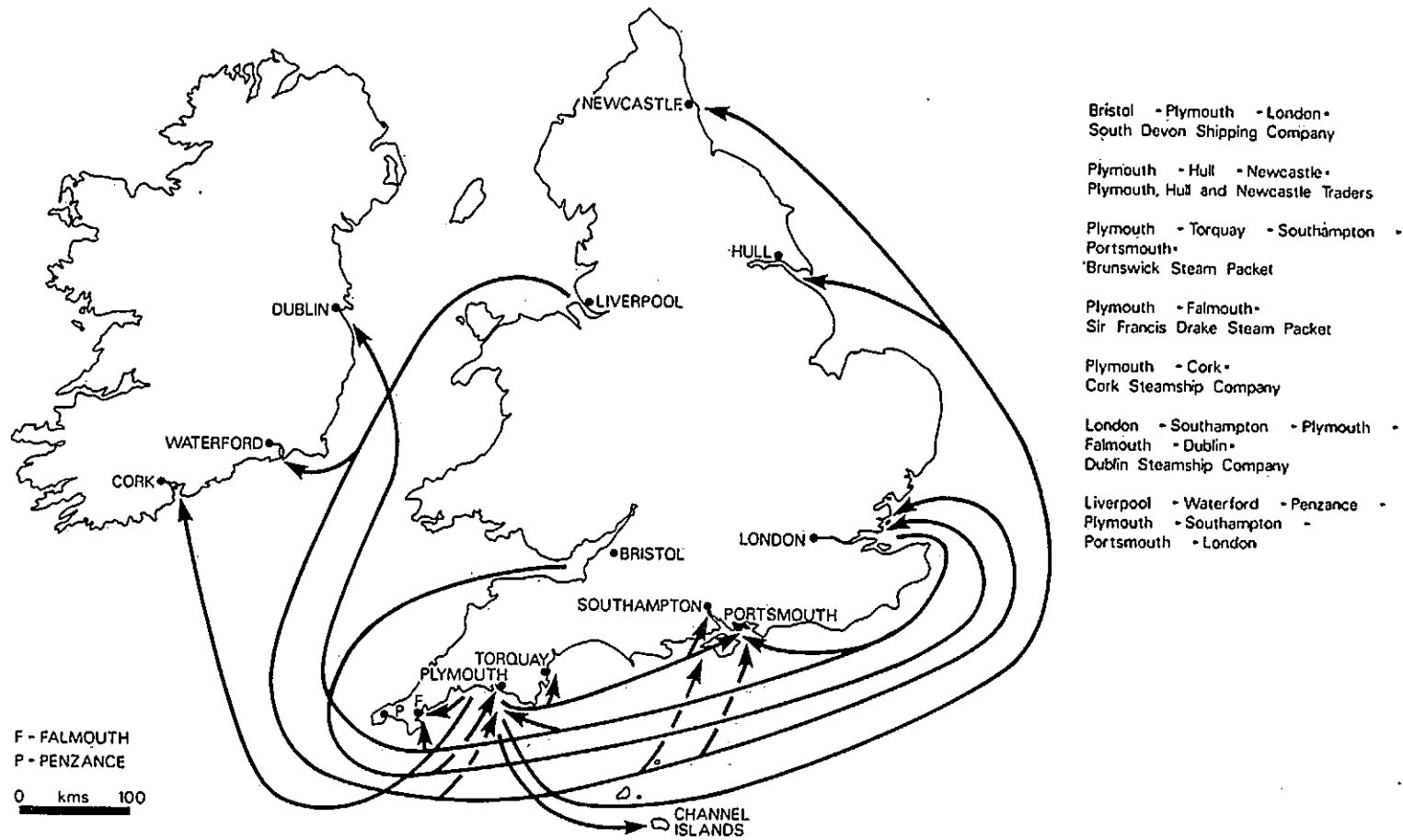


Figure 4.9: Coastal packets and traders out of Plymouth based on evidence in Kelly's Post Office Directory, 1856.

many of them destitute and "weakened by months of hunger" (Brayshay, 1980) following the famine - en route, chiefly, to Australia and North America (see Plate 4A). Plymouth's significance as a magnet for Irish migrants is emphasised by comparison with Exeter whose population contained only 0.9% Irish-born through the mid-19th century, against an average of about 3.5% in the study area.

The Irish inhabitants of Plymouth and Stonehouse were very obviously concentrated in one district of Plymouth lying to the north east of Millbay; this can be clearly seen in the choropleth maps (Figure 4.10). In 1851, Victory Court, off King Street, contained 133 inhabitants, in 17 households, 94 of whom were born in Ireland; Quarry Court had 16 households in six houses with 80 Irish-born out of a population of 95 inhabitants. These two courts alone housed nearly ten percent of Plymouth's total Irish population. Close by, No 6 Stonehouse Lane contained nine households with 49 Irish-born out of 65 inhabitants.

Not only did the Irish, therefore, cluster together in ghettos, but also overcrowding was such that their living conditions encapsulated all the horrors that are usually inferred from the term 'ghetto'. A revealing enquiry, reported in a contemporary newspaper, betrays one reason for such ghetto formation. Councillor T W Fox was particularly concerned about the Irish immigrants, and in February 1849 he asked the quarterly meeting of the full council: "Had the police received any instructions as to how they were to treat the numerous Irish vagrants who swarmed in the streets?" The meeting was informed that when the new prisons opened in April the problem would be alleviated, meanwhile the police were under instructions "to keep the beggars on the move" (PDSH, 10 Feb 1849).

Curiously, the ghetto concentration seems to have become diluted by

Plate 4A: Modbury Inn on Exeter Street, the road into Plymouth from the east. Posters on the building to the left advertise ships sailing for Canada and New York.



Illus. Paper, Cigar, Tobacco, and Con-  
sumables, - Prisms.

Licensed to sell in Retail, Brines, Spirits.

Modbury  
1899.



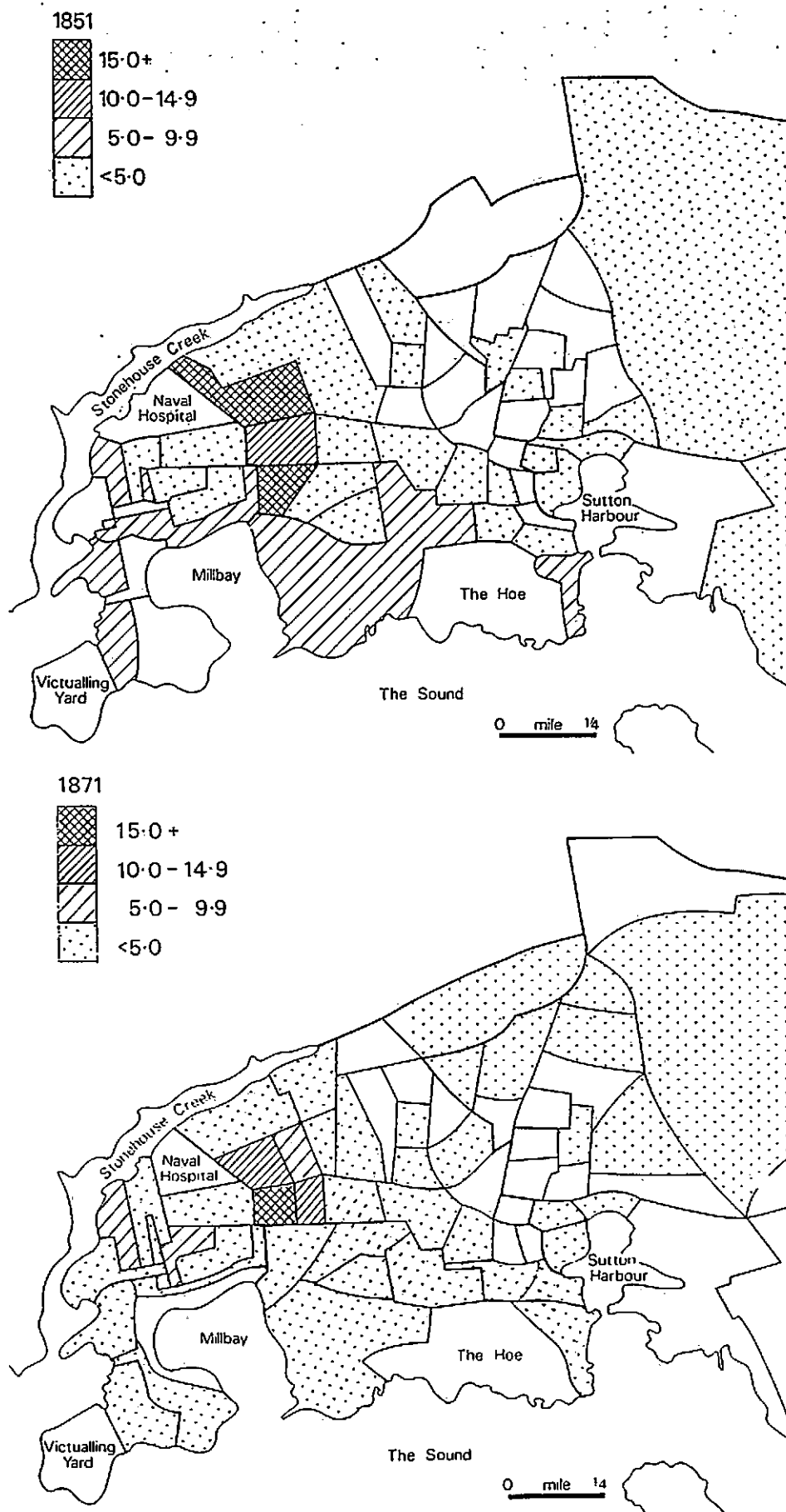


Figure 4.10: The distribution of the sample population born in Ireland and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Figures are in percentages.

1871 - indeed a subjective observation made during the sampling of the enumeration books was that the Irish did appear to be more spread through the two towns. The figures bear this out: comparing the two census samples, in 1871, there were more enumeration districts containing at least some Irish-born inhabitants, and the heavy concentration in just a few enumeration districts was a good deal less noticeable (Table 4.6). Moreover, analysis of the sample also suggests that the overall number of Irish people in Plymouth and Stonehouse was declining: they formed 2.8% of the sample in 1851 and 2.5% in 1871.

Despite declining proportions and diffusion through the two towns, the Irish inclination to form ghettos in the 19th century was as prevalent in Plymouth as elsewhere in Britain.

"The Irish tended to keep together and wherever they occurred they were likely to excite hostile comment and worse; many, perhaps most, of the really big public disturbances... had Irishmen willy-nilly at the bottom of them." (Best, 1971)

Engels (1892), severely criticising the Irish for their lack of cleanliness, overcrowded housing, drunkenness, and even their poor clothes and eating habits, considered that they exerted a "strong

TABLE 4.6: Distribution of Irish by enumeration district

	1851		1871	
	% of EDs	average percentage*	% of EDs	average percentage*
Eds with no Irish	37.25	0.00	30.51	0.00
Eds with under 5%	41.18	1.72	59.32	2.01
Eds with over 5%	15.70	10.14	10.16	10.47

\* The total number of Irish expressed as a percentage of the total ED population for each group.

Source: Sample population data.

degrading influence" upon the indigenous population. Chiefly, Irishmen were prepared to do unskilled work for very little reward and so depressed the level of wages for all.

At a time when Plymouth was expanding rapidly and witnessing several large capital works including dock expansion and the extension of the railways, the area strongly attracted the poverty-stricken Irish immigrant. But by the 1860s and 1870s, when these projects were largely completed, other parts of the world exerted an even stronger attraction and the itinerant Irish moved elsewhere.

#### 4.1.3 The residential segregation of migrant groups

The preceding section has revealed that different migrant groups often exhibited different distribution patterns within Plymouth and Stonehouse. In particular, the distributions of the various migrant groups indicate an overall dissimilarity with the locally-born residents who lived predominantly in the eastern parts of Plymouth and northern Stonehouse. In order to establish more precisely the extent of this dissimilarity, residential segregation indexes (Duncan & Duncan, 1975) were calculated to determine what proportion of any given migrant group would theoretically need to move in order to achieve an even distribution through the two towns (Table 4.7); such a statistic can be used to express the 'unevenness' of a spatial distribution.

It was noticeable that the population was less segregated in 1871 than in 1851, adding further weight to the argument that Plymouth, by then, had a more settled population experiencing decreasing



TABLE 4.7: Residential segregation indices of migrant groups

1851:	Plymouth & Stonehouse	Elsewhere in Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties
Plymouth & Stonehouse		15.49	24.79	37.03	60.03	26.14	43.10
Elsewhere in Devon			18.84	37.60	59.24	25.25	41.26
Cornwall				37.11	51.43	24.61	35.95
Southwest counties					60.44	24.01	35.69
Ireland						55.19	62.27
Seaboard counties							31.87
Population	2585	1772	687	137	166	446	165
Is	18.42	14.26	18.77	33.42	56.46	21.71	38.52
Mean Id = 38.44 (SD = 14.33)							
Mean Is = 28.79 (SD = 13.89)							

1871:	Plymouth & Stonehouse	Elsewhere in Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties
Plymouth & Stonehouse		15.14	19.84	32.97	48.56	25.96	40.28
Elsewhere in Devon			17.55	33.29	48.52	23.78	35.12
Cornwall				32.90	48.68	24.78	32.55
Southwest counties					57.73	27.16	39.62
Ireland						49.28	55.50
Seaboard counties							30.83
Population	3871	1985	832	206	197	556	219
Is	14.86	13.21	16.62	31.71	46.76	22.11	36.07
Mean Id = 35.24 (SD = 12.11)							
Mean Is = 25.91 (SD = 11.68)							

in-migration. In examining the segregation indices it emerges, as expected, that the Irish contingent were the most segregated group in both census years with overall indices of 56.46 and 46.76, followed by inhabitants from inland counties.

The patterns are, of course, very complicated but this exercise is regarded as a useful indication that migrants played an important role in shaping the internal social structure of Plymouth and Stonehouse, a theme which will be considered more fully in Chapter Nine. A number of authors have demonstrated a relationship between the residential segregation of migrant groups and socio-economic status, demographic characteristics, cultural identity, and migrants' previous experience of urban life (Ward, 1969; Conzen, 1975; Pooley, 1977; Williams, 1979). While no single variable entirely explains dissimilarity in the distribution of migrant groups, broadly socio-economic and cultural factors do seem particularly influential. The segregation of the Irish is the most pronounced of any group in British cities, and Williams (1979) also found a concentration of locally-born inhabitants in the older parts of Cardiff. Indeed, 19th-century Cardiff displays a number of similarities with Plymouth: the development of dock and rail facilities, the rates and patterns of population growth, and the consequent impact upon the towns' morphology.

#### 4.2 The demographic characteristics of migrants to Plymouth

Analysis of the 1851 and 1871 census manuscript samples permitted more detailed examination of differences in the characteristics of the various migrant groups resident in mid-Victorian Plymouth and

Stonehouse. This analysis focused on the age, sex, family status and occupation of inhabitants; information on the sex structure was also obtained from the published census data for 1861 and 1871. Although the age and sex structures of the whole migrant population was established in Chapter Three, the following analysis seeks to ascertain differences which may be associated with different migrant origins, and which may help to explain their residential patterns.

Age structure histograms (Figure 4.11) of migrant groups living in Plymouth and Stonehouse constructed from the sample data for 1851 and 1871 (Table 4.8) clearly show that while the number of Devon-born inhabitants, which included locally-born residents, decreased progressively as age increased, all the true migrant groups were concentrated in the young adult age bands. Migrants from Cornwall particularly display an excess of adults in the 20-34 age bracket, and inhabitants from the other southwest counties show a similar age distribution, especially in 1871, though of the slightly older age group of 25-44 years. Curiously, there was a less marked difference in the age distributions of immigrants from seaboard counties and also from Ireland in 1851, but the more expected pattern occurred in 1871 with noticeably more young adults, particularly among Irish migrants. Those drawn from inland counties were dominated by people in their twenties in 1851, which appears to have continued into the following decade; in 1871 the largest group of these migrants were aged 30-39.

Differences in the age structures of migrant groups will have been related to their occupations. Distinctions may be made between more permanent sources of employment, chiefly in marine-based industries, as opposed to temporary work to be found in, for example, the construction industry with major building projects such as the

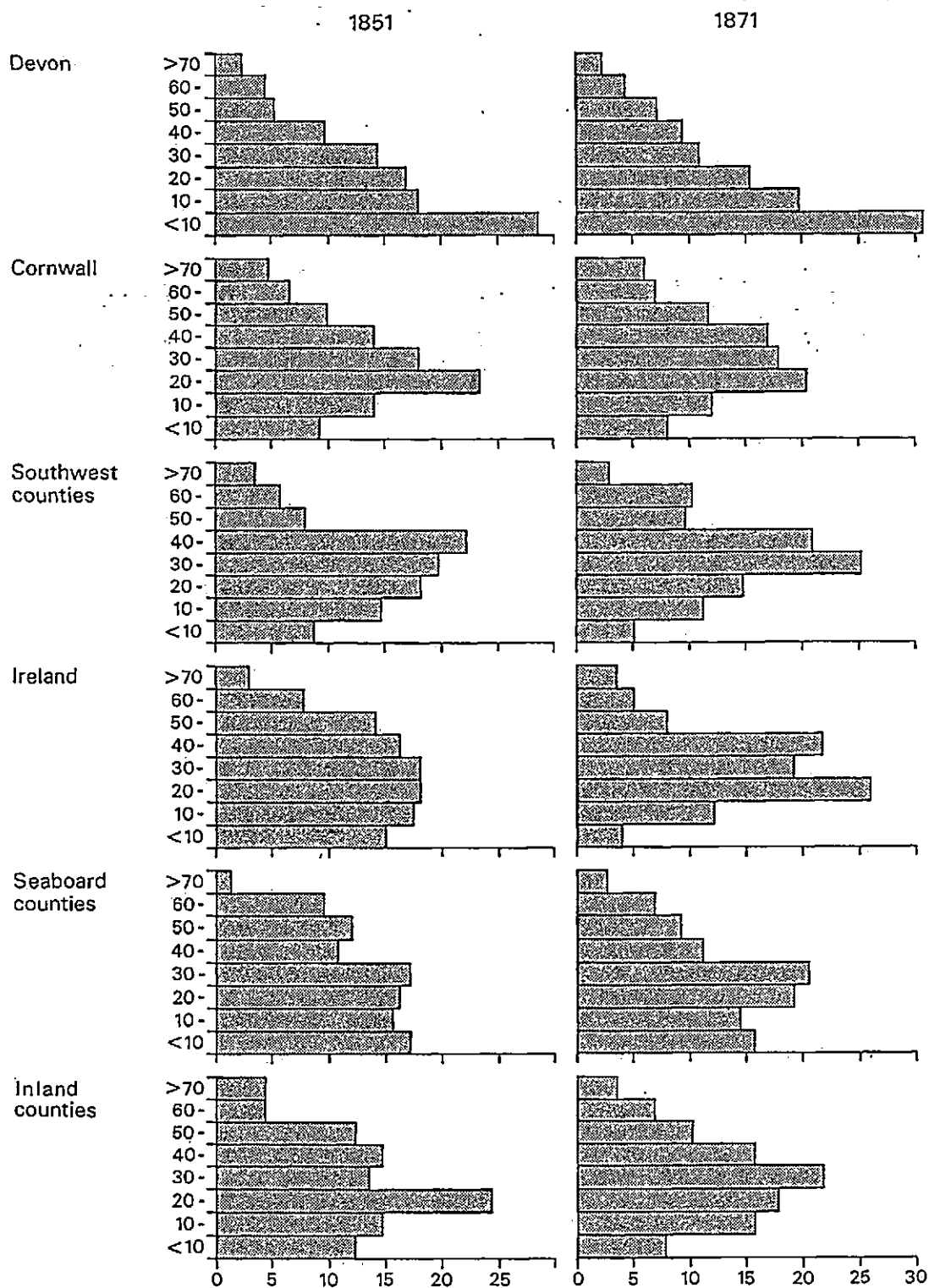


Figure 4.11: Age structure histograms of migrant groups living in Plymouth and Stonehouse in 1851 and 1871, based on the published census data. The percentage of the population is shown on the x axis and age groups are shown on the y axis.

TABLE 4.8: Birthplace by age group (showing column percentages)

1851:	Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties	Other	Total
10	1247	64	12	25	54	19	10	1431
	28.6	9.3	8.8	15.1	17.2	12.3	8.9	
10-	788	97	20	29	49	23	15	1021
	18.1	14.1	14.6	17.5	15.6	14.8	13.4	
20-	742	161	25	30	51	38	23	1070
	17.0	23.4	18.2	18.1	16.2	24.5	20.5	
30-	621	124	27	30	54	21	21	898
	14.3	18.0	19.7	18.1	17.2	13.5	18.8	
40-	423	97	29	27	34	23	17	650
	9.7	14.1	21.2	16.3	10.8	14.8	15.2	
50-	229	67	11	7	38	19	10	379
	5.3	9.8	8.0	14.2	12.1	12.3	8.9	
60-	201	45	8	13	30	7	13	317
	4.6	6.6	5.8	7.8	9.6	4.5	11.6	
70+	103	32	5	5	4	7	3	159
	2.4	4.7	3.6	3.0	1.3	4.5	2.7	
Total:	4354	687	137	166	314	155	112	5925

1871:	Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties	Other	Total
10	1800	67	11	8	58	16	30	1990
	30.7	8.1	5.3	4.1	15.7	7.9	19.1	
10-	1161	99	23	24	54	32	30	1423
	19.8	11.9	11.2	12.2	14.6	15.8	19.1	
20-	888	170	30	51	71	36	23	1269
	15.2	20.4	14.6	25.9	19.2	17.8	14.6	
30-	640	149	52	38	76	44	28	1027
	10.9	17.9	25.2	19.3	20.5	21.8	17.8	
40-	552	141	43	43	41	32	16	868
	9.4	16.9	20.9	21.8	11.1	15.8	10.2	
50-	427	97	20	16	34	21	10	625
	7.3	11.7	9.7	8.1	9.2	10.4	6.4	
60-	251	58	21	10	26	14	11	391
	4.3	7.0	10.2	5.1	7.0	6.9	7.0	
70+	137	51	6	7	10	7	9	226
	2.3	6.1	2.9	3.6	2.7	3.5	5.7	
Total:	5856	832	206	197	370	202	157	7820

Source: Sample census data

Breakwater, Millbay docks, the railway, and the new Guildhall and municipal buildings. Migrant groups with more evenly distributed age structures, such as those from seaboard counties, are likely to have been working in long-term industries. It should be noted, though, that the sample groups are too small, and the governing factors too varied, for absolute conclusions to be drawn from these data. It is, moreover, important to restate that assessment of population age structure from the census according to birthplace is, at best, only an indication of age at the time of migration. The results of such an analysis must, therefore, be interpreted with extreme caution and offer only a general guide to observed patterns.

The sex of migrants can be obtained from the 1861 and 1871 published census abstracts - though only for Plymouth and Devonport combined - permitting investigation of any significant difference between male and female migration. The data were weighted as before and the resultant values are summarised in Table 4.9.

These data are particularly interesting for they indicate that the male population comprised a greater mix of birthplaces, and reveal that men contributed the majority of in-migrants from Scotland, Wales, Ireland, London, Somerset, Kent, Gloucestershire, Lancashire, Sussex, Yorkshire and Dorset. More women than men living in Plymouth and Devonport were born in Devon and Cornwall - 86 percent of women but only 75 percent of men in 1871. It may be concluded that the coastal location was a vital factor in its potential for 19th-century growth, attracting large numbers of men from other similarly located areas, while female migration came principally from adjacent counties. Simply, this pattern reflects Ravenstein's law that women migrated over shorter distances than men. Evidence will be put forward later

TABLE 4.9: Ranked lists of weighted birthplace values by sex

PLYMOUTH AND DEVONPORT

		National Ratio	Population	Weighting	Value/1000	
<b>MALES</b>						
1861:	1	Devon	2.86	34665	12120.63	578.70
	2	Cornwall	1.80	5163	2868.33	136.95
	3	Islands	0.68	388	570.59	27.24
	4	Somerset	2.14	928	433.64	20.70
	5	Sussex	1.79	681	380.45	18.16
	6	Pembroke	0.47	176	374.47	17.88
	7	Dorset	0.94	288	306.38	14.63
	8	Kent	2.81	805	286.48	13.68
	9	Hampshire	2.33	658	282.40	13.48
	10	Ireland	14.02	2926	208.70	9.96
	11	Gloucester	2.34	465	198.72	9.49
	12	London	13.38	2216	165.62	7.91
1871:	1	Devon	2.58	37569	14561.63	617.35
	2	Cornwall	1.53	4921	3216.34	136.36
	3	Islands	0.60	320	533.33	22.61
	4	Somerset	1.98	925	467.17	19.81
	5	Hampshire	2.49	1111	446.18	18.92
	6	Dorset	0.86	333	387.21	16.42
	7	Pembroke	0.39	140	358.97	15.22
	8	Kent	2.83	676	238.87	10.13
	9	Sussex	1.82	380	208.79	8.85
	10	Ireland	12.47	2587	207.46	8.80
	11	Gloucester	2.28	415	182.02	7.72
	12	London	13.77	2196	159.48	6.76
<b>FEMALES</b>						
1861:	1	Devon	2.96	42330	14300.68	671.56
	2	Cornwall	1.88	7462	3969.15	186.39
	3	Islands	0.75	388	517.33	24.29
	4	Hampshire	2.22	665	299.55	14.07
	5	Somerset	2.29	578	252.40	11.85
	6	Pembroke	0.45	103	228.89	10.75
	7	Dorset	0.94	198	210.64	9.89
	8	Kent	2.63	413	157.03	7.37
	9	Gloucester	2.50	322	128.80	6.05
	10	Ireland	13.80	1316	95.36	4.48
	11	Wiltshire	1.23	108	87.80	4.12
	12	London	14.54	1232	84.73	3.98
1871:	1	Devon	2.71	45023	16613.65	671.07
	2	Cornwall	1.65	7765	4706.06	190.09
	3	Islands	0.67	380	567.16	22.91
	4	Hampshire	2.26	777	343.81	13.89
	5	Somerset	2.10	552	262.86	10.62
	6	Dorset	0.86	208	241.86	9.77
	7	Pembroke	0.42	100	238.10	9.62
	8	Kent	2.71	486	179.34	7.24
	9	Ireland	12.34	1506	122.04	4.93
	10	Gloucester	2.42	274	113.22	4.57
	11	Wiltshire	1.12	108	96.43	3.90
	12	London	14.86	1421	95.63	3.86

to explain this phenomenon which seems to have been influenced by both occupational and cultural factors.

Devon, Cornwall and the Channel Islands remained the principal birthplaces, Ireland was also still in the top twelve sending populations, as were the other southwest counties of Somerset and Dorset, and the seaboard counties of Gloucestershire, Hampshire, Kent and Pembroke. But London appears as the twelfth-ranked sending county for the first time; reference to the abstracts for Devonport in 1851 and 1861 shows that the town had a larger population of Londoners than Plymouth or Stonehouse and, therefore, it may be assumed that this distribution continued. There was, in fact, one clear difference between the male and female ranked lists in both 1861 and 1871: the male list included Sussex while the female list contained Wiltshire. With regard to Sussex, this reiterates the fishing industry connection; the corollary, therefore, is that this factor would not noticeably affect female birthplace structure, thus Wiltshire, as a southwest county, is promoted in the female ranks (confirmed in that Wiltshire ranked thirteenth in the complete lists of male birthplaces).

For reasons related to the occupational structure of the two counties, Cornwall contributed rather more women than men to the two towns. While male employment was decreasing in Cornwall with the decline in the mining industry, Plymouth did not provide appropriate work for such skilled employees and so the Cornish men went elsewhere (many emigrated to mining areas in USA, Australia and South Africa) (Rowe, 1954). As will be seen later, local female employment opportunities were at once more numerous and more limited in range, and many Cornish women found work as domestic servants in Plymouth.

Table 4.10 also demonstrates Ravenstein's Law that women migrated



TABLE 4.10: Birthplace according to sex (showing row percentages)

	Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties	Other	Total
1851:								
men	1921	247	74	77	153	63	64	2599
	73.9	9.5	2.8	3.0	5.9	2.4	2.5	
women	2434	440	63	89	162	92	48	3328
	73.1	13.2	1.9	2.7	4.9	2.8	1.4	
1871:								
men	2521	297	97	85	176	94	73	3343
	75.4	8.9	2.9	2.5	5.3	2.8	2.2	
women	3333	535	109	112	194	108	84	4475
	74.5	12.0	2.4	2.5	4.3	2.4	1.9	

Source: Census enumerators' books, sample data.

over shorter distances as proportionally more men came to Plymouth and Stonehouse from more distant parts of the country such as the other southwest counties, Ireland, and seaboard counties. Migrants from inland counties were, however, more equally balanced suggesting different motives for moving.

In order to ascertain migrant family status, the relationships between marital status, type of family unit and the county of birth of household heads were examined using the sample data (Table 4.11). The status of the Devon-born heads of household may be taken as a norm with nearly two-thirds of the total included in this group. Those heads born in seaboard counties living in Plymouth and Stonehouse were similarly distributed according to marital status and family type, while migrants from the southwest counties tended to include more married heads of household in nuclear family units, thus it would appear that immigrants from these counties moved as family units rather than individually.

Despite their propensity for forming ghettos the Irish contingent

TABLE 4.11: Migrant family status

(a) Marital status by county of birth (showing column percentages)

	Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties	Other	Total
1851:								
married	700	146	46	26	66	34	27	1045
	76.5	68.9	82.1	68.4	76.6	73.9	84.4	75.4
single	55	13	1	.	6	.	2	77
	6.0	6.1	1.8	.	7.0	.	6.3	5.6
widowed	160	53	9	12	14	12	3	263
	17.5	25.0	16.1	31.6	16.3	26.1	9.4	19.0
Total:	915	212	56	38	86	46	32	1385
1871:								
married	970	201	72	60	92	51	36	1482
	74.5	70.5	82.8	75.0	78.0	75.0	85.7	
single	84	16	1	3	8	5	.	117
	6.5	5.6	1.2	3.8	6.8	7.4	.	
widowed	248	68	14	17	18	12	6	383
	19.0	23.9	16.1	21.2	15.2	17.6	14.3	
Total:	1302	285	87	80	118	68	42	1982

(b) Type of family by county of birth (showing column percentages)

	Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties	Other	Total
1851:								
solitary	88	30	6	5	10	6	3	148
	9.6	14.1	10.7	13.2	11.6	13.3	9.4	
nuclear	656	142	43	29	61	35	23	989
	71.7	67.0	76.8	76.3	70.9	77.8	71.9	
extended	171	40	7	4	15	4	6	247
	18.7	18.9	12.5	10.5	17.4	8.9	18.8	
Total:	915	212	56	38	86	45	32	1384
1871:								
solitary	174	35	8	6	12	11	5	251
	13.4	12.3	9.2	7.5	10.2	16.2	12.2	
nuclear	924	209	70	67	87	50	33	1440
	71.0	73.3	80.5	83.8	73.7	73.5	80.5	
extended	203	41	9	7	19	7	3	289
	15.6	14.4	10.3	8.7	16.1	10.3	7.3	
Total:	1301	285	87	80	118	68	41	1980

Source: Sample census data.

seem less likely to have lived in extended family units, and their numbers included a particularly large proportion of widowed heads of household in 1851. This almost certainly reflected their generally poor state of health on arrival from their homeland: this census closely followed a severe outbreak of cholera in Plymouth, and the Irish, weakened by famine and forced by poverty to live in the worst housing, were certainly the most at risk in such epidemics (see Chapter Eight).

Heads of household from inland counties also included a higher percentage of widows and widowers in 1851 and mirrored the Irish with regard to family type with rather more solitary and nuclear units. This superficial similarity, however, was not matched by any coincidence of location. The index of residential segregation, already presented, for these two groups showed the highest level of dissimilarity of the component birthplace categories in 1851 (see Table 4.7).

Occupational status has already been mentioned in several respects as influential in determining the nature of migration to Plymouth and Stonehouse and the distribution of migrant groups on arrival in the two towns. Three aspects of the occupational structure in relation to birthplace stand out (Table 4.12):

(1) the numerical dominance of the industrial sector and the greater proportion of Devon-born residents working in this sector - six occupational orders are combined in the Table, but within this class the principal areas of employment were manufacturing and textile trades;

(2) the increase in the proportion of people employed in defence by 1871, noticeably from all areas except Devon and Cornwall (which

TABLE 4.12: Birthplace by occupation (showing column percentages)

	Devon	Cornwall	Southwest counties	Ireland	Seaboard counties	Inland counties	Other	Total
1851:								
Professions	62	12	4	2	10	6	9	105
	3.4	3.1	5.1	2.4	6.3	7.5	14.5	
Defence	59	14	22	12	20	11	12	150
	3.2	3.7	27.8	14.6	12.6	13.8	19.4	
Dom. service	309	100	6	15	17	10	6	463
	16.9	26.2	7.6	18.3	10.7	12.5	9.7	
Commerce	176	28	11	2	30	11	6	264
	9.6	7.3	13.9	2.4	18.9	13.5	9.7	
Industry	906	148	22	17	49	27	17	1186
	49.6	38.8	27.8	20.7	30.8	33.8	27.4	
Indefinite	152	34	12	30	13	5	7	253
	8.3	8.9	15.2	36.6	8.2	6.2	11.3	
Other	161	45	2	4	20	10	5	247
	8.8	11.8	2.5	4.9	12.6	12.5	8.1	
Total:	1825	381	79	82	159	80	62	2668
1871:								
Professions	109	12	8	6	12	11	8	164
	4.5	2.5	6.0	5.1	6.3	9.5	11.1	
Defence	128	22	23	23	35	26	12	271
	5.3	4.6	17.3	19.5	18.2	22.4	16.7	
Dom. service	426	128	20	22	25	18	11	650
	17.6	26.8	15.0	18.6	13.0	15.5	15.3	
Commerce	255	41	16	13	27	8	8	368
	10.6	8.6	12.0	11.0	14.1	6.9	11.1	
Industry	1021	189	40	26	59	25	18	1378
	42.3	39.6	30.1	22.0	30.7	21.6	25.0	
Indefinite	281	47	13	22	15	10	5	393
	11.6	9.9	9.8	18.6	7.8	8.6	6.9	
Other	195	38	13	6	19	18	10	299
	8.1	8.0	9.8	5.1	9.9	15.5	13.9	
Total:	2415	477	133	118	192	116	72	3523

The occupational classifications are those employed by the census authorities in the published census abstracts. 'Other' occupations comprise wives assisting in their husband's business, agricultural occupations, and those of independent means.

Source: Sample census data

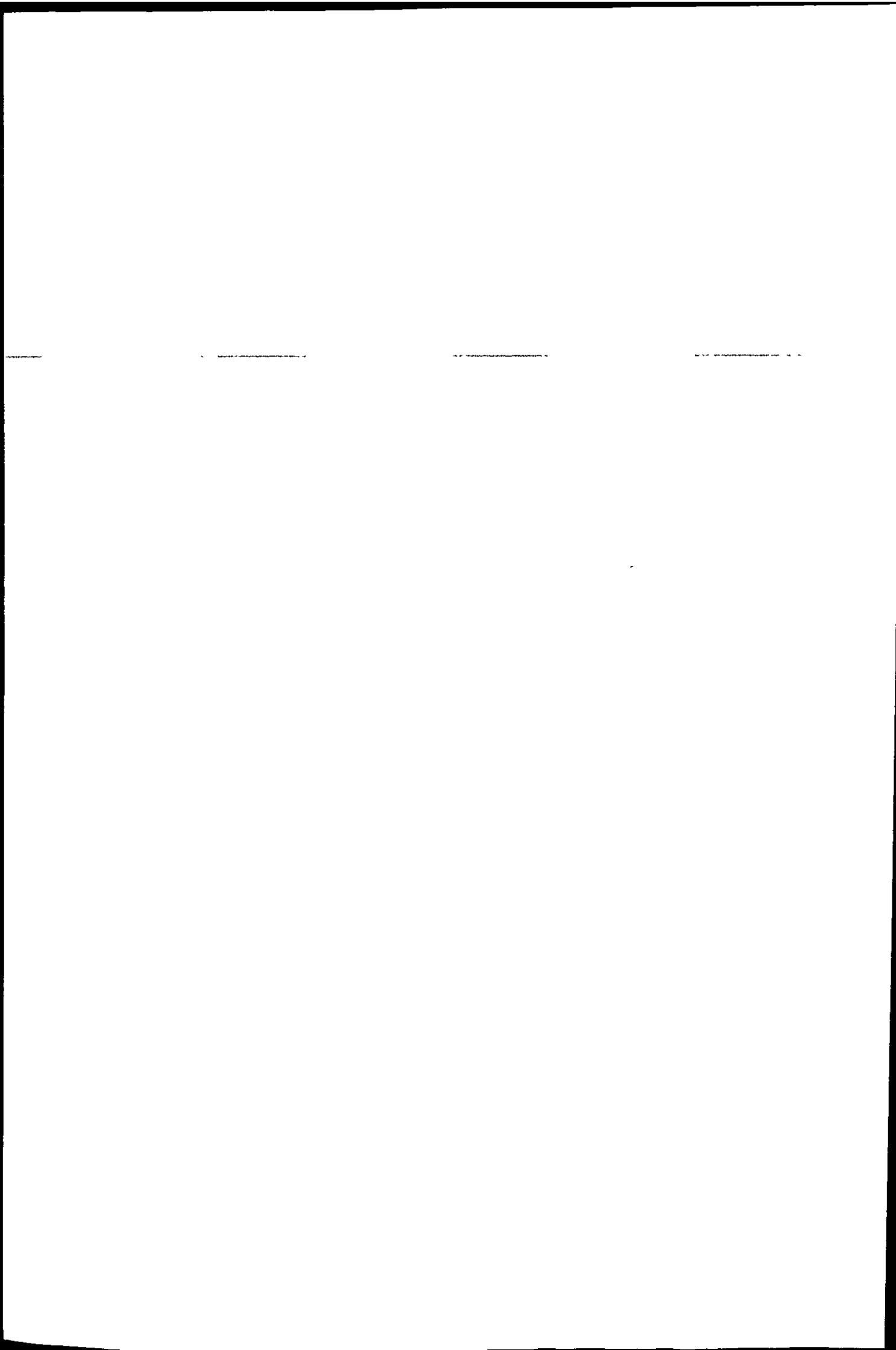
increased only slightly) and undoubtedly related to the expansion of Millbay Barracks; and

(3) the predominance of Cornwall as a provider of domestic servants, followed by Devon and Ireland.

A detailed examination of the occupational structure of mid-19th century Plymouth will be presented in Chapter Six, but clearly links between employment and migration are crucial and, therefore, demand attention in any discussion of migrants characteristics. While the numbers of inhabitants involved in this stage of the sample analysis were inevitably quite small, making it unwise to read too much into the results, some key trends and differences are sufficiently marked to enable conclusions to be drawn.

Over 26 percent of migrants from Cornwall were engaged in domestic service, the largest single occupational group from that county, followed by textile workers (chiefly dressmakers) with just under twenty percent in 1871. Significantly, these were principally female occupations and there were over 22 percent more Cornish women than men living in Plymouth and Devonport in 1871. While a smaller proportion of Devon-born inhabitants were employed in these areas, the indications are that similar influences were in operation, consequently two aspects will subsequently be explored in greater detail: the pattern of West Country (i.e. Devon and Cornwall) migration to Plymouth (section 4.3), and the employment of female rural migrants in domestic service (Chapter Seven).

As has been found elsewhere (Richardson, 1968; Lobban, 1971; Lawton & Pooley, 1978), the Irish show strongly in the general labouring category, especially in 1851 when over a third of these migrants were thus employed. A large proportion of Irish also worked in textiles and domestic service - displaying, in fact, a similarity with Cornish



and Devonian inhabitants - again, these will have been the occupations of the womenfolk. The other migrant groups were chiefly employed in the industrial and defence sectors, especially by 1871, and, in comparison to people from Devon and Cornwall, it is particularly significant that defence workers came from further afield, clearly showing the impact of the forces presence upon the birthplace structure of Plymouth and Stonehouse.

The Chi-squared test was used to determine the contribution of the migrant population to Plymouth's employment structure by comparing actual and expected numbers of locally-born and in-migrant workers in each of the main occupational groups (Table 4.13). Only life-time migrants from Devon and Cornwall from the sample data were used in this analysis which, therefore, meant that both long-distance migrants and the greater number of forces personnel were excluded. It can be seen that migrants from Devon and Cornwall contributed proportionally more workers to the domestic and indefinite occupational classes, and slightly more also to the professional class, than did the indigenous population. In effect, once again the strength of the female migration stream from Cornwall, and also from rural Devon, may be recognised as the main source of domestic servants, and there appears

TABLE 4.13: Occupational class of natives and lifetime migrants from Devon and Cornwall

	Locally-born		In-migrant	
	Observed	Expected	Observed	Expected
Professional	50	56	95	89
Domestic	120	168	318	270
Commercial	87	76	111	122
Agricultural	28	27	41	43
Industrial	476	396	554	634
Indefinite	64	103	204	165

Source: Sample census data.

also to have been a significant number of labourers moving to Plymouth and Stonehouse from the rural hinterland.

This analysis also revealed that there was a statistically significant difference in the occupational class distributions of natives and in-migrants from Devon and Cornwall.\* It seems clear that while the indigenous population was usually able to provide skilled workers and tradesmen, the local economy relied upon immigration for some of its unskilled workers, though in keeping with migrant-employment patterns found elsewhere (e.g. Lawton & Pooley, 1978), such workers tended to migrate over shorter distances.

#### 4.3 The pattern of West Country migration to Plymouth

It has been established that nearly three out of every five residents in Plymouth and Stonehouse in 1851 were in-migrants and that two-thirds of these in-migrants came from Cornwall or Devon. This indicates that other factors were influencing the flow of migration, such as distance, the range and number of transport links between Plymouth and elsewhere, and the positive attraction of other destinations whose influence may be said to have intervened. Moreover, the individual motivations of migrants will have been important in shaping the aggregate flows which the census so clearly reveals. Lawton (1979) discussed the importance of individual perception in the migration process, but to what extent were the new Plymothians influenced by the character of the community from which

\*  $\chi^2 = 76.24$  with 5 degrees of freedom, significant at 99.9% level.



they came, their experience of urban life, and their sense of cultural identity? Such questions are difficult to answer, except in rare cases where individual experiences have been recorded in diaries and letters, but an analysis of aggregate statistical evidence can yield useful inferences about motivations although it is recognised these are no more than speculations.

The migrant population of Plymouth and Stonehouse was diverse and disparate, hampering attempts to determine the inner mechanics of the migration process, and the size of the samples drawn from the 1851 and 1871 censuses inevitably yielded rather small numbers of migrants to explain in-migration from elsewhere in Britain in terms of factors such as distance and intervening opportunity. However, the possibility of explaining and modelling the pattern and process of migration to Plymouth from the sub-region of Devon and Cornwall was more feasible: since some forty percent of the two towns' population had been born in Cornwall or elsewhere in Devon, the sample population for this migrant group was sufficient to permit more detailed investigation.

A striking pattern is revealed by the maps, based on sample data, showing the parish of origin of migrants from Devon and Cornwall resident in Plymouth in 1851 and 1871 (Figures 4.12-13): while distance from the study area seems to have influenced the extent of migration, the pattern was clearly complex and other factors must have been involved. Of course, the actual populations of the sending parishes should be considered; however, even when migrants were expressed as a rate per thousand of the sending populations (Figure 4.14-15), the overall pattern is preserved and remains complex and difficult to explain. The key question is: why were migrants attracted in greater numbers from some areas and not others?

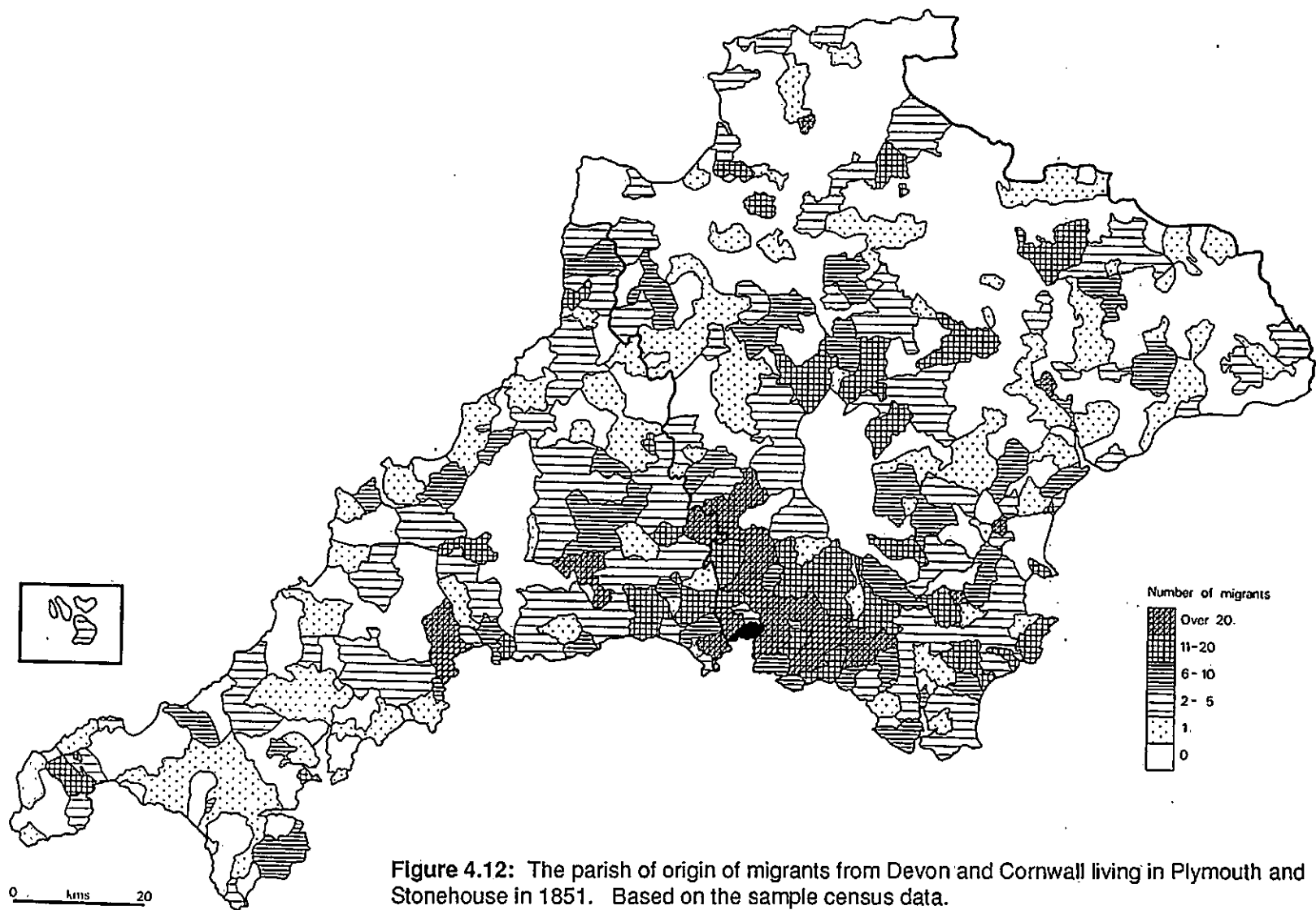


Figure 4.12: The parish of origin of migrants from Devon and Cornwall living in Plymouth and Stonehouse in 1851. Based on the sample census data.

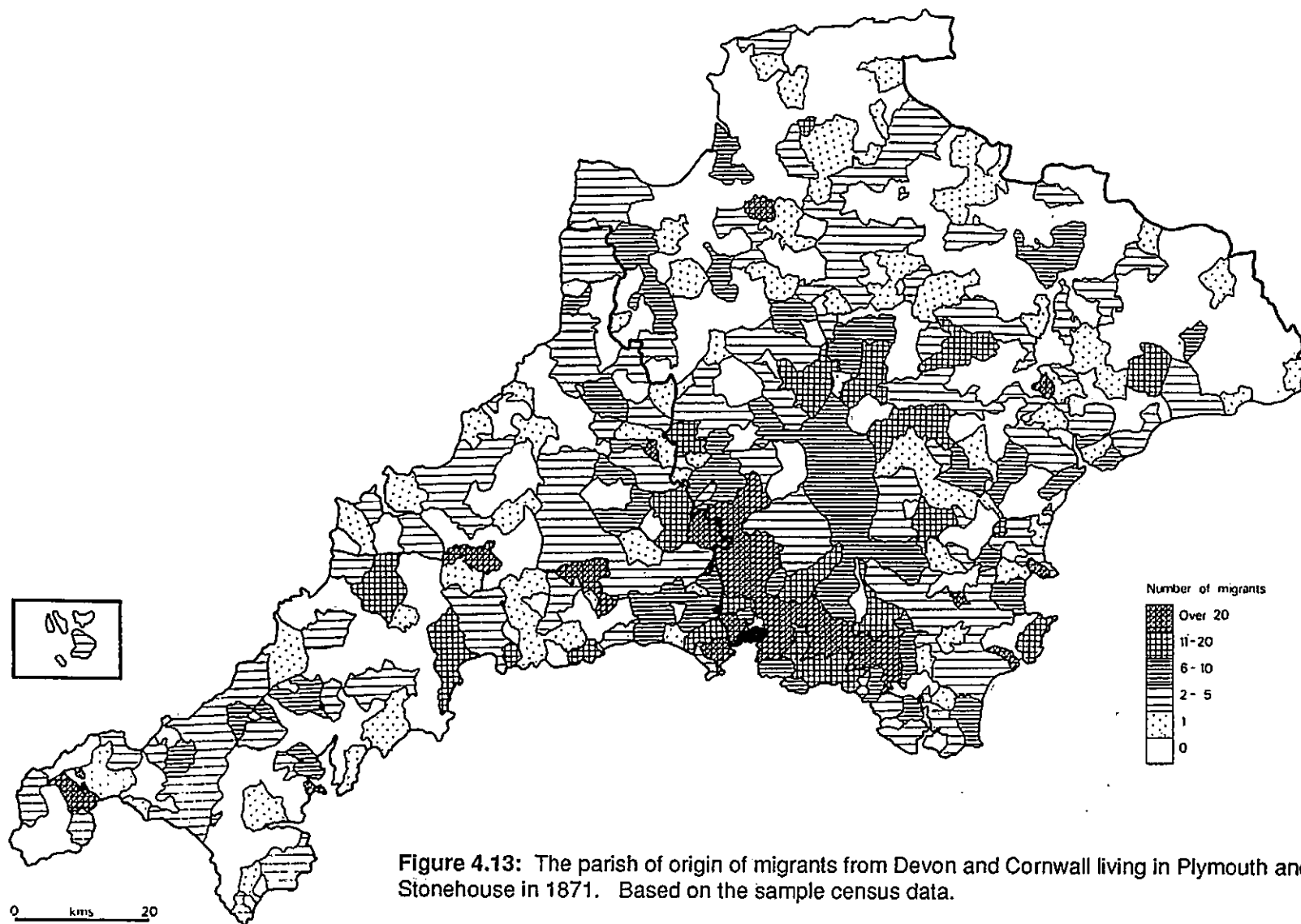


Figure 4.13: The parish of origin of migrants from Devon and Cornwall living in Plymouth and Stonehouse in 1871. Based on the sample census data.

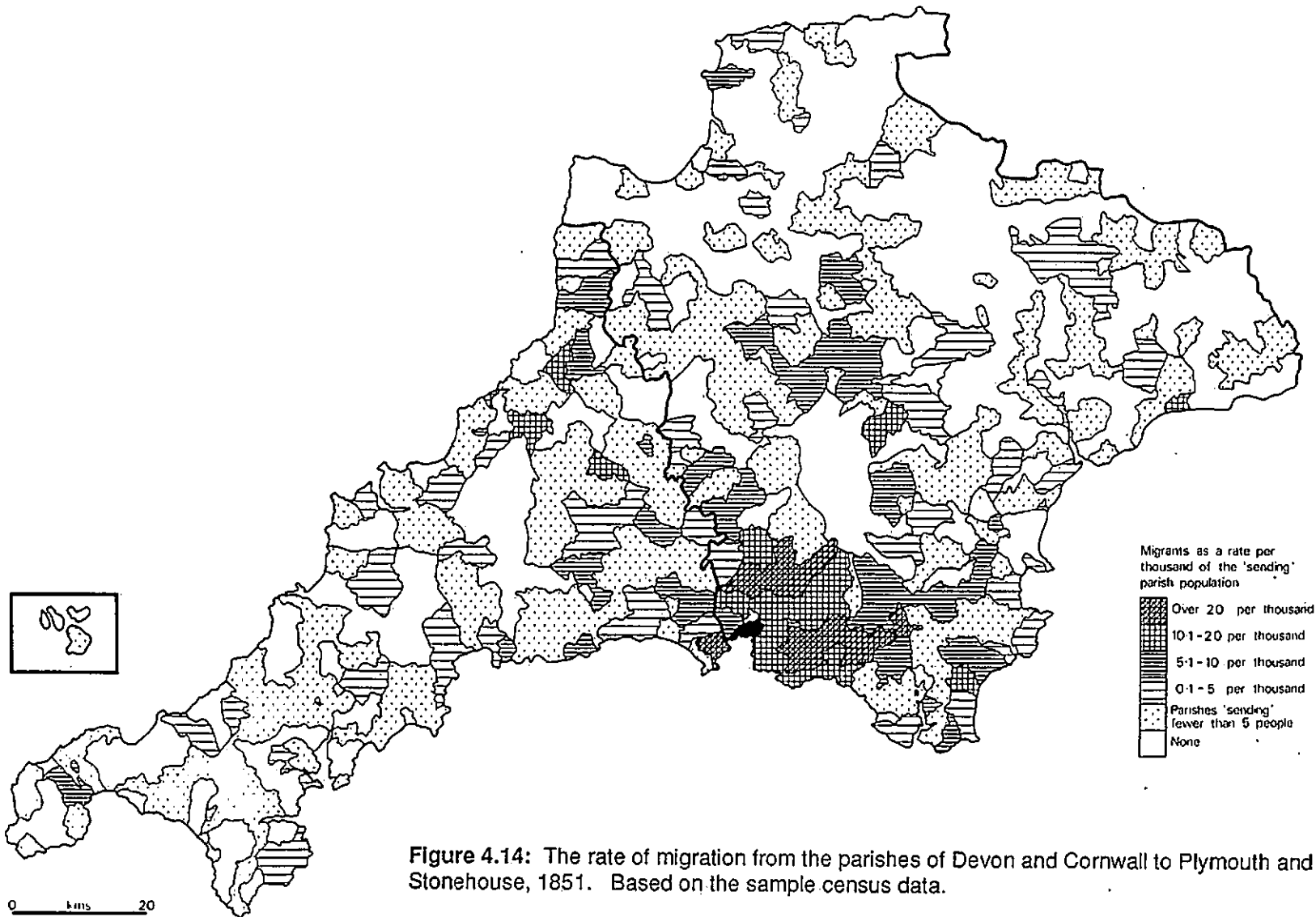


Figure 4.14: The rate of migration from the parishes of Devon and Cornwall to Plymouth and Stonehouse, 1851. Based on the sample census data.

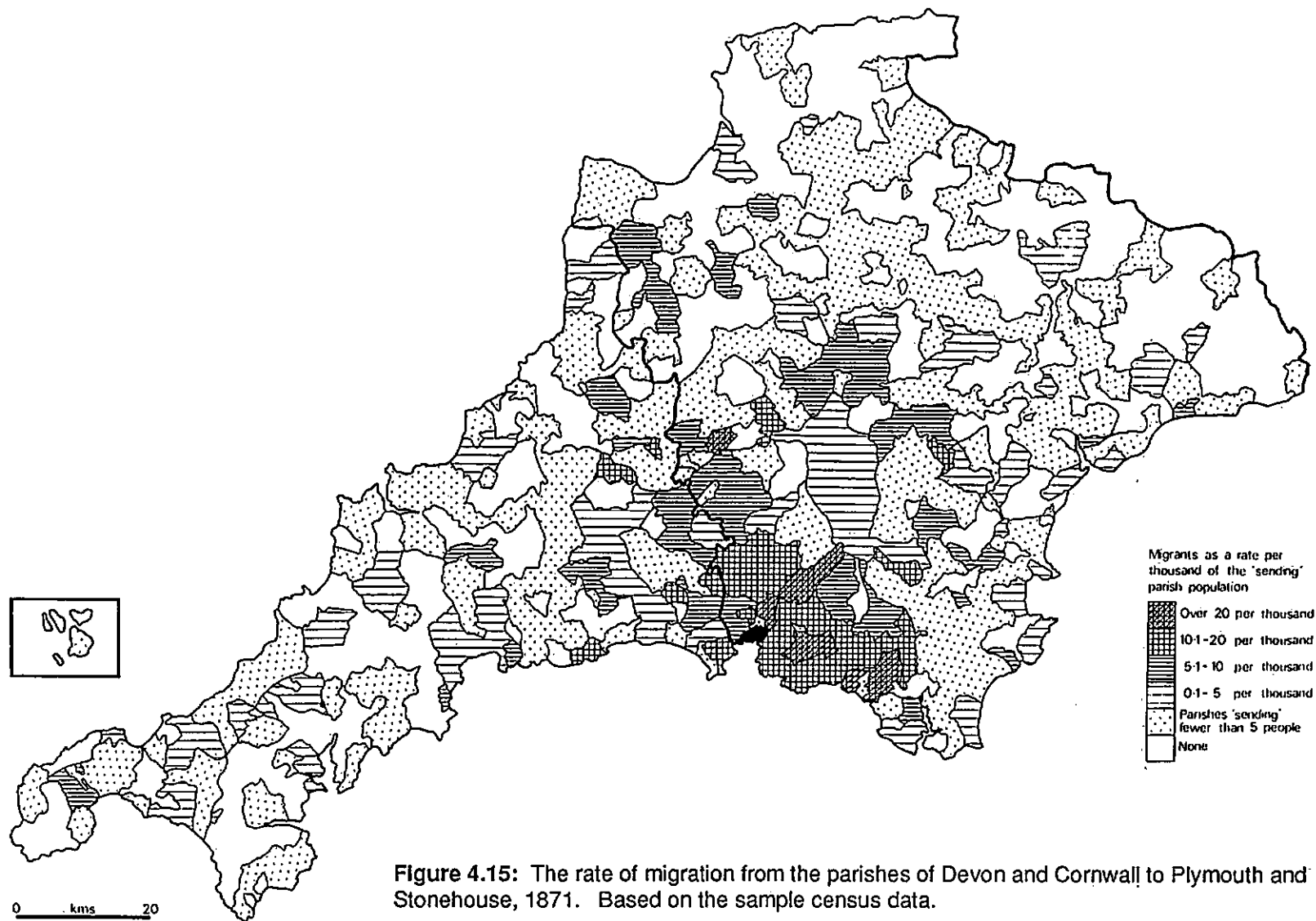


Figure 4.15: The rate of migration from the parishes of Devon and Cornwall to Plymouth and Stonehouse, 1871. Based on the sample census data.

The gravity model, evolved from Newtonian physics by Carey (1858-59) and Ravenstein (1885) and refined by Zipf (1949) and Stewart (e.g. 1947), and even intervening opportunity models (Stouffer, 1940, 1960) proposed to explain migration fields by focusing upon only one or maybe two variables, were considered to be rather blunt instruments in attempting to explain local migration to mid-Victorian Plymouth. So a more sophisticated multivariate approach was attempted.

Factors which were likely to have influenced the pattern of migration from Devon and Cornwall were identified and these may be divided into three groups:-

- (1) the characteristics of the parish of origin with regard to sex ratio, age and occupational structures, level of urbanisation (and thus competing opportunity), and population size and density;
- (2) the distance of the parish of origin from Plymouth and Stonehouse;
- (3) the frequency and regularity of transport contacts with Plymouth and Stonehouse.

Exploratory measurements were first taken of a large series of variables (Table 4.14) to assess the relative importance of and relationships between these factors on the pattern of migrant origins already presented. Although there may have been advantages in taking the sending parish as the areal unit of analysis (a total of 666 in the two counties), the samples drawn from the Plymouth census yielded too few cases from certain areas of Devon and Cornwall; thus most of the analysis deals with migrants from the thirty-three Superintendent Registrar Districts (SRDs).

An initial stage in the selection of variables was to explore their pattern using the computer mapping routine SYMAP. This was employed simply as an exploratory tool whereby a visual comparison of the map of migrant origins and any particular variable could indicate whether

TABLE 4.14: Variables used for correlation and regression analysis

1. Total population born in each SRD of Devon and Cornwall but resident in Plymouth and Stonehouse in 1851 and 1871 (hereafter referred to as 'migration totals')
2. Migration totals from each SRD standardised to the population of the source SRD
3. Distance between migrant origin and destination
4. Intervening opportunities in 1851 and 1871 (the product of the number and population size of urban areas between the source and destination)
5. Average weekly contacts between source parishes and Plymouth by road and sea prior to railway communication (1830-1856)
6. Average weekly contacts between source parishes and Plymouth by road and sea throughout the mid-19th century (1830-1878)
7. Sex ratio of migrants from source SRDs in 1851 and 1871
8. Size ratio: population of source SRD expressed as percentage of population of Plymouth and Stonehouse in 1851 and 1871
9. Percentage of males aged 20 years and upwards employed in agriculture in each SRD in 1851 and 1871
10. Percentage of males aged 20 years and upwards employed in industry in each SRD in 1851 and 1871
11. Percentage of males aged 20 years and upwards employed in fishing in each SRD in 1851 and 1871
12. Percentage of males aged 20 years and upwards employed in shipbuilding in each SRD in 1851 and 1871
13. Index of youthfulness: percentage of migrants from each SRD aged less than 25 years in 1851
14. Population density per square mile of sending SRD in 1851
15. Percentage of migrants employed as servants in Plymouth and Stonehouse in 1851

correlation analysis would be worthwhile. A limited number of the SYMAP figures are included for illustration (Figure 4.16a-1).

The linear distance from the centre of the source SRD to Plymouth was used in this analysis. Directory evidence suggests that many people would have travelled to Plymouth by boat rather than overland; however, the discrepancies were balanced by the more sensitive measure of 'contacts with Plymouth'. Drawing on contemporary directory evidence, the number of weekly road and sea links between Devon and Cornwall SRDs and Plymouth was determined. Although the SYMAP output of this variable tended to blur the finer detail of the pattern of contacts revealed, later analysis more than justified its inclusion.

Unfortunately it proved impossible to include a straight measure of

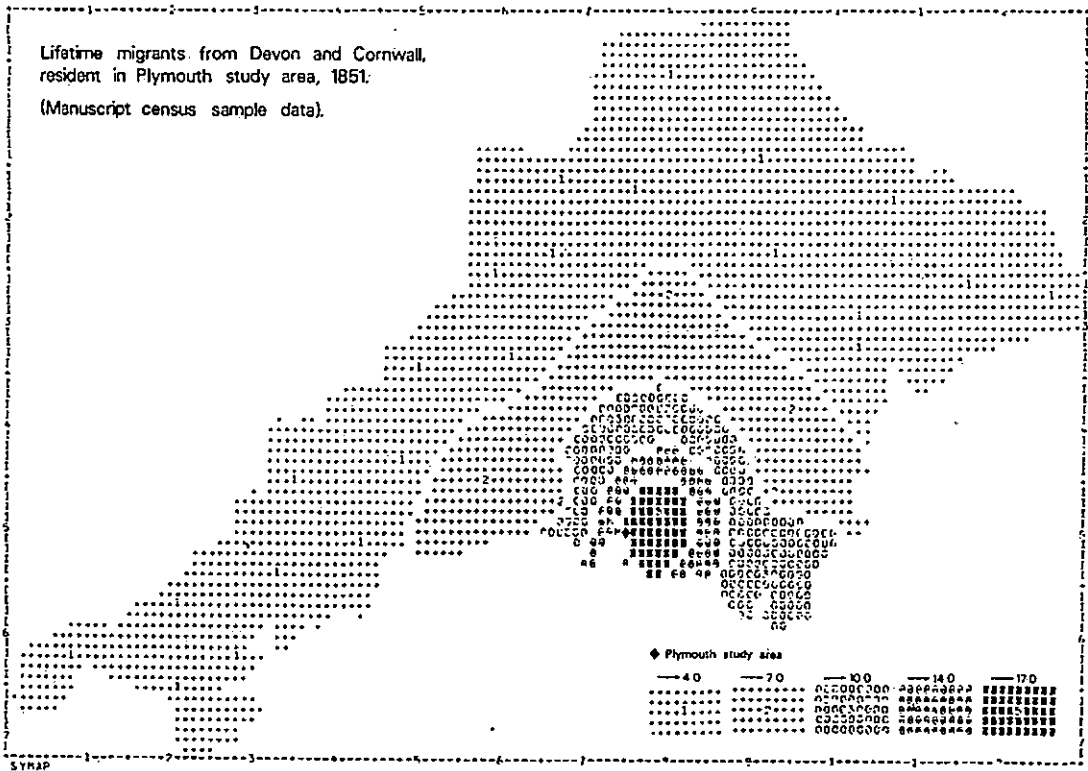
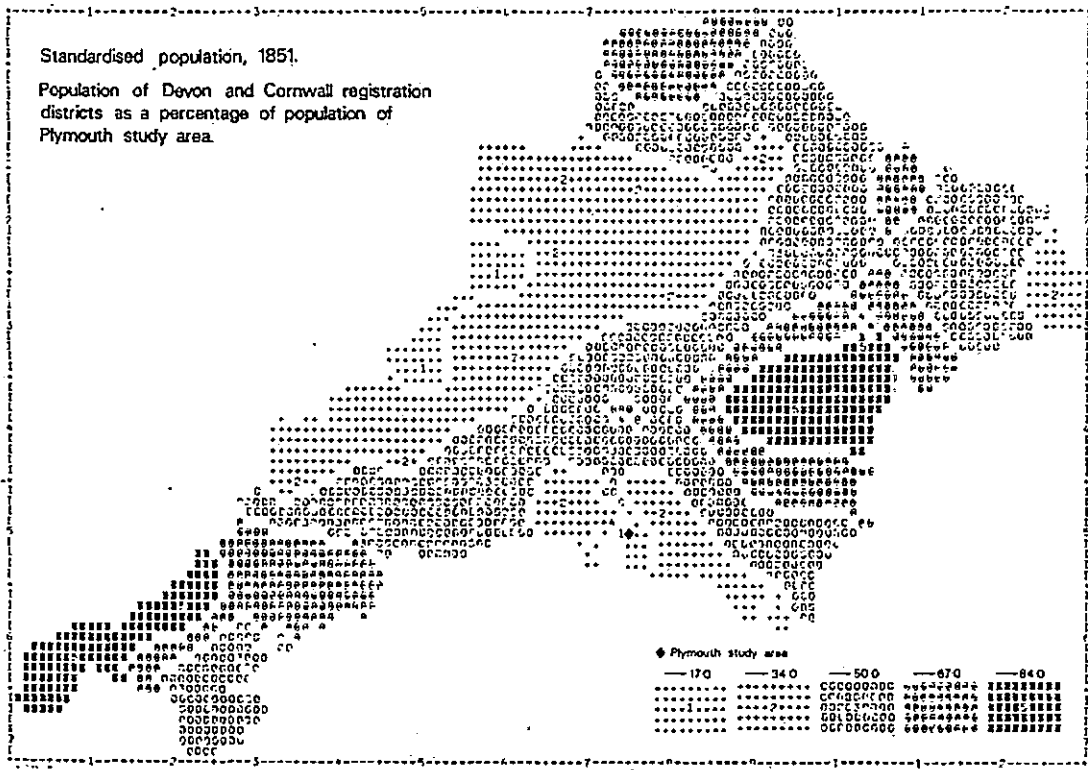


Figure 4.16: SYMAP exploration of variables thought likely to have influenced the pattern of migration to Plymouth and Stonehouse.  
(a) A higher density around the coast can be seen with pockets of concentration to the west (Penzance, St Just), north (Ilfracombe, Barnstaple), and east (Exeter, Torquay).  
(b) The effect of distance decay is very clearly demonstrated.





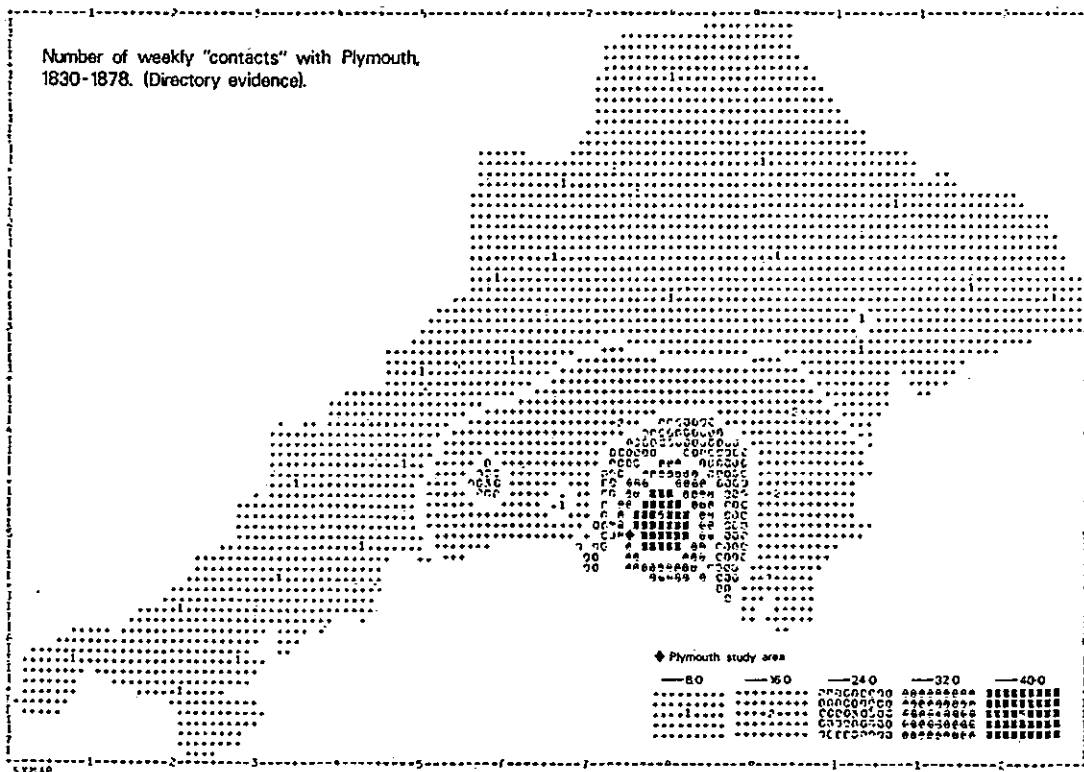
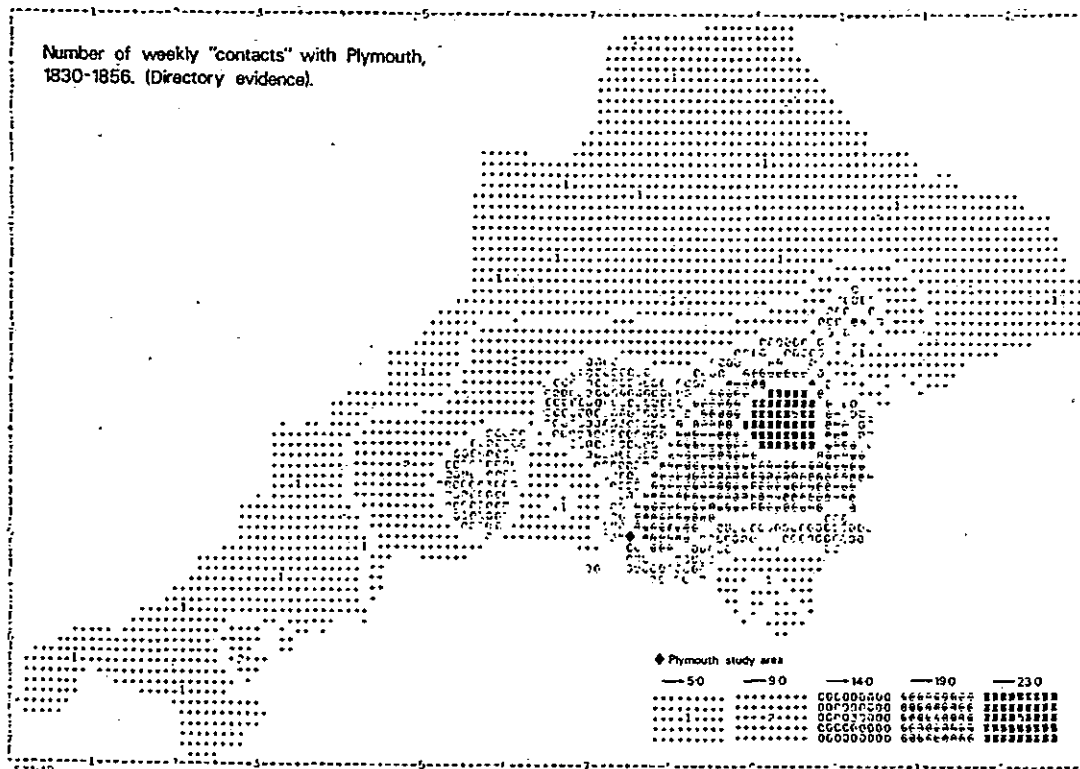


Figure 4.16: SYMAP exploration of variables thought likely to have influenced the pattern of migration to Plymouth and Stonehouse.  
 (c) & (d) The earlier eastward bias was curtailed following the establishment of the rail link with Plymouth.

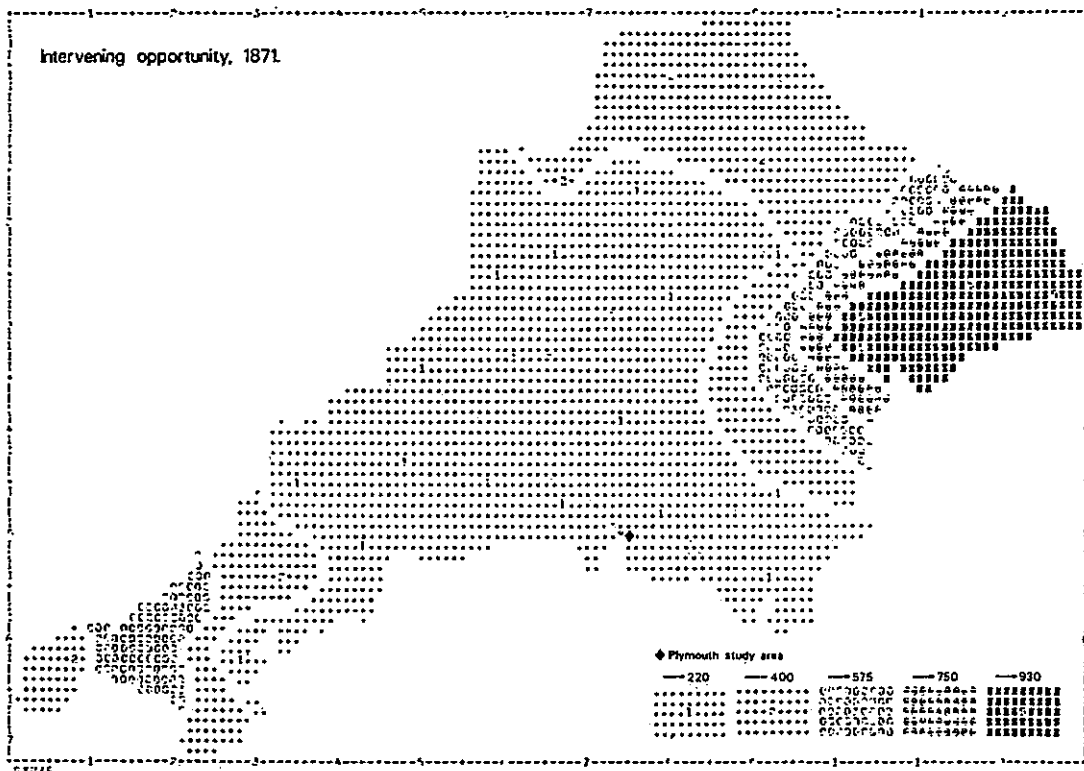
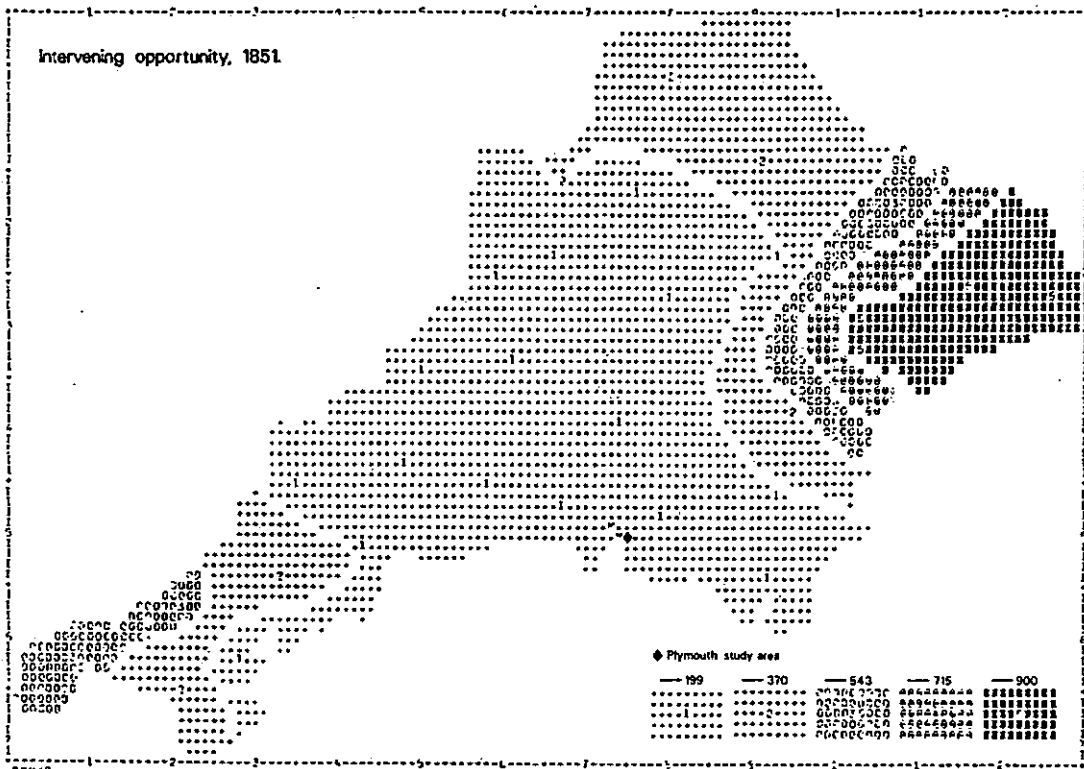


Figure 4.16: SYMAP exploration of variables thought likely to have influenced the pattern of migration to Plymouth and Stonehouse.

(e) & (f) Intervening opportunity did not alter markedly between 1851 and 1871 with Exeter maintaining a strong attraction for migrants in east Devon.

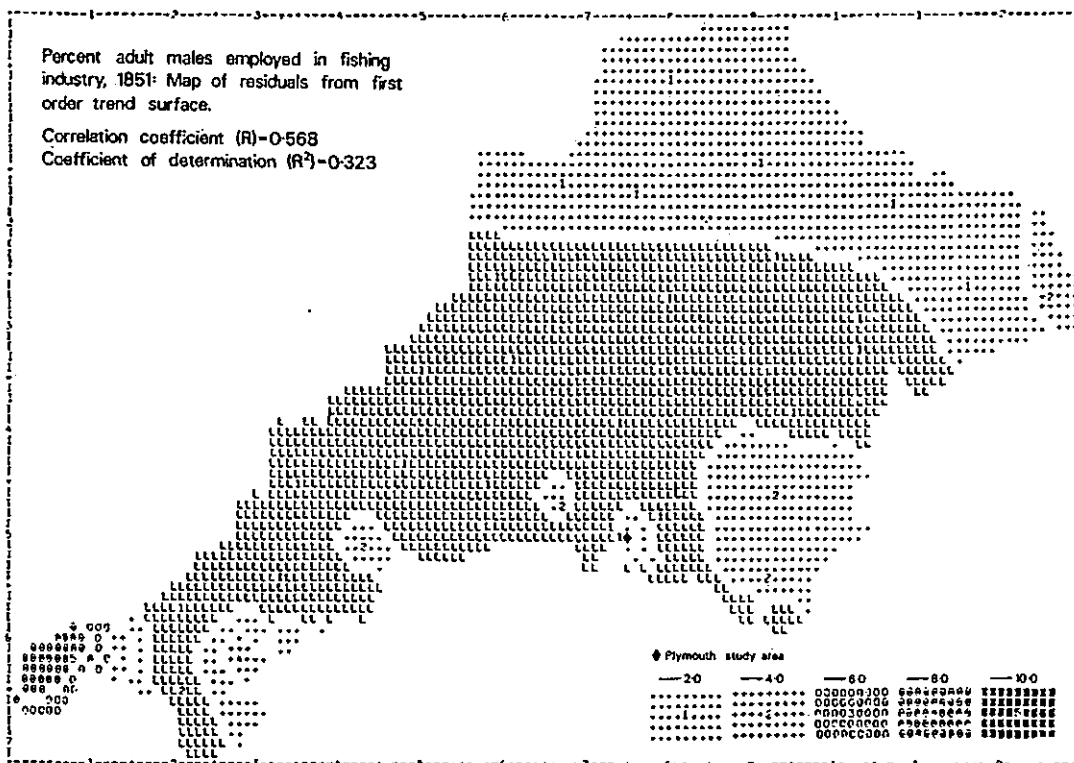
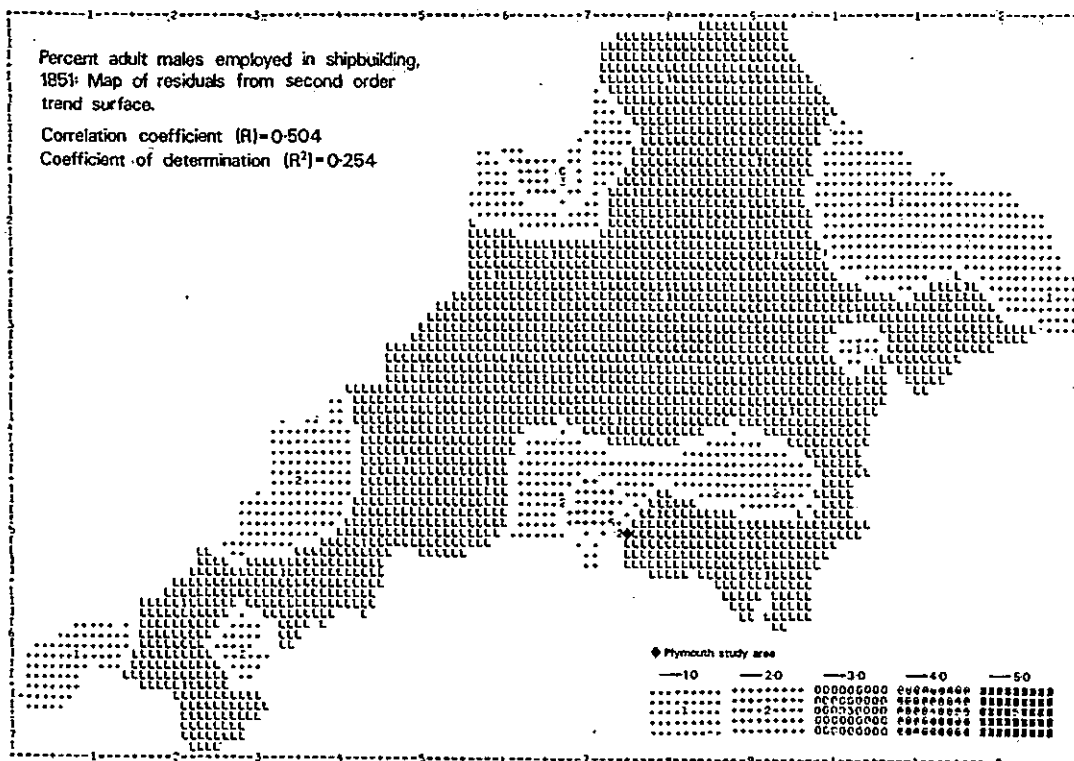


Figure 4.16: SYMAP exploration of variables thought likely to have influenced the pattern of migration to Plymouth and Stonehouse.

(g) The principal shipyards were at Falmouth, Penzance, Bideford and Appledore, Topsham, and Plymouth and Stonehouse.

(h) There were many fishing ports around the coast of Devon and Cornwall, chief among which were Brixham (with Torquay and Paignton), Plymouth (with Cawsand), Bideford (with Barnstaple and Clovelly), Ilfracombe and Combe Martin, Exeter and Topsham (Hoskins, 1972); Cornish ports included Looe, Fowey, Mevagissey, Penzance (Mounts Bay), St Ives, Newquay, and Padstow.

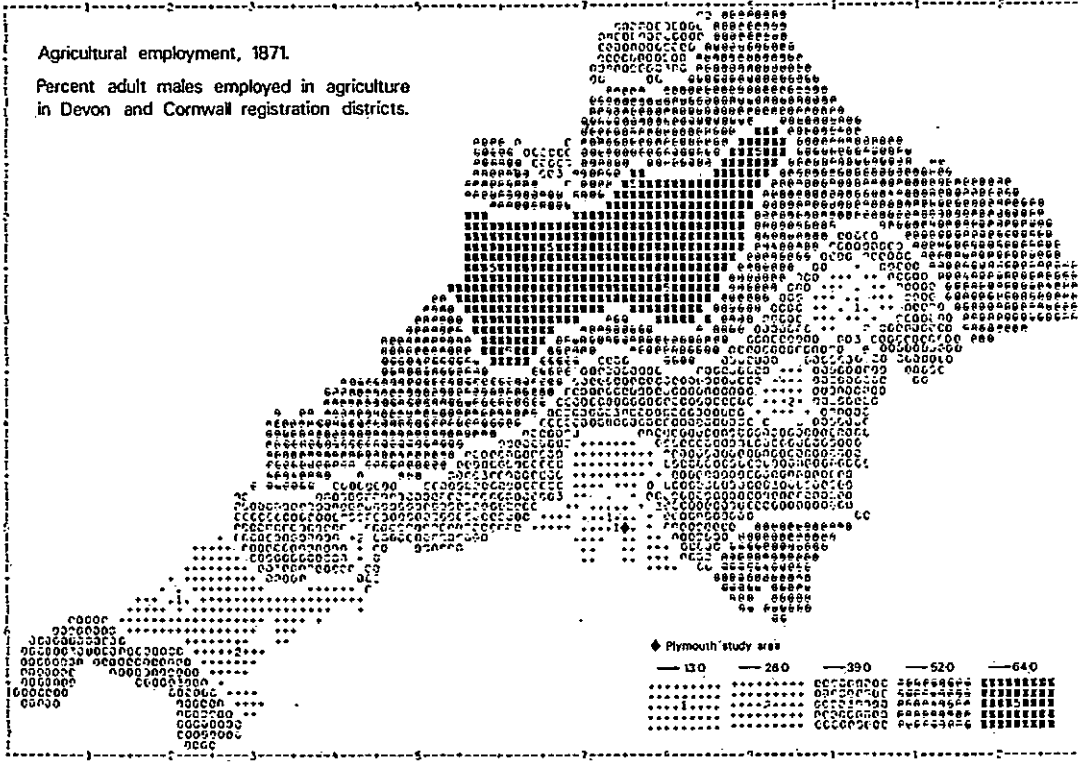
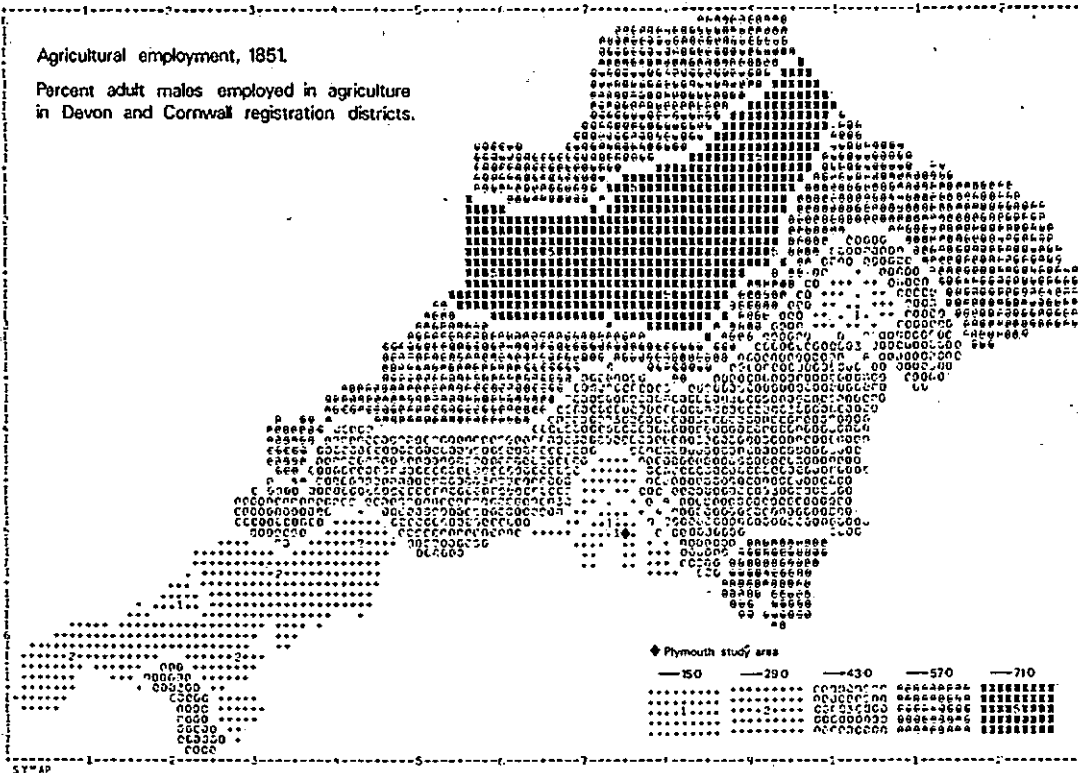


Figure 4.16: SYMAP exploration of variables thought likely to have influenced the pattern of migration to Plymouth and Stonehouse.  
(i) & (j) Agricultural employment was clearly concentrated in north Devon with only minimal contraction in the northeast (Exmoor) by 1871. The importance of this employment is strikingly demonstrated.

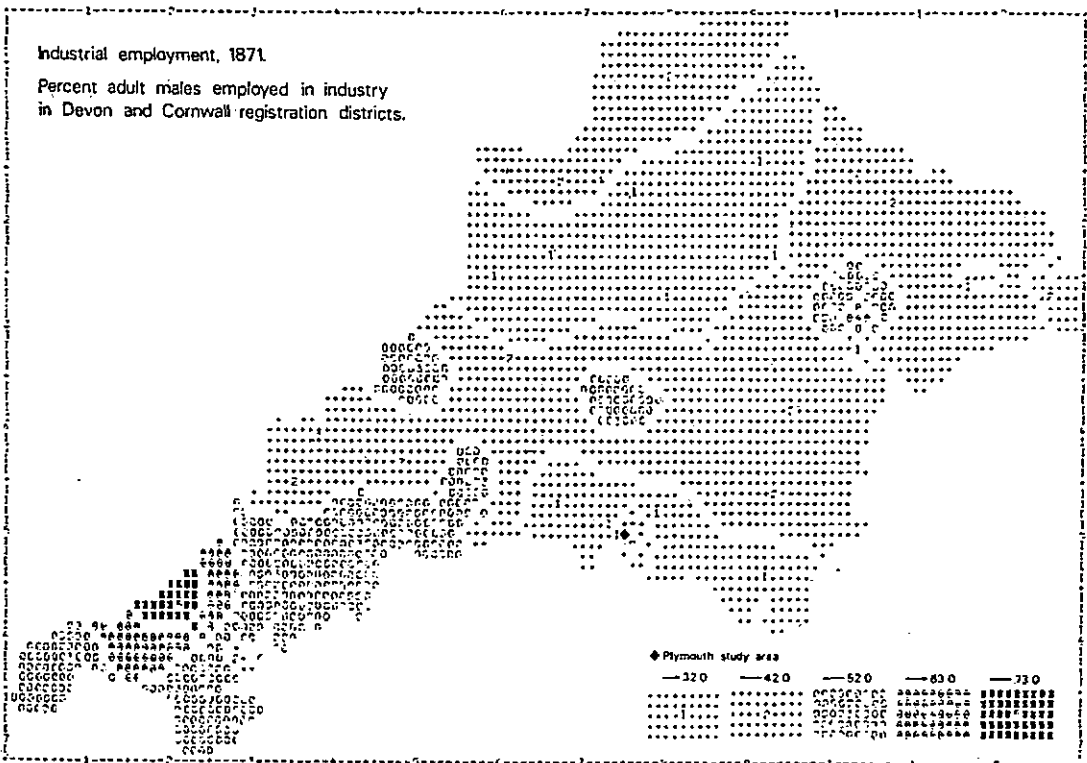
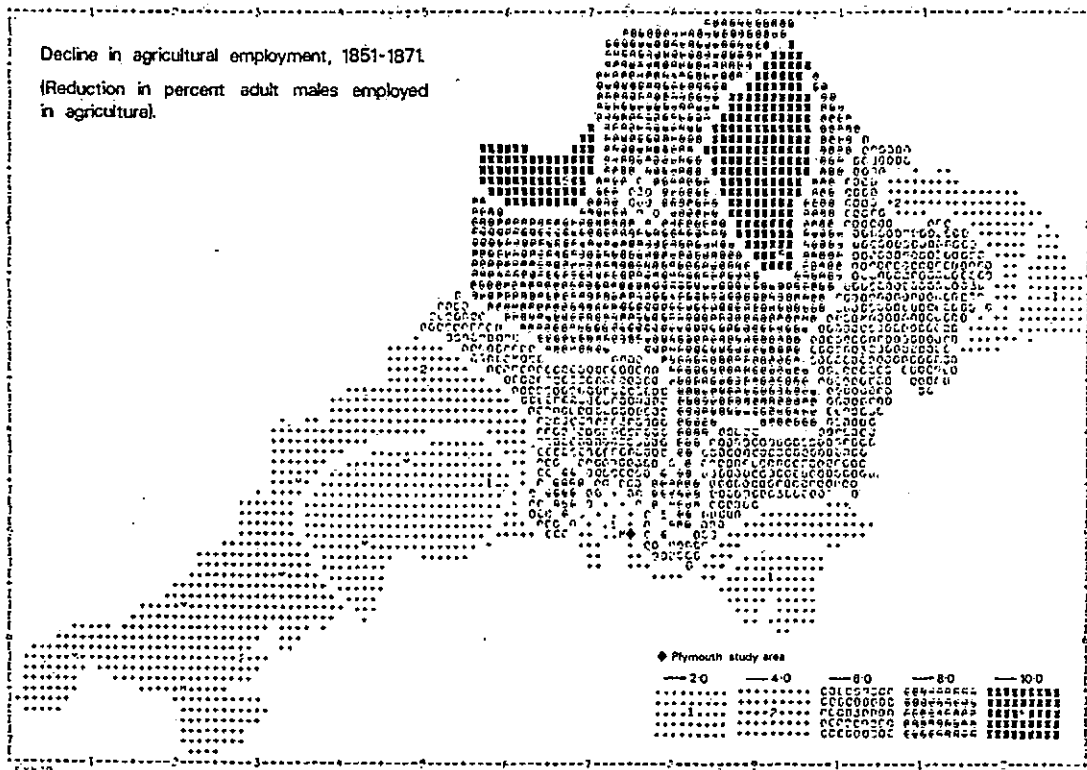


Figure 4.16: SYMAP exploration of variables thought likely to have influenced the pattern of migration to Plymouth and Stonehouse.

(k) The decline in agricultural employment was obviously centred in north Devon.

(l) The largest centre of industrial activity was in west Cornwall and principally involved tin mining and associated occupations.

rail contacts. A rail link to Plymouth was established by 1848 and by 1859 there was a through-route to Cornwall, and road contacts in the 1850s clearly show the effect of the railway as carriers and carters brought Cornish goods to Plymouth for shipment by rail (Figures 4.17-19): before 1848 the pattern of road links showed no such spatial bias. In general, towards the mid-1860s and 1870s the number of operators and the range and frequency of road contacts were much increased. To eliminate bias, average weekly contacts before and after the Plymouth-Cornwall rail-link was established were calculated, but in the analysis the two sets of figures were, in fact, virtually interchangeable.

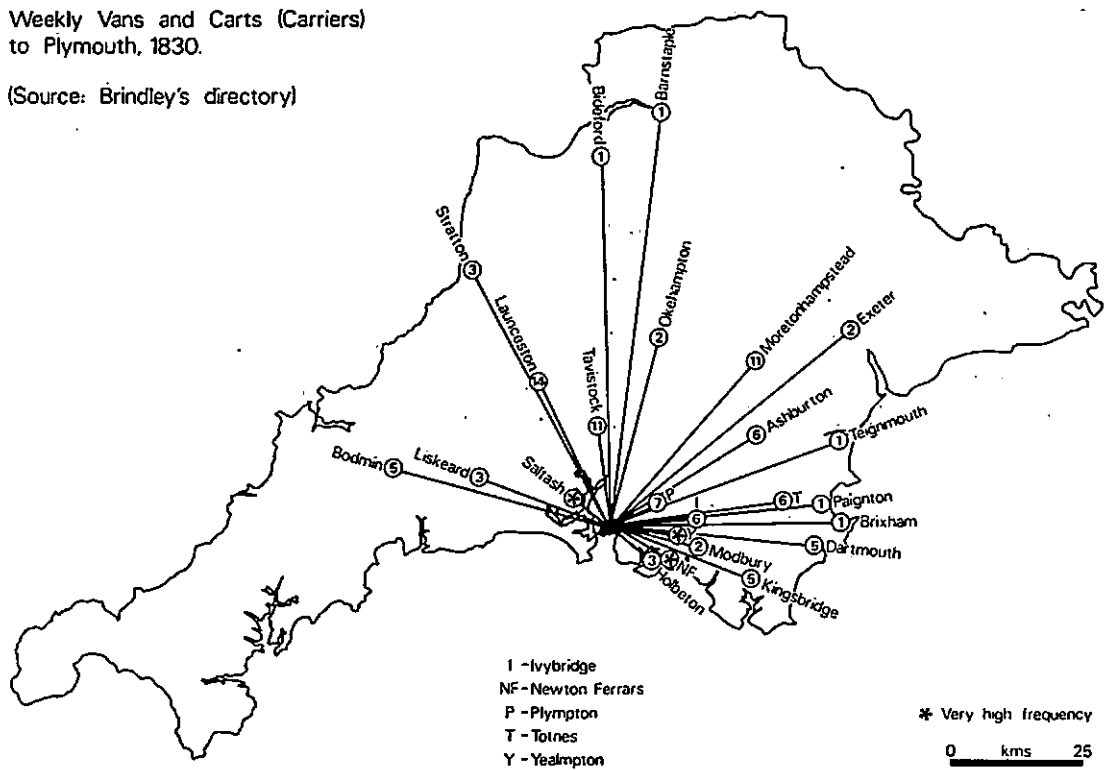
The importance of a regular road or sea link probably operated in two ways: first, van drivers, omnibus operators and carriers and would have been a source of news and information about Plymouth in a rural parish. Simply, remote areas with few or no road contacts might be expected to contribute fewer migrants because information and services were more scarce. Secondly, carters and carriers often provided ad hoc passenger transport for the would-be emigrant (coaches and omnibuses were obviously carrying passengers).

Published census data revealed the varying importance of different occupations in 19th-century Devon and Cornwall such as agriculture, industry, shipbuilding and fishing. Although the evidence was only very general at this stage it emerged that migration tended to be heavier from areas where industry, shipbuilding and fishing was important and from where fewer opportunities intervened.

In order to explain the relationships between the variables identified as important in explaining the pattern of West Country migration to Plymouth, rank correlation coefficients were calculated. Two groupings emerged (see Figure 4.20):-

Weekly Vans and Carts (Carriers)  
to Plymouth, 1830.

(Source: Brindley's directory)



Weekly Vans and Carts (Carriers)  
to Plymouth, 1856.

(Source: Kelly's directory)

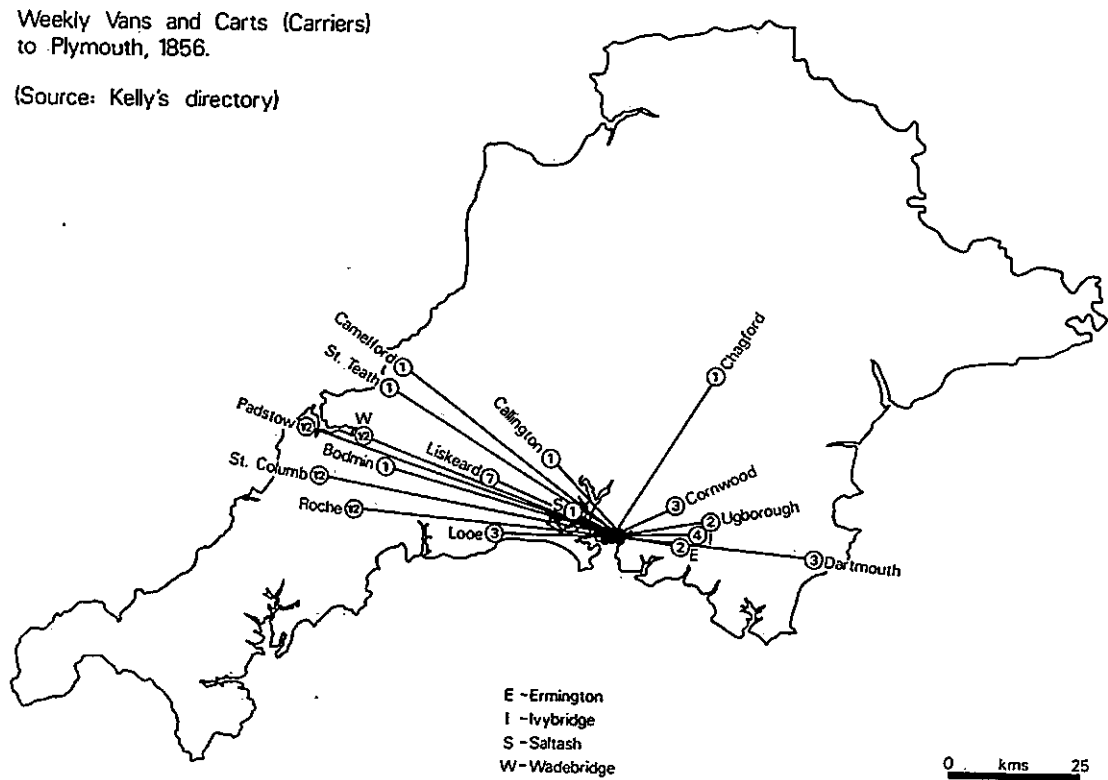
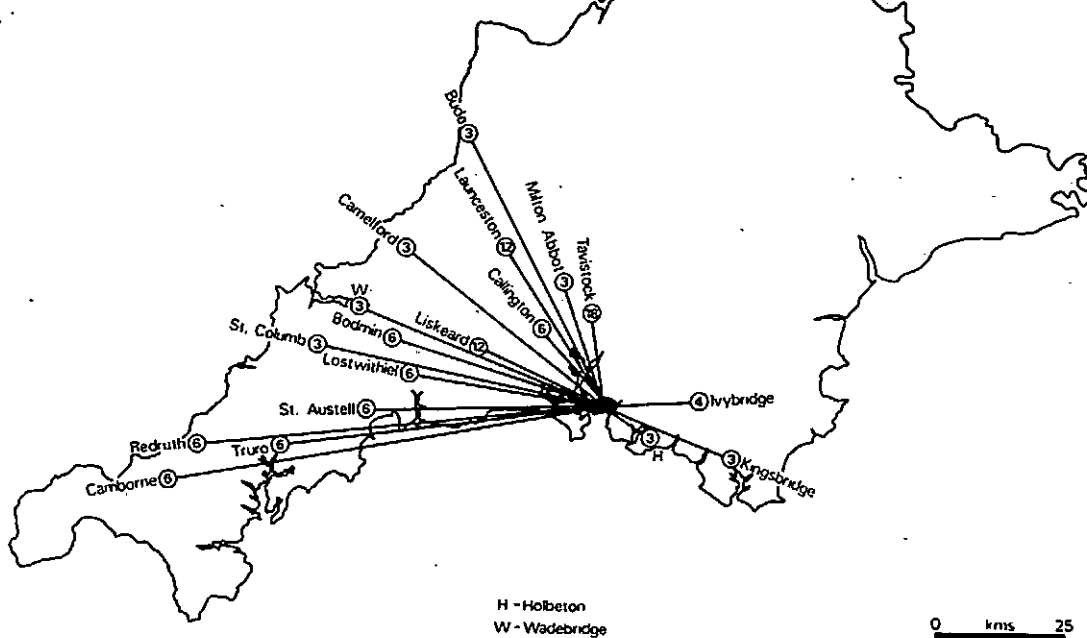


Figure 4.17: Transport links with Plymouth based on directory evidence.



Weekly Coach and Horse-Omnibus connections with Plymouth, 1856.

(Source: Kelly's directory)



Weekly Carriers from Plymouth, 1878.

(Source: White's directory)

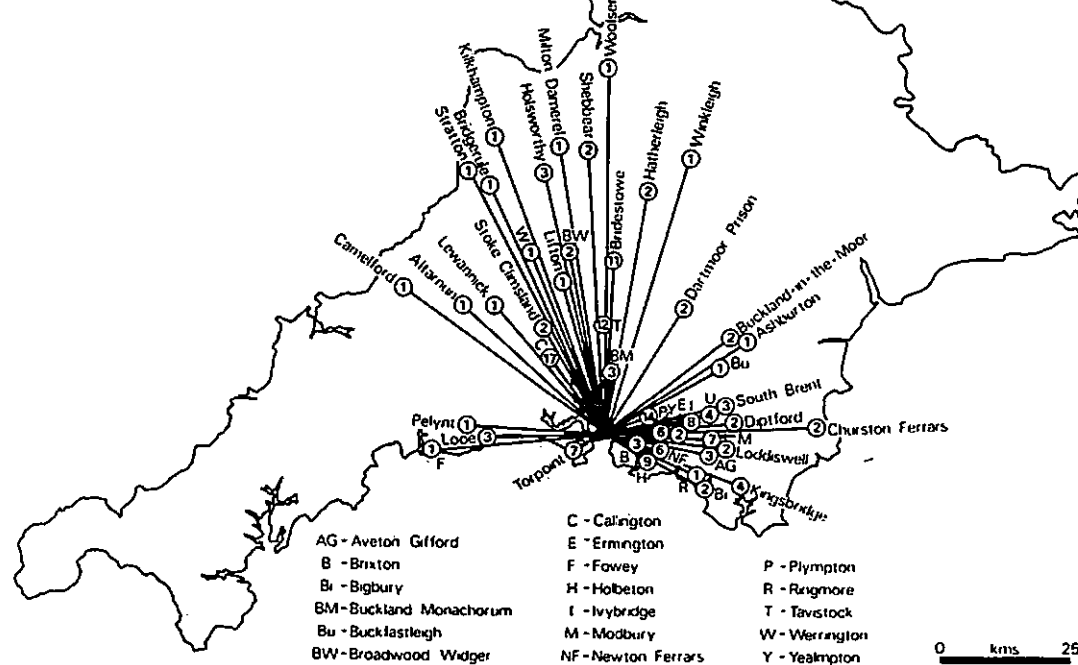
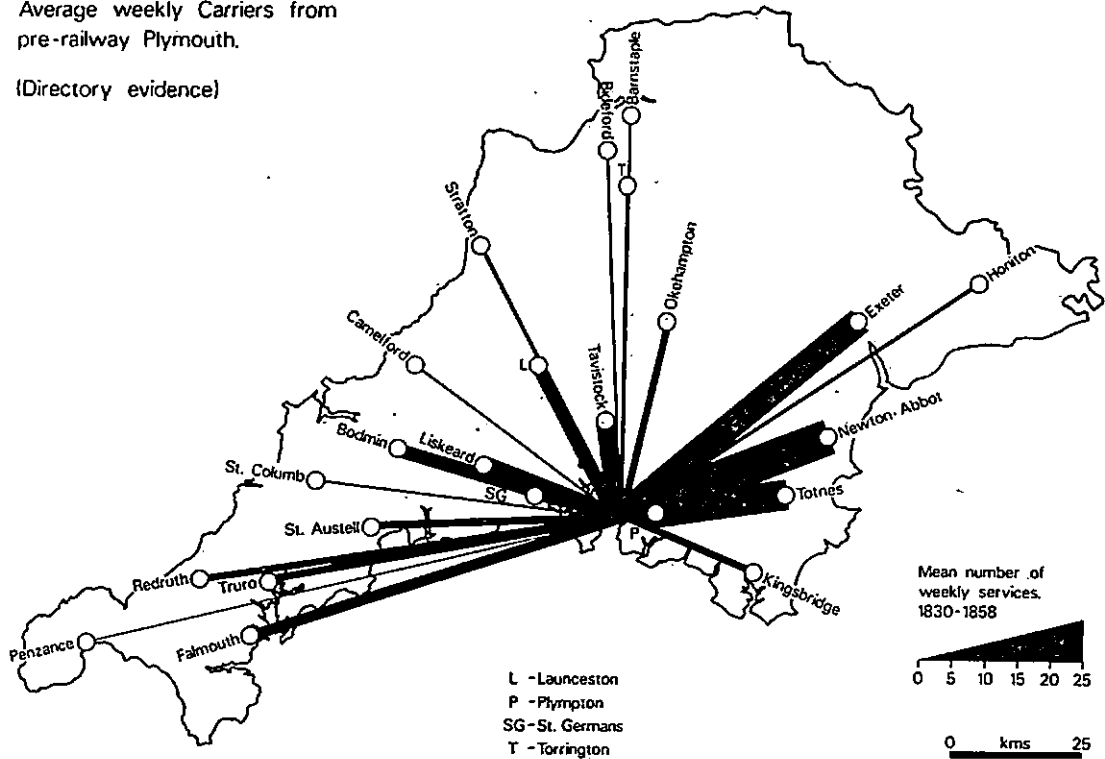


Figure 4.18: Transport links with Plymouth based on directory evidence.

Average weekly Carriers from pre-railway Plymouth.

(Directory evidence)



Average weekly Carriers from mid-Victorian Plymouth.

(Directory evidence)

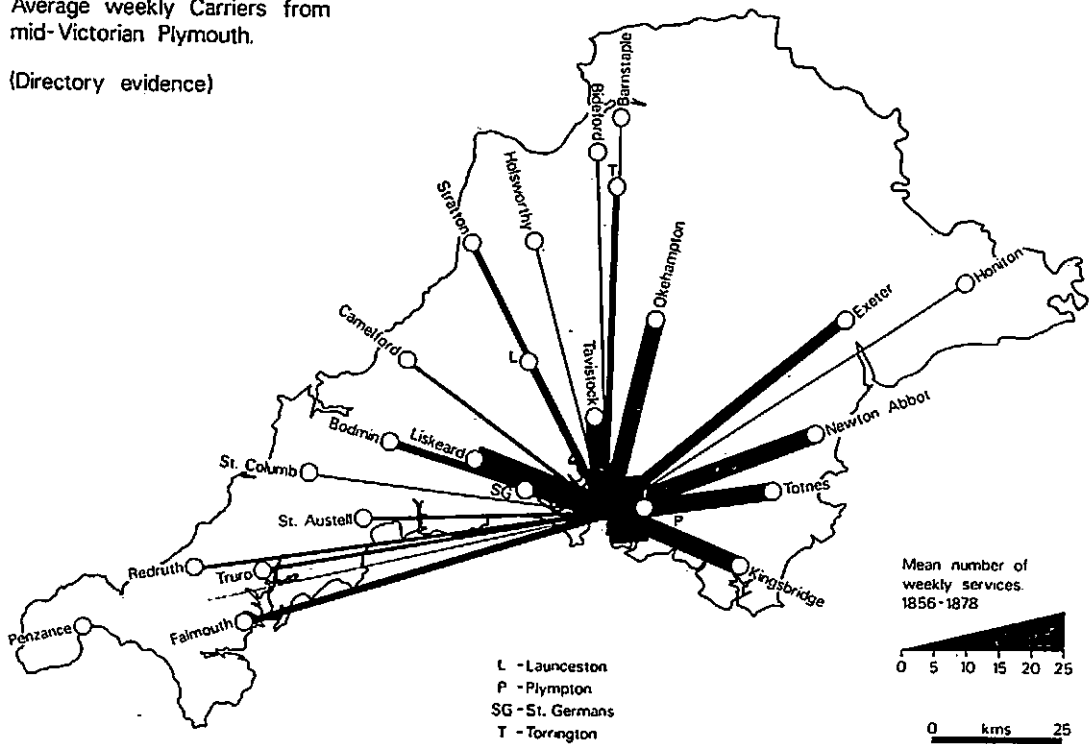
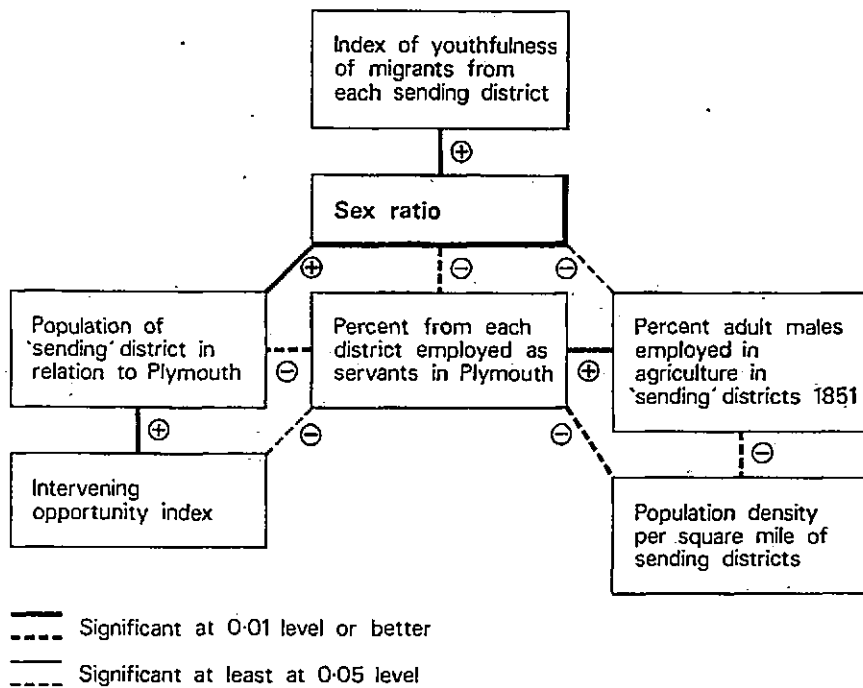


Figure 4.19: Transport links with Plymouth, 1830-1858 and 1856-1878, using directory evidence.

Age, sex ratio and the character of life-time migration from Devon and Cornwall to Plymouth: Correlation bonds



Life-time migrants from Devon and Cornwall resident in Plymouth: Correlation bonds

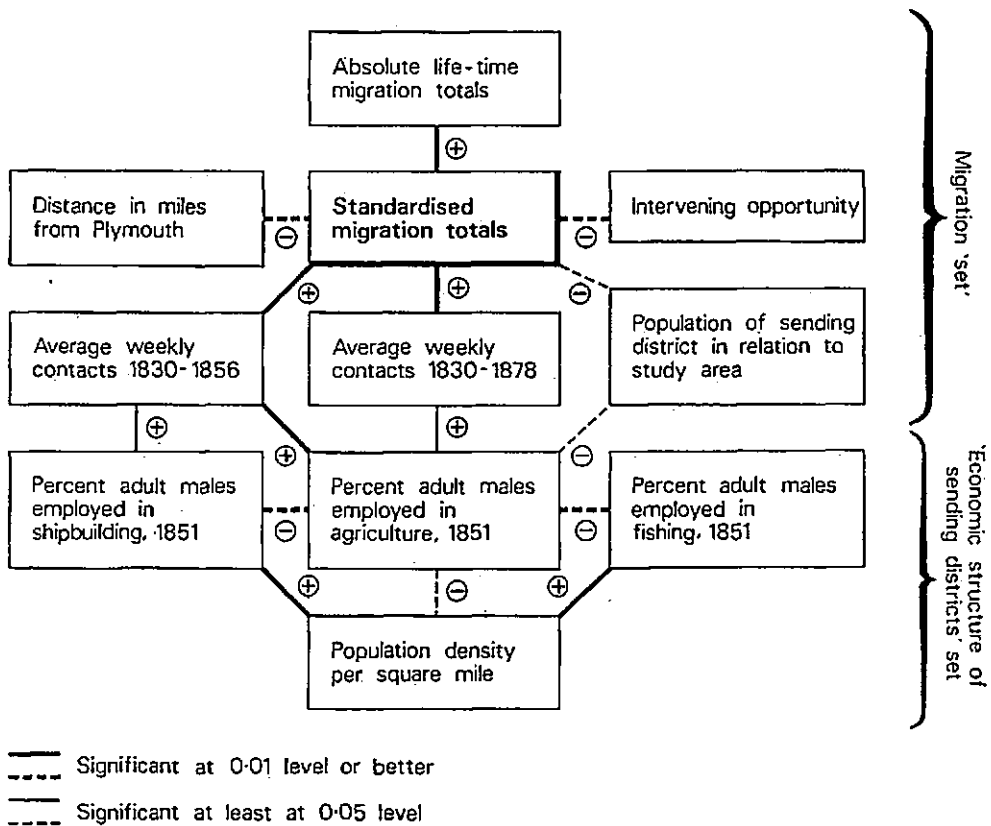


Figure 4.20: Rank correlations between variables influencing migration.

(a) there were statistically significant relationships which highlighted the sex imbalance and youthfulness of the in-migrants. Figure 4.21 clearly shows the greater number of young female migrants from Devon and Cornwall to Plymouth and Stonehouse. Although the pattern of relationships is not easily explained, the occupational and demographic characteristics of the migrants were obviously closely linked.

(b) the size of the resident migrant group from each SRD was closely related to the size of the sending population, distance, intervening opportunity and the frequency of road contacts. This set of 'migration' variables was in turn related to the population density and the broad economic geography of Devon and Cornwall SRDs.

The connection between the numbers of migrants from each SRD and other variables, including distance, regular road contacts, and intervening opportunities, which were identified in the correlation analysis, indicated the possibility of modelling the pattern of migration. A multiple regression model was used, therefore, to examine the degree to which the identified variables explained the pattern of migration to Plymouth from elsewhere in Devon and Cornwall. The dependent variable of standardised migration was inevitably highly skewed in distribution and so was transformed (Figure 4.22). Various solutions were obtained using both transformed and untransformed independent and dependent variables. It was found that the explanatory power of the model improved only slightly using transformed independent variables and so they were not transformed in the final model, with the exception of road contacts.

Table 4.15 shows the first four or five significant variables entered into the stepwise regression model. In the first solution the F test to enter variables was set at the 99 percent level and in the

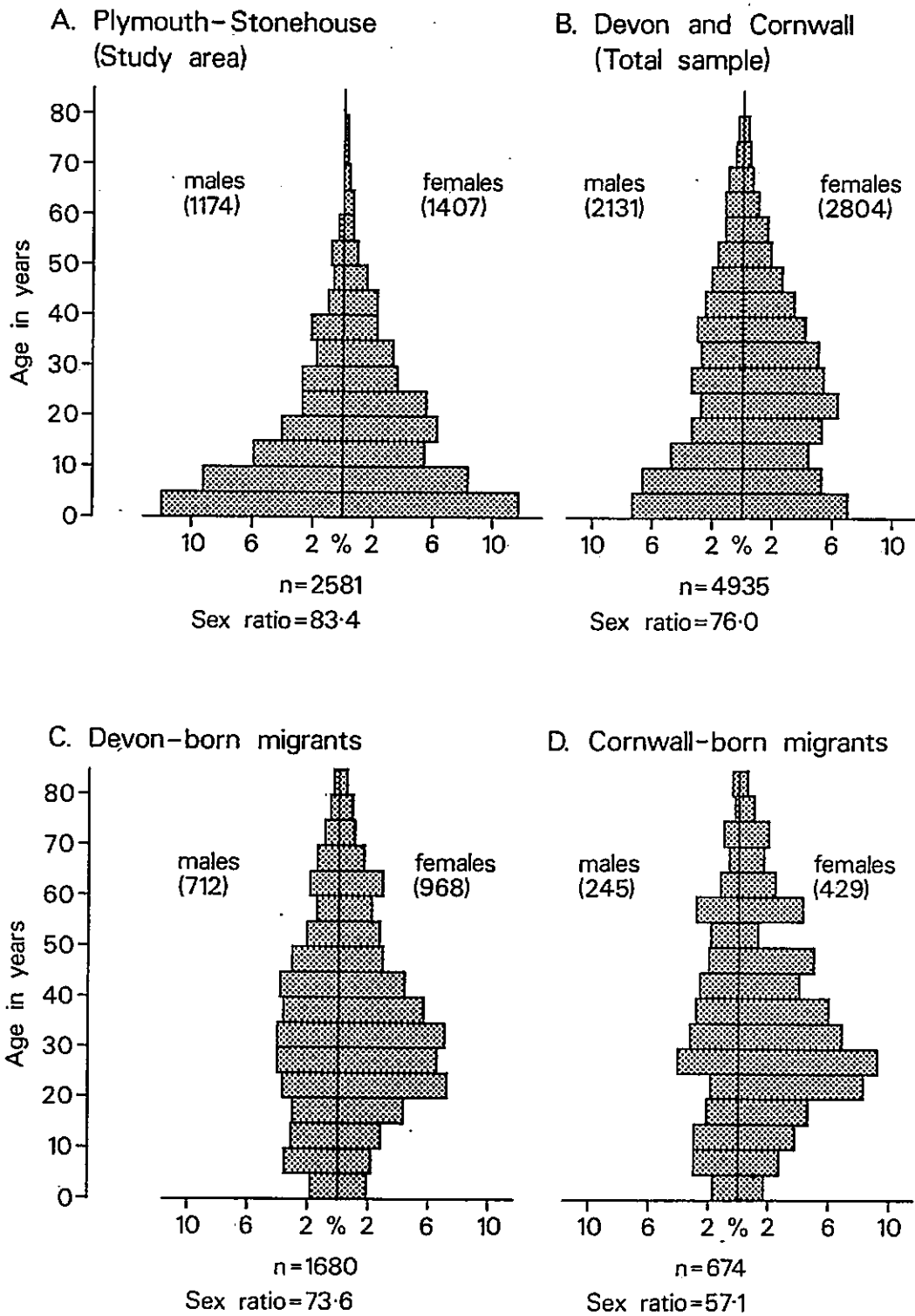
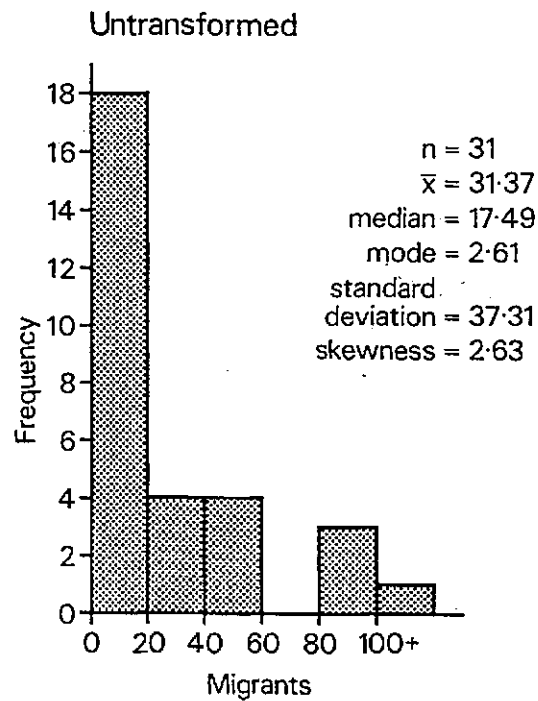
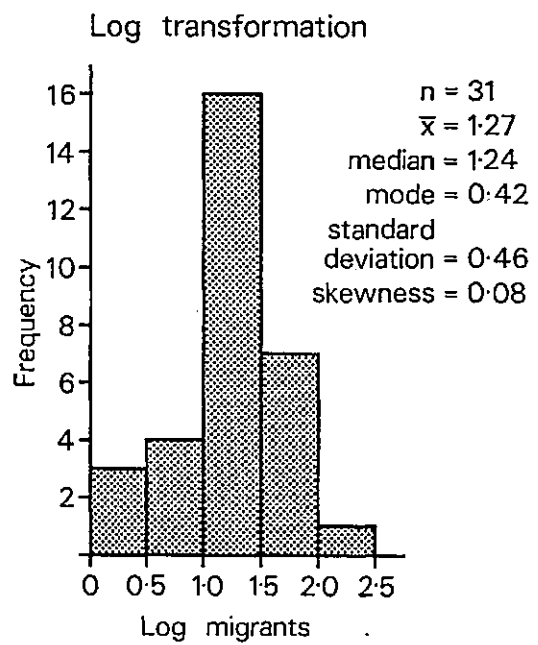


Figure 4.21: Age-sex pyramids of people born in Devon and Cornwall and living in Plymouth and Stonehouse in 1851. Based on sample census data.



Data

District	Standardised Migration	Log
AXMINSTER	2.96	0.47
HONITON	7.56	0.88
ST. THOMAS	3.07	0.49
EXETER	19.60	1.29
NEWTON ABBOT	21.41	1.33
TOTNES	39.68	1.60
KINGSBRIDGE	85.61	1.93
PLYMPTON	183.04	2.26
STOKE	91.67	1.96
TAVISTOCK	48.79	1.69
OKEHAMPTON	47.55	1.68
CREDITON	17.49	1.24
TIVERTON	13.12	1.12
S. MOLTON	10.21	1.01
BARNSTAPLE	10.22	1.01
TORRINGTON	12.58	1.10
BIDEFORD	10.25	1.01
HOLSWORTHY	26.55	1.42
STRATTON	48.45	1.69
CAMELFORD	28.41	1.45
LAUNCESTON	26.22	1.42
ST. GERMANS	82.20	1.91
LISKEARD	49.16	1.69
BODMIN	16.10	1.21
ST. COLUMB	12.64	1.10
ST. AUSTELL	14.95	1.30
TRURO	8.04	0.41
FALMOUTH	14.06	1.15
HELSTON	7.75	0.89
REDRUTH	2.61	0.42
PENZANCE	5.05	0.70



**Figure 4.22:** The transformation of standardised migration from Registration Districts in Devon and Cornwall, 1851. Based on sample census data. NB: The transformed dependent variable data were used in the final regression model.

TABLE 4.15: Lifetime West Country migrants resident in Plymouth and Stonehouse in 1851

STEPWISE MULTIPLE REGRESSION: summary of results

4-step model (dependent variable: standardised migration)

Step	Variable entered	R	R <sup>2</sup>	Increase in R <sup>2</sup>	Coefficients B	Standard error	F ratio
1	Distance (miles from Plymouth)	0.866	0.749	-	-0.0098	0.004	**
2	Intervening opportunities (1851)	0.911	0.829	0.080	-0.3977	0.125	**
3	Contacts with Plymouth (1830-1856)	0.925	0.855	0.026	0.0782	0.027	**
4	Population size of SRD : Plymouth (1851)	0.936	0.877	0.021	-0.0042	0.002	**

Constant = 2.5269

5-step model (dependent variable: standardised migration)

Step	Variable entered	R	R <sup>2</sup>	Increase in R <sup>2</sup>	Coefficients B	Standard error	F ratio
1	Distance (miles from Plymouth)	0.894	0.799	-	-0.0154	0.0054	**
2	Intervening opportunities (1851)	0.917	0.841	0.041	-0.2488	0.1594	**
3	Population size of SRD : Plymouth (1851)	0.921	0.849	0.007	-0.0048	0.0032	*
4	Contacts with Plymouth (1830-1856)	0.929	0.864	0.015	0.0446	0.0329	*
5	Sex ratio of migrants (1851)	0.930	0.866	0.002	0.0013	0.0027	NS

Constant = 2.3976

F ratio: \*\* = significant at 0.01 level, \* = significant at 0.05 level

Independent variables were entered in order of contribution to the solution. Six cases were excluded from analysis in the five-step model because the values entered for some of the independent variables were regarded as unreliable (i.e. the numbers were very small). Thus the two models were derived from slightly different initial data sets, hence the differences in the value of R and R<sup>2</sup> for the same variable in the two models.

second solution it was set at 95 percent. The four-step model for 1851 is the more satisfactory of the two (see Figure 4.23): the four independent variables together account for 88 percent of the variation in the dependent variable of standardised migration. All the regression coefficients for variables entered are significant at the 0.01 level. Distance alone explains 75 percent of the variation in migration, while intervening opportunity accounts for a further eight percent, road contacts with Plymouth for three percent, and the population size of the sending districts for two percent of the remaining variation.\*

One further problem concerns the effect of data transformation which was necessary in order to make the initial sets of observations on the variables conform more closely to a normal distribution. As Table 4.15 shows the dependent variable (standardised migration) was normalised, by taking its logarithmic value. Contacts with Plymouth were especially skewed and these values were square-rooted.

These kinds of transformations inevitably make it harder to interpret the multiple regression solution based upon them. There seems to be no easy answer - parametric tests demand normally-distributed data - but in practice it means that the four-step model can predict the logarithm of the number of migrants expected in Plymouth from the Districts of Devon and Cornwall and not the actual numbers. This predictive value reflects not the original measures of distance, population contacts, and so forth, but some

\* One reason why the amount of additional variance explained in steps 2 to 4 is small is the degree of multicollinearity between the so-called independent variables. For example, there is a simple correlation coefficient of -0.79 between distance and road contacts with Plymouth. Other correlations are of a more modest order but, nevertheless, the problem of multicollinearity remains.



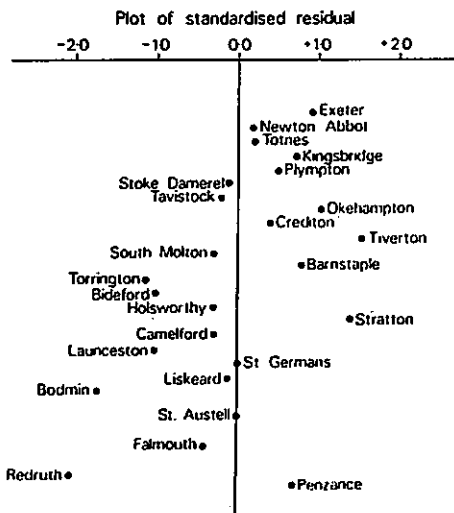
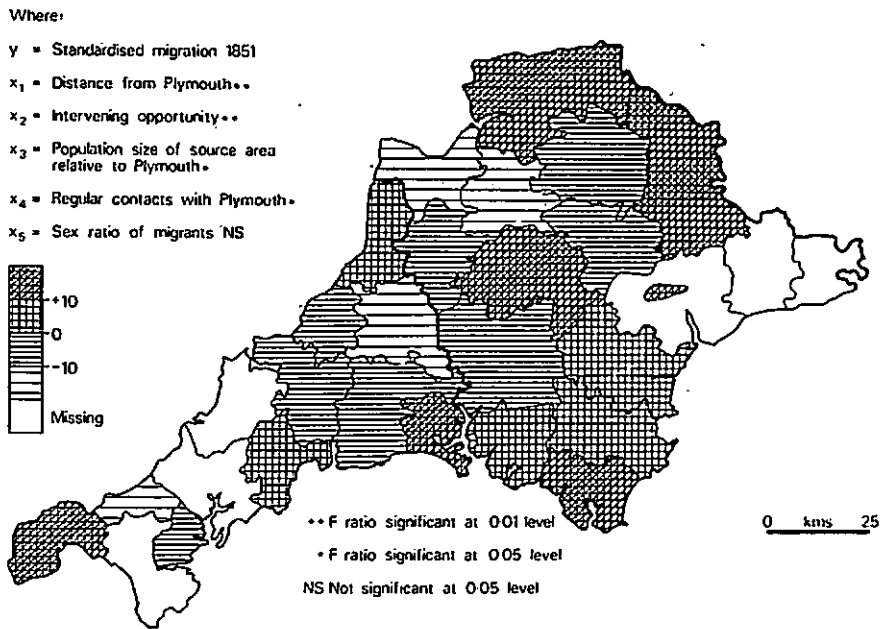


Figure 4.23: (a) The map of residuals for the five-step model.

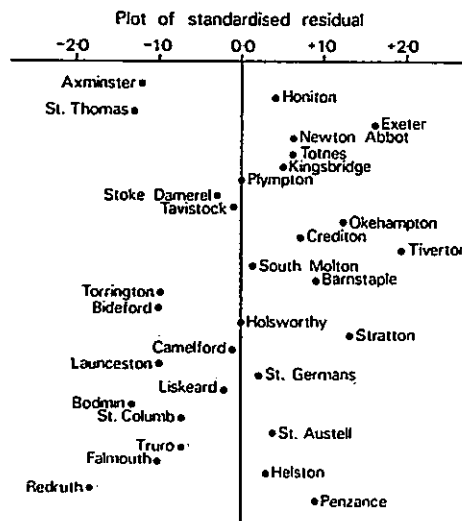
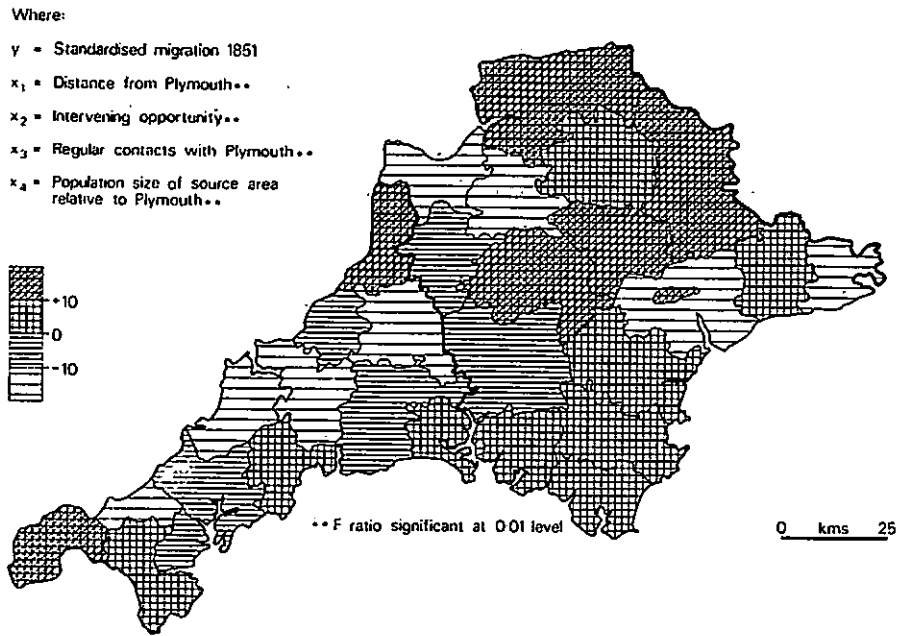


Figure 4.23: (b) The map of residuals for the four-step model.

extrapolation of them.\*

Despite these cautionary remarks, the empirically-derived mathematical model produced by multiple regression analysis provides an extremely useful statistical picture of the pattern of life-time migration from Devon and Cornwall as well as yielding a substantial amount of predictive power.

The five-step model for 1851 is included as an illustration of attempts which were made to extend the four-step solution and thereby explain something of the so far unexplained twelve percent of variation in the pattern of immigration. A range of other independent variables were tested to determine whether they could contribute further explanation. Two problems were encountered: for some variables, certain source areas had yielded too few observations for the data to be regarded as reliable (in practice this meant excluding 'offending' districts from the analysis, thereby reducing the size of the initial file of cases); and multicollinearity was severe in certain instances.

The five-step model (Table 4.15) shows the effect of including the sex ratio of in-migrants as an independent variable. Sex ratio is positively correlated with total migration (0.55) but when it is used

\* The standardised migration (total numbers born in other SRDs of Devon and Cornwall expressed as a percentage of the population of the sending SRDs) figures were not normally distributed - they were positively skewed. A log transformation produced a distribution closer to normal (see Figure 4.22). If the dependent variable (standardised migration) was not transformed the predictive power of the regression model fell to 74 percent and the F ratio test of significance for the regression coefficients of certain independent variables fell below the 0.05 level. This weakening of the model could be circumvented to some extent by manipulating other independent variables. For instance, by taking the square root of the distance variable the predictive power of the multiple regression equation could be slightly increased to 76 percent, but still, two of the four variables in the final four-step solution had (B) coefficients which were not significant or only barely significant at the 0.05 level.

in the stepwise multiple regression solution the regression coefficient (B) is not significant even at the 0.05 level. Moreover, the amount of additional variation separately accounted for by the sex ratio of immigrants is very small indeed (0.2%). The same kinds of results were achieved when measures were used, for example, of the employment structure of the sending regions, decline in employment levels in agriculture and mining, and of the age and employment characteristics of the migrants who arrived.

Two alternative conclusions could be drawn: either the variance unexplained in the four-step model reflects personal, localised decisions of individuals about whether to migrate, such behavioural factors being impossible to quantify; or the variables tested in attempts to sharpen the model are wrongly measured. This statistical test was limited to data drawn from the 19th-century census material, but it is recognised that other explanatory variables may have exerted an influence. Future studies might usefully build in measures of factors such as local wage levels or access to housing to refine the method.

It is worth noting again, however, that the four-step model has proved to be a useful explanatory tool. It confirms the theories of migration advanced by numerous authorities from Ravenstein onwards, and it demonstrates very clearly that population movement can be fairly accurately modelled for a small catchment of people over short distances.

The predictive accuracy of both models means that the residuals are quite small (the standard error terms are 0.002 and 0.003 respectively). Nevertheless an analysis of the residuals proved valuable by revealing that the model is a much better predictor of immigration over very short distances (St Germans, Liskeard,

Tavistock, Plympton, Kingsbridge, etc.; see Figure 4.23). Moreover, in general it predicts migration from coastal districts much better than from landlocked, partly landlocked, or otherwise less-accessible parts of the southwest peninsula.

In the four-step model for 1871 (Table 4.16), four independent variables together account for 83 percent of the variation in the dependent variable (standardised migration). All the regression coefficients were significant at the 0.01 level. Distance explains almost 77 percent of the variation (slightly more than in 1851), intervening opportunity accounts for a broadly comparable six percent, contacts with Plymouth for less than one percent, and the population size of the sending districts for only one tenth of one percent.

The slight reduction in the explanatory role of intervening opportunity, road contacts and population of the source area in the

TABLE 4.16: Lifetime West Country migrants resident in Plymouth and Stonehouse in 1871

STEPWISE MULTIPLE REGRESSION: summary of results

4-step model (dependent variable: standardised migration)

Step	Variable entered	R	R <sup>2</sup>	Increase in R <sup>2</sup>	Coefficients B	Standard error	F ratio
1	Distance (miles from Plymouth)	0.875	0.765	.	-0.0156	0.005	**
2	Intervening opportunities (1871)	0.906	0.821	0.056	-0.3868	0.152	**
3	Contacts with Plymouth (1856-1878)	0.910	0.828	0.008	0.0358	0.032	**
4	Population size of SRD : Plymouth (1871)	0.911	0.829	0.001	-0.0083	0.003	**

Constant = 2.6959

F ratio: \*\* = significant at 0.01 level

1871 model may reflect the increased accessibility of Plymouth to the southwest as a whole which came with railway development. The effect of the railways might be expected to reduce the importance of regular road contacts in explaining spatial variation in migration. Similarly, the railways would lessen the pull of intervening opportunities by providing quick, direct access to Plymouth.

#### 4.4.0 Intra-urban and suburban migration

Two other important aspects of migration have also been investigated: the impact of suburban movement on the immediately-adjacent parishes (noted in Chapter Three) and the movement of families within Plymouth and Stonehouse. Both aspects warrant more research attention than it has been possible to accord to them in this thesis but the evidence presented below does indicate their importance in shaping the social geography of the study area in the mid-19th century.

#### 4.4.1 The early suburbs

Four parishes had common boundaries with Plymouth: Compton Gifford and Eggbuckland lay to the north of the town, and Plympton St Mary and Plymstock to the east, separated from Plymouth by the Plym estuary; Pennycross was also situated to the north, sandwiched between Compton Gifford and Stoke Damerel, though not immediately adjacent to Plymouth (Figure 4.24). The populations of these parishes were analysed to

determine the effect of their proximity to the growing urban area. Although, in theory, it might be assumed that, while neighbouring parishes will have experienced some out-migration due to the attraction of the central urban area, adjacent parishes will subsequently have experienced in-migration as the process of suburbanisation commenced. In fact, the rates of population change in these parishes fluctuated considerably and the processes of change are not easily interpreted.

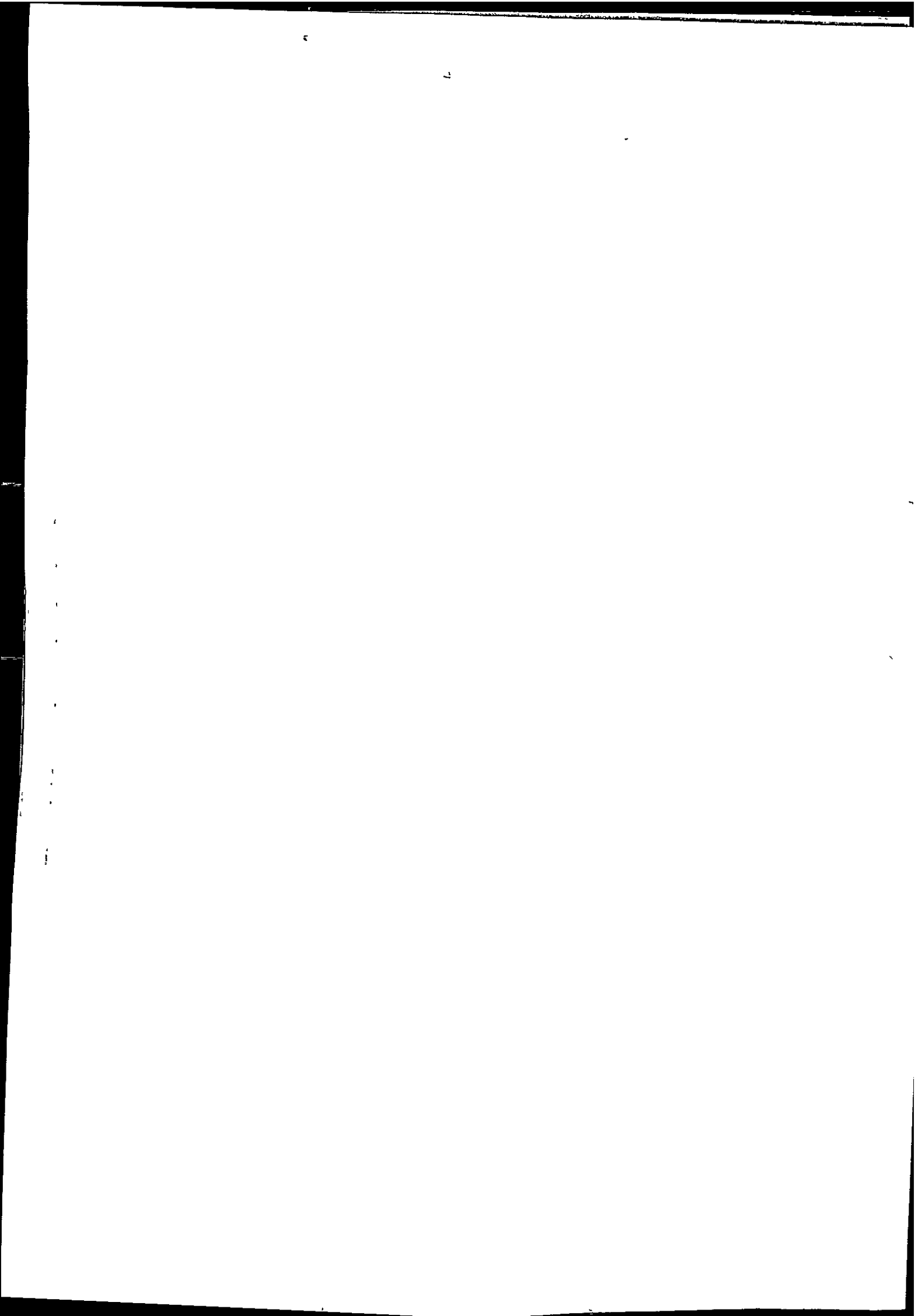
Compton Gifford (Plate 4B) experienced the most spectacular growth: in 1801 there were only 92 people living in the parish, by 1891 there were 3,264; its rate of growth was far in excess of any other local parish or Sub-district. A spatially compact parish, Compton Gifford lay on the main Tavistock road out of Plymouth, at the end of the Plymouth, Devonport and District Tramway route, and it was thus a prime candidate for suburbanisation, if not actually close enough to be enveloped by urbanisation. A footnote to the 1861 published census abstracts explains a growth rate of over 125 percent in the previous decade with the remarkable understatement that "The increase of population in Compton Gifford is attributed to the proximity to the Tything of Plymouth". Its rapid development may have stimulated (and have been stimulated by) the establishment of the Mutley Plain shopping centre just to the south (see Chapter Six). In the 1896 Boundary Extension Act, the parish became part of Plymouth.

Figure 4.25 illustrates the actual growth and the rate of growth in this parish: clearly, the rate of growth increased considerably in the second half of the century. Figure 4.26 shows the dramatic nature, in comparison with the other proximate parishes, of Compton Gifford's growth.

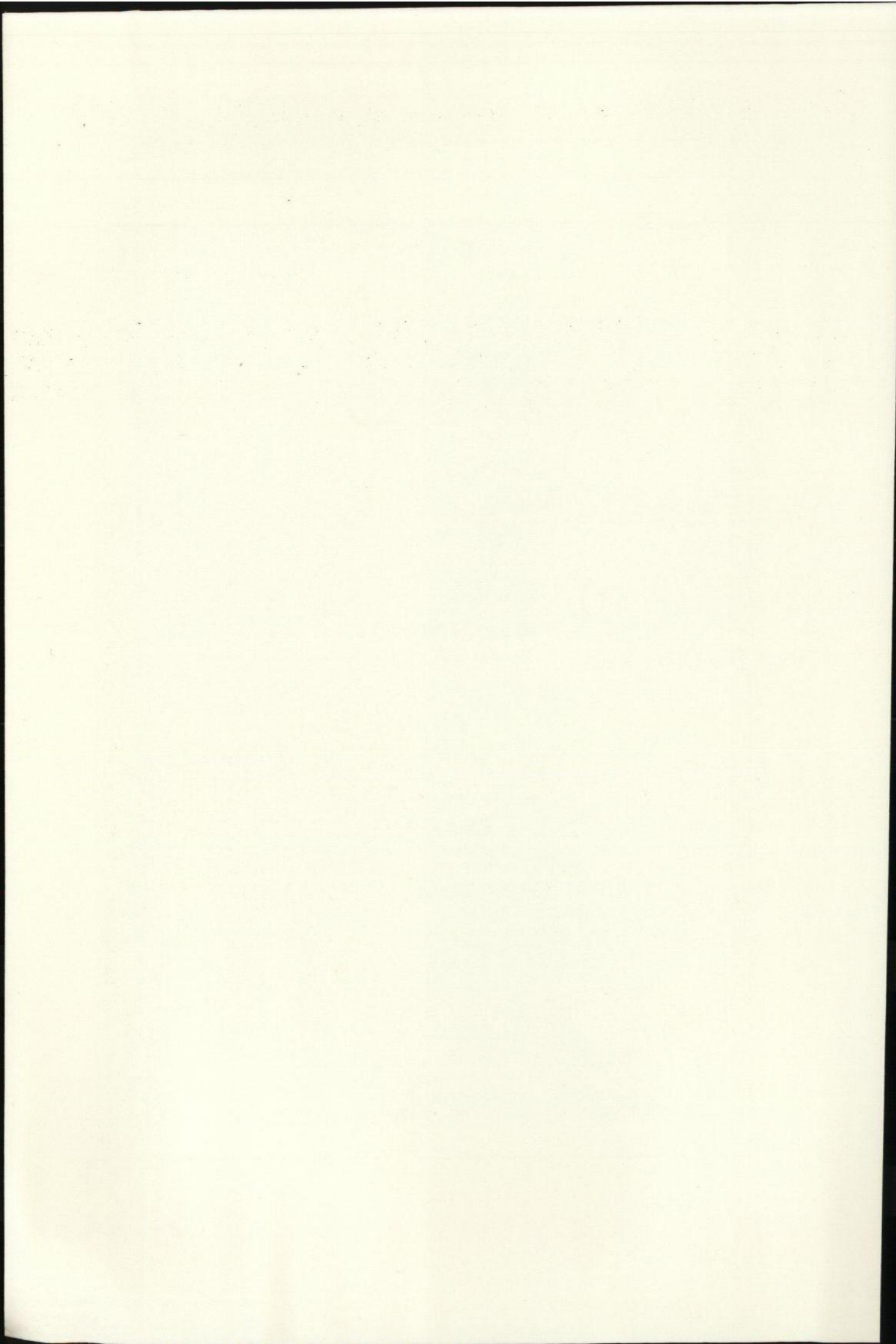
A ten percent sample survey was made of the Compton Gifford

Plate 4B: This post-war view of Compton Gifford shows the kind of suburban housing development experienced by the parish in the latter half of the 19th century.









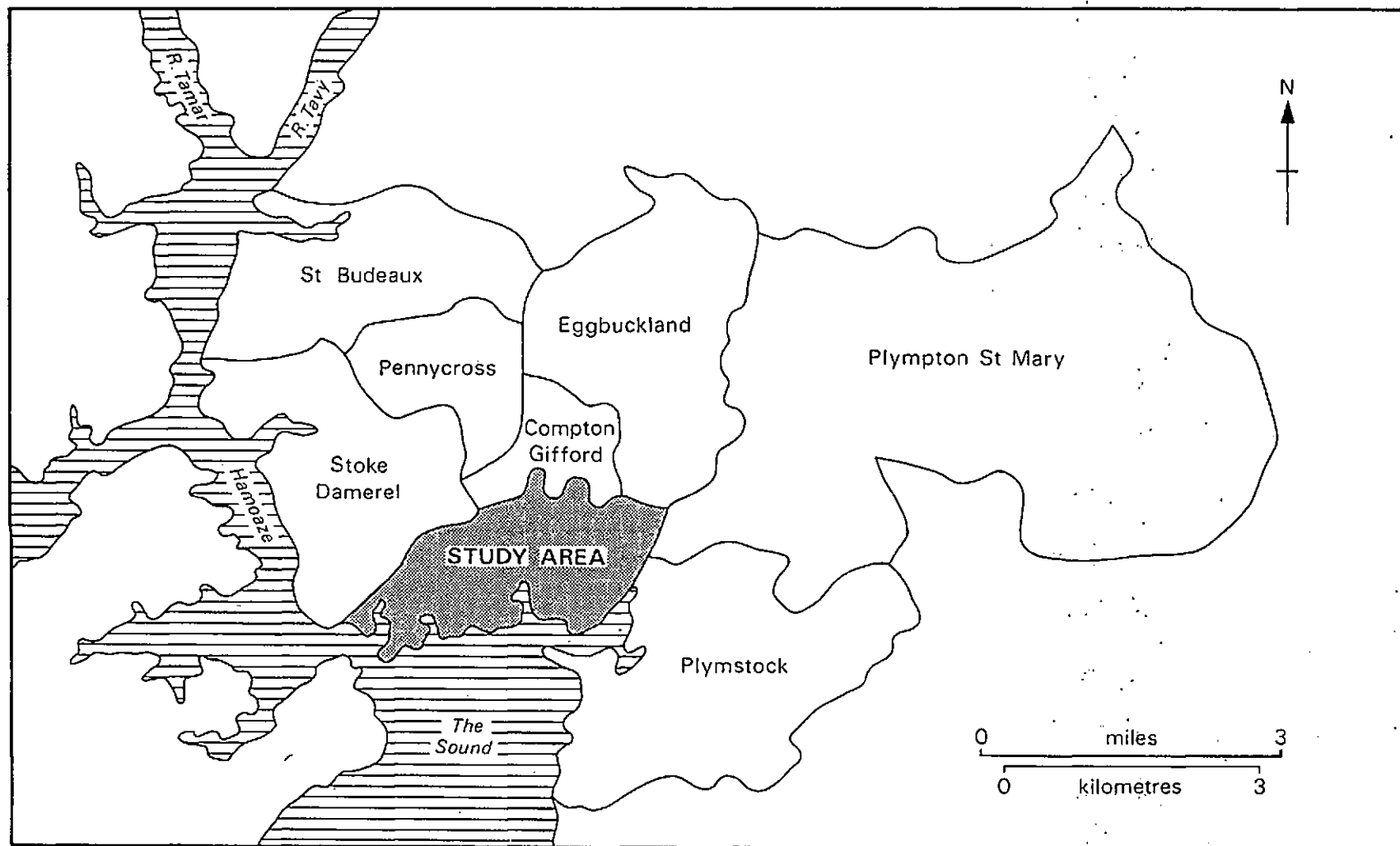
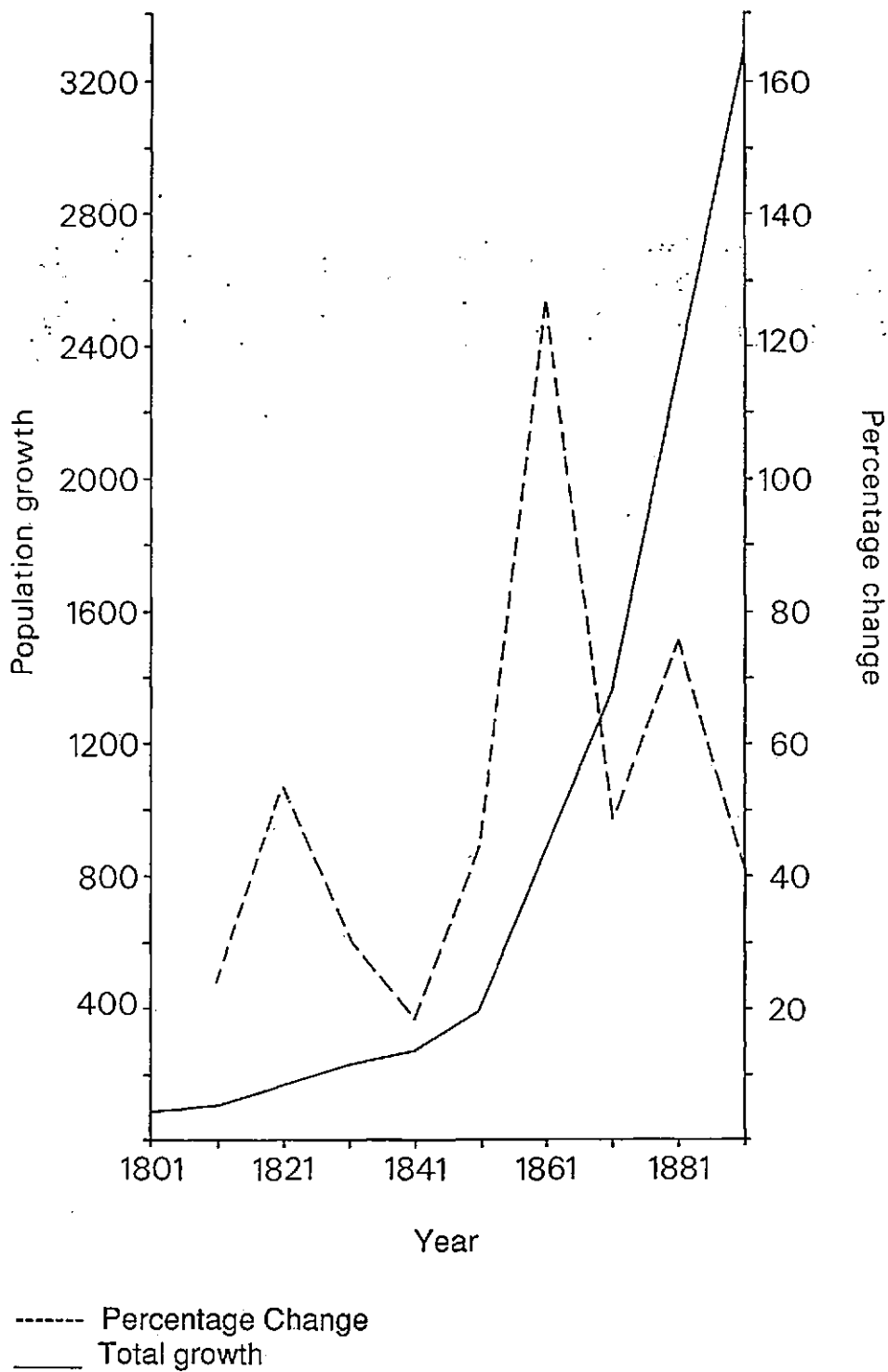
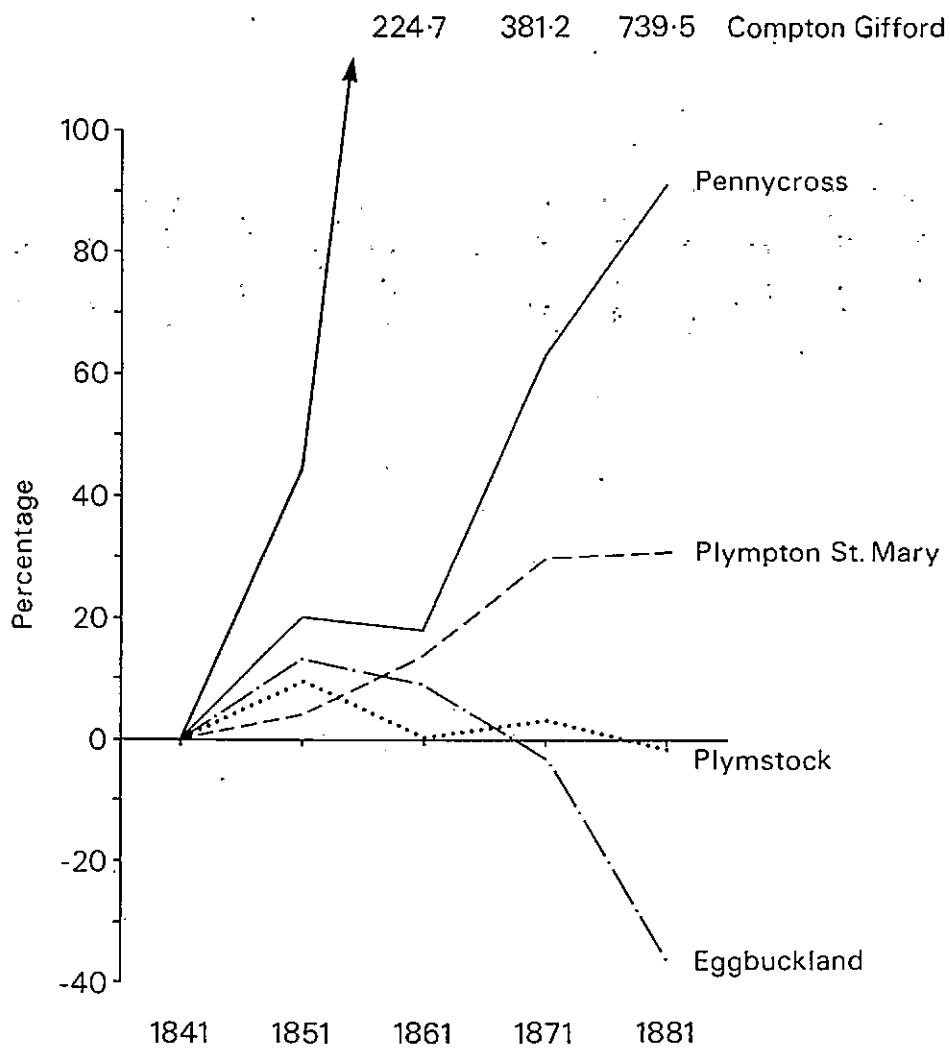


Figure 4.24: Parishes adjacent to the study area of Plymouth and Stonehouse.



**Figure 4.25:** The growth of Compton Gifford parish between 1801 and 1901 and the percentage population change between censuses. Based on the published census data.



**Figure 4.26:** The growth of parishes adjacent to Plymouth and Stonehouse shown as percentages of their 1841 populations. Based on the published census data.

enumerators' books for 1851 and 1871 because of the importance of this rapid growth in an adjacent parish.\* The age structure of this population was broadly comparable with that of Charles the Martyr, St Andrew and East Stonehouse (67.1% aged under 35). Most significantly, however, was the fact that nearly half of those employed were domestic servants, demonstrating the affluence of the parish. As in Plymouth, some two-thirds of the Compton population were Devon-born and over 14 percent Cornish; 23.1% of the population were born in Plymouth or Stonehouse with a further 11.3% born in Compton Gifford. These figures suggest that at least part of Compton Gifford's growth may be attributed directly to suburbanisation.

Eggbuckland, a much larger parish, was only partly annexed by Plymouth in 1896, the greater part lying further away from the expanding urban area; consequently the parish displayed a different pattern of population growth. During the first half of the 19th century, Eggbuckland's population grew from 711 (1801) to 1,468 (1851) and then stagnated for the next 30 years, perhaps experiencing some out-migration, and falling to 1,269 in 1881. However, the 1880s saw a sudden reversal of this trend with an increase in population of nearly 600 by 1891 to 1,833. The housing stock increased from 255 to 391 in the 1880s which suggests that there was a deliberate building programme in progress, probably following the release of farm land for suburban development. But it is clear that Eggbuckland did not experience large-scale suburban development during the study period of this research project.

\* The sample comprised 8 households from the 1851 books and 24 households from the 1871 books, involving a total of 161 people; the data were combined in analysis, the intention being merely to assess the general nature of the population.

There were 246 people resident in Pennycross in 1801, and the size of the population remained stable for the first 40 years of the century followed by an increase of over 20 percent in the next decade (1841-1851), although this only took the population to 321. Rapid population growth in this parish commenced in the 1860s; there were already 811 people by 1891, and soon afterwards it was enveloped in the outwards expansion of Plymouth with the Extension Act of 1896. The location of Pennycross parish - sandwiched between northeast Stoke Damerel and Compton Gifford - inevitably meant that it became a suburb. The emphasis of its growth in the latter half of the 19th century (when the rate of growth in Plymouth had actually declined) suggests that it was, in fact, fulfilling this function.

The physical separation of Plympton St Mary, as well as Plymstock, from Plymouth by the Plym estuary will have severely limited their potential as suburbs in the 19th century. While the population of Plympton St Mary did increase from 1,562 in 1801 to 3,837 in 1901, this growth is more likely to have been self-generated, forming a community independent of its urban neighbour. Plymstock parish had 1,633 inhabitants in 1801 and grew to a peak of 3,302 in 1851, the population then stabilised for the remainder of the century, falling slightly to 3,195 in 1901. It is possible that the attraction of Plymouth or, indeed, Plympton St Mary, neutralised its own propensity for growth in the latter half of the century when it became an area of out-migration, but this cannot be confirmed from the published census data.

In summary, Compton Gifford was the first parish to experience suburbanisation, followed by Pennycross. Significantly, Egguckland, being more peripheral, did not feel the effect of the growing city until the turn of the century. Plympton St Mary and Plymstock were



less noticeably influenced by their proximity to Plymouth.

The five parishes had one characteristic in common throughout the study period: a population per house ratio of between five and six which was close to the national average but considerably less than Plymouth and Stonehouse (or Stoke Damerel). This will have made them attractive places for those people living in the heart of the overcrowded towns. It is, therefore, likely that the governing factors in the process of suburbanisation were the rate of land release for building and the availability and improvement of commuter transport. Thus, though the patterns are by no means clear cut, Plymouth's neighbouring parishes may be seen to have experienced initial net out-migration, though at different times dependent upon their individual proximity, succeeded by in-migration and consequent suburbanisation as available building land was exhausted within the town boundaries. The boundaries of the city of Plymouth have since been successively extended and now enclose all these parishes.

#### 4.4.2 Intra-urban mobility: the Gifford family, 1840-1859

While it has not been possible to make a detailed investigation of intra-urban residential mobility of the kind attempted by Pooley (1979) within the confines of this research project, one surviving individual account, that of Emma Gifford Hardy (1979), has been used to shed a little light on the process. Between 1840 and 1859 her family moved house five times within the town of Plymouth.

Emma Gifford was born in 1840 at number 10 York Street. This was established by the poet and novelist Thomas Hardy, Emma's future

husband, who checked the register of births. She was the fourth child of attorney John Attersall Gifford.

In her memoir, Emma says she had "slight recollections" of a house in Courtenay Street, before the family moved to "the third house down in Buckland Street" which she remembered "distinctly". Her father is listed in White's Directory 1850 at number 18 Buckland Street; this is the only directory reference to the family throughout the period. From the upper windows of this house the children viewed the opening of Millbay Railway station in April 1849. The property depreciated due to the proximity of the station, so they left "soon afterwards" and moved to number 9 Sussex Street, a grand modern dwelling on the Hoe.

The family is listed at this address in the 1851 census enumerators' book. The census also reveals that John Gifford, his wife, also named Emma, and their eldest son, Richard, were all born in Gloucester. Their next child, a daughter, Helen, was born in Plymouth. The ages of these children place the family's move to Plymouth at between 1834 and 1836. Gifford's mother, after whom their first daughter was named, was born in Devonport and was widowed and living with the family by the time of the 1851 census.

Emma's paternal grandparents lived in Durnford Street, Stonehouse. Presumably on the death of her grandfather, her grandmother came to live with the family at Sussex Street. They subsequently moved to the new Bedford Terrace, on North Hill. When Mrs Gifford senior died, the Gifford family moved, in June 1859, to Bodmin, leaving Plymouth for good.

Figure 4.27 illustrates how, as their situation improved, the family moved closer into the centre of the town, to newer and more substantial houses, until the final Plymouth move took them to the

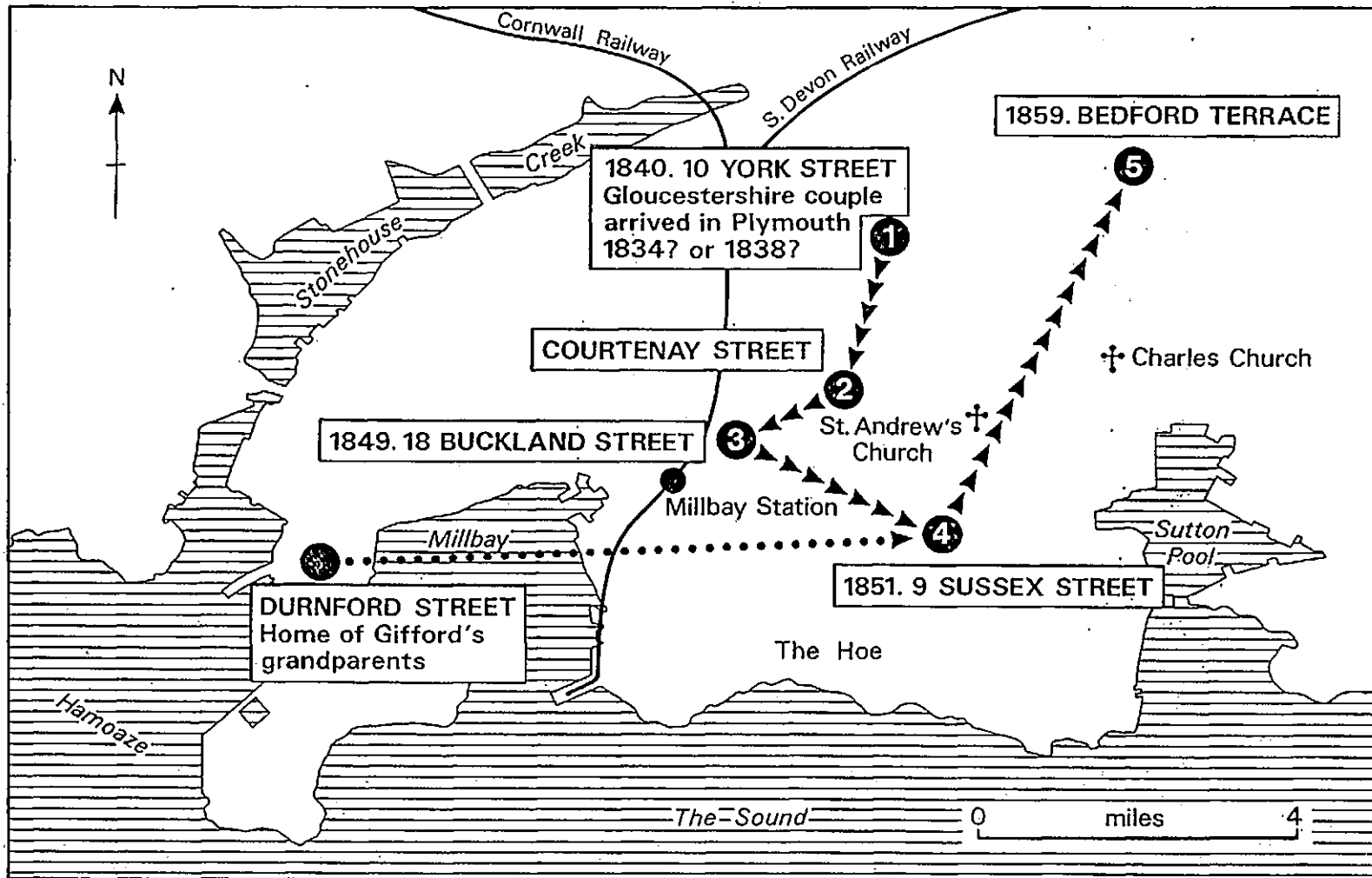


Figure 4.27: Intra-urban residential mobility. The house moves made by the Gifford family between 1841 and 1859, based on Emma Gifford Hardy's autobiography and census evidence.

outskirts of the town. The sequence provides a useful glimpse of what may have been a process of social change operating more generally in mid-Victorian Plymouth.

#### 4.5 Conclusion

In 19th-century Britain, no part of the country remained untouched by the radical redistribution of population. Examination of the changing patterns in Plymouth and Stonehouse in the twenty-year study period has revealed a complex birthplace structure. Clearly, the process of Plymouth's mid-Victorian population growth was far more complicated than the aggregated figures initially suggested; even though the census provides only a decennial snapshot.

It has been shown that the two towns had a large migrant population whose component groups exhibited marked spatial distributions. Moreover, the migrant communities made distinct demographic, social and economic contributions to the overall structure of the towns' population. Although an examination of the factors influencing patterns of in-migration from the greater part of Britain has not been possible, a study of the flow from Devon and Cornwall has indicated that intervening opportunities, transport links with Plymouth, and the population size of the sending areas were crucial factors in determining the nature of regional population movement.

There is little tangible evidence of out-migration, but combined figures for Plymouth and Devonport from the published census data show an increase of 22/1000 Devon-born inhabitants between 1861 and 1871, at the expense of more distant birthplaces. While this is indicative

of an outward movement, only far more detailed investigation, not within the scope of this study, can determine the precise nature of this out-migration.

One factor must be borne in mind throughout this investigation of the mid-19th century population of Plymouth and Stonehouse: by 1871 the Registration District boundaries enclosed, for the most part, an area almost entirely built-up, and urban growth was extending beyond these arbitrary boundaries and contributing to evidence of out-migration. Examination of the Compton Gifford parish census books for 1851 and 1871 has indicated evidence of suburbanisation and the experience of the Gifford family illustrates the kinds of house move being made, at least by professional people, in Plymouth during the years of most rapid population growth.

CHAPTER FIVE: PLYMOUTH'S URBAN MORPHOLOGY: THE PHYSICAL SETTING OF  
DEMOGRAPHIC CHANGE

5.0 Introduction

Rapid population growth and population movement have an immediate and dramatic effect upon the form and structure of a town, and the central purpose of this chapter is to examine the nature of that effect in Plymouth. Several important changes in the urban morphology of Plymouth and Stonehouse will be described to show the physical setting of the demographic changes examined elsewhere in this thesis. This chapter will consider the extension of the built-up area which occurred as private estates were sold to speculators who constructed new housing, but only partially supplied the needs of the growing population. Major developments in the infrastructure will also be described, although no attempt is made to examine in detail the development process and its links with inter- and intra-urban transport, or with the role and activities of speculative builders, as these concerns are beyond the scope of this study.

Integral to the physical expansion of Plymouth and Stonehouse were major building projects commensurate with the two towns' commercial and industrial development. The construction of the Breakwater, the improvements made at Sutton Pool and the extension of Millbay docks were crucial to the local economy. Land-based transport facilities were similarly upgraded, significantly with the arrival of the railway. Plymouth expanded beyond its cramped medieval streets with the construction of whole new thoroughfares, public open space and public buildings, and service industries developed apace, most notably

with the growth of a new retailing centre in Plymouth. All these morphological developments will be reviewed in this chapter.

It has already been established that 19th-century Plymouth had a rapidly growing population, in keeping with its role as a port, military base and regional centre for Devon and Cornwall. This, of course, had a profound impact upon the fabric of the town and contemporary maps illustrate the outward expansion of the built-up area as well as changes occurring in the central area. Maps also indicate the limitations on the extent and nature of expansion: the situation and relief of the site, the ownership of the land, and less tangibly, the artificially imposed town boundaries; all acted as constraints on the physical growth of Plymouth.

The pressures put upon the available space by the rate of growth and consequent density of Plymouth's population, the limitations to physical growth which shaped the present-day urban area and the evolution of the Victorian town centre will be briefly explored. It has already been noted in Chapter Four that one of the consequences of the scarcity of space in the old town centre was an expansion beyond the 19th-century town boundaries, particularly in the latter half of the century when the neighbouring parishes began to experience suburban development.

The growth of Victorian towns is a well-known and well-documented phenomenon and Plymouth's expansion was mirrored throughout Britain. Along the banks of every major estuary, the Thames, the Severn, the Tyne, the Bristol Channel, the Mersey, the Clyde and the Forth, along the shores of Southampton Water and Belfast Lough, at Middlesborough, Hull and scores of smaller ports, trade "transformed hundreds of square miles". While at Plymouth, Portsmouth and Chatham, "this transformation of country into mercantile landscape was hastened by

the building of Royal Naval docks, yards and barracks" (Hyams, 1974). Every town and city was influenced by different stimuli and constraints, the history of each town is different, the style and function of its parts may be repeated elsewhere, but its form and structure cannot. The morphology of 19th-century Plymouth and Stonehouse both shaped and was shaped by their social geography. The link between the two was inextricable and any study of the social geography of a town must include a review of its urban morphology.

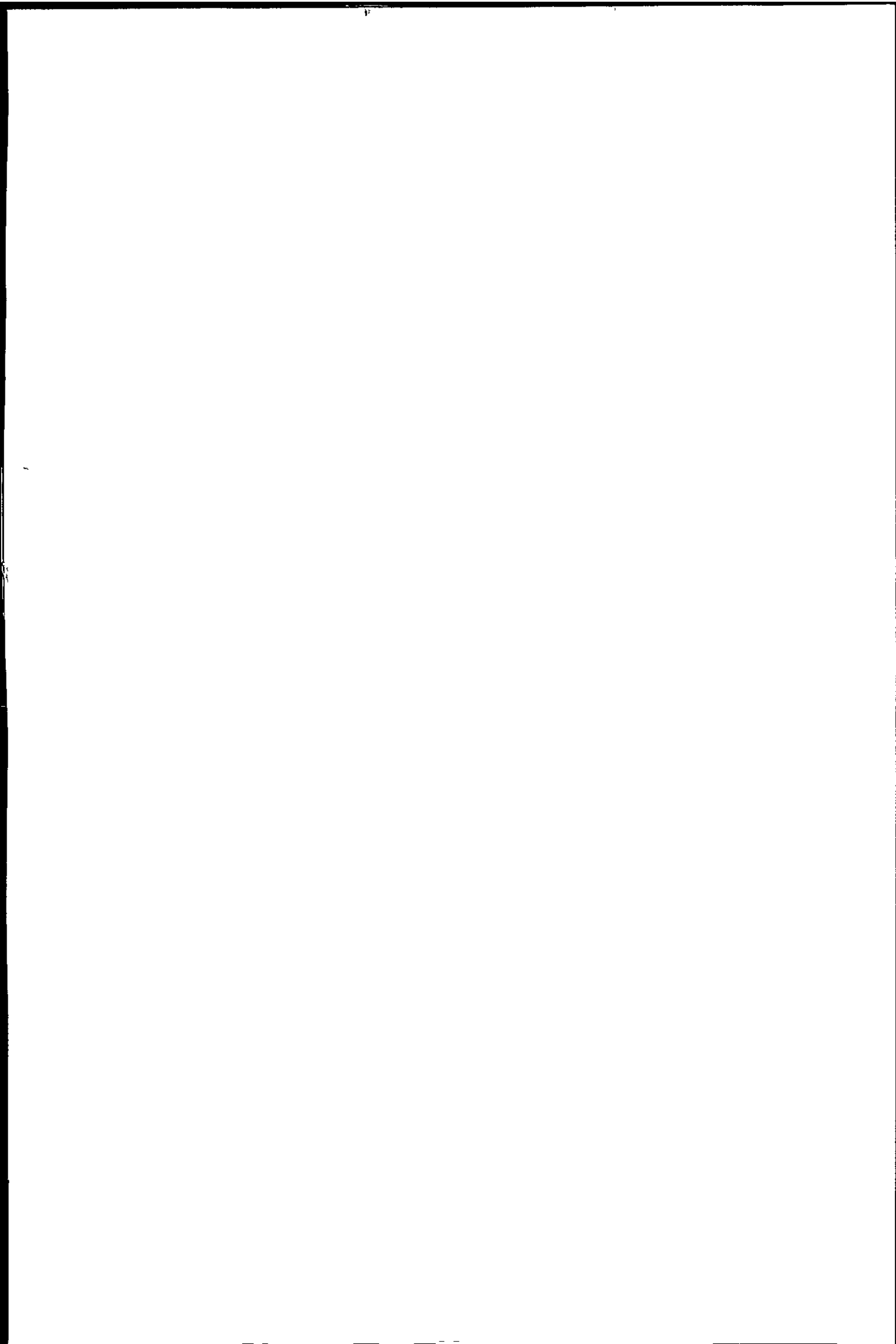
#### 5.1 The growth of the town and the provision of housing

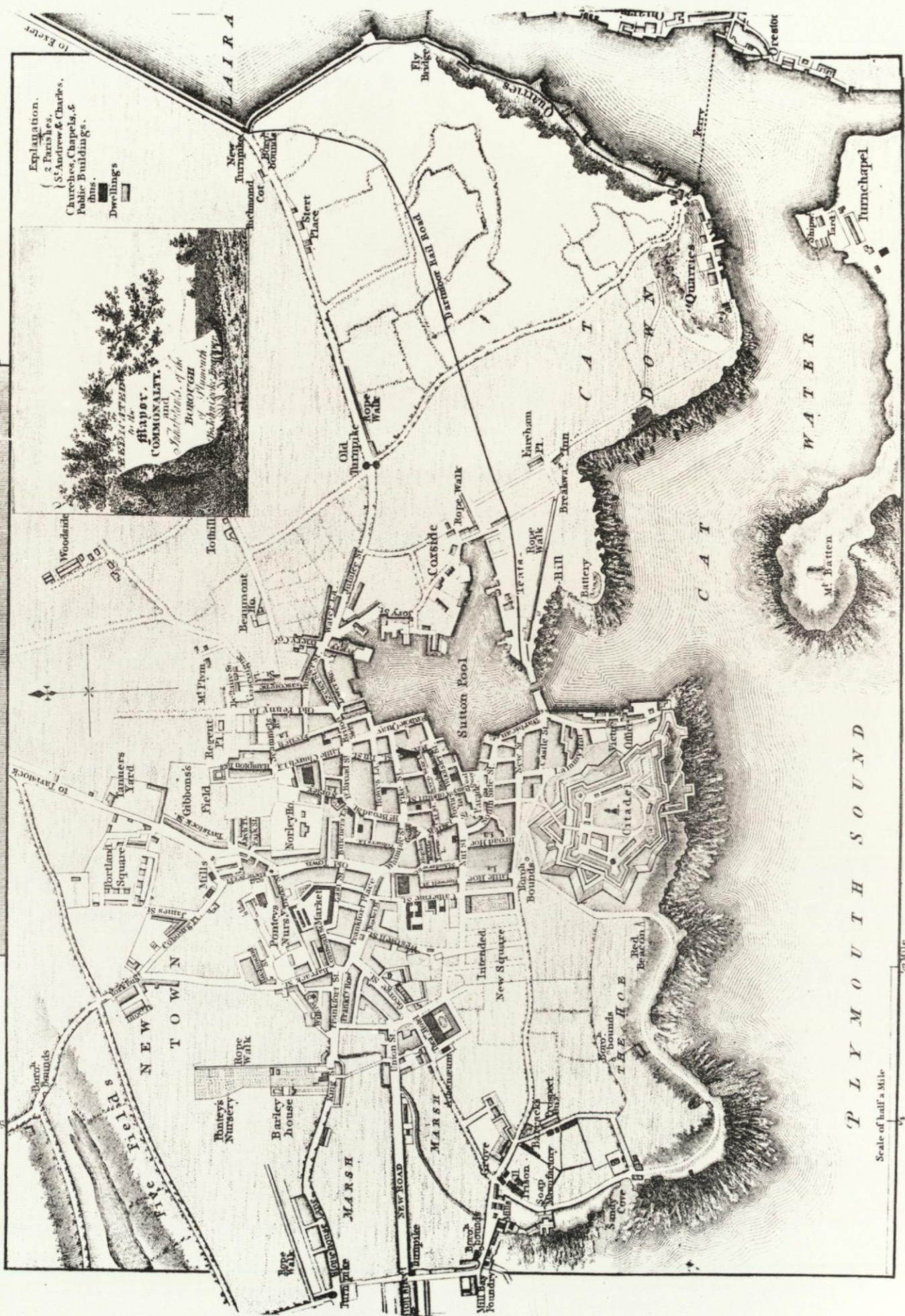
At the end of the 18th century there were only about 1600 houses in Plymouth, many of them thatched. The compact town was surrounded by fields, and even Charles Church was still half in the country. To the west, where Union Street later would be built, was a salt marsh; reclamation and development lay in the future. Worth (1890) marked the building of George Street in 1776, "a pleasant series of suburban residences", as the start of the "tide" of street-building - Frankfort Street soon followed - thereafter new streets were added rapidly (Table 5.1). Many of these streets can be easily identified on contemporary maps such as Plate 5A.

Pitts provides a first-hand account, and implicitly suggests one stimulus for growth: "Plymouth, about the year 1820... consisted of a series of narrow streets and lanes..." He noted that the principal inhabitants lived in the lower parts of the town, around Sutton harbour, and that through the "principal parts of these streets carts could not pass". The old streets were impossibly cramped, an



Plate 5A: The Borough of Plymouth, engraved by John Cooke and  
published in 1820 by E Nile of Stonehouse.





Explanation.  
 { 2 Parks.  
 { St Andrew & Charles.  
 Churches, Chapels, &  
 Public Buildings.  
 Inns.  
 Dwellings



PLYMOUTH SOUND

Scale of half a Mile

1/2 Mile

Publ'd April 15, 1820, by W. E. N. H. N<sup>o</sup> 43, Union St Stonehouse.  
 \* ENGRAVING & COPPER-PLATE PRINTING OFFICE



TABLE 5.1: The new streets of Plymouth

Tavistock Street (1803)	Portland Square (1811)
Park Street (1809)	Cobourg Street
Cornwall Street (1810)	James Street
New Town (later York Street)	Union Street (1811-16)
Richmond Street (1811)	King Street
Barrack Street (later Russell Street)	Princess Square
Market Alley	The Crescent
Exeter Street	St Andrew Terrace
Jubilee Street	Charles Place
Brunswick Terrace (1811)	Fareham Place
Gascoigne Terrace (1811)	Woodside

Source: R N Worth, A History of Plymouth, 1890.

undesirable environment for both inhabitants and business. On the other hand, Worth (1890) noted that Gibbon's Field and Charlestown (to the east) "were in the hands of the farmer and the dairyman".

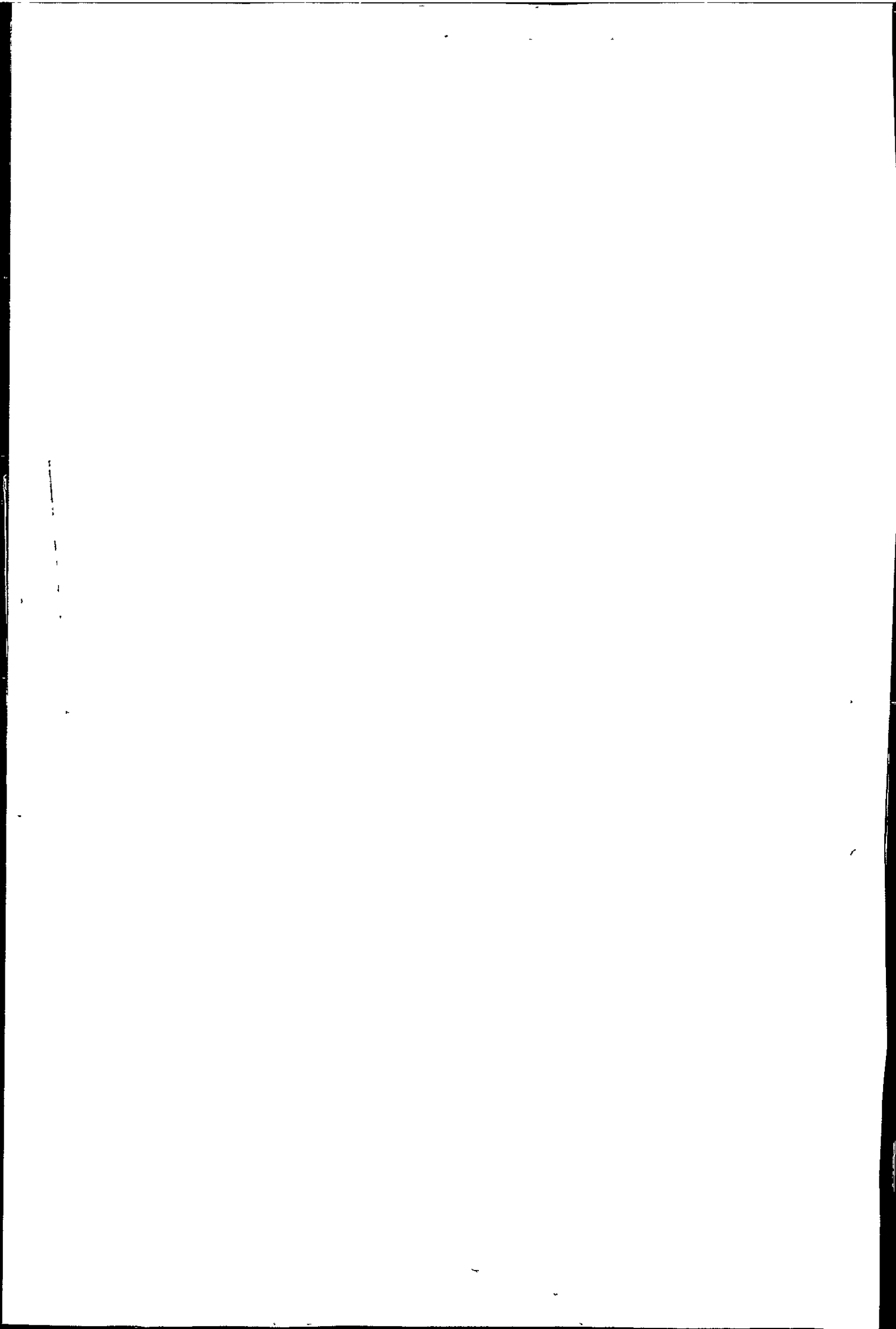
Contemporary maps give shape to this expansion and form to the development described by Worth and Pitts. Cooke's 1820 Plan (see Plate 1A, between pages 3 & 4) shows the three towns clearly separated - Union Street is marked 'The New Road' across Plymouth Marsh - while the map engraved by Rapkin in the 1850s (Plate 5B) shows how Plymouth and Stonehouse had now become a contiguous urban area. New building had started to creep northwards but the era was mostly one of in-filling. Moreover, the railway had cut through to Millbay, connecting with Thomas Gill's new pier by the limestone quarries.

Sourpool marshes had been drained and bisected by Union Street where houses were built forming a ribbon of development linking Stonehouse and Plymouth. Wyndham Square was built and North Road was constructed eastwards from the Naval Hospital wall. Land to the west of North Road was released by the Derry family. In the 1860s, the Barley estate, vacated by the Elliot family, was covered by Harwell, Well and Tracey Streets, built by Thomas Trenaman. Plymouth and

4

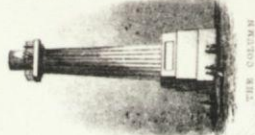
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Plate 5B: Plymouth, Devonport and Stonehouse, c1860; drawn and  
engraved by J Rapkin with illustrations by H Bibby,  
published by John Tallis & Co.





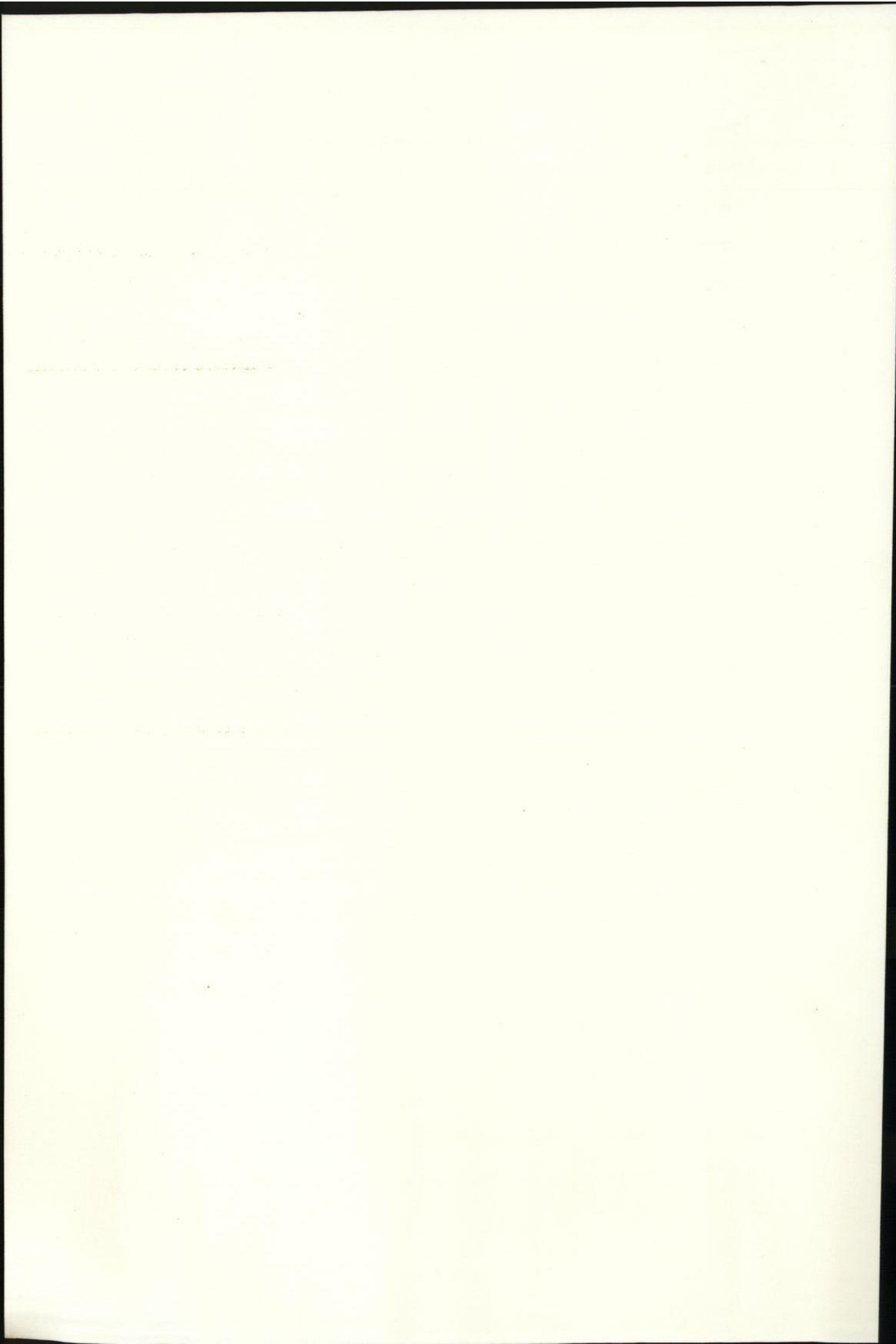
PLYMOUTH, DEVONPORT AND STONEHOUSE.



The Plan Drawn & Engraved by J. Hapten

JOHN TALLIS & COMPANY, LONDON & NEW YORK.

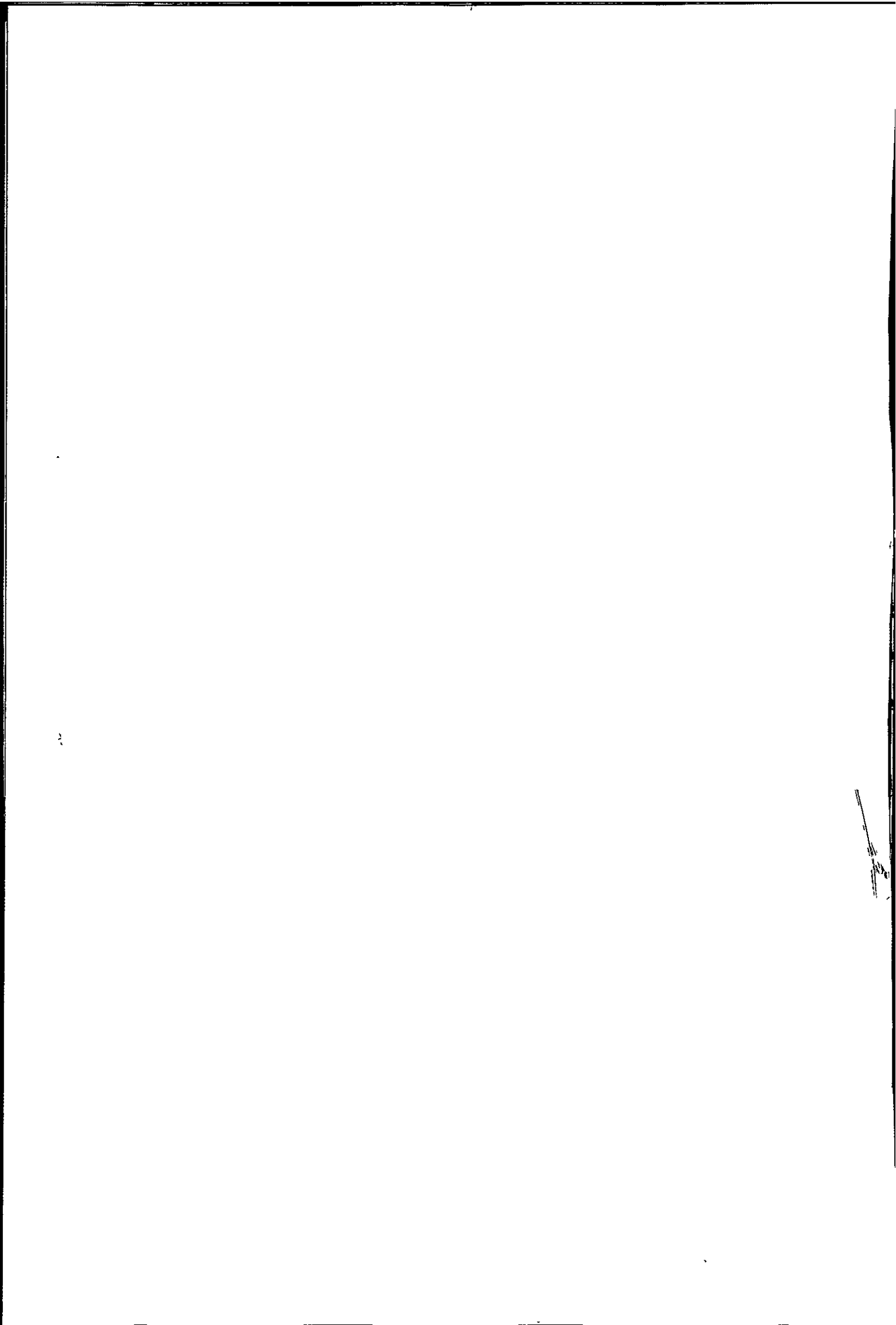
The Illustrations Drawn & Engraved by H. Fisher



Stonehouse were thus already reaching the boundaries of encircling private estates and future growth became dependent upon the release of such land to speculative builders. Apart from the obvious physical constraints of cliff and inlet, there were the long-held homes of local landowners, like Beaumont Park, the demesne of the Bewes until 1890. Part of the Bewes' estate was then preserved as a public park in keeping with the growing awareness in the late 19th century of the need for open space in urban areas. To the east of Beaumont lay the 87-acre Mannamead Fields estate of the Culme-Seymour family which, though sold in 1851, was not developed until the end of the 19th century. Such private land ensured that eastward development was effectively blocked, so working-class housing, confined by these estates, was built at exceptionally high densities.

The gross overcrowding of dwellings in some of Plymouth's central enumeration districts has already been noted, together with the high levels of multiple occupancy. Such conditions were further aggravated by extremely high building densities. A shortage of space led to averages of 30, or even 35, dwellings to the acre in Looe Street, How Street, Batter Street and Stillman Street (Plate 5C). These figures, based on calculations made using the Ordnance Survey 1:2500 map (surveyed in 1855-6 and revised several times thereafter), demonstrate the stark contrast between the tightly-packed, older, central enumeration districts and the more salubrious districts further west. Although terraced dwellings were predominant, those in the Princess Square area (Plate 5D) were built at densities of only ten to the acre. In the Crescent, the density of dwellings was less than eight per acre. Moreover, the larger houses in these areas benefitted from broader streets, public open space and private rear gardens (Plate 5E).

Plate 5C: Sutton Pool and the older, Barbican area of Plymouth.  
OS 1:2500, 1892.





BREVILLE STREET  
BIBBY STREET  
BRITON SIDE  
NORTH QUAY

317 319 320 329  
324 328  
322 334  
336  
342  
Vauxhall Quay  
B.M.12-5  
B.M.12-6

Guild Hall  
Chapel  
Nailhouse  
B.M.11-0  
PARADE  
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WEST PIER

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Boogate Brewery  
Public Baths  
Plymouth Dock  
Dunithy Church  
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Dunithy Church  
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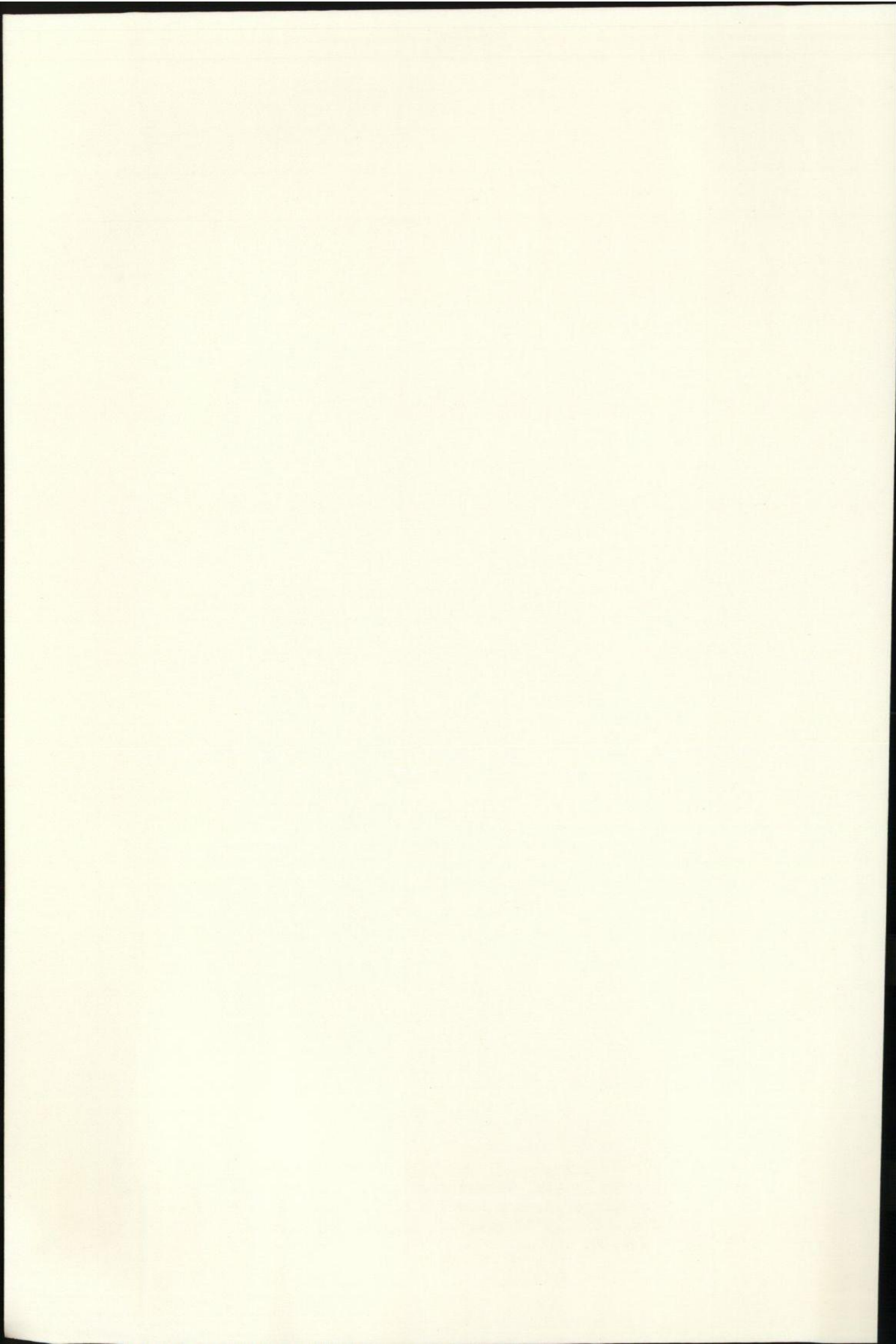


Plate 5D: Princess Square, 1868. Built in 1819 and named in 1833 when Princess Victoria visited the Breakwater (Cluer & Winram, 1985).










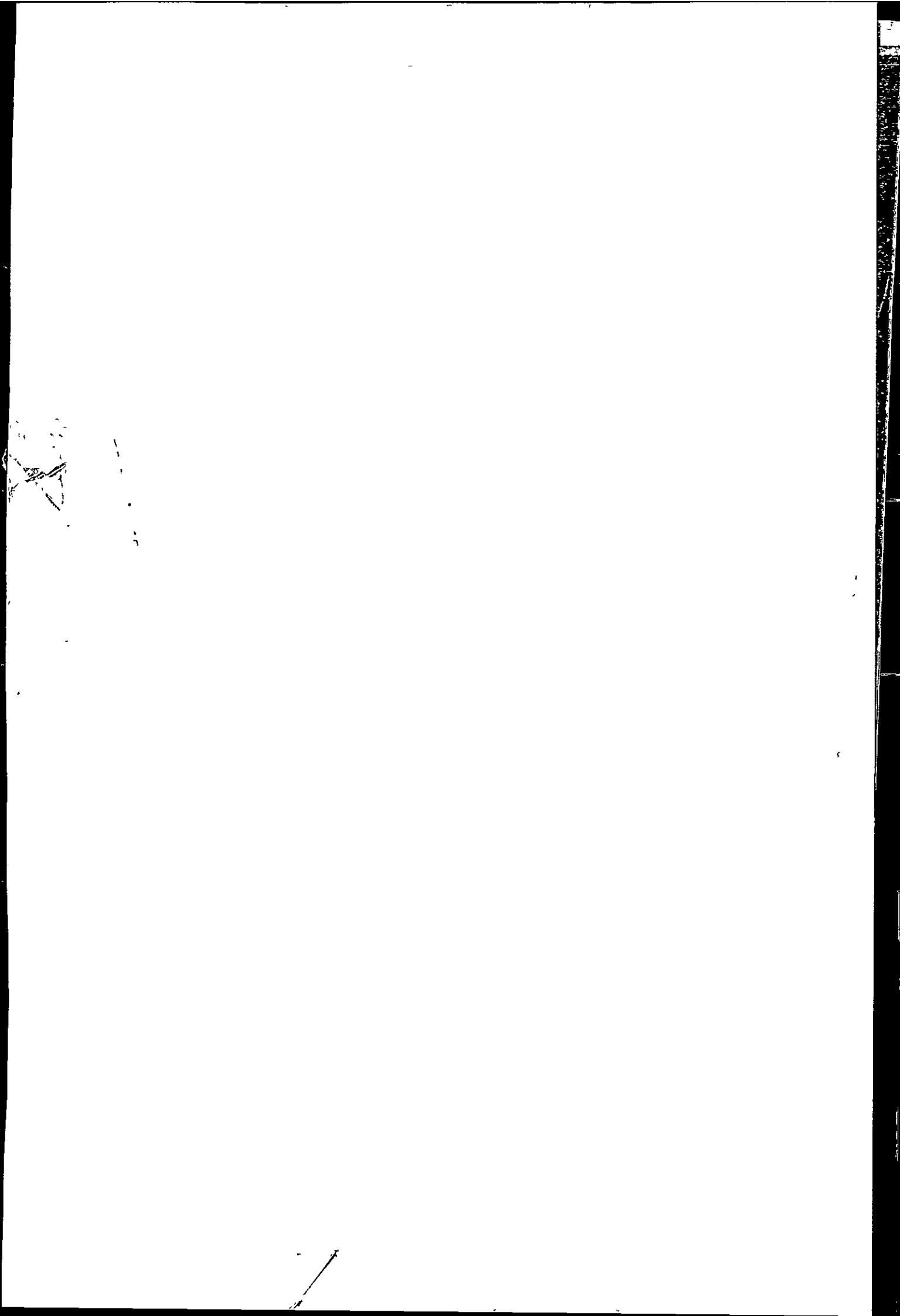


Plate 5E: The newer, more affluent streets of Plymouth, including Princess Square, George Street and Bedford Street (the new retailing area, see section 5.4), Sussex Street (where the Gifford family lived), and part of the Hoe.  
OS 1:2500, 1892.







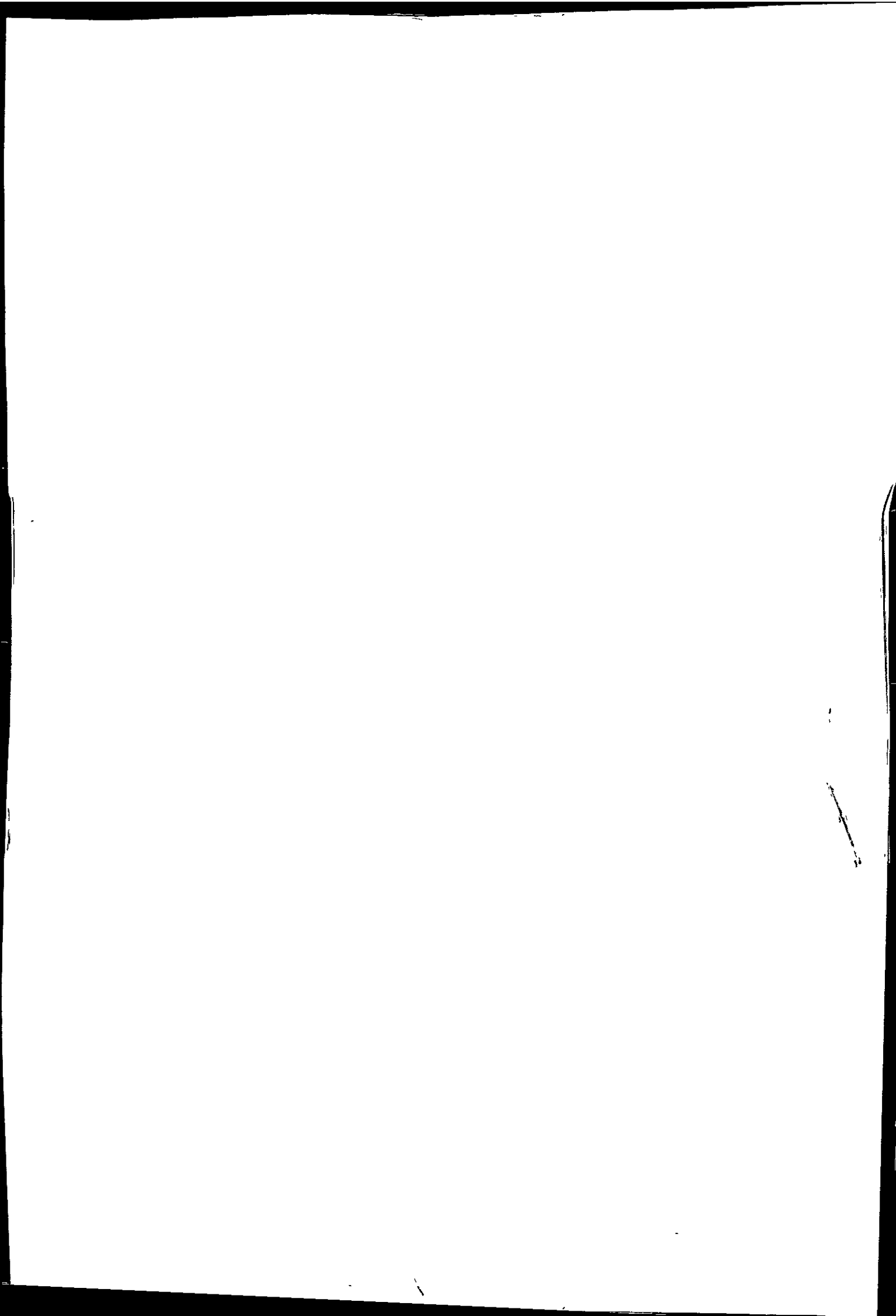
Open space in the poorer districts was extremely rare, the in-filling of backyards deprived many of the dwellings in Southside Street, New Street and Vauxhall Street of any kind of rear access. Thus, though back-to-back dwellings in Plymouth were rarely built (the only true back-to-back cottages were at West Hoe quarries), land shortages produced building densities embodying the attributes of the familiar back-to-back urban landscape found elsewhere. Ventilation, sunlight and open space were uncommon luxuries, therefore, in many parts of mid-Victorian Plymouth (Plate 5F).

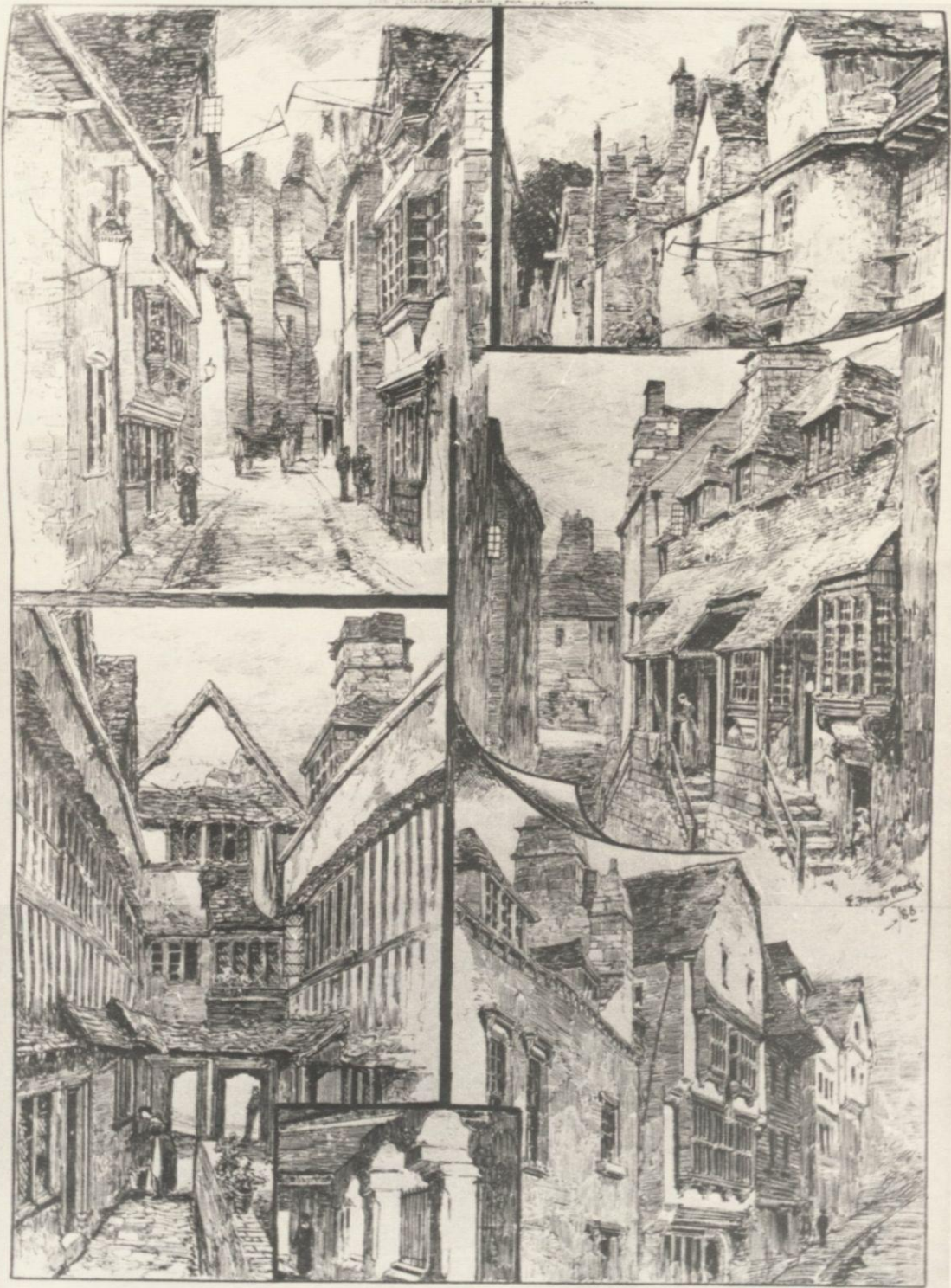
In the latter half of the 19th century, expansion gained a new impetus from intra-urban transport. Following the Tramway Act of 1870, Plymouth had one of the first horse-drawn tramways in Britain when the Plymouth, Stonehouse and Devonport Tramways Co, opened on March 18, 1872, and ran from Derry's Clock through Stonehouse to Cumberland Gardens in Devonport. In 1880 the Plymouth, Devonport and District Tramways Co was formed, using steam traction, but the noise, smoke and smell of the engines brought a swift end to the company which was bought out and replaced by horse-drawn trams. The route taken by these trams indicates both the spread of the town and its centre of activity. A line had been laid where they anticipated the traffic would be most lucrative (Sambourne, 1972), the route ran from Millbay Station along Millbay Road, George Street, Lockyer Street, Princess Square, Westwell Street, Bedford Street, Russell Street, Richmond Street, Cobourg Street, North Road, and Houndiscombe Road terminating at the northern end of Mutley Plain, at Hyde Park Corner. Transport facilities of this kind came too late to prevent prodigious levels of crowding in central Plymouth and, in any case, movement to peripheral housing was an option open only to those able to afford the tram fares.



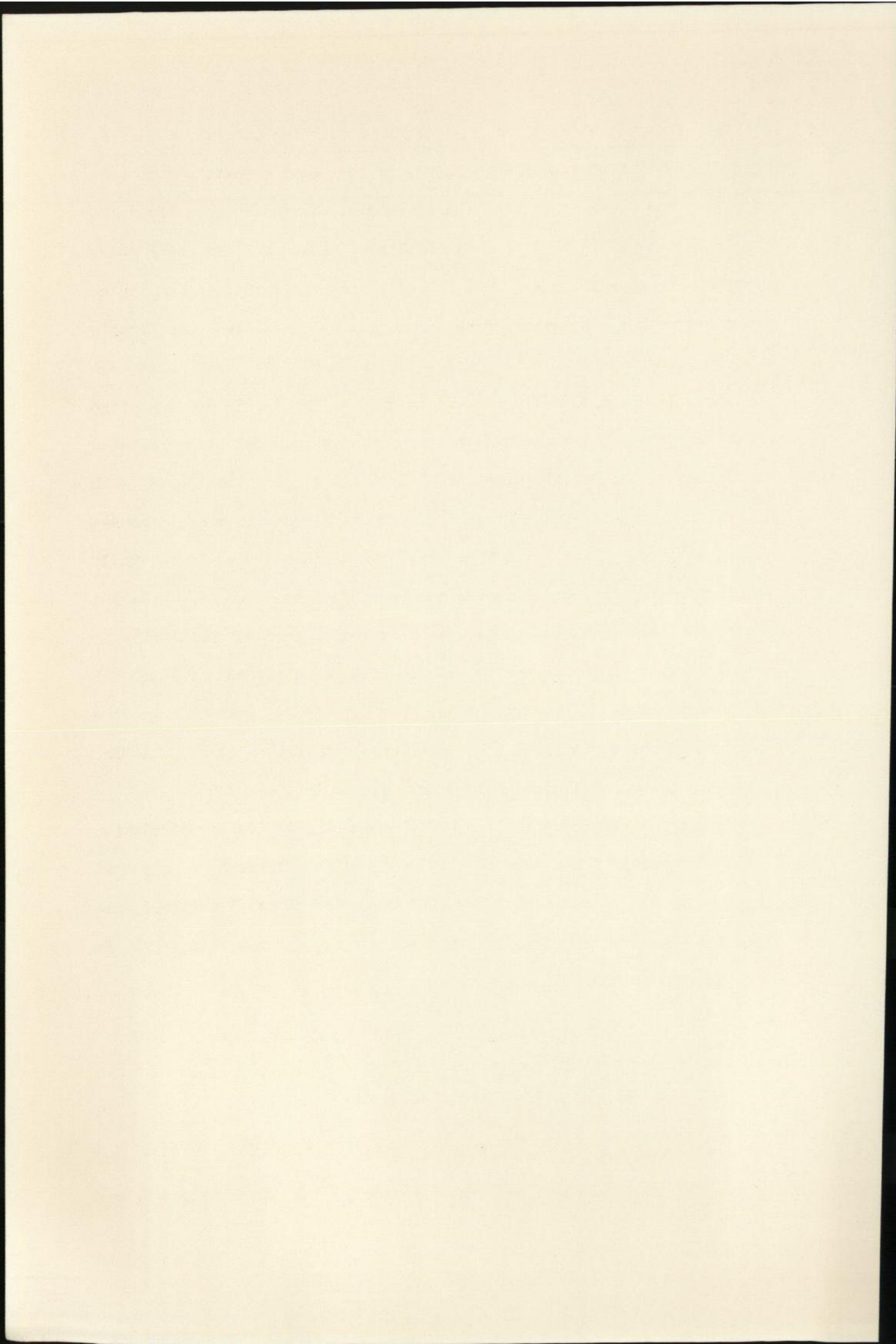
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Plate 5F: Pen sketches of old Plymouth by E F C Clarke, 1886.  
Clockwise from top left: New Street numbers 17 and 32; Looe Street, the backs of houses viewed from Vauxhall Street; the east side of Pin Lane; St Andrews Street, number 33 and adjacent buildings; High Street, Nicholl's Court; New Street, the back courts of numbers 34 and 35.





PEN SKETCHES ABOUT THE BARBICAN, OLD PLYMOUTH, DRAWN BY E. FRANCIS C. CLARKE, ARCHITECT



The theoretical model of a gradient of building density, declining from the very high levels encountered in the poor central districts towards the lower levels on the periphery, is distorted in Plymouth. The three towns are built on particularly hilly terrain with many steep slopes and inlets, bounded to the south by the sea and to the east and west by the rivers Plym and Tamar, which limited the supply of building land. Demand for accommodation was such that when suitable land was finally released to speculative builders, dwellings were erected at exceptionally high densities. The Barley estate, mentioned in Chapter Three, was rapidly built up in the 1860s with terraced houses in a regular grid of streets at densities of 25 houses to the acre. Back yards were tiny, tenements extended to the whole depth of each plot, and street widths - subject only to the weakest control (see Chapter Eight) - were extremely narrow. Nottingham is usually cited as experiencing development constrained by lack of building land (Chambers, 1952; Carter, 1983) and, though the difficulty there involved the enclosure of common land, similar effects may be observed on a less dramatic scale in Plymouth.

Despite these constraints, the scale of activity by speculative builders meant that between 1870 and 1890 Plymouth's physical expansion was phenomenal. By 1890 Worth reported: "Practically the whole of the building land within the borough... is now occupied". He added, in a footnote:

"This is due mainly to the activity of speculating builders, and the manner in which they have been financed; so that at the present moment Plymouth is largely overbuilt." (Worth, 1890)

Maddock's 1881 map of the three towns (Plate 5G) shows that northward expansion had reached the town boundary and suburban growth had

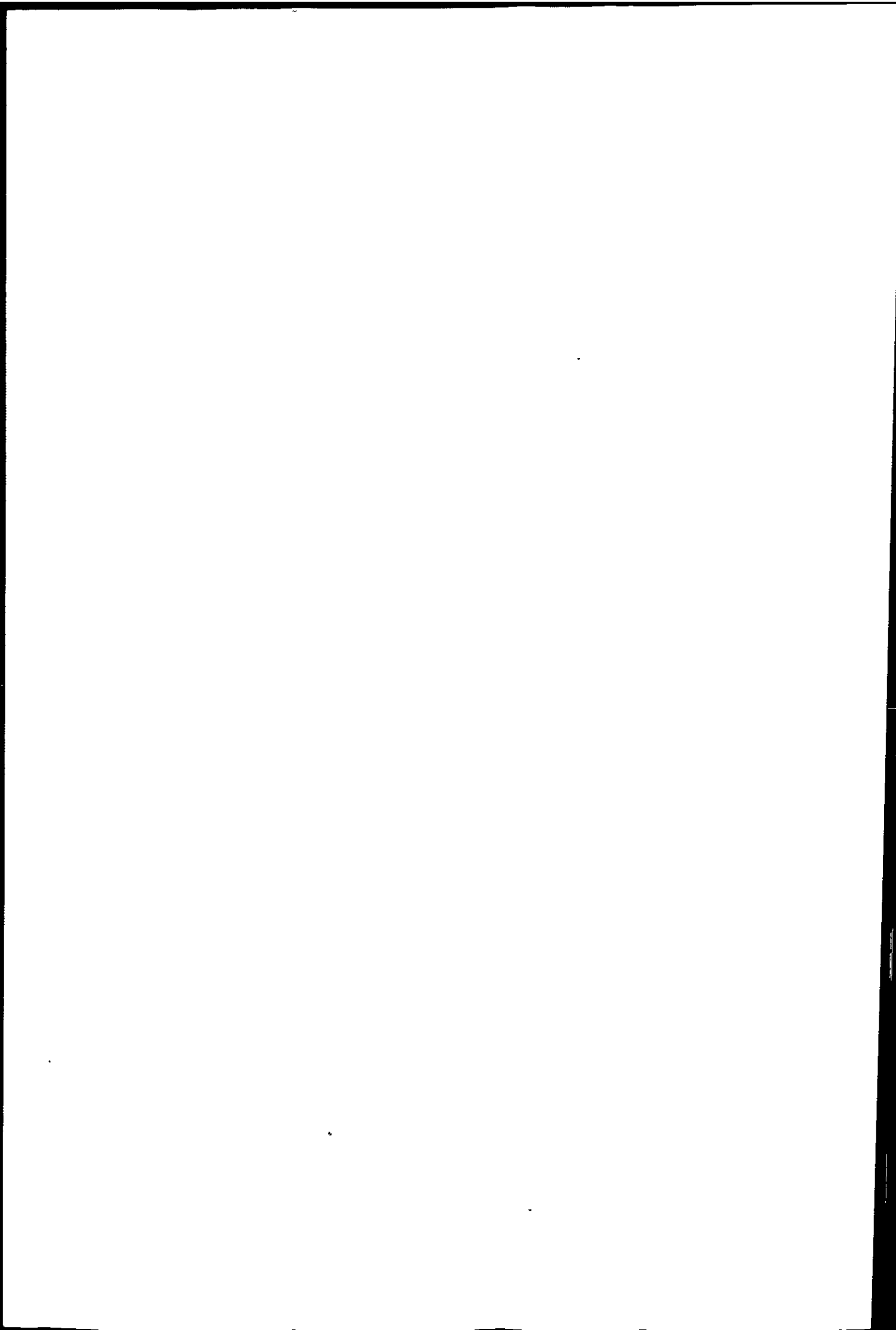
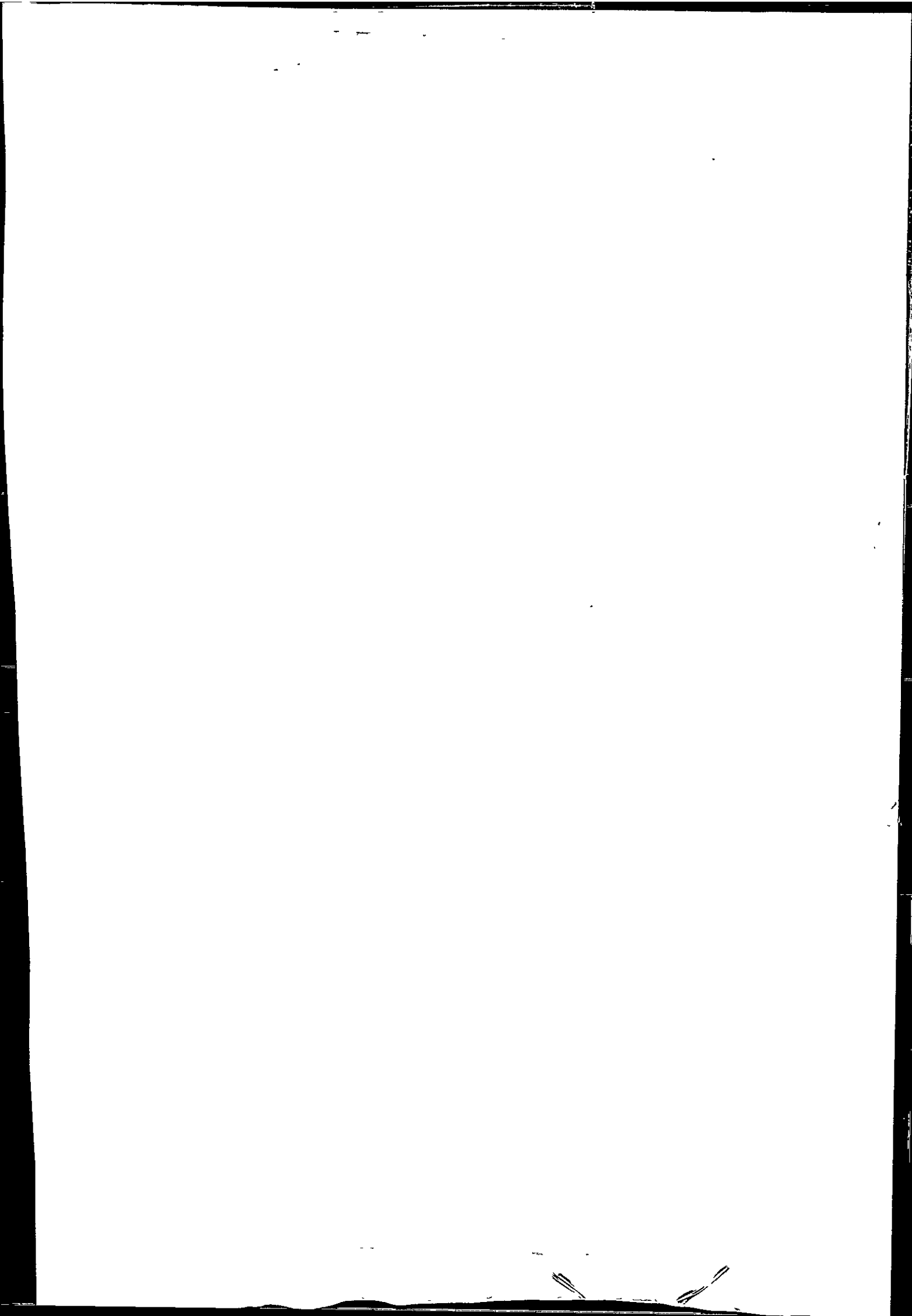
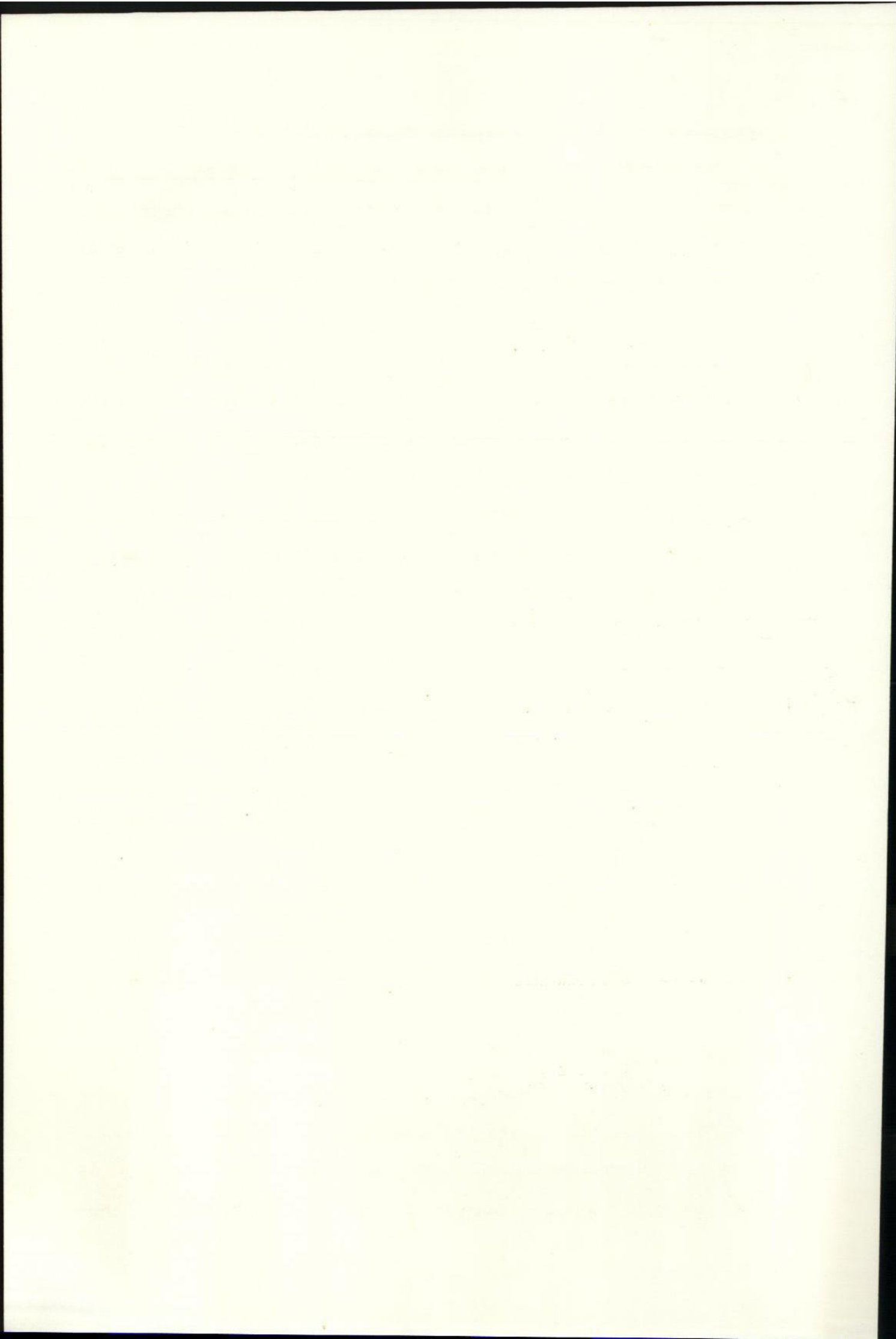


Plate 5G: Plymouth, Devonport and Stonehouse, lithographed and published by H Maddock in 1881.









commenced beyond, into the parish of Compton Gifford.

The details of building densities as well as the density of Plymouth's population (Chapter Three) demonstrate most clearly the consequences of the pressure exerted on land available for housing. Overcrowding caused a considerable health risk in houses ill-served with drainage and water supply and, created serious public health problems in Plymouth which are considered in Chapter Eight. Even after the adoption of the Public Health Act in 1854, because dwellings were demolished as part of street improvement schemes, overcrowding was not reduced much before the 1870s.

Figure 5.1, compiled from a series of contemporary street maps, indicates the age of housing and the physical expansion of the three towns. Although this map is obviously a generalisation masking much of the detailed local variation in the ages of Plymouth's buildings, it does enable some of the key elements in the nature of the town's expansion to be highlighted. The apparently piecemeal development reflects both the extension along main thoroughfares and the sale of blocks of land for house construction already identified. The original three towns and the village of Stoke can be clearly seen, and the expansion along the main arterial routes, particularly between Plymouth and Stonehouse following the construction of Union Street.

The increase in the rateable value of the borough of Plymouth underlines its physical expansion (see Table 5.2), while the number of assessments increased from 7,003 in 1861 to 10,925 in 1890. These figures do not take into account the impact of inflation but they do offer an indication of both the increase in the absolute number of dwellings and the aggregated value of those dwellings in Plymouth. The highest rateable values in Plymouth in 1871 (Figure 5.2) were to be found in the main shopping streets, Bedford Street and George

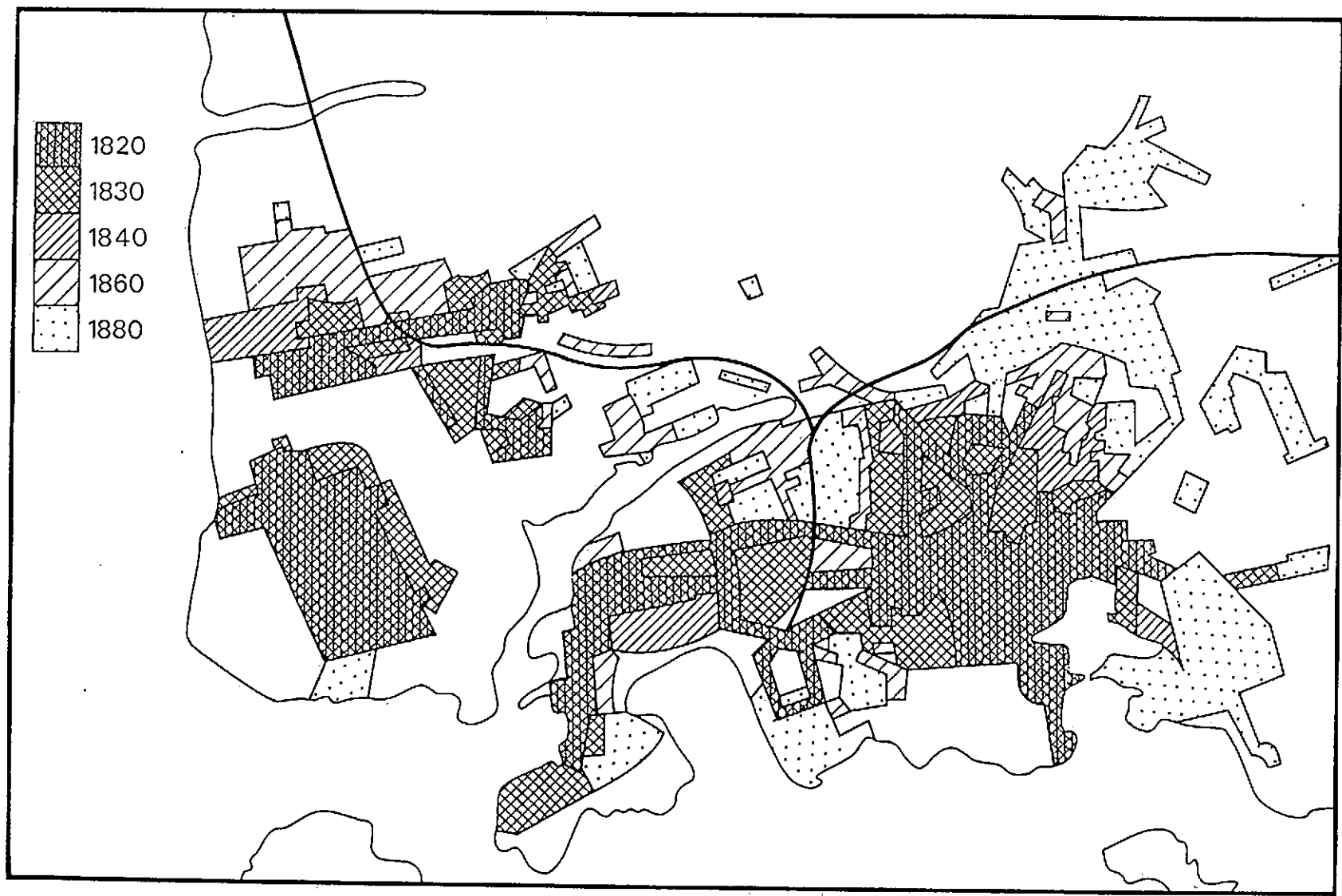


Figure 5.1: The physical expansion of Plymouth, Stonehouse and Devonport in the 19th century.

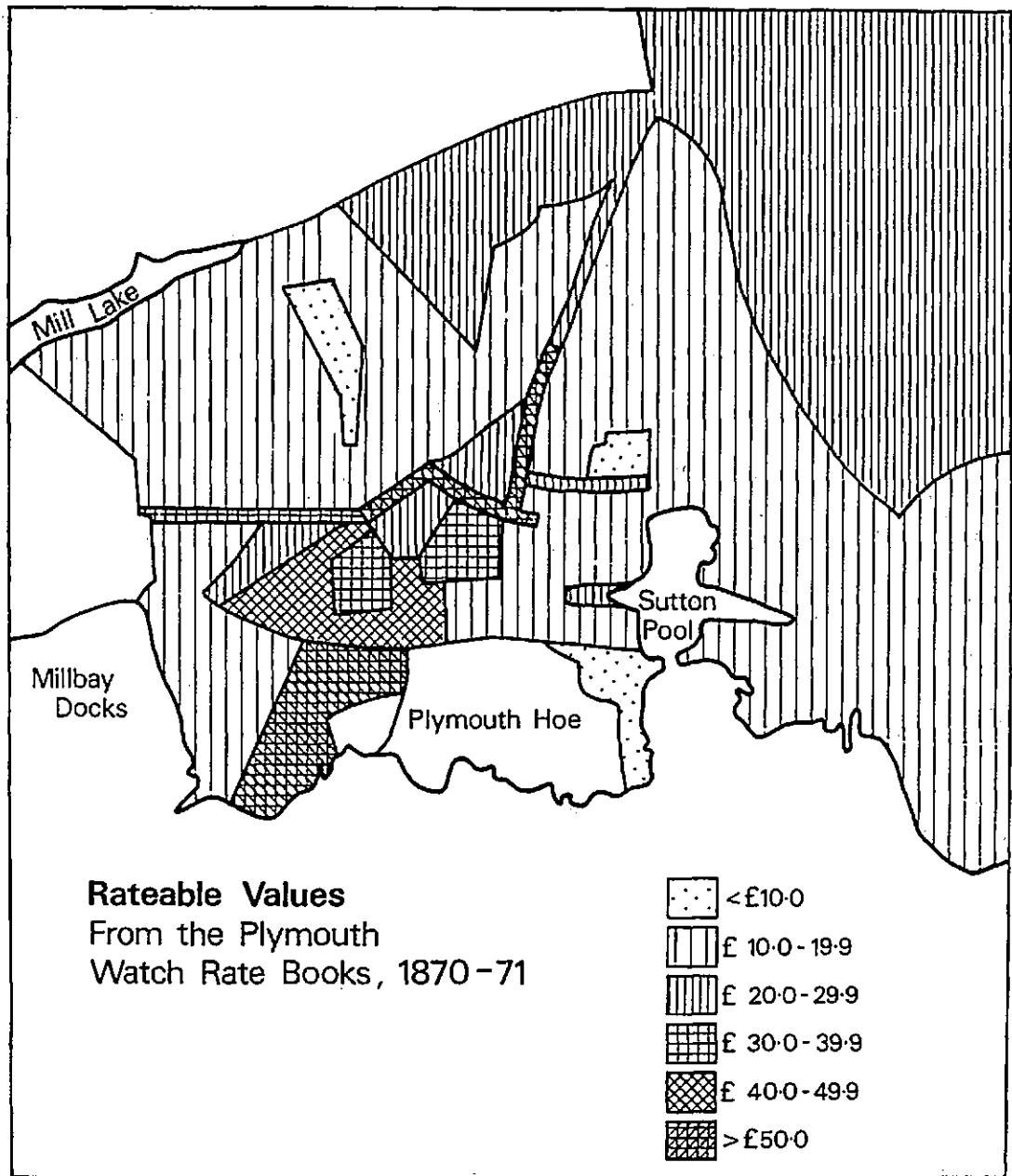


Figure 5.2: Rateable values, from the Plymouth Watch Rate Books, 1870-71.

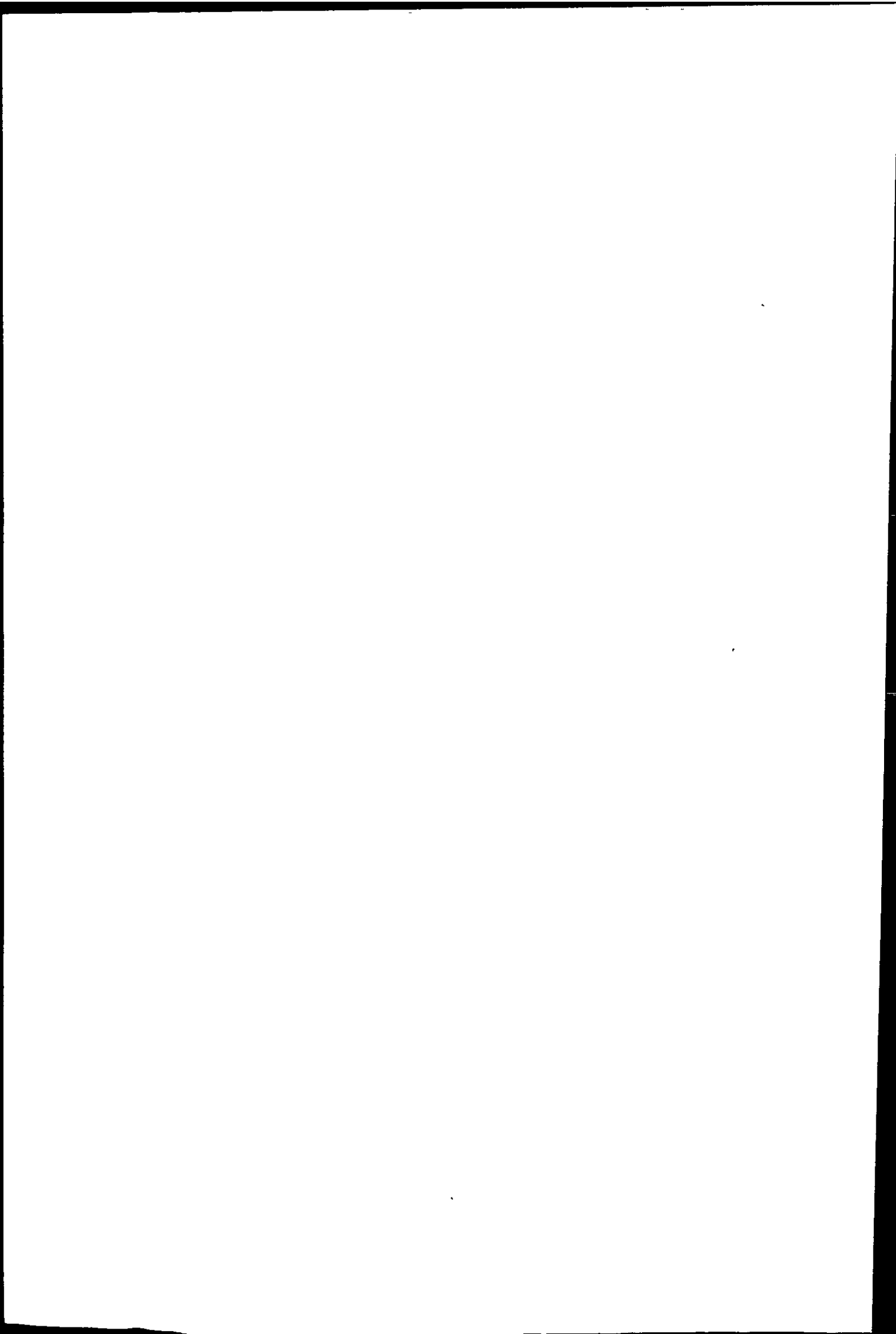


TABLE 5.2: The rateable value of Plymouth

1821	£28,983	1861	£127,184
1831	£36,923	1871	£165,953
1841	£76,000	1881	£193,845
1851	£101,818	1890	£297,999

Source: R N Worth, A History of Plymouth, 1890.

Street (average: £80.33), and Old Town Street and Whimble Street (£56.53); Union Street (£38.16), Treville Street (£28.91) and Tavistock Road (£26.37) also stand out. Rates for the greater part of Plymouth were between £10 and £20, with the exception of the sector to the southwest of the central area which contained high value residences, principal hotels and the Theatre Royal.

The information on housing stock which may be obtained from the census abstracts (Table 5.3) is especially useful in the context of this thesis. This gives the number of inhabited houses, from which may be calculated the rate of increase in the housing stock, and the

TABLE 5.3: Mid-Victorian housing in Plymouth and East Stonehouse

	Inhabited	Rate of increase*	Uninhabited	Being built
1851:				
Charles	2012	21.5	127	61
St Andrew	3159	18.5	120	115
Stonehouse	1172	9.6	49	6
TOTAL	6343	17.7	296	182
1861:				
Charles	2421	20.3	83	56
St Andrew	3663	16.0	138	47
Stonehouse	1245	6.2	18	.
TOTAL	7329	15.5	239	103
1871:				
Charles	2927	20.9	223	37
St Andrew	4362	19.1	310	12
Stonehouse	1340	7.6	43	.
TOTAL	8629	17.7	579	49

\* Rate of increase over previous decade.

Source: Published census abstracts



number of houses uninhabited or being built at the time of the census, though these data only indicate the prevailing situation for a single day once in ten years. Nevertheless, when mapped, the data (Figures 5.3 & 5.4) give an indication of the areas of housing development at the time of the 1851 and 1871 censuses. While the increase in housing stock continued unabated, the rate of population growth was falling in the 1860s and this eased the population per house ratio slightly. But one possible explanation for this reversal, which will most likely have had a crucial impact upon the population growth rate, was the extension of the built-up area beyond the town boundaries.

## 5.2 Infrastructural development

The improvement of the regional and local road network was an important prerequisite to Victorian prosperity, and in the late 18th and early 19th centuries a series of Turnpike Acts resulted in better roads to the north, east and west of the three towns. Ferries were established across the rivers Plym and Tamar to link the road network. Union Street was, and still is, the principal artery between Plymouth and Stonehouse (Plates 5H & 5I); it was constructed around 1816 and remained turnpiked at the boundary of the two towns until September 1843. Mill Bridge was built across the Stonehouse Creek in 1773 to connect Fore Street, Stonehouse, with Devonport. Laira Bridge was opened in 1827; designed by Rendel, it crossed the narrowest part of the Cattewater to Plymstock and was, at that time, the second longest iron bridge in Britain.

There were, however, four major infrastructural developments which

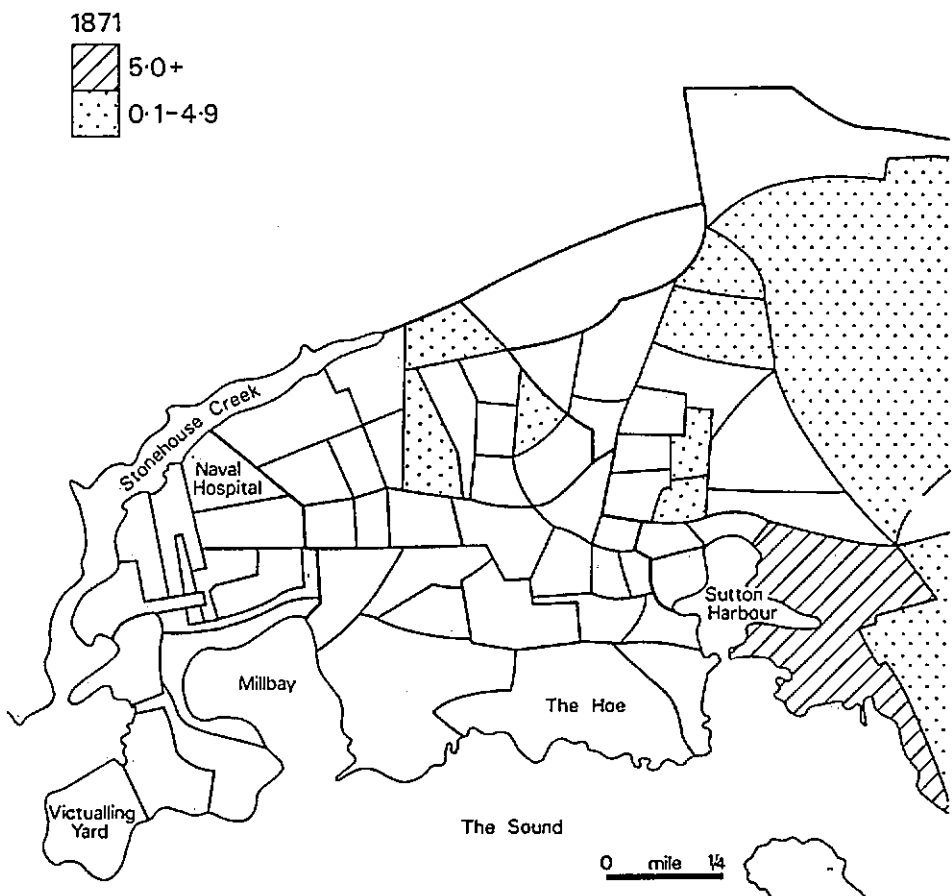
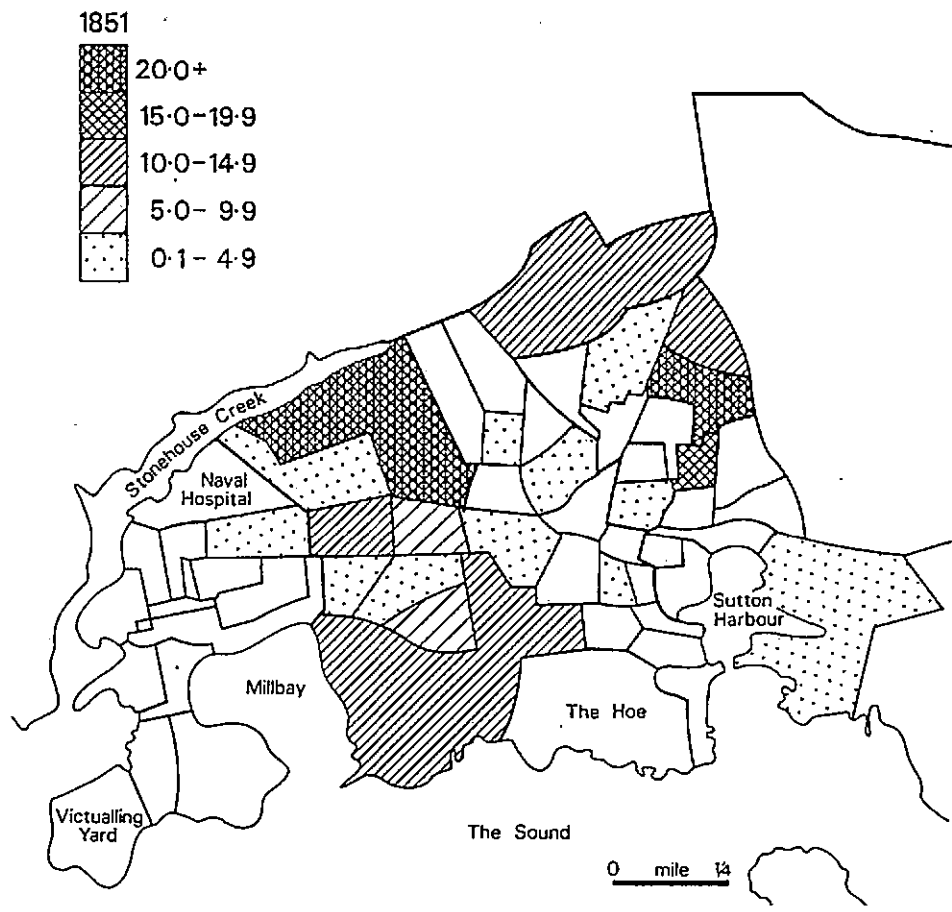
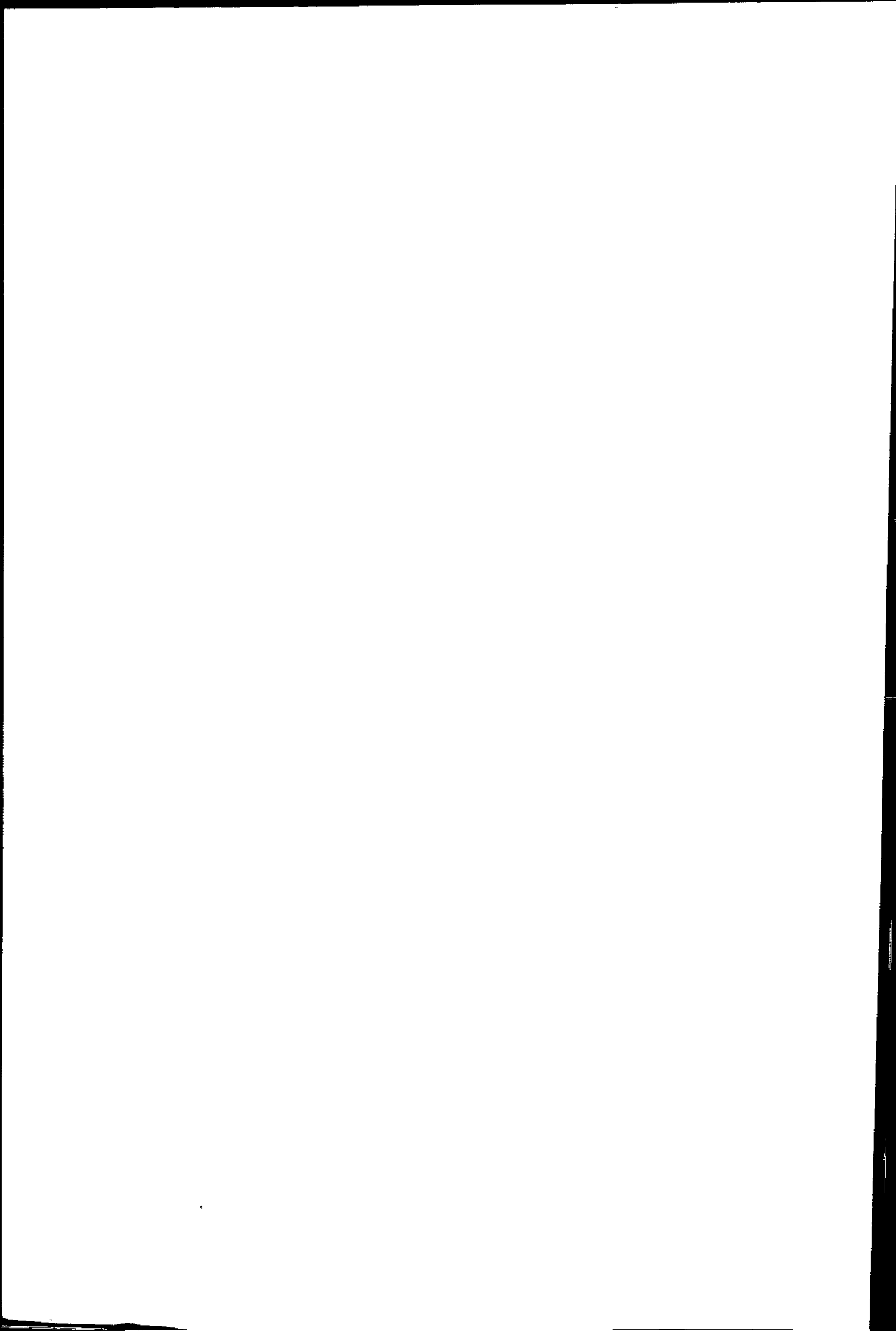


Figure 5.3: The number of houses being built as a percentage of built housing stock in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the published census data.



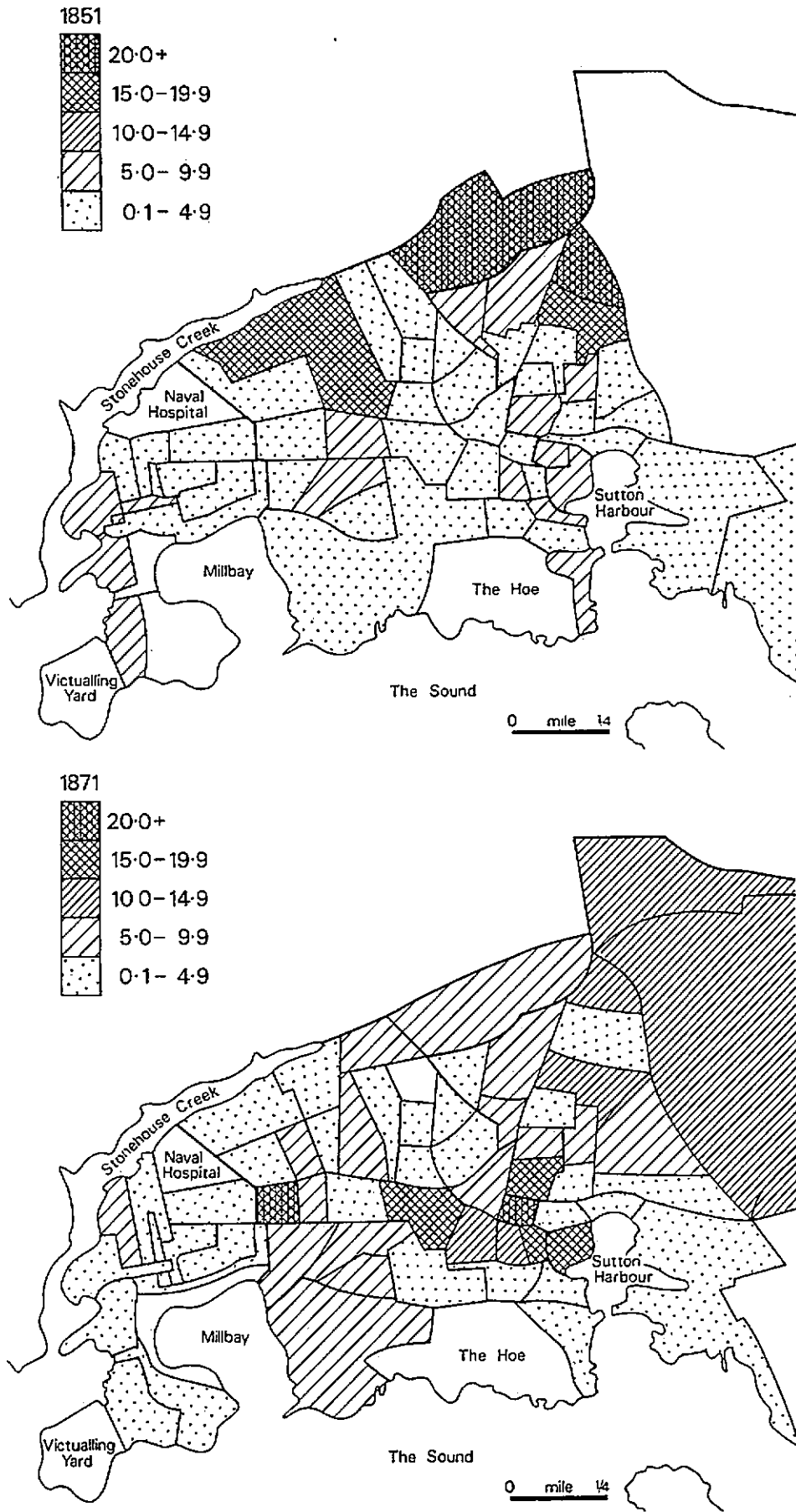


Figure 5.4: The number of uninhabited houses as a percentage of built housing stock in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the published census data.



Plate 5H: Union Street c1892, looking west towards Stonehouse from the railway bridge. Photographer: Francis Frith.

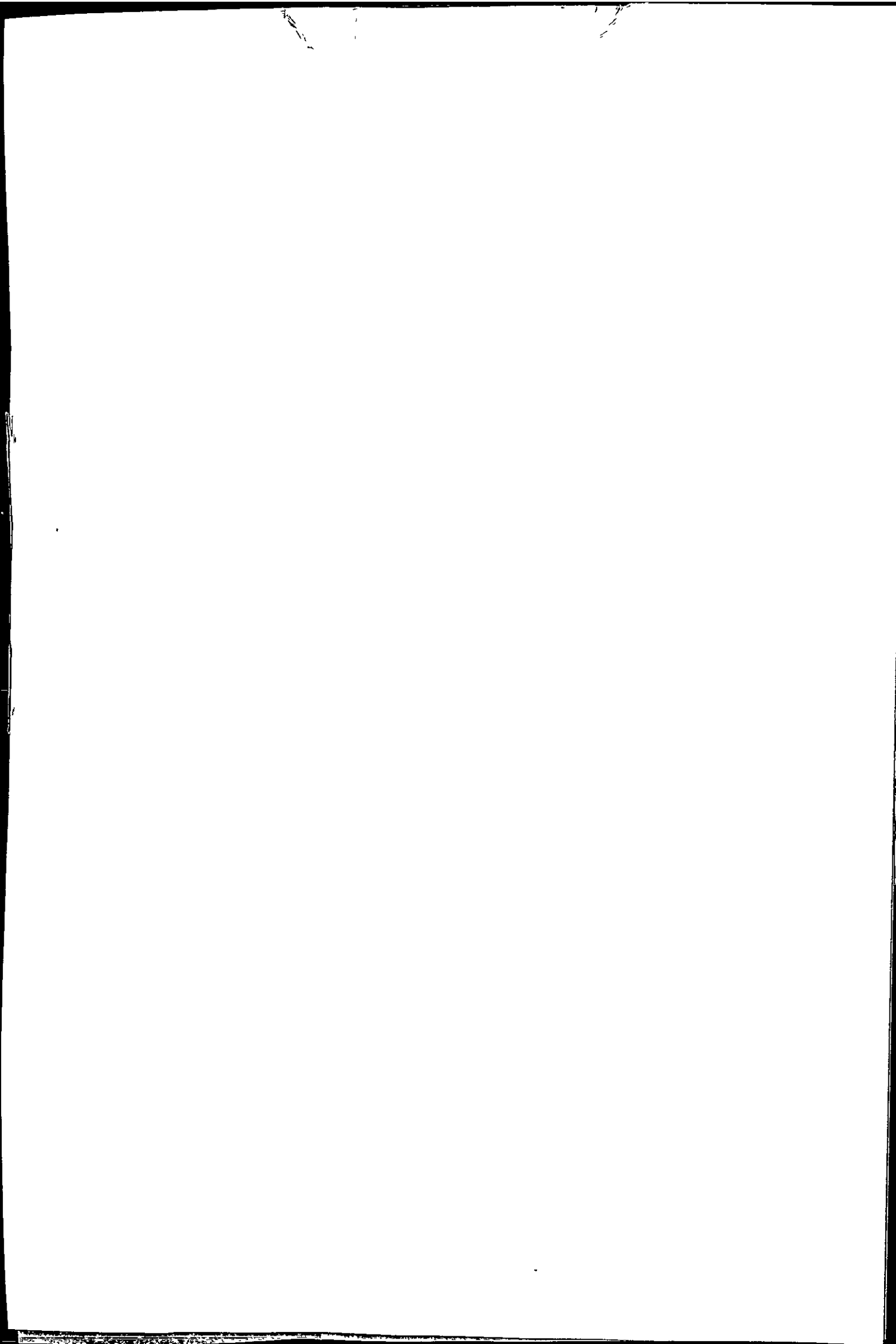
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Plate 5I: Union Street looking east towards Plymouth from the railway bridge. Probably also taken by Frith, c1892.







radically improved Plymouth's prospects for economic and demographic expansion in the 19th century. Their links with the social and demographic changes taking place in mid-Victorian Plymouth are seen as particularly germane to the central concerns of this thesis.

The construction of the Breakwater provided Plymouth with one of the largest sheltered anchorages in Britain. Due to the prevailing southerly and westerly winds, the Sound was of limited use to shipping, the natural inlet at Millbay being too exposed to be useful. The engineer John Rennie recommended building a mile-long breakwater about two and a quarter miles to the south of the Hoe along a ridge of submerged sandbanks. Work commenced in 1812 and, even before its completion, it was providing a valuable sanctuary for vessels escaping storms. Built of limestone and dovetailed granite blocks, the Breakwater was completed in 1840 at a total cost of £1.5 million. Its construction paved the way for a period of greater prosperity when Plymouth was able to take full benefit of expanding overseas links in Victorian times and become a major port.

The medieval harbour of Sutton Pool was improved to keep pace with trade expansion and technological improvement, preserving its role in the commercial activity of the town, and both responding to and encouraging increased business. The piers across the entrance to the harbour were constructed in 1791 and 1799 but their value was questionable for they reduced the tidal flow and caused the harbour to silt up (Gill, 1976). With a growing population adding sewage to the problem, action had to be taken and there followed a series of company formation, reformation and takeover which culminated in the Sutton Harbour Improvement Company.

The Admiralty refused permission in 1845 for Sutton Harbour to be made into a dock but, during the 19th century, quays and wharfs were built and widened to cope with increased traffic. Overseas trade links were established with the West Indies, North America, New Zealand, the Baltic and the Mediterranean, and there were consuls or vice-consuls for thirty nations in Plymouth. An imposing Custom House (Plate 5J) stands on the Parade, built in 1820 and designed by David Laing with five arches supported by rusticated piers. Large numbers of emigrants passed through Sutton in the 19th century en route to North America, South Africa, New Zealand and Australia. A Government Emigration Depot was set up at Phoenix and Commercial Wharves in 1842, and Plymouth was thus firmly established as an emigration port, given impetus by the flood of Irish migrants.

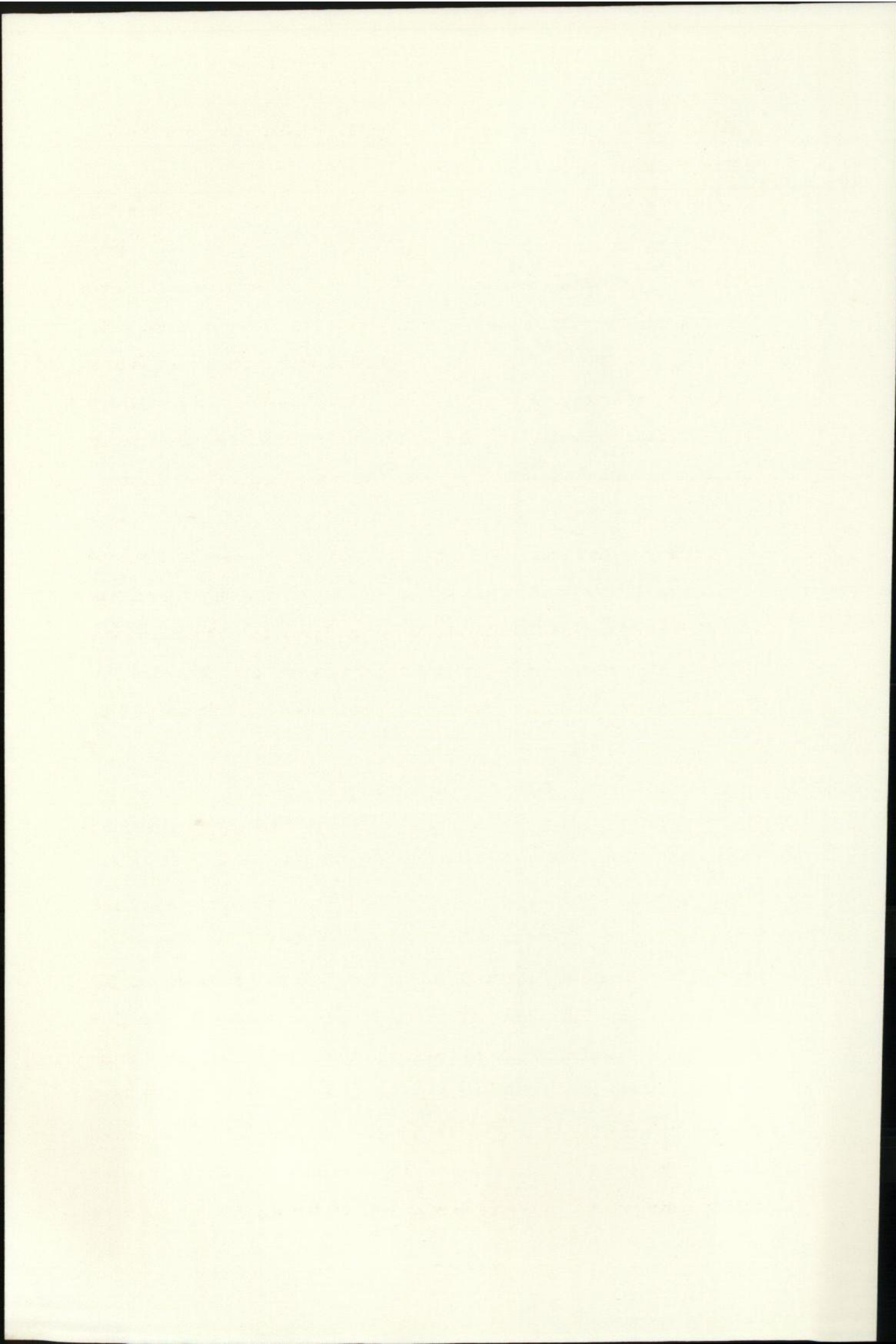
Until the development of Millbay, Sutton was the unrivalled commercial centre of the town. Millbay handled more tonnage from 1851 but did not take more ships for another decade; Sutton was better equipped to receive the smaller vessels. The fishing industry, however, remained Sutton's own preserve, by law all the port's fish catches were landed on the Barbican, although a covered fish market was not built until the 1890s.

The arrival of the railway was a major turning point in Plymouth's history, its significance for freight and passenger transport cannot be overstressed: whole new markets were opened up, in Britain via connection with the national distribution network and abroad by providing faster access to markets for imports and exports through the port. The Great Western Railway put up one third of the money for the South Devon railway linking Exeter and Plymouth. It reached the edge of Plymouth in 1848 with a temporary station at Laira, and Millbay

Plate 5J: The Sutton Harbour Custom House designed by David Laing and  
built in 1820.





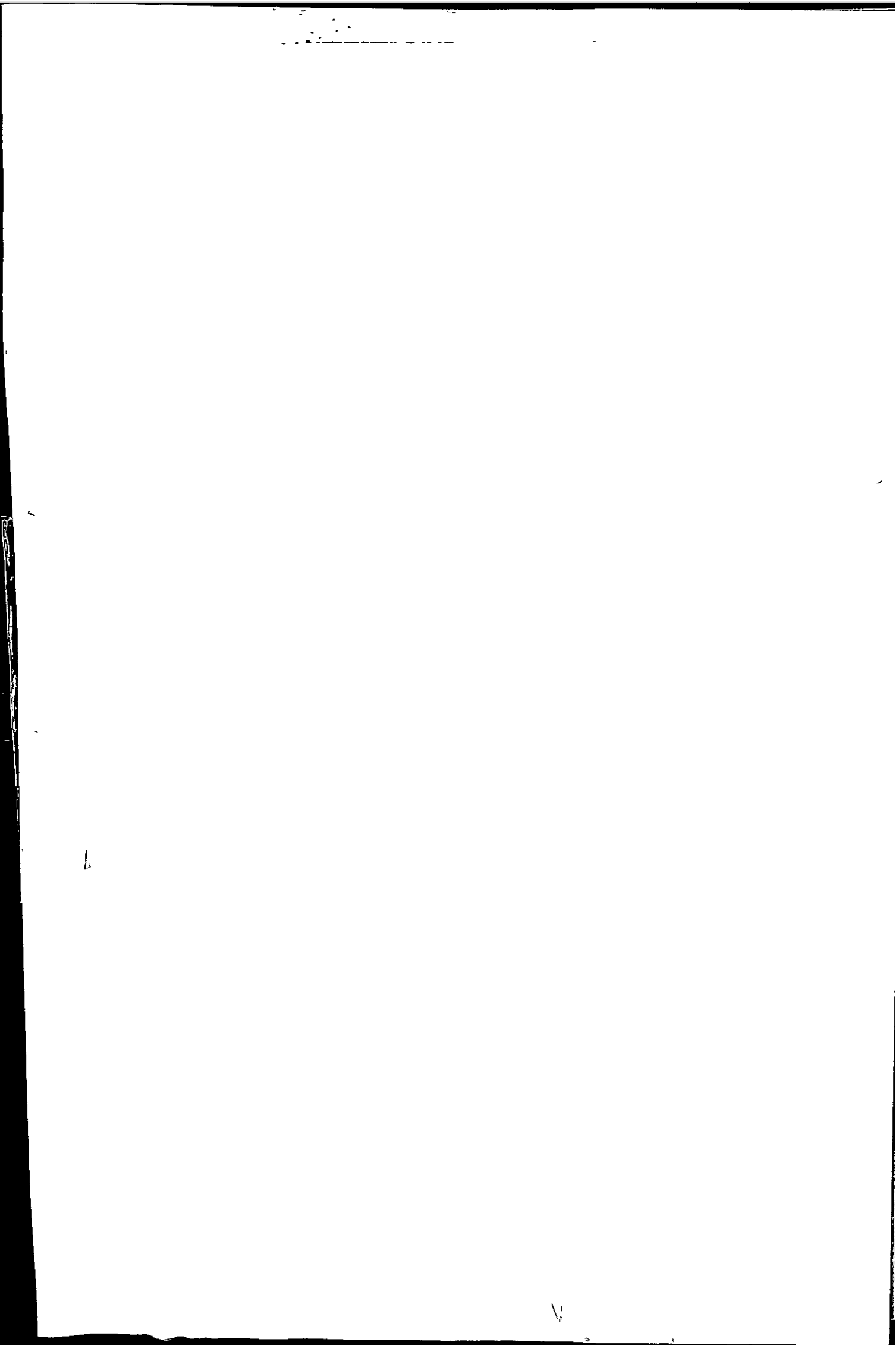


station (Plate 5K) was opened on April 2, 1849. The town was now within six hours of London.

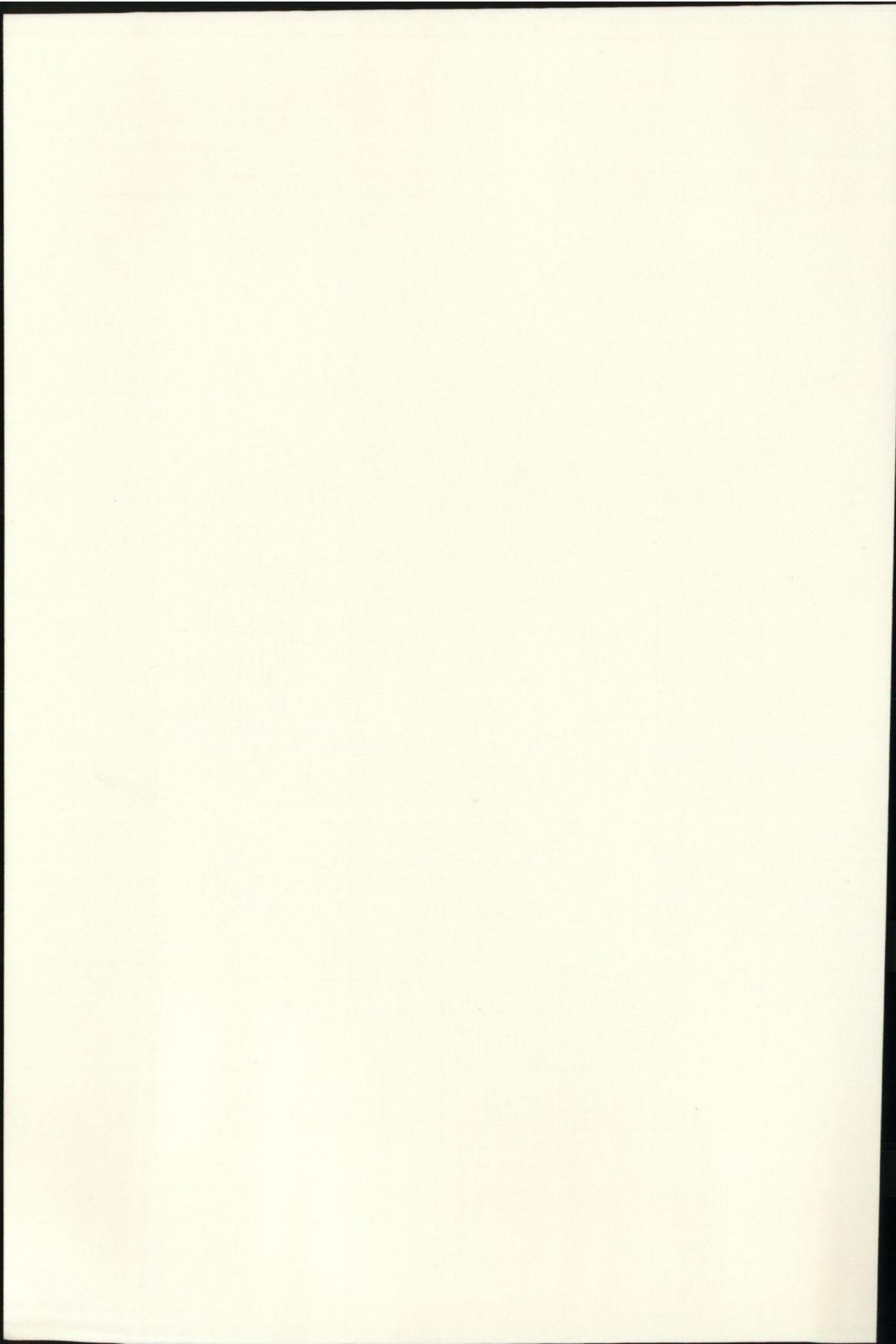
A small extension to serve Millbay docks was opened in 1850, in May 1853 the Sutton Harbour branch of the SDR was opened, and a branch line serving Cattedwater opened in 1878-9. The northward expansion of the town was acknowledged when Mutley station was opened on August 1, 1871 (Liddle, 1980). In 1859 the railway was carried west (via a station at Devonport) across the Tamar (and Brunel's Royal Albert bridge) into Cornwall, joining the line to Penzance; the line to Tavistock was completed the same year (Figure 5.5, after Simmons, 1959-60). Three hotels were built to serve the new trade generated by the railway: the Duke of Cornwall (1863) can be seen in Plate 5K overlooking Millbay station (it was described by Sir John Betjeman as the finest Victorian Gothic building in Plymouth). The Albion was also built close to the station, and the Grand on the West Hoe in 1880. The town already boasted the Royal Hotel built in 1811-13 to John Foulston's design.

The development of a second harbour at Millbay with deep-water docking facilities further strengthened Plymouth's growing port economy. Until the mid-18th century Millbay was a natural inlet in a rural setting. Thomas Gill built small quays in the early 19th century to serve his limestone quarries on the West Hoe; he completed the 500 foot long Millbay Pier, designed by James Rendel, in 1844 (Plates 5L & 5M). When the Admiralty refused permission for lock gates at Sutton in 1845, the way was clear for the formation of the Great Western Dock Company in the following year and Brunel was appointed to design the docks. The design for the new docks comprised a partially dredged outer basin with quays on the east side of the bay, and an enclosed

Plate 5K: Millbay railway station overlooked by the Duke of Cornwall  
Hotel. Photographed by Rugg Monk, c1898.







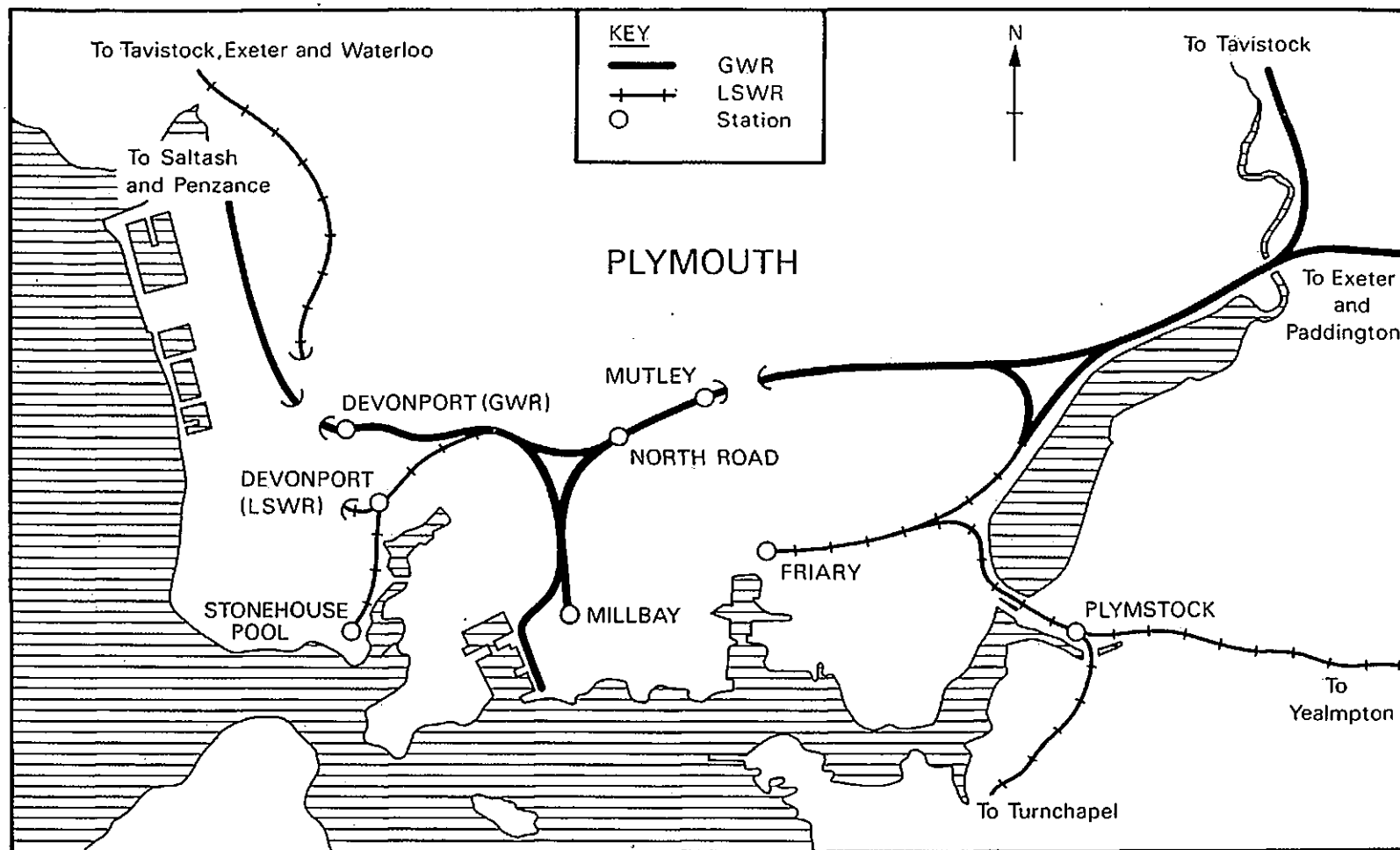


Figure 5.5: Plymouth's railway network in the late-19th century.



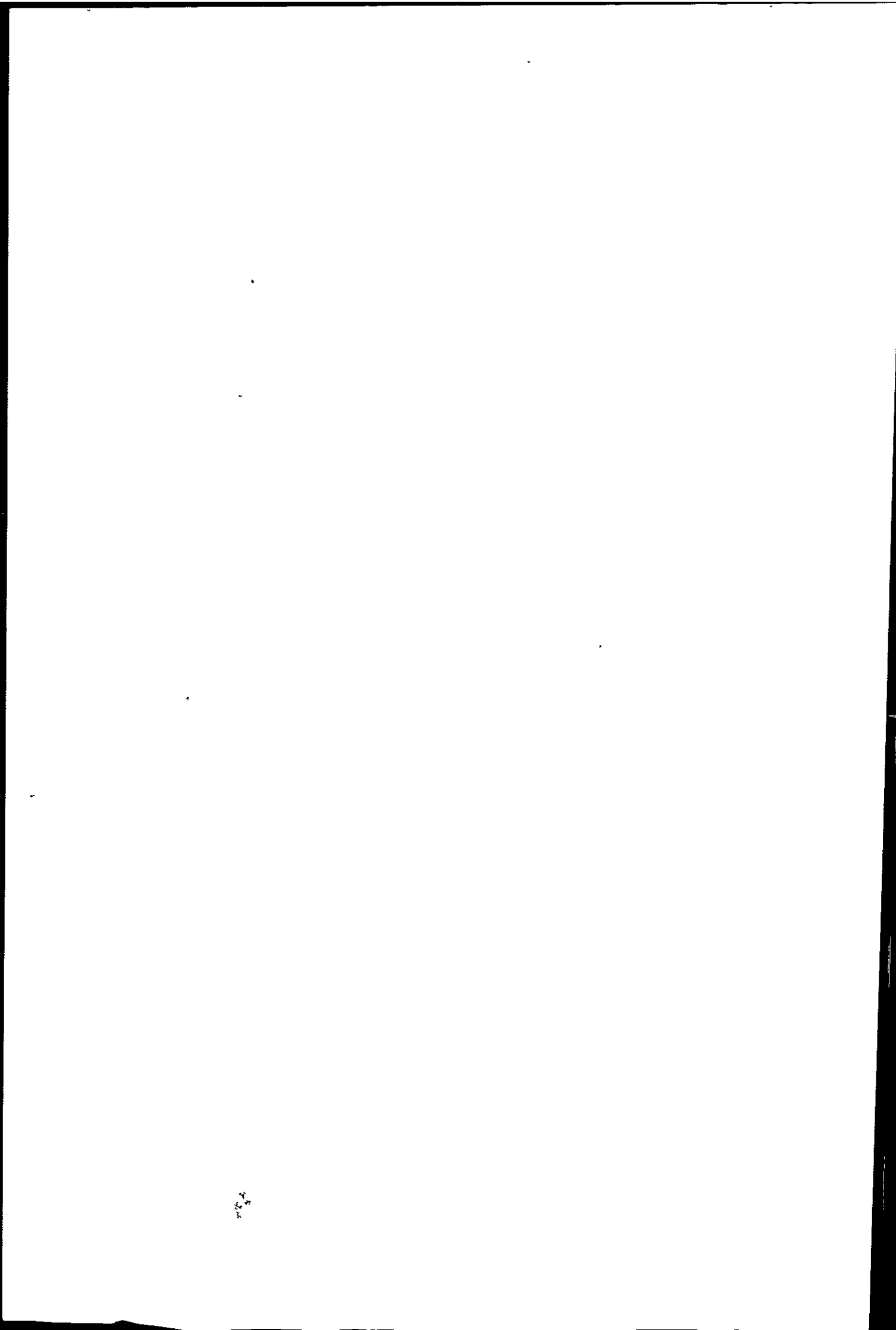
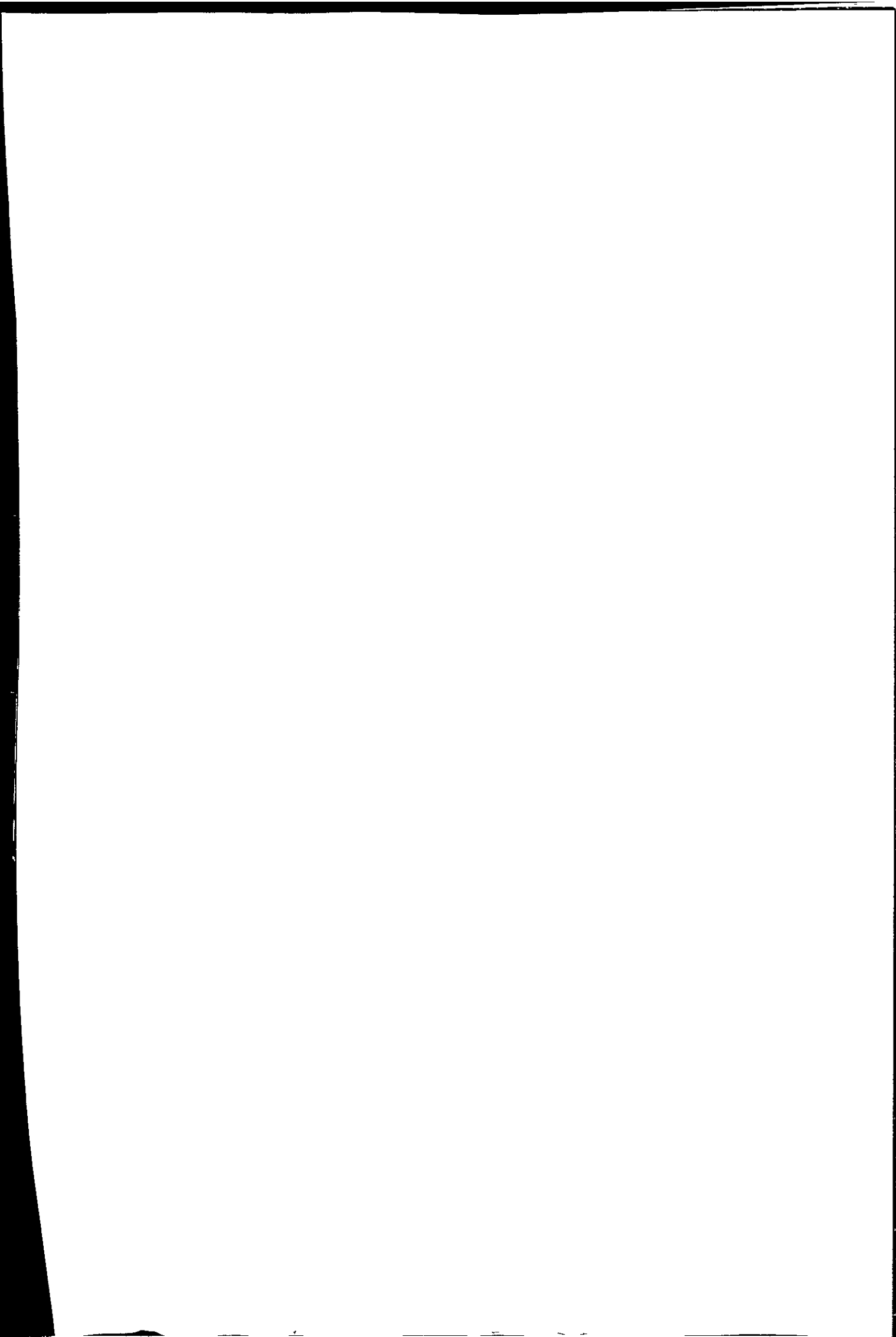
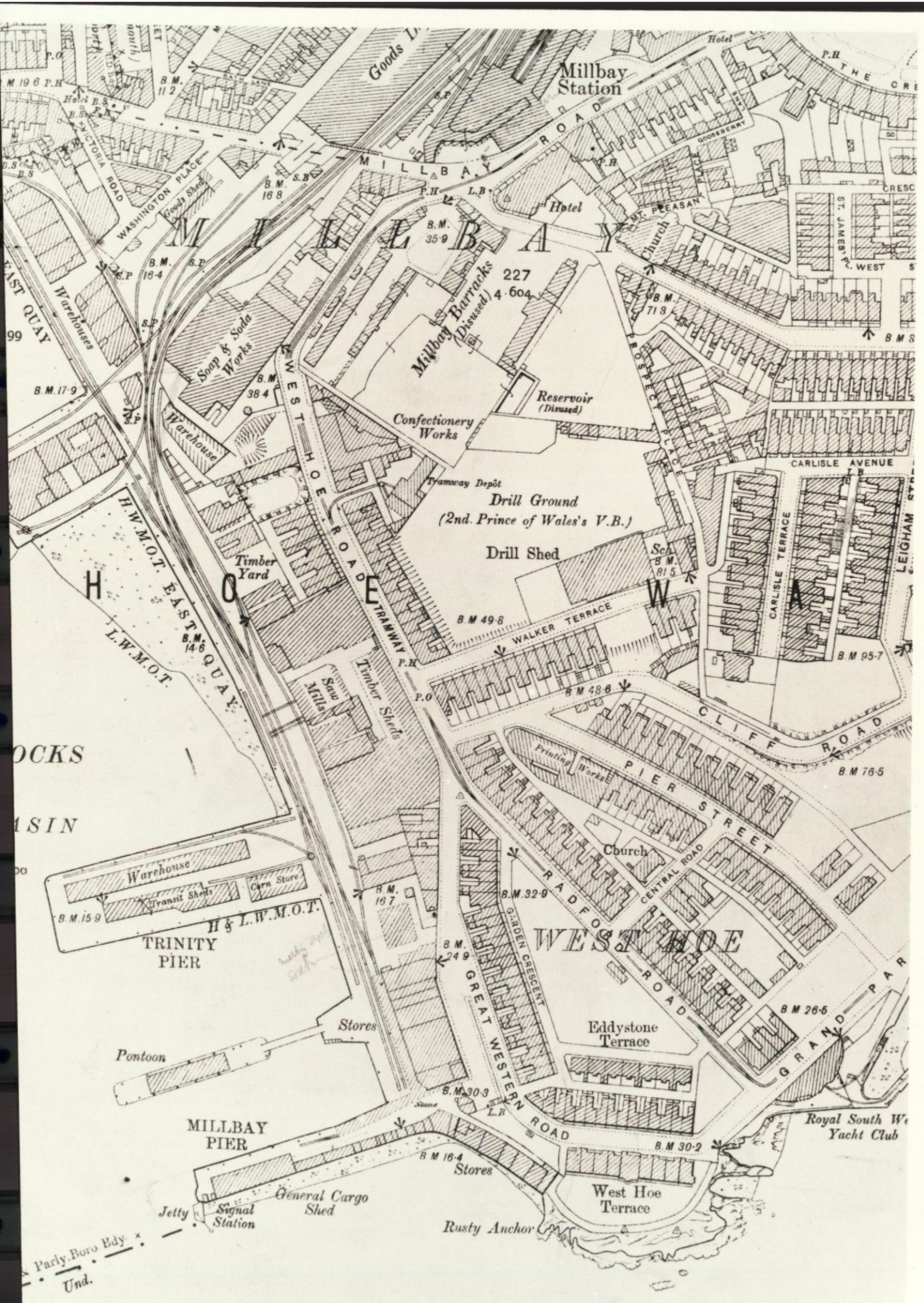


Plate 5L: The eastern side of Millbay Docks and the West Hoe area  
showing Millbay railway station. OS 1:2500, 1892.





Millbay Station  
MILLBAY ROAD  
MILLBAY

Hotel  
Church  
227  
4.604  
Reservoir (Disused)  
Confectionery Works  
Tramway Depot

Drill Ground  
(2nd. Prince of Wales's V.B.)  
Drill Shed

Goods Yard  
Warehouse  
Soap & Soda Works  
Warehouse  
H.W.M.O.T. EAST QUAY  
L.W.M.O.T.  
Timber Yard  
Saw Mills  
Timber Slads

OCKS  
SIN

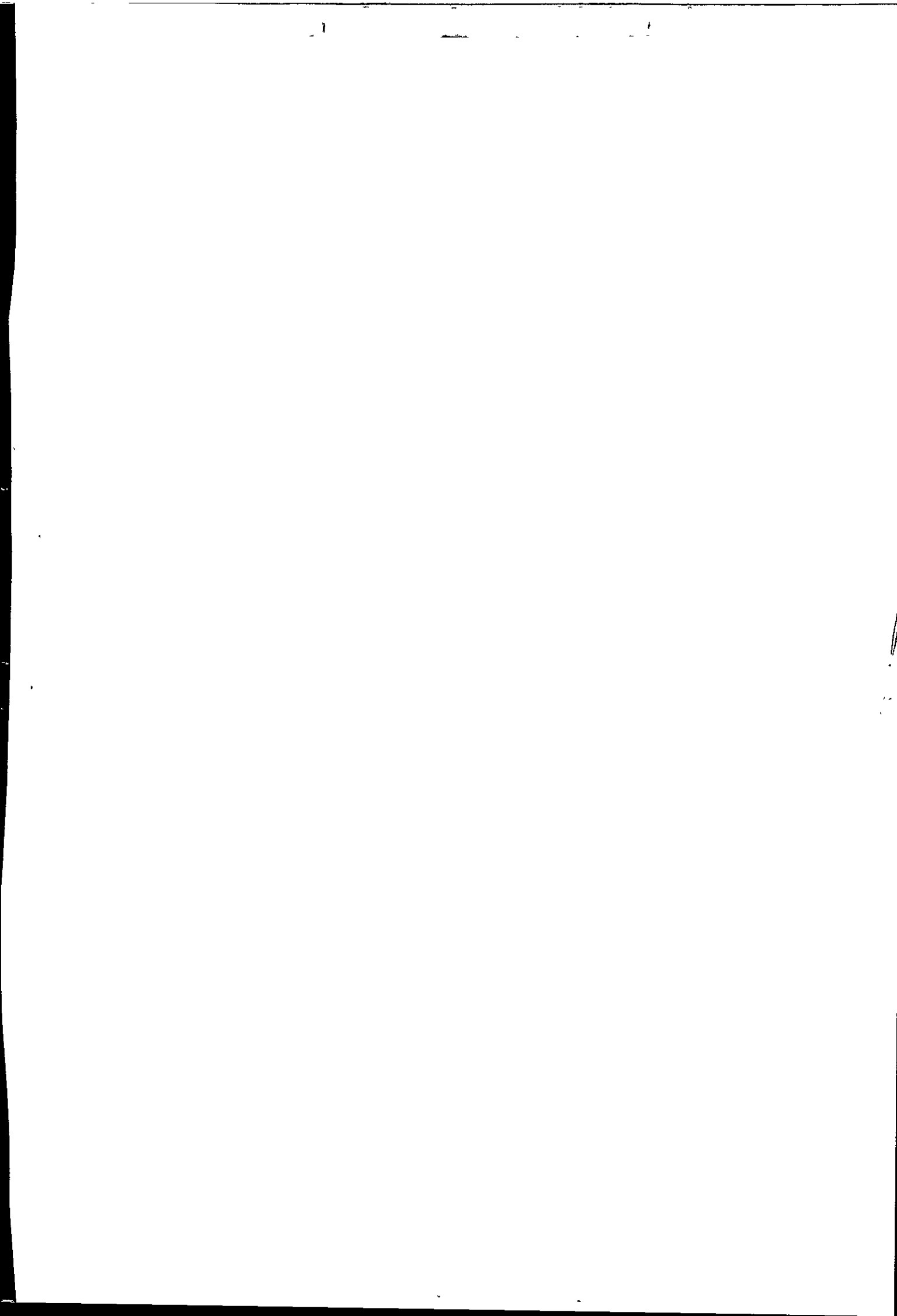
Warehouse  
Transit Sheds  
Corn Store  
H & L.W.M.O.T.  
TRINITY PIER

Pontoon  
Stores  
MILLBAY PIER  
General Cargo Shed  
Signal Station  
Jetty  
Partly Boro Eddy  
Und.

Walker Terrace  
Cliff Road  
Pier Street  
Church  
Printing Works  
WEST HOE  
Eddystone Terrace  
Royal South West Yacht Club  
West Hoe Terrace  
Rusty Anchor  
B.M. 496  
B.M. 486  
B.M. 815  
B.M. 957  
B.M. 765  
B.M. 159  
B.M. 197  
B.M. 329  
B.M. 249  
B.M. 303  
B.M. 164  
B.M. 302



Plate 5M: Millbay Docks looking east towards Trinity Pier (far left) and Millbay Pier (right). The fine houses of the Esplanade, facing the Hoe, can be seen in the distance.









inner basin with lock gates, including a graving dock at the west end.

The Great Western Docks were opened in February 1857.

In the late 1840s Millbay served chiefly coastal shipping, especially cattle and passenger traffic from Ireland. In 1850 customs facilities were granted and a customs house was built. The foreign trade potential was greatly improved and Millbay gained Government Mail contracts because the rail link to London was quicker than that from Southampton. The Pier Hotel was completed in the same year, taking full advantage of the new link with Millbay railway station. As the docks became established, they first handled larger ships than Sutton, and then took a larger share of the total number of vessels. The early business of immigrant and packet ships was eclipsed by the ocean liner traffic which started in the 1870s.

### 5.3 Public buildings and public space

The ambitious development schemes described in the previous section exerted a profound influence upon the morphology of Plymouth, as well as providing employment opportunities for in-migrants. The appearance of the townscape was also being transformed by a new enthusiasm for a style of architecture in municipal buildings which befitted the growing size and prosperity of a regional capital. Foremost among architects promoting this heightened awareness of civic status, reflected in the quality of public buildings, was John Foulston, who won a competition for the design of a new theatre, hotel and assembly rooms in Plymouth. The foundation stone for the Ionic style buildings was laid on September 10, 1811, and the work was completed in eight

years (Plate 5N).

Foulston was also responsible for the designs of Union Street, Devonport town hall (1821), St Andrews Chapel (1823), the Proprietary Library in Cornwall Street, and the Royal Union Baths (1828), and he was the architect for several housing schemes including Wyndham Square and Princess Square. Foulston's work influenced many other architects in Plymouth; his fondness for the classical style of architecture ensured its fashionability throughout the town. The work of these architects provided an important impetus to the construction trades in Plymouth which stimulated in-migration and population growth.

There are also examples of Foulston buildings in the neo-gothic style (Worth, 1890). The new Guildhall and Municipal Offices, opened in 1874, also followed this style, and the majority of Plymouth's new churches were neo-gothic, although some had a semi-classical or 'Italian' character. One follower of Foulston's classical and neo-gothic styles was Wightwick, architect for the South Devon and East Cornwall Hospital in Notte Street in 1835, relocated at Greenbank in 1884. Other constructions included the Royal Eye Hospital in Cornwall Street which moved to Mutley in 1900, and the Blind Institution, founded in 1859, which moved to its new building on North Hill in 1876. The new workhouse and prison were built at Greenbank in 1849-51.

When the new workhouse was built in 1849 it was decided that the site of the old workhouse, to the west of St Andrew Church, would be the most central site for a new guildhall and municipal offices. In 1869 plans were invited and three premiums offered for the best, the first premium being awarded to architects Alfred Norman and James Hine, of Plymouth. Early in 1870 building tenders were invited; the Council selected that of Messrs Call and Pethick for £32,475 and the

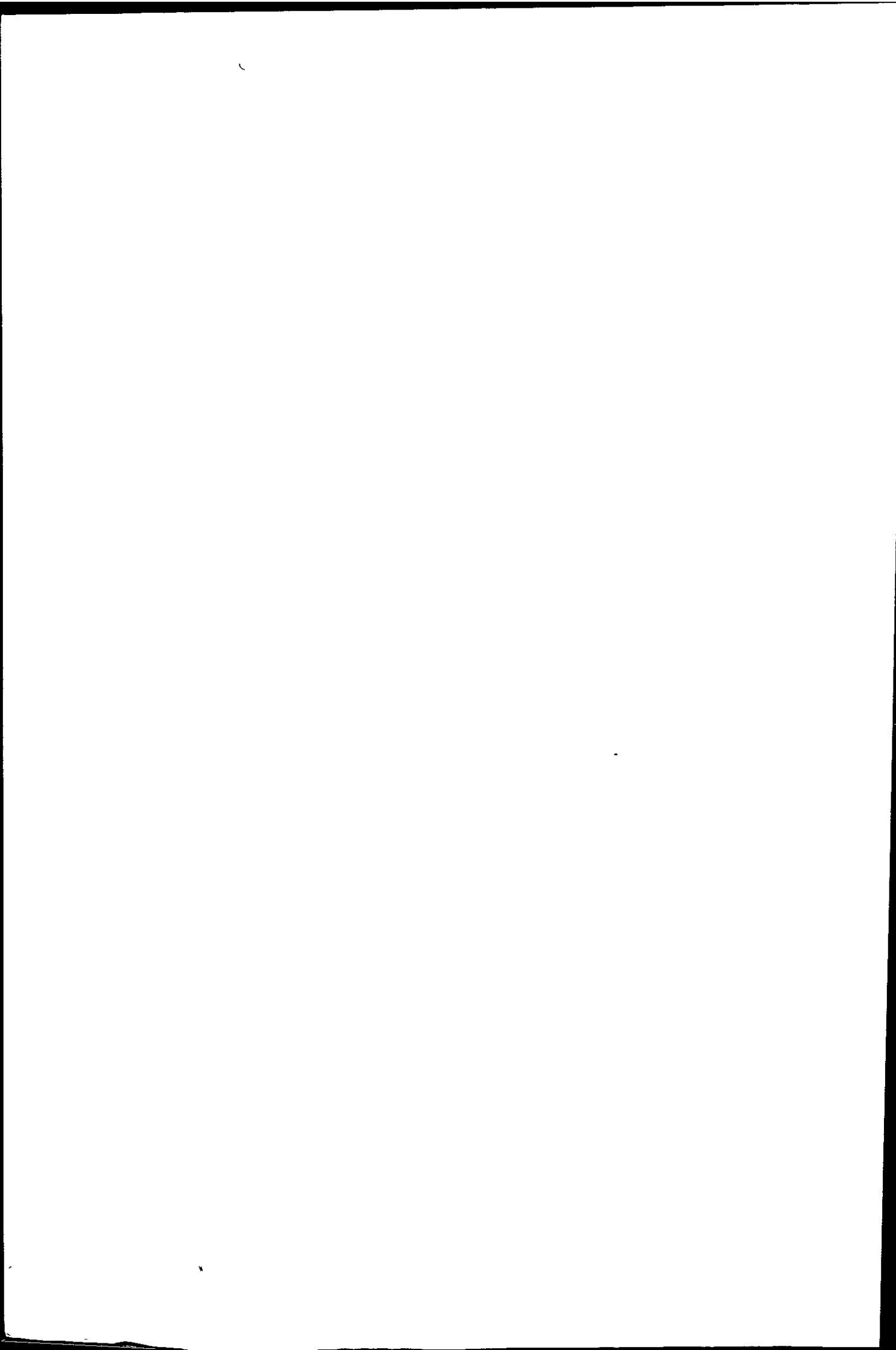


Plate 5N: The Theatre Royal on George Place, looking northeast towards George Street. The Athenaeum is on the right and Derry's Clock can be seen to the left of the Wilts & Dorset Bank.





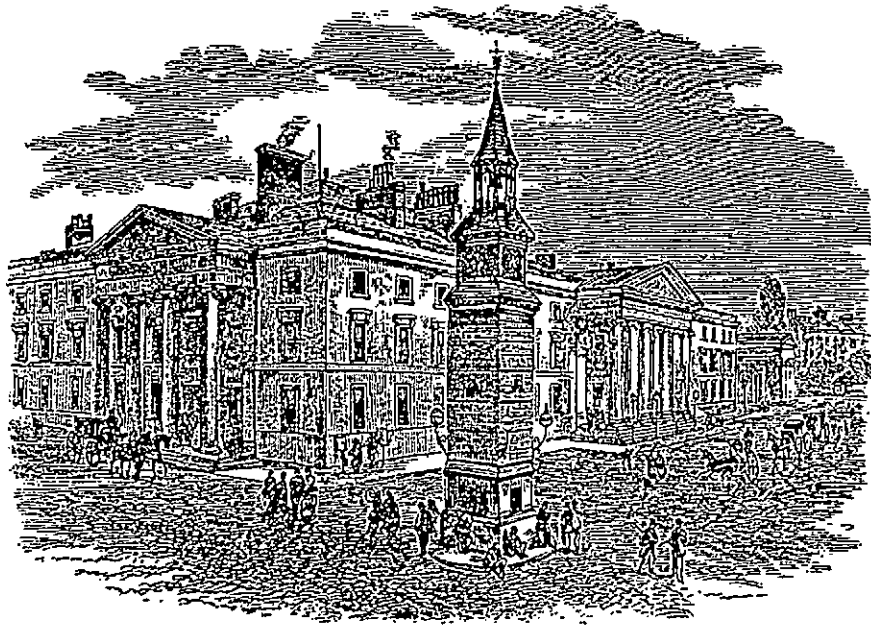




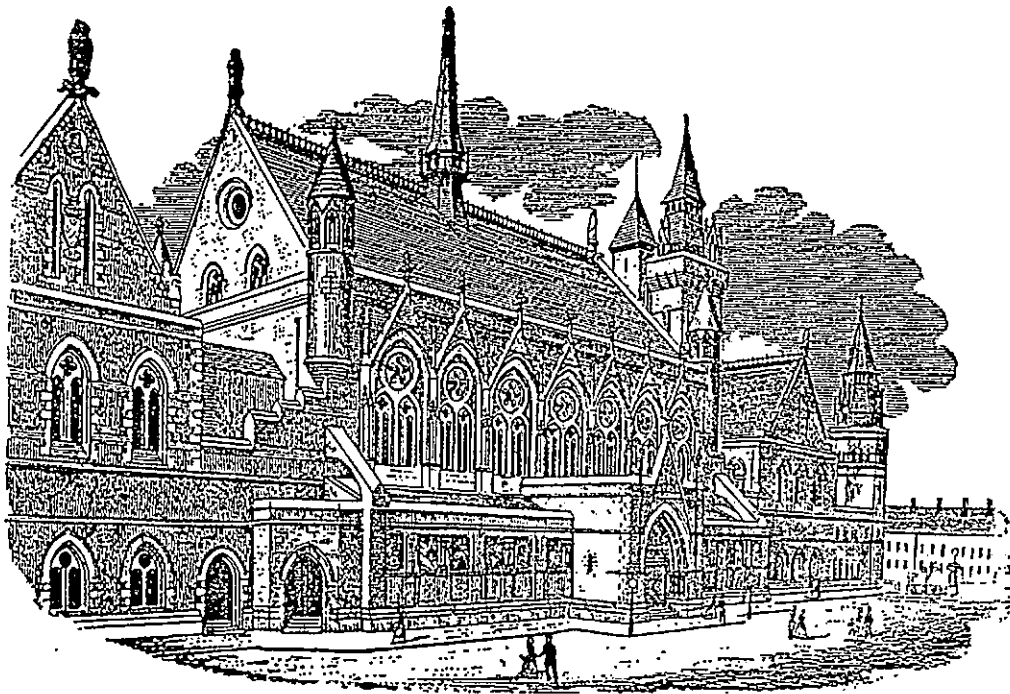
work was carried out by Plymouth's largest building firm, owned by John Pethick, though the final cost approached £50,000 (Worth, 1890). The foundation stone was laid on July 28, 1870, in an elaborate civic ceremony, and on August 13, 1874, the Prince of Wales performed the opening ceremony (Figure 5.6).

Civic investment of this kind was made possible by the substantially increased rate income produced by the rapid growth in households and dwellings in Plymouth (rateable value increased by 62.9% between 1851 and 1871) and may, therefore, be seen as an indirect response to the demographic trends outlined earlier in this thesis. The extension of education also played a part in the structural embellishment of the town and provided employment opportunities for the growing population. Most notable were the High School for girls at North Hill (1874), and Plymouth College at Compton (1877); the Technical College was opened in Tavistock Road in 1892. An important local landmark, Derry's Clock Tower, was built in George Street to contain the clock donated by William Derry, Mayor of Plymouth, 1861-63 (Figure 5.6 & Plate 5N).

In addition to the construction of new public buildings, the town authorities were also concerned with the provision of public open space. The Hoe (Plate 5P) had long been Plymouth's focal point and spiritual heart, but it was not until the 19th century that its aesthetic and recreational value was fully recognised - "a glorious playground which beguiled me to spend many hours... to the neglect of other matters..." (Emma Gifford Hardy, 1979) - perhaps because it was then that the "unbroken grandeur from Sutton Pool to Millbay" began to be eroded. Huge quantities of limestone had been quarried from the West Hoe and this was regarded as mutilation: "More has been lost in



Theatre Royal and Derry's Clock. Old Plymouth, Devon, England



Guildhall and Mechanics' Institute, Old Plymouth, Devon, England

Figure 5.6: Two views of Plymouth's public buildings in the late-19th century.

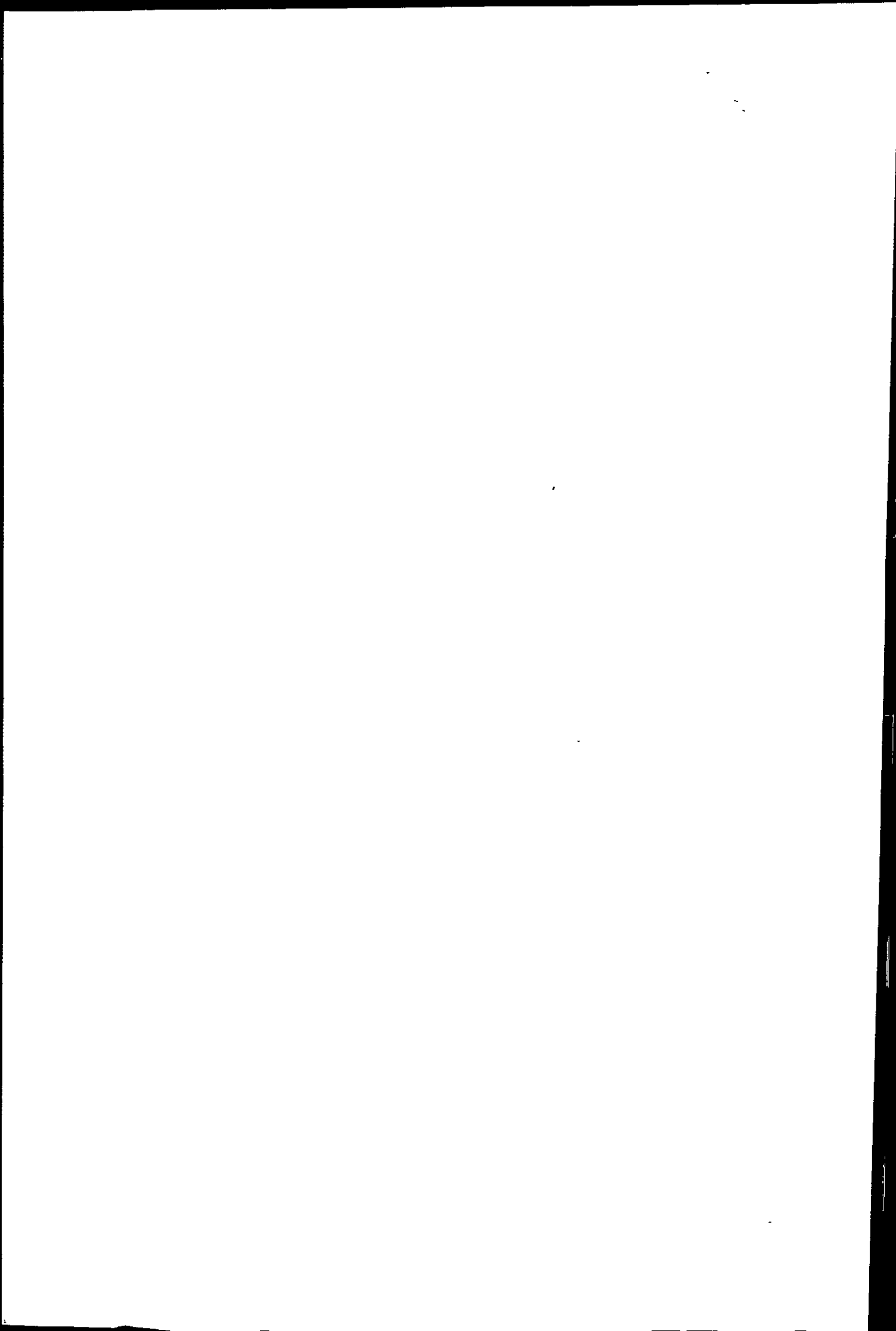
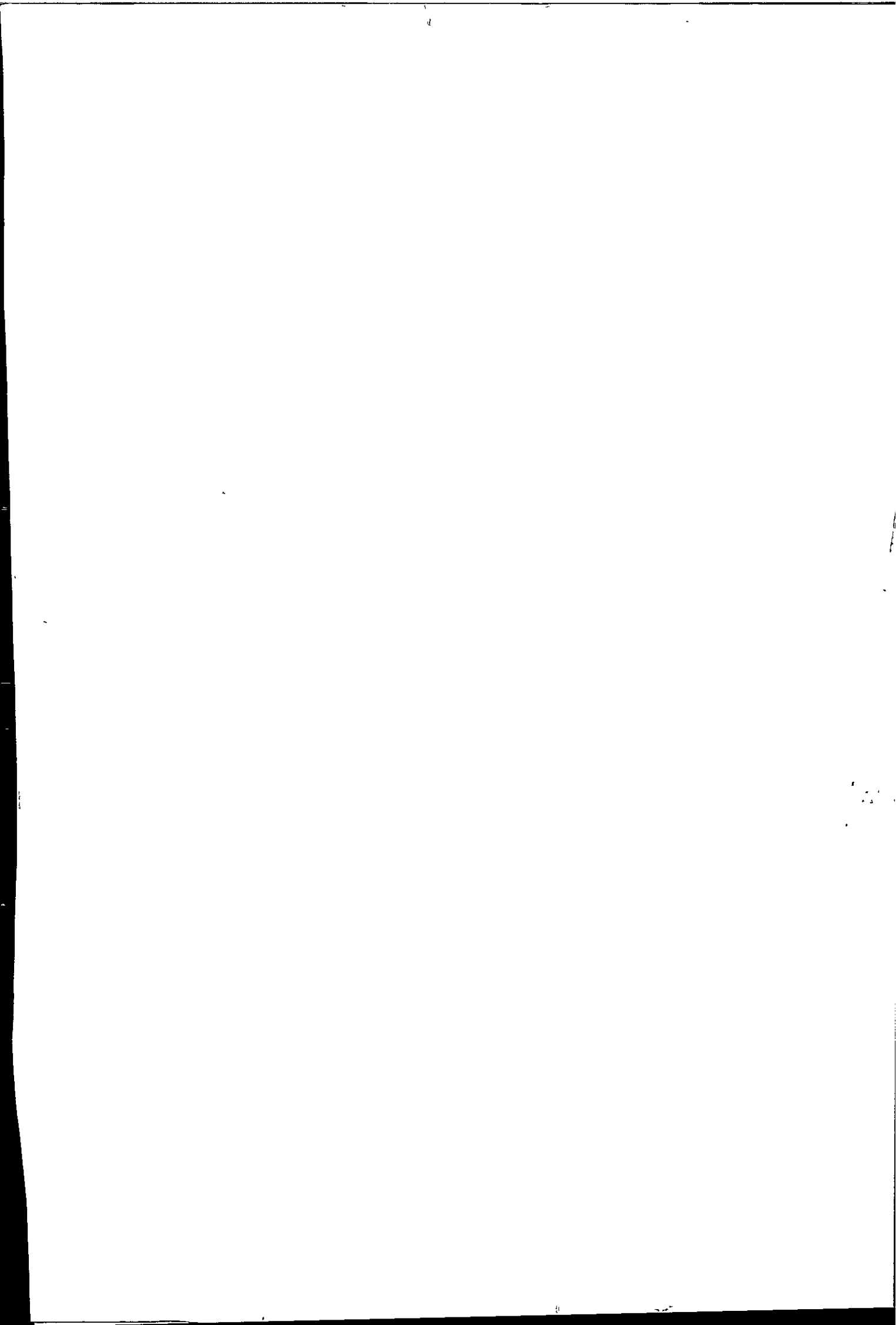


Plate 5P: Plymouth Hoe and its recreational amenities.  
OS 1:2500, 1892.







the destruction of the glorious sweep of swarded cliff... than all 'improvement' can replace" (Worth, 1890).

The armed forces had long-established rights to the Hoe but, early in the 19th century, the Plymouth Corporation sought to establish the rights of local inhabitants to use it. This was actively contested by the military authorities who erected trespass notices in January, 1818, whereupon the Mayor, Aldermen, Freemen and Constables walked there in procession and instructed the notices to be removed. Eventually the rights of the Corporation on Plymouth Hoe were recognised while the Government were still permitted to use the area for the exercise of troops (Worth, 1890).

Gradually the mixture of competing users of the Hoe gave way and its role as a key recreational resource for the townspeople was established. At the suggestion of Councillor and Alderman, Thomas Pitts, a ladies bathing place was installed and the West Hoe Pier and Basin, fronting the West Hoe Baths, were constructed by Harris, Bulteel and Co (Worth, 1890). The privately-owned promenade pier was opened on 29 May 1884. In 1887, the military authorities surrendered the outworks of the Citadel to the town, an area of about 27 acres. The eastern end of the Hoe was thus extended and laid out ornamentally with gardens and paths, and new drives were created through the old trenches, and along the sea face immediately below the ramparts (Worth, 1890). Pitts was elected Chairman of the Committee during the whole of the operations and he recorded that the total spent exceeded £17,000. Madeira Road, which runs through this part of the Hoe, was so named by Pitts.

By the 1890s, the Hoe had ceased to be the only public recreation ground in Plymouth. Stonehouse Mill Creek was filled in and Victoria Park created in 1891, the land attached to the reservoir at Hartley



was laid out in walks, and land was allocated at Freedom Fields and Beaumont for public parks.

By the close of the 19th century, Plymouth's highly varied townscape had taken shape. The haphazard street pattern was flanked by an eclectic mixture of building styles and sizes. Limestone, granite, stucco and red brick were common materials, while Delabole slate provided the most frequent kind of roof. New public buildings gave eloquent expression to the confidence, sense of purpose and civic pride of an expanding Victorian town now pre-eminent in the life of the West Country. In the context of this thesis, their significance is that they reflect the growth in the size of the town, brought about by in-migration and natural increase, and the fact that Plymouth could offer a wide and diverse range of employment opportunities and benefited from the increased prosperity which resulted. Table 5.4 summarises the major building projects in Plymouth in the 19th century.

#### 5.4 The town centre

Population growth in 19th-century Plymouth had an effect on the commercial district of the town both in terms of location and capacity. The additional demands of a rapidly increasing residential population stimulated the development and growth of retailing and business services. One of the most striking changes was that the centre of Plymouth's economic and municipal activity gradually moved west during the 19th century, from the cramped medieval streets of old

TABLE 5.4: A chronology of building in 19th-century Plymouth

- 1811: Royal Hotel, Theatre, Assembly Rooms (completed 1819)  
1812: Breakwater construction commenced (completed 1844)  
1818: Road built from Citadel gateway round under Hoe to Millbay  
1820: New Custom House at Sutton Harbour  
1821: Eye Hospital set up at Millbay, became Royal in 1828  
1824: Royal William Victualling Yard, Stonehouse (completed 1835)  
1827: Laira Bridge opened  
1828: Royal Union Baths  
1834: Steam-driven chain ferry, Stonehouse-Torpoint  
1839: Thomas Gill commences development of Millbay  
1840: South Devon and East Cornwall Hospital in Nötte Street  
1848: Railway reaches Plymouth, temporary station at Laira  
1849: Millbay railway station opened  
New prisons at Greenbank  
Plymouth, Stonehouse and Devonport Cemetary opened between Ford  
Park and Pennycomequick, 37-acre site  
1851: New workhouse at Greenbank  
1857: Millbay docks completed  
1859: Brunel's Royal Albert bridge to Saltash opened  
South Devon and East Cornwall Blind Institution, Cobourg St.  
1861: Shaftesbury Cottages built on North Hill  
1862: Royal Albert Hospital at Devonport (used as lock-up for Plymouth  
prostitutes)  
1867: Durnford Street block of Royal Marine Barracks added (doubled  
size of barracks)  
1874: New Guildhall and Municipal Offices opened  
1881: Site purchased for new Post Office in Westwell Street  
1884: Promenade pier

Sources: Bracken (1931), Gill (1979), Worth (1890).

Sutton to Bedford Street, George Street and Westwell Street. Several factors which combined to attract business activity westward: the arrival of the railway at Millbay, the construction of Millbay Docks and the expansion of the Marine Barracks. One indicator of change was a move in the location of the town's red light district which was traditionally concentrated around the inns in the Barbican area (see Chapter Seven). By the 1860s it had shifted to the area behind Union Street and to the northern part of Stonehouse, close to Millbay Docks where there was a newly emerging area of business and retail activity.

In the course of the 19th century a completely new principal shopping

area emerged on what had been, not long before, open ground and behind it the market was purpose-built.

Retail structure is a relatively neglected aspect of the 19th-century city, especially with regard to its role in shaping commercial land use patterns, although changes in "the structure, organization and location of retail facilities are stimulated by changes in population, per capita income and consumer mobility" (Shaw, 1982b). Geographers have researched the location of shops at the intra-urban level (Wild & Shaw, 1974), but little work has been done on links with urban social change. One exception is Berry's (1963) work on Chicago which forged a link between urban ecology and retailing studies, but the dynamics of urban retailing were only superficially examined for British cities. Previous urban geography has been chiefly concerned with either cross-sectional studies of retail patterns or hierarchical studies of shopping centres, related to central place theory.

Two schools of thought dominate literature on the emergence of modern retailing. It is believed either that the distribution system was primitive prior to 1850 and that major changes in retailing have occurred since then (Jeffreys, 1954; Davis, 1966), or that change in the retailing system began in the latter part of 18th century (Alexander, 1970; Wild & Shaw, 1979). This debate is considered further in Chapter Six, suffice it to say here that evidence on retailing in Plymouth suggests the second interpretation to be more appropriate.

The scope of this study does not permit extensive analysis of the distribution of retailing in 19th-century Plymouth, although this could be the subject of future research. However, general assessments can be made of the morphology of the shopping centre, the location of

shops, and the causes and effects of retail site differentiation.

Pitts recalled the centre of the early 19th-century town:

"The principal shops were in Whimple Street, Buckwell and Billbury Street (then called Higher and Lower Broad Street) Treville Street (then called Butcher's Lane), High Street (then called Market Street) and Old Town Street." (WDRO 688/1)

These streets are easily identified on Benjamin Donn's 1765 map of the town (Plate 5Q) from which it can also be seen that outward expansion of the built-up area was just commencing. In the first decade of the 19th-century Plymouth town was bounded by Park Street, Tavistock Place, Cornwall, William and York Streets. At this time, according to Pitts,

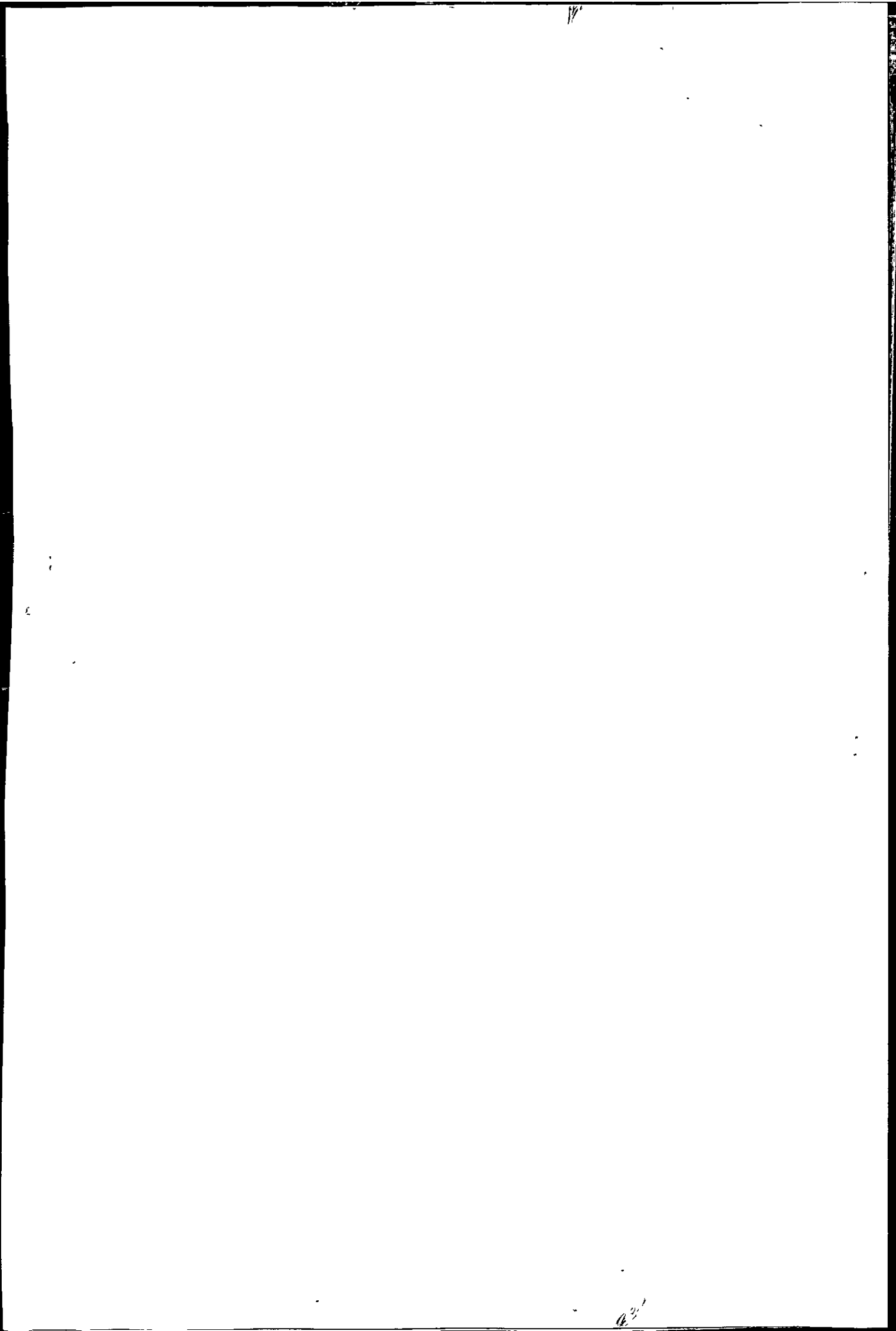
"In Bedford Street (formerly called Frankfort Place) and in Cornwall Street, there were a few shops but Frankfort Street and George Street were chiefly private houses having gardens in front and back of them." (WDRO 688/1)

However, Brindley's Directory of 1830 shows that retailers were beginning to move west from the old cramped streets to the newer, wider Bedford Street, George Street and Westwell Street. This was almost certainly a direct response to growing demand from an expanding population. George Street, which began in 1776 as a pleasant series of suburban residences (Wright, 1894), became a bustling shopping street. The migration of Plymouth's shopping centre appears to have been gradual, spreading to newer streets around the old town.

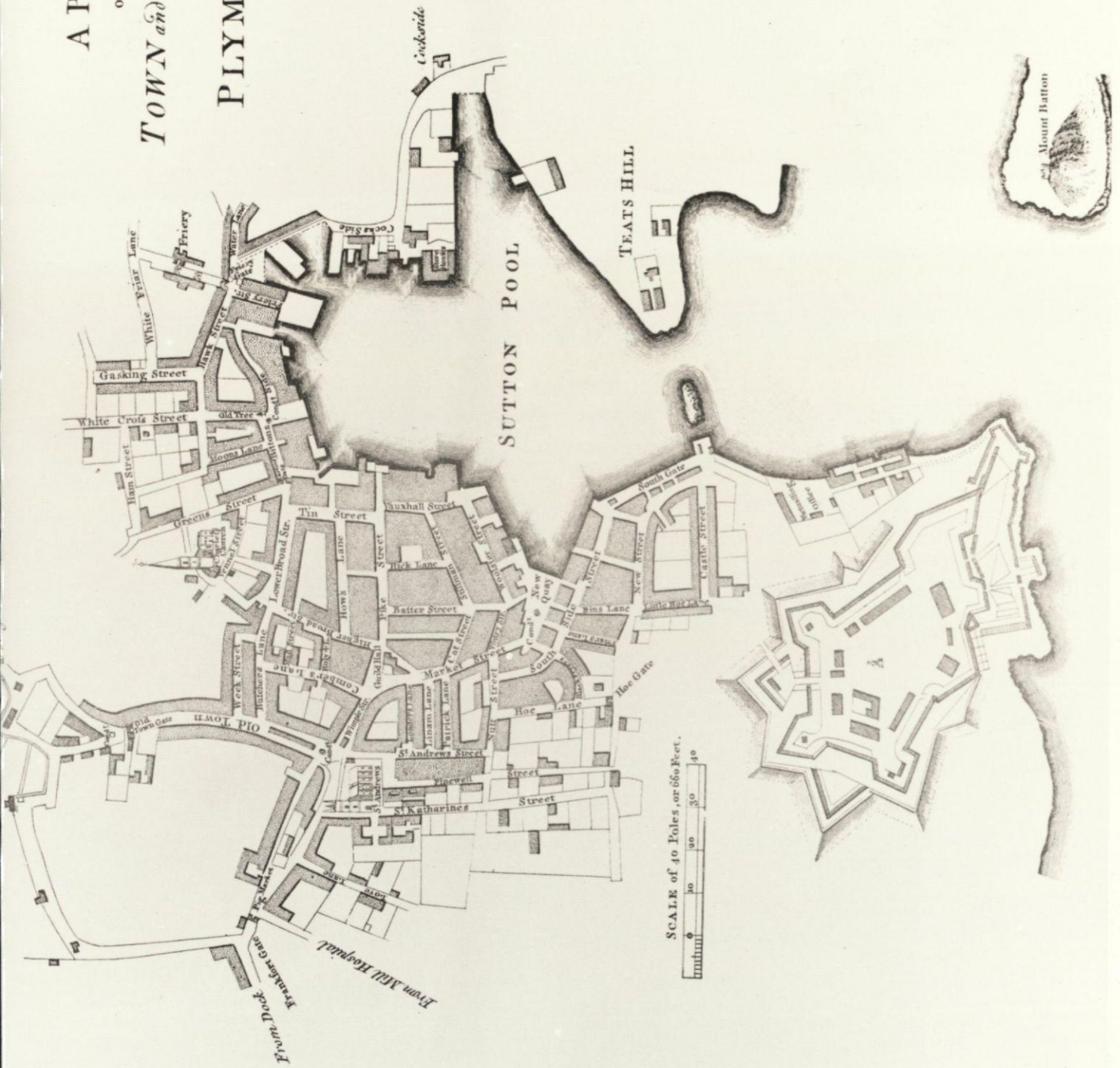
Bayley's Western and Midland Directory of 1783 listed 133 merchants, professional men and tradesmen in the town at that time, whereas a glance at an 1894 Directory reveals as many traders in George Street and Bedford Street alone,

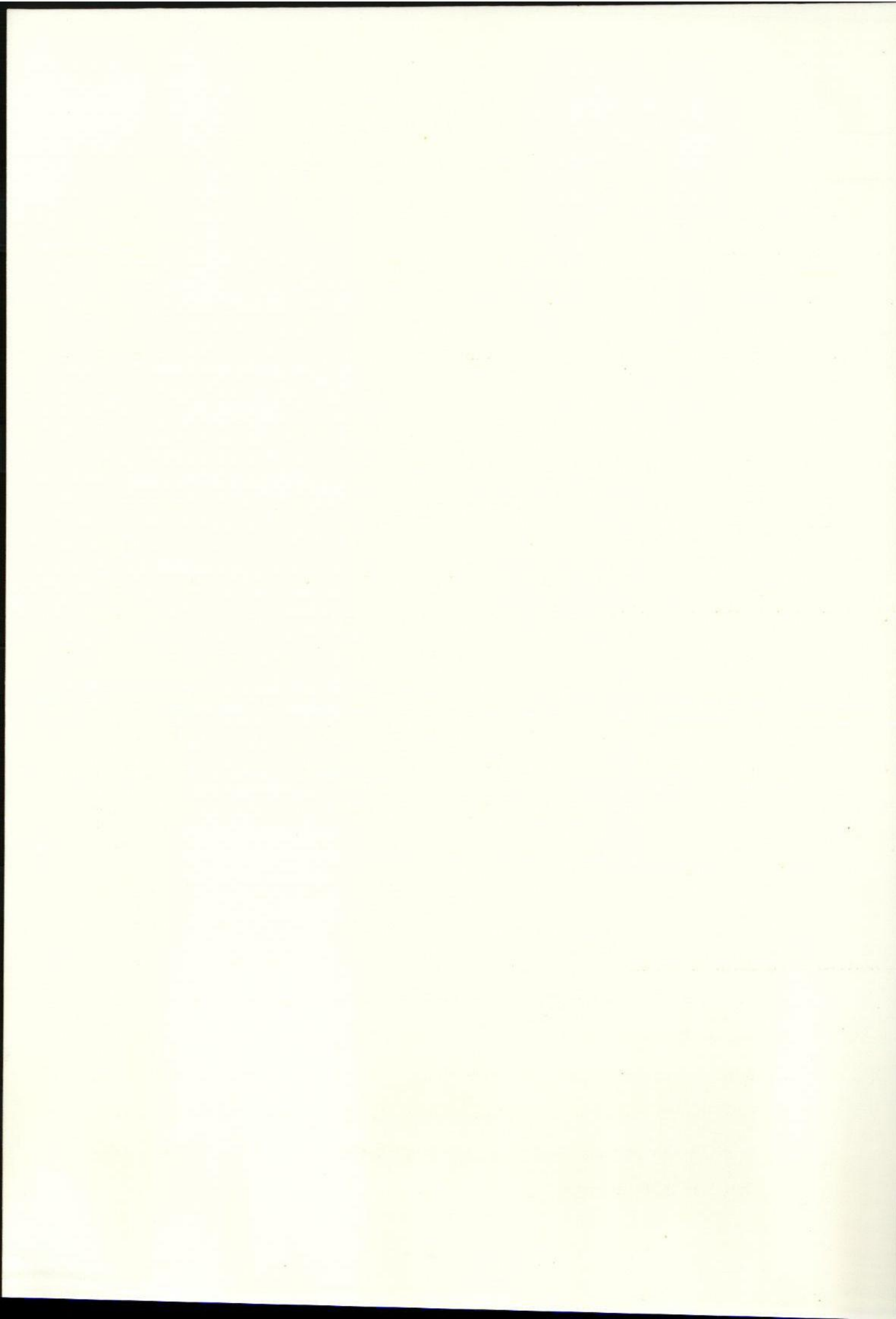
"...while the size and appearance of the

Plate 5Q: Benjamin Donn's 1765 Plan of Plymouth.



# A PLAN of the TOWN and CITADEL of PLYMOUTH.



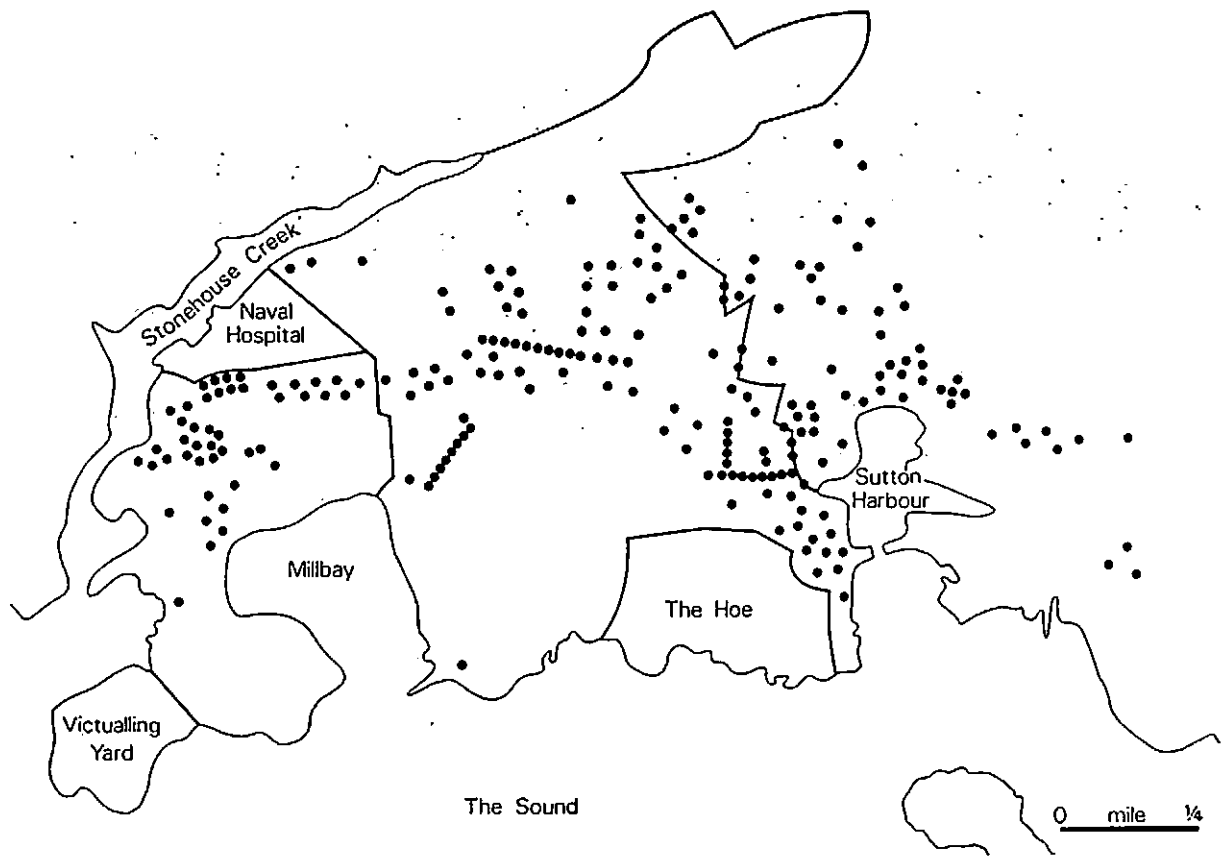




establishments themselves leaves comparison out of the question. Probably, the amount of business now done in one street, or even in one establishment, would equal or exceed the trade of the whole town in the closing years of the last century." (Wright, 1894)

Shops may be classified by their location: "relatively concentrated trades (ironmongers) had much clearer geographical expression, with their higher densities occupying the more central parts of the city" (Wild & Shaw, 1974), while relatively dispersed trades (grocers) showed no pattern. Stephens (1943) shop-by-shop descriptions of George Street and Bedford Street reveal a predominance of drapers and similar concerns - hatmakers, shirtmakers, tailors, silk mercers - plus jewellers, chemists, ironmongers, stationers and tobacconists. He notes very few primary food shops in the immediate town centre: fruiterers at the Island House (Bedford Street) and in Old Town Street and a grocer also in Old Town Street. Basic foodstuffs were overwhelmingly concentrated in the market, behind East Street.

The mid-19th century saw movement towards suburban retailing clusters (Wild & Shaw, 1974) and the distribution map of general shopkeepers in Plymouth and Stonehouse in 1856 (Figure 5.7) shows them to be very widespread; concentrations occurred in what were principally newer housing areas, notably on King and Bath Streets, and also Cecil and Cambridge Streets. In addition there were the remnants of the former shopping centre in Plymouth. Stonehouse was a special case: it had its own 'shopping centre' but, by this time, it was being overshadowed by that of Plymouth. Fore (later High) Street and George Street (not to be confused with George Street, Plymouth) bounded the main trading area in Stonehouse, while Barrack Street (soon demolished to make way for the Marine Barracks extensions) and Union Place served local neighbourhoods.



**Figure 5.7:** The location of shopkeepers in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

The rapidly expanding population also stimulated development in the towns's market. In the 18th century Plymouth markets were held under the old Guildhall in Whimble Street with meat stalls and corn and vegetable markets (Bracken, 1931). At the beginning of the 19th century the "Shambles" or Butchers' Stalls were "against the churchyard wall in Bedford Street" - that is, next to St Andrews churchyard on the south side of the street (Stephens, 1943). The new market building was erected on a field to the north of Bedford Street, tucked into the northern side of East Street; the foundations were laid in 1804 and it was opened in 1807. Increased demand from the growing population led to plans for rebuilding in 1853 - the 1856 Directory noted that improvements were in progress in the vegetable and butter markets - and further plans for improvement were obtained in 1882. The three-acre site was roughly triangular in shape and bordered by Cornwall, Drake and East Streets. In contrast, the rival market of neighbouring Stonehouse was situated in Edgumbe Street and because it was less centrally placed, it was less prosperous. A cattle market was also provided in Plymouth; it was "a spacious enclosed piece of ground fitted with pens and stalls, adjoining the Tavistock road" (1856 Directory).

The central position of the purpose-built market in 19th-century Plymouth was clearly an important factor in ensuring its prosperity (Scola, 1975), but traders may also have benefited from the large numbers of rural migrants resident in Plymouth. Davis (1966) and Alexander (1970) have suggested that a market filled an important transition stage in the purchasing habits of rural-urban migrants, and similar arguments are put forward by Thompson (1971) and Rudé (1967). As in other Victorian towns, Plymouth's market was not used purely by producer-retailers, but by a mixture of traders. While the majority

of Plymouth stallholders were butchers or greengrocers, contemporary accounts mention a variety of other traders selling, for example, china or shoes.

## 5.5 Conclusion

This chapter has briefly described some of the remarkable changes in the townscape of Plymouth and Stonehouse which occurred in Victorian times, the Plymouth of 1900 was entirely different in appearance from that of 1800. This chapter has shown that much of the change in Plymouth's morphology occurred in the mid-century: the infilling of available space for housing, the movement to the suburbs, the eclipse of the old commercial centre, and the large-scale building projects. Space had to be found to accommodate the growing population, a problem not unique to Plymouth: "developers bought up every inch of open space, gardens, orchards, even courtyards", wrote Hyams (1974), newly-vacated estates were redeveloped at astonishing speed. The growing population brought growing demands upon the urban market, aided by transport improvements. The impossibly narrow streets of the old centre gave way to a larger and more spacious new business district. The larger building projects both encouraged and responded to the expanding economy, the stimuli of the docks and the railway, and the grandeur of the Guildhall and Municipal Offices. In the latter half of the century, influenced, no doubt, by the national recognition of a need to provide urban parks (inspired by Peel), the last remnants of open space were retained for public recreation, the Hoe being foremost among them.

## CHAPTER SIX: EMPLOYMENT IN MID-NINETEENTH CENTURY PLYMOUTH

### 6.0 Introduction

In the mid-19th century Plymouth and Stonehouse experienced rapid and sustained economic expansion, which provided a powerful magnet to prospective migrants. There were many "large and thriving industries... employing... a large number of persons, and representing a large amount of capital" (Wright, 1894). The main aim of this chapter is to show how the mid-Victorian population of Plymouth and Stonehouse was employed; it will seek to identify the main sectors of the local economy and to establish their relative importance with regard to changes in occupational structure and employment levels. The development and character of fishing, shipping and mercantile trading, and manufacturing will be reviewed, the impact of the armed forces presence will be considered, and local retailing will be investigated as the structure of modern marketing evolved. This chapter will seek to determine levels of employment within these sectors and to identify the spatial patterns of employment. The particular contribution made by women to the local economy - they accounted for nearly forty percent of the workforce in mid-19th century Plymouth - will be examined separately in Chapter Seven.

The principal sources of work included shipping (not only building and trading but also many spin-off trades and ancillary activities) and fishing was a long-standing local industry. Employment in the Royal Dockyard in neighbouring Devonport also made a significant contribution to the marine-based sector of the local economy. In addition, there was a great range of industry based upon imports

including soap and chemical manufacture, sugar and salt refining, gin distilling, starch, blue and soda manufacture, candle-making, paper-staining, rope-making, pipe-making, gunpowder milling, china and earthenware manufacture, oil milling, sail-cloth and canvas weaving, fellmongering, and bell founding (census, 1851; Jewitt, 1873).

In the previous chapter it was argued that the construction of the Breakwater, the development of Sutton Pool and of Millbay Docks, and the coming of the railway were crucial in opening up Plymouth to further economic expansion. The town's role as a naval base and port outlet for local produce would undoubtedly have been eclipsed had not far-sighted local men taken advantage of technological advances in civil and marine engineering and enabled Plymouth to benefit from the unparalleled economic expansion of Victorian Britain. By building upon traditional maritime industries, and playing a significant part in the rapid growth of coastal and overseas trade, Plymouth's sea-going activities represented the backbone of the local economy. Behind the wharves and docks there was a diversity of employment which was not only contingent upon the port, but which also befitted a thriving regional centre.

For these reasons Plymouth survived the decline of Devon's woollen industry in the late 18th and early 19th century - formerly a staple of the local economy - and the crash of the copper industry in Cornwall and west Devon in the 1860s. In part this was made possible by the railway; that Plymouth was linked to the national rail network by 1848 was both a reflection of its established regional importance and a safeguard of its continued dominance. The town profited from the other southwest industries of mining and quarrying, plus new industries such as horticulture and tourism. As Chapter Four showed, thousands of migrants flocked into the town to find work: skilled men

from near and far and young women from rural Cornwall and Devon.

The town of Plymouth provided the port of Plymouth with supplies, services and a workforce, and processed its imports and exports; many local businesses existed because of the port, wholly dependent upon its trading gateway. But the town also served the surrounding region, fulfilling all of its central place functions. The two roles seem virtually indivisible, but the port gave the local economy its tremendous impetus; the marine-based sector of Plymouth's economy was crucial to its success.

#### 6.1.1 The local employment structure, 1851-1871

Occupational data drawn from the census were used to discover the numbers of people employed in the various sectors of the local economy. A detailed examination of these data showed the diversity of economic activity in Plymouth and Stonehouse and the changing structure of employment as old industries declined and new industries came to the fore. The occupational structure of Plymouth's mid-Victorian population showed a broad spread through the principal kinds of employment. Around 38 percent of the total population of Plymouth and Stonehouse were in employment through the study period (excluding 'Wives') (Table 6.1(a)).

The number of people in employment increased with the growth in population in the 1850s, although the proportion of the population employed decreased very slightly. In the 1860s employment growth fell to less than five percent against population growth of 8.4%. Table 6.1(b) shows that these data are noticeably influenced by the forces

TABLE 6.1: Numbers in employment, 1851-1871

(a) Working population excluding 'Wives':

	1851		1861		1871	
	No.	%	No.	%	No.	%
Plymouth	20455	39.1	24322	38.8	25910	37.6
Stonehouse	4564	38.1	5626	39.2	5533	37.9
Total area	25019	38.9	29948	38.9	31443	37.6

Showing percentages of whole population.

(b) Working population excluding 'Wives' and forces personnel:

	1851		1861		1871	
	No.	%	No.	%	No.	%
Plymouth	18084	36.3	21946	36.4	23441	35.3
Stonehouse	3581	32.6	3757	30.1	3569	28.3
Total area	21665	35.6	25703	35.4	27010	34.2

Showing percentages of whole population excluding forces personnel.

Source: Published census data.

population, which represented a sizeable section of the total population. As proportionally more of the forces personnel were based in Stonehouse, a comparison of the two towns indicates the impact of their presence.

It was found that the number of people employed in all of the Occupational Classes, except that for agricultural employment, increased through the study period. As Table 6.2 demonstrates, considerable numbers of people were involved in every case. The largest occupational class comprised those employed in the industrial sector, amounting to some forty percent of the total number employed. The commercial sector, in particular, expanded through the three censuses, taking an increasing share of the total employed and reflecting Plymouth's enhanced role as a trading port. The



TABLE 6.2: Employment by Class in Plymouth and Stonehouse

	1851	1861	1871	% change: 1851-71
I Professional	1448	1827	1756	+21.3
Forces	3354	4245	4433	+32.2
II Domestic	3841	4206	4963	+29.2
III Commercial	2204	3073	3582	+62.5
IV Agricultural	1161	1138	800	-31.1
V Industrial	10307	12660	11950	+15.9
VI Indefinite	2731	2799	3959	+45.0
TOTAL	25019	29948	31443	+25.7

Source: Published census data.

agricultural and fishing class appears to have suffered a sharp drop in the 1860s; although farming land was certainly being lost as new building swallowed up land, the majority of workers in this class were actually fishermen and an explanation of this apparent decrease in their numbers will be sought below. The number of forces personnel remained steady in Plymouth but doubled in Stonehouse in the 1850s with the extension of Barracks there. Each of these classes is examined in greater detail in section 6.2; Table A1 (see Appendix C) shows a more detailed breakdown of these data according to occupational order and this is illustrated in Figure 6.1a-c.

While the published data on occupations are, for the most part, detailed and specific, the nature of their presentation (figures are given only at the Registration District level) limits their value. Apart from the Army and Navy, those occupations employing large numbers of men (taken as five percent or more of the total employed) are listed in Table 6.3. These occupations fall into three groups: (a) those employed in pursuits connected with the sea; (b) skilled workers employed in building and furnishing trades; and (c) those who provided food and clothing. Dockyard artificers were employed in the Devonport shipyard; over three hundred were recorded as living in

1851

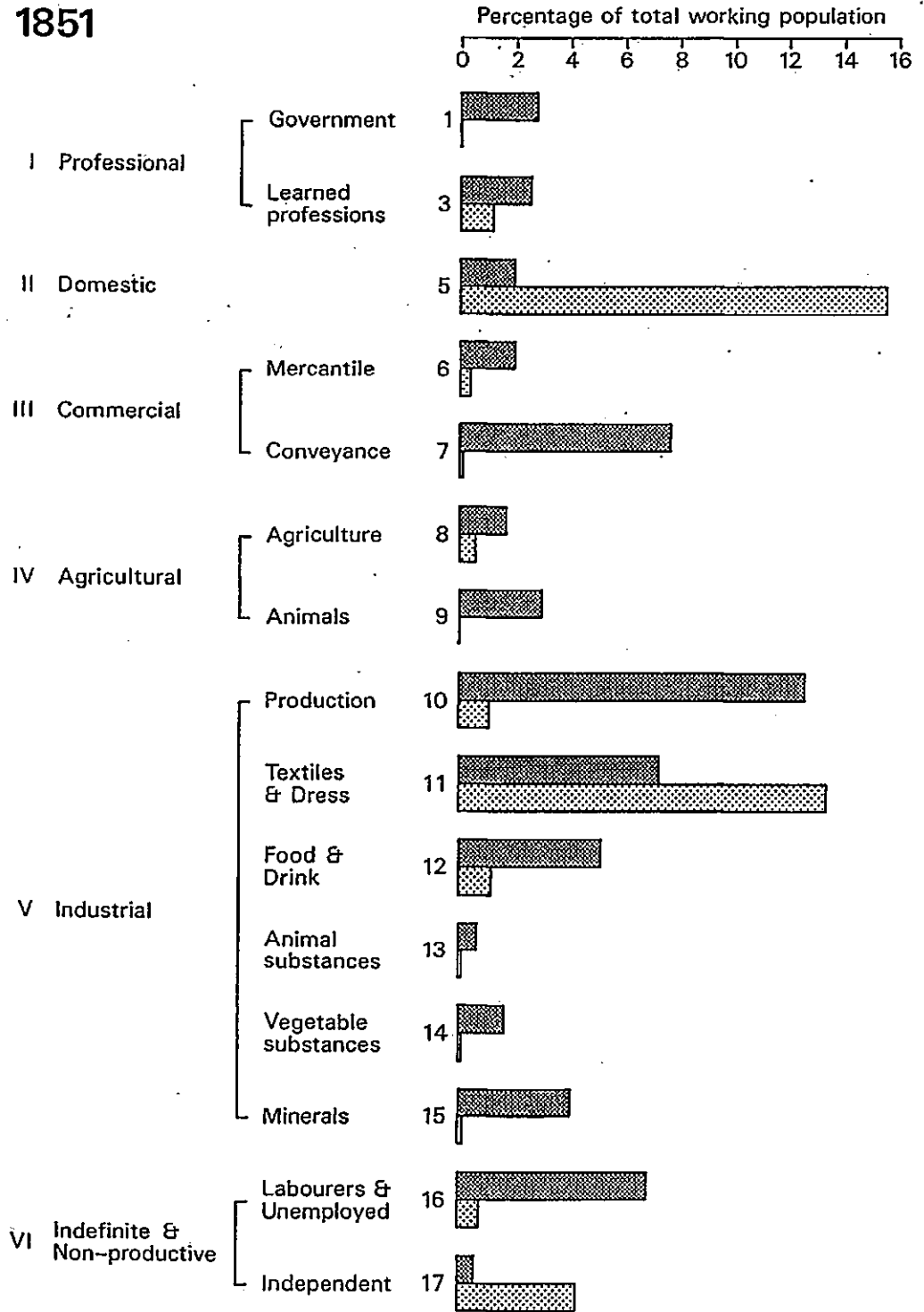


Figure 6.1: (a) Male and female employment by Occupational Order, 1851. Based on the published census data. (Males = dark shading, females = light shading)

1861

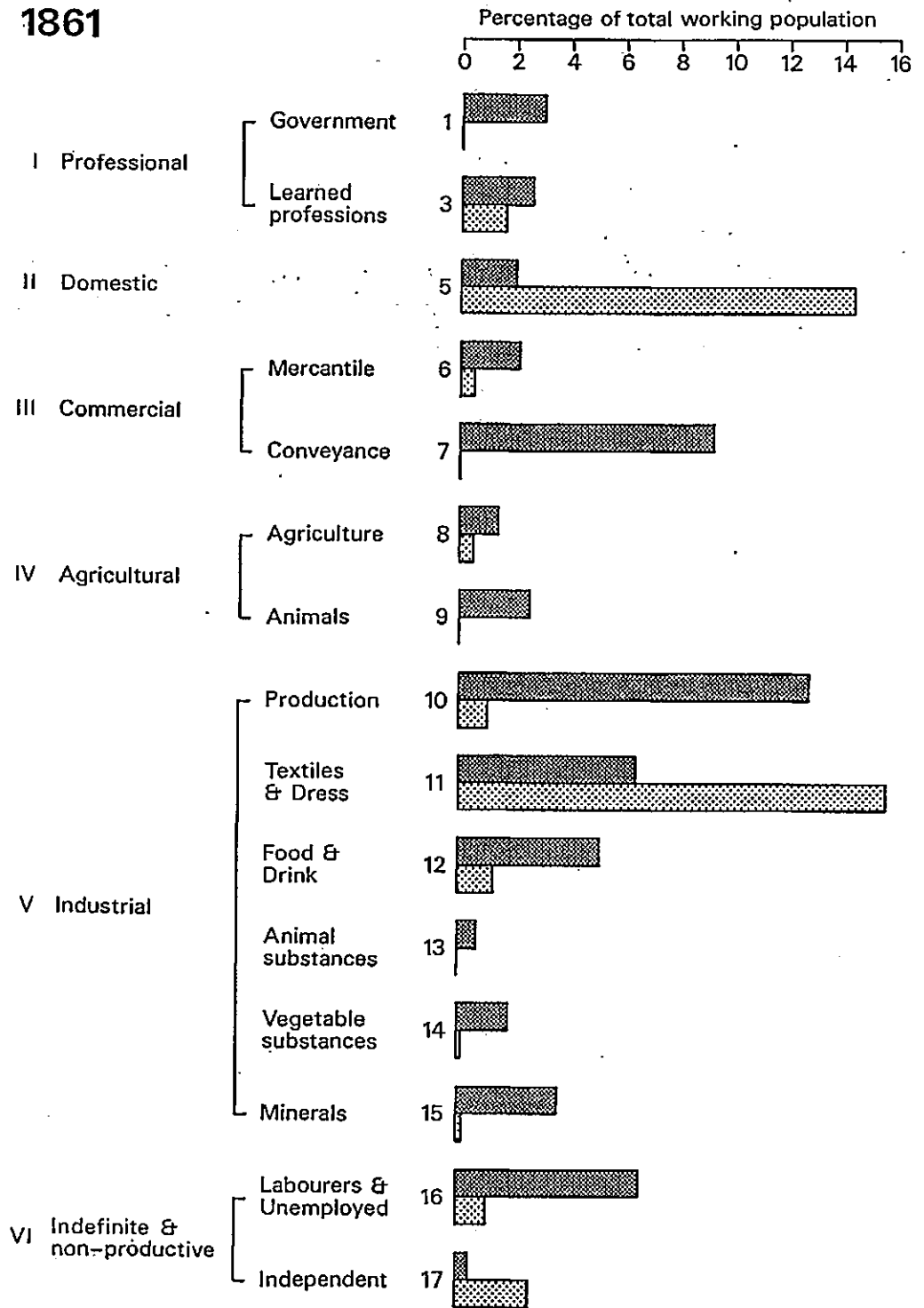


Figure 6.1: (b) Male and female employment by Occupational Order, 1861. Based on the published census data. (Males = dark shading, females = light shading)

1871

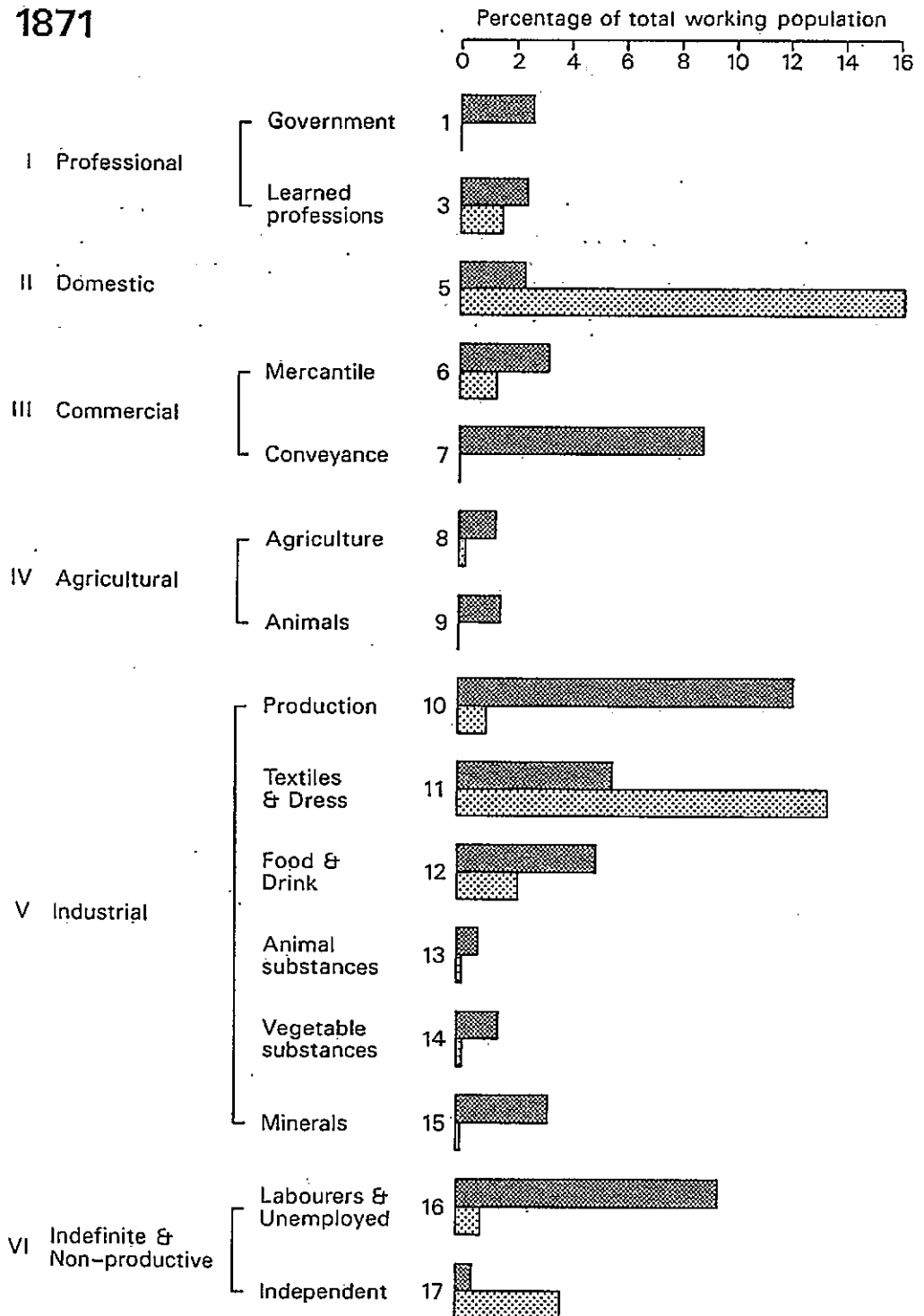


Figure 6.1: (c) Male and female employment by Occupational Order, 1871. Based on the published census data. (Males = dark shading, females = light shading)

TABLE 6.3: Principal occupations, Males

Class/Order	Occupation	Plymouth		Stonehouse	
		1851	1861	1851	1861
I.1.	Dockyard artificer/ other Govt. officer Police	*	*	*	o
II.5.	Beerseller/publican/ beershopkeeper/ licensed victualler	o	o	o	o
7.	Domestic servant Carman/cARRIER/ carter/drayman Boat/bargeman/ waterman Merchant seaman Messenger/porter/ errand boy	o	o	o	*
IV.8.	Agricultural labourer Gardener	o	o		
9.	Fisherman	*	*		
V.10.	Shipbuilder/shipwright Carpenter/joiner Mason/pavior Plasterer Plumber/painter/ glazier Cabinet maker/ upholsterer	o	*	o	*
11.	Woollen cloth manuf. Woollen draper Draper/linen draper/ mercier Tailor Shoemaker/bootmaker	o	o	o	o
12.	Butcher/meat salesman Baker Grocer/tea dealer	o	o	o	*
14.	Sawyer	o	o		
15.	Blacksmith	o	o		o
VI.16.	General labourer	*	*	*	*

\* = 10% or more of total employed in District

o = 5- 10% of total employed in District

Source: Published census data.

TABLE 6.4: Principal occupations, Females

Class/Order	Occupation	Plymouth		Stonehouse	
		1851	1861	1851	1861
I.3.	Schoolmistress	o	o		
II.5.	Lodging/boarding housekeeper		o		
	Domestic servant	*	*	*	*
	Housekeeper	o		o	
	Cook	o	*	o	*
	Housemaid		o		*
	Hospital nurse				o
	Nurse (not domestic servant)	o	o	*	o
	Charwoman	o	*	*	*
V.10.	House proprietor	o	o		o
11.	Draper/linen draper/ mercier		o		
	Tailoress	o	o	o	o
	Milliner/dressmaker	*	*	*	*
	Shirtmaker/seamstress	*	*	*	*
	Shoemaker/bootmaker	o	o	o	*
	Laundry keeper/ laundress	*	*	*	*

\* = 10% or more of total employed in District

o = 5- 10% of total employed in District

Source: Published census data.

Plymouth and Stonehouse in 1861, some 22 percent of the total living in the three towns. The most popular female occupations are similarly given in Table 6.4 from which it can be seen that women were largely employed in the traditionally female pursuits: domestic service, laundering, teaching and needlework.

Comparisons between censuses are made difficult by changes in classification and comparison between sources - censuses and directories, for example - are even more problematic. However, accepting these reservations, the various sources together may serve to give general indications of occupational emphasis and change over a wider time-scale. Worth (1890) demonstrated the changing trades

composition of Plymouth from directory evidence and the increase in numbers of retailers is particularly noticeable. His table represents a useful summary of 19th-century trades in Plymouth and is reproduced here (Table 6.5) with additional data taken from contemporary directories. Very few trades saw a decline in numbers, the general increase in the total numbers of traders recorded in the directories, over three-fold in sixty years, merely emphasizes the economic and demographic growth of the town.

TABLE 6.5: Trades in Plymouth (from directories)

	1830	1850	1870	1890
Attornies	31	43	65	66
Auctioneers and Salesmen	7	12	15	17
Bakers and Confectioners	58	104	140	148
Boot and Shoemakers	25	108	94	163
Braziers, Plumber and Timners	11	15	19	43
Brewers, Wine & Spirit Merchants	15	27	53	42
Brokers	9	19	18	31
Butchers	11	120	109	152
Cabinet Makers	8	34	33	25
Carpenters and Builders	31	85	96	131
Chemists	15	33	38	39
Corn Factors	6	11	38	26
Drapers and Hosiers	43	48	100	107
Earthenware Dealers	6	7	10	20
Grocers and Tea Dealers	53	78	104	116
Hatters	10	19	16	19
Ironmongers and Ship Chandlers	18	30	28	35
Masons and Plasterers	11	36	56	44
Merchants	18	22	17	16
Painters and Glaziers	11	42	46	52
Pawnbrokers	9	13	37	34
Physicians and Surgeons	33	48	49	67
Printers and Booksellers	20	39	40	45
Shipbuilders	13	10	8	11
Silversmiths	15	18	29	58
Smiths	10	41	27	26
Tailors	27	78	80	90
Tobacconists	1	5	21	44
Victuallers and Beershop Keepers	96	268	412	314
	621	1413	1798	1981

Sources: Data for 1830, 1870 and 1890 taken from Worth (1890), with a few amendments. Data for 1850 compiled from White's Directory.

### 6.1.2 The spatial distribution of the employed population

Sample data drawn from the manuscript censuses have been used to construct a series of choropleth maps in order to examine the nature of the spatial distribution of the employed population in mid-Victorian Plymouth (the data for each enumeration district are given in Tables A2 and A3 in Appendix C). These data excluded institutions such as the Royal Naval Hospital and the Marine Barracks, so the only forces personnel included were those enumerated in private residences; thus mapping of the distribution of population in employment was not greatly distorted by the forces presence. It has been shown that there was a rise in the number of jobs commensurate with the growth in population during the study period. The two maps (Figure 6.2) show a complex and changing pattern: there were evidently many different governing factors.

The apparent decline in employment levels in southeast Plymouth is surprising, but this may have been a consequence of the enumeration district boundary changes. On the other hand, an area in the north of the town, on its boundary, was still largely green fields in 1851 and became built up over the next twenty years; it was, however, an affluent area and much of the employment seen in the 1871 map would have been of domestic servants (Figure 6.7 supports this). Another area which was developed for housing in the intervening period was the Barley estate: as has already been seen in Chapter Five, the estate became densely inhabited very rapidly, in fact mostly by people in industrial occupations.\* Stonehouse saw an increase in employment

\* That this group of enumeration districts appears to show a decrease in employment is misleading, a statistical quirk: the maps illustrate the percentage of the total enumeration district population in employment.



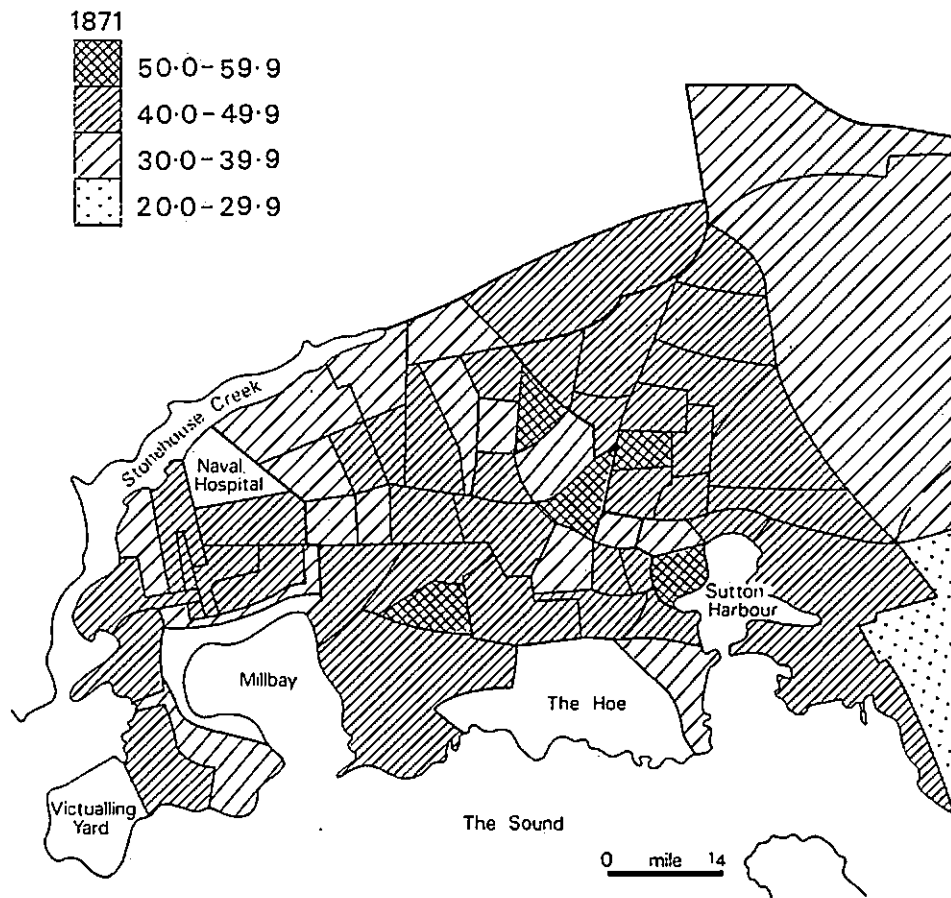
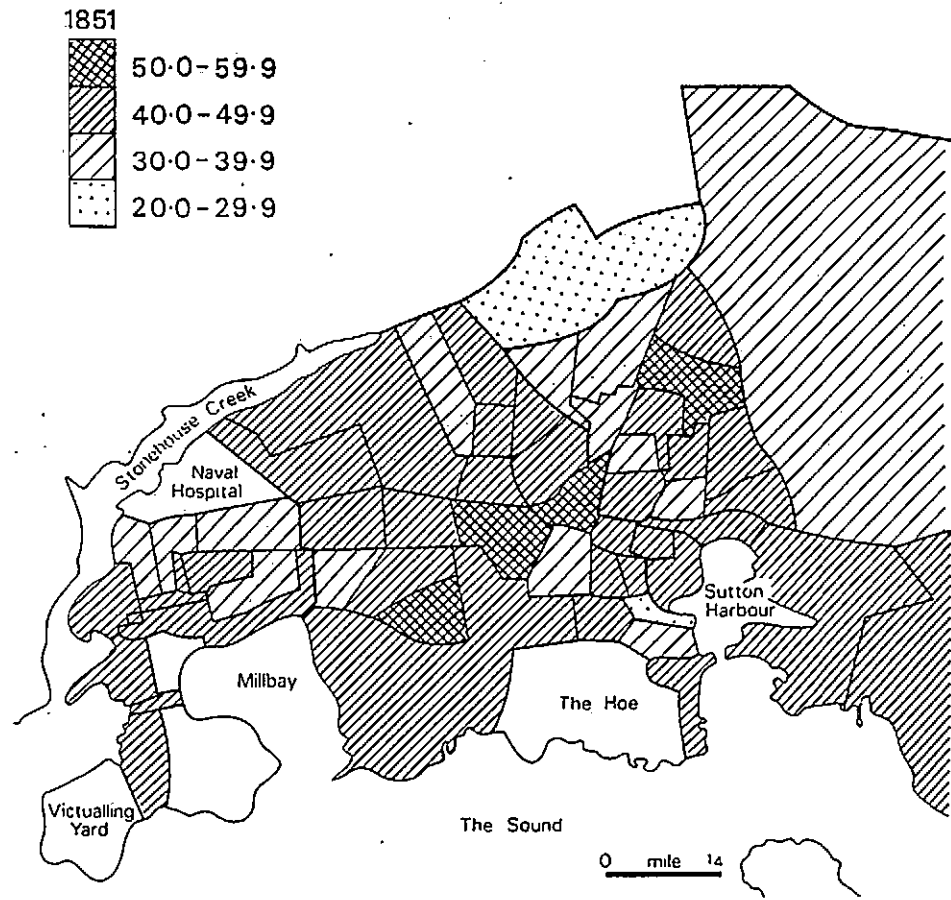


Figure 6.2: The distribution of the population in employment shown as a percentage of the total population in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Based on the sample population data.

levels and this may be regarded as a result of the development of Millbay docks, the arrival of the railway, and the expansion of Millbay Barracks (which will have had a 'spin-off' effect on local trade). Perhaps the most surprising element emerging from the distribution of the employed population is the apparent rise in the proportion of economically-active people on the Barbican, though this may be related to growth in the fishing industry.

The overall rate of employment in the enumeration districts was generally forty to fifty percent of the population and did not fall below twenty percent in any district. This employment rate, based on the sample data taken from the census enumerators' books, is some seven percent higher than that calculated from the published census data because the published census data on occupations counted only those aged 20 years and upwards whereas the sample data included all age groups. Thus it may be concluded that seven percent of the population were working before the age of 20 years and that this was the equivalent of about 4,200 people in 1851 and 5,600 people in 1871.

Ranked lists of occupations were obtained from the sample analyses of the 1851 and 1871 censuses; since these lists include retired persons, and wives of soldiers and sailors, Table 6.6 may be regarded as revealing sources of income rather than occupations as such. Fifteen occupational categories covered over three-quarters of the working population of Plymouth and Stonehouse in both census years. The principal categories of occupation were, first, the main occupations, identified as domestic service, textiles, building and labouring, plus the navy; second, sea-connected employment (the merchant navy, shipbuilding); third, non-working persons such as the retired, paupers, property owners, and wives of mariners and soldiers (who often appear to have been heads of household in the absence of

TABLE 6.6: Occupations of the sample population, 1851 and 1871

	Number	Percent of employed	Cumulative percentage
<b>1851:</b>			
Workers & dealers in dress	467	17.4	17.4
Domestic servants	419	15.6	33.0
Houses & building workers	239	8.9	41.9
General labourers	158	5.9	47.8
Navy personnel	119	4.4	52.2
Persons of property	113	4.2	56.4
Carriers on seas & rivers	80	3.0	59.4
Merchantile persons	70	2.6	62.0
Porters & messengers	58	2.2	64.2
Workers & dealers in vegetable food	58	2.2	66.4
Wives of soldiers & sailors	57	2.1	68.5
Workers & dealers in drinks	57	2.1	70.6
Workers & dealers in ships	49	1.8	72.4
Board & lodging	48	1.8	74.2
Retired & pensioners	42	1.6	75.8
<b>1871:</b>			
Domestic servants	595	16.8	16.8
Workers & dealers in dress	538	15.2	32.0
Navy personnel	256	7.2	39.2
Houses & building workers	230	6.5	45.7
General labourers	219	6.2	51.9
Persons of property	121	3.4	55.3
Retired & pensioners	99	2.8	58.1
Merchantile persons	91	2.6	60.7
Workers & dealers in animal food	91	2.6	63.3
Wives of soldiers & sailors	90	2.5	65.8
Carriers on seas & rivers	84	2.4	68.2
Workers & dealers in drinks	67	1.9	70.1
Porters & messengers	64	1.8	71.9
Workers & dealers in ships	61	1.7	73.6
Board & lodging	58	1.6	75.2

Source: Sample population data.

their husbands); and fourth, those who may be regarded as supplying trades and services commensurate with a regional centre (board and lodging, portering, and drinks manufacture - chiefly brewing).

### 6.1.3 Plymouth's employment structure in the national context

During the 19th century, Plymouth, used to the riches of wartime plunder, was able to exploit its peacetime role as a trading port and its progress mirrored national developments quite closely. The Great Victorian Boom, which occurred approximately between 1850 and 1873, may be attributed to the early industrialisation of economies outside Britain and the opening up of formerly unexploited areas of primary production. The British economy was based on expansion abroad and the "rate of expansion of British exports was far higher between 1840 and 1860... than ever before or since" (Hobsbawm, 1968). The Boom was characterised by rising prices and wages, expanding investment, production and trade, and increasing prosperity (Church, 1975), and investment and technological change brought industrial growth. By contrast, the 1870s saw the start of the Great Depression which lasted to the end of the century, during this time Britain ceased to be the 'workshop of the world' and became just one of three major industrial powers (with USA and Germany). Put simply, British profits had financed the development of its future competitors.

It has been shown that, in the 1860s, the rate of employment growth declined in Plymouth and this deceleration must be attributed, at least in part, to the slowing down of national economic growth. There were local factors which contributed to the decline, the crash of the copper industry has already been noted. Some industries moved elsewhere, William Bryant and Francis May, manufacturers of lucifer matches moved to London after accidentally burning down their Plymouth factory, and biscuit-maker George Frean also moved to London where he went into business with two nephews of a Devon tea dealer called Peek. The published census data for 1871 notes a series of strikes for more

pay and shorter hours to which the Registrar of St Andrews District attributed a depression of trade and out-migration of artisans which diminished the local rate of population increase. This District also included Millbay docks and the new railway station, the completion of which probably had a greater impact on local employment levels as building work came to an end.

Before examining in detail the occupational structure of mid-19th century Plymouth and Stonehouse, it is interesting to note how the range of occupations in the two towns differed from that of the country as a whole. Mathias (1983) listed the principal occupation groups in Britain in 1851 (after Clapham, 1932) and Table 6.7 compares some of these data with those for Plymouth.

Predictably, the two towns' population contained considerably fewer agricultural workers and far more people in sea-connected occupations: merchant seamen, fishermen, and shipbuilders. Nationally, domestic

TABLE 6.7: Principal occupation groups 1851 (per 1000 population)

	Britain	Plymouth & Stonehouse
Agriculturalist	85.4	5.1
Domestic servant	49.6	43.6
Building craftsman	21.1	28.3
Labourer (unspecified)	17.9	21.6
Dressmaker, milliner, etc.	16.3	22.9
Wool worker	13.6	4.5
Shoe-maker	13.1	12.1
Tailor	7.3	7.4
Washerwoman	6.9	10.6
Merchant seaman	6.9	15.3
Blacksmith	5.4	3.4
Carter, cabman, etc.	4.0	3.0
Baker	3.0	4.0
Charwoman	2.6	4.0
Fisherman	1.8	9.0
Sawyer	1.7	2.6
Shipbuilder	1.5	3.2

Source: Mathias (1983), after Clapham (1932); published census data.

service was the second largest occupational group; the Table suggests it was the largest single group in Plymouth, though proportionally smaller than in Britain as a whole. Mathias' cross-section omits servicemen, however, who accounted for 52.2 per thousand population in Plymouth and Stonehouse in 1851. Building was the next largest industry - nationally and locally - very heavy seasonal unemployment was characteristic for labourers during winter months, as were great fluctuations in the rhythm of the investment cycle: "It was one of the most important receiving points for Irish migrants, and for seasonal Irish labour" (Mathias, 1983). The higher proportion of builders and labourers in Plymouth may be expected in a growing town where ambitious civic schemes were matched by extensive speculative house-building.

The fourth largest national employer was the cotton industry, scarcely represented in Plymouth (and thus omitted from the table); however, Mathias observes that if the smaller wool and silk industries are added, and the half million tailors, dressmakers and seamstresses, textiles were by far the largest industry proper. This industry, in particular, benefited from the introduction of machinery in the 1850s, but the secondary branches of textiles trades continued to be "much concerned with outwork". There were rather fewer Plymothians employed in the wool trade by 1851 than formerly, but for the women, dressmaking, laundry work and so forth were clearly important livelihoods (see Chapter Seven).

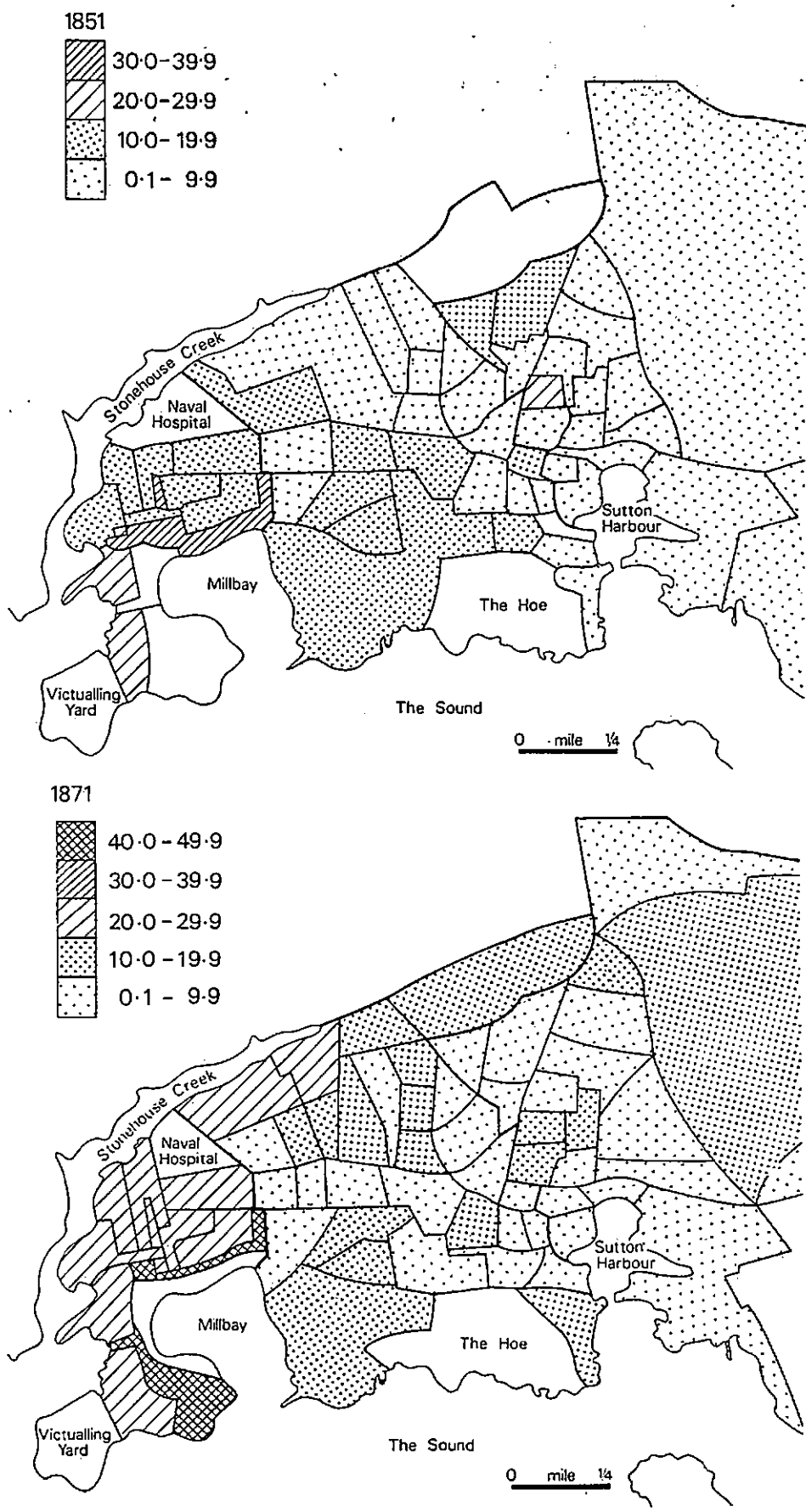
### 6.2.1 The professional sector, including the armed forces

The largest group within the professional class, as defined by the census authorities, was forces personnel whose numbers increased through the study period. Those employed in the other professional occupations increased in the first decade and then decreased slightly (Table 6.8). Two distribution maps based on the sample population data for 1851 and 1871 indicate concentration of professional people (Figure 6.3); two kinds of clustering can be identified, the affluent districts and districts including military or naval institutions. Another distribution map of professional people, excluding forces, was drawn from the 1856 Kelly's Post Office Directory (Figure 6.4), and this shows a clear grouping in the centre of St Andrew Sub-district. It should be remembered, however, that some of these listings were based on business and not home addresses; the group comprises mostly solicitors, physicians and surgeons. Legal work expanded in the 19th century; there were two barristers resident in Plymouth in 1830 and four by 1890, White's Directory for 1850 lists 44 attorneys, and this increased to 49 by 1870. It has already been noted that this occupational class also included Devonport dockyard artificers, a substantial number of whom were living in neighbouring Plymouth and

TABLE 6.8: Professional people by occupational order and sex

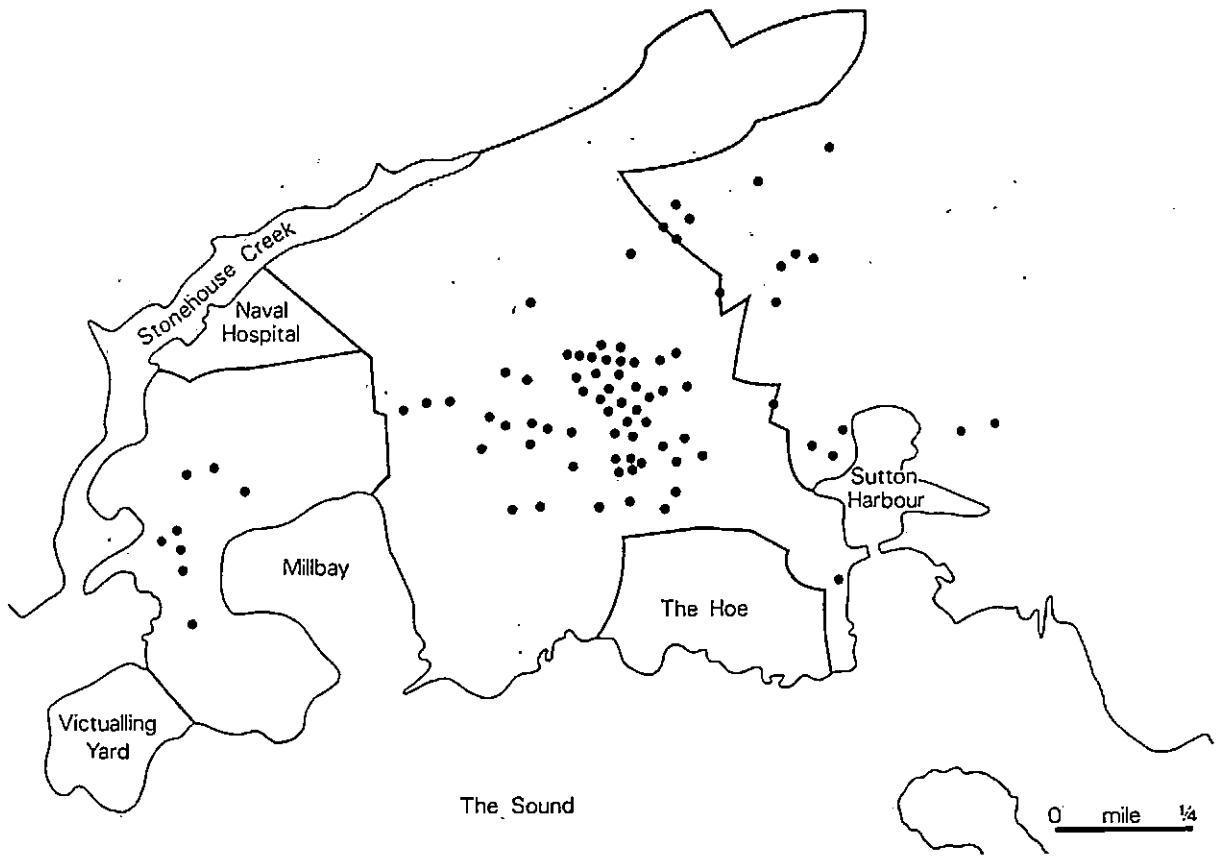
	1851		1861		1871	
	M	F	M	F	M	F
1 Government	611	7	764	6	707	12
2 Defence	3354	.	4245	.	4433	.
3 Learned Profs	570	260	657	400	639	398
17 Independent	129	927	120	691	149	1026

Source: Published census data.



**Figure 6.3:** The distribution of people employed in professional occupations (Occupational Class I) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Shown as a percentage of the working population and based on the sample population data.





**Figure 6.4:** The location of people employed in civilian professions in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

Stonehouse. This indicates the importance of the proximity of the Royal Dockyard both directly and indirectly in contributing to the marine-based sector of the local economy.

In the mid-19th century the main concentrations of armed forces were at the Citadel, Millbay Barracks and the Royal Marine Barracks; in addition there was the Royal Naval Hospital, and a Militia Station on Drake's Island (included in the St Andrew Sub-district). Although the sample survey did not cover institutions, the distribution maps (Figure 6.5) show a considerable concentration of forces personnel in Stonehouse. It should be noted that these maps show where 151 soldiers and sailors were enumerated in 1851, and 273 in 1871; thus numerically it is a very small sample (Table 6.9). Also, some of these men were Chelsea or Greenwich Pensioners (69 in 1851 and 78 in 1871).

TABLE 6.9: 'Persons engaged in the Defence of the Country'

	1851		1861	1871	
	Sample	Census	Census	Sample	Census
Army Officer	8	58	70	2	.
Army Half-pay Officer	2	25	31	0	.
Army Retired Officer	2	.	.	0	.
Soldier	0	818	978	1	.
Militia	0	.	9	0	.
Chelsea Pensioner	18	184	126	8	.
Others	2	.	1	6	.
Navy Officer	9	192	154	9	.
Navy Half-pay Officer	14	94	88	1	.
Navy Retired Officer	3	.	.	9	.
Seaman RN	3	575	894	16	.
Royal Marine	23	892	1384	85	.
Coastguard/RNR	2	.	.	2	.
Greenwich Pensioner	51	489	479	70	.
Others	14	26	.	64	.
Total	151	3354	4245	273	4433

Sources: Published census data and census enumerators' books.

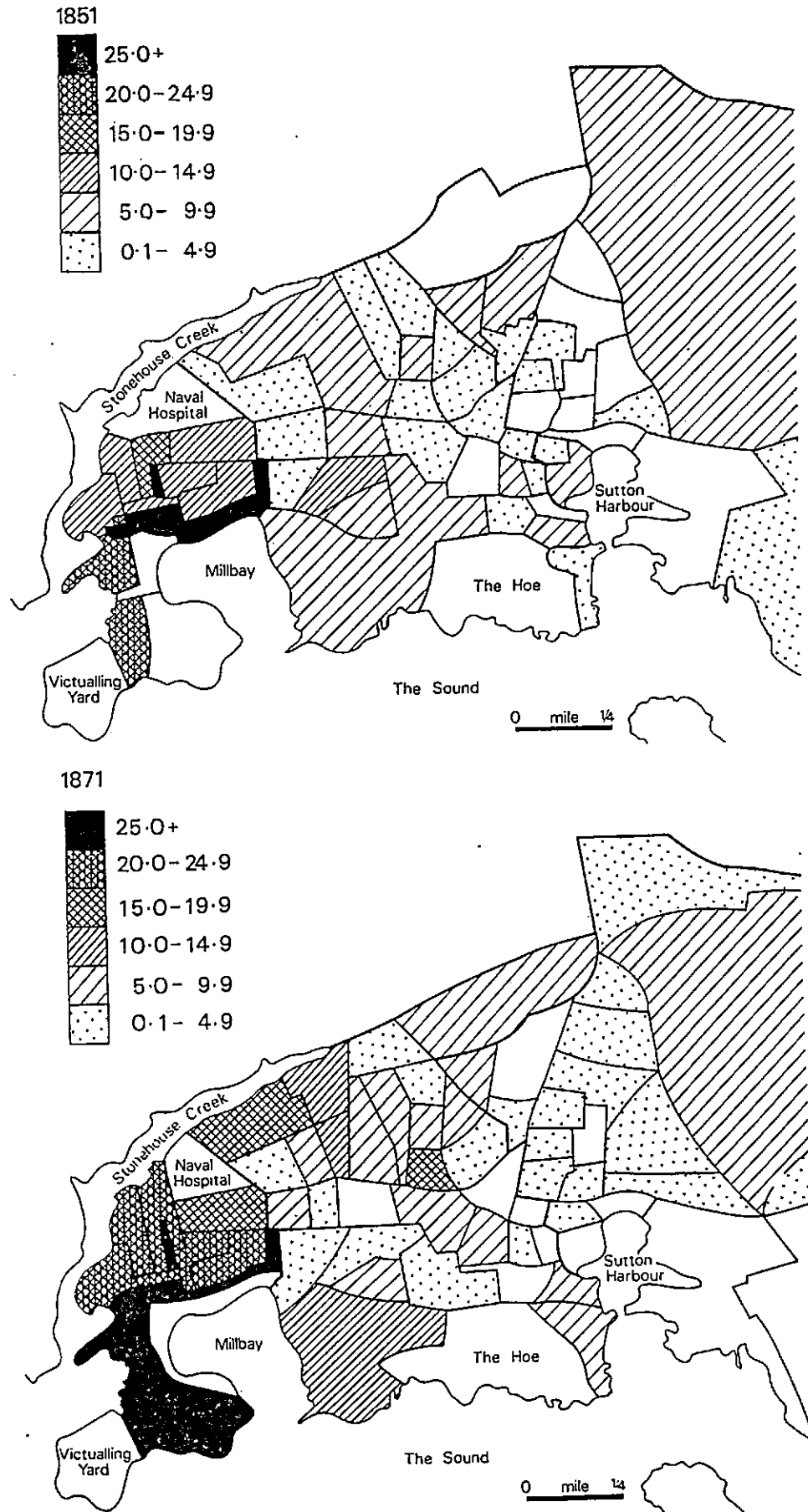


Figure 6.5: The distribution of the sample population employed in Occupational Order 2: "Persons engaged in the Defence of the Country".

The published census abstracts show that the vast majority of the forces were concentrated in Stonehouse - they represented over 13 percent of the total population there in 1861 and 1871. The increase in the population of Stonehouse owed much to the increase in the number of servicemen based there; forces personnel accounted for over one third of total population increase in the decade 1851-1861 and over half the increase in males. In the following decade there was actually a decrease in the male population despite a rise in the number of forces personnel. Much of this increase may be attributed to the doubling in size of the Royal Marine Barracks. Data on armed forces presence may also be drawn from the census abstracts on Public Institutions for 1861 and 1871 and, to a lesser degree, from footnotes to the Area, Houses and Inhabitants tables for 1851. Seven Royal Navy ships were also included in these data for St Andrew Sub-district in 1871, enumerating 1504 persons (including five women).

In the context of this study, the most important aspect of the forces presence is the ancillary work it generated. Undoubtedly, there will have been some trade in provisions, despite the very well-equipped Royal William Victualling Yard containing its own bakery, brewery, slaughterhouse, cooperage, and a general storehouse in the fourteen-acre complex (Anon, 1859; Ashford, 1980). Bracken (1931) noted that the soldiers and sailors stationed in Plymouth "increase the number of those who patronise local traders, and thus add to local prosperity".

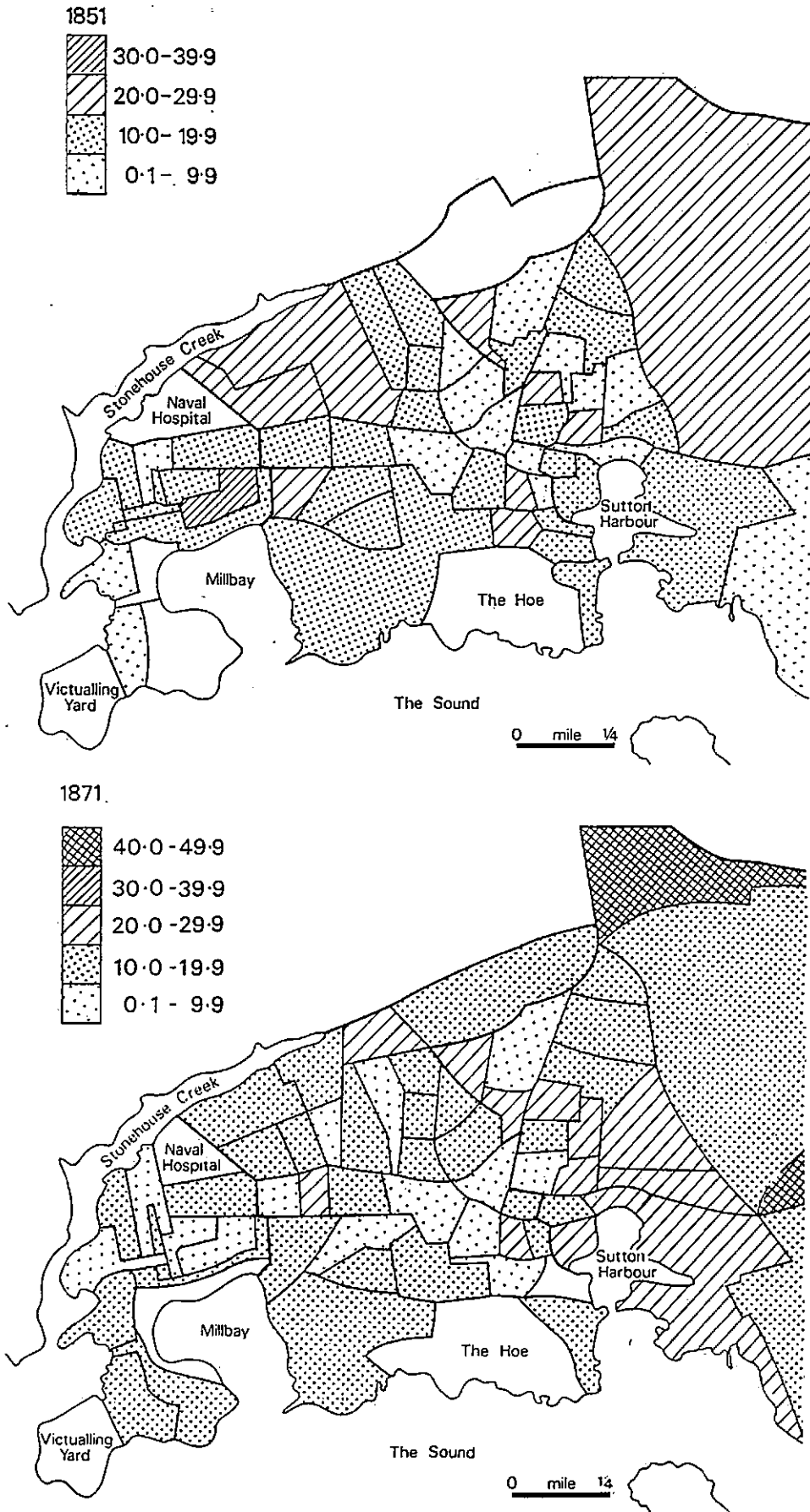
Those classified as of independent means, the far greater proportion of whom were women, ought to be considered here, although the census authorities combined them with labourers in the sixth occupational class of 'indefinite and non-productive occupations'. One in eight of the employed population were enumerated in this class

and perhaps as many as half of these people were not actually employed. The number of labourers counted in the class appears to have increased by seventy percent between 1851 and 1871 (see Table A1 in Appendix C), but their number also included vagrants and others of undefined occupation which makes interpretation difficult. This very diverse collection of people are, therefore, understandably spread fairly evenly throughout the two towns (Figure 6.6) and little can be said about their distribution owing to the unrealistic grouping which it represents; it is included here only for the sake of completeness.

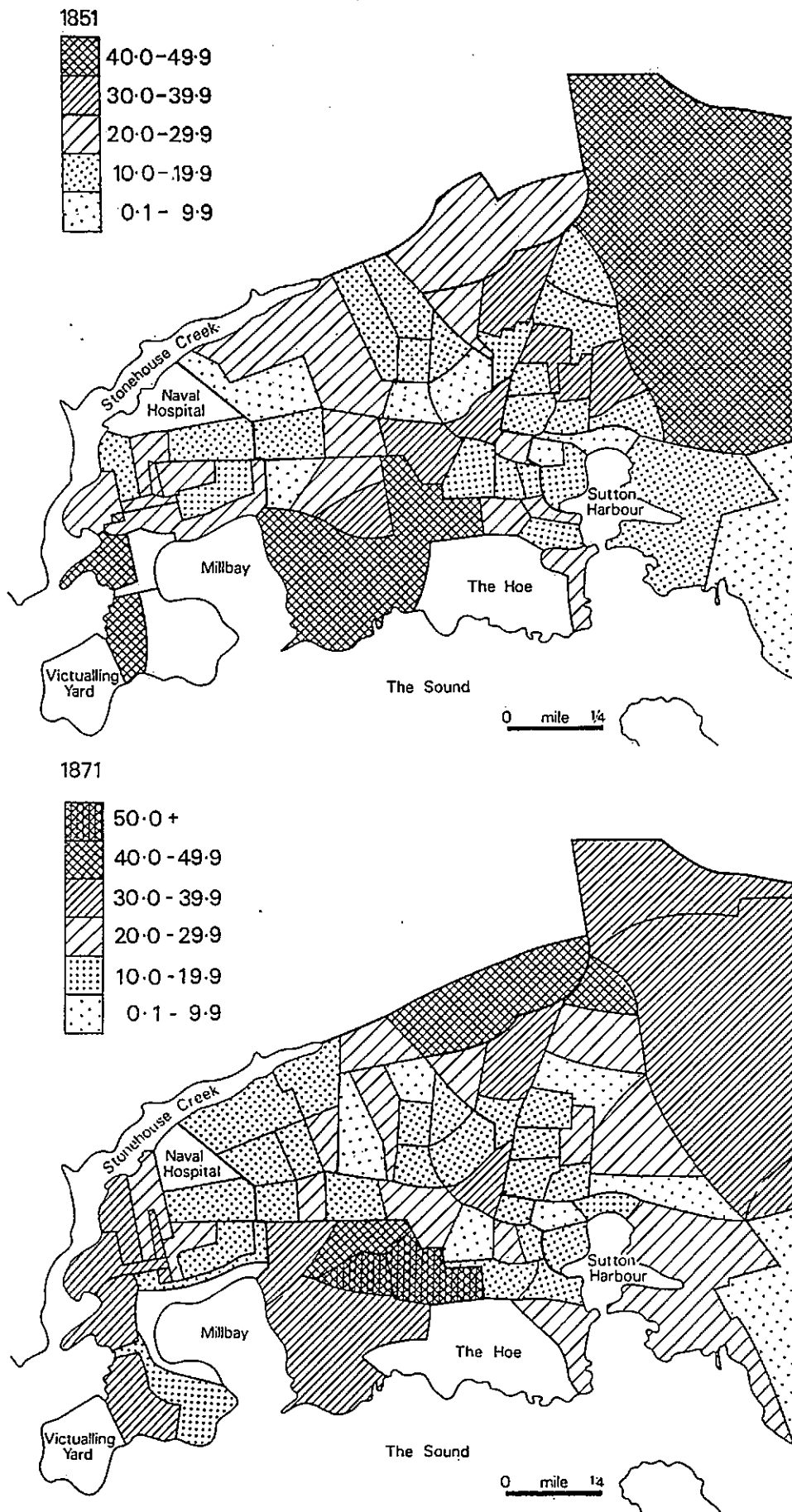
#### 6.2.2 The domestic sector

The number of people employed in domestic occupations increased throughout the study period. Their distribution (Figure 6.7) throughout the two towns is considered here to be a strong indication of the status of households; simply, the wealthier households contained servants. The greater share of this work was taken by women working in private domestic service and the importance of this source of work for women begs more detailed attention, accordingly this will be discussed in Chapter Seven. Also enumerated in this class were those employed in board and lodging and, while the published census abstracts combined domestic servants in homes and hotels, some commercial occupations can be clearly identified (Table 6.10). Here, too, women provided the greater share of the labour force.

Provision of accommodation and refreshment was an essential service in a busy town; trade brought travelling salesmen, ships and trains brought emigrants and tourists, and all these hotels, inns and taverns



**Figure 6.6:** The distribution of people employed in indefinite and non-productive occupations (Occupational Class VI) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Shown as a percentage of the working population and based on the sample population data.



**Figure 6.7:** The distribution of people employed in domestic occupations (Occupational Class II) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Shown as a percentage of the working population and based on the sample population data.

TABLE 6.10: People engaged in board and lodging

	1851			1861		
	M	F	T	M	F	T
Inn, hotel keeper	61	16	77	83	34	117
Lodging, boarding house keeper	27	113	140	22	171	193
Coffee, eating house keeper	.	.	.	16	15	31
Inn servant	56	87	143	41	36	77
Others	13	6	19	9	2	11
Total	157	222	379	171	258	429

Source: Published census data.

brought work to hundreds of men and women (Figure 6.8). Not only did these establishments provide work once built, but also in the building for an itinerant band of navvies and labourers.

"In 1792, Plymouth contained several Inns for the accommodation of Strangers..." said Jewitt (1873) and named seven such establishments including two taverns. The 1830 Brindley's Directory listed nine 'principal hotels and inns'; forty years later hotels, inns and taverns took up five columns in the trade directory, there were 145 places listed. The "large and commodious" hotels were the foundations of the tourist industry, given incalculable impetus by the railway, and while, compared to other resorts, Plymouth's aesthetic attraction will have been challenged by the noise and dirt of its other industries, the Hoe was undoubtedly an asset: "the centre of attraction for all who come here" (Stephens, 1943). The city fathers were not slow to realise this as Plymouth's seaboard location furnished another facet of the local economy.



# MILLBAY PIER HOTEL, PLYMOUTH.

THE  
MOST CONVENIENT FOR TRAVELLERS & PASSENGERS

BY THE  
*London, Southampton, Cork & Dublin Steamers.*

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GOOD BEDS,  
GOOD ATTENDANCE, MODERATE CHARGES,

And all that constitutes the comfort of a well-conducted Hotel.

## MRS. FARLEY'S COMMERCIAL HOTEL AND FAMILY Boarding House,

23, UNION STREET, PLYMOUTH,  
WITHIN TWO MINUTES' WALK OF THE RAILWAY TERMINUS AND  
ROYAL UNION BATHS.

FIXED CHARGE FOR SERVANTS.  
EMIGRANTS ACCOMMODATED ON MODERATE TERMS.

Figure 6.8: Two advertisements from *Kelly's Post Office Directory*, 1856, indicating Plymouth's role as a passenger port and tourist centre.

### 6.2.3 The commercial and shipping sector

The census occupational class concerned with commerce covers quite a wide range of employment by combining mercantile and transport activities. The choropleth maps (Figure 6.9) accordingly reveal a fairly even spread across the two towns.\* An increase in employment in conveyance (transport of various kinds) naturally followed the arrival of the railway, with consequent benefits to local business. Additionally, expansion of the shipping trade with the construction of Millbay docks and the growth of the Devonport dockyard can be seen in the employment data presented in Table 6.11. The growing importance of this sector of the local economy is reflected in the proportion of the employed population for which it provided work: 10.2% in 1851 rising to 13.3% in 1871. Figure 6.10 shows a clear concentration of workers in conveyance around Sutton Harbour in 1851, but by 1871 the distribution is less concentrated as employment at Millbay increased.

With the newly-developed docks, the sheltering arm of the Breakwater and the vital arterial link provided by the railway preparing the way, Plymouth's shipowners and traders were well-placed

TABLE 6.11: People employed in commerce by order and sex

	1851		1861		1871	
	M	F	M	F	M	F
6 Mercantile	438	95	537	137	865	342
7 Conveyance	1658	13	2392	7	2364	11

Source: Published census data.

\* The high value for one enumeration district to the north of Plymouth in 1851 is misleading for it was very sparsely populated at this time; only 238 people were enumerated there.

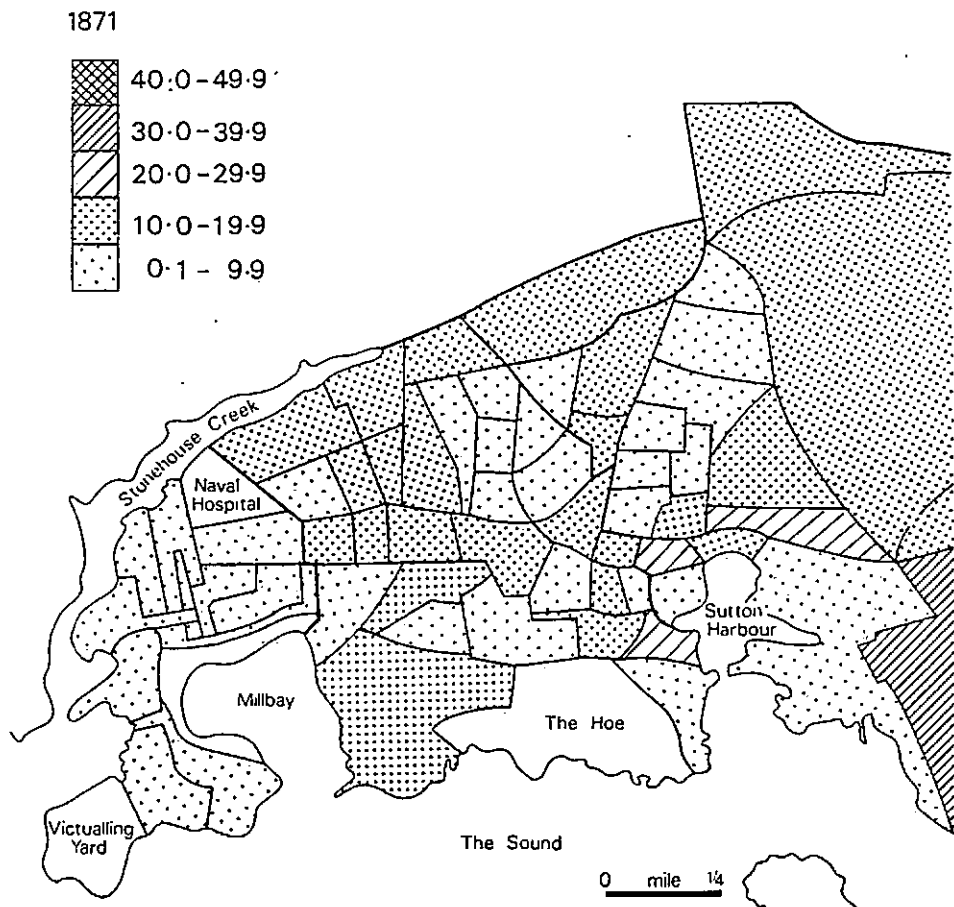
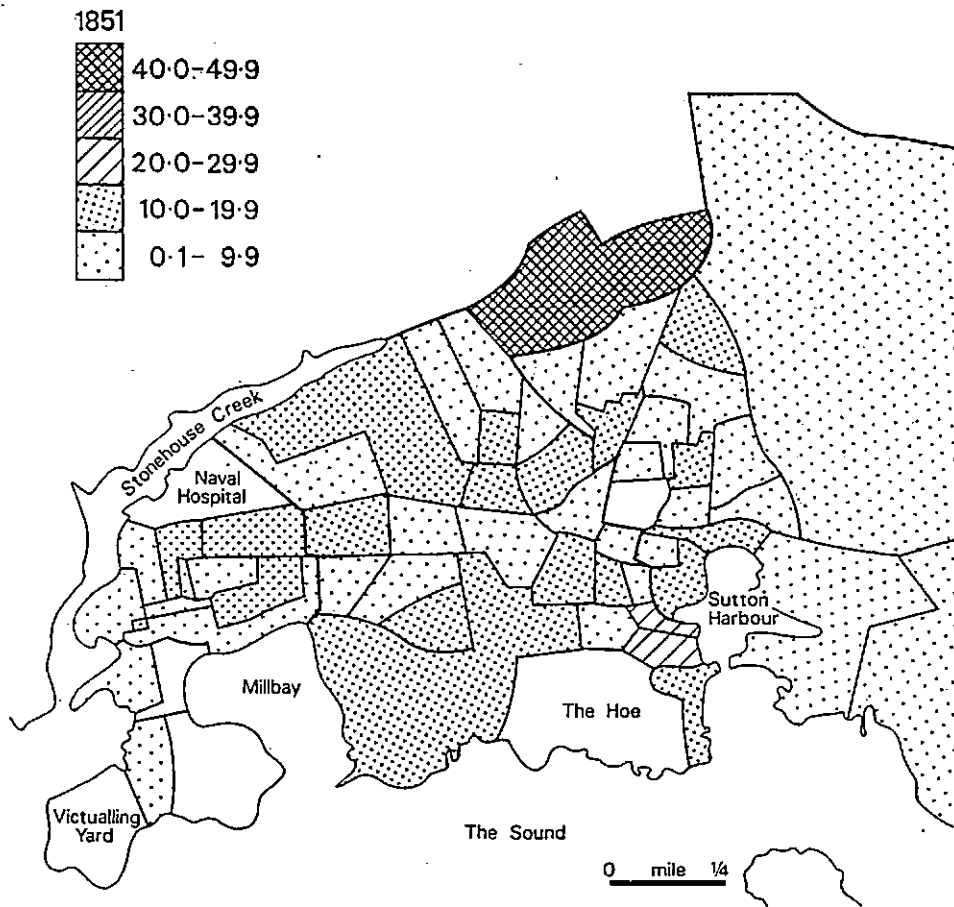


Figure 6.9: The distribution of people employed in commercial occupations (Occupational Class III) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Shown as a percentage of the working population and based on the sample population data.

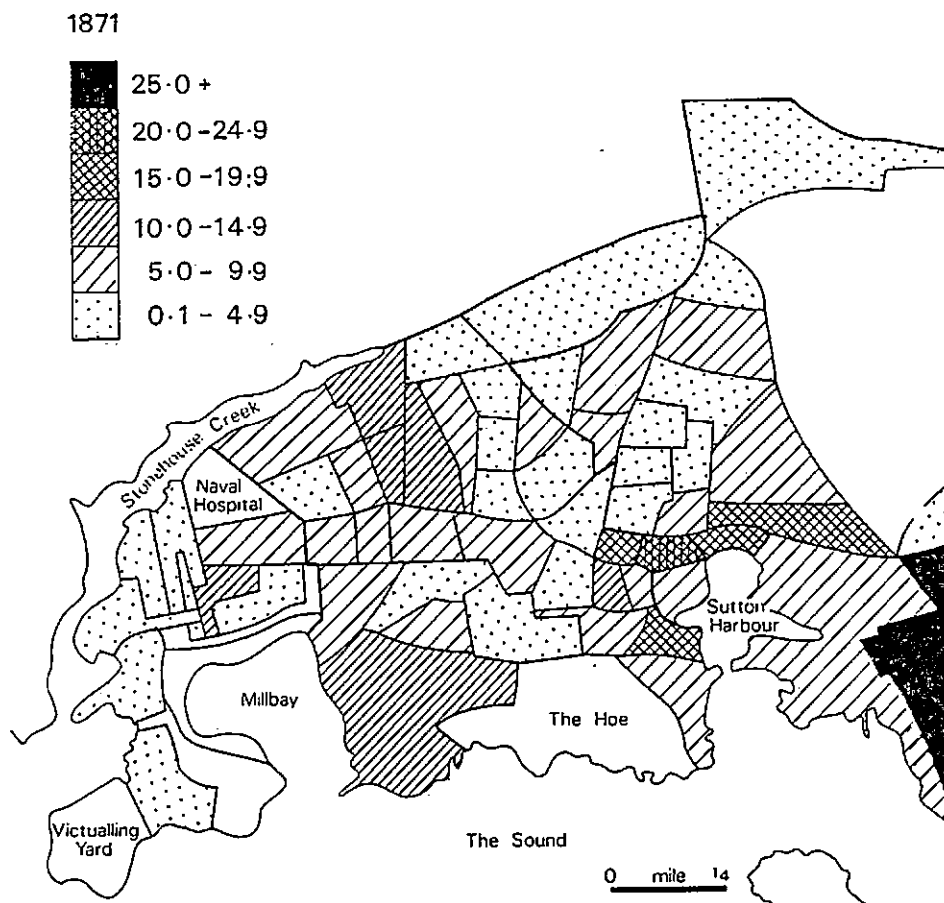
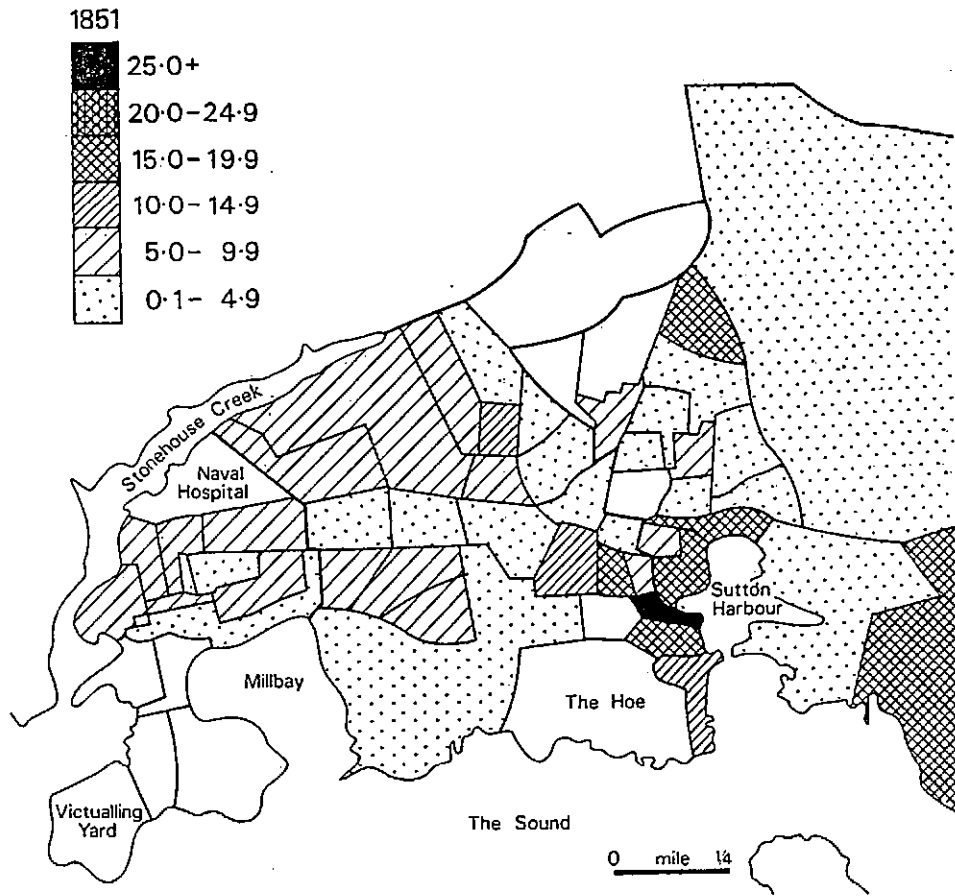


Figure 6.10: The distribution of the sample population employed in Occupational Order 7: "Persons engaged in the Conveyance of Men, Animals, Goods and Messages".

to do profitable business. The mid-19th century was largely a time of peace, despite the Crimean War of 1854-56 and the Indian Mutiny of 1857-58, and thus it was the traders of the town whose activities both encouraged and responded to the demographic change characteristic of this period. The flood of imports and exports through the town's docks made possible a host of ancillary activities, dealing in and producing goods and services for the shipping industry. Plymouth's role as a port exerted an influence on almost every part of the town's economy. Shipping directly employed over one thousand people in 1851, and many businesses were dependent upon the trading lifeline which the port endowed. The business generated by Plymouth's mid-Victorian shipping industry affected profoundly the economic health of the entire community. Craig (1973) has identified four factors which explain the importance of shipping in a region like the southwest:

- (a) the invisible earnings of the southwest shipping sector will have been an important stimulant to the region's economy,
- (b) the southwest ship-building industry made a considerable contribution to the British mercantile marine,
- (c) southwest seafarers played a significant role in manning the British mercantile marine and,
- (d) by means of their remittances to wives and dependants, channelled much income to the region's economy.

The influence of the shipping industry spread so far through the local community that it is impossible to say exactly how many people were dependent upon it for a living. Some occupations can be easily identified in the census abstracts, and these are listed in Table 6.12 which includes workers from other occupational classes. Other occupations, under such general descriptions as shopkeeper or general trader, will doubtless conceal countless other workers in sea-connected trades.

TABLE 6.12: Trades connected with the sea: Plymouth and Stonehouse

	1851	1861	1871
Commercial occupations:			
ship broker, agent	14	13	nk
marine store dealer	nk	27	nk
Total	14	40	nk
ship owner	23	21	nk
seaman/mariner	958	1356	nk
pilot	25	23	nk
boatman on seas	nk	70	nk
dock servant/labourer	nk	71	nk
wharfinger	nk	3	nk
others	59	57	nk
Total	1065	1601	nk
Total in Order 7	1671	2399	2375
Percentage of Order 7	63.7	66.7	nk
Industrial occupations:			
shipbuilder, shipwright	169	364	nk
barge, boatbuilder	7	8	nk
block, oar, mast maker	nk	18	nk
sailmaker	nk	58	nk
sailcloth maker, dealer	46	16	nk
others	25	19	nk
Total	247	483	nk
Grand Total	1326	2124	nk
Percentage of workforce	6.1	8.3	nk

Source: Published census data.

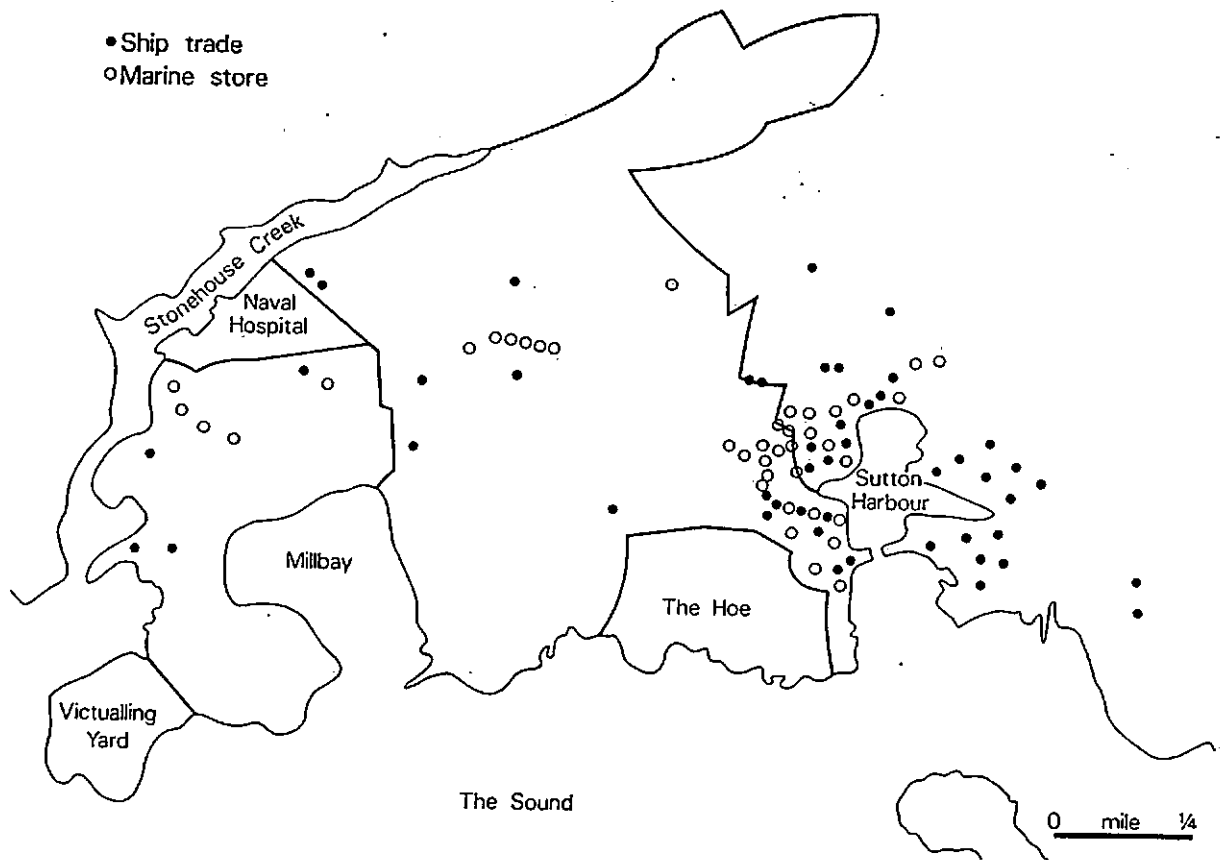
The data available do show how the shipping industry was expanding: blue collar workers, in particular (mariners and shipwrights), were obviously in greatest demand, whereas the number of owners and brokers seems, if anything, to have been decreasing. This probably reflects the size of individual businesses which increased as capital outlay increased on bigger and better vessels. The proportion of the workforce in sea-connected occupations grew by over two percent in the 1850s; comparable figures are not available for the 1860s, due to the paucity of the 1871 published census abstracts.

The greater part of the ship-building industry was based in

Devonport, but there were firms in Plymouth such as Charles Gent of Coxside and Richard Hill of Cattedown (1823 to 1887). Others like Hocking's, at Whitehall in Stonehouse (operating from 1823 to 1877), were both ship owners and traders (White's Directory, 1870). Millbay's inner basin included a dry dock for paddle steamers where Watson & Fox operated until 1891, plus Willoughby's engineering firm which continued until 1969. William Moore & Son were based in Sutton Harbour, but ceased work in 1876, refusing to build iron vessels. The majority of these small firms were located in the Cattedown area and tended to be boat-builders more than ship-builders.

The distribution of ship trade manufacturers and marine store dealers listed in the 1856 Kelly's Directory (Figure 6.11) shows clearly that the great majority were located in the immediate vicinity of Sutton Harbour at that time, with a small group of marine stores in King Street. Noticeably, there was an absence of such businesses at Millbay and this situation had not altered to any extent by 1870 (Morris' Directory). By way of explanation, it is possible that these firms served the small tramp vessels and fishing smacks which used Sutton, these craft having single owner-masters for the most part; the vessels docking at Millbay were much more likely to be company-owned, being of greater tonnage, and their service demands and supply will have been markedly different and probably met elsewhere.

Advertisements in contemporary directories often give much detail of the business of shipping trade manufacturers and marine store dealers (Figure 6.12). The local importance of this business was highlighted by Wright (1894) who noted the special clothing required by mariners which was manufactured and sold locally. Such firms are not always identified as trades connected with the sea in contemporary data sources and are, therefore, typical of the way in which the



**Figure 6.11:** The location of shipping trade manufacturers and marine store dealers in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.



**41, HIGH STREET, 41,  
PLYMOUTH.**

**W. JEFFERY, SUCCESSOR TO R. GARLAND,**

IN RETURNING THANKS FOR THE LIBERAL SUPPORT HE HAS RECEIVED SINCE HIS COMMENCING  
BUSINESS, BEGS RESPECTFULLY TO INFORM

**SHIPOWNERS, YACHTSMEN, & NAVAL & MERCANTILE CAPTAINS,**

THAT HE HAS JUST RECEIVED THE APPOINTMENT OF

**AGENT TO THE HOUSE OF JOHN FLETCHER & SONS,**

**THE CELEBRATED CHRONOMETER MAKERS,**

(Patronised by the LORDS COMMISSIONERS of the ADMIRALTY,) and will consequently  
be enabled to supply articles of superior qualities.

W. J. also solicits an inspection of his large and valuable Stock of Gold and Silver Lever Watches.

CHRONOMETERS RATED BY TRANSIT OBSERVATIONS.

**N.B. SECOND-HAND CHRONOMETERS ON SALE.**

*d 2*

Source: 1856 Directory

**J. E. MONK,**

WHOLESALE

*Wholesale of Clothing*

Source: 1878 Directory

MANUFACTURER,

25 & 27, SOUTHSIDE STREET,

PLYMOUTH.

Source: 1878 Directory



**HENRY J. HAM,**

**SAILMAKER,**

**No. 32, SOUTHSIDE STREET,**

**PLYMOUTH.**

**A LARGE STOCK OF EVERY NUMBER AND DESCRIPTION OF CANVAS AND TWINES  
ALWAYS ON HAND.**

Figure 6.12: Advertisements from Kelly's Post Office Directory, 1856, and White's Directory, 1878, promoting marine-based trades in Plymouth.

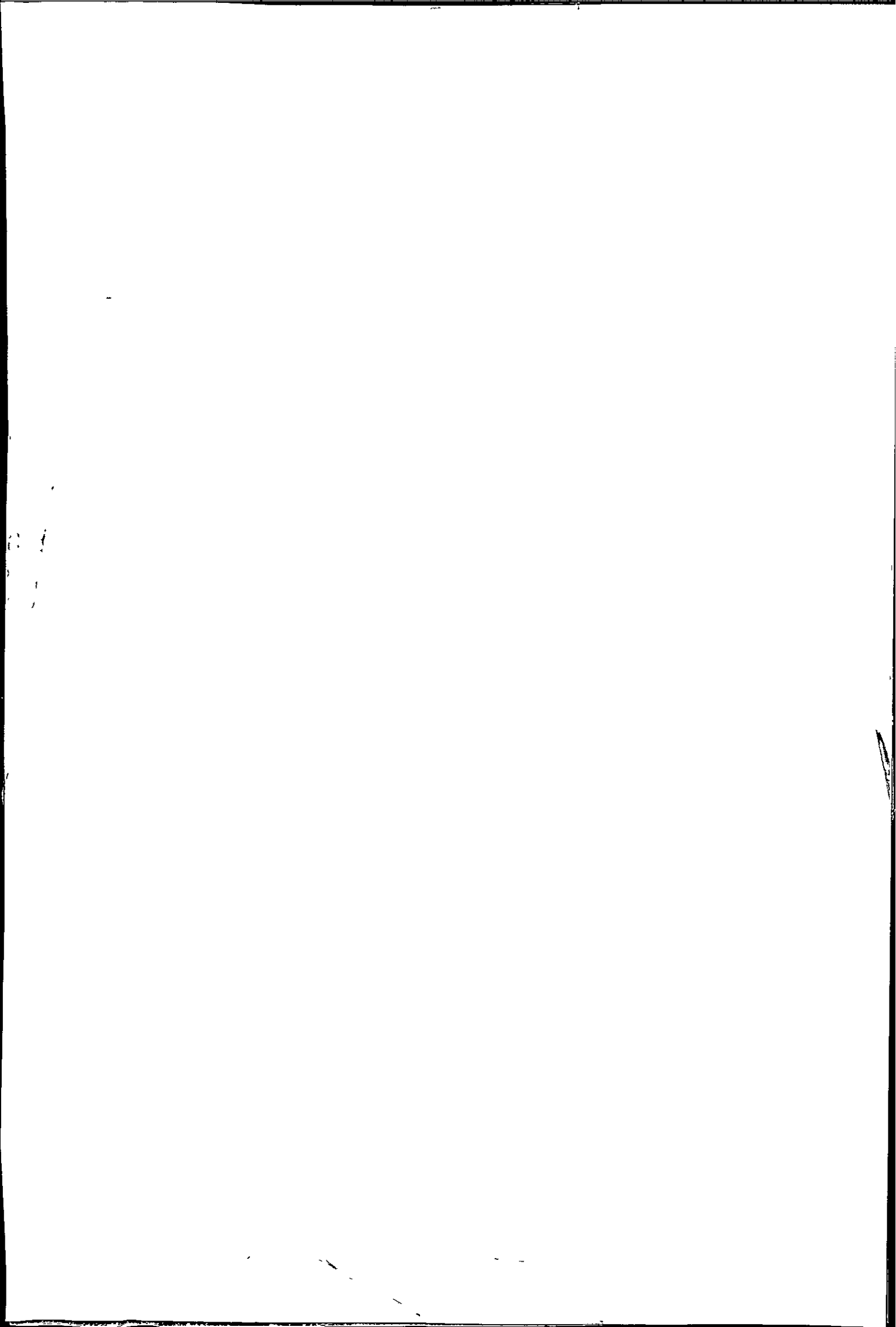
shipping industry penetrated deep into local economic life.

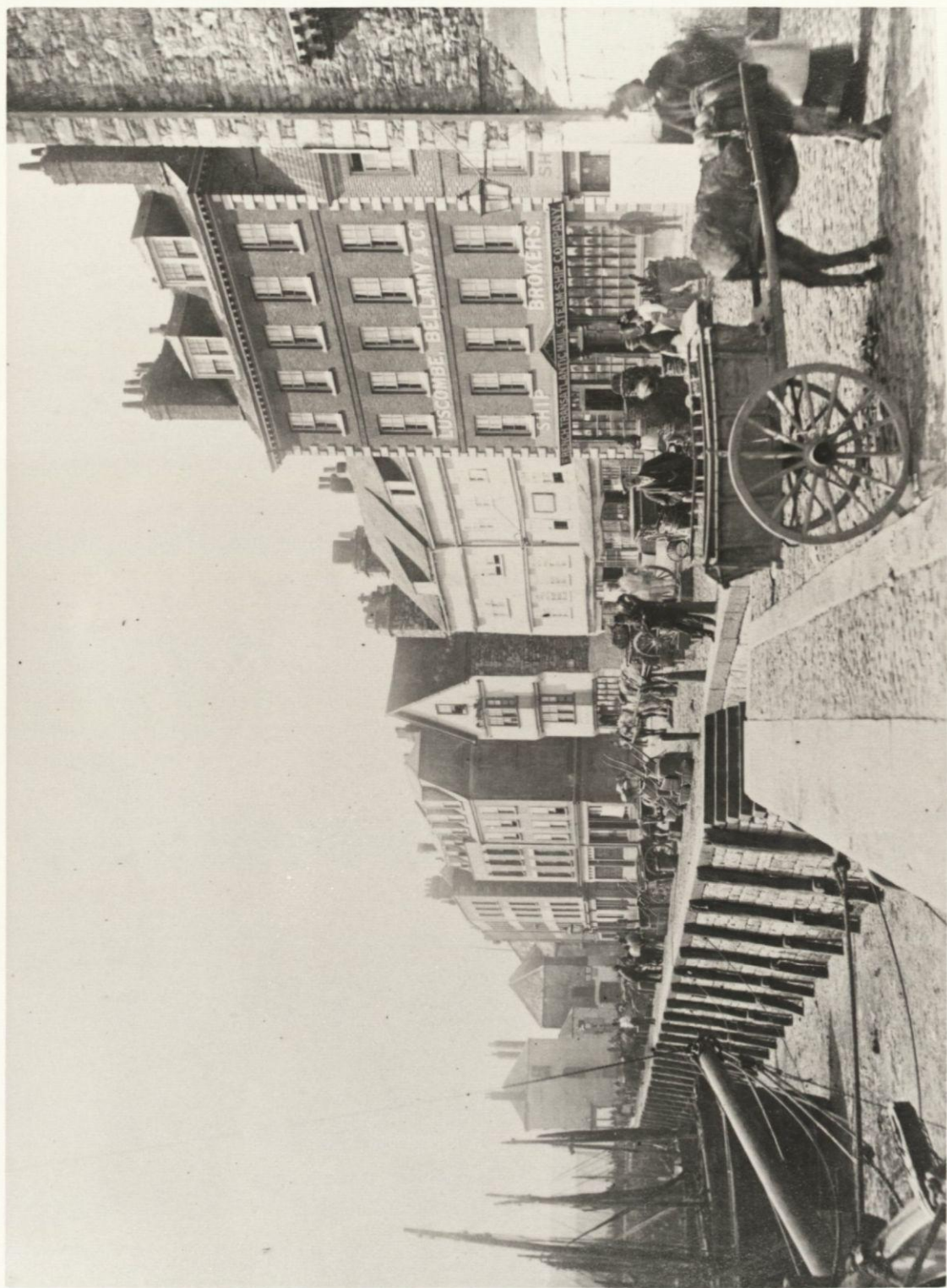
In the 18th and early 19th century British ship-owning tended to be ancillary to the main business of trading involving small firms or partnerships, or single-owner operators. During the mid-19th century, there was a gradual move away from casual ownership and operation of vessels by individuals towards larger undertakings which specialized exclusively in shipping, in effect there was a separation of the mercantile and shipowning functions of the business (Dyos & Aldcroft, 1969). Changes of this kind came slowly to Plymouth, for example, Bellamy of Plymouth, a principal shipowner in Devon and Cornwall, went into partnership with Luscombe in the early 1870s (Plate 6A). Contemporary directories can be used to reconstruct the company's history (Table 6.13), and indicate the far-reaching extent of the firm's affairs as merchant and passenger ship agents and brokers, and insurance underwriters, conducting business over a wide area of Europe, the Americas and Australia. This was just one firm; there

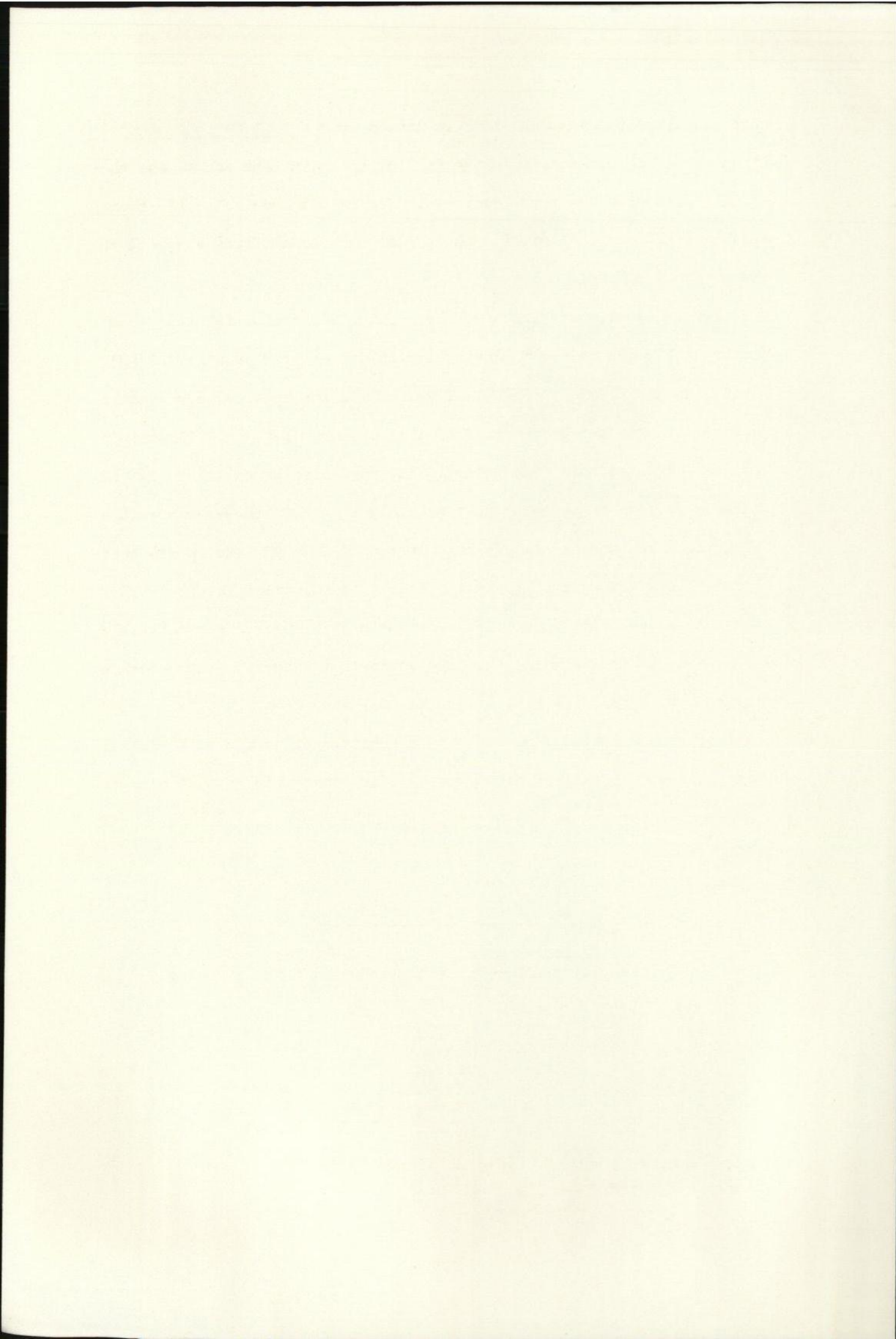
TABLE 6.13: Luscombe and Bellamy, Plymouth shipowners

- 1850 Luscombe, Driscoll, & Co listed as merchants, consuls, agents and brokers at 7 Vauxhall Street;
- 1856 Luscombe, Driscoll & Co, consulates at Vauxhall St, and Luscombe, Thomas & Son, shipowners, coal merchants and importers of salt at Phoenix Wharf, Commercial Road; Scales, Joseph, merchant and shipping agent, 9 Parade;
- 1862 Driscoll & Scales, Parade, and Luscombe, Sons & Co, Vauxhall St;
- 1870 Luscombe, Sons & Co, agents, brokers, consuls, etc. at 11 Vauxhall Street, and Bellamy, Joseph Arthur appears as a cashier at Teats Hill; Driscoll & Scales are no longer listed;
- 1873 Luscombe, Bellamy & Co listed at 12 Barbican, also Bellamy, Joseph, French and Spanish interpreter, Commercial Road;
- 1878 Luscombe, Bellamy & Co, ship agents, ship brokers, and merchants, details of business include "weekly departures to New York";
- 1882 Bellamy & Co, steamship agents, consuls & shipbrokers, steam coal merchants, 28 Southside Street.

Plate 6A: The Barbican in the 1870s, looking south. Luscombe, Bellamy & Co had a prominent position by Sutton Harbour.







were twenty ship agents and brokers listed in Morris & Co's Commercial Directory of 1870, among them the Collier brothers, and Fox & Sons had equally extensive business interests. Yet it was precisely this broad spread of economic activity which made such local firms atypical in the national context.

Farr (1968) studied Custom House Ship Registers for the West Country and recorded the following registrations at Plymouth: 1824-35, 749; 1836-55, 1105; 1855-99, 1072. While the apparent decrease in registrations in the latter half of the century reflects Plymouth's neglect of steamship technology, it may also be explained by the increase in size of vessels. Between 1849 and 1871, the average size of vessel registered at Plymouth increased from 91 tons to 114 tons (based on statistics in White's Directory, 1850, and Worth, 1872). From its outset Millbay's Great Western Docks harboured substantially larger vessels than Sutton but, as Table 6.14 shows, the average tonnage per vessel served at Sutton broadly increased.

By the mid-century, Plymouth's main coasting trade was with London, Bristol, Newport, Exeter, and Newcastle, and steamships sailed once or

TABLE 6.14: Foreign vessels entering Plymouth

Year	Sutton Harbour			Great Western Docks		
	vessels	tonnage	av.ton.	vessels	tonnage	av.ton.
1850	1335	76949	57.6	292	62654	214.6
1855	1535*	106215	69.2	500	106616	213.2
1860	1644*	109775	66.8	1564	335966	214.8
1865	1564	108837	69.6	1758	370699	210.9
1870	1380	103942	75.3	2079	410947	197.7
1875	1394	100990	72.4	2308+	469811	203.6
1880	1230	87392	71.1	2193+	472687	215.5

\* above average years                      + below average years

Source: Lattimore, 1958.

twice a week with goods and passengers to other English ports as well as the Channel Islands and Ireland. In 1848, 4,106 vessels entered port: 538 from abroad, 175 from Ireland, and 3,393 coasters; and vessels leaving port numbered 2,343 including 105 to foreign ports, 236 to Ireland, 238 in ballast, 1,585 coasting vessels, and 89 emigrant ships (White's Directory, 1850). By 1860, Plymouth ranked sixth among English ports, handling over a thousand foreign trade ships and over 4,500 coastal vessels a year; Worth (1872) recorded "a total of 1,105 entries inwards and outwards in the foreign trade; and 4,579 in the coasting" in 1871.

In 1870 Plymouth ranked eighth in population "in the kingdom" and still held sixth place in trade, yet with regard to its main imports it ranked second for cattle, fourth for saltpetre and sugar, fifth for hemp and hides, seventh for wine and wood, and ninth for corn (Worth, 1890). But the port began to lose its importance in the 1870s and never regained its high rank. Not only were local shipowners slow to embrace the new steamship technology but also Plymouth's docks proved inadequate to take the larger ships; the Royal Navy held the best deep-water berths in Devonport (Gill, 1979). Small sailing vessels predominated in the southwest and in Plymouth, and there is little evidence that southwest shipowners invested in large bulk-carrying sailing vessels so typical of ports such as Liverpool. By 1876, Plymouth had fallen to eleventh in the trade ranking.\* Nevertheless, the local volume of trade continued to increase in terms of both the value of imports (from £1.3 million in 1872 to £1.7 million in 1877) and the number of ships and their combined tonnage arriving at the

\* The ports, in order of importance, were: London (including Folkestone, Southampton, Newhaven, Dover, Harwich and Rochester), Liverpool, Hull, Bristol, Newcastle, Grimsby, Goole, Hartlepool, Gloucester, Swansea, Plymouth.



port. At this time foreign trade was equal to about one third of coasting trade with regard to imports.

The wide range of imports received at Plymouth for the period 1857 to 1877 is shown in Table 6.15. Billings' Directory and Gazetteer (1857) identified trading links with the Baltic, the Mediterranean, the West Indies, the British possessions, North America, Norway, Havannah, the Brazils, Buenos Aires, Rio Grande, Turkey, Cadiz, Oporto, the Charente, "and a constant trading between the Channel Islands, Guernsey, Jersey and Aldernay"; he also noted that while Plymouth did not receive Indian goods generally, large quantities of teas, coffee, spices, were received under bond by coast from London, Liverpool and Bristol. Plymouth had also become an important mail

TABLE 6.15: Imports at Plymouth, 1857-1877

Animal products:

butter, cheese, eggs, lard, live animals, bones, hides, manures, meat preserves, blubber, fish, guano, tallow, cochineal, ivory

Vegetable produce:

barley, flour, maize, oats, rice, wheat, beans, peas, seeds, pepper, spices, chocolate, cocoa, coffee, hops, tea, tobacco, currants, lemons, onions, oranges, potatoes, raisins, molasses, sugar - refined and unrefined, bark, mahogany and other wood, gum, oilseed cake, palm oil, tar, valonia

Mineral products:

bricks, brimstone, coal, copper ore, glass, ice, iron, iron castings, nitrate of potash, oil, petroleum, phosphate of lime, pig iron, plaster of Paris, Portland stone, pyrites, salt, saltpetre, spelter, unwrought tin, zinc, and other metals

Textiles:

cotton - manufactured and raw, flax, hemp, rags, silk, wool, manufactured wool, and also dyes

Alcohol:

brandy, geneva (gin), rum, whiskey, wine, and other spirits

Sources: Billings' Directory, 1857; Lattimore, 1958; Worth, 1872.

packet station during the 19th century and, in 1852, became the Australian mail port. Soon after, all the British companies were calling at the port (White's Directory, 1870).

The chief exports from mid-19th century Plymouth were copper, lead, ores, manganese, granite, limestone, fish, china clay, and timber. In addition, of course, were locally manufactured products which figured large among the exports; in order of value, they were general cargo, chemical preparations, manures, refined sugar, candles, machinery, provisions, products of coal and slate, soap, leather, and spirits. Also there were quantities of foreign and colonial merchandise re-exported, including wheat, barley, maize, guano, manure, cubic nitre, petroleum, spirits, and wine (White's Directory, 1850, 1870).

In addition to the occupational data, published census abstracts include 'Persons on Board Vessels'. Very large numbers of people were thus enumerated, though, of course, service personnel will have been included here. In 1851, 2,073 persons were counted on board sea-going vessels on census night, plus 480 people aboard inland navigation craft - though only 173 men were engaged in inland navigation at that time (the remainder being passengers). A footnote to 'Persons on Board Vessels' in the published census notes the inclusion of people who slept or dwelt, on the night of the census, in barges and other vessels employed exclusively in inland navigation or in fishing smacks in harbour.\* In subsequent censuses sea-going vessels were identified as British or Foreign and Colonial, though they included navy ships. Thus there were 1,576 people on board British vessels and 158 on board foreign and colonial vessels in 1861, and in 1871 there

\* Stephens (1943) talked of the sand barges "which used to come to the Sand yard on the Coxside roadside of Sutton Pool" and which will have been typical of the inland navigation vessels; they carried 25 to 30 tons of builders' sand.

were 2303 on British and 97 on foreign vessels, a total of 2400 aboard 182 craft.

The coming of the railway prompted a rapid increase in Plymouth's importance as an emigration port, with 26 vessels carrying 1,230 passengers embarking in 1847 rising to 130 vessels with 15,895 passengers in 1849. By 1856, emigration had decreased slightly, but there were still 54 vessels carrying 8,898 emigrants to the colonies. The mid-Victorian period also saw the development of tourism, signalled most emphatically by the birth of the ocean liner. German and French liners bound for America were calling at Plymouth from the 1870s, and dockside facilities were improved to accommodate the P & O Line's use of the port in the 1880s. This new business had a clear ancillary benefit to the town and new hotels were built to serve the passengers.

Financial institutions mushroomed in tandem with trade and industry, and Plymouth shared in this expansion. The first Plymouth Bank was established in 1772 and the second, the Naval Bank, in the next year. The Plymouth Bank (Elford's) stopped payment in 1825 and caused widespread distress to local business. But by 1850 there were five new banks in the town, including the Devon & Cornwall, with headquarters in Plymouth, which was established in 1832 as the Plymouth & Devonport. Forty years later the number had increased to nine. Similarly, the number of brokers increased from nine in 1830 to 31 in 1890; and while two insurance companies were listed in 1870, there were numerous agencies - such work was often done in addition to ship broking or law practice.

Clearly, therefore, the impact of trade and shipping in Plymouth exerted a profoundly important influence by creating a wide range of job opportunities for the town's increasing population and an

important impetus to demographic change. While, nationally, the port was not exceptional in its trade and shipping expansion during the Great Victorian Boom, Plymouth became firmly established as the principal port for the southwest region; the port took a substantial share of the nation's trade, its nearest competitors being Bristol and Southampton. In addition, Plymouth's location as the first major British port en route from the Atlantic approach was a singular advantage, especially when coupled with the rail link to London.

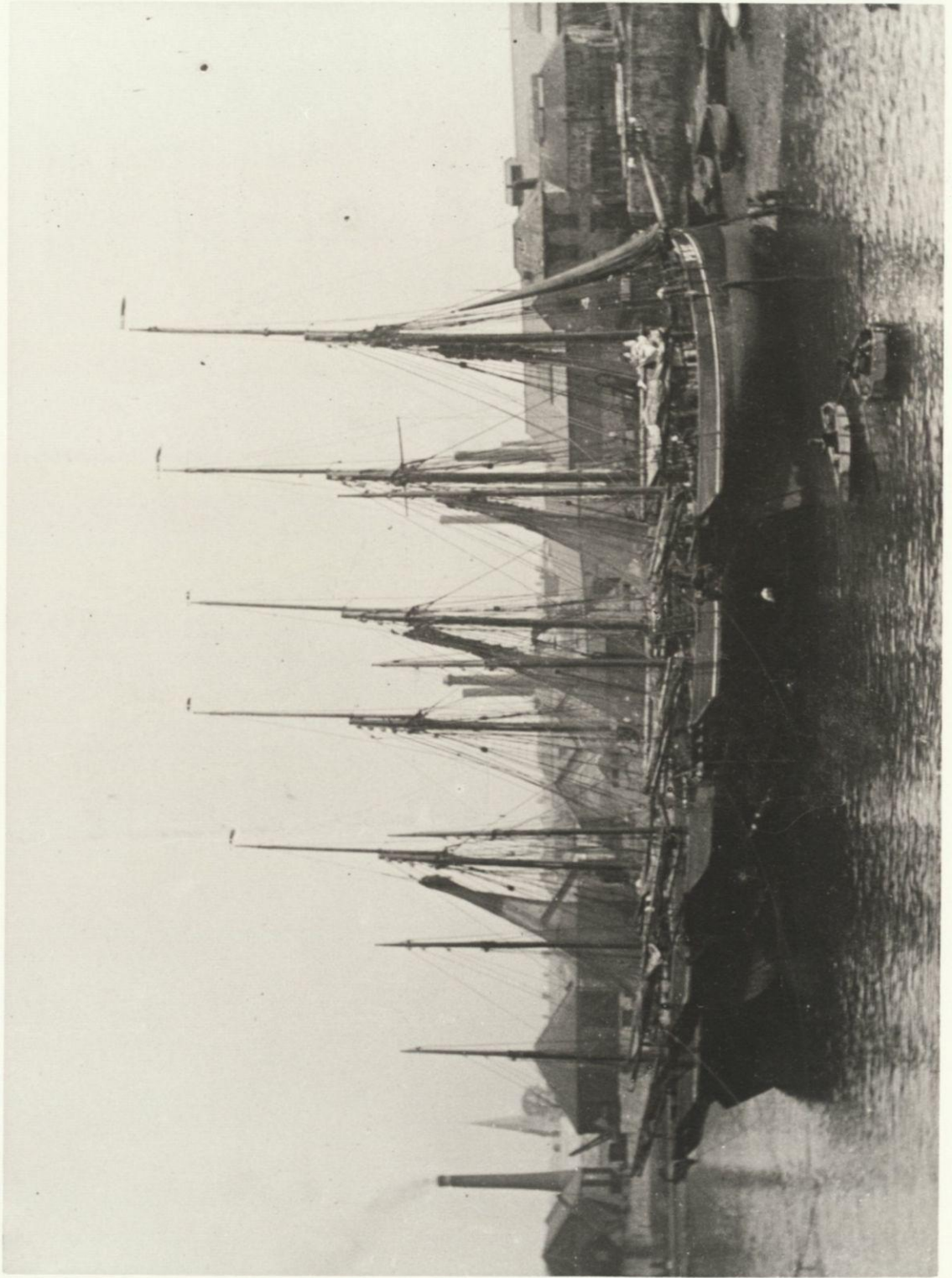
#### 6.2.4 The agricultural and fishing sector

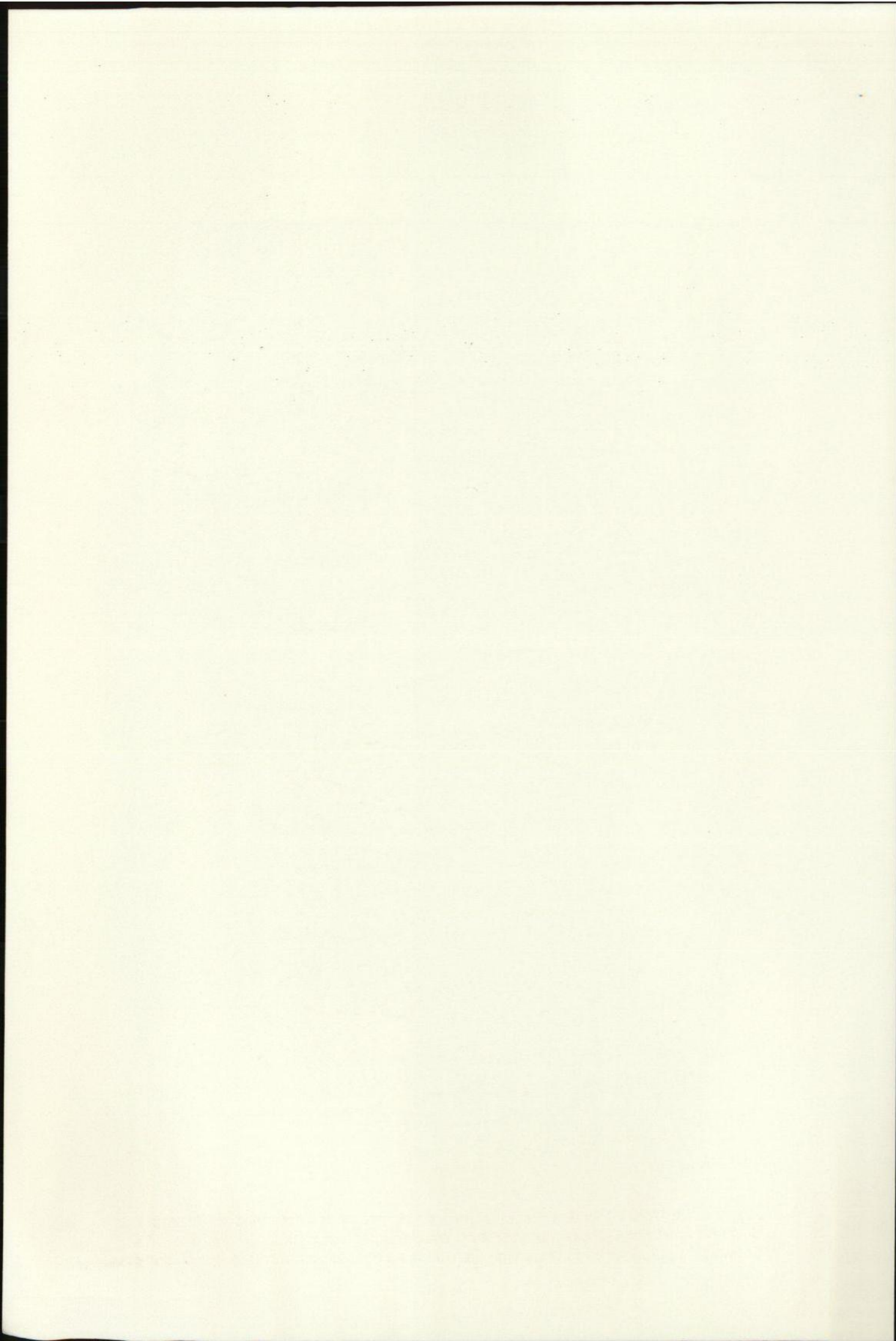
Agricultural employment was clearly declining in mid-19th century Plymouth as land was used up for building (Figure 6.13); the number of people employed nationally in agriculture declined steadily throughout the study period (Booth, 1886; Purdy, 1864; Jones, 1964). However, the largest group of workers in this occupational class in Plymouth comprised fishermen.

Plymouth Registration District (specifically Sutton harbour, Plate 6B) was the base for local fishing, with 573 men thus employed in 1851 and 576 in 1861. While the actual figure for 1871 is not available, the total number of men enumerated in the occupational order ('Persons engaged about Animals'), which also included horse keepers and so forth, was 644 in 1851, 660 in 1861, but only 386 in 1871. The combined data for Plymouth and Devonport also show a drop in numbers (Table 6.16). This decrease is difficult to explain (497 fishermen were recorded in the Urban Sanitary District of Plymouth in 1881), possibly the local fishermen had temporarily migrated to richer

Plate 6B: Trawlers harboured at Marrowbone Slip, Sutton Pool.

Plate 6B: Trawlers harpooned at Marrowbone Slip, Sutton Pool.







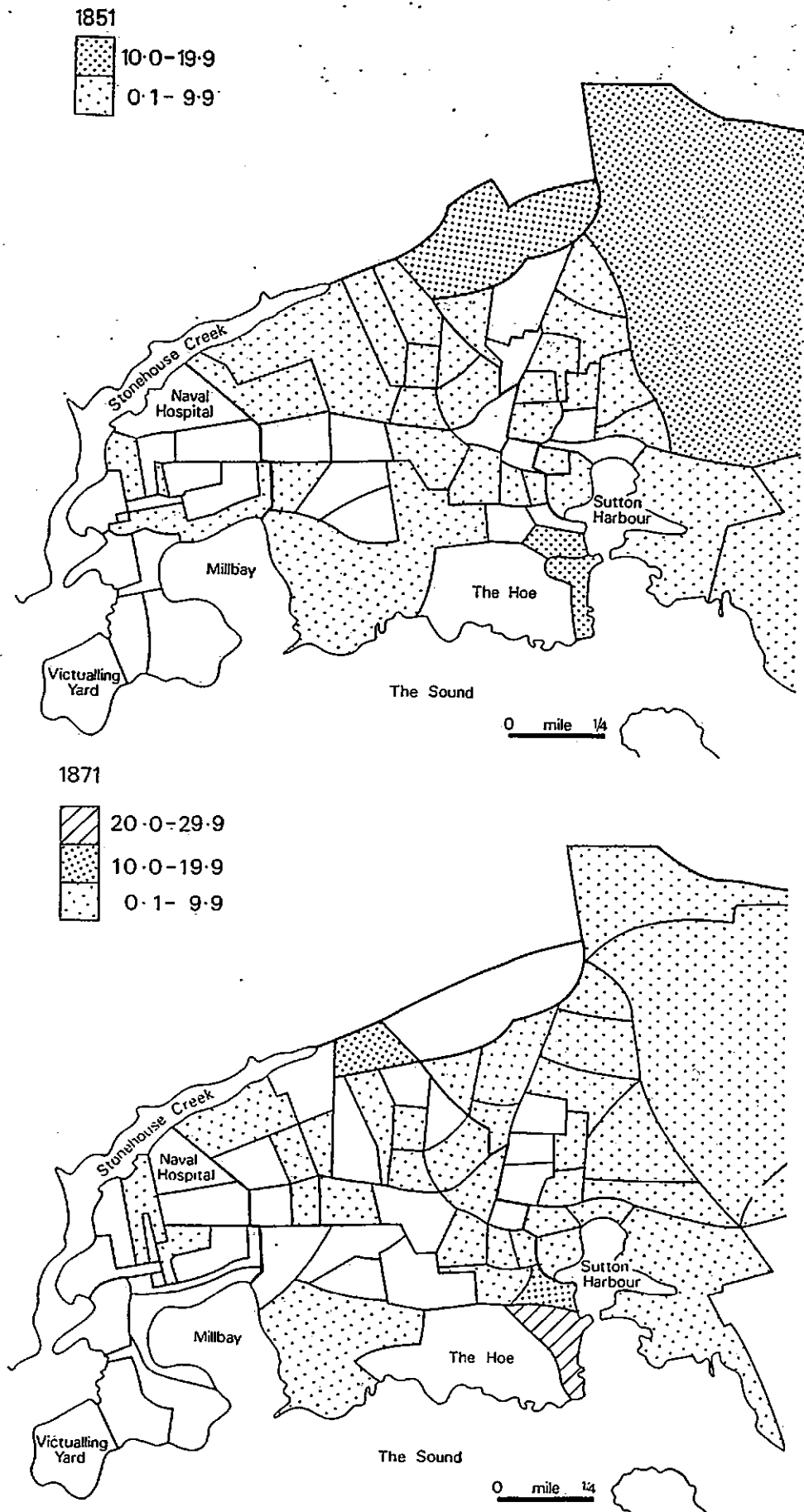


Figure 6.13: The distribution of people employed in agricultural occupations (Occupational Class IV) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Shown as a percentage of the working population and based on the sample population data.

TABLE 6.16: Employment in the fishing industry

	1851		1861		1871	
	M	F	M	F	M	F
Plymouth and Stonehouse:						
Fisherman/woman	575	.	580	1	.	.
Fishmonger	48	37	44	44	.	.
Plymouth and Devonport:						
Fisherman/woman	579	:	580	1	311	5
Fishmonger	46	69	40	58	45	66

Source: Published census data.

fishing grounds. Southwest fishermen increasingly migrated seasonally to fish from other ports; this migration served to found the North Sea trawling industry - more able to land large catches for London - and many West Country fishermen subsequently settled in Hull and Grimsby (Rule, 1976). Also, Booth (1886) noted that it was uncertain whether fishermen who were at sea on the census night were included in the returns, although it was thought that few escaped enumeration (Armstrong, 1972).

Northway (1973) points to a source of confusion in the 19th-century data sources: the term 'mariner' appears to have been a cover-all occupation and will have included some part-time fishermen. In 1825, he says, 18 vessels were wholly or partly owned by 'mariners' or 'fishermen'. The ownership of fishing vessels reveals a rather complex occupational situation, and the main conclusion which may be drawn is that the variety of sea-going employment was inextricably interwoven. Owner-operators were common through the first half of the 19th century, the remaining owners being involved in other maritime occupations and a number being owned by widows. By 1861 there was a wider range of non-maritime occupations among the smack owners; it may have been simply that some owners had retired from going to sea.

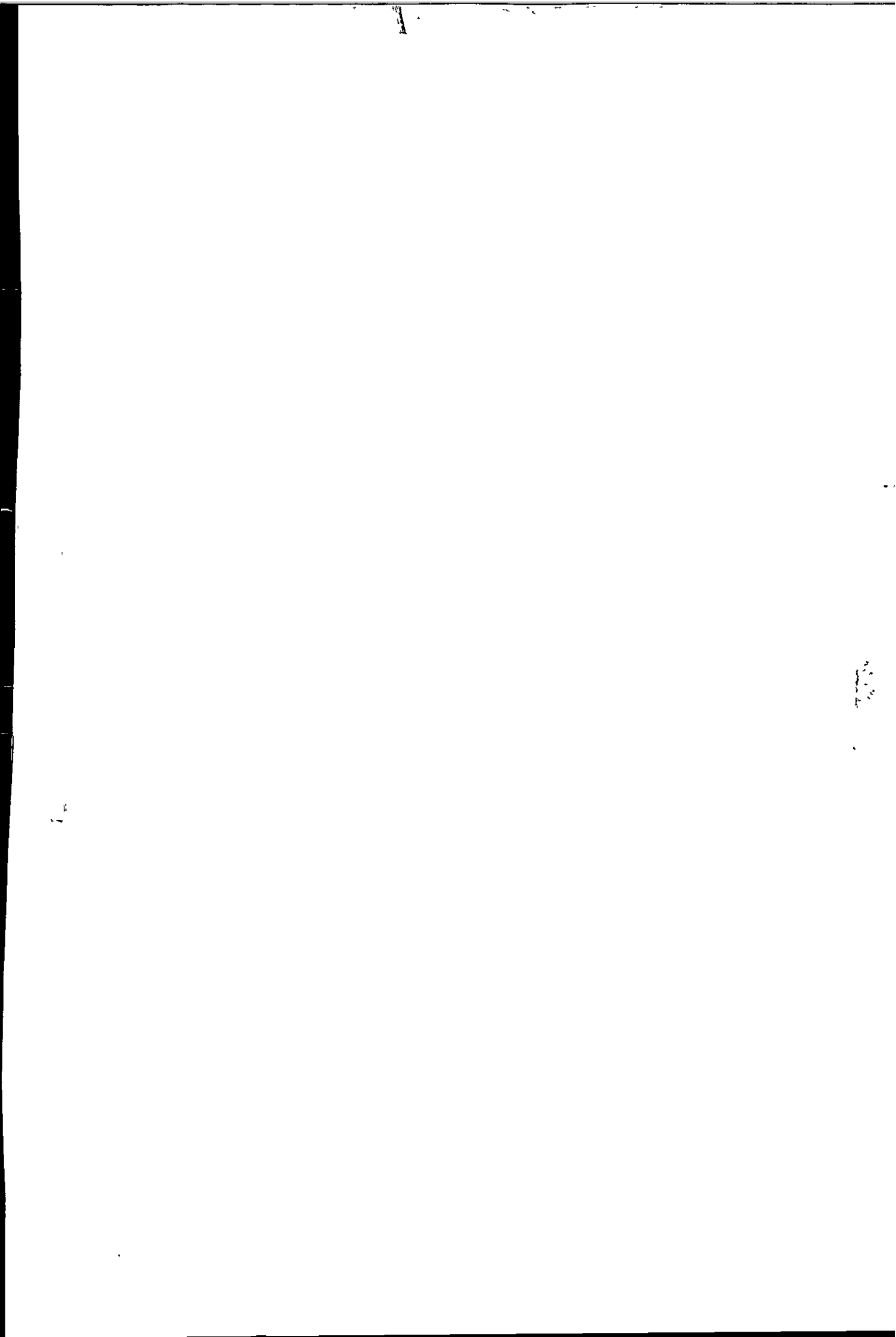
Addressing the assembled company at the opening of Millbay station

(2 April 1849), Thomas Fox drew attention to its benefits in "stimulating" the local fishing industry, he hoped to see the number of Plymouth trawlers trebled and said he had seen, within the port, "300 trawlers from Brighton and other places, and these vessels gave employment to 1500 men" (PDSH, 7 April 1849). In the context of this thesis, therefore, it is clear that the fishing industry was not only a major employer, but also engendered a range of ancillary trades to service its activities. By law the only permitted wholesale fish market in Plymouth was at Sutton Harbour and, with up to 300 vessels in harbour, hundreds of handcarts would be waiting on the Barbican quay to handle the catches (Plate 6C). More fish came to Millbay by rail from Cornwall, and was also landed there to avoid the congestion and dues of Sutton harbour, and all this fish was carted through the streets to the Barbican. At the 1861 census, a quarter of Devon's fishmongers lived in Plymouth.

Devon and Cornwall ports concentrated on trawling and drifting, and the principal ports were Plymouth and Brixham. Plymouth trawling began before the start of the 19th century and by the 1820s there were about thirty smacks operating from the Barbican. Because the town was first connected by rail to London in 1848 (via the temporary station at Laira), twenty years before a branch line reached Brixham, it gained a singular advantage over its chief fishing rival.

There were up to sixty trawlers in a fleet of eighty fishing boats at Sutton Harbour in 1850, with two or three hundred more craft using the harbour during the pilchard and mackerel season. Directory evidence indicates that the number of trawlers held steady at around sixty in the 1880s and these vessels were probably twice the size of the earlier smacks; they were typically of 30-40 tons in contrast to North Sea trawlers of 60-80 tons. In 1883 one sixth of Devon and

Plate 6G: Sorting and gutting the catch on the Barbican quayside.







Cornwall fishermen sailed from Penzance, Fowey, Plymouth and Brixham (Walpole, 1884).

Three classes of fishing vessel were used in Devon (Northway, 1973): first-class boats became larger, to between 40 and 50 tons, and developed finer lines through the first half of the 19th century; the majority were based at Plymouth and Brixham, and all were used for deep-sea trawling. Second-class vessels were, until the 1860s, mostly 2-3 tons, in the latter part of the century, however, some boats in this category weighed 12-14 tons, they were used for many fishing operations such as drift netting, line fishing, crabbing, oyster dredging or trawling. The introduction of a small class of sailing trawler increased their number at Brixham and Plymouth after 1860. Third-class boats were generally propelled solely by oar and were 10-24 feet in length with up to five or six crew; they were also used for a variety of purposes but only a few operated in the Plymouth region.

Large first-class steamers in the 1860s cost between £700 and £800 when fitted out ready for sea and, in 1863, the total value of all the trawlers at Brixham and Plymouth was £120,000 (Northway, 1973). The low value of individual vessels meant that most of them could be owned by one or two men. This is in contrast to trading vessels whose shares were generally divided among several people. In 1825, out of 36 fishing smacks at Plymouth, at least two-thirds had one owner per boat; and by 1861, 45 out of 68 Plymouth vessels still had only one owner, a further nine had two owners, and the remaining 14 had three or four part-owners. The pilot and fishing boats traditionally had a larger number of part-owners. Clearly, the 573 men employed as fishermen in Plymouth in 1851 would have worked for small-scale enterprises.

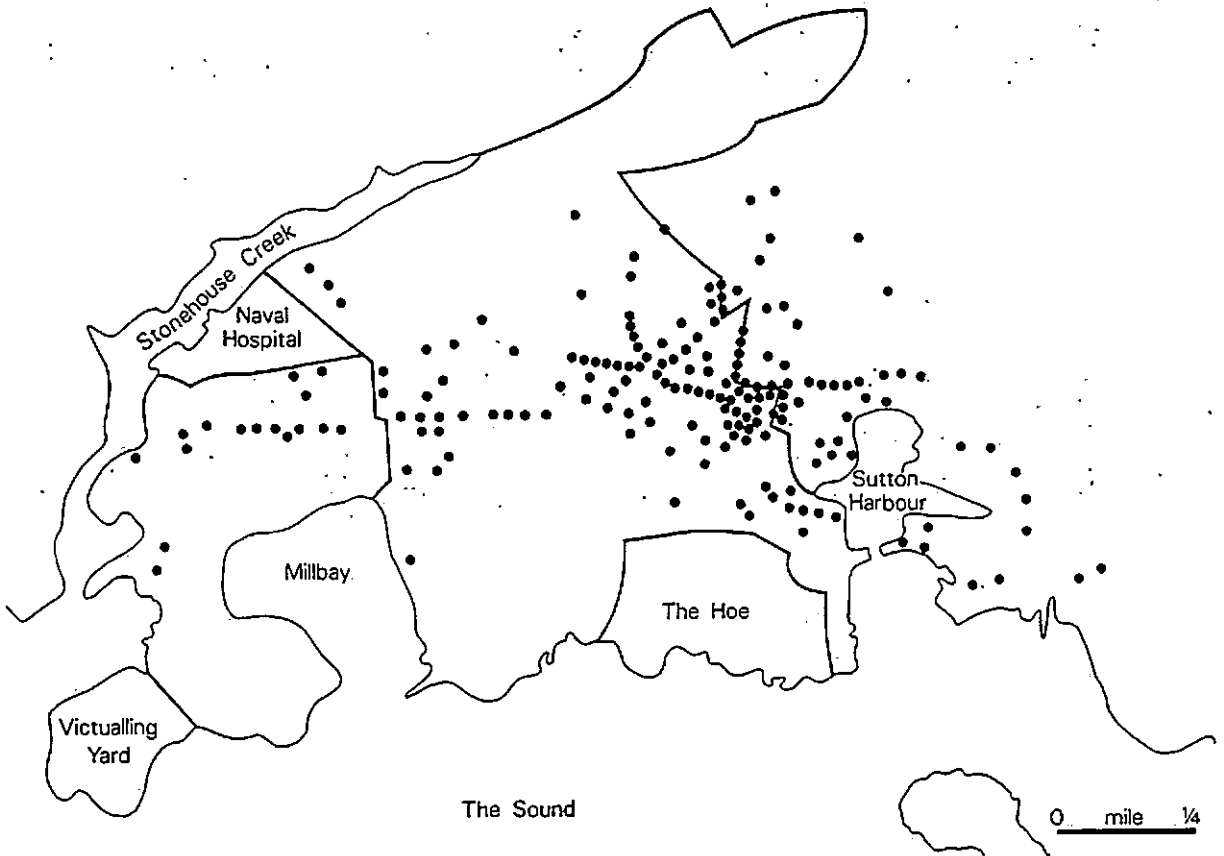


The 1841 census records some 24,000 men engaged in fishing in England and Wales; by 1881 this had risen to 58,000; this overall expansion was due largely to the North Sea ports of Hull, Grimsby, Yarmouth and Lowestoft, and by 1883 these ports employed one third of the country's fishermen. In regard to the size of the industry, therefore, Devon and Cornwall were increasingly overshadowed. The tonnages transported by the rail companies emphasizes the point: between 1865 and 1880 the GWR carried only 5,000 tons per annum to Billingsgate out of a total of nearly 75,000 tons a year brought by all the rail companies to London. Even so, Devon and Cornwall remained the most important fishing area outside the North Sea.

#### 6.2.5 The industrial and manufacturing sector

The range of goods manufactured in 19th-century Plymouth was extensive: biscuits, soap powder, and gin were three of the more noteworthy products. Bracken (1931) listed the large-scale concerns as starch, cement, white lead, paint, brushes, tar, limestone, pianos, and clothing; most of this manufacturing had commenced in Victorian times, and some had launched nationally-famous companies. Effectively, there were three industrial areas in the town: Mill Lane (site of corn and woollen mills in previous centuries), an area to the northwest of Sutton Pool running between Russell Street and Saltash Street; Millbay, mainly the ground on the east side of the harbour; and Coxside, later extending into Cattedown. Although the map showing the distribution of manufacturers in 1856 (Figure 6.14a) provides a useful indication of the spatial pattern, it is important to read its

Manufacturers, 1856.



**BEST SOAP,**  
STAMPED

MILL  BAY MILL  BAY

REGISTERED TRADE MARK.

EXTRA QUALITIES, for FAMILY USE:  
STAMPED

**MILL  BAY AND MILL  BAY  
LAUNDRY, PRIMROSE.**

The MILLBAY SOAP, ALKALI, and SODA COMPANY, LIMITED,  
PLYMOUTH, (late THOMAS GILL & CO.) Established 1818.  
MAKERS OF ALL KINDS OF

**TOILET, HOUSEHOLD,  
AND  
MANUFACTURERS' SOAP.**

TRADE MARK: MILL  BAY.

Figure 6.14: (a) The location of manufacturers in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.  
(b) An advertisement from Kelly's Post Office Directory, 1856.

evidence with caution because it includes producers such as watchmakers, gunsmiths, lace weavers, wig makers, and hat and shoe manufacturers, many of whom will have been one-man businesses. Also some of the addresses in Kelly's Directory (upon which the map is based) will have been of residence and not necessarily of employment.

Overall there was a decrease in the proportion of people employed in industry in mid-19th century Plymouth, although the actual number employed increased by 15.9%. Examination of the occupational census abstracts show that within the industrial class it was the occupational order concerning Textiles and Dress which saw the greatest rise in numbers employed (26.8%) in the first decade and the greatest drop (ten percent) in the second decade, for both men and women (Table 6.17). All of the industrial occupational orders saw a substantial increase in employment during the 1850s, total industrial employment rose by nearly 23 percent, but virtually all experienced some decrease in the 1860s amounting in all to 5.6%. A greater proportion of labourers were counted in the indefinite occupation class in the 1871 census abstracts and it is possible that some of these workers would previously have been enumerated in the industrial class. It is interesting to note that if the two classes are

TABLE 6.17: People employed in the Industrial Class by order and sex

	1851		1861		1871	
	M	F	M	F	M	F
10 Production	2724	244	3293	286	3298	283
11 Textiles	1580	2908	1681	4012	1513	3608
12 Food & Drink	1131	261	1344	343	1339	324
13 Animal Subs.	145	11	184	7	183	19
14 Vegetable Subs.	375	12	479	32	399	64
15 Minerals	882	34	959	40	889	31
TOTAL	6837	3470	7940	4720	7621	4329

Source: Published census data.

combined, growth between 1851 and 1871 amounted to 22 percent against individual growth rates of 16 (industrial) and 45 percent (indefinite) (see Table 6.2). The distribution of people employed in industrial occupations is illustrated in Figure 6.15; the change occurring between the two census years probably most reflects the spread of new housing. The wide variety of skills employed in the industries and the numerous job descriptions make it difficult to determine from the census abstracts how many were employed in any specific business. However, a selection of occupations does give some indication of the relative importance of the manufactories in providing employment (Table 6.18).

Less than five percent of Plymouth's population were employed in working and dealing with minerals in 1851, yet the importance of this sector of the economy should not be underestimated. Thomas Gill quarried limestone from Millbay to the Hoe, but his operations were only one of a number of successful quarry companies in and around the town. Stone for building was in great demand in the 19th century, and much of it was obtained locally. The choropleth map of the sample population shows a concentration of mineral workers to the east of

TABLE 6.18: Industrial Occupations, Males, 1851

blacksmith	219	soap boiler	24
shipbuilder	201	dyer, scourer, calenderer	22
stone quarrier	79	tallow Chandler	22
coal heaver, labourer	75	whitesmith	21
stone, clay worker	51	gasworker	15
engine, machine maker	41	millwright	14
iron manufacturer	39	marble mason	12
tinman	36	brazier	11
tanner	34	chemical factory worker	11
wheelwright	33	brick maker	9
sugar refiner	30	brass founder	8
copper miner	27	limestone quarrier, burner	8

Source: Published census data.

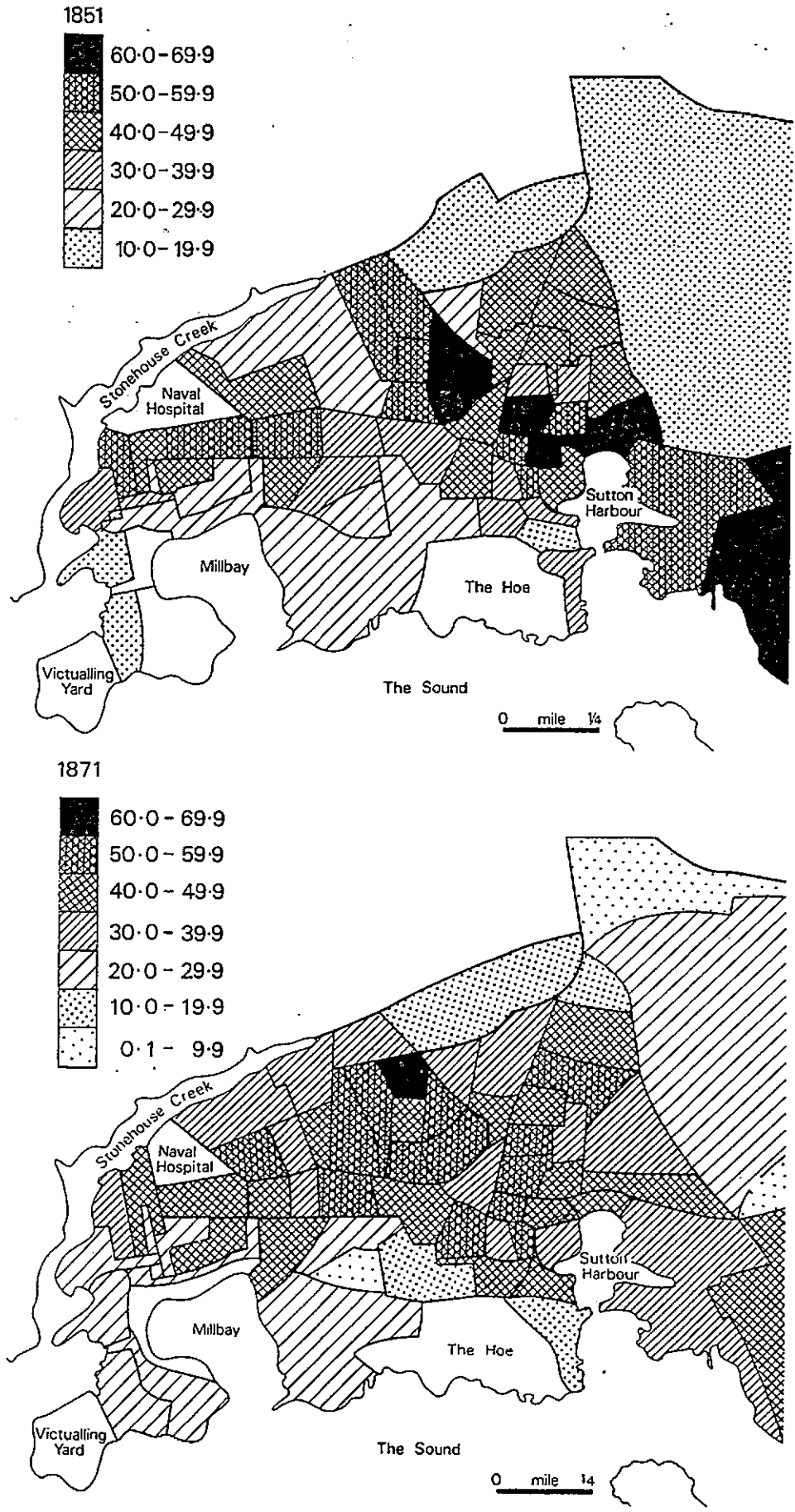


Figure 6.15: The distribution of people employed in industrial occupations (Occupational Class V) and living in Plymouth and Stonehouse enumeration districts in 1851 and 1871. Shown as a percentage of the working population and based on the sample population data.

Sutton Harbour (Figure 6.16) working quarries at Cattedown.

There were two limestone merchants in 1850: Gill & Sons of Millbay Road, and Sparrow Simons & Co of Cattedown (White's Directory, 1850). By 1870 Sparrow and Simons had parted company, Benjamin Sparrow continuing operations at Cattedown and Simons going into partnership with Scott at Deadman's Bay (White's Directory, 1870). Stone merchants listed in 1870 included the Dartmoor Granite Company at Laira Bridge, plus Sparrow and the West Hoe Lime and Stone Quarries. Other categories of business in this sector were slate merchants, coal merchants, and stone and marble masons.\*

The chemical industries formed a substantial part of the manufacturing economy. Thomas Gill, the quarry owner, progressed from lime-burning to the production of soda ash and other alkalis, founding his alkali and soap factory at Millbay in 1818 (see Figure 6.14b). The factory occupied the entire area between Millbay Barracks and the railway line into the docks, it became the largest such factory in the west of England and a major source of local employment.

Brothers William and James Bryant, Edward James and John Burnell were together responsible for several companies at Mill Lane and Sutton Road producing matches, soap, starch, and refining sugar, and employing a considerable local workforce. In addition were the artificial manure works of Charles Norrington, at Deadman's Bay, Burnard, Lack & Alger at Sutton Road, and James Gibbs & Co at Cattedown. Harvey's tar distilling works was also based at Deadman's Bay, the only such firm "in the west of England". All of these businesses relied upon the port for their raw materials and provided valuable employment in the town.

\* Large blocks of limestone from the Oreston quarries, to the east of Plymouth, were used in the construction of the Breakwater.

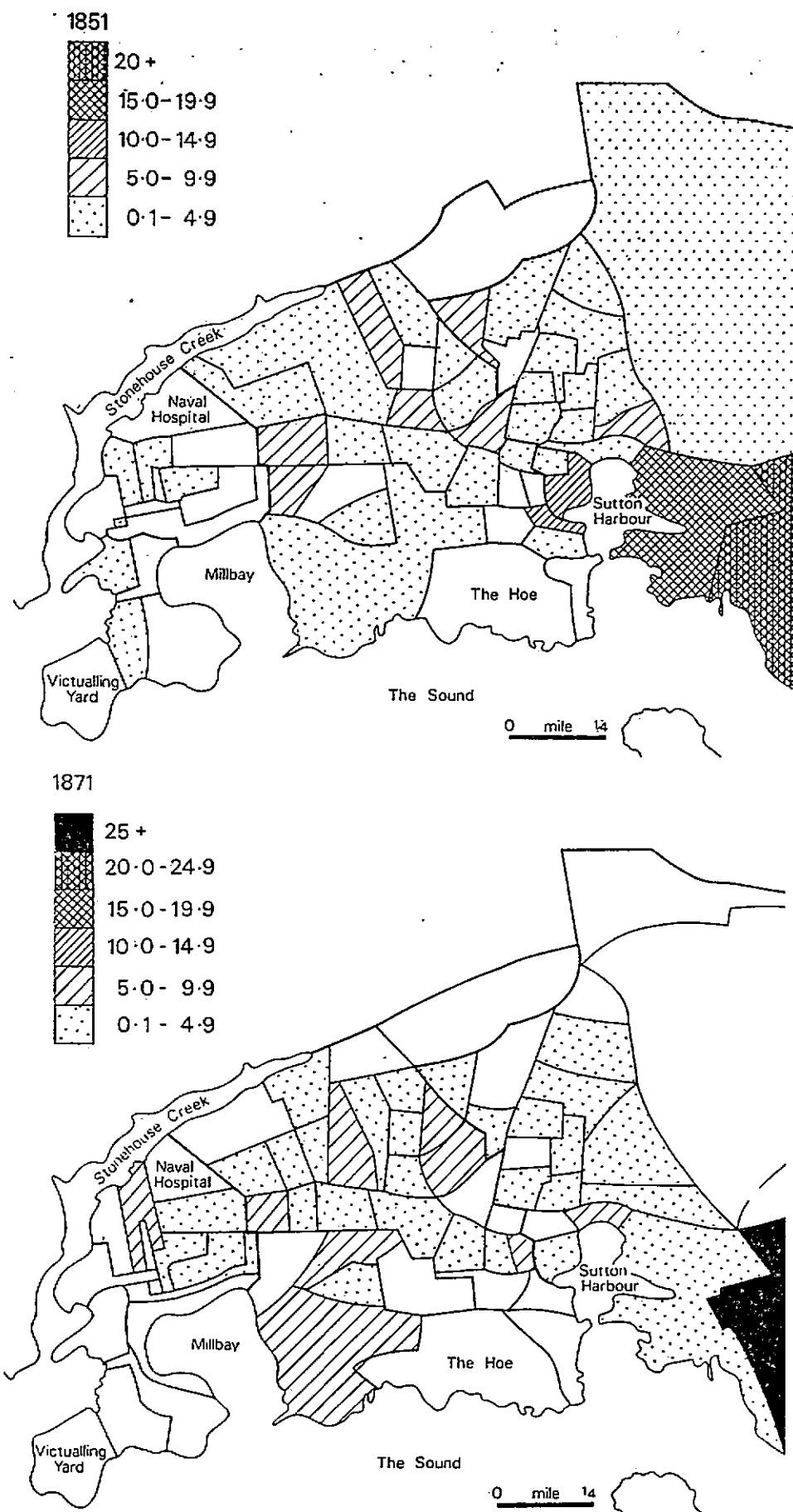


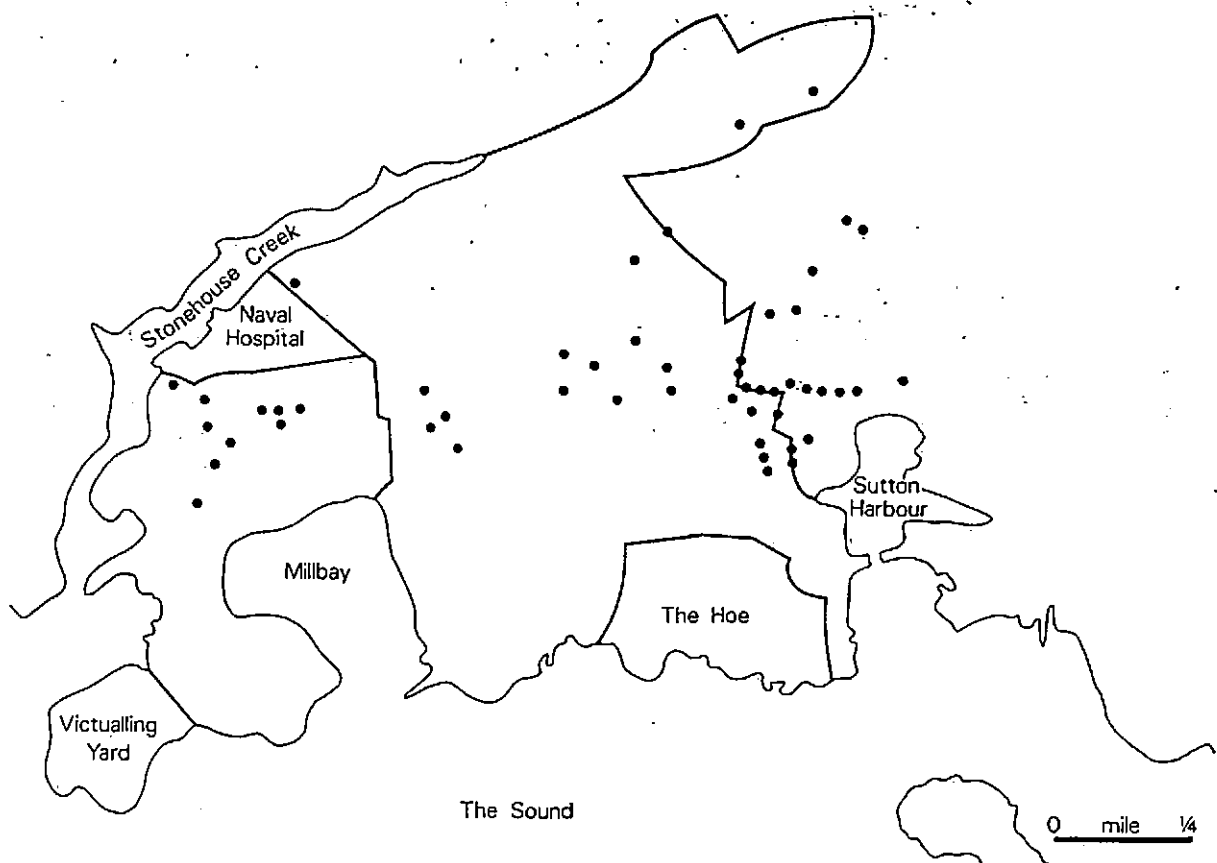
Figure 6.16: The distribution of the sample population employed in Occupational Order 15: "Persons working and dealing in Minerals".

Heavy industries were most noticeably represented in ship-building which has already been discussed. Ironfounding was limited in Plymouth by the need to import both iron and coal. Local ironfounders concentrated on commercial shipping, agricultural machinery and builders' hardware, to supply the needs of the growing town (Law, 1980). The principal firms were Thomas Mare, Moir, Ellacott, and Willoughby. The numbers directly employed in Plymouth's foundries were, however, never very large, despite the trade generated elsewhere in the local economy (especially by the shipping industry).

The manufacture of furniture and furnishings also contributed to the industrial sector, emphasising Plymouth's role as regional capital. Timber was a major import, although most of this was used for pit props - Fox, Elliott & Co had a timber pool at Mill Bridge - other better quality woods such as mahogany were also imported. Morris' Directory of 1870 listed ten timber merchants and dealers, eighteen furniture brokers, and thirty-three cabinet makers and upholsterers. Furniture-making was mostly concentrated in the commercial part of town, around the Mill Lane area (Figure 6.17a). Piano-making was also a noted local industry: a large export market was to be found in America. Although furniture manufacture was not a major source of employment in mid-19th century Plymouth, that it existed at all is evidence of the town's regional importance. Thus the wallpaper manufacturer, George Tucker could claim in his advertisement to have the largest stock of "papers & borders ever exhibited in the West of England" (Figure 6.17b).

Pottery was also made in the town though, by the 19th century, this was not on a scale which might have been envisaged by Plymouth's Quaker chemist, William Cookworthy who patented his formula for porcelain in 1768. While the plentiful supplies of ball and china





**G. TUCKER,**  
**PAPER-HANGING MANUFACTURER,**  
 41, WHIMPLE STREET, PLYMOUTH,

HAS ON HAND THE LARGEST

**STOCK OF PAPERS & BORDERS**

Ever exhibited in the West of England, amounting to many Thousand Pieces of the Newest Designs, consisting of splendid Decorations, suitable for Drawing and Dining Rooms, Parlour, Bed and Serjeants' Rooms; Washable Papers for Halls, Staircases, Passages, Offices, Shops, and Cellars; all of which being made on the Premises by clever and experienced workmen, he can warrant to be of the best quality, at very reduced prices.

**A LARGE VARIETY OF CYLINDER MADE PAPERS, AT THE LOWEST PRICES.**  
 Laminated Lead for underlining Damp Walls.

**THE BEST PAPER-HANGERS EMPLOYED.**

**HOURS OF BUSINESS, FROM EIGHT TILL HALF-PAST SIX.**

Figure 6.17: (a) The location of furniture makers and dealers in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.  
 (b) An advertisement from Kelly's Post Office Directory, 1856.

clay needed in its production were locally available, the much greater quantities of coal required were not. This did not deter Staffordshire-born earthenware manufacturer, William Allsop; however, whose Victoria Pottery was situated in Sutton Street.

The manufacture of textiles and dress was a major source of employment in the town, especially for women, representing some 19 percent of the total employed population in Plymouth and Stonehouse. The choropleth maps (Figure 6.18) emphasize the large number of men and women working in textiles and dress, the sample population in these occupations was spread throughout the two towns, though living predominantly in the less affluent enumeration districts. This was not a factory-based industry in Plymouth, thus, while many people were employed, there were no major companies until the late 1880s when two were established.

Since the published data for 1871 omit details beyond the level of occupational order, reference may be made to the abstracts for Principal Towns wherein Plymouth and Devonport were combined (but Stonehouse excluded) in order to identify which occupations particularly contributed to the fluctuations in employment levels for the whole study period. Table 6.19 shows decline in the woollen industry in sub-order (1), the number of woollen cloth manufacturers fell from 108 in 1851 to nine in 1871.\* Cloth manufacture in Plymouth dated from at least Elizabethan times and the woollen trade had been the major contributor to the local economy, excepting port activities, but by the 19th century, this industry was fast contracting. The numbers of silk (2) and linen (3) workers were too small to be of significance, while the number of drapers (4) increased over the twenty-year period from 160 to 235.\* The number of rope-makers

\*Aged 20 years and over.

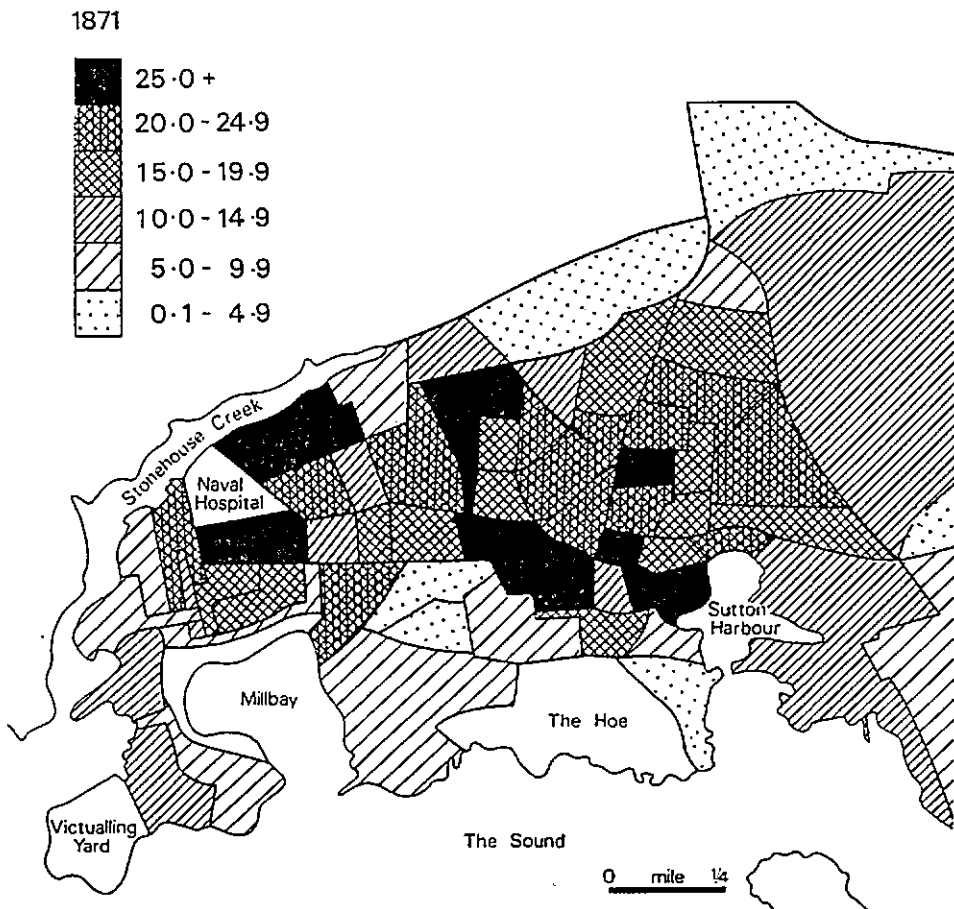
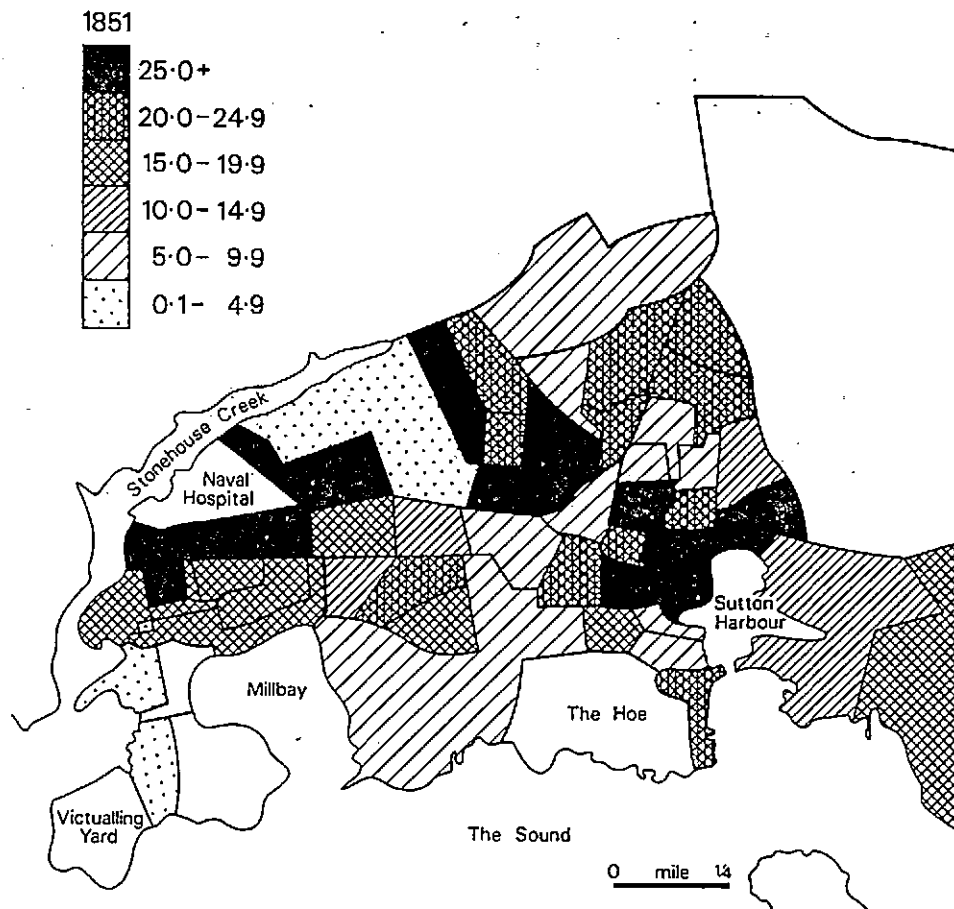


Figure 6.18: The distribution of the sample population employed in Occupational Order 11: "Persons working and dealing in Textile Fabrics and in Dress".

TABLE 6.19: The Textiles and Dress Occupational Order, Plymouth and Devonport Boroughs (aged 20 years and over)

	1851		1861		1871	
	M	F	M	F	M	F
(1) Wool	123	49	67	29	32	13
(2) Silk	16	13	27	4	6	2
(3) Linen	25	41	17	46	11	34
(4) Drapery	160	95	220	218	249	298
(5) Apparel	1755	4479	1816	5296	1525	4644
(6) Rope	267	35	265	27	185	29

Source: Published census data.

declined overall from 171 in 1851 to 149 in 1871, though there were 235 in 1861. This rise and fall may have been due to local fluctuations in demand. Rope-making was a traditional trade in a sea-faring town and several rope-walks are marked on the contemporary maps, at Coxside, for example, and later in the century, at Mutley.

By far the largest group of workers in this order were those in the clothing and shoemaking business (5), and this was, alongside domestic service, the principal source of employment for women and, therefore, will be dealt with in detail in the next chapter. The majority of men working in textile and dress occupations were either shoemakers or tailors. More than seven percent of the male workforce was thus employed in 1851 and, while the proportion decreased in the next two censuses, this group remained one of the top three occupations for men. Shoemaking was the principal occupation, by a factor of nearly two to one; there were 1094, 1181, and 948 shoemakers enumerated in the two towns at the three censuses, respectively. Boot and shoemakers appear to have been fairly randomly distributed through the area (Figure 6.19), though with some concentration to the north of the Barbican district, effectively close to the market around the streets which were becoming the centre of retailing in Plymouth.

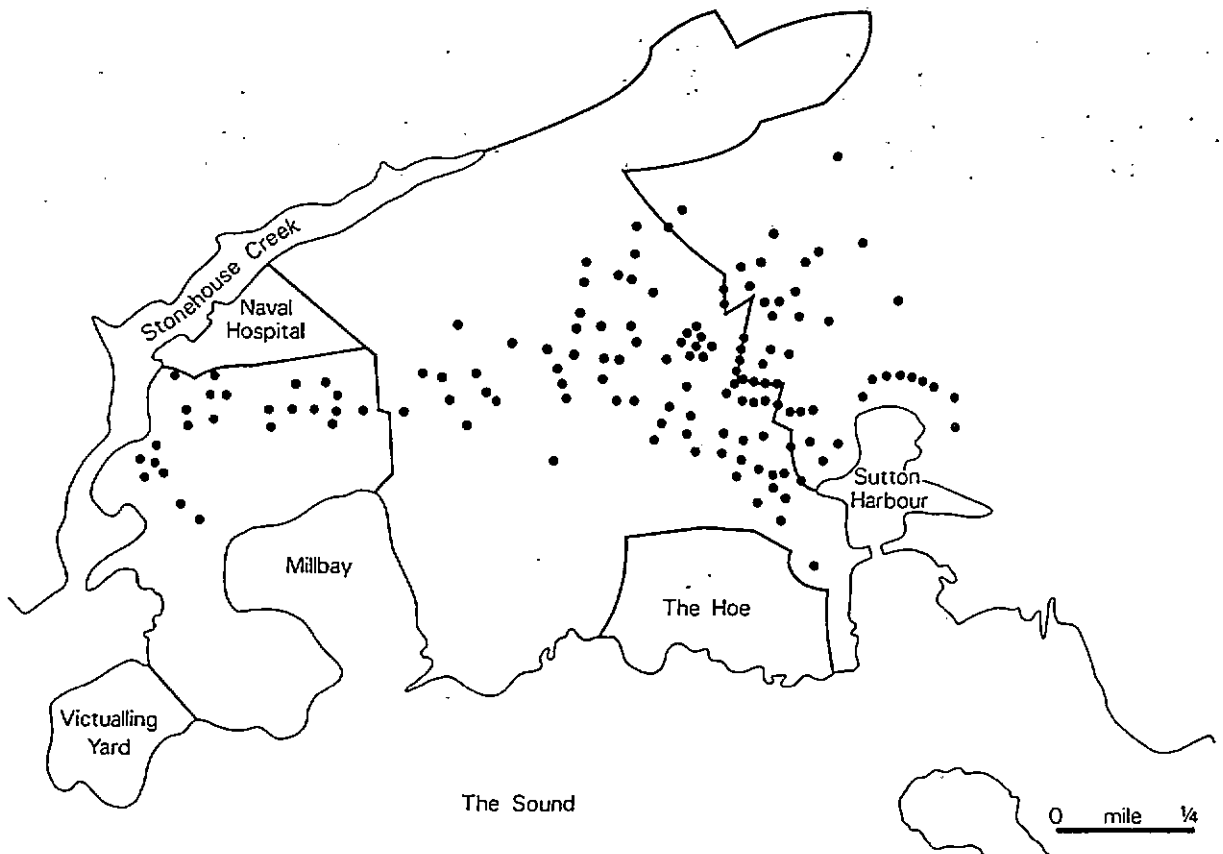


Figure 6.19: The location of boot and shoe makers in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

Another group of manufacturing industries produced food and drink; it is important to note that such work could often also be described as service industries - baking, for example - for many of these people were producer-retailers (as indeed were others such as furniture manufacturers). There is no clear pattern to either the 1851 or the 1871 distribution map (Figure 6.20) of the sample population employed in the food and drink occupational order, reflecting the fact that this was a rather disparate amalgamation of workers and dealers in animal food, vegetable food, and drinks and "stimulants".

One internationally-known company (already noted) has its roots in 19th-century Plymouth: George Freen, a miller from Ashburton began making biscuits with flour millers, Daw and Serpell, at King's Bakery, Lambhay, when the navy moved its baking to the new Victualling Yard in the 1830s. There were three local distilleries in Plymouth in the 1870s, including James Rew of Buckwell Street, who also brewed beer, and Coates & Co of Southside Street. Soft drinks were also manufactured in Victorian Plymouth, notably ginger beer and soda water; the more lasting businesses were Mackey & Co, and Samuel Gibbens, continued by his son Edward.

The breweries of Plymouth rank among the oldest local industries, and White's Directory of 1850 records 15 breweries in the two towns, six years later there were 20 and one agent for Bass pale ale and Guinness porter beer; by 1870 there were 22 breweries and four agents in Plymouth alone, and several of the breweries were controlled by non-local companies, for example: Allsopp Samuel & Sons (Burton-on-Trent), the Anglo-Bavarian Brewery Co, Ind Coope & Co (of Romford), and Whittle & Co (Dorsetshire Brewery). Eyre's Directory for 1882 lists only 19 breweries in the two towns, six of them run by out-of-town companies, and the agents were now listed separately.

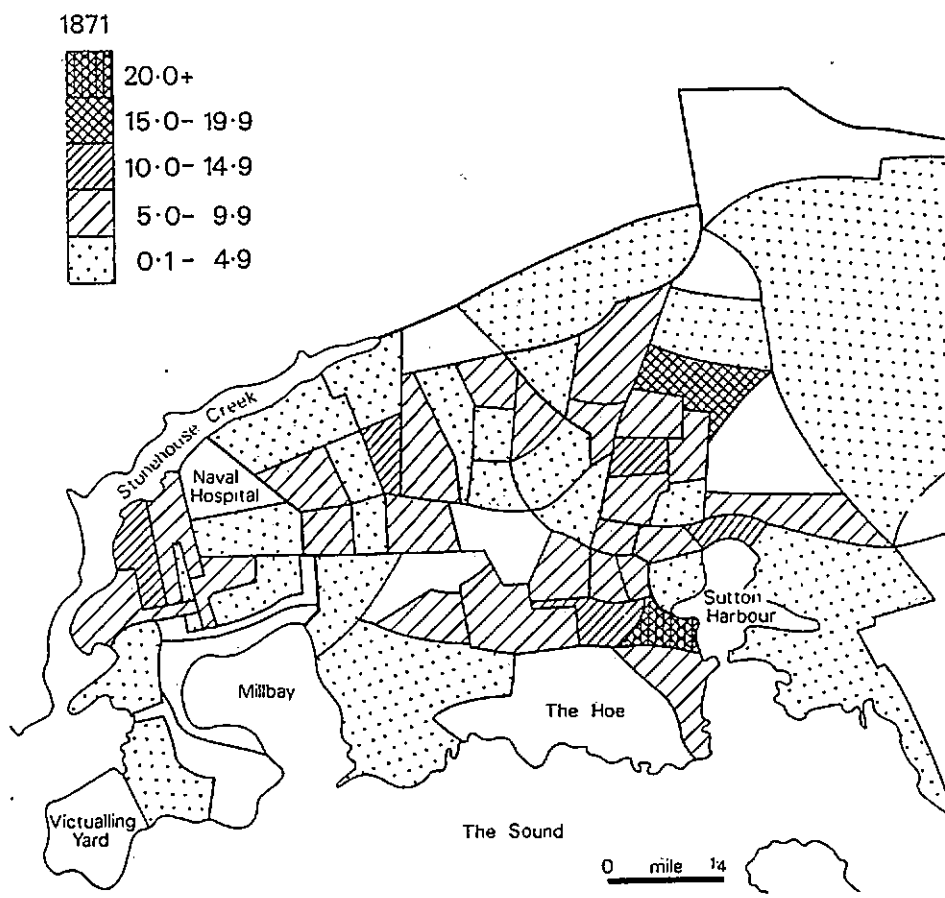
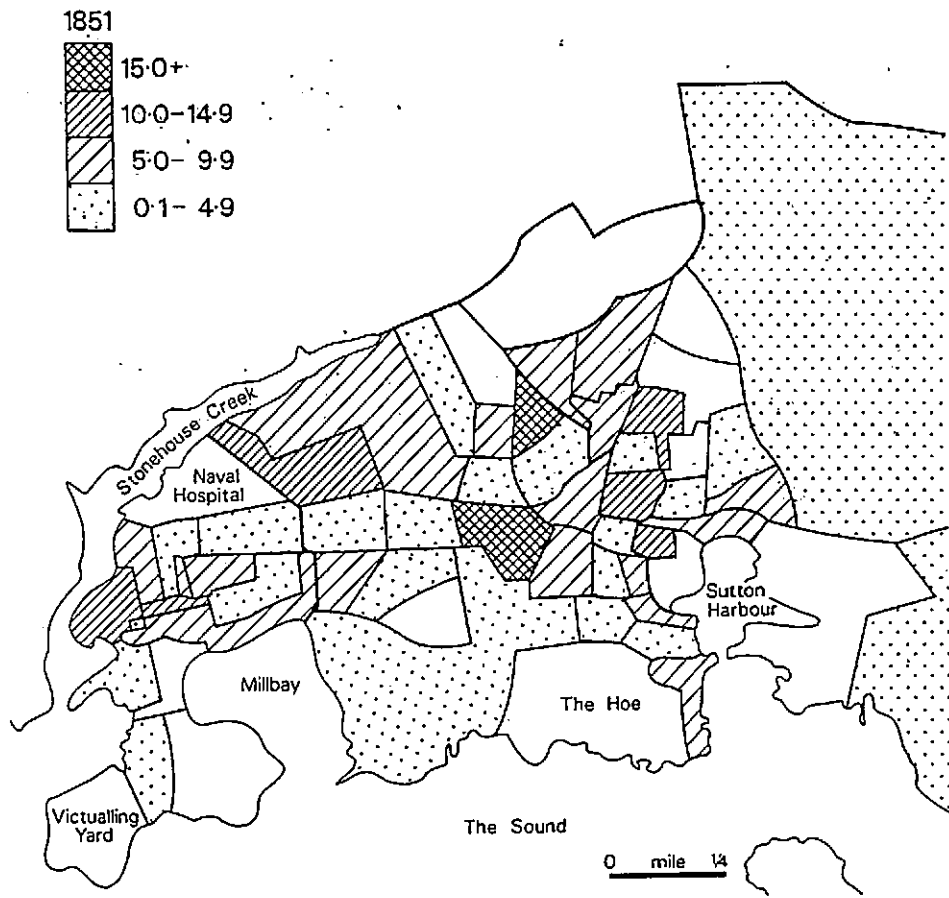


Figure 6.20: The distribution of the sample population employed in Occupational Order 12: "Persons working and dealing in Food and Drinks".

Thus, in just over thirty years, the change in the structure of the industry can be clearly seen; in 1890 Worth could record that a number of breweries "have recently been amalgamated into one concern", referring to the 1889 formation of Plymouth Breweries Ltd which served over 180 public houses (Wright, 1894). Included in this amalgamation of five companies was the Anchor Brewery in Stonehouse, run for many years, following her husband's death, by Amanda Henrietta Butcher (Figure 6.21).

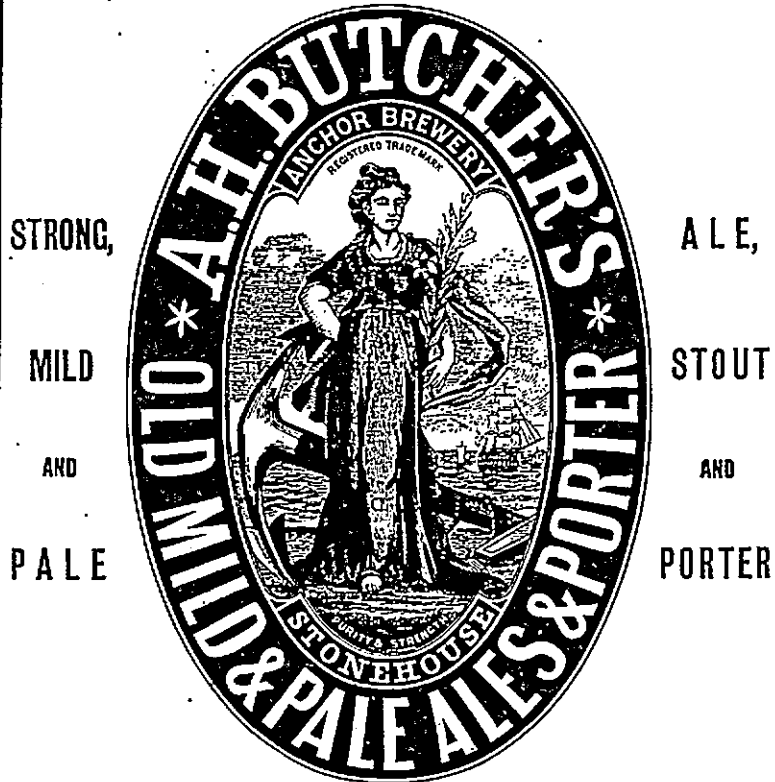
#### 6.2.6 The retailing sector

The 19th century saw substantial change in the system of distribution, especially with regard to the methods and form of retailing. It was an important industry in its own right as a major source of employment, tying up a considerable amount of fixed capital, and the purchase of food represented half to two-thirds of working-class budgets for much of the century (Scola, 1975). Yet retailing is still a neglected aspect of economic and urban history, though its evolution has important consequences for the social geography of 19th-century towns - a mature retailing sector is indicative of the impact of urban population growth.

It has already been shown (Chapter Five) that Plymouth seems to have had a well-developed retailing centre by the mid-19th century which existed alongside a purpose-built central market. The indications are that retailers, as distinct from producer-retailers, emerged in the early years of the 19th century. Worth (1890), in an



A. H. BUTCHER,



B R E W E R,  
ANCHOR BREWERY, STONEHOUSE,  
DEVON.

FAMILIES SUPPLIED.

FAMILIES SUPPLIED.

Figure 6.21: An advertisement from White's Directory, 1878, promoting one of the larger Plymouth breweries.

examination of traders\* in Plymouth, found a remarkable expansion in retailing from 39 to 230 between 1783 and 1830.

The occupational order concerning food and drink provision gave work for five percent of the male and 1.2% of the female workforce, they formed the fifth largest occupational group in mid-Victorian Plymouth, and this excludes people engaged in board and lodging, licensed victuallers, and so forth. The workforce was fairly evenly divided between the three occupational orders for animal food, vegetable food, and drinks and stimulants, their numbers increasing in the 1860s and then maintained roughly the same level (Table 6.20).

About half of those working and dealing in animal food were butchers, and one in eight were fishmongers. The other main occupations in this occupational sub-order were cowkeepers and milksellers (combined in the census abstracts); a map of their distribution, drawn from the 1856 Kelly's Directory (Figure 6.22), shows that the dairymen were well spread throughout the two towns. Bakers comprised over half of the workers and dealers in vegetable food, they were mostly one-man shops, producer-retailers; this sub-order also included millers, and corn merchants. The sub-order of occupations in drinks and stimulants covered brewers, distillers, wine and spirit merchants, tea dealers, tobacco and snuff manufacturers, soft drinks manufacturers, and also sugar refiners. About forty percent of these workers were grocers and tea dealers; and the next largest group was brewers.

It is difficult to estimate how many people were specifically

\* The traders were bakers & confectioners, cheesemongers, earthenware dealers, drapers & hosiers, grocers & tea dealers, ironmongers & ship-chandlers, printers & booksellers, tailors, and tallow-chandlers (Worth, 1890). While some of these occupations did involve production as well as retailing, it may be assumed that the majority of these traders will have had retail outlets.

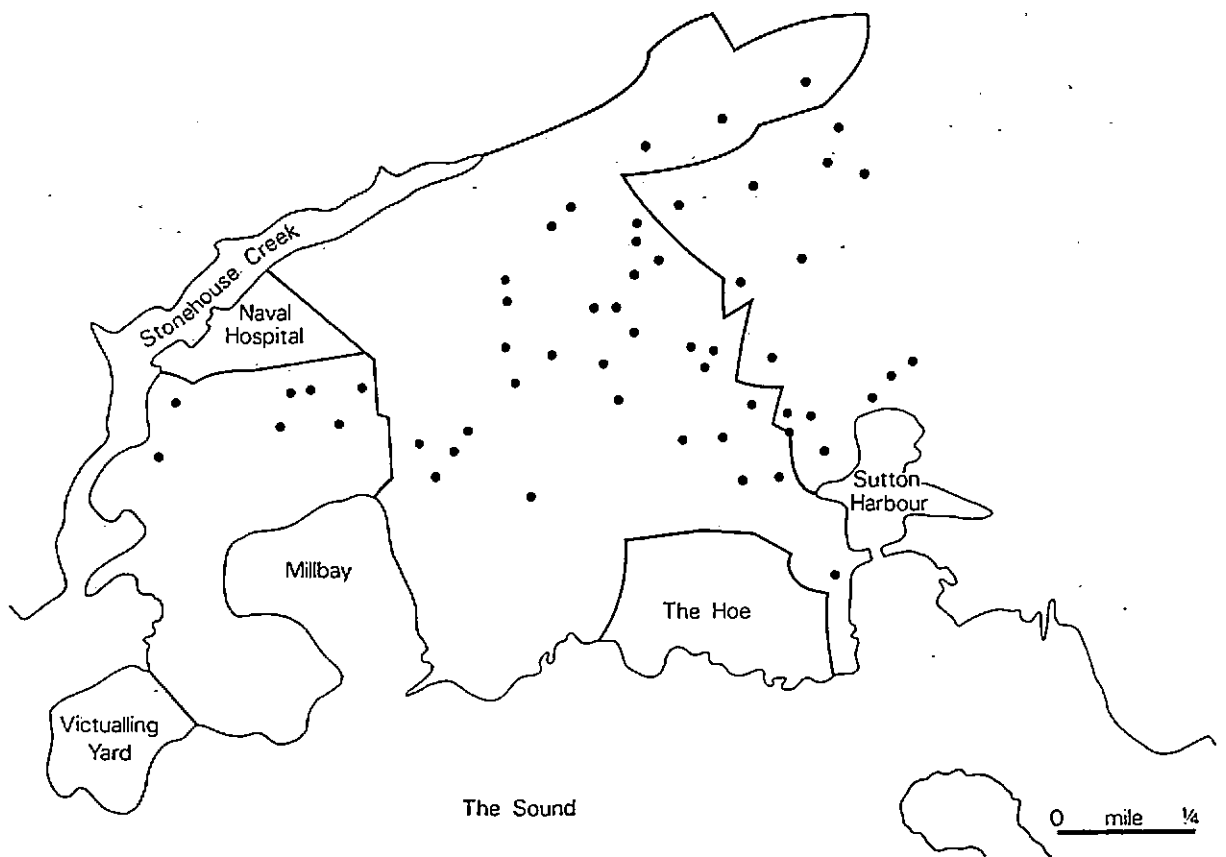


Figure 6.22: The location of dairymen (cowkeepers) in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

TABLE 6.20: Workers and dealers in food and drink

	1851		1861		1871	
	M	F	M	F	M	F
Animal food	310	92	350	108	.	.
Vegetable food	402	98	507	128	.	.
Drinks & stimulants	419	71	487	107	.	.
Total	1131	261	1344	343	1339	324

Source: Published census data.

employed in retailing, the census did not distinguish sufficiently between producers and retailers or wholesalers and retailers. Nevertheless, Table 6.21 does show that a considerable number of people did rely upon this sector of the economy for their livelihood.

The market (discussed in Chapter Four) was just to the north of East Street; as can be seen from the map of food retailers in 1856 (Figure 6.23 inset), the vast majority of stalls were rented by butchers (Plate 6D). White's Directory (1850) gave the home addresses of butchers and indicated which were using the market to sell their produce. Out of 120 butchers listed, 93 had market stalls and 27 of these had 'out of town' addresses; Figure 6.24 shows that the farmer-butchers travelled quite long distances - up to 15 miles - to bring their meat to market. This map emphasises Plymouth's regional role: the next nearest markets were Liskeard, Launceston, Tavistock, Exeter, Ashburton and Totnes. White's Directory (1850) noted that the corn market, held on Tuesdays and Thursdays, was well attended by the farmers and dealers residing within the distance of 15 or 20 miles.

On weekdays the market stayed open until nine pm in summer and eight pm in winter, and it did not close until midnight on Saturdays, enabling the dockyard, shipyard and factory employees, who worked from six am to six pm, to go to the market (Stephens, 1943). The role of

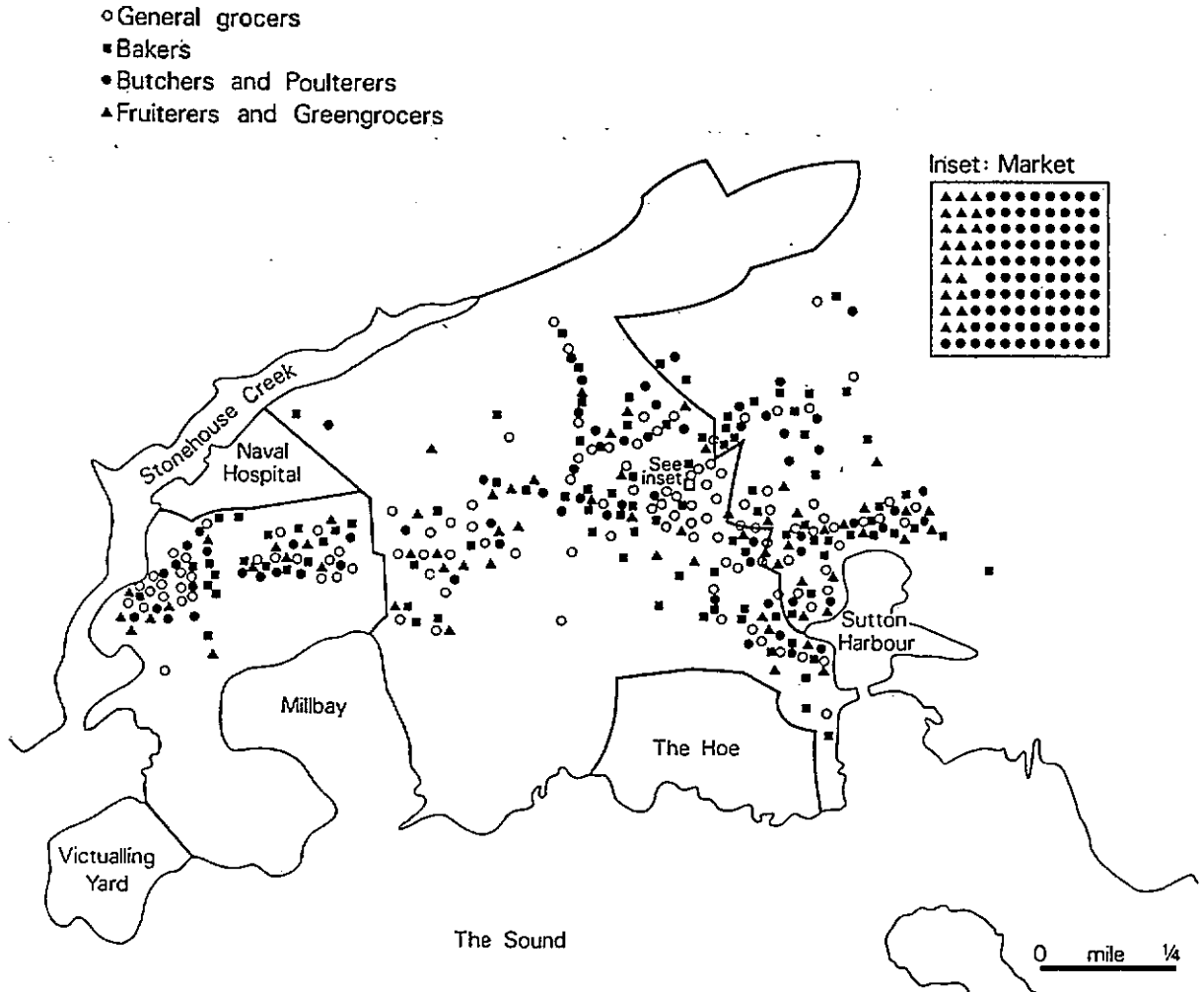


Figure 6.23: The location of food retailers in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

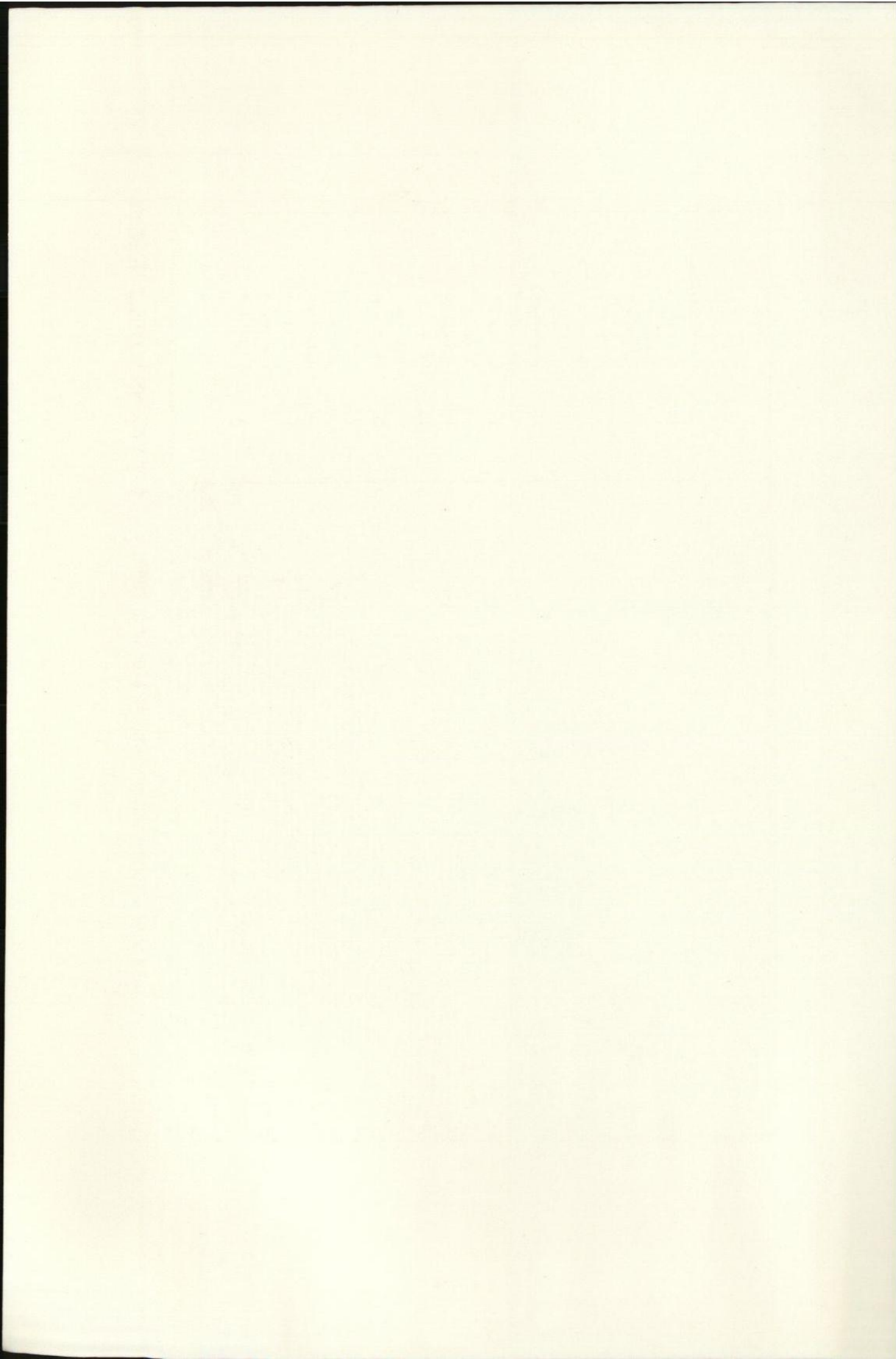
Plate 6D: The market. The butchers' stalls ran from Cornwall Street to Drake Street along the northwest side. The fish stalls were also on the northern side, the fish slabs were made of slate on iron legs. The butter, vegetable and poultry stalls were in the southern half of the market (Stephens, 1943). Photographer: Rugg Monk.





Plymouth Market





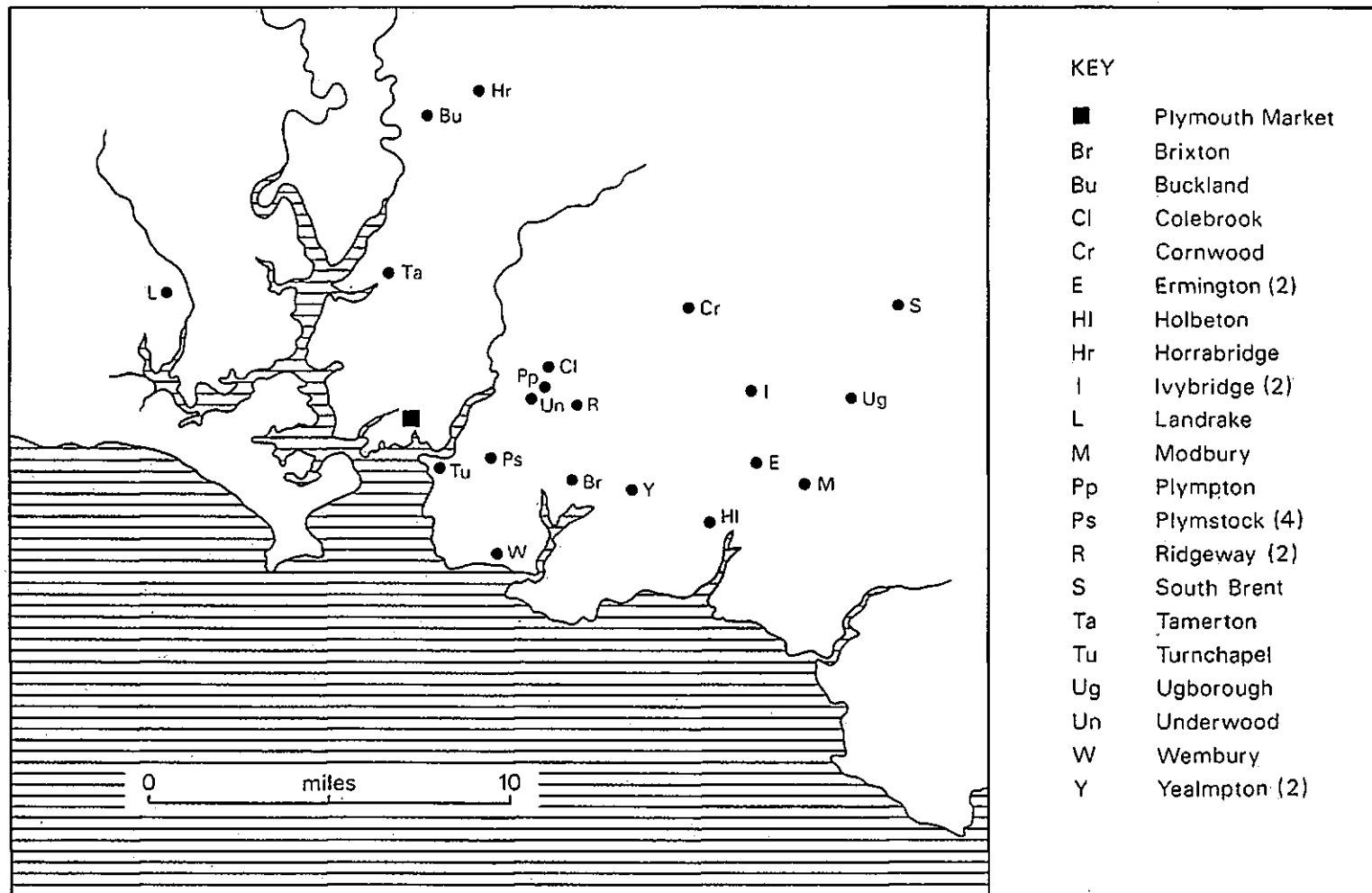


Figure 6.24: The origins of butchers using Plymouth Market in 1850, based on evidence in White's Directory.

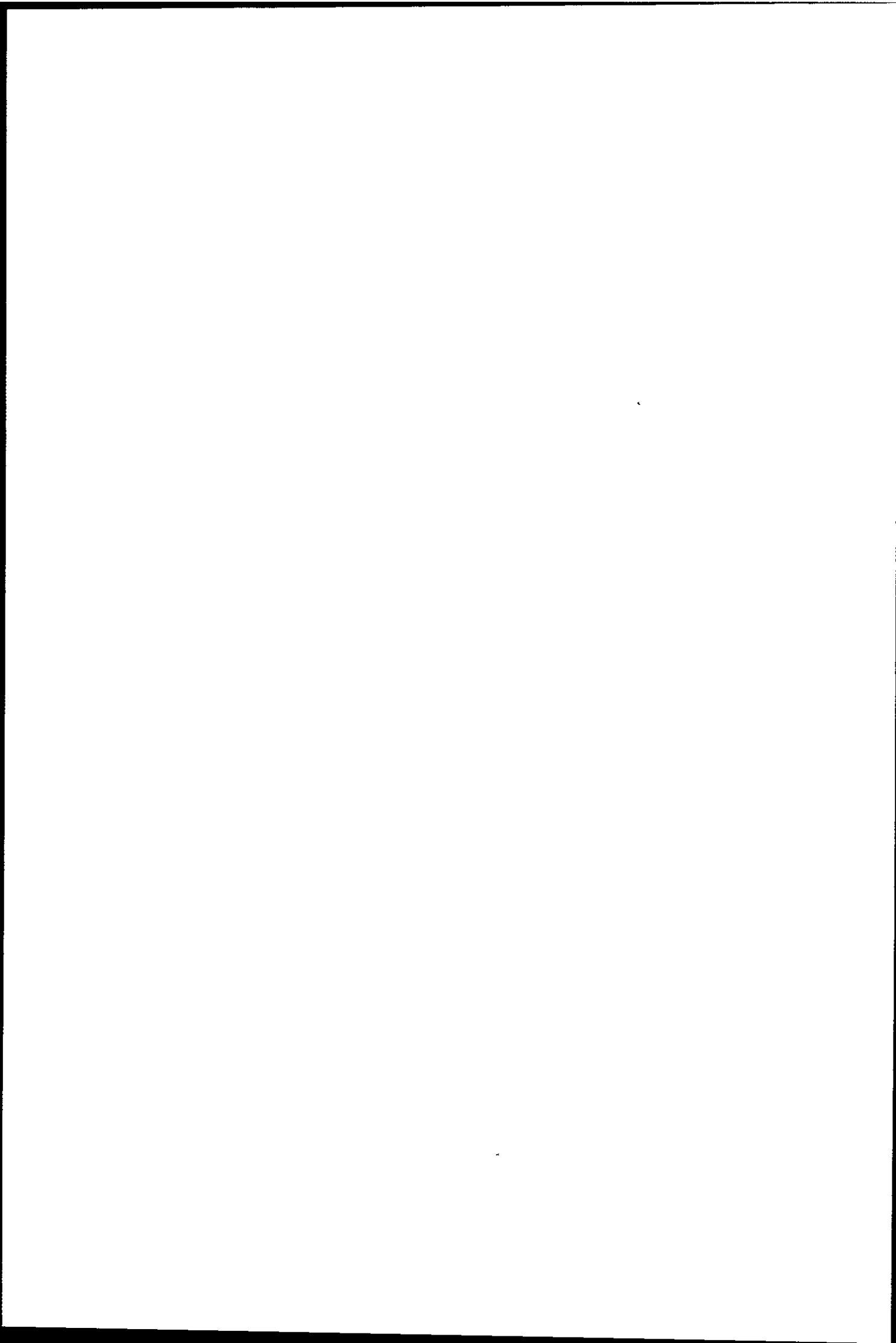


TABLE 6.21: Retailing trades in Plymouth and Stonehouse

	1851			1861		
	M	F	T	M	F	T
Chemist, druggist	76	2	78	79	1	80
Pawnbroker	14	.	14	27	10	37
Shopkeeper, general dealer	23	51	74	11	46	57
General dealer, costermonger	.	.	.	40	18	58
Hawker, pedlar	49	11	60	55	21	76
Bookseller, publisher	37	3	40	48	4	52
Draper, woollen	111	.	111	.	.	.
linen, etc.	30	65	95	183	148	331
Tailor	339	135	474	350	230	580
Outfitter	.	84	84	22	110	132
Cowkeeper, milkseller	57	19	76	94	20	114
Cheesemonger	5	.	5	1	3	4
Butcher, meat salesman	173	14	187	185	25	210
Provision curer, dealer	.	.	.	16	4	20
Poulterer, game dealer	11	.	11	10	4	14
Fishmonger	48	37	85	44	44	88
Others	16	22	38	.	.	.
Baker	235	19	254	287	24	311
Greengrocer, etc.	22	41	63	47	77	124
Confectioner	45	8	53	44	26	70
Grocer, tea dealer	173	66	239	190	97	287
Tobacconist	4	.	4	12	1	13
Earthenware, glass dealer	20	1	21	15	2	17
Gold, silversmith, jeweller	41	.	41	34	7	41
Ironmonger	49	.	49	48	6	54
Total	1578	578	2156	1842	928	2770

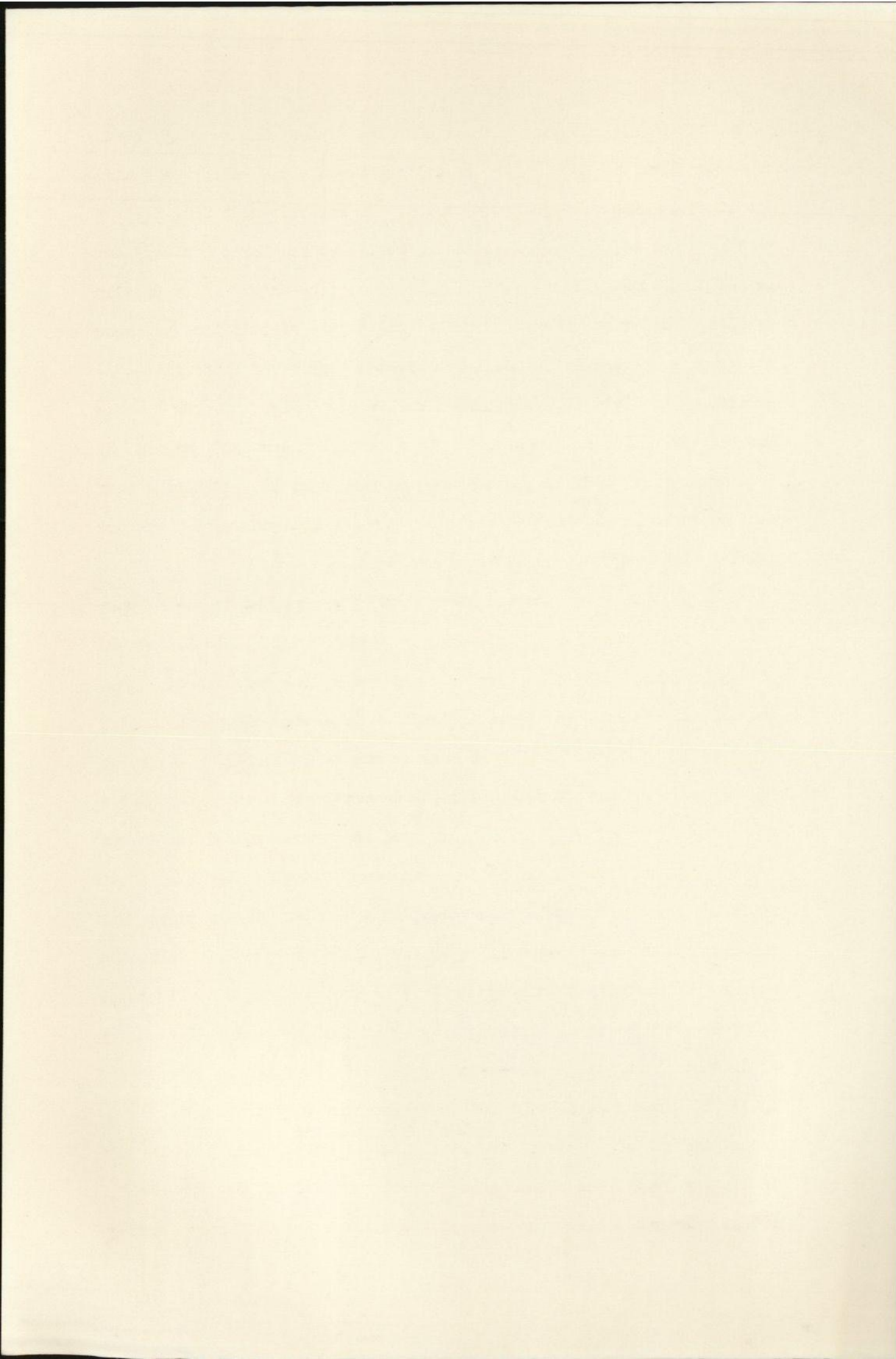
Source: Published census data.

the market in serving the working classes, at least, is thus demonstrated. Contemporary accounts contain descriptions of 19th-century retailers, and the hawkers were particularly colourful characters (Plate 6E).

Plate 6E: A French onion seller in Looe Street in 1876. On the left is the Minerva, reputed to be Plymouth's oldest public house.

2







The 1856 distribution map of clothing trades (Figure 6.25) shows concentrations in the main retailing areas but also a wide distribution through the two towns. An advertisement from Kelly's Directory for 1856 gives illuminating detail of Mrs May's hosiery shop in Bedford Street (Figure 6.26). Such advertisements, in typically detailed Victorian fashion, record the nature of retailing business and provide, perhaps, the best available source of information - excepting individual business archives. Figure 6.27 shows advertisements for Rendle's of Old Town Street, where all manner of furniture (and coffins) was made on the premises, and Matthews of Bedford Street, a restaurateur, baker and confectioner with a factory nearby delivering throughout the three towns.

As suggested in the Chapter Four, retailing expanded to keep pace with Plymouth's rapid growth in population. Calculation of shop-population indices is severely hampered by the quality of data, but limited application may be instructive in demonstrating the extent of retail provision in 19th-century Plymouth (Table 6.22). Of these four types of outlet, bakers and confectioners seem least vulnerable to changes in classification or trading practice; all the others require some qualification: grocers and tea dealers will inescapably include some wholesale merchants; the number of butchers was considerably underestimated in 1830, and in 1850 included a sizeable number of producer-retailers based in the market but with rural addresses; and beershop keepers, in particular, were affected by Government legislation: permitted by the 1830 Beer Act but restricted by the temperance movement later in the century (Harrison, 1971).

Comparisons of the level of retail provision, however, do make the assumption that the average size of outlet remained constant (Scola, 1982). In considering the economic importance of different forms of

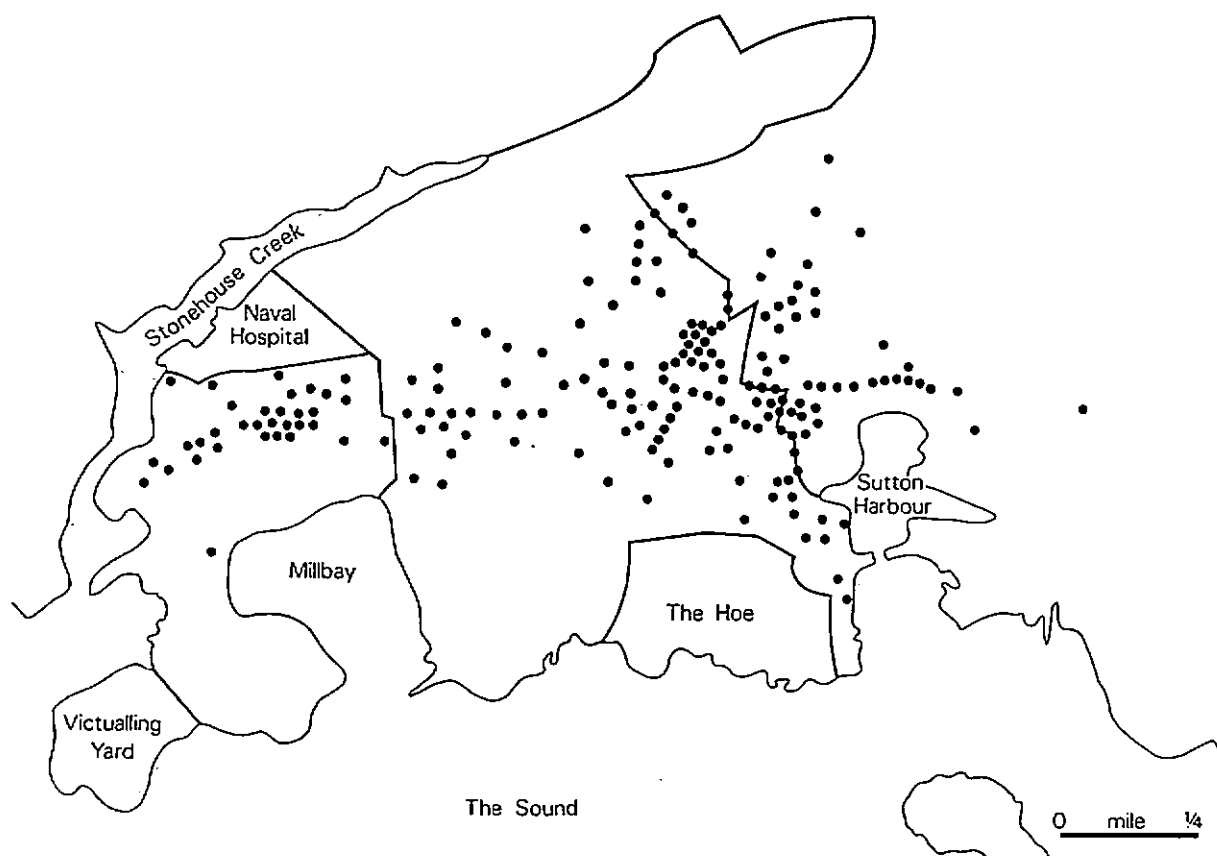


Figure 6.25: The location of clothing trade establishments in Plymouth and Stonehouse in 1856, based on evidence in Kelly's Post Office Directory.

AN EXTENSIVE AND RECHERCHÉ STOCK OF  
**LADIES' READY-MADE LINEN,  
 BABY LINEN, JUVENILE APPAREL,  
 HOSIERY AND GLOVES OF EVERY DESCRIPTION,**  
 AT  
**MRS. B. MAY'S,**  
 29, BEDFORD STREET, PLYMOUTH,

Who has always ready, for immediate use, Ladies' Outfits for the Colonies, India, Home and Wedding Occasions; Infants' Cloaks, Hoods, Hats, and Bonnets; Children's Frocks, Coats, Pelisses, &c.; Boys' and Girls' Pajamas, Dresses, Mantles, &c.; and all kinds of Under-clothing for a Young Family.

The above Departments under Mrs. M.'s personal superintendence (aided by efficient assistants), whose sole desire is to produce every article at the smallest remunerating rate. Improved and Comfortable Shapes, Neat Work, and none but the Best Materials used.

New Patterns constantly received from London and Paris. Wedding Trousseaux, from £10 upwards. Foreign Outfits, from £20 (Lists on application).

**MORNING GOWNS, DRESSING DITTO, AND TOILET JACKETS, IN GREAT ABUNDANCE.**

**FOR WEAK LEGS, ANKLES, KNEES, &c.**

**B. MAY,**  
 OF 29, BEDFORD STREET, PLYMOUTH,

HAS A REGULAR ASSORTED STOCK OF

**ELASTIC WIRE AND VULCANIZED INDIA-RUBBER STOCKINGS,  
 SOCKS, KNEE-CAPS, LEGGINGS, THIGH PIECES, &c.,**

AT LOWER PRICES THAN USUALLY SUPPLIED BY THE RETAIL TRADE,

The **BEST INVENTED STOCKINGS** for real support being charged but **FIVE SHILLINGS EACH.**

They are drawn on the leg as an ordinary stocking; are light in texture, cool, and warranted to wash; afford constant support in all cases requiring equal pressure; and the intention of offering them at so cheap a rate, is to place them within reach of all classes.

THE OLDEST ESTABLISHED ARMY, NAVY, AND GENERAL OUTFITTING, HOSIERY, AND GLOVE SHOP IN THE WEST OF ENGLAND, IS

**PLYMOUTH HOUSE,  
 29, BEDFORD STREET, PLYMOUTH;  
 B. MAY, PROPRIETOR,**

(SUCCESSOR TO NORRINGTON),

Whose Stock is remarkable for the Choicest Manufacture in

**SEASONABLE UNDER-CLOTHING FOR LADIES, GENTLEMEN & CHILDREN,  
 IN WELSH FLANNEL, MERINO, SAIGON, CIRCASSIAN, BALBRIGGAN, & SCOTCH FABRICS, &c.**

**PARIS KID & BRITISH MADE GLOVES,**  
 IN GAUNTLETS, BUCK, DOE, MILITARY, AND DRIVING, not to be equalled in Variety, nor surpassed for Moderate Prices. A continual supply of every Fashionable Production in

MORNING AND DRESS TIES, SCARFS, SILK NECKERCHIEFS, FRENCH CAMBRIC AND SILK HANDKERCHIEFS;  
 SHIRT COLLARS AND FRONTS; DRESSING GOWNS, &c.;

GENTLEMEN'S AND BOYS' SHIRTS MADE TO MEASURE—A FIT THEREBY GUARANTEED.

A LARGE STOCK SUITABLE FOR FOREIGN OUTFITS ALWAYS ON HAND.

Coloured Shirts, from 1s. 6d. each; Strong White Shirts, 2s.; Ditto, with Linen Collars, Fronts, and Cuffs, 3s. each; Bedding; Sea-chests, complete, &c.

Cadets equipped for the Army or Navy 20 per cent. cheaper than any London House.

**LINCOLN & BENNETT'S HATS, UMBRELLAS, RAILWAY RUGS, &c. &c.**

Figure 6.26: An advertisement from Kelly's Post Office Directory, 1856, illustrating the marketing of one of a growing number of clothing retailers in Plymouth.

**THE LARGEST & CHEAPEST FURNISHING ESTABLISHMENT IN  
THE WEST OF ENGLAND.**

**RENDLE'S,**  
46, OLD TOWN STREET, PLYMOUTH.

THOMAS RENDLE begs to call the attention of the Public to his extensive assortment of useful and ornamental

**CABINET FURNITURE,**

Consisting of every article in Rosewood, Mahogany, Walnut, Birch, and Painted; suitable either for the Mansion or Cottage; the whole of which is of sound and seasoned material, manufactured on the premises under his own inspection.

**A LARGE ASSORTMENT OF CHIMNEY AND DRESSING GLASSES,  
FEATHER BEDS, HAIR AND OTHER MATTRESSES.  
FUNERALS FURNISHED.**

**H. MATTHEWS,**  
**Baker, Cook, and Confectioner,**  
12, BEDFORD STREET, PLYMOUTH.

**FIRST-CLASS REFRESHMENT HOUSE.**  
*(Close to the New Guildhall) opens with every Accommodation for Tourists, Visitors, &c.*

HOT JOINTS,		WINES, ALE, &C.
DAILY,		WEDDING
FROM 1 to 3 O'CLOCK.		BREAKFASTS,
COLD JOINTS,		DINNERS,
SOUPS, CUTLETS,		BALL SUPPERS,
STEAKS, &C.,		&C.,
ALWAYS READY.		CATERED FOR.

**CELEBRATED FOR BRIDE CAKE.**

STEAM BREAD AND BISCUIT FACTORY:—  
**67, HIGH STREET.**  
DELIVERY CARTS, DAILY, to all PARTS of the THREE TOWNS.  
**VIENNA FLOUR.**

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Figure 6.27: Advertisements from Kelly's Post Office Directory, 1856, and White's Directory, 1878. Retailing in mid-Victorian Plymouth.

TABLE 6.22: Selected shop population indices

	Year	No.	Pop.*	Index
Bakers & confectioners:	1830	58	31080	535.9
	1850	104	52221	502.1
	1870	140	68833	491.7
	1890	148	84253	569.3
Grocers & tea dealers:	1830	53	31080	586.4
	1850	78	52221	669.5
	1870	104	68833	661.9
	1890	116	84253	726.3
Butchers:	1830	11	31080	2825.5
	1850	120	52221	435.2
	1870	109	68833	631.5
	1890	152	84253	554.3
Victuallers & beershop keepers:	1830	96	31080	323.8
	1850	268	52221	194.9
	1870	412	68833	167.1
	1890	314	84253	268.3

\* Taken from the nearest census.

Sources: Worth (1890) and the directories of Brindley (1830), White (1850) and Morris (1870).

retailing, it is possible to make comparisons between towns, or over time, in terms of percentage of retailing outlets and of census occupations. Scola (1982) attempted to compare the number of outlets from directories with census data on occupations, using ten types of food retailer in five northern towns, but the non-comparability of the two data sources hindered his analysis. Table 6.23 shows the results of a simplified use of Scola's method with the Plymouth data. The choice of outlet or occupation is crucial: the inclusion of non-food retailers, for example, markedly alters the results. What may be concluded, however, is that more people were employed per outlet in bread and grocery shops than in butchers. Further interpretation, as Scola admits, is difficult.

The preceding analysis shows that the elements of change which characteristically identify the evolution of modern retailing

TABLE 6.23: Retail outlets and occupations (expressed as percentages)

	1850 Directory		1851 Census	
	No.	%	No.	%
Bakers & confectioners	104	31.9	307	38.6
Grocers & tea dealers	78	23.9	239	30.0
Butchers, meat salesmen	120	36.8	187	23.5
Greengrocers, fruiterers	24	7.4	63	7.9
Total	326		796	

Sources: White's Directory (1850) and published census data.

structures were to be found in mid-19th century Plymouth. At the start of the 19th century, the shop had begun to play an increasingly important role in retailing in Plymouth. It is possible that the transition from market to shop occurred at different times in different places, and the timing of the transition may be related to the prevailing urban growth rate and other local factors such as infrastructural changes, or the commercial maturity of the settlement. In Plymouth, the market existed alongside the main shopping streets both in its location and in its service to the local community. The thriving retailing sector emphasised Plymouth's role as regional capital and provided a great deal of employment for local inhabitants.

### 6.3 Conclusion

Plymouth's twin roles of port and regional centre seem indivisible but it has been argued that the marine-based sectors of the economy exercised a profound and pervasive influence on the economic health of the two towns. It has been shown how major infrastructural improvements were the mainsprings for economic success. The

Breakwater made Plymouth a much safer port and laid the foundation for expansion of its shipping facilities. Millbay Docks enabled access for much larger vessels and thus did not wholly compete with Sutton Pool which kept the smaller vessel trade. The adaptability of the docks to new types of vessels was paramount in attracting new trade; most coasting vessels and the fishing fleet used Sutton while Millbay harboured the heavy foreign vessels and the Irish and Channel steamers. In addition to these marine improvements, the railway brought new trade and new markets; though it may have worked in competition with the coasting trade, thanks to the rapidly expanding economy, there was room for both competitors to survive. In fact, the effect of competition may have been advantageous in that freight charges were kept low and, therefore, attracted more customers.

The increase in employment kept pace with the expanding population during the 1850s but not during the 1860s, indicating that, while Plymouth's range of employment opportunities differed markedly in some respects from the national pattern, its economy seems to have responded to the same fluctuations in fortune experienced by the country as a whole. The constituent parts of the local economy were affected differently by the respective boom and recession, however, the commercial sector, accounting for approximately one tenth of the employed population, provided two and a half times its share of the increase in employment.

It has been shown that local manufacturing, largely based upon commodities traded through the port, prospered in the mid-19th century. Plymouth and Stonehouse did not comprise a manufacturing centre comparable with the northern mill towns or Midlands engineering centres but did provide a base for significant manufactories. The old cloth mills had gone, replaced by salt and soap works, starch works

and paper mills, printing, the distilling of gin, brewing, and the manufacture of biscuits. The shipyards in Plymouth declined, though local skilled men undoubtedly found work in the expanding Devonport dockyard. The local fishing industry responded to national changes and, while out-migration is not within the scope of this thesis, there is evidence that Plymouth fishermen migrated, at least temporarily, to other fishing grounds. At least nine percent of the working population were employed in retailing and it has been shown that, in this sector too, the two towns experienced growth and change in line with national trends.

An analysis of the sample data from the census enumerators' books indicated that there were marked variations in the residential distribution of those employed in different kinds of occupations and, also, that there were some changes in the distribution patterns between 1851 and 1871. Earlier chapters have identified equally striking spatial patterns in the distribution of the demographic attributes of the study area population. The extent to which such patterns are related and their wider significance in revealing the social geography of mid-Victorian Plymouth and Stonehouse are explored in the final chapter of this thesis.

During the 19th century, Plymouth's rapid population growth fuelled and was fuelled by its economic expansion. This chapter has covered a broader time period than was set by the aims of the study, it has been necessary to examine previous events and subsequent outcomes in order to explain the processes of change. The enduring message of the economic life of mid-Victorian Plymouth is one of self-confidence and prosperity. The town prospered as a trading and service centre, serving the regional populace with a market for goods and produce and serving the nation as a mercantile port and armed forces base.



## CHAPTER SEVEN: WOMEN IN MID-VICTORIAN PLYMOUTH

### 7.0 Introduction

Several factors have been identified in this thesis which have indicated that women played a particular role in shaping the social geography of mid-19th century Plymouth. It has further been suggested that the significance of their contribution warrants separate examination. The aim of this chapter, therefore, is to discuss the especially female themes of dressmaking, domestic service, and prostitution in particular, and the more general contribution of women to the demographic and economic structure of mid-Victorian Plymouth.

It has been shown that there was a marked surplus of women in 19th-century Plymouth and Stonehouse (Chapter Three), in excess of national sex ratios; explanations for this will be advanced below. Moreover, there were differences in the birthplace origins of men and women, in line with the observations of Ravenstein (1885, 1889) and subsequent researchers; the nature of female-dominated, short-distance migration will be further investigated. Finally, the specific contribution of women to the local economy will be examined; it has already been established that employment opportunities for Victorian women were very limited; in consequence certain occupations were heavily over-subscribed by working women. All these factors had an influence on the distribution patterns of the mid-19th century population of Plymouth and Stonehouse.

While Britain led the world in the Industrial Revolution, and indeed influenced the political and economic development of the modern world as her Empire expanded, the beginnings of some important social

changes are also rooted in Victorian times. At this time people were beginning to reassess the role of women in society, and while real changes have occurred in the 20th century, the intellectual foundations of women's emancipation were laid in the 19th century. In The Subjection of Women, J S Mill (1869) wrote: "...the legal subordination of one sex to the other - is wrong in itself and now one of the chief hindrances to human improvement." As early as 1792 Mary Wollstonecraft had published A Vindication of the Rights of Women although this forthright attack on the prevailing socio-economic system and call for egalitarian reform was probably ahead of its time.

In the factories, where women were working alongside men possibly harder than ever before in very poor conditions, while still fulfilling the twin role of mother and house manager, the first real steps towards female emancipation were taken. These early stirrings were both part of the labour movement and at the same time a separate issue, for it was also in the fashionable drawing rooms of the middle and upper classes that intelligent women found the traditional feminine pursuits provided inadequate fulfilment and sought other more meaningful outlets. The 1850s and 1860s saw the beginning of a major change in attitudes towards work among middle-class women (Riemer & Fout, 1983); in addition, many spinsters, wives and widows had to work for subsistence. In recognition of this, the Society for Promoting the Employment of Women was founded in 1859 and ran for eighteen years.

In those formative years, before the Pankhursts, Nancy Astor, Elizabeth Garrett Anderson, and many other women began to influence the role of women in society, what was life like for the ordinary working woman in a mid-19th century town like Plymouth? This question suggested itself repeatedly during the sampling of the 1851 and 1871

Plymouth censuses. Behind the figures of the computer coding were young widows with babies sometimes only a few months old, mothers with six or more children born at two-year intervals, and many young domestic servants from outlying rural areas. How did widows survive without the welfare state? How did mothers cope with large families in often cramped living quarters? How did country girls adapt to the bustle of the port city?

The Industrial Revolution radically altered social and economic relations between men and women, both at home and at work, but regardless of the eventual consequences, millions of women, men and children flocked into the towns and cities for work as rural employment opportunities contracted, and as the urban areas beckoned a new kind of wealth. It is hard to determine the perceptual view of these rural-urban migrants, but there must logically have been both negative and positive motives for moving. Contemporary literature throws little light on the distinction between 19th-century perceptual and operational environments. Novelists of the time concentrated on interpersonal relationships and the property issue, essentially exploring the problems of middle-class women (Anne Bronte, 1848; Collins, 1859). Even Dickens, whose descriptions of urban poverty and deprivation are a regular source for modern social historians, failed to consider how those very poor, whose pitiful condition he sought to publicise and thus improve, actually saw their situation; he was unable to enter the minds of the working class and elucidate their perception of their lives. Such literary perceptual studies only appear in the present century: Fielding (1974) cites American studies of migrant behaviour by John Steinbeck (1939), Sinclair Lewis (1920) and Erskine Caldwell (1932) who may be said to have considered the social consequences of migration and the psychological problems

inherent in the adjustment to a new operational environment.

Thus it is possible only to speculate as to the hopes and fears of a young country girl making her slow journey into an alien town like Plymouth in search of work - her motive may be clear enough, but how she learned to cope with this completely new environment remains shrouded in mystery enlightened only by conjecture. She must have suffered something akin to culture shock.

For the poor working woman in the 19th century perhaps life was mostly a matter of coping. Learning to survive in a strange town; coping with widowhood, or the absence, for service wives, of their husbands for long periods of time; or in the most tragic cases, not coping. Illegitimacy rates rose from the early part of the 19th century as migration to urban areas disrupted the social norms of rural communities where premarital sex was acceptable (Riemer & Fout, 1983). A brief slip from the establishment's strict moral codes often compelled women to prostitution, an 'occupation' which was ironically better paid than most other jobs for women (Adams, 1982). Behind the grandeur of Victorian life lay the tragic hypocrisy of the age.

In the 19th century "two classes of women accounted for the socio-sexual division under the double standard" (Millett, 1970), crudely defined as wife and whore, and romantically praised by Ruskin in Sesame and Lilies (1865). This double standard and the lack of employment opportunities for women were recognised by the more enlightened as two causes of prostitution. Reformers such as Josephine Butler saw the solution in better education and job training for women, cogently advocated in her testimony to the Parliamentary inquiry in 1871 into the Contagious Diseases Acts (Walkowitz, 1974).

7.1 Women alone: Temporarily deserted wives, spinsters and widows

It was established in Chapter Three that there were some three percent more married women living in the Plymouth area than nationally; in Stonehouse the figure was even higher at 6.6% in 1851. The simple explanation for this is that many Plymouth wives will have been left alone while their husbands were at sea or on active service, and it is possible to obtain some idea of the number of married women thus temporarily deserted for they often gave their occupation as wife of sailor or mariner in the census. From the sample survey, 4.9% of married women were enumerated in this way in 1851, and 5.7% in 1871; though, of course, these are likely to be underestimates. Similarly, in the published census of occupations 'wives not otherwise described' were enumerated and, since this was a count of omission rather than specific designation, it will have been an overstatement. Despite these recognised deficiencies, the data for Plymouth do show a marked difference from those for Devon's other major urban centre, Exeter (Table 7.1).

Calculation of expected numbers of husbands and wives, based on the percentage proportions for the southwest counties, probably give the most accurate assessment of the number of temporarily deserted wives.

TABLE 7.1: Wives ('not otherwise described') in Plymouth and Exeter

	Plymouth*		Exeter	
	No.	%	No.	%
1851	13400	44.6	3697	32.5
1861	16462	47.5	4174	36.5
1871	21635	59.3	5604	47.8

\* Plymouth and Devonport combined, Stonehouse excluded.  
 Showing percentage of total female population aged 20 years and over.  
Source: Published census data, occupation tables.

Table 7.2 shows that there were approximately one thousand more female spouses living in Plymouth and Stonehouse than might have been expected. Proportionally more men were living in military and naval institutions in East Stonehouse than in Plymouth, so the greater disparity between numbers of husbands and wives in this District (identified in Chapter Three, see Table 3.10) seems to support the suggestion that the presence of the forces was causing this 'temporarily deserted wives' phenomenon. It must be remembered, though, that wives of fishermen would also be included in this category, and they were based chiefly around Sutton Harbour on the other side of Plymouth.

Female heads of household show a concentrated distribution (Figure 7.1) in the poorer and more crowded parts of the two towns, in enumeration districts around Sutton Harbour (the centre of the fishing industry - see Plate 7A) and to the north of Stonehouse, though there is an element of greater dispersion in 1871 than in 1851. These maps show an interesting similarity with those of solitary household units

TABLE 7.2: Actual and predicted numbers of spouses in Plymouth and Stonehouse

	Actual		Predicted		Difference* No.
	No.	%	No.	%	
1851: husbands	9836	46.5	10388	49.1	-552
wives	11320	53.5	10768	50.9	+552
total	21156	100.0	21156	100.0	1104
1861: husbands	12907	47.5	13395	49.3	-488
wives	14262	52.5	13774	50.7	+488
total	27169	100.0	27169	100.0	976
1871: husbands	14042	47.5	14552	49.2	-510
wives	15536	52.5	15026	50.8	+510
total	29578	100.0	29578	100.0	1020

\* The expected number, based on the distribution in the southwest as a whole, is subtracted from the number actually recorded.

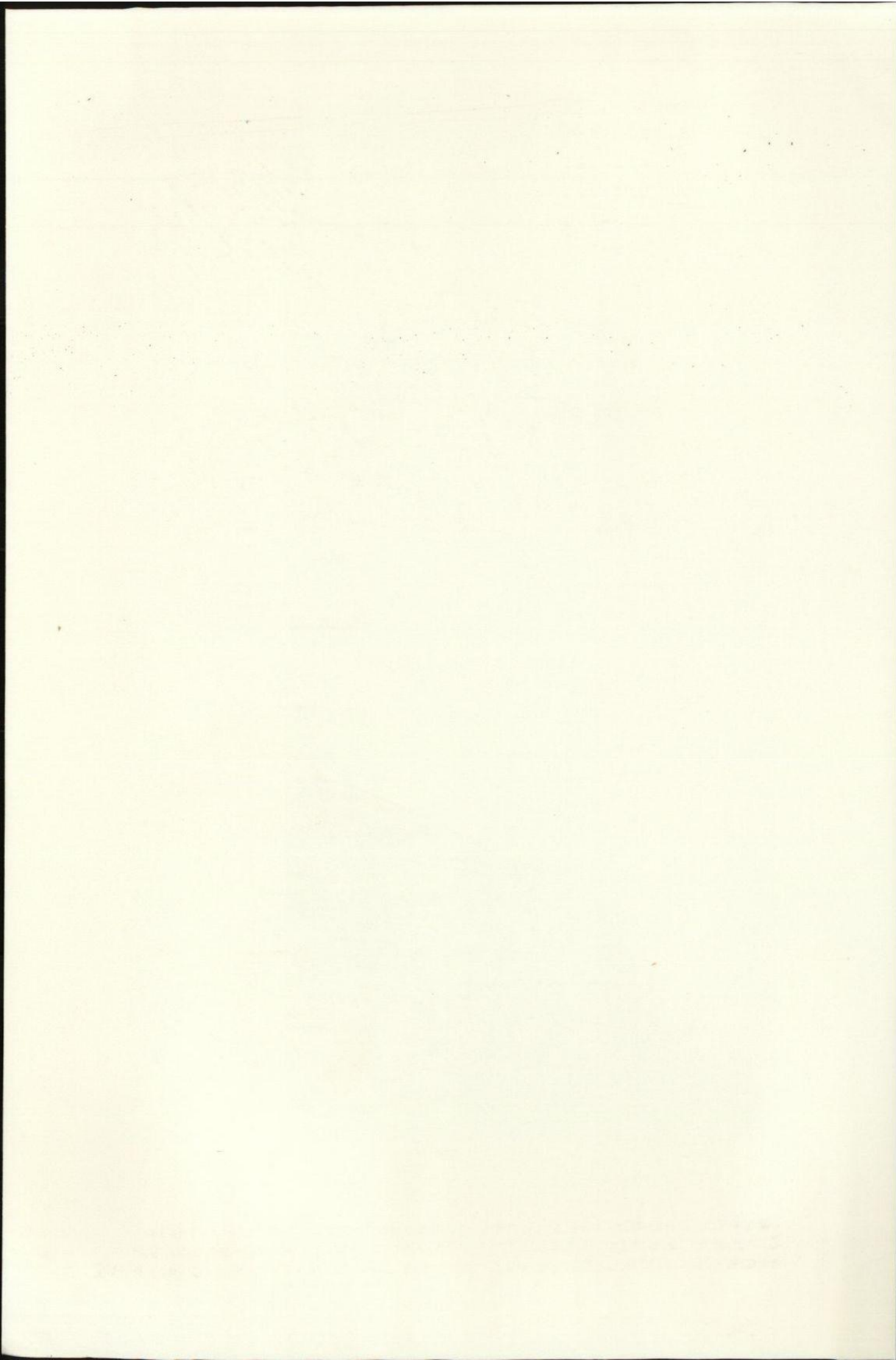
Source: Published census data.

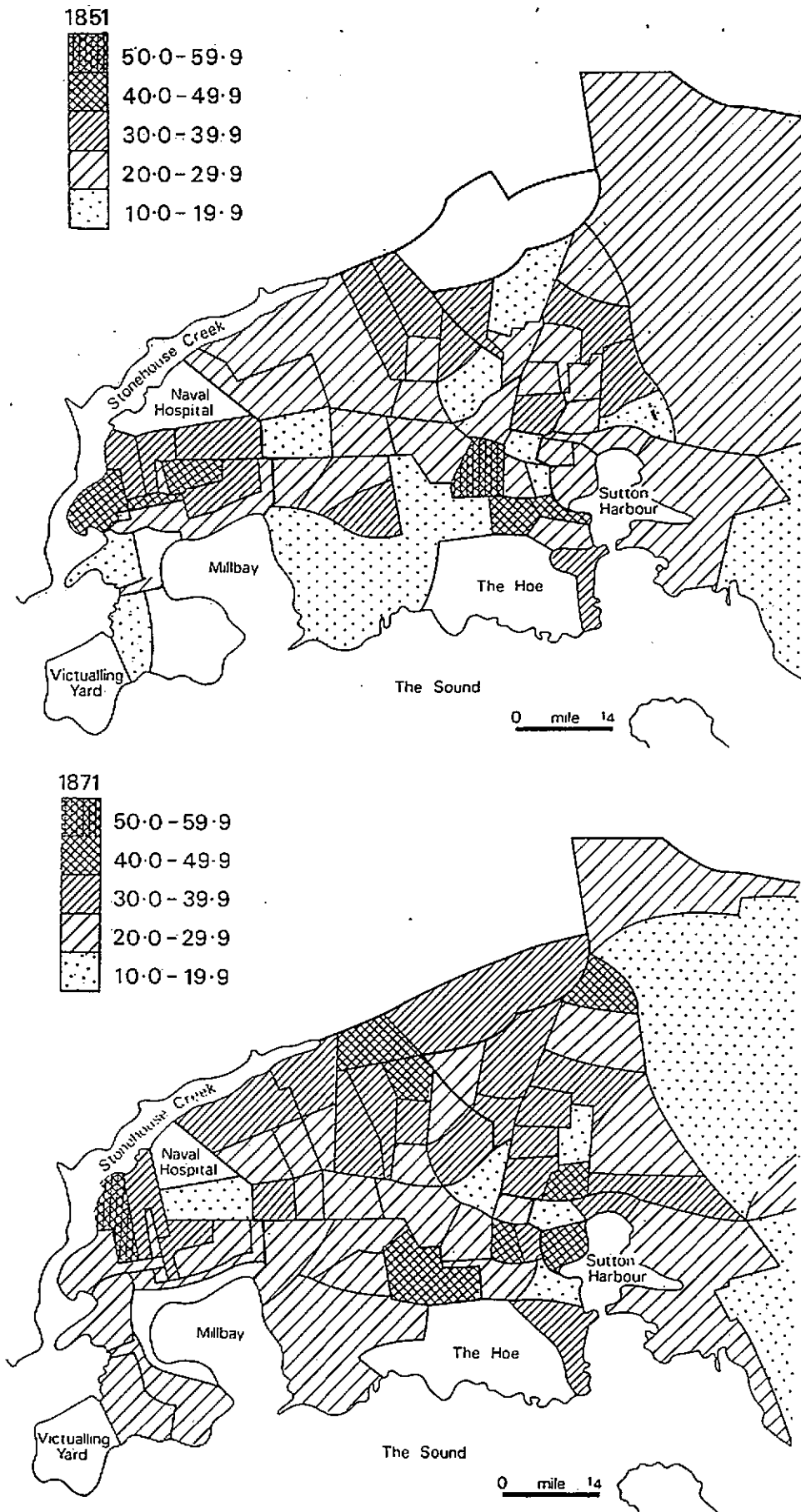
Plate 7A: Pin Lane c1880, looking towards Southside Street. These fishermen's cottages are typical of the poorer type of housing where women were left when their husbands went to sea. Residents were reprimanded in 1858 for not keeping their drains in order (Cluer, 1974).











**Figure 7.1:** The distribution of the number of female heads of household in Plymouth and Stonehouse enumeration districts in 1851 and 1871, expressed as percentages of the total number of heads of household per enumeration district. Based on the sample population data.

(see Figure 3.14). Both sets of maps emphasise the effect of the temporarily deserted wives phenomenon, even though other women and men, not connected with fishing or the forces, will have been included in the single-person household category.

According to the published census data, the study area population did not contain a noticeably higher proportion of single women than single men (see Table 3.11), but this masks the true composition of the population since many of the single men belonged to the armed forces. They did not live in ordinary dwellings in the towns but rather in barracks, whereas the single females were residing amongst the civilian population. If it is then assumed that Plymouth and Stonehouse also contained a large number of single women employed principally as domestic servants, in common with other 19th-century towns and cities, it will be seen that a balance between the sexes was achieved. The separate figures for Plymouth and Stonehouse bear this out. While the number of spinsters was rising faster than the number of bachelors in Plymouth, the reverse was occurring in Stonehouse. This was a direct reflection of the extension of the marine barracks in the 1850s which nearly doubled the size of the military establishment. The sample population data, in which the influence of defence establishments could be eliminated, also adds weight to the hypothesis.

TABLE 7.3: Single people in Plymouth and Stonehouse

	1851	1861	1871
Plymouth:			
men	5332	7660	7788
women	5326	8936	9468
Stonehouse:			
men	837	2191	1774
women	1201	1710	1487

Source: Published census data.

The greater number of widows than widowers in the study area (see Table 3.11) as compared to the whole of the southwest counties probably reflects the combination of factors previously noted: the propensity of women to migrate more frequently than men (at a time when the flow of migration was to urban areas), the increased chances of the husband dying prematurely in a sea-faring town, and the generally greater longevity of women over men. As early as 1867, Worthington recognised that the sex ratio of a town was largely dependent upon its economic base, and he noted a "marked excess of females in seaport towns", naming Plymouth by way of example. But he also cited Liverpool as having an excess of females between the ages of 15 and 45, although Lawton (1955) attributes this to the large number of young women employed in domestic service. There is evidence that in towns where there was an economic dependence on sea-going occupations, there were likely to be proportionally more wives than husbands enumerated in the census, and Plymouth and Stonehouse were typical in this respect.

"There is... a marked excess of females in seaport towns, such as Plymouth, Yarmouth, Bristol, and King's Lynn. Where ship-building is carried on at a sea port, as at Hull, the excess of females is not so great. This excess of females is owing to the absence of a large proportion of the male population as sailors in the merchant service."  
(Worthington, 1867)

Out of 205 local studies based on 19th-century census enumerators' books, cited by Pearce and Mills (1982), only 32 included the calculation of sex ratios. Yet the published census abstracts show a wide variation in the numbers of men and women enumerated in different towns and even counties. This fact was noted by Ravenstein (1885) as supportive evidence for his law of migration concerning the greater

movement of young females.

"the proportion of females among the native county element is higher than it is in the rural parts of the counties, which proves that a migration of females has taken place into the towns in excess of that of males." (Ravenstein, 1885)

This greater proportion of migrant women was attributed to the search for domestic work and also the expectation, in some instances, of employment in shops and factories. Ravenstein distinguished between towns and counties in terms of the different gravitational pull exerted by different kinds of employment; an area with a high incidence of mining and heavy industry would attract men and repel women, for example.

Lawton (1955) noted this effect in Liverpool where there was a greater number of women, often unmarried, employed in service in the better-off households found in the West Derby district at the 1851 census. In the centre of Liverpool, where there were many hotels and lodging-houses, there was also a high incidence of women in the 10-29 age groups. Similarly, Bryant (1971), studying a group of three towns and eight rural parishes in the Dart Valley, found an imbalance between male and female populations for the urban and rural areas in the young adult age groups at the 1851 census. This imbalance was also attributed to the different migratory habits of men and women as a result of differing employment opportunities.

Table 7.4 gives the sex ratios (calculated as the number of males present per hundred females) for a number of southwest and seaboard counties - those which might be regarded as possessing characteristics similar to Devon. These counties are listed in approximate proportional order and it can be seen that there was a remarkably wide variation at the three censuses cited. While Devon did not display

TABLE 7.4: The sex ratios of selected counties, 1851-1871

	1851	1861	1871
Middlesex	0.88	0.86	0.87
Pembrokeshire	0.87	0.91	0.87
Somerset	0.91	0.89	0.89
Gloucestershire	0.91	0.89	0.90
Cornwall	0.93	0.91	0.88
Devon	0.91	0.92	0.90
Cheshire	0.95	0.94	0.93
Lancashire	0.95	0.93	0.93
Sussex	0.97	0.93	0.92
Dorset	0.94	0.94	0.97
Wiltshire	0.98	0.97	0.97
Kent	0.99	1.01	0.97
Hampshire	0.99	1.05	1.02
County Durham	1.01	1.03	1.06
England & Wales	0.96	0.95	0.95

Source: Published census data.

the greatest imbalance of males to females, it can be seen that the county contained fewer males per hundred females than did the whole of England and Wales; in 1851 and 1871 this represented a deficit of five males per hundred females.

Evidence from these other studies has indicated that male-female imbalance is likely to have been greater in 19th-century towns than in rural areas. Table 7.5 lists the sex ratios of a number of principal towns and cities in mid-Victorian England and Wales. The sex ratios of several major urban areas do not differ markedly from the ratios for England and Wales; Birmingham, Hull, Liverpool, London and Newcastle reflect the national ratios. Cardiff and Chatham had considerably more men than women at the three census dates, as did Portsmouth and Devonport in 1861 and 1871. Bristol, Manchester, Southampton and Stockport, on the other hand, like Plymouth, contained a greater number of females. The different characteristics of these fourteen towns and cities do explain in part the variation in sex

TABLE 7.5: The sex ratios of principal towns and cities, 1851-1871

	1851	1861	1871
Plymouth	0.86	0.86	0.86
Devonport(1)	0.81	1.10	1.04
Birmingham	0.97	0.96	0.97
Bristol	0.86	0.86	0.87
Cardiff	1.15	1.08	1.09
Chatham(2)	1.10	1.18	1.11
Hull	0.92	0.94	0.98
Liverpool	0.97	0.97	0.96
London (city)	0.96	0.93	0.95
Manchester	0.92	0.90	0.91
Newcastle	0.96	0.98	0.98
Portsmouth(3)	0.97	1.04	1.03
Southampton	0.87	0.89	0.88
Stockport	0.90	0.88	0.86
England & Wales	0.96	0.95	0.95

(1) Stoke Damerel RD. A footnote in the published census abstracts for 1861 attributes the much greater number of men in Devonport to the "temporary presence of seven ships-of-war, on board which were several thousand seamen". The figures for 1871 were similarly affected.

(2) Medway RD.

(3) Portsea Island RD.

Source: Published census data.

ratios. Stockport, for example, was a milltown and, therefore, provided more work for women than men. Chatham and Devonport contained substantial military and naval establishments; yet so did Plymouth. The forces presence in Plymouth accounted for some ten males for every hundred females in the mid-19th century (see section 3.3.1). Significantly, the 1851 sex ratio for Devonport, when several thousand seamen were not present, was even lower - by five males per hundred females - than that for Plymouth. The forces presence cannot, therefore, be regarded as the sole cause of an excess number of females in the study area population, rather Plymouth's function as a seaport seems to be a more crucial influence on the balance of the sexes enumerated in the mid-19th century censuses. The sex ratios for



Plymouth and Stonehouse were below the national average because the local population contained some five percent more wives than husbands at the 1861 and 1871 censuses (and seven percent at 1851). In addition, as will be shown later in this chapter, the town was also an attractive source of employment for domestic servants which further weighted the local sex ratio in favour of the female population.

### 7.2.1 The female workforce

The 1851 census revealed that, in Great Britain, there were two million single women, amounting to one third of all women, who needed to maintain themselves. This "startled every thinking mind in the kingdom" and did much "to effect a change in public opinion" (Boucherett, 1860). At the same time, newspaper stories

"...revealed the lowness of the wages paid to needlewomen, and the cruel sufferings from overwork inflicted on milliners' apprentices. Workhouses were found to be overcrowded with able-bodied females, while charities were besieged by women praying to be provided either with employment or bread." (Boucherett, 1860)

There were 34,427 women living in Plymouth and Stonehouse in 1851, this figure increased by over 30 percent to 44,934 in 1871; and there were some seven percent more women than men (including forces personnel) throughout this period. Some 24 percent of the female population were in employment, thus ten thousand women were working in the study area by 1861. They were not evenly distributed through the area, the choropleth maps of female workers as a percentage of the total sample population (Figure 7.2) illustrate that a higher

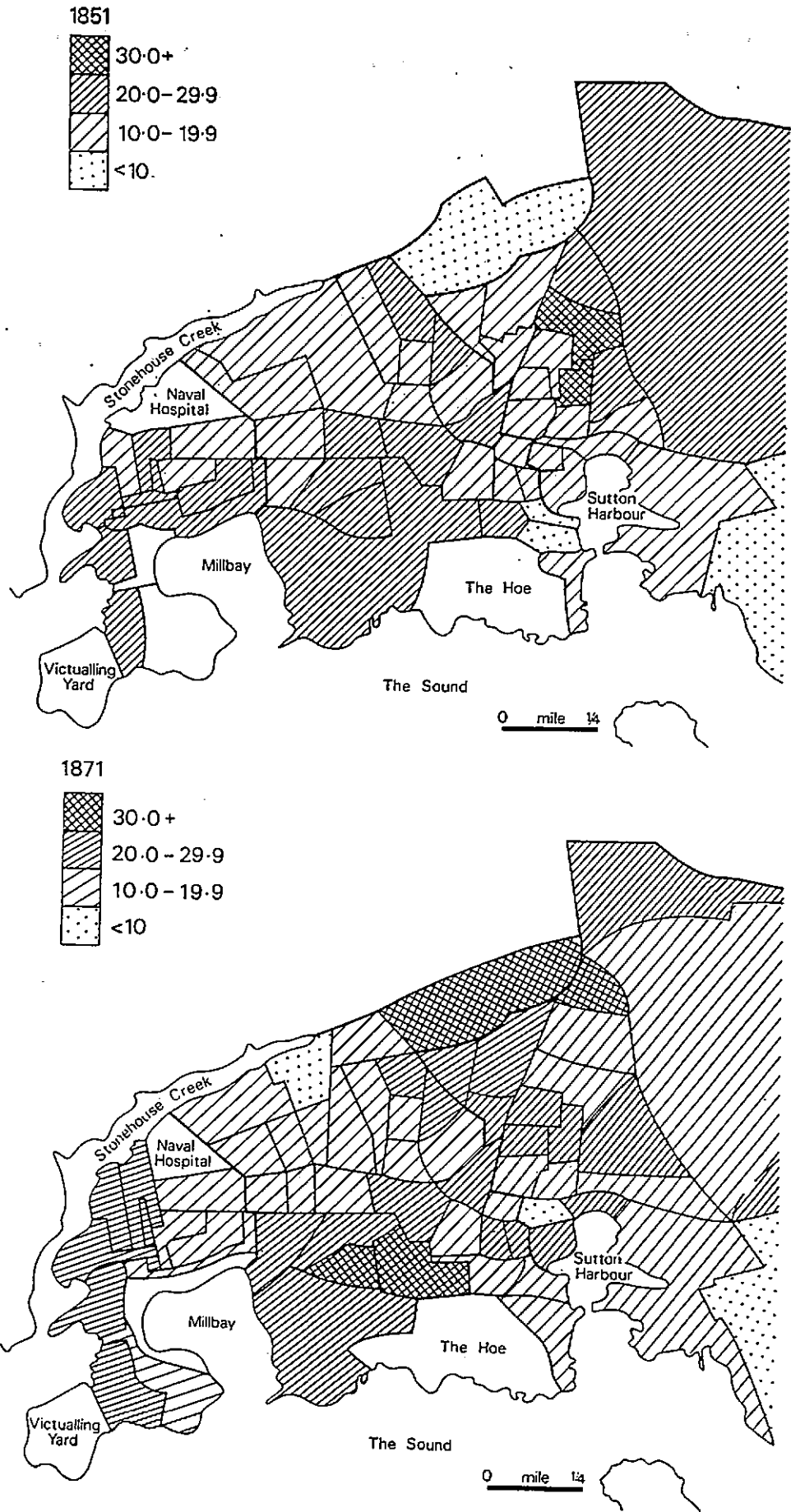


Figure 7.2: The distribution of female workers in Plymouth and Stonehouse enumeration districts in 1851 and 1871, shown as a percentage of the total sample population.

proportion were employed in the better class enumeration districts. This is a direct reflection of the distribution of domestic servants (Figure 7.3), indeed there is a marked visual similarity between these two sets of maps which is supported by Spearman correlation coefficients of 0.6 in both 1851 and 1871 (with 99.9% significance).

Women accounted for around 34 percent of the total Plymouth and Stonehouse workforce including forces personnel, and nearly forty percent of the civilian workforce. Table 7.6 shows that women in Plymouth accounted for a larger share of the total number in employment than for England and Wales as a whole. The proportion of the whole female population in work, however, was lower locally than nationally, reflecting the 'temporarily deserted wives' phenomenon. In England and Wales an increasing percentage of women were employed,

TABLE 7.6: Women in employment

	1851	1861	1871
Female population:			
Plymouth	27616	33589	37193
Stonehouse	6811	7478	7741
Total	34427	41067	44934
Total population	64200	76942	83418
Percentage increase"	-	19.3	9.4
Women working (P & S)	8470	10062	10771
Percentage	24.6	24.5	24.0
Women working (E & W)*	2348'	2710'	3118'
Percentage	25.7	26.3	26.8
Plymouth & Stonehouse:			
Working men†	16549	19886	20671
Working women	8470	10062	10771
Total	25019	29948	31442
Percentage women	33.9	33.6	34.3
England & Wales:*			
Percentage working women	27.9	30.8	29.4

" Increase in number of employed women over preceding decade.

\* Booth's figures are for people aged over 15 years (total numbers in thousands), local figures are for 20 years plus.

† Including forces personnel.

Source: Booth, 1886; published census data.

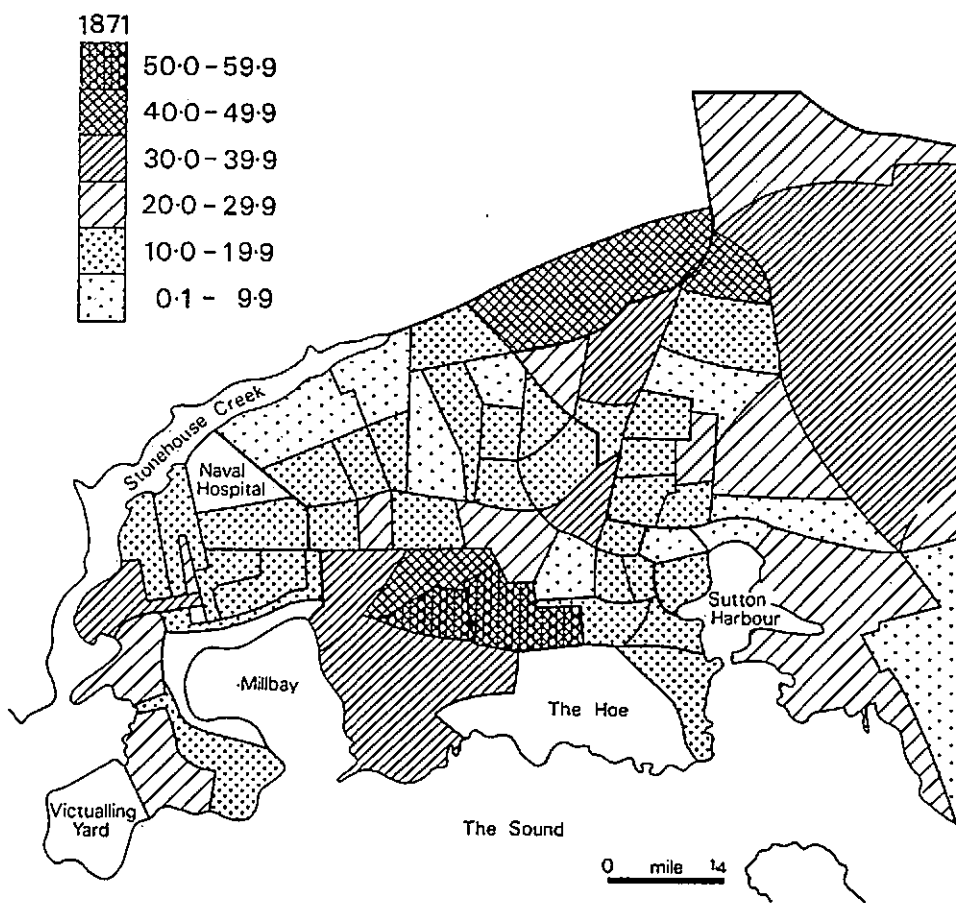
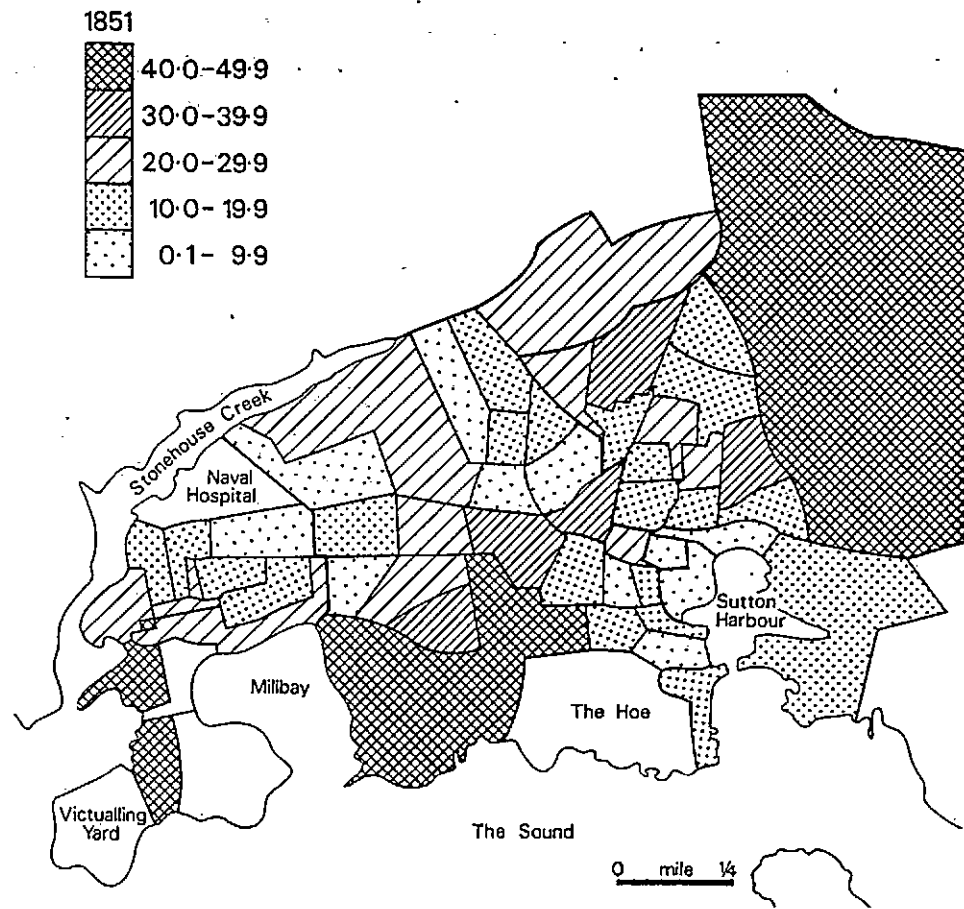


Figure 7.3: The distribution of the sample population employed as domestic servants, shown as a percentage of the total sample population, in Plymouth and Stonehouse enumeration districts in 1851 and 1871.

rising from 25.7 in 1851 to 26.8 in 1871 (Booth, 1886), but this percentage actually fell slightly in Plymouth and Stonehouse over the same period.

Nationally, women's wages were between twenty and fifty percent lower than men's and women had practically no access to higher-paid occupations. Women's work was concentrated in three areas: domestic service, the garment industry, and textile manufacture (Riemer & Fout, 1983). This was well known by contemporaries such as Josephine Butler (1868) who suggested that "the principal employments open to women are teaching, domestic service and sewing." One serious impediment to the general employment of women was their inferior education, even among female teachers and governesses. Mill (1869) contended that Victorian women's education perpetuated the system which oppressed them. Dressmaking was a major component of the girls' school curriculum, but the introduction of the sewing machine would soon remove thousands of dressmaking jobs, making the study of the subject in schools almost redundant. Boucherett (1860) recommended that, with appropriate training, women could run mercantile businesses, for example, and there were also many possible openings as clerks and as shop assistants, especially selling female apparel.

As the previous chapter indicated, in mid-Victorian Plymouth, employment opportunities were much less dictated by a factory-based economy for either sex, unlike the well-documented occupational conditions of, say, the milltowns of Lancashire or the Staffordshire Potteries. As the censuses show, of the few occupations available to women seeking work in Plymouth and Stonehouse, dressmaking and domestic service were by far the most important.

### 7.2.2 Country girls and domestic service

Ten years ago, Ebery and Preston noted a lack of research on domestic service, given its social and economic importance, and that comparative studies of domestic service in a spatial context were non-existent. Subsequent work has provided much qualitative information but quantitative and spatial research is still lacking. Ebery and Preston (1976) carried out a detailed study of domestic service in selected groups of towns, and concluded that "the relationship between social and economic characteristics of the areas... and the domestic servants who worked therein was exceedingly subtle and complex."

Over eighty percent of the published census occupational order described as "Persons engaged in Entertaining, and performing Personal Offices for Men" in mid-Victorian Plymouth were female domestic servants. The published census further reveals that over 63 percent of these women were 'general servants' in 1851 and over 48 percent in 1861. Nationally, the number of working women employed in domestic service peaked in 1871 at 46.4% (Ebery & Preston, 1976) or 15.8% of the whole occupied workforce (Booth, 1886). Domestic service (an almost singularly Victorian form of employment) was thus the largest category of female occupation in the 19th century.

Clearly, a principal reason for this was the lack of alternative employment opportunities; further, domestic service was seen as providing a valuable education:

"...her prospects of making in due course a good wife and mother would be bettered. Her prospects of marriage itself might be bettered by removal from a humble home and restricted acquaintance to the busy servants' hall in 'the big house'."  
(Best, 1971)

Thus, beckoned by prospects of securing respectable employment and of personal improvement, hundreds of country girls flocked to Plymouth, encouraged also by the chance to amass savings, which might encourage offers of marriage, from an annual income of between £9 and £14 in 1861. Domestic service was considered a respectable occupation, even if a lowly one, because it was usually residential and under supervision. Not all servants lived in, however, up to a third were forced, through low wages, to find accommodation in overcrowded, insanitary lodging houses (Riemer & Fout, 1983).

While there is little direct documentary information on the lives of Plymouth servants in Victorian times, Hiley (1979) published extracts from the diary of Hannah Cullwick, a 'maid-of-all-work' in Kilburn which she kept at the insistence of Arthur Munby who, from the 1850s until his death in 1910, collected many photographs and descriptions of working women. By example, Hannah's duties reveal what life may have been like for her counterparts in Plymouth. She sometimes had only enough time for four or five hours sleep - "...if it kept on as long as it's bin the last 3 or 4 days i shall be knock'd up i think" - with perhaps only two days holiday a year. Up to a 100-hour working week would have been expected of the single general servant in private employment (Ebery & Preston, 1976).

Certainly there was no shortage of available work - it was "impossible to be properly middle-class without a servant" (Roebuck, 1973). Vera Karsland (1891) quoted one long-established servants' registry office as needing servants on the books but not mistresses. Such offices were profit-making enterprises and were not licensed or controlled until the present century (Davidoff & Hawthorn, 1976), which left the way clear for some to be fronts for recruiting prostitutes. But most were strictly honourable and served a very

useful function. Both potential employer and servant paid a fee to the office, although there was no guarantee that either the job or the employee would be suitable; in the mid-19th century employers generally paid commission of one shilling in the pound on a year's wages (Dawes, 1973). Several such registries are recorded in the Plymouth directories, the earliest being that of Mrs Jane Watton of Russell Street (Kelly's Directory, 1856), and there were three agencies named in Elvin's Directory for 1867 including that of Mrs Annie Watton of 67 York Street (it is not known if these two were related).

How the Plymouth agencies worked, how many girls were on their books, how successful they were in placing staff or what commission they charged is not known. The West of England High-Class Governess & Servants' Agency was founded in the 1880s, but while Wright (1894) describes the business premises - "centrally located" with apartments containing "every convenience" - he tells nothing of how the "enterprising and energetic proprietress", Miss Ford, conducted her George Street business. However, a leading and respected London registry, that of Mrs Hunt of Marylebone, provides a late-19th century example: "...servant girls newly arrived from the country slept in the attics, like disposable stock, while waiting to be placed" (Dawes, 1973). The "seediness" of these agencies persisted from their beginnings in the 18th century through to the 1920s, and their modus operandi encouraged sharp practice: they had a vested interest in maintaining as high a turnover as possible for each placement meant another fee (Dawes, 1973).

Not all girls seeking domestic employment found their positions through agencies. Traditionally, vacancies were heard of through friends or relatives already in service; in an age before mass



communication and universal education, when many working people were illiterate, word-of-mouth was often the only source of information, and the reliability of this information was doubtful. In addition, there were notices in local shops or post offices, or a young girl might be recommended by her schoolteacher or the officers of the local workhouse or orphanage, and Plymouth newspapers, with a circulation in Devon and Cornwall, carried advertisements of situations vacant.

It has already been established that there were proportionally more women than men born in Devon and Cornwall and living in Plymouth and Stonehouse in the mid-19th century, nearly fifty percent more women than men came originally from Cornwall. Moreover, because employment opportunities for women were so limited, it may be inferred that many of these women were young and single rural girls working as domestic servants. Supportive evidence is provided by analysis of occupations according to birthplace: over 26 percent of Cornish-born inhabitants in the sample were employed in domestic service, by far the largest occupational group from that county (see Chapter Four). There was also a marked excess of young adults from Cornwall, especially for the 1851 sample population, and the majority of female servants were generally in their late teens and early twenties (see Chapter Three). The rural areas of Devon will similarly have provided many girls for domestic service in Plymouth, some 17 percent of Devon-born inhabitants were thus employed in the mid-19th century.

However hopeful their expectations of life in service may have been, and however horrific the reality of the work turned out to be, the impressions of the young country girl on arriving in the bustling town have rarely been recorded. Horn (1975) quotes one general servant in Northamptonshire who, though blessed with a benign mistress, was distressed at leaving family and friends behind to live

among strangers. Loneliness was most acute among the youngest servants "who were frightened by the solitude of the long evenings in which they had to sit in the kitchen by themselves, or perhaps remain in the house entirely alone" (Horn, 1975). Rural girls were preferred because they were generally harder-working and healthier than girls from urban backgrounds. Writing of domestic service in Exeter, Jane Emerson (1982) notes that Devonshire girls were renowned throughout the country as trustworthy and hard-working, and that Exeter acted as a "temporary stopping point" for girls from the surrounding rural hinterlands who frequently started work between the ages of 12 and 14.

Domestic servants were a particularly youthful sector of the workforce, as the evidence for England and Wales shows, one in three girls between the ages of 15 and 20 were thus employed in 1871, and over one in four aged 20 to 24. Despite there being only limited data available for Plymouth and Devonport Boroughs combined (excluding East Stonehouse), the towns were not atypical with nearly 26 percent of girls in this age group working as domestic servants in 1851 and 29 percent in 1861. Ebery & Preston (1976) found that towns with port or naval associations had lower servant-to-family ratios, though not as low as northern industrial and mining centres; their figures for 1911 show that there were 247 female servants per thousand families in Devon, compared to 212 for the whole of southern England. In Plymouth, in 1851, there were 221 female servants per thousand households.

Apart from the decennial census, detailed records of household membership in the 19th century do not survive for Plymouth; it is, therefore, difficult to establish servant turnover rates. But the enumerators' books do suggest levels of mobility amongst the domestic staff of Plymouth households equally high as those recorded by Emerson

in Exeter; this may be inferred from the young ages of servants (Table 7.7). It was common to change positions quite often; only ten percent of households maintained the same servants for ten years or more; a reflection, no doubt, of the often uneasy relationship between mistress and servant. Karsland (1891) notes that a mistress was not always sufficiently knowledgeable about household duties to instruct usefully the new servant, a situation which must have bred mistrust and lack of understanding, especially when "...the poor 'general' finds herself expected to do kitchen-maid's, housemaid's and parlour-maid's duties at one and the self-same time".

The conditions of general service, often akin to slavery and giving little time off for a social life, meant that servants were actually less likely to marry than women in other occupations; a situation exacerbated by the greater number of women than men living in towns and the probability of losing their position once married (Ebery & Preston, 1976). However, Davidoff and Hawthorn (1976) suggest that

TABLE 7.7: Age of female private domestic indoor servants

(a) ENGLAND AND WALES

Date	Under 20	%	Over 20	%
1851	265,883	38	441,749	62
1861	372,399	42	512,565	58
1871	476,554	40	727,923	60

Source: Davidoff & Hawthorn, 1976.

(b) PLYMOUTH AND DEVONPORT BOROUGHES

Date	Under 20	%	Over 20	%
1851	1,163	31	2,575	69
1861	1,557	40	2,328	60
1871	n.a.		2,553	-

Source: Published census data.

the majority of servant girls did eventually marry, although comparatively late at about 25 years old; and Emerson (1982) says that about two-thirds left to get married between the ages of 25 and 30. Of the few that remained, some continued in service into old age, but most found it difficult to obtain work beyond about 40 years old. On average most young women would remain in service for some 12 years, holding between three and five different situations. After marriage there were fewer employment opportunities, live-in service being virtually impossible, and these women would become chars or washerwomen; a similar fate awaited older unmarried servants. Family poverty or widowhood subsequently forced many women to work as chars. In Plymouth 7.6% of women in 1851 employed in the domestic service occupational order were charwomen, and this percentage nearly doubled by 1861.

### 7.2.3 Dressmakers, seamstresses and laundresses

By far the largest group of workers counted in the occupational order "Textiles and Dress" (which included makers of sailcloth, rope and canvas) were those providing dress. The order comprised an extensive collection of occupations from hairdressers to clog makers, furriers to laundresses, and in these kinds of occupations women out-numbered men by three to one. Over 34 percent of the female workforce were thus employed in 1851, rising to nearly 40 percent in 1861. There are four principal female occupations in the dress and textiles occupational order which can be drawn from the published census and the sample census data in a reasonably comparable form, and these are presented in Table 7.8. It can be seen that about three-quarters of

TABLE 7.8: Women working in dress and textile occupations

	Total population			Sample population	
	1851	1861	1871	1851	1871
Dressmakers	1189	1597	n.a.	145	165
Milliners	n.a.	n.a.	n.a.	34	32
Seamstresses	280	490	n.a.	35	33
Laundresses	678	948	n.a.	53	83
Total	2147	3035	n.a.	267	313
Total women in Textiles	2908	4012	3608	348	457
Percentage increase*	-	37.9	24.1	-	31.3
Percentage of working women	34.3	39.9	33.5		

\* Percentage increase since 1851.

Source: Published census data; census enumerators' books.

the women employed in this occupational order were dressmakers, milliners, seamstresses or laundresses. From the sample survey, this proportion appears to fall a little in 1871, which may reflect the increasing diversification of female occupations; more women did seem to be moving into tailoring and drapery by this time. Overall, there was an increase of 24 percent in the number of women working and dealing in textiles and dress through the twenty-year study period.

For the working-class woman, dressmaking was more often done on a poorly-paid, piece-work basis at home or in small workshops in frequently appalling conditions. Such sweat shops were cramped and overcrowded, and wages as low as three shillings (15 pence) per week were common for such work (Adams, 1982).\* The invention of the sewing machine in 1830 eventually brought a lasting change to this work: machine-sewn dresses began to appear in England from about 1860 and

\* In 1889, Kelly's Directory noted two large firms of outfitters and costumiers in Plymouth together employing over 500 women. The Directory says they "earn good wages and work in well-lighted and well-ventilated factories, in which sanitation is duly enforced". Evidently much had been done to improve working conditions towards the end of the century.

soon began to influence fashion. By 1870 there were four sewing machine makers and dealers in Plymouth.

There is a considerable shortfall in the number of laundresses caught in the 1851 sample when compared with the published census. The latter source reveals that some eight percent of working women were thus employed. It is probable, therefore, that the 1871 sample percentage of 5.5 is also an underestimate, especially since the 1861 published census attributes over ten percent in this occupation.

Statistics notwithstanding, there has been surprisingly little written about this most basic of all women's work, domestic appliances designed to relieve the drudgery of the week's washing are, after all, a very recent addition to many households. It is unlikely that the women who found a meagre living as laundresses would have appreciated Vera Karsland's (1891) rose-tinted images of children blowing soap bubbles, the "hearty shake of well-rinsed clothes" and the neighbourly gossip in Victorian laundries.

Hundreds of Plymouth and Stonehouse laundresses seemed to have toiled on without attracting much attention from either contemporary commentators or today's historians. Cluer (1975) published one photograph of a Victorian washhouse "With well scrubbed floors which could accommodate four washerwomen who took in the yachtsmen's white trousers". The stark reality was that, even by the end of the 19th century, a Plymouth washerwomen could expect to earn only 2s 6d or 2s 9d (around 13 pence) a day, and ironers 3s to 3s 6d (15-17.5 pence), and the work was intermittent (Bulley & Whitley, 1894). These hard truths are not revealed by Karsland (1891), who quotes incomes of £70 to £100 per annum for lady superintendents and adds that "there is nothing menial in the work". Her uncritical judgment of laundry work seems very hard to justify.

### 7.3 Prostitution

"A great port must always be subject to periodic disturbance by the enthusiastic behaviour of men too long confined to the company of their own sex - a circumstance liable to give rise to displays of uninhibited licentiousness." (The Memoirs of Cora Pearl, Blatchford, 1984)

It is one of the greatest ironies of Victorian morality that there existed a thriving underground of illicit sex but, perhaps predictably in an age of repression, sexuality occupied the minds of otherwise honourable gentlemen sufficient to have left a good deal of documentary evidence, the autobiography of "Walter" being the most sordid diary of pornographic adventure (Harrison, 1977). To be fair, the fate of fallen women was becoming a genuine concern in Victorian times and institutions for their rehabilitation were being established.

In Plymouth several concerned respectable ladies, mainly wives of local shopkeepers and widows of independent means, wrote to the Mayor in 1828 to protest about the prostitutes who plied their trade in and around the public houses in Castle Street (Marlow, 1982). This area, in the narrow, overcrowded maze of streets behind the Barbican quays, was notorious for licentious behaviour centred on the numerous unlicensed beerhouses. One witness at a Board of Health inquiry told of trawler apprentices, boys aged between 10 and 16, who supplied fishermen with bait for up to five shillings a week and spent their money on beer and prostitutes as young as eight. Even more startling are the prostitutes who were openly described as such in the enumerators' books for 1871 (Figure 7.4), some of whom were entertaining an anonymous customer on the night of the census.

The most eminent courtesan in Paris during the Second Empire, Cora

Page 20, The undermentioned Houses are situate within the Boundaries of the

City or Town of		Municipal Borough of		Municipal Ward of		Parliamentary Borough of		County of		Village or Hamlet, &c. of		Local Board, or Improvement Commission, or District of		Ecclesiastical District of	
East Stonehouse						Devonports								East Stonehouse	
No. of House	ROAD, STREET, &c., and No. or NAME of HOUSE	HOUSES Inhabited in 1871 (as per Census)	NAME and Surname of each Person	RELATION to Head of Family	CON- DITION	AGE of Male Female	Rank, Profession, or OCCUPATION	WHERE BORN	Whether						
									1. Deaf and Dumb	2. Blind	3. Imbecile or Idiot	4. Lunatic			
154	77 Fore Street		Beattie Fryear	Head	Widow	27	Laundress	Devon. Devonport							
155			Mary A. Newfield	do	do	27	do	do. Plymouth							
156			Leahy Davis	do	do	24	do	do. Newton							
158	78 do	1	Mary A. Bernal	do	do	20	Prostitute &c	do. Plymouth							
159			Emma Oliver	do	do	20	do	do. Devonport							
			U.K.			26	Sergeant 2 <sup>nd</sup> Regt	England							
161			Mary J. Lucombe	Head	Widow	22	Prostitute	Devon. Plymouth							
162	79 do	1	Milba Blight	do	do	19	do	do. Exeter							
			U.K.			26	Guinea R. M. A.	U.K.							
163			George Wilcox	Head	Single	26	Laborer	Devon. Exmouth							
			George do	Son		12	do	do. Devonport							
			William J. do	do		11	Schooler	do. Stonehouse							
			Ricciella Salomas	Servant	Widow	46	Housekeeper	do. Ringwood							
164			Eliza Davis	Head	Widow	28	Prostitute	Cornwall. Redruth							
			John do	Son		1	do	Devon. Devonport							
			U.K.			20	Private 7 <sup>th</sup> Regt	U.K.							
165			Emma Cornish	Head	Widow	27	Servant	Devon. Tavistock							
166			Eliza Carr	do	do	22	do	Cornwall. St. Ives							
167			Grace Adams	do	do	27	do	Devon. Stonehouse							
168	80 Fore Street	1	Elizabeth Williams	do	do	22	do	Cornwall. Tridewater							
169			Annice Friend	do	do	22	do	Devon. Plymouth							
170			Daniel Hannitt	do	Mar.	44	Colonel Pensioner	Ireland. Cork							
171			Annalia Burnett	do	Widow	22	Prostitute	Cornwall. St. Ives							
			U.K.			26	Private R. M.	U.K.							
Total of Houses..		3			Total of Males and Females..		9	15							

\* Draw the pen through such of the words as are inappropriate.

Figure 7.4: A page from a Plymouth census enumerator's book for 1871 listing several prostitutes and their clients.



Pearl, was born Emma Crouch in Plymouth in 1835 (Lebrecht, 1983), but the glamorous riches she achieved were far removed from the lot that befell the 'sisters' she left behind. As a child she lived in Stonehouse and sometimes accompanied her musician father to theatres around Union Street. As noted in Chapter Two, the authenticity of both of her autobiographies is dubious, yet one contains a vivid and plausible account of prostitution witnessed on the walk home:

"I was conscious of a number of people lining the pavements; they were in couples, and leaned against the walls... and I was conscious of a murmur of noises, of low moans and muttered expletives... My father took the first opportunity of turning into another street... and I was unconscious at that time of what the spectacle meant: of course it was my first display of the animal nature of sexual congress. The bodies had been those of the lowest prostitutes of the town and of willing sailors..."  
(Blatchford, 1984)

In December 1871 there were 503 prostitutes in Plymouth, Stonehouse and Devonport who were registered under the terms of the Contagious Diseases Acts of 1864, 1866, and 1869; this means that seven out of every one thousand women living in the three towns were known prostitutes. They were young, single women who resided in lodgings, catered to a working-class clientele, and were born locally or in the surrounding countryside. Their migration patterns appear no different from those of the general population, they moved to Plymouth because of declining employment opportunities in agriculture and also in the Cornish mining industry. According to the Town Clerk, Mr Phillips, the women from the Cornish mining districts were an ever replenishing pool of prostitution (Walkowitz, 1973). Repressive measures were used to discourage them: for example, they were imprisoned rather than fined for drunk-and-disorderly charges.

By migrating, these women were not necessarily breaking with

traditional roles which prescribed that women work to support themselves and contribute to the family income. It is likely that the discomfort of poor, overcrowded homes and the problems of family life, beset by high birth- and mortality-rates, plus the emigration overseas of many men, brought women from rural Devon and Cornwall in search of domestic work in more prosperous households in Plymouth. The men and women who moved to the town from the surrounding countryside inevitably found a more complex and established community and economic life, but while the town experienced considerable population and commercial growth in the mid-19th century, as already noted, there were limited employment opportunities for the women. An editorial on the poor regretted "that Plymouth does not open up such a field for feminine industry as is presented in the midland counties" (Lantern, 9 December 1871).

Economic conditions were the most compelling cause of prostitution; it was better paid than most women's jobs. Stephen Marcus, quoting from "Walter's" autobiography, gives a price list from the 1880s which ran from five shillings (25 pence) "for quite a nice girl" to £1 "for a very good woman" (Adams, 1982), and it was not unknown for other women to be jealous of the fine clothes that prostitutes could afford.

It may be assumed that similar prices were charged in Plymouth. But it was not the lure of a better income which led women to the streets, rather the lack of an alternative source of income. Emerson (1982) points to the "downward economic and social spiral caused by the lack of job opportunities for women, and the absence of any form of social welfare" experienced by girls who lost their positions as domestic servants or women who were replaced by younger employees. These unfortunates could not be described as professional prostitutes and they were probably the women who subsequently found themselves in a

Home for Fallen Women; one such home in Plymouth at the time of the 1871 census housed 16 inmates.

Often unemployment pushed women into prostitution as a last resort, and the previous employment of many of the registered women was general domestic service. However, using the 1871 census Walkowitz (1974) found a more diverse occupational background among identified prostitutes in Plymouth. Of thirty-one women aged 15 to 29 from three notorious streets only two were listed as prostitutes, four as domestic servants and the remainder were dressmakers, tailoresses, seamstresses, bookbinders, or unemployed. Conventional employment probably paid only six to eight shillings a week, working a fourteen-hour day, and was subject to the demands of the local social season, whereas prostitution was perceptibly better paid at a shilling per customer.

Other seasonal factors also operated to draw women into prostitution, notably the arrival of ships or new regiments produced many more street-walkers and an increase in disorderly behaviour among prostitutes. In addition, it was generally held that women were particularly vulnerable to seduction - which led to prostitution - in certain types of employment, particularly domestic service (Sigsworth & Wyke, 1972). Moreover, until 1875 the age of consent was only twelve; it was eventually raised to 16 in 1885. Postponement of marriage by middle-class men contributed to demand, while working-class demand also existed and was closely associated with the beer-houses which after 1830 catered for the working man (Sigsworth & Wyke, 1972).

The restriction of marriage in the armed forces and the lack of provision of entertainment during leisure hours were said to encourage clandestine prostitution. Living conditions for soldiers were

appalling and only about six percent of enlisted men were married, hence this "bachelor army" was accustomed to turn to prostitutes in dockyard and garrison towns like Plymouth (McHugh, 1980). Some did marry unofficially, however, and their wives lived in lodgings outside the barracks (Sigsworth & Wyke, 1972).

The conventional view saw soldiers and sailors as somehow depraved, requiring special discipline and 'social arrangements', but this view was changing with reform of their living conditions (McHugh, 1980). In 1857 the Army Sanitary Commission investigated the primitive conditions endured by soldiers; barracks were overcrowded, ill-ventilated and insanitary, and the mortality rate among soldiers was found to be double that of the comparable civilian population (Sigsworth & Wyke, 1972). The Commission's improvements were said to have produced a fall of forty percent in the rate of venereal disease in six years (Scott, 1890), though in 1861, Florence Nightingale still noted that half of all sickness in the Army at home was due to "the disease of vice" (McHugh, 1980).

One measure designed to improve the serviceman's self-esteem was the abolition of periodical medical inspection in 1859. The self-esteem of women suspected of prostitution was not similarly considered. Army reformers recognised the inevitability of prostitution in the vicinity of camps and ports and so insisted on the importance of ensuring that known prostitutes were as healthy as possible. The official purpose of the Contagious Diseases Acts of 1864, 1866 and 1869 was to halt the spread of venereal disease among soldiers and sailors stationed at certain towns including Plymouth, and thereby save the government from the resulting financial penalties and loss of manpower. Women accused or suspected of being prostitutes were registered, placed under police supervision, had periodic medical

examinations, and if found to have VD, placed in lock hospitals for up to nine months. Josephine Butler held that the true purpose of the Acts was not to suppress vice but to ensure "clean" prostitutes for the forces. In effect, they

"...provided for a system of state regulated prostitution in the garrison towns of England. Under their provision any woman could be arrested merely on the suspicion of a plain-clothes government spy and be compelled to sign a voluntary submission to be medically examined once a fortnight or else vindicate her character in the police court." (Thomas, 1959)

The 1864 Act was applied to eleven garrison and dockyard towns (Portsmouth, Plymouth, Woolwich, Chatham, Sheerness, Aldersot, Colchester, Shorncliffe, the Curragh, Cork, and Queenstown), though the lack of appropriate hospital facilities delayed extension to all the towns and it was not until 1870 that the system was in full operation. It was passed through parliament with evident secrecy (Arthur, 1885). When the 1866 Act (which added Windsor to the original list) was brought in, Plymouth was one of only four districts which had been covered. A small force of plain-clothes Metropolitan Police were employed to enforce the second act; in ports these were usually recruited from the dockyard or water police (McHugh, 1980). The 1869 Act extended provisions to more stations (Canterbury, Dover, Gravesend, Maidstone, and Southampton) and widened the area affected at each station.

The Admiralty subsidised the construction of the Devonport Royal Albert Hospital in 1863 (Walkowitz, 1973) which immediately attended to the moral and physical rehabilitation of the women in its care. The sometimes over-zealous Plymouth police inspector, Anniss, lived above the examination house in Flora Street, just round the corner

from the red light area. There were ten special police in the three towns who made daily visits to known brothels.

The advocates of the Acts were, for the most part, genuinely seeking a solution to an intractable problem. It was not until 1870 that there was any sustained public outcry against the legislation, and the repeal movement and the government both used Plymouth as the focus for their propaganda. In Plymouth, middle-class repealers tangled with the police when they gathered to protest. Josephine Butler led the Ladies National Association for the Repeal of the Contagious Diseases Acts, founded in 1869, and spent 17 years campaigning; she saw prostitutes as victims of men's economic and sexual domination of women (Riemer & Fout, 1983). Walkowitz (1977) contends that the effect of the CD Acts upon prostitution was to turn it into a more readily identifiable profession. If 19th-century prostitution was largely the consequence of limited employment opportunities for poor working women, made more acceptable by their ability to reintegrate themselves into the community, then lower-class prostitution was transformed by repressive public sanctions. The Acts were eventually suspended in 1883 and repealed in 1886.

A favourite meeting place in mid-Victorian Plymouth was under the railway bridge across Union Street. A Lantern correspondent noted hundreds of people passing under this bridge in the space of five minutes one evening and wrote:

"We have read many letters contributed by... inhabitants complaining of the immoral scenes often presented underneath this archway after dark, particularly on Sundays. The matter has been brought before the Town Council more than once, and the consequence is that additional gas light has been placed there, and the police urged to take in charge the more obscene and

disorderly..." (Lantern, 11 November 1871)

In another article, a lane (probably Granby) near the bridge and parallel with Union Street is described:

"The lower part is occupied with a few houses mostly tenanted by the demi-monde... When H M ships are paid off, the lane is full of excitement and revelry, and scenes arise which I will not attempt to describe" (Lantern, 24 June 1871).

Three streets in Plymouth, Central (population: 135), Granby (212) and Summerland (263), were regularly condemned in local newspaper reports for being insanitary and full of brothels. In 1872 the Town Clerk remarked that Granby Street was very unhealthy, "its level being as low as the sea, and its inhabitants still lower" (WDM, 26 April 1872).

Twenty-seven women living on these streets had police records identifying them as prostitutes, and 68 percent of single women aged 15 to 29 in these streets were living in lodgings. In a wider survey, Walkowitz (1974) found nearly 44 percent of such women were living independently, compared to only eight percent in Plymouth generally. She notes that any single woman, living thus, would have been suspect to the police. Yet a common experience of economic hardship united such neighbourhoods, regardless of the legality of their occupation. These streets were, after all, located in enumeration districts already identified in this thesis as among the poorest and least salubrious in Plymouth. Eighty percent of the brothels under police surveillance catered to a working-class clientele.

Walkowitz (1974) used hospital, police and census records to provide a social and economic profile of Plymouth prostitutes: ninety percent of those in the lock hospital were aged 15 to 29, their average age being 21.8 years, and 95 percent were unmarried. The 1871

census also revealed that, of the 77 interned women, 43 percent were born locally and 49 percent in Cornwall and the rest of Devon. Similar proportions were found among women identified as prostitutes living on the three Plymouth streets. Plymouth magistrate, Luscombe, recorded that four out of five women brought to book were Cornish. Police returns indicate that of the 503 registered prostitutes in Plymouth; Stonehouse and Devonport, 220 were single 15 to 29 years olds; they constituted 39 percent of all single women of that age residing in lodgings in Plymouth (based on a ten percent sample of single women in Plymouth).

The Plymouth Female Home in Hill Street was established "for the reclamation of the outcasts of society". Inmates contributed to the maintenance of the home by taking in washing and they underwent "a course of industrial training which qualifies them for situations of usefulness when they are discharged."

"One of the claims of the Home... is that its doors are open, at any hour, to give temporary shelter to fallen women, and discharged female prisoners, on their expressing sorrow for their past lives and a sincere desire to amend."  
(Lantern, 15 July 1871)

Victorian concern about the 'social evil' of prostitution reached its height in the 1850s and 1860s and the subject was widely discussed in the press. Acton (1857) argued for the humane treatment of prostitutes, realising that for most it was a temporary 'occupation', while Lecky (1869) neatly summed up the situation: "herself the supreme type of vice, she is ultimately the most efficient guardian of virtue." One Plymouth doctor believed, however, that prostitution was



encouraged by "idleness and the love of finery" (WDM, 18 May 1870). The CD Acts are often regarded as embodying the double standard of sexual morality, based on the premise that women and not men were responsible for the spread of VD (McHugh, 1980).

Little or no work has been done on the significance of the vice zone in urban spatial structure, although Banks (1968) has discussed the sociological implications. This is, however, one of the most difficult elements of a population to enumerate; very few prostitutes confessed their occupation in the census, and other documentary evidence relates only to those women who were brought to court under the Contagious Diseases Acts, or who sought escape in homes for fallen women. Furthermore, many women drifted into prostitution on a temporary basis to get through particularly hard times. The total number of prostitutes present in any town at a given time is, therefore, impossible to estimate with real accuracy.

Geographically, one most interesting aspect emerges from the known haunts of prostitutes in 19th-century Plymouth. The red light district had shifted, in parallel with the centre of economic activity, with the development of Millbay Docks and the arrival of the railway. Thus the town's prostitutes provided, perhaps, a somewhat unorthodox indicator of a move in Plymouth's commercial centre.

#### 7.4 Illegitimacy: a hidden factor in natural population change

The Victorians generally supposed there to be a link between prostitution and levels of illegitimacy but there is little evidence to support this theory. There was no single cause for illegitimacy in the 19th century, explanations for the phenomenon are immensely complex and diverse. The contemporary view favoured the image of the fallen servant: that "country girls, humble in station, innocent in the ways of the world" were "seduced by predatory city men, socially their superior" (Gillis, 1983). In fact, extra-marital sexual relations between people of the same station in life were far more common, and towards the end of the century female servants were more mature and much wiser in the ways of urban life.

With some trepidation in deference to the mores of his time, Worthington (1867) supplied some interesting data on illegitimacy, he quoted national averages of 6.5% illegitimate births in 1853 and 6.4% in 1864, and noted the Registrar General's report for 1864 wherein it was suggested that some such births escaped registration, especially in large towns. Levels of illegitimacy are difficult to determine, but rates of 18-19 per thousand births are advanced for the period 1851-1870 (Glass, 1973).

Curiously, Worthington reported that ports such as Plymouth, Liverpool, Hull and Bristol fell below the national average by half to one percent or more. Attempting to explain the lower rate of illegitimacy in sea ports, Worthington (1867) considered that "It is to be feared that this advantage is counterbalanced by other sins which are generally supposed to prevail in such towns." It was later thought, with reference to large towns such as London, Birmingham, Liverpool and Manchester, that "the unrestrained passions

which in other districts result in illegitimate offspring are in these large towns diverted into the channel of barren prostitution."\* Quite simply, the number of illegitimate births was lower in ports such as Plymouth because prostitution was more widespread. In addition, the town did not have a factory-based economy wherein men and women were crowded together, a circumstance often blamed by contemporaries for illegitimate pregnancies.

Illegitimacy in the south of England was lower than for England and Wales as a whole, despite a tradition of premarital sex among fishermen, miners and agricultural workers (Walkowitz, 1977). It was not unknown in Plymouth, though, and cases can sometimes be identified in the census manuscripts: in 1871 Eliza Davis of 79 Fore Street, Stonehouse, was unmarried with a one-year-old son - it should also be noted that her occupation was given as prostitute. The Return of births and deaths in Plymouth for March 31, 1851, claimed the figures included

"...a smaller number of births than actually took place, as, in the first place, the law admits of a certain interval between the birth and registration; and next, registrars had more important duties to attend to than hunting after births which were not voluntarily reported. Hence a somewhat undue preponderance is thrown into the scale of mortality, and the population rated below the amount at which it ought to stand, according to its true increase from natural causes."

This quarterly report closely followed the cholera outbreak of 1849, and came at the mid-point of the heated debate as to what to do about local public health (Chapter Eight), so it may be assumed that the number of deaths - and the causes - were a particularly sensitive

\* From the Forty-Second Annual Report of the Registrar General, cited in the Journal of the Royal Statistical Society XLIV, June 1881.

issue at that time.

In Plymouth, therefore, rates of illegitimacy, and thus concealed childbirth, are likely to have been lower than elsewhere. While Victorians preferred to believe that sexual promiscuity and loose morality was the major cause of illegitimacy, the evidence suggests otherwise.

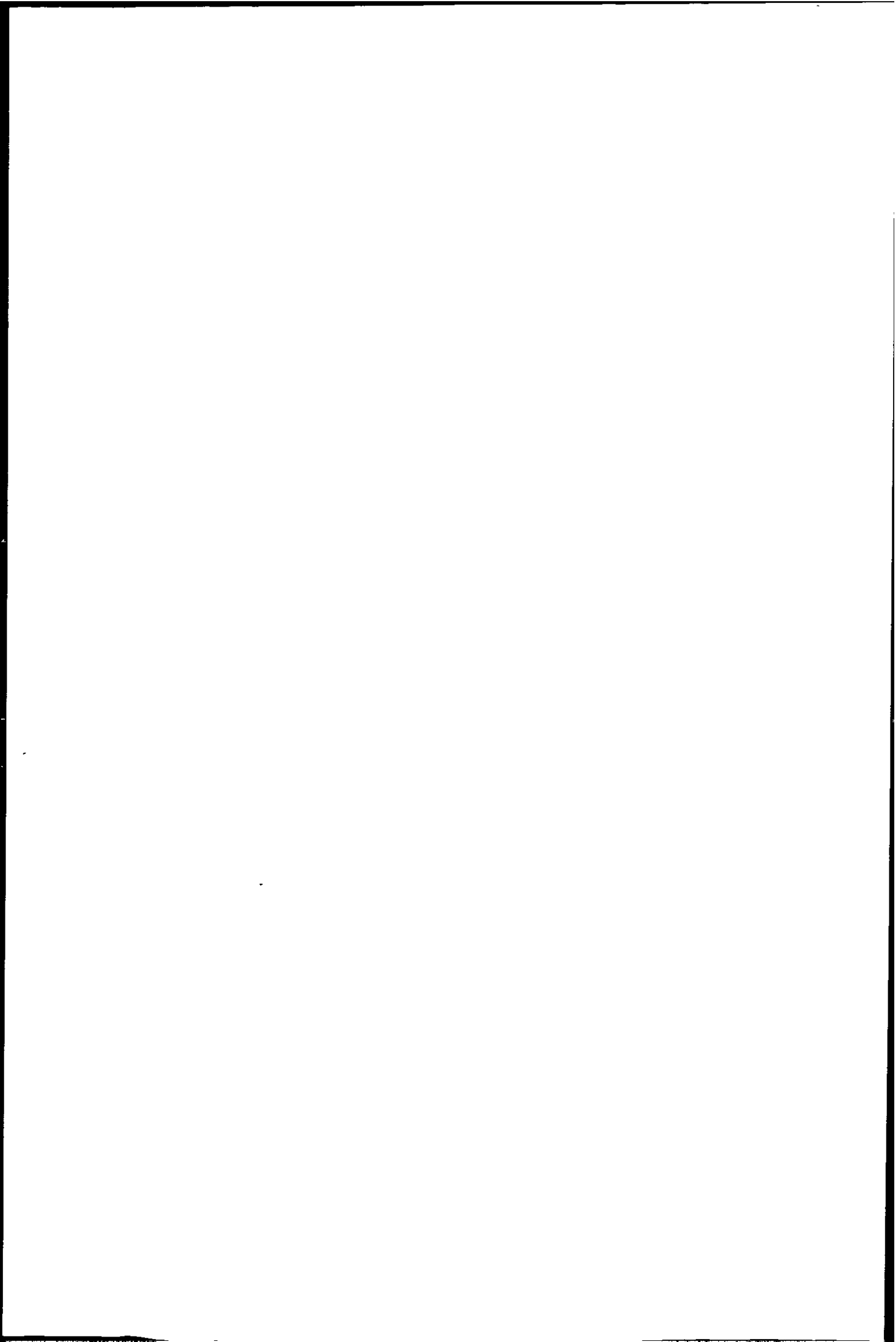
## 7.5 Conclusion

In focusing upon the woman's role, this chapter may be seen as a case study which draws together many of the individual threads discussed in earlier chapters, thereby making it possible to reconstruct a further dimension of the social geography of mid-19th century Plymouth. Yet it is scarcely possible today to comprehend fully the reality of life in mid-Victorian times. The deprivation and degradation of the age have received extensive academic and literary attention, but the sheer weariness of a Victorian working-class woman's life remains one step removed from subjective understanding. Most contemporary observation was made from the outside looking in by Munby, Dickens, and Butler, for example; yet the Victorian passion for organised documentation recorded much of the minutiae of the condition of the poor.

For men and women alike the working day was long and hard and poorly rewarded, but the woman's burden was greater, for the wife or widow also had a home to run, however much of a hovel that might have been. For single women, life was particularly hard; although there were about half a million more women than men in England and Wales,

they were frequently hounded as prostitutes by the authorities or ridiculed as spinsters (Roberts, 1978).

With the decline of employment in agriculture and cottage industries, Victorian women were limited to a few characteristically female occupations - textile manufacture, dressmaking, millinery and domestic service - a situation aggravated by the growing feeling that they should not work in mines, fields or factories (Davidoff & Hawthorn, 1976) and, particularly, where they might be in competition with men. Yet financially, at least, the daughters of the working class needed to find work. For many, domestic service was the only option. When all else failed prostitution, if only temporarily, was the final resort and, in a naval port like Plymouth, prostitution was simply one of the more unfortunate aspects of its mid-Victorian social geography.



## CHAPTER EIGHT: PUBLIC HEALTH AND POLITICS IN MID-VICTORIAN PLYMOUTH

### 8.0 Introduction

Evidence introduced earlier in this thesis has indicated a rapidly worsening urban environment, particularly in the older districts of Plymouth. The town ranked as one of Britain's most unhealthy towns by the mid-19th century; in the 1840s the rate of mortality averaged twenty-five per thousand, a figure as high as the worst of the country's industrial cities. By failing to keep pace with changing circumstances, outmoded municipal institutions were unable to cope with the new kinds of problems created by rapid population growth and, in parts, overcrowding was as bad as that found in London, Liverpool and Manchester. Plymouth's health and sanitation problems were the result of the population growth from 16,040 in 1801 to over 52,200 in 1851, and notably in the 1840s when the population grew by over 1,600 per annum. This massive influx of people, the character of which was described in detail in Chapters Three and Four, was not matched by the building of new houses and serious overcrowding resulted.

"The borough of Plymouth included an area of 1,500 acres, of which 500 acres only were occupied with houses. In 1851 there were 5,178 houses in Plymouth, and in 1871 they had increased to 7,867... The area occupied by buildings had not increased in the same proportion as the population..." (Rooker, 1873)

Rooker's figures for 1871, which suggest an average of 16 dwellings per acre in Plymouth as a whole, mask blackspots where the density was more than 25 (see Chapter Five). The large houses in the old commercial centre of the town were vacated by the better-off, then

subdivided as accommodation for the poor in conditions which soon became scandalous.

Examples of overcrowding, in addition to those cited earlier (see section 3.3.2), may be given to emphasize how desperate conditions were: Claremont Street housed 614 people in sixty dwellings; New Street had 23 houses and 598 people, an average of twenty-six people per dwelling. There were houses containing sixty, seventy, even ninety people; Basket Street (Plate 8A), Stillman Street, and Lower Street were notorious blackspots - in one court off Lower Street 171 people lived in six houses, none of which was drained, all sharing a single stand-pipe for their water supply. Regular steamers from Belfast and Cork brought large numbers of Irish emigrants, some en route to Australia, Canada, and elsewhere, but some settled in the least salubrious parts of Plymouth, most notably Quarry Court and Stonehouse Lane (see section 4.1.2).

The situation was exacerbated by the acute shortage of suitable land for building; as noted in Chapter Five, Plymouth's physical expansion was impeded by several large private estates and also by the steepness of some sites and the marshy nature of others. Ironically, attempts to overcome the problems of overcrowding and insanitary conditions, initially at least, actually aggravated the situation by crowding the population still further. Wright (1894) wrote of "the disadvantages of transition":

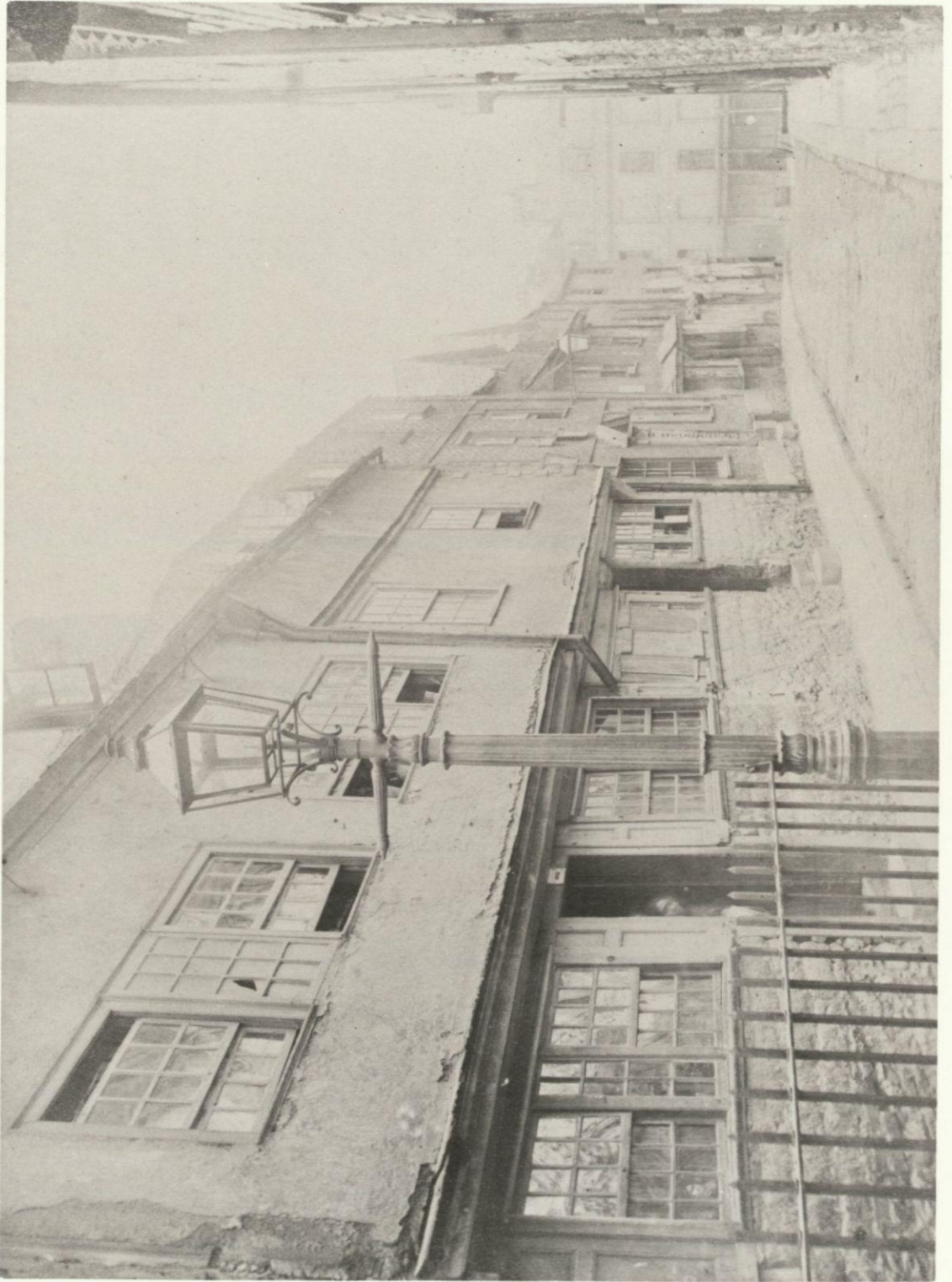
"Constant alterations were inevitable, old localities must be pulled to pieces, old houses destroyed, old thoroughfares diverted or widened to make way for the new order of things...

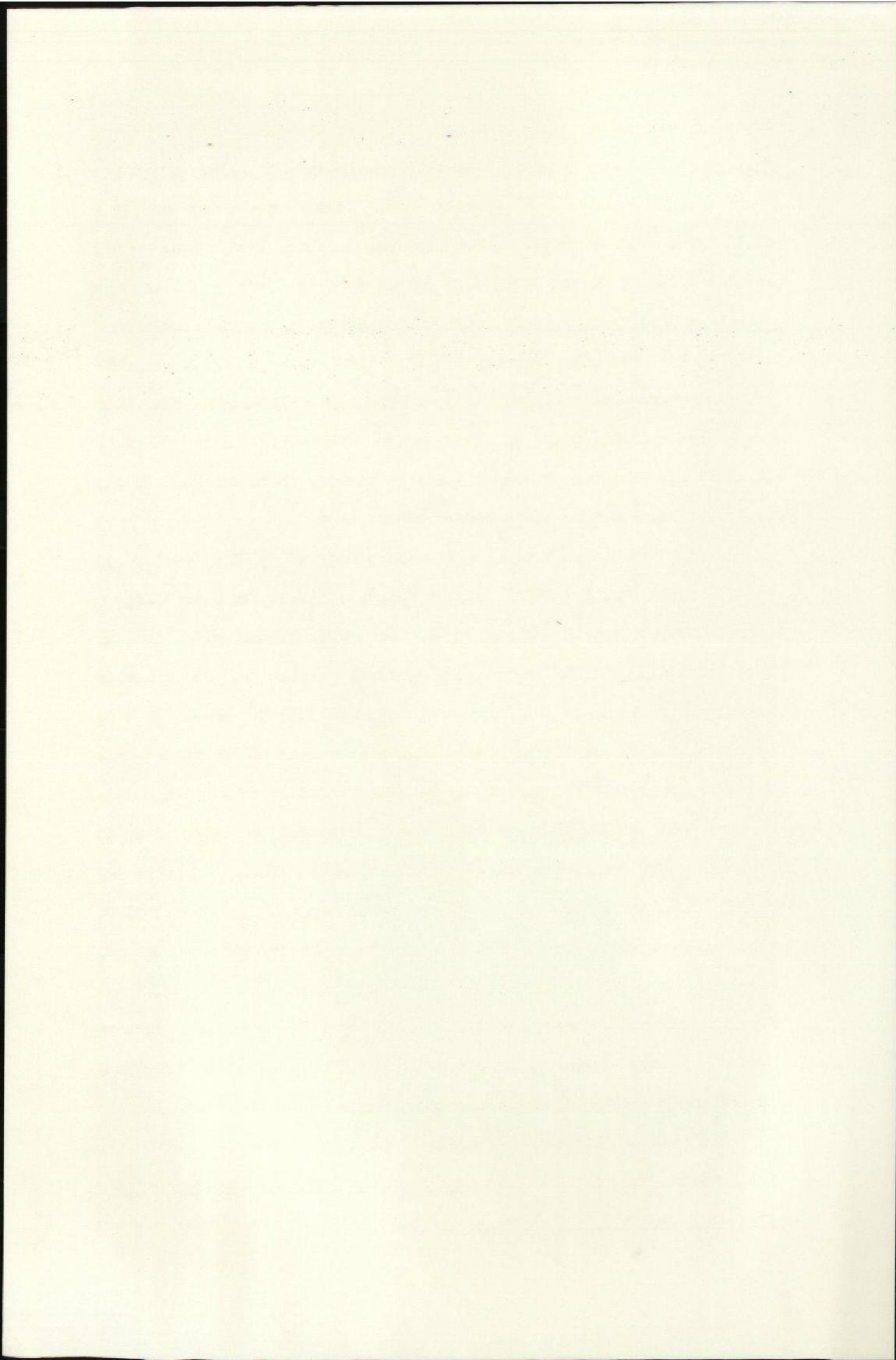
"Whether...it was the result of these constant changes, the neglect of the authorities, owners, or occupiers, or all combined, or whatever the cause, certain it is that the sanitary condition of the town forty years ago was anything but satisfactory..." (Wright, 1894)



Plate 8A: Basket Street c1869, just prior to its demolition to make way for the new Guildhall and municipal offices.







Moreover, in a town where casual dock labour was an important form of employment, working men were reluctant to live too far from the wharfingers' pitches and thereby risk losing the chance of being hired, which further added to overcrowding in these localities. Other local industry involved processing animal products and Plymouth was also a major livestock market, thus huge numbers of cattle were driven through the streets into the heart of the town to the cattle market and slaughterhouses. Additionally, cowkeeping was common in the town to provide a fresh supply of dairy produce; the effect of keeping farm animals in domestic premises lining narrow, undrained streets did little to improve the health record of the town.

While several notable studies have been made of public health in other towns (White, 1951; Gill & Briggs, 1952; Toft, 1966; Large & Round, 1974), Plymouth has previously received little attention in this regard. This chapter will, therefore, examine the public health debate in the town and its links with local political change. It will be shown that Plymouth was no exception when public health issues and agitation for political reform became interlinked in provincial towns. As the old ruling elite tried to hang on to their monopoly of local civic institutions, a barrage of criticism about their handling of public health matters provided a useful weapon for a new breed of political activist who "pitched his tent in whatever battlefield was open to him" (Fraser, 1976). For six years, public health was Plymouth's local political battlefield and by 1854, when the fighting ceased, a new regime had gained control, more accountable and considerably more sensitive than that which had been defeated.

Edwin Chadwick started the national public health debate with the publication, in 1842, of his Report on the sanitary condition of the labouring population of Great Britain, in which he assembled a battery

of evidence about health and living conditions which both shocked and outraged the nation; this was one of the most influential and far-reaching Blue Books of the entire Victorian era. As the first person to preach effectively that destitution and disease were closely related, Chadwick conducted the first scientific, street-by-street inquiry into the living conditions of the poor and discovered an excessive amount of disease and mortality caused primarily by a lack of adequate sanitation, polluted water supplies and general filth. Ultimately, Chadwick's work led to the Public Health Act of 1848 which, though it fell well short of the compulsory new public health administration for which he had campaigned, nevertheless gave local pressure groups a new weapon with which to fight their own separate battles for reform. In Plymouth, the Act prompted one of the most acrimonious political arguments in the long history of the town.

The 1848 Public Health Act created a General Board of Health in order to encourage and co-ordinate the establishment of local boards of health to replace existing ad hoc bodies and assume responsibility for ensuring adequate and efficient water supply, sewerage, and refuse disposal systems, the provision and regulation of cemeteries, and also, through the appointment of local medical officers, to oversee all matters related to public health. The fundamental flaw in the Act was that it was not made mandatory, except in towns where the death rate exceeded 22 per 1000 or where one-tenth of ratepayers petitioned for its adoption. In their first major report early in 1854, the General Board of Health were able to name only 284 towns that had formally requested the application of the Act, and a mere 182 had completed the necessary legal process by December 1853. In fact, many of these towns already had relatively good public health records, or else they were very small in population and were unlikely to be able

to afford the necessary measures for improvement. In large towns a different situation prevailed: although some, like York, Southampton, Dover, and Coventry, had adopted the Act with alacrity, others such as Birmingham, Newcastle, and Hull became notorious for their stubborn resistance.

The tactic employed by those who resisted was to frustrate the introduction of a new local board of health by substituting, or perhaps merely revising, an existing local act of Parliament which legislated on matters such as urban water supply, drainage, and refuse removal. These local acts were rarely sufficiently comprehensive to cope with the mounting sanitary deficiencies of Britain's growing towns and, moreover, they were often excessively costly to local ratepayers. However, they were a way of preserving local political power in the hands of those accustomed to wielding it and they eliminated any prospect of interference by the General Board of Health in local matters. This ploy was used wherever vested interests stood to forfeit either political or civic fiscal control in the event of the Act being applied in their borough.

In Plymouth a relentless and hostile campaign against the 1848 Act was waged for almost six years, during which time the appalling conditions in the town steadily deteriorated. The local anti-Public Health Act lobby tried to promote two bills in order to circumvent the need to adopt Chadwick's controversial new measures. One was a revision of the town's "Improvement" Act, the other was a specific attempt to remedy the woefully inadequate local water supply.

8.1.1 Plymouth's Improvement Commission and the Health of Towns'  
Association

A local Act of Parliament dating back to 1770 "for better paving, lighting, cleansing, watching and improving the town and borough... and for regulating the Police thereof, and for removing and preventing nuisances and annoyances therein" (PRO, MH 13/144 fo.8003/49) formed the basis of Plymouth's urban management through the first half of the 19th century. Subsequent amendments empowered a freshly-mandated commission to order the building of public drains, the construction and cleansing of private drains; to cleanse, pave and light the streets; to order the removal of offensive buildings, matter, or refuse; to prevent public nuisances specified in the Act such as cattle straying in the streets; and to provide for watering the town and effecting public improvements. The Commissioners were enabled, for the purposes of the Act, to levy rates and exercise the powers it conferred.

In practice, although the Act was comprehensive, the work was not fully effected due to a number of operational difficulties. First, the Commissioners had no power to insist on the installation of adequate drainage for new development. Thus, ironically, most of the ill-drained and unhealthy areas of the town were on the periphery where new housing was rapidly being erected as soon as land became available. Second, the establishment of Plymouth Town Council under the Municipal Corporations Act of 1835 led to divided jurisdiction. Although this Act allowed for local improvement commissioners to surrender their powers to the new councils, this did not happen in Plymouth. So, while the town's water supply was controlled by the Council, other improvement matters remained the concern of the



Commission. A third problem in Plymouth was that by the 1850s most of the Town Council and the Commission were effectively self-elected for life - although this was vehemently denied by both authorities when revealed in a government report in 1853 - a certain number of town councillors were automatic members of the Commission and they co-opted their friends to complete the number, thus the faces were said hardly ever to change.

Local newspapers contained accusations that some commissioners, those who were also landlords of overcrowded slums, blocked attempts to oblige houseowners to improve badly-drained, insanitary properties because such action would have involved unwelcome personal expense. There is little documentary evidence to suggest any real corruption and, though there may have been some mismanagement of funds, the problem seems to have resulted from deficient administrative methods rather than bad intent. Many commissioners were practising solicitors who, in Victorian times, often invested their clients' funds in property. Instead of ensuring that all new houses were properly serviced when they were erected, the Commission installed sanitation piecemeal where the local outcry about conditions became loudest, and at considerable cost to the ratepayers. While none of the new local boards of health in England levied a rate of more than sixpence in the pound in 1853, the Commission in Plymouth by 1849 expected one shilling and hoped for 1/3d. Moreover, they borrowed heavily on the security of the rates: together the Corporation and the Improvement Commission owed £67,518 by 1852.

In the face of apparent inactivity on the part of the Town Council and the Improvement Commission, local pressure for more radical reform and more positive action to improve Plymouth's sanitary condition was mounting. Edwin Chadwick's 1842 report inspired the formation of the

national Health of Towns Association, in 1844, with the object of informing public opinion and educating those who could pressurize the government. Branches were set up in provincial towns and, following Liverpool's example a year earlier, Plymouth's leading Liberal town councillor, George Soltau, called a public meeting at the Mechanics' Institute in 1846 to discuss public health. The Plymouth branch of the Association was founded at this meeting and the Plymouth Health of Towns Advocate was launched, a periodical modelled on similar publications produced successfully elsewhere. Although the Plymouth Advocate was short-lived, it did provide stimulus for one of the most comprehensive public health investigations undertaken anywhere in Britain culminating in November 1847 with the report on the Sanitary Condition of Plymouth by the Rev W J Odgers.

One scheme clearly illustrates how attempts to improve conditions for the poor of Plymouth foundered: the establishment of the Health of Towns Association in Plymouth led to the formation of a plan to provide baths and washhouses. The Odgers report showed that there were 11,000 individuals living in single rooms who were, consequently, obliged to wash and dry their clothes in the same rooms in which they ate and slept and nursed the sick: "how vastly the washing, drying, and ironing of clothes in miserably small living and sleeping rooms must add to the inconveniences and discomfort of the poorer classes", wrote the Plymouth, Devonport and Stonehouse Herald, reporting an address by George Soltau in June 1849. He and another gentleman had visited some of the dwellings of the poor in Lower Street, and in numerous instances they found washing, drying, and ironing going on in rooms where the sick lay stretched, "and such was the effluvia occasioned, that both his friend and himself became unwell therefrom" (PDSH, 2 June 1849).

Medical opinion concurred that the erection of baths and washhouses would diminish disease, and greatly add to the comforts of the poor. Testimony from Edward T Roe, MD, vividly described the problem; he wrote on 29 May 1848:

"Almost daily did I see indisputable evidence of the absolute necessity existing for Wash-houses for the poor, in the misery attending poverty when combined with sickness. Often am I called to see the sick lying on their lowly beds in rooms reeking with the odour of foul clothes and offensive steam of hot and soapy water; often have I painfully to observe how much convalescence is retarded - nay even recovery prevented - by the heavy oppressive & vitiated atmosphere they breathe; how much their rallying powers of life are depressed by the densely loaded air, by the feeding, the nursing, and the washing, all going on in some ten feet square." (PDSH, 2 June 1849)

The Town Council sanctioned the principle of baths and washhouses and purchased, at a cost of £600, premises in Hoegate Street. Subsequently, however, "a change most unfortunately came over them, and that which they had commenced they did not seem willing to carry out" (PDSH, 2 June 1849); the Council found that, owing to other large demands upon corporate funds, the money was not available to build the baths and washhouses. The Health of Towns Committee thus determined to complete the construction through voluntary and individual effort, to accomplish "what the Council had abandoned", and the public washhouses were opened in Hoegate Street in 1850.

#### 8.1.2 The Odgers report

The detailed investigation, funded by voluntary contributions and co-ordinated by the Rev Odgers, surveyed drainage, refuse removal,

water supply, ventilation, the "physical and moral evils from want of sanitary regulation", and the economic costs and benefits of sanitary improvement (Odgers, 1847). As a Unitarian Minister, Odgers was in daily contact with Plymouth's slum-dwellers, and he seems to have modelled himself upon the famous Dr William H Duncan, who did much to draw attention to public health issues in Liverpool. While Odgers was not a medical man himself, his studies of health matters were equally meticulous. Odgers championed the rights of Plymouth's sizeable minority communities (the Jews, for example), visited the sick and dying in areas of the town where few middle-class people would have ventured, and addressed the Mechanics' Institute on the works of Charles Dickens (PDWJ, 28 December 1848; 1 January, 15 March 1849); in a lecture for the Plymouth Health of Towns Association, to promote the scheme for public washhouses, he

"dwelt upon the great importance of a clean skin to the proper discharge of the functions of the perspiratory organs, and the influence of cleanly habits in promoting moral as well as physical health..." (PDSH, 9 June 1849)

Odgers was both an intellectual and a radical, and he was singularly successful in making the civic establishment extremely uncomfortable. He was lampooned and derided in a steady flow of anonymous letters to the local press between 1846 and 1852, and invariably responded with clever, often withering, counter-argument (PDWJ, 7 December 1848; 25 January 1849).

While the only immediate result of his efforts was the opening of the public washhouses, and despite criticism of his report by opponents of public health reform in Plymouth, Odgers' survey was crucial in stimulating debate in the town. Chadwick's national survey was rather too global, too far removed from local circumstances to

stir many ordinary Plymothians, but the news that their own town was more overcrowded and unhealthy than Liverpool, Manchester, or Nottingham brought a flood of indignation, shock, and outrage.

"The report showed that at that time there was a population of 38,600; that 28 streets, having 3,300 inhabitants, had no drains, and 53 streets, with 9,996 inhabitants, were very imperfectly drained; and there were 80 pigsties and 12 slaughter-houses within the town; that there were 753 houses without town water, and only one house in 81 had a cistern or tank; and the average number of people living in one house was larger than in London, Manchester, and Nottingham." (Rooker, 1873)

Odgers' report recognized the special drainage problems posed by Plymouth's coastal site: large areas were marshy and some streets were actually below sea level at high tides so that, for example, basements in Lockyer Street were often flooded with stagnant water. Union Street and the Octagon - constructed on land reclaimed from the sea to link Plymouth with Stonehouse - lay below sea level at higher tides and the cellars of houses along this route gradually filled with water (see section 5.1). Street drains, where they existed, were often inadequate, in fact only 1,763 houses in Plymouth (out of a total 4,930) were linked to any kind of drainage system (Figure 8.1). Moreover, there were more than 2,200 houses with neither a privy nor a water closet. Indeed, it had become the practice in Plymouth, particularly in the area of the docks, to allow "night soil" to accumulate in heaps until there was a sufficient load to sell as manure to the Tamar valley farms; Odgers declared that many local people were "living on vast dung heaps".

Much was made at the time of the injurious effects of noxious gases and vapours given out by decaying refuse, it was a common belief that the miasma, or foul air, itself could spontaneously cause disease. At

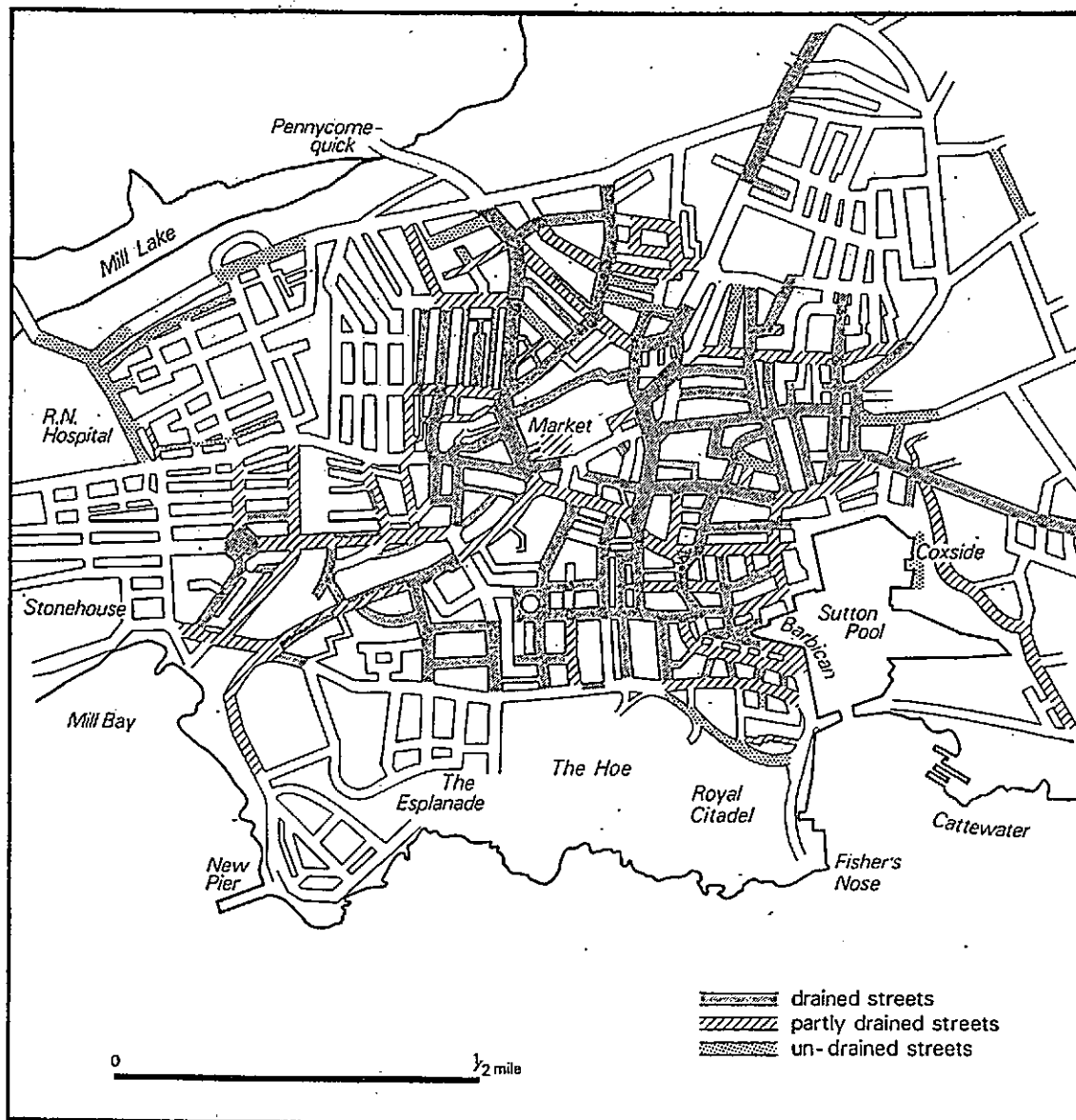
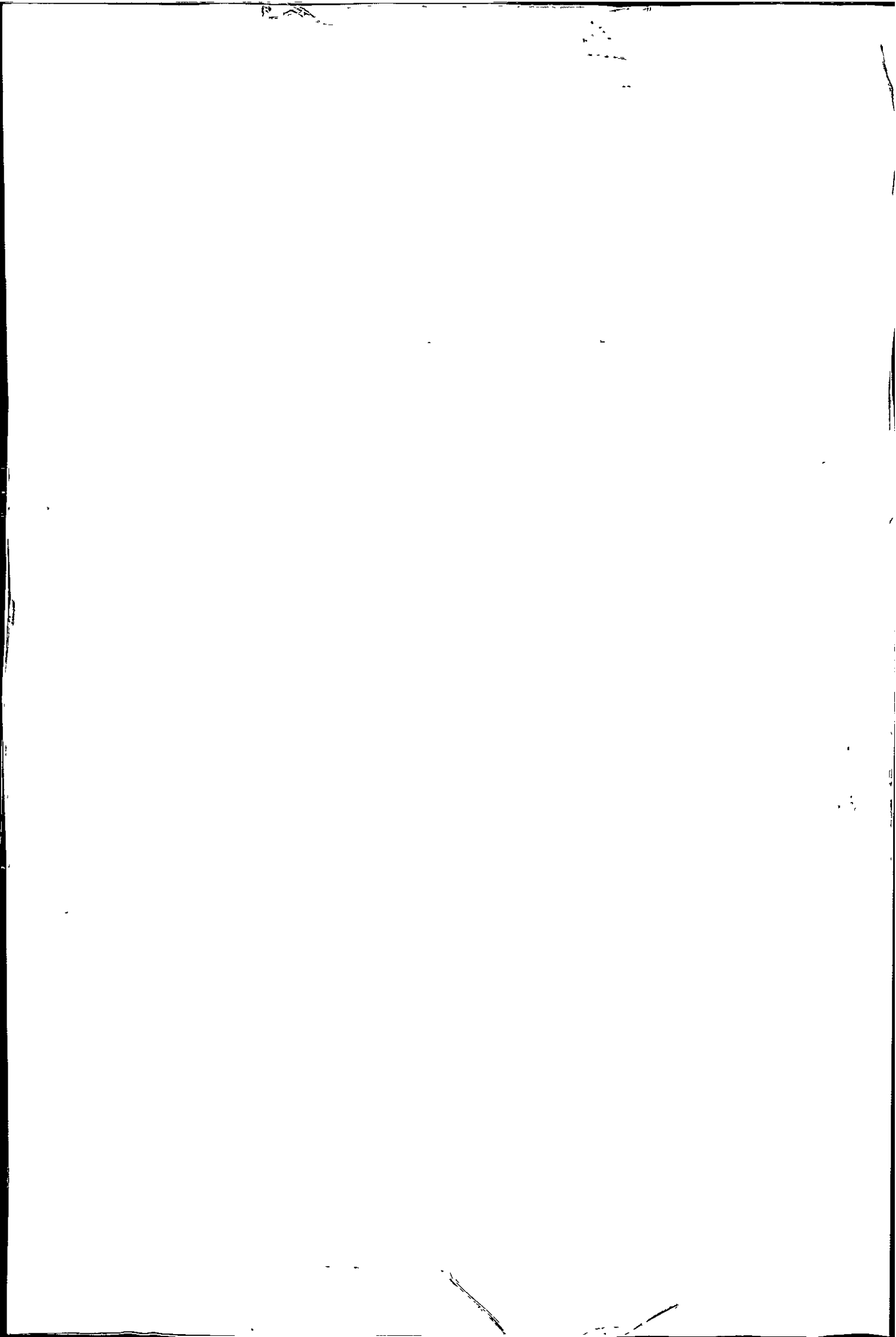


Figure 8.1: Plymouth street drainage based on the Odgers' Report, March/April 1847.

Plate 8B: Hick's Lane which connected How Street and Looe Street.





a Town Council meeting, on 4 July 1849, Cllr Stevens referring to "the causes which operate to promote sickness and disease, directed attention to the continued accumulation of mud in Sutton Pool, from which the most offensive exhalations proceeded at low water" (PDSH, 7 July 1849); and at the next meeting, Cllr Bulteel drew the Council's attention to "an immense heap of rotten manure, within a few feet of the leat... the leat ought to be covered along the course from Manadon Hill into the town" (PDSH, 29 Sept 1849). In fact, accumulations of filth contaminated the town's water supply to the point where dysentery and diarrhoea became endemic, and Odgers' surveyors noted that the subsoil and foundations beneath houses often became "perfectly saturated" from nearby cesspools. Living conditions like these must have weakened the population and left them prey to a range of acute infectious diseases as well as chronic wasting diseases like tuberculosis (Table 8.1).

During the 1840s Plymouth experienced serious outbreaks of scarlet fever and smallpox, and whooping-cough regularly claimed the lives of a number of its young victims. Each year there were between twenty and thirty deaths from diseases of the bowel - mostly very young or elderly people - but these figures mask the much larger numbers of sufferers who were weakened by illnesses such as diarrhoea and dysentery. As Table 8.1 shows, only in 1846 was Plymouth relatively free from some acute infectious disease, and chronic illnesses like tuberculosis took a steady annual toll. Plymouth's Irish quarter, particularly, was dealt repeated heavy blows by epidemic disease in the 1840s and early 1850s. But when cholera struck in 1849, the rate of mortality reached a new peak, causing genuine terror and giving a new and dramatic impetus to the local public health campaign.

TABLE 8.1: Mortality due to infectious diseases, 1841-1850

YEAR	ZYMOTIC DISEASES:						OTHER CAUSES:				TOTAL
	Smallpox	Scarlet fever	Croup	Whooping cough	German measles	Influenza	Diarrhoea & dysentery	Cholera	Respiratory diseases*	Others	
1841	47	72	5	10	1	-	11	2	238	443	829
1842	47	238	2	29	17	-	27	6	255	486	1107
1843	63	6	4	26	18	1	27	5	247	490	887
1844	25	10	12	24	41	2	25	5	312	566	1022
1845	9	2	5	17	15	1	25	-	216	459	749
1846	-	1	5	2	26	-	56	-	353	587	1030
1847	18	-	1	65	36	40	52	2	318	616	1148
1848	177	18	12	37	19	-	46	22	nd	937	1268
1849	2	25	17	15	20	3	55	819	nd	920	1876
1850	3	197	4	59	9	-	66	7	nd	1018	1363
TOTAL	391	569	67	284	202	47	390	868	1939	6522	11279
AVERAGE	39	57	7	28	20	5	39	87	277	652	1128

\* Mostly Respiratory Tuberculosis.

nd = no data.

The term "zymotic" was used to refer to acute infectious diseases.

Sources: PDWJ, 19 October 1848, 15 January 1852, 29 January 1852; also PRO MH 13: Plymouth Public Dispensary data.

## 8.2 The cholera epidemic of 1849

Over one thousand people had died in the earlier cholera epidemic of 1832 in the three towns of Plymouth, Stonehouse and Devonport, including 779 victims in Plymouth alone (Creighton, 1894). For a time it had been feared that the whole population would suffer but the outbreak was largely confined to the poorer classes living in the old town centre around Sutton Pool. In consequence, the political impact of the outbreak was blunted and the potential threat quickly forgotten. In 1849, however, circumstances were different: cholera claimed 1,894 lives in the three towns, 819 in Plymouth, including several noted members of the business community and local authorities, although again the disease hit hardest in the slum areas. Odgers must have derived some grim satisfaction when the conditions his report had exposed helped to produce exactly the disaster he had predicted.

Initially, local newspapers confidently assured their readers that, although other towns were afflicted with cholera, Plymouth was likely to escape. In November 1848 there was a scare when a convict ship bound for Hobart Town, put into Plymouth because one of the prisoners had contracted the disease; the victim died within hours and was buried at sea near the Eddystone Reef. Public anxiety subsided, only to be roused again in June 1849 when an emigrant ship from Portsmouth bound for New York, anchored in the Sound after six of her passengers had died of cholera during the Channel voyage. There were almost fifty cases aboard this vessel but no more fatalities. Plymouth's Port Admiral, Sir William Hall Gage, arranged for disposal of the bodies at sea and the transference of the remaining passengers to quarantine vessels anchored off the Hoe.

Once more, the local press sought to assuage fear, noting that

mortality at that time was "peculiarly light": "Every precaution has been taken by the Authorities, and there is just reason to hope that the exertions used to meet the exigencies of the case will have its effect" (PDSH, 9 June 1849). The soothing of the public mind - "so needlessly and improperly alarmed by the exaggerated reports of reckless newsmongers" - continued one week later, suggesting that while "it would not be very reasonable" to expect Plymouth to escape the malady, "nothing has yet taken place here which should excite unreasonable alarm in the minds of the inhabitants" (PDSH, 16 June 1849). Yet the newspaper preached "the speedy removal of nuisances", and implored the authorities to fulfil their duty to correct "whatever tended prejudicially to affect the health and comfort... of the inhabitants". Both the Plymouth and Devonport Weekly Journal and the Plymouth, Devonport and Stonehouse Herald monitored the progress of the epidemic in the following months; interestingly, the statistics they published do not exactly match. The Herald printed the details of deaths for the first two weeks of June as supplied by the local registrars: there were two fatalities from cholera out of a total 34 deaths, one an Irish labourer, landed from a steamer, who came into the town in a diseased state, and the other a labourer from Noss Mayo.

Another case of cholera, that of a woman in Looe Street, was reported but not yet registered.

The authorities hastily made contingency plans, belatedly serving some two hundred notices for the removal of "existing nuisances", and sought to assure the public that every measure was being taken to deal with any cases of cholera. By the third week in July the disease had taken hold in Plymouth; over five hundred cases and one hundred deaths were notified in the first fortnight of the month, chiefly confined to King Street and Stonehouse Lane. The town was divided into fourteen

districts and a surgeon appointed to each; the poorer quarters were visited and in many streets men were employed in the construction of drains; tents were erected in a field, near Five Field Lane, to which children from the affected area were evacuated; and a temporary wooden hospital was built for the cholera victims and a convalescent home set up in Cobourg Street (PDSH, 21 July 1849). Still there was an air of confidence that the disease would be confined to one district of Plymouth and there were no cases recorded in Devonport or Stonehouse at this time.

At the beginning of August, the disease seemed to be retreating; there were 159 cases of cholera reported that week and 20 deaths, making a total of 156 deaths since the commencement of the outbreak. By this time there were also cases in Stonehouse, 42 deaths recorded to date, of whom a dozen were marines and the Stonehouse Guardians were "about to erect a Hospital in a field adjoining the Royal Naval Hospital burial-ground". But in Devonport: "Within the last week, we regret to state that 70 cases of cholera have been reported, and 40 deaths have taken place" (PDSH, 4 August 1849). One week later, however, cholera took hold again with 278 cases and 36 deaths; the total number of deaths rose to 192 in Plymouth, although "the parish of Charles...continues very healthy - the mortality not being more than the usual average." In Stonehouse, the disease had not made much further progress amongst civilians with only ten deaths reported, although there were fresh cases at the Royal Marine Barracks. Devonport was in a considerably worse state: "The ravages of the Cholera promises to be worse here than it was in the memorable year 1832"; there was no means of ascertaining the number of sick, but in the first nine days of August there were 100 deaths (PDSH, 11 August 1849).

While new cases of cholera and fatalities recorded decreased through the remainder of August, accounts of its progress in outlying settlements were now being reported (Bere Alston, Calstock, Mevagissey, Callington, Hayle, and South Brent were mentioned). Three weeks later the situation reversed again:

"We deeply regret to state that the deaths, from this malignant disease, during the past week, has exceeded the number for the week ending Friday, the 7th inst. The mortality is still, however principally confined to the poor, ill-fed, and desolate, who reside in ill-ventilated and badly-drained residences in the low parts of the town." (PDSH, 15 September 1849)

There were 298 cases that week and 56 deaths and total fatalities rose to 517. Reports from Stonehouse were still favourable with only ten deaths in the week, despite the deaths of a young businessman and his wife who "moved in a respectable sphere". In Devonport the disease still raged, killing three of the town's Commissioners. The following week the news was much worse:

"It becomes our painful duty to state that... a fatal outbreak of Cholera has been experienced in the eastern quarter of the town... it was reported that several persons had been seized with the poison of cholera, in its most malignant form, in Higher-street, - a low close neighbourhood, where a great number of the poor resided. As the evening advanced, the fears that it would extend became realised, - during the Saturday night, its pestilential ravages were extended right and left, and by Sunday night, 28 deaths and 64 cases of cholera were recorded, - nearly the whole in the quarter above described." (PDSH, 22 September 1849)

On the Sunday morning a hastily-constituted temporary board of health met, requisitioned the fire-engines to cleanse the courts and streets, and instigated "very active measures" to separate the sick and dying from the healthy. On Monday, 17 September, the disease spread further

through the neighbourhood taking in Exeter Street, Gascoyne Street, Whitecross Street, Moon Street, Britonside, Moon's Lane, Lower Street, Ham Street, and Ebrington Street; deaths were taking place "every hour" and official sources counted 379 cases and 90 deaths from cholera in Plymouth that week, bringing the overall total to 2,902 cases and 607 deaths. In Stonehouse, however, the disease continued to abate, and in Devonport the daily returns were "gradually diminishing".

The Charles parish outbreak actually proved to be the last major attack of the cholera and at the end of September it was stated that "the wide-spread and fatal pestilence...is disappearing from our neighbourhood". In October it was time to take final stock of the cholera's toll upon the local population; the first count of fatalities was underestimated "as during the most fearful period of the awful visitation, bodies were... removed to the cemetery, and were interred without the deaths being registered" (PDSH, 6 October 1849). Accordingly, two months later, the final death toll was given as 819 in Plymouth, comprising 272 men and 281 women in St Andrew and 122 men and 144 women in Charles between 1 July and 8 November (PDSH, 7 December 1849). The weekly totals, as reported in the Weekly Journal, are given in Table 8.2, upon which data Figure 8.2 is based.\* While these data differ slightly from those published by the Herald, the week-by-week impact of cholera upon the Plymouth population is clearly demonstrated.

\* While the Herald's regular reports of the cholera's progress in Plymouth are mostly used in this account, the newspaper did not publish a complete set of figures throughout the period. The data for Table 8.2 and Figure 8.2 were taken, therefore, from the Weekly Journal.

TABLE 8.2: The progress of cholera in Plymouth, July-October 1849.

	Cholera	Choleraic diarrhoea	Total cases	Deaths
4-17 July	nd	nd	364	81
17-24 July	58	168	226	47
24-31 July	31	109	140	24
31 July-7 August	75	164	239	29
7-14 August	155	176	331	81
14-21 August	132	200	332	72
21-28 August	122	165	287	62
28 August-4 Sept	94	183	277	45
4-11 September	118	205	323	63
11-18 September	210	150	360	87
18-25 September	89	106	195	60
25 Sept-2 October	36	107	143	25
Totals:	1120	1733	3217	676

nd = no data

NB: Between 5 June and Christmas 1849 there were a total of 819 cholera deaths recorded in Plymouth.

Source: PDWJ, 16 and 23 August, 6, 13, 20 and 27 September, and 4 October 1849; Plymouth Public Dispensary data.

### 8.3.1 The consequences of the cholera epidemic

At the height of the cholera scare, Plymouth's Improvement Commissioners had established the temporary board of health, but by December 1849 there was already talk of disbanding it and returning to the status quo. In any case, the local board had been largely ineffectual: newspapers carried regular criticism of the local authorities' procrastination. In an editorial on the sanitary condition of Plymouth on 22 September 1849, the Herald claimed:

"For years past...we have repeatedly urged the adoption of measures which may... diminish the large amount of disease and misery... The result of the inspection instituted four years ago proved that Plymouth...was indeed in a very much worse state than



Cholera Cases in Plymouth July - October 1849

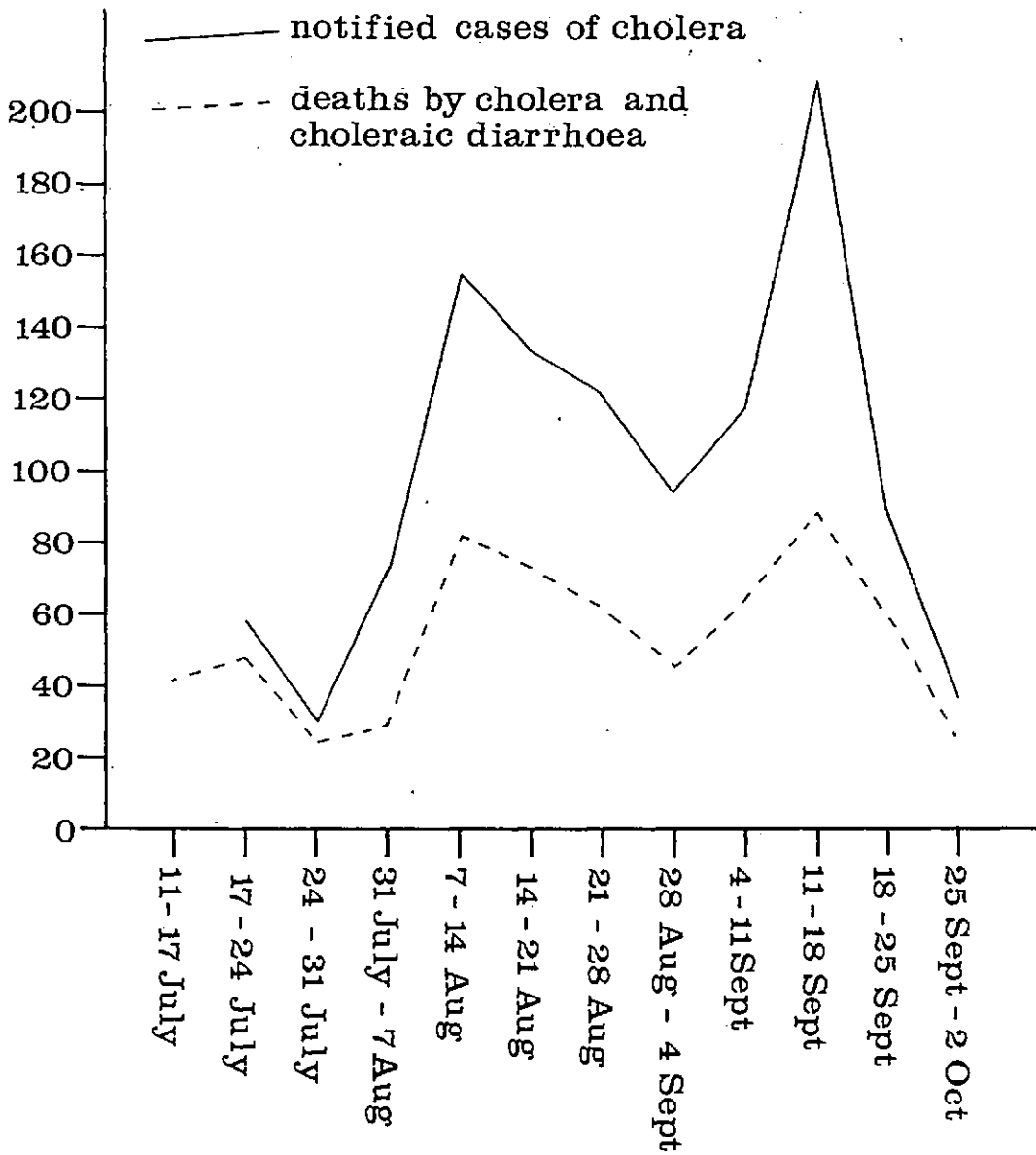


Figure 8.2: The course of the cholera epidemic in Plymouth, based on data published in the Plymouth and Devonport Weekly Journal, August 16-October 4, 1849.

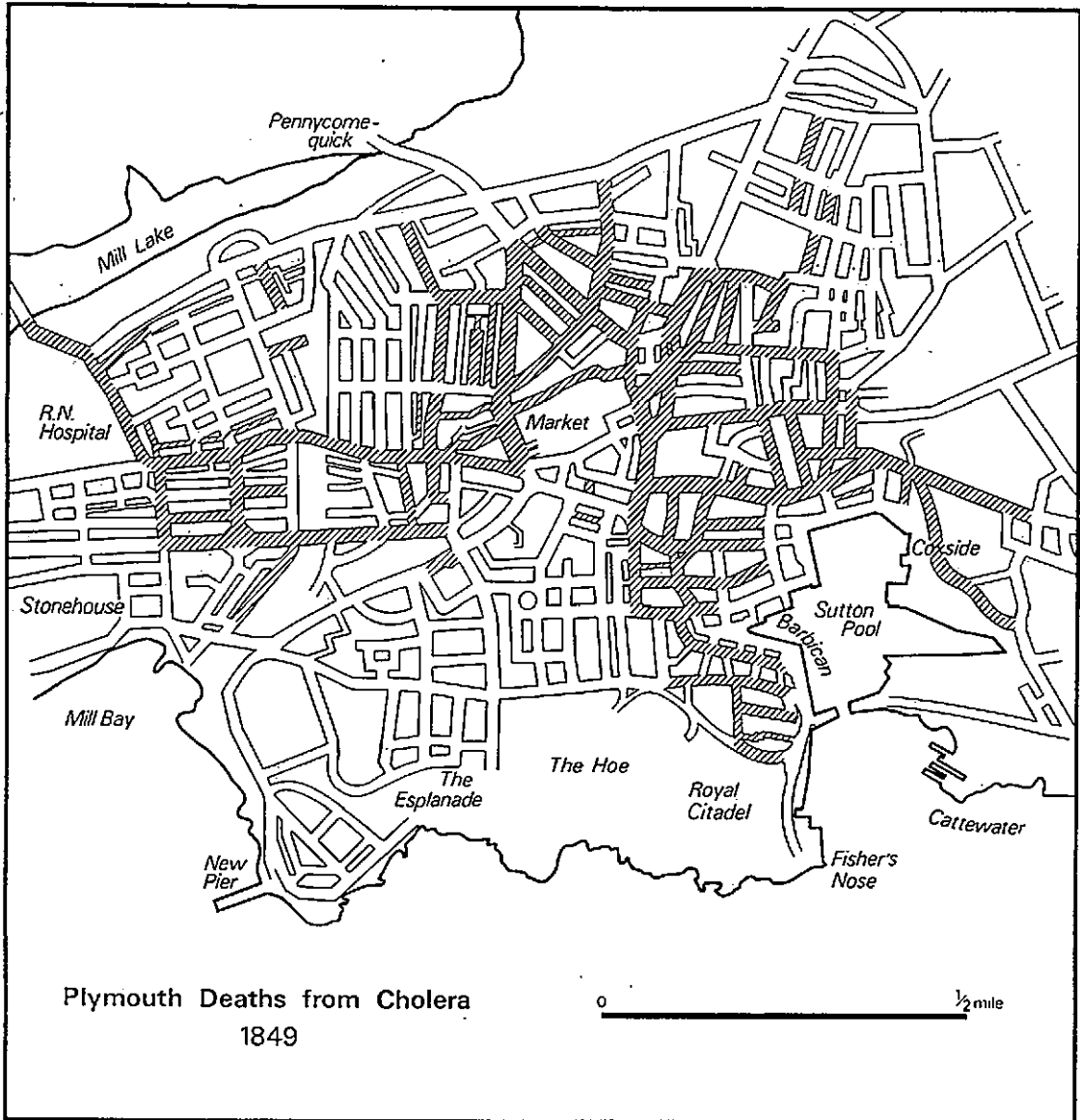
was possibly conceived before the enquiries were made. And yet what has been done? ...A third of the population of this Borough are living in single rooms, cribbed, cabinned, and confined in the worst drained, most ill ventilated, and comfortless parts of the town, where sanitary regulations most needed are least found... And yet where is the remedy which has been applied as the consequence of our better enlightenment as to the sanitary condition in which our poorer brethren...exist... The returns of the last three months...in Plymouth...where cholera has prevailed, have supplied the means of shading out a map in exact accordance with the sanitary needs of each locality." (PDSH, 22 September 1849)

In October the paper listed the streets in which fatalities had occurred and these have been mapped (Figure 8.3); this map does indeed bear some similarity to that of Odgers' survey of street drainage (Figure 8.1).

Unable to make an impression on either the Plymouth Improvement Commission or the town's Corporation, many individual townspeople complained direct to the General Board of Health. In December 1849, the Board received a petition from the ratepayers of Plymouth; signatures had been collected by H C Martin, a retired army captain whose efforts almost certainly precipitated the subsequent actions of the General Board of Health (Brayshay & Pointon, 1983).

The debate which ensued at the Town Council's quarterly meeting on 26 September 1849 illustrates the conflict of interest and opinion which fostered procrastination. Cllr Moore thought that those who had signed the petition could not be aware of the great expense which the application of the provisions of the Public Health Act would involve, also

"The government of the town ought not to be...taken out of the hands of those who from their position and property and knowledge of local circumstances, were the best calculated to have the management. ...the residents in Charlestown seemed to think that they had claims upon the Town Council to provide them with water and drains.



**Figure 8.3:** The distribution of cholera fatalities in the streets of Plymouth in 1849, based on data published in the Plymouth, Devonport and Stonehouse Herald, October 6, 1849.

This ought not to be; the parties who built the houses and formed the streets, ought to supply the other requirements." (PDSH, 29 Sept 1849)

Cllr Stevens spoke of the apathy of the Improvement Commissioners with regard to cleansing and draining the town, "until the necessity had been forced upon them by the outbreak of the scourge which was now prevailing in the borough", and he accused them of "gross negligence in not attending to the warning voices that had... been raised". He continued:

"The working of the two principal governing bodies in Plymouth had of late years become a purely personal and political affair... The consequence of that was the malformation of Committees and general bad management." (PDSH, 29 Sept 1849)

His remarks were greeted with some disapprobation from other councillors, but Stevens feared that nothing would be done in the way of sanitary improvement unless the Act was applied to Plymouth.

In defence, the Chairman of the Improvement Commission, Cllr Mortimer, named several streets which had been sewered during the past 18 months, evidence that the Commissioners were not now negligent of their duties. While Cllr Hallett stated that the inhabitants of Charlestown were wholly without any supply of town water and had suffered very severely in the cholera epidemic; a Water Supply Committee report actually recommended the Council to undertake the supply of water to this district. Mortimer countered that according to a return which he had obtained, there were only 394 houses in Plymouth unsupplied with water, and he described statements on the subject in the Odgers Report as fallacious, criticism of the sewerage was "very erroneous", and he did not believe what was said about the number of families occupying single rooms.

Notwithstanding this conflict of views, Capt Martin's petition had

already been despatched and the wheels were in motion in London. As already noted, under the terms of the 1848 Public Health Act, a group of ratepayers equivalent to ten percent of their total number could bypass the local authority and appeal direct to the General Board of Health to have the Act applied in their town. Moreover, in certain circumstances, the Board could insist that the Act was adopted; where the local level of mortality had averaged twenty-three per thousand over the previous seven years, the terms of the Act allowed for its immediate application to the locality. The ratepayers' petition therefore satisfied both conditions under which the Board could intervene and their immediate reaction was to appoint Robert Rawlinson as Superintendent Inspector of Plymouth with authority to investigate sewerage, drainage, water supply, and the sanitary condition of the town. It was a bitter pill for the Improvement Commissioners to swallow: Mortimer opened a correspondence with the General Board, and later with the Local Government Act office, which was to last well into the 1870s. His opposition was relentless and by January 1867 his letters were no longer even acknowledged, each was viewed as just "another of Mr Mortimer's regular tirades against the Board".

### 8.3.2 The Rawlinson inquiry

Robert Rawlinson was employed by the General Board of Health in the wake of the cholera epidemic as a kind of roving inspector to conduct detailed local inquiries into public health matters and report back to the Board in London. Before coming to Plymouth in January 1852, Rawlinson presided over similar inquiries in Birmingham (1849) and

Bradford (1851), thus his reputation preceded him and there is no doubt that the Board's Inspector was regarded with a certain awe and commanded considerable respect. The Plymouth inquiry opened on 15 January and local interest was intense as Rawlinson took evidence and made his pronouncements; all the important local figures assembled including the Rev Odgers, William Mortimer, and Capt Martin. Opponents of the Public Health Act tried hard to sustain their case. For example, Plymouth's Superintendent Registrar, Mr Pridham, argued that Irish inhabitants and seamen who happened to die in Plymouth falsely inflated the town's average mortality rate. Rawlinson was unconvinced:

"Far from the presence of Irish and other unfortunates in Plymouth being an excuse for the town's appalling health record, this was just the very reason why an enquiry was necessary and why further powers must be obtained." (PDWJ, 15 January 1852)

Capt Martin, who had been vilified in the local press, was praised by Rawlinson for his efforts in alerting the General Board of Health to Plymouth's problems (Brayshay & Pointon, 1983). Odgers presented files of evidence and data to the Inspector, together with new information that amounted to a re-survey of streets examined in 1847, so that changes that had occurred in the intervening five years could be assessed. Most tellingly, Odgers was able to show that in so-called bad streets not only were there more cases of cholera in 1849 but also a greater fatality rate from the disease.

On 20 January Rawlinson went to inspect the slums for himself; what he found was apparently too grim to be reported in the press. He then left Plymouth to prepare his report, which he presented to the General Board at the end of 1852; it was a faithful, but by no means

flattering, picture. Rawlinson described nearly every house and shop as having an independent style of its own, the macadamised streets were dirty in wet weather and dusty in dry, and the old back streets were narrow, crooked, and steep (Plates 8B, 8C & 8D), with a dirty surface-channel running down the centre. The report abundantly proved that the sanitary condition of the town was anything but satisfactory.

Many houses, originally erected as residences for the nobility and gentry, now gave partial shelter to the improvident, the vagrant, the vicious, and the unfortunate; the walls were half in ruins and the gables shattered.

"Within, matters are even worse: the rooms are now divided and sub-divided on every floor, the staircase is darkened, its massive handrail and carved balusters are crippled and broken; the once firm stairs are now rickety and dangerous; the stucco-finished plastering is blackened and in holes, the dusty and rotten laths being in many places bare; the landing windows, where the space is open, have neither frame nor glass, so that the rain drives in right and left; make-shift doors lead into small spaces let off as separate tenements." (Rawlinson, 1852)

Rawlinson's report amounted to a comprehensive and uncompromising indictment of the inefficiency and incompetence of both Plymouth Town Council and the Improvement Commission. The divided jurisdiction exercised by these two public bodies was identified as a principal obstacle to reform; furthermore, Rawlinson alleged that Plymouth's public health problems were attributable, in part, to the "vicious constitution of the body of Commissioners".

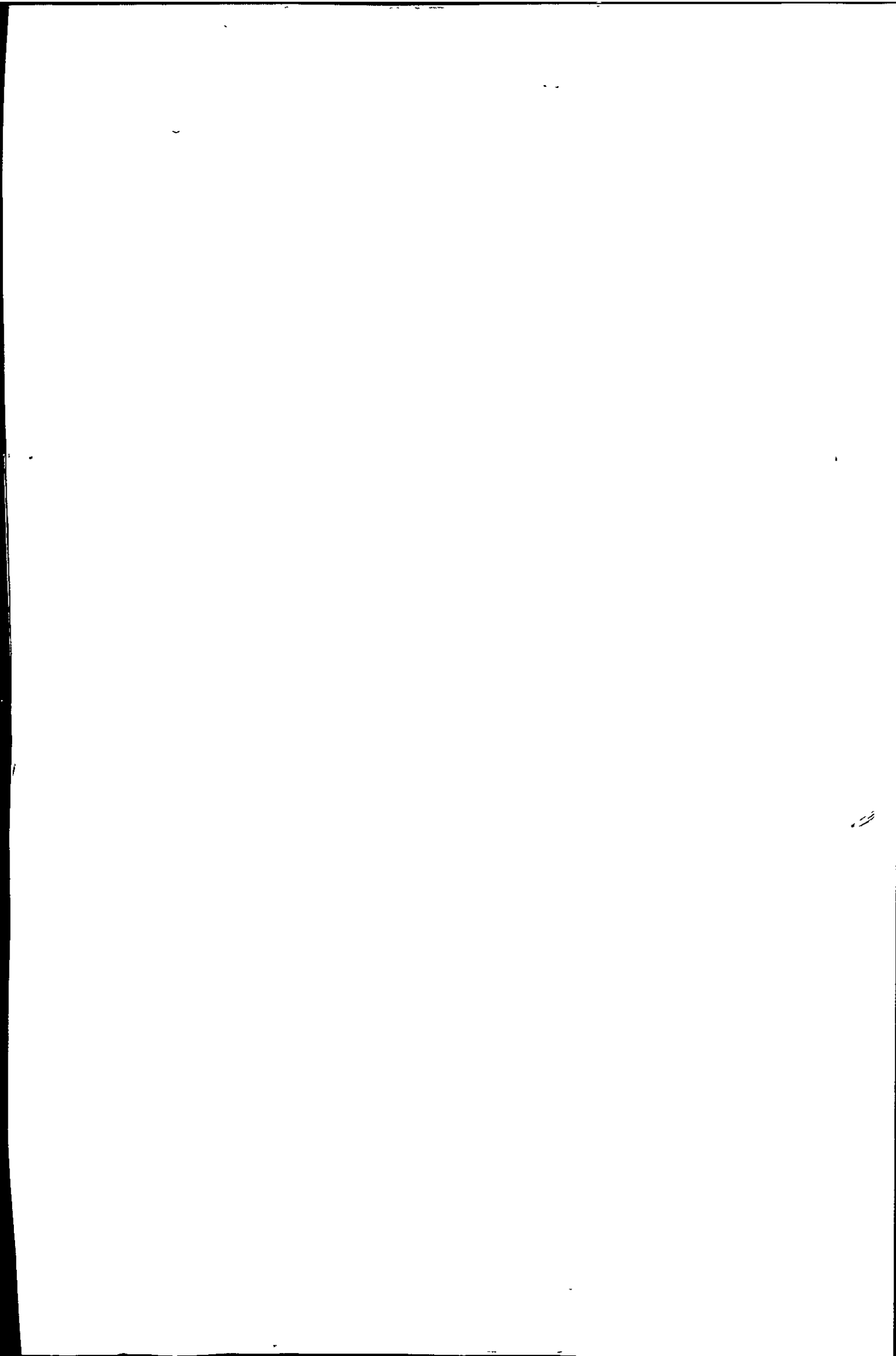
By April 1853, the Improvement Commissioners had prepared their response to the controversial report; in an eighteen-page statement to the General Board of Health, they entirely refuted Rawlinson's findings. Acknowledging that their powers had been too limited, they







Plate 8C: The eastern end of Castle Street photographed by G W Copeland in 1914. Once referred to as 'Damnation Alley', there were several disreputable public houses here, serving fishermen and mariners, and drunkenness and prostitution were common.





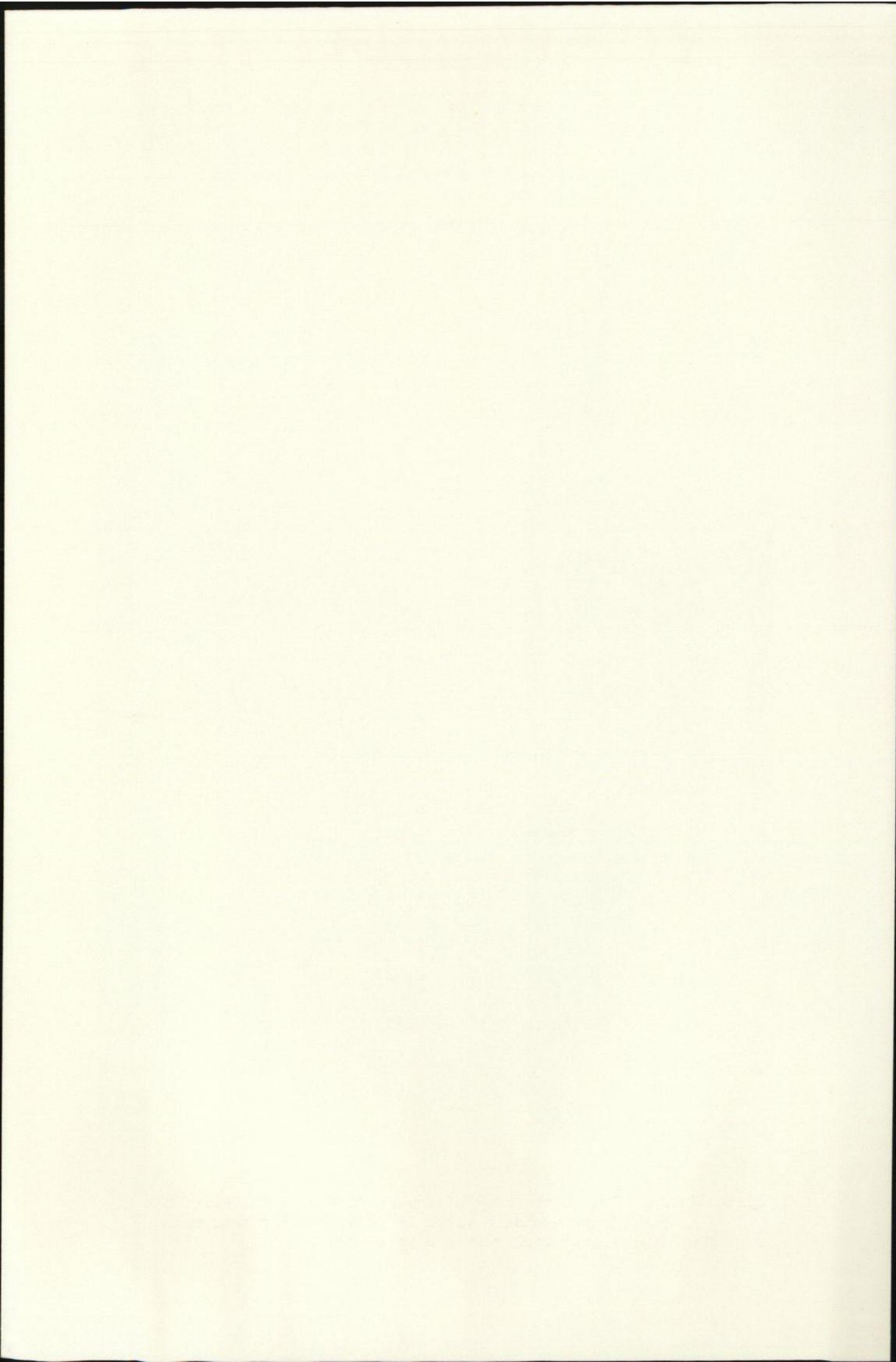


Plate 8D: An alley to the rear of number 16 Castle Street. This photograph was also taken in 1914, showing that much improvement work remained to be done.







announced their intention to promote an Improvement Bill and a Waterworks Bill by way of remedy. Soon afterwards, the objections of the Town Council to Rawlinson's report were received in London; this time the emphasis was on the detailed figures and calculations contained in the report and they did actually uncover some slight numerical discrepancies. But the damning testimony of the report could not be denied; Plymouth's public health record was deplorable.

### 8.3.3 The adoption of the Public Health Act

Plymouth ratepayers had formed a committee by 1853 and its new chairman, ex-Town Councillor, Thomas Stevens, began to press the General Board Of Health in a fresh attempt to obtain local adoption of the terms of the 1848 Public Health Act. In March, a second petition was submitted which indicated the scale of opposition to the two proposed local bills that had been designed to thwart supporters of the Act's adoption. Some 5,400 townspeople recorded their opposition to the Waterworks Bill and the Improvement Bill, regarded as unlikely to produce any significant improvement in Plymouth's sanitary condition. A month later, the Ratepayer's Committee began collecting information on the experience of other towns that had adopted the 1848 Act; knowledge from Exeter, Rugby, Tottenham, Launceston, Leamington, Wolverhampton, Derby, Southampton, Wigan, Gateshead, Salisbury, and York indicated that Chadwick's arrangements would cost only £100 in legal expenses whereas the local bills were certain to cost £3-£4,000.

By this time, the General Board had accepted Rawlinson's evidence and was convinced that the Public Health Act should be applied in

Plymouth. Although a draft provisional order for the application of the Act to Plymouth had been prepared by September 1852, its progress was halted when there was a fresh outbreak of cholera in the town; this was on nothing like the scale of the 1849 epidemic but the connection between the incidence of the disease and insanitary conditions was doubtless made clear again. Most of the cases on this occasion were confined to the Irish quarter in St Andrew's parish, but they were sufficient to prompt the Commissioners to re-establish their temporary independent local board of health, to appoint an "Inspector of Nuisances" to clear away some of the filth, and to "take active measures to counteract the progress of the disease" (PRO, MH 13/144 fo.8/54, 2 January 1854).

When a new provisional draft order for the application of the 1848 Act to Plymouth was issued in February 1854, the Town Council gave it their approval. Even the opposition of the Improvement Commission was muted: they reiterated their earlier objection to the allegation that the two local authorities were in conflict, but realised that the battle was now lost. Parliament approved the incorporation of Plymouth under the terms of the Act in July 1854 and within weeks a permanent local board of health was being formed.

#### 8.4 The work of Plymouth's Board of Health

While Chapter Five described the changing morphology of Plymouth and Stonehouse, this chapter has set forth a major impetus to that change. The antagonism of the long, acrimonious campaign over sanitary conditions in the town took years to heal and, in the short

term, this made the work of the new Plymouth Board of Health more difficult. Nevertheless, the scale of their efforts is impressive: sewage disposal, street-paving, and street-widening were early priorities; Table 8.3 identifies the powers and obligations of the Board. By 1860, a range of legislation that applied locally had been established on matters such as lodging-houses, slaughterhouses, open spaces, street widths, and access. The Plymouth Board was administering public baths and washhouses recently purchased from the Ratepayers Committee and refurbished at a cost of over £4,000. The Board even undertook the complete rationalisation of house-numbering and street-labelling. Even so, Plymouth did not have a Medical Officer of Health until 1890 when Dr F M Williams was appointed to the

TABLE 8.3: The powers and obligations of the Plymouth Board of Health

- Water supplies: to lease or purchase waterworks, to supply water to domestic users at a rate not exceeding 2d per week, and to supply public baths and washhouses.
- Streets: to provide street lighting, to pave the streets, to fix the level and width of every street, to control gas and water pipe alignments, to purchase property to enable street improvement, and also to provide parks.
- Waste, sewerage: to remove nuisances (e.g. pig sties, overflowing cesspools), to build, repair and clean sewers, to sweep the streets, and to provide drains for streets and houses.
- Noxious trades: to control blood, bone tripe, and soap boilers, fell mongers, tallow melters, and slaughterers.
- Cemeteries, mortuaries: to manage and fit up 'reception' houses for the dead, and to provide for decent and economical extra-mural interment.
- Lodging-houses: to regulate their numbers, cleanliness, and ventilation, and to control and eliminate cellar dwellings.

Source: Borough of Plymouth Local Board of Health, Report of the Public Health Act Committee (Chairman: Thomas Stevens), October 1854.

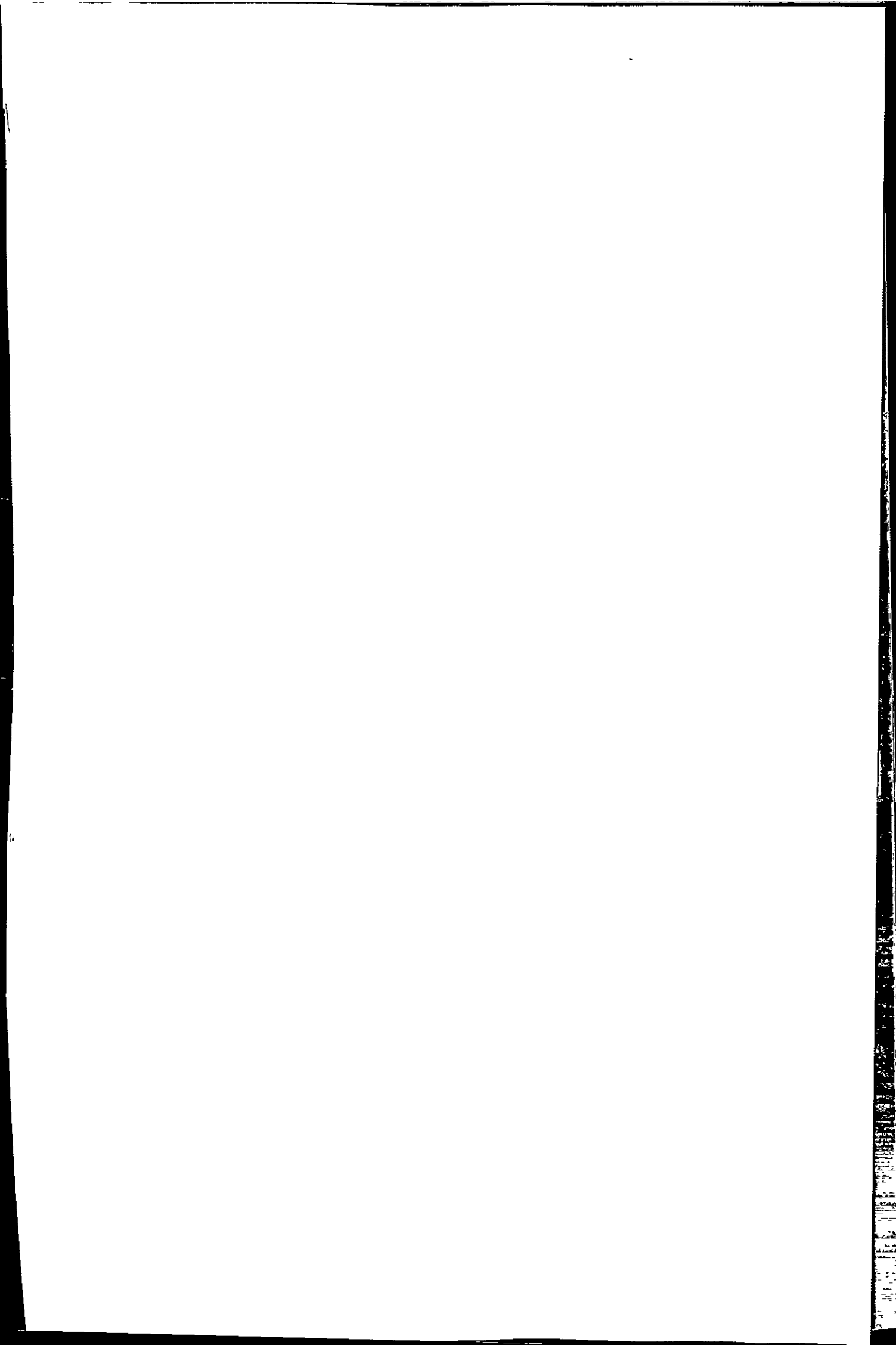
post under the terms of the 1888 Local Government Act.

Regulations on minimum street widths were established whereby no new streets could be less than thirty feet and no back lane less than fourteen feet wide; many applications were rejected because they failed to comply with these rules. Under the terms of the Lands Clauses Consolidation Act of 1845, the Plymouth Board of Health framed a steady stream of provisional orders for the compulsory purchase of property to enable street improvements to be carried out and hundreds of houses were demolished (Figure 8.4a). Ironically, this made overcrowding worse at first but the development of suburbs to the north and northwest of the town gradually eased the problem.

In the commercial district, where the old and narrow streets were wholly inadequate to carry the traffic to and from the quays, much work was done: Notte Street (Plate 8E) and Woolster Street were widened almost throughout their entire length, and Southside Street (Plate 8F) and Vauxhall Street were similarly improved. Also the capacity of the main manufacturing thoroughfare, Sutton Road, was increased (Worth, 1890). Pitts (WDRO 688/1) observed that, in order to widen Bedford Street, a number of shops adjoining the churchyard were demolished. Union Street, George Street, Old Town Street (Plate 8G), and Tavistock Street all received attention, as did Treville Street at a cost of £15,000, and Whimple Street was widened from 15 feet at its narrowest part to 35 feet. These and many other streets are indicated in Figure 8.4b, while Figure 8.5a shows some of the streets that were re-paved.

Following the formation of the local board, work on an entirely new sewerage scheme was begun which received approval of the General Board in August 1855; costs were to be met by mortgaging the rates and construction began the following year. Figure 8.5b shows some of the

Plate 8E: Notte Street was one of the oldest streets in Plymouth; the entrance to King's Brewery is on the right. This photograph, taken c1870, shows work in progress to install new sewers.





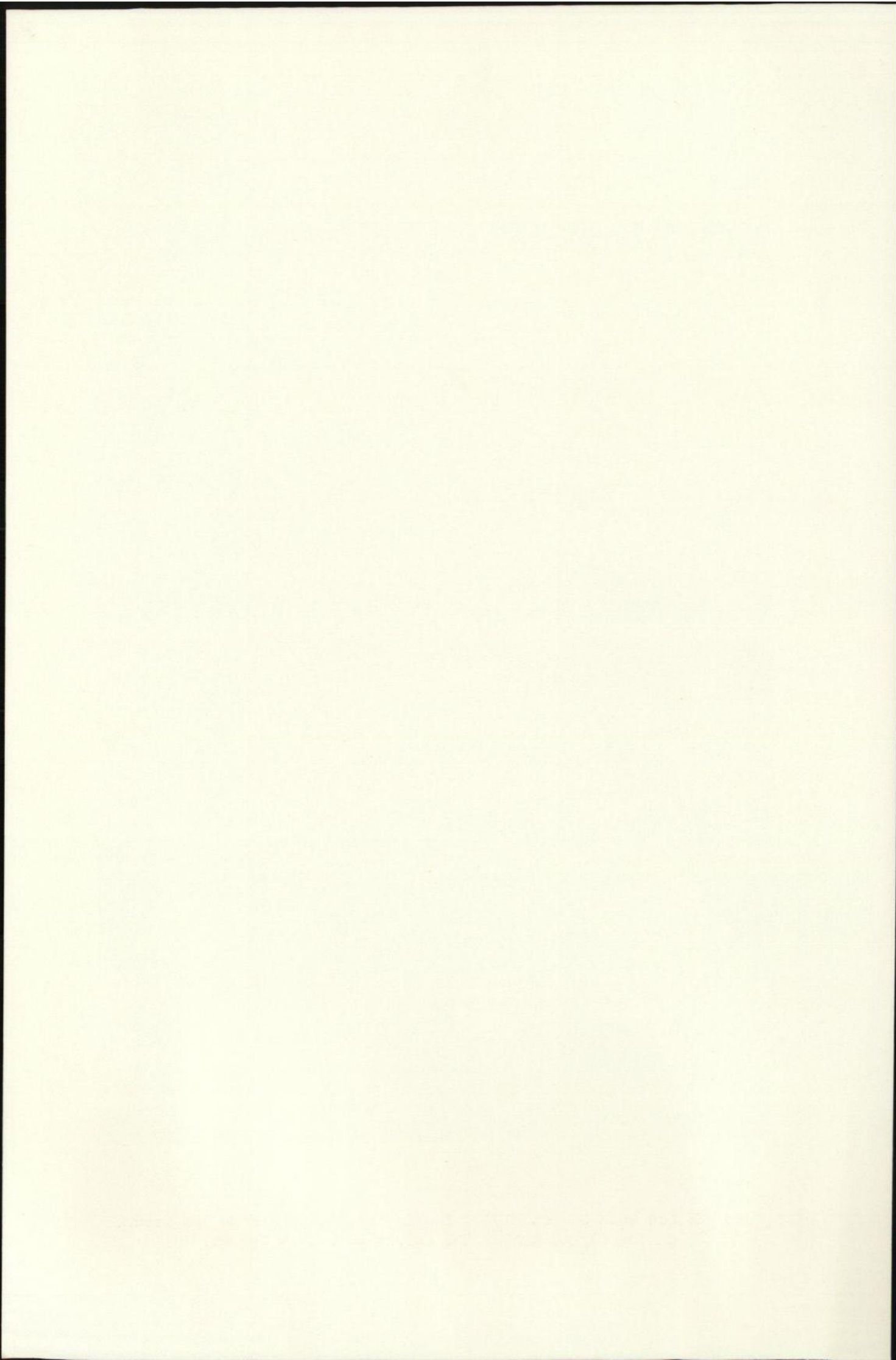




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Plate 8F: Southside Street c1898, looking east.





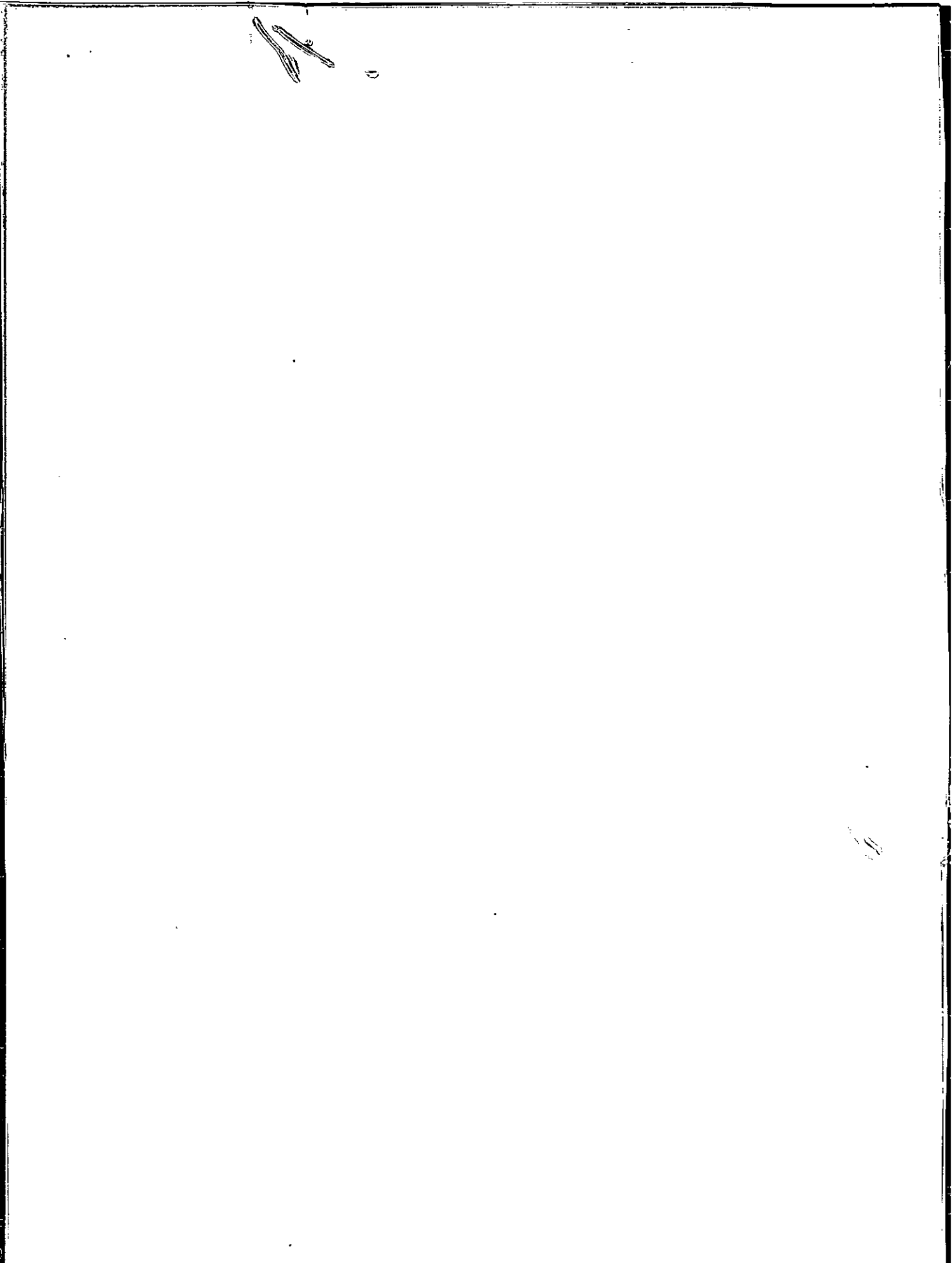
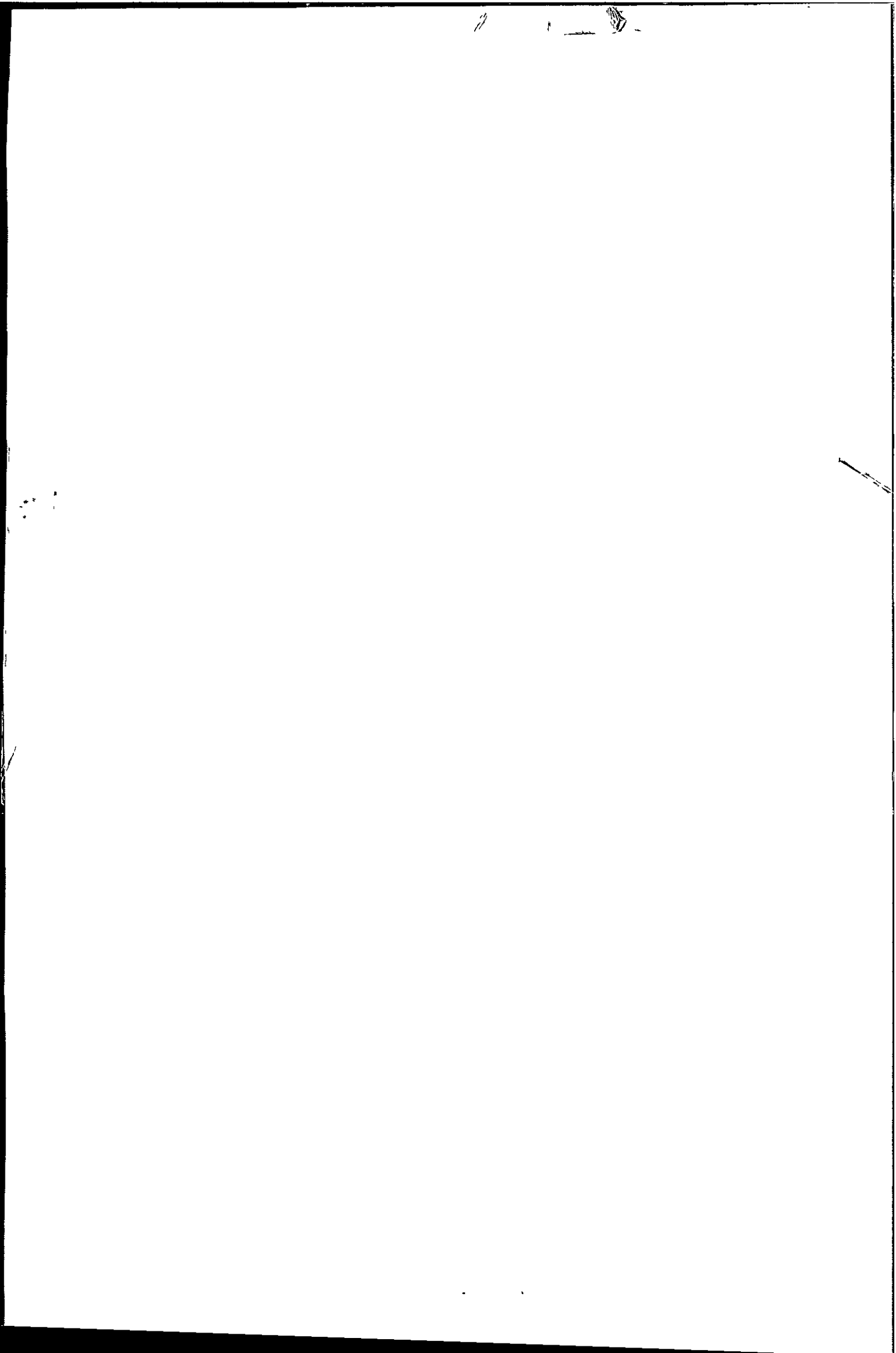
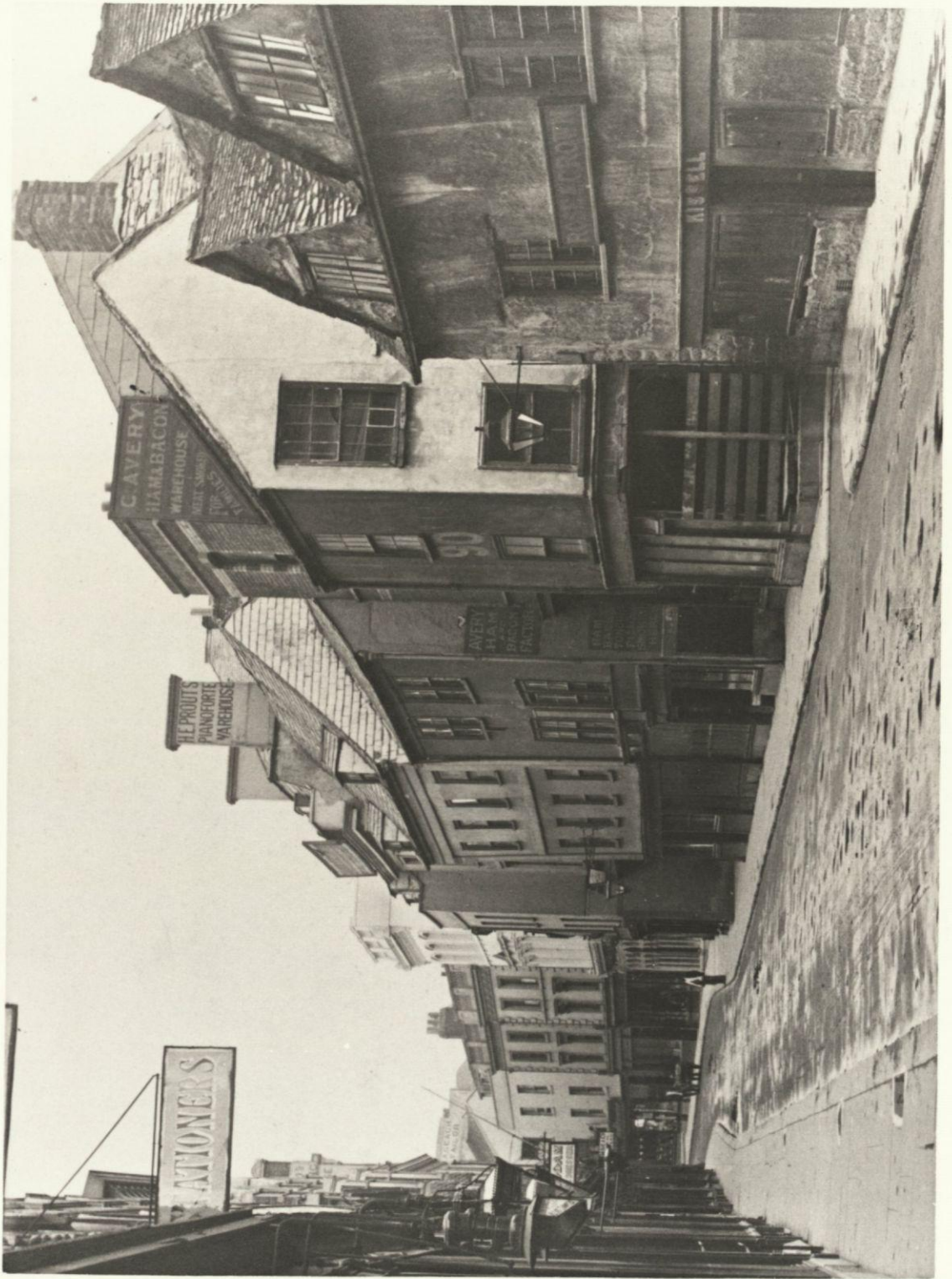
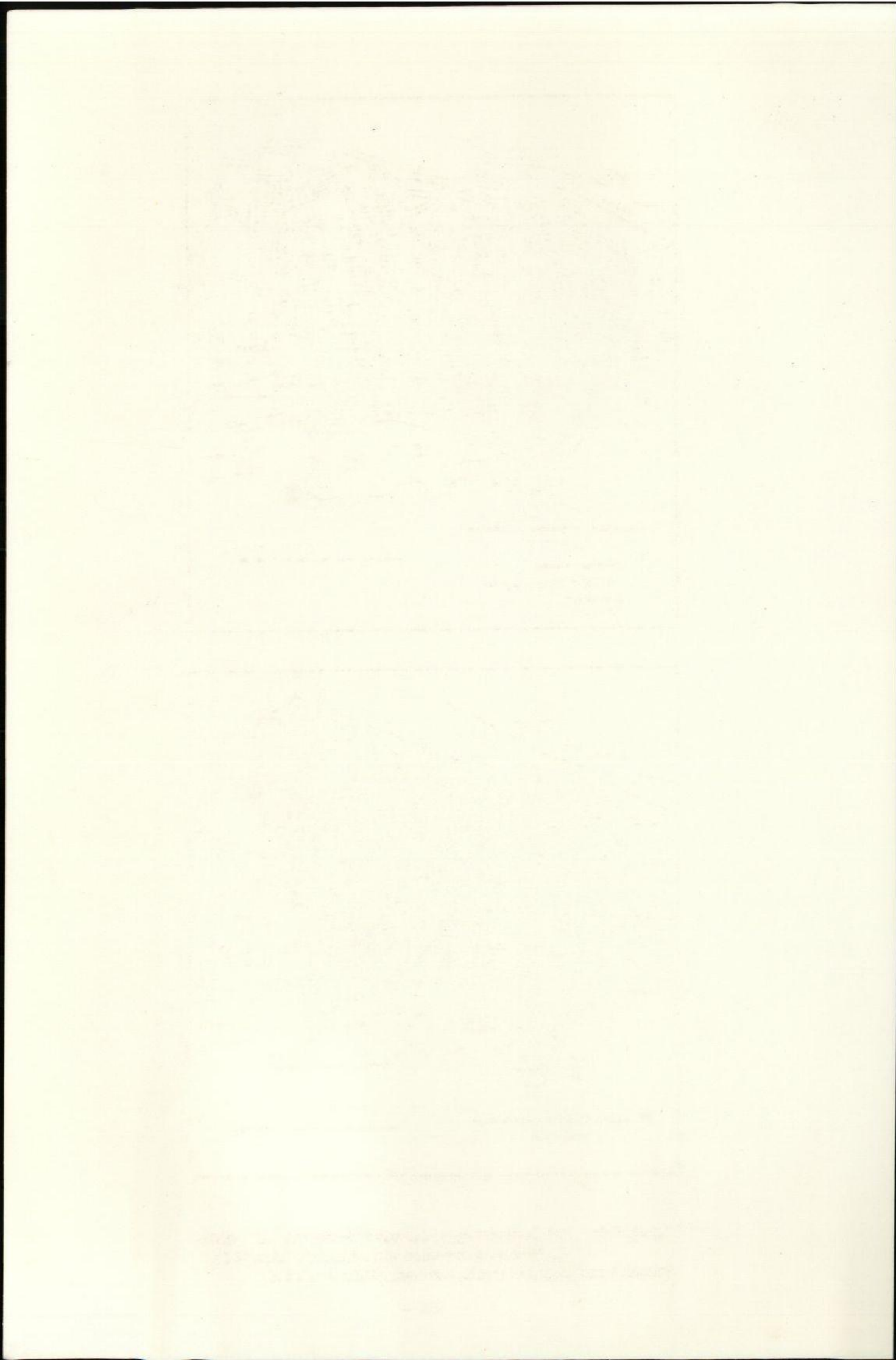


Plate 8G: Old Town Street c1914, looking north. The Rose and Crown,  
on the right, was on the corner with Week Street.







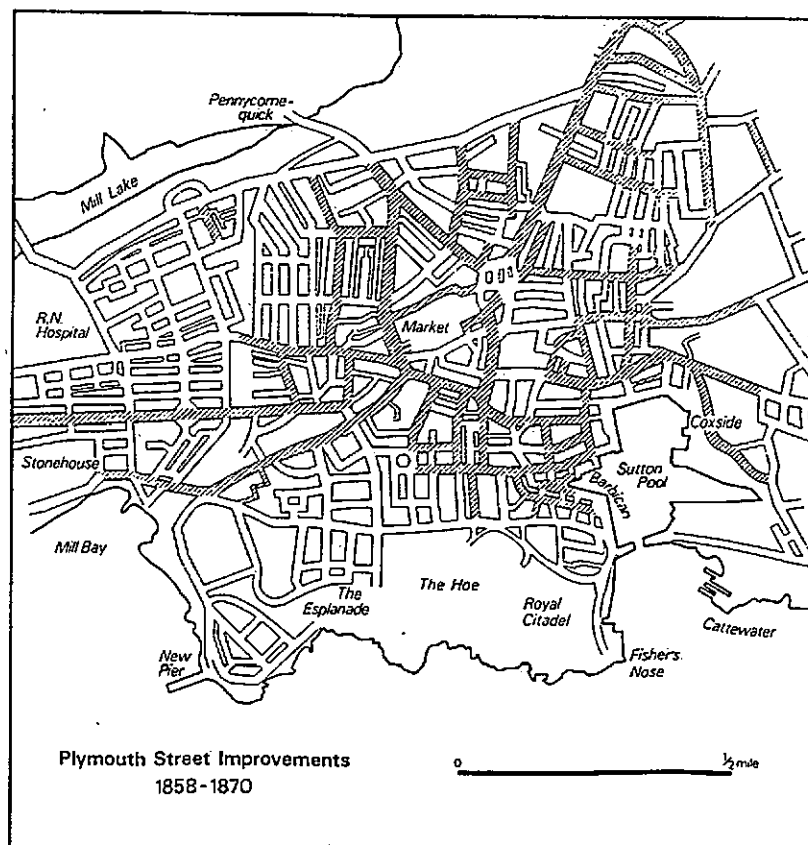
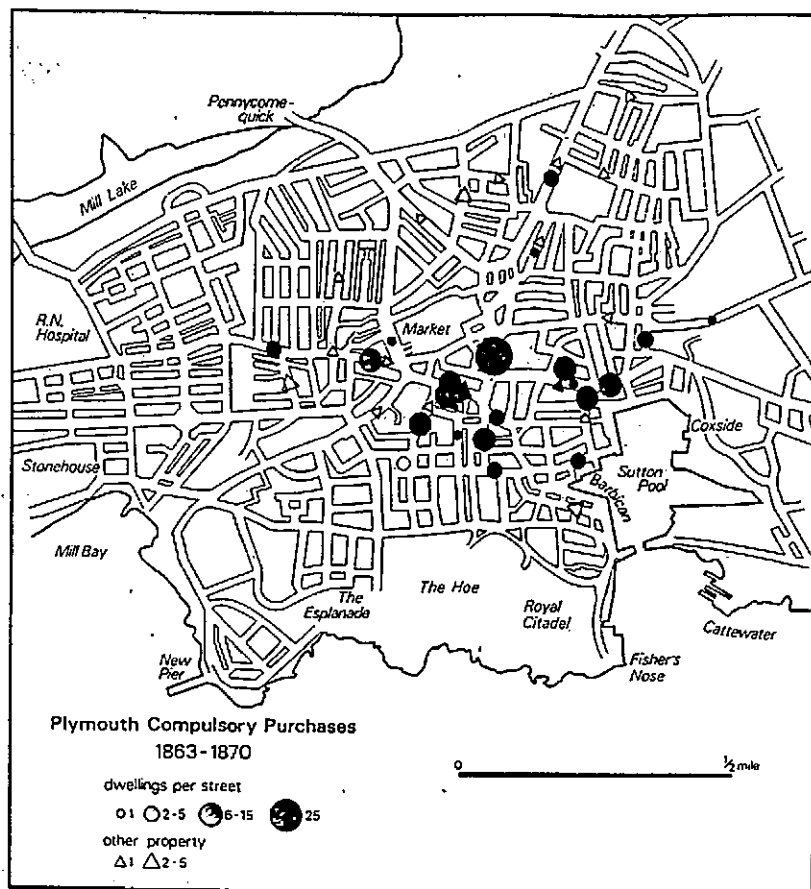


Figure 8.4: (a) Compulsory purchases in Plymouth, 1863-1870.  
 (b) Street improvements in Plymouth, 1858-1870.  
 Source: Local Board of Health minutes, PRO MH 13/145.



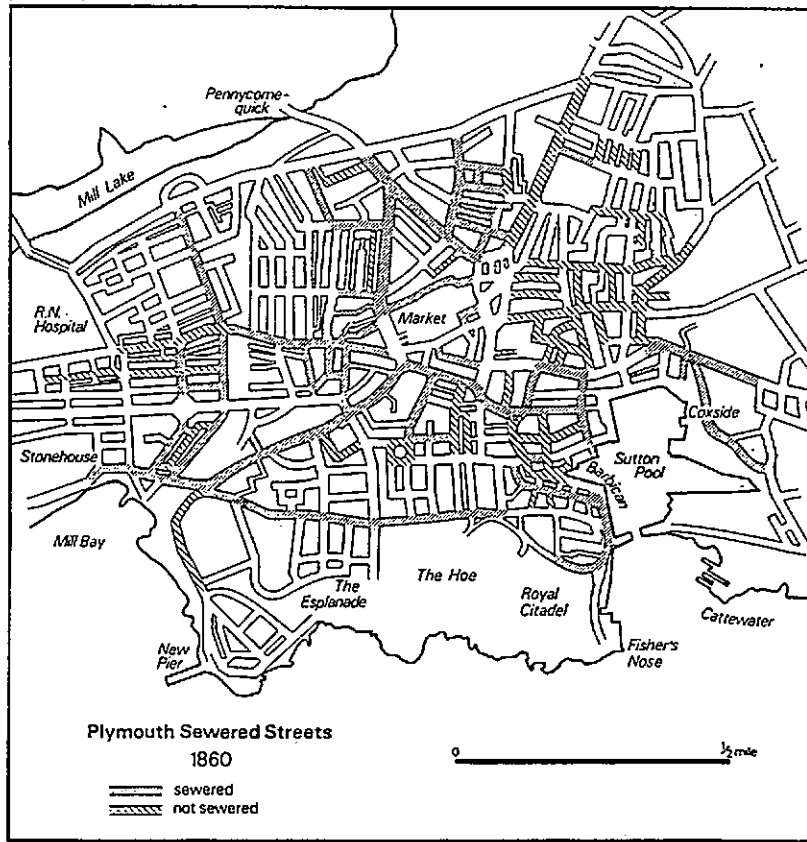
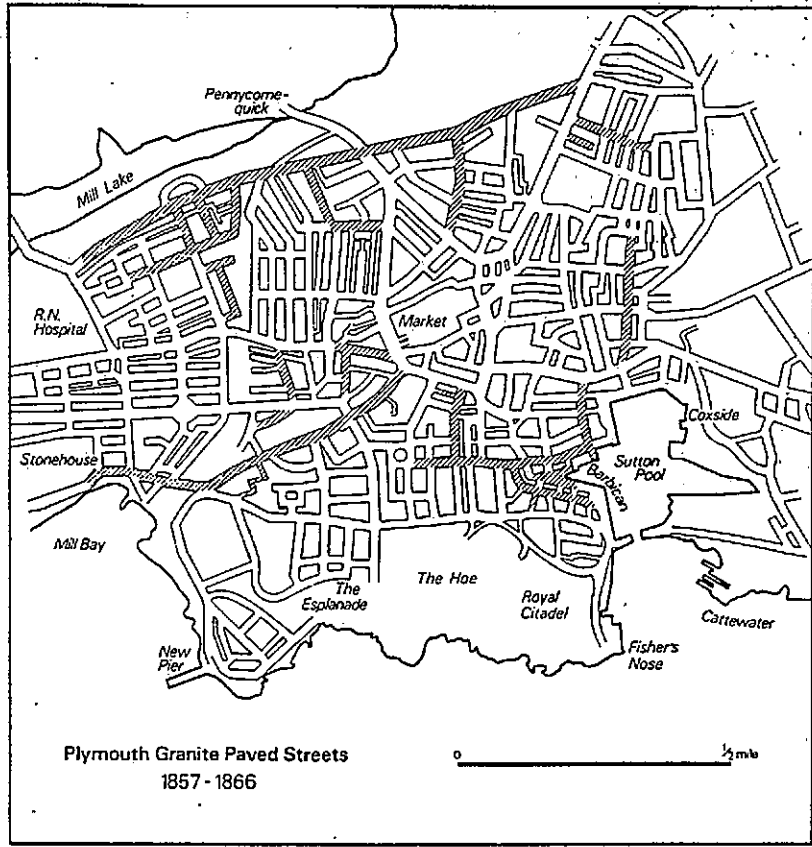
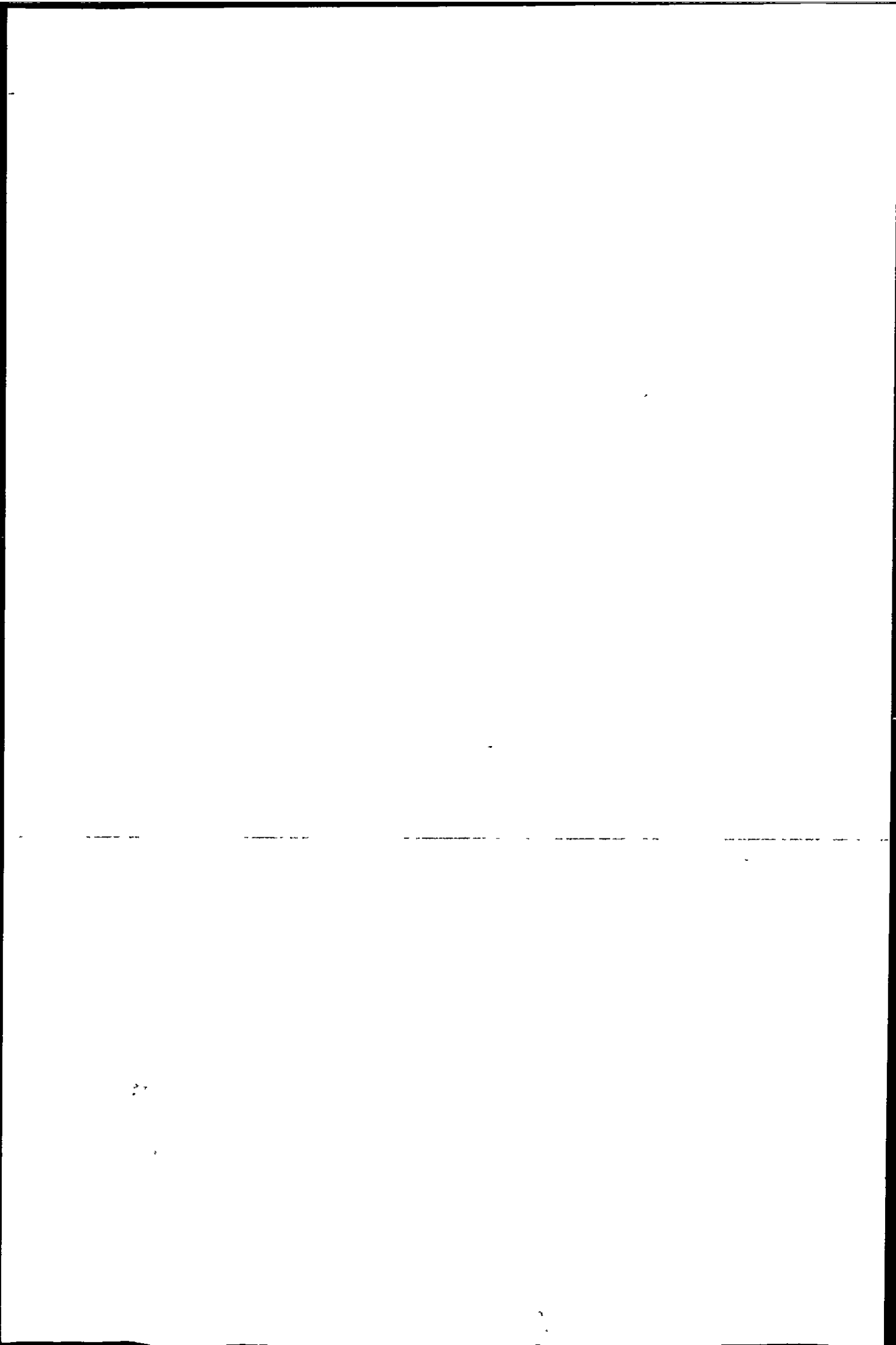


Figure 8.5: (a) Granite-paved streets in Plymouth, 1857-1866.  
(b) Sewered streets in Plymouth, 1860.  
Source: Local Board of Health minutes, PRO MH 13/145.



early work; by 1873, Rooker noted, £30,000 had been spent on the public drains, and a further £10,000 for catchpits. The Odgers report had shown that, although Plymouth was provided with the means for a good water supply, it was not put to full use. A house-to-house survey of water supply arrangements was begun in the 1850s and eventually resulted in a vastly improved service. By the end of the century, Wright (1894) could claim that the town's water supply was "abundant and singularly pure and free from defilement" and he noted that they were "within measurable distance of having a fine storage reservoir". Burrator Reservoir was commenced in 1891 and was supplying the town by 1898. Thus Plymouth was transformed from one of the unhealthiest towns in England into one of the healthiest.

At the start of the 19th century it had been proposed to provide dwellings for the poor, but such provision was slow in coming. The first notable accommodation being Shaftesbury Cottages, almshouses on North Hill built in 1861. The new workhouse and prison at Greenbank in 1849-51 doubtless received grudging welcome since they were certainly a great improvement on the previous accommodation. The latter part of the century saw greater effort to provide better housing: the Plymouth Improved Dwellings Association built workmen's dwellings at Coxside, and blocks were also erected in St Andrew and Victoria Streets, and at the rear of Notte Street.

Between 1844 and 1850 the death-rate in Plymouth was over 25 per thousand, but from 1867 to 1872 it decreased steadily to 21.5 and the average saving of life was calculated to be 200 annually. Sanitary conditions had been greatly improved: in 1854 Plymouth stood low in the list of healthy towns but by 1871, when the death-rate in London was 25, Bristol 26, Birmingham 32.5, Liverpool 37, Manchester 28, and Portsmouth 17, in Plymouth it was only 20.6 (Rooker, 1873). The

improvement continued and by the late 1870s, Plymouth had achieved a lower mortality rate than many other cities of comparable size: at 14.6 per thousand it was appreciably lower than Manchester (21) or Newcastle (23).

### 8.5 Conclusion

Just months before cholera took hold in Plymouth, the Herald had stated: "the treatment which the destitute poor have too often received, has not been such as men of ordinary Christian feeling would expect or desire" (PDSH, 10 February 1849); and as the fatal epidemic approached George Soltau reported that crime, destitution and misery, were attributable to the state of town, and that

"the crowded nature of the dwellings of the poor and the filth that was there to be found, the want of proper sewerage, the dirty condition of the streets and lanes, and the absence of a proper supply of water, resulted in disease, depravity and death." (PDSH, 2 June 1849)

Robert Rawlinson wrote in his 1852 report that Plymouth's "natural climate - pronounced by physicians to be conducive to health - is by neglect allowed to become poisonous". After so long a period of neglect, it is no surprise to find that remedies were slow to take effect but steady improvement in the town's health record did begin in 1854.

The accepted view of the 1848 Public Health Act is that it was more important for introducing the concept of public health in Britain rather than for any lasting practical effect. At the national level

this seems a fair assessment, but it tends to ignore the impact of the Act on local government in provincial towns. This chapter has shown how Plymouth's battle over the adoption of the Act led to fundamental changes in the management of urban affairs. The power of petitions and well-organised protest was tested on the public health issue and proved effective. But Plymouth was not unique; the same kind of denouement has been observed elsewhere (Fraser, 1976; Gauldie, 1974). The public health and urban environment crisis was essentially a symptom of the process of excessively rapid population growth, a growth not matched by adequate provision of accommodation, amenities or infrastructure. Plymouth had been slow to react to the problems caused by overcrowding and this chapter has indicated the impact of the crisis and responses to it which exerted a lasting effect on the townscape and social geography of the town.

CHAPTER NINE: THE SOCIAL GEOGRAPHY OF MID-VICTORIAN PLYMOUTH:

OVERVIEW AND CONCLUSIONS

9.0 Introduction

The emphasis of urban historical research has shifted since the research for this thesis commenced in January 1980. In the 1970s, social geographies of mid-Victorian towns and cities were in the vanguard of British historical geography. From the inter-disciplinary conference of 1966 which produced The Study of Urban History (Dyos, 1968), through Wrigley's Nineteenth-Century Society (1972) which laid the groundrules for census-based analysis, to Lawton's culminant "interpretative guide to 19th-century censuses" (The Census and Social Structure, 1978), the census data for 1851, 1861 and, when released, 1871 were subjected to extensive statistical analysis made possible by new computer technology. Studies of Liverpool (Lawton & Pooley, 1975, 1976, for instance), Huddersfield (Dennis, 1977, 1979), Wolverhampton (Shaw, 1977, 1979), Aberystwyth (Carter & Wheatley, 1977, 1979), and Cardiff (Williams, 1979), to name but a few, contributed substantially to understanding of the patterns and processes of mid-Victorian towns and cities.

Many historical geographers have sought to set their findings into a theoretical framework which regarded the Victorian city as transitional from pre-industrial to modern (Warnes, 1973; Pritchard, 1976), and the test of relative modernity was seen to be the degree of social differentiation. In retrospect, geographers may be said to have 'run aground' for too great a reliance was placed upon the Sjoberg-Burgess continuum of modernisation. The Ward-Cannadine debate

revealed flaws in the theoretical framework (Ward, 1975; Cannadine, 1977); it became clear that, while different towns developed at different rates, at different times and in response to different motivating forces, the scale of measurement (Peach, 1975) and the choice of variables were crucial in determining research results. Further, the crux of Ward's criticism rested upon the way in which differentiation is defined (as 'over-representation' or 'exclusiveness'). While Ward looked for areas exclusively inhabited with certain characteristic groups, most other researchers looked only for an over-representation of distinctive social groups.

This thesis has followed the latter style, the patterns which have been identified in mid-Victorian Plymouth, based upon the relatively crude areal unit of the enumeration district, clearly do not identify exclusivity. Thus, according to Ward's criterion, Plymouth would not be regarded as socially segregated, the town was far too overcrowded to permit the development of such selective areas at anything but the smallest scale. Yet it may be said that trends have been identified in the social distribution of Plymouth's mid-19th century population. This study of mid-Victorian Plymouth has established the population characteristics, the impact of population growth mechanisms, the origins of the population, the employment structure, and the physical setting of this population change and growth. It has also begun to explore processes which were shaping the patterns of social distribution or, more precisely, to focus on the role of certain forces in shaping the patterns here revealed and thus beginning to identify the processes at work.

This social geography of Plymouth is unashamedly situated in the tradition of empirical social investigation; it has not sought to fulfil the demands of a pre-set theoretical framework. While a more

overtly hypothesis-testing and theory-formulating approach may be preferable in the late 1980s, empirical studies do make an important contribution. In this final chapter, the results of principal component analyses of the 1851 and 1871 census data are presented. The factor analytic method is used in this instance as a summary tool to clarify inferred patterns and to help explain the residential structure of mid-Victorian Plymouth and Stonehouse.

Notwithstanding the criticism that descriptive studies have rarely "attempted to assimilate recent philosophical and theoretical debates in urban history or modern social geography" (Pooley & Lawton, 1988), the empirical study of mid-Victorian Plymouth does add a new dimension. Previous studies have mostly focused on medium-sized industrial towns, and thus failed to represent the "full range of British urban experience" (ibid). Plymouth was a medium-sized town but it was not an ordinary industrial town; it was a port, a gateway for the West Country and thence to the rest of southern and midland England, it was an armed forces base, and it was a regional market place. The validity for studying mid-19th century Plymouth lies in its atypicality: it was not directly comparable with any other town or city and it represents another facet of British urban history. The position of this study in relation to the development of themes and methods in urban historical geography research in recent years will be discussed below and the chapter will conclude with a review of the research on mid-Victorian Plymouth and aspects revealed which may provide profitable future research.



### 9.1.1 The principal component analysis of the Plymouth data

In the analysis of Plymouth's mid-Victorian population presented earlier in this thesis (Chapters Three, Four, Five, and Six), distributional maps have shown the areal pattern of features such as housing density, domestic service, ethnic concentration, and the multiple-occupancy of dwellings. A visual comparison of these maps suggests that distinct areas of mid-Victorian Plymouth and Stonehouse may be defined in socio-economic and demographic terms. There were, for instance, areas where concentrations of lower status, relatively overcrowded and generally more deprived households seemed to be higher. By contrast, there were districts which appeared to be more favoured with lower densities, more servants and higher status occupations. But the separate evaluation of each aspect of Plymouth's social and population geography makes it hard to define the town's overall structure with any real precision or certainty. An objective method of evaluating the collection of distribution maps as a whole was clearly required.

Many other studies carried out elsewhere have addressed these problems and have employed factor analysis as a method of areal classification which reduces a large number of variables to a smaller, more manageable number of derived or composite variables (e.g. Goheen, 1970; Lawton & Pooley, 1975; Shaw, 1977; Rowland, 1982). These composite variables (usually called factors or components) help to explain the patterns displayed by individual variables and thereby account for a large amount of the variability among the original criteria. Moreover, by simplifying the complex pattern of explanatory variables, factor analysis is a valuable aid to understanding and describing urban social structure.

Factor analysis was used in this research, therefore, to group the Plymouth and Stonehouse enumeration districts according to a set of derived or composite variables, and to identify the underlying dimensions of variation in the original data by statistically linking those sets of characteristics which were most closely associated. Because so much work had already been carried out in examining the spatial pattern of individual variables, factor analysis is employed here as a summarising exercise rather than an initial exploratory technique. It was seen as a way of simplifying the patterns already inferred and sharpening explanations of Plymouth's residential structure. To these ends, the principal component method of factor analysis was applied to the Plymouth and Stonehouse sample data for 1851 and 1871.

Principal component analysis works on the basis that original variables will group according to the degree of correlation between them; in other words, the maps of individual variables already presented can be grouped with regard to the extent of similarity they display. The analysis summarises these groups in new indices which combine the original variables in proportion to how closely their own patterns correspond with the group, or general, pattern. The new index is known as a principal component. Original variables will correlate with the derived principal component and these correlation coefficients are known as component loadings.

The sum of the squares of the component loadings indicates how much of the variance in the original variable distributions is explained by the newly-derived principal component. This is known as the eigenvalue and is a measure of the 'strength' of the component. It is unlikely that the eigenvalue will account for all the original variance in the data set but a further principal component can be

derived orthogonal (that is, at right angles) to the first, thereby accounting for a further proportion of the original variance. This exercise may be repeated until all the variance has been explained.\*

The original variables which have the highest loadings on (i.e. are most highly correlated with) the component are identified in order to determine the nature or character of each of the derived principal components. Each of the areal units (in this case, enumeration districts) for which the original input variables were measured can be assigned a component score, which is the sum of the products of the component loading and the original data value for each variable for that area. These component scores can then be mapped to define the areal structure of the component, that is, its spatial distribution pattern.

Twenty-nine census variables, measured for each enumeration district, were selected as described in Chapter Two and are listed again in Table 9.1. Examination of these variables individually has indicated that their distribution patterns were more sharply differentiated in 1851 than in 1871, in other words, segregation levels were diminishing.+ One expectation, therefore, was that the principal component analysis for 1871 would reveal a rather different social structure from that derived for 1851. The processes of change

\* Principal component analysis can produce the same number of components as there were original variables but only the first few components are usually examined because they will normally account for most of the variation. This method also assumes that all the variance is explained by the data in the analysis (Conway & Haynes, 1973).

+ A problem which affects the initial stages of the analysis and stems from the distributional characteristics of the input data is the normality assumption in components models: "While transformations are applied to fit the data to some model assumption, they may also drastically alter the relationships among the variables" (Clark, 1973). Clark found that different treatments of the normality assumption produced widely different results. For this reason, transformations were not employed in the Plymouth analyses.

TABLE 9.1: Variables used in the principal component analyses

1. Sex ratios of whole population
2. Age ratios of sample population
3. Fertility ratios of sample population
4. Mean age of heads of sample households
5. Percentage of widowed heads of sample households
6. Nuclear families as percentage of sample households
7. Single-person households as percentage of sample households
8. Number of servants per sample household
9. Number of lodgers per sample household
10. Percentage of female heads of sample households
11. Population densities for whole population
12. Population per inhabited house for whole population
13. Population per household for whole population
14. Number of households per inhabited house for whole population
15. Percentage of sample population in employment
16. Women in work as percentage of sample population
17. Percentage of sample employed in professional occupations
18. Percentage of sample employed in the armed forces\*
19. Percentage of sample employed in conveyance\*
20. Percentage of sample employed in art and mechanic production\*
21. Percentage of sample employed in textiles and dress\*
22. Percentage of sample employed as labourers or unemployed\*
23. Percentage of sample born in Plymouth and East Stonehouse
24. Percentage of sample born in the rest of Devon
25. Percentage of sample born in Cornwall
26. Percentage of sample born in seaboard counties
27. Percentage of sample born in Ireland
28. Uninhabited houses as percentage of total housing stock
29. Houses under construction as percentage of total housing stock

\* Occupational orders containing five percent or more of the total employed and showing irregular pattern of distribution.

in Plymouth seem to have operated at remarkable speed; social structure appears to have been extraordinarily fluid and the multi-factor analysis described below seeks to clarify these changing patterns.

There were three stages to the interpretation of the principal component analysis of the mid-19th century data for Plymouth and Stonehouse:

(1) The variables which loaded most strongly on each component were identified to determine what aspects of the social structure of Plymouth and Stonehouse were explained by each component. The highest

loading variables for each component are listed in Tables 9.2 and 9.3.

(2) The correlations between those original variables identified in stage (1) were examined in order to shed more light on the real nature of the component. Figures 9.1 and 9.2 show the correlation bonds constructed for the highest loading variables on the principal components, and Tables 9.4 and 9.5 present the correlation matrices pertaining to these figures.

(3) The component scores were mapped for each of the major components in the Plymouth and Stonehouse enumeration districts for 1851 and 1871. Figures 9.3-9.7, therefore, show the areas most affected by the highest loading, positively correlated variables for each principal component.

#### 9.1.2 Principal component analysis of the 1851 data

Component One clearly identifies the poorer, more densely-populated and, consequently, overcrowded enumeration districts, although this component explains only about a quarter of total variance (Table 9.6). Four variables measured aspects of density of population: population density (number of people per acre), population per house, households per house, and population per household. The first three were strongly positively correlated in both census years, while the latter correlated negatively. Component One demonstrated that this difference reflected a socio-economic distinction - high population per household values being found frequently in more affluent areas, thus correlating positively with the number of servants per household.

It is particularly interesting to note the importance of the

TABLE 9.2: 1851 Component loadings from varimax rotated factor matrix

Component One

Households per house	.88161
Population density	.78038
Employed in textiles and dress	.77689
Population per house	.74286
Sex ratio	.58468
Fertility ratio	.40864
Size of household	-.78311
Servants per household	-.83124

Component Two

Professional class	.85839
Employed in defence	.83642
Born in seaboard counties	.68928
Employed in production	-.45705
Locally born	-.58200

Component Three

Population in employment	.75041
Working women	.73844
Born in Cornwall	.69084
Locally born	-.44352
Employed in conveyance	-.46139
Fertility ratio	-.47670

Component Four

Female heads of household	.77085
Single-person household	.72090
Widowed heads of household	.48671
Employed in production	-.42164
Nuclear household	-.71564

Component Five

Lodgers per household	.76298
Born in Ireland	.75294
Labourers and unemployed	.62916
Born elsewhere in Devon	-.52927

TABLE 9.3: 1871 Component loadings from varimax rotated factor matrix

Component One

Age ratio	.87306
Population in employment	.85488
Age of head of household	.80502
Working women	.76595
Servants per household	.62629
Size of household	.50337
Born in Cornwall	.46294
Nuclear households	-.45972
Sex ratio	-.53754
Fertility ratio	-.78588

Component Two

Population per house	.89664
Households per house	.88786
Population density	.75735
Sex ratio	.50470
Employed in textiles and dress	.41721
Size of household	-.53079
Servants per household	-.56797

Component Three

Professional class	.90386
Employed in defence	.87400
Born in seaboard counties	.67540
Labourers and unemployed	-.50553
Employed in conveyance	-.53005
Locally born	-.58248

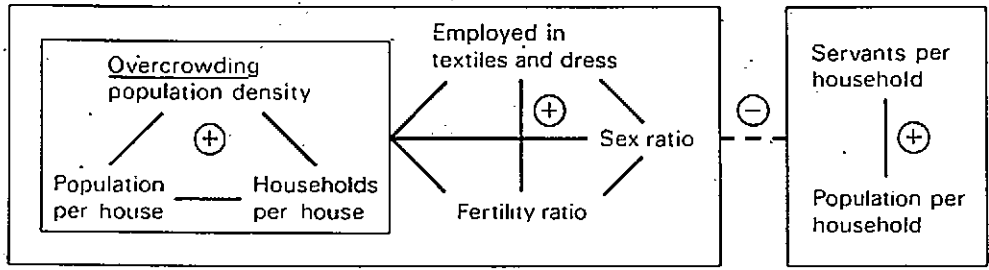
Component Four

Single-person households	.87978
Female heads of household	.67600
Nuclear households	-.73788

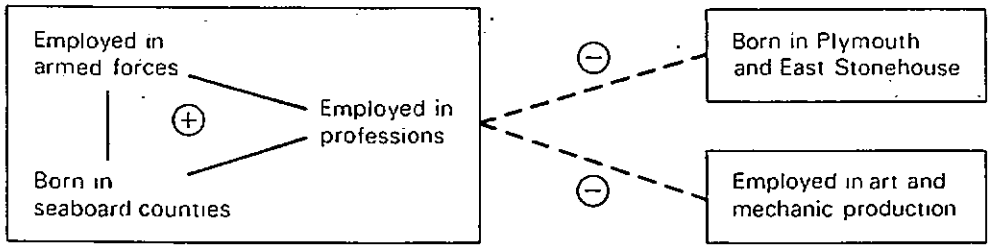
Component Five

Lodgers per household	.53923
Size of household	.42748
Employed in production	-.55366
Employed in textiles and dress	-.69553

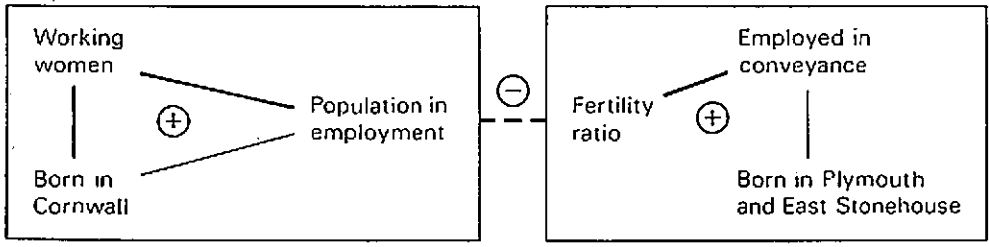
Component One:



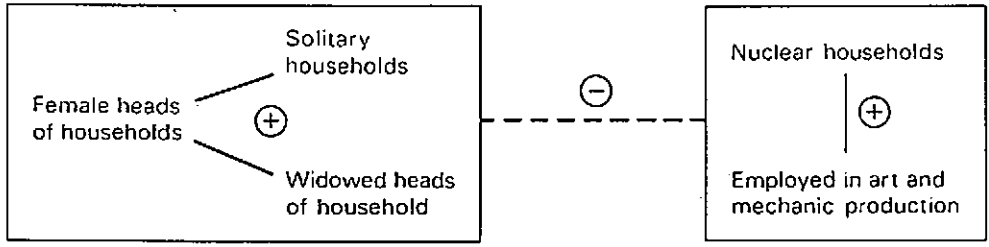
Component Two:



Component Three:



Component Four:



Component Five:

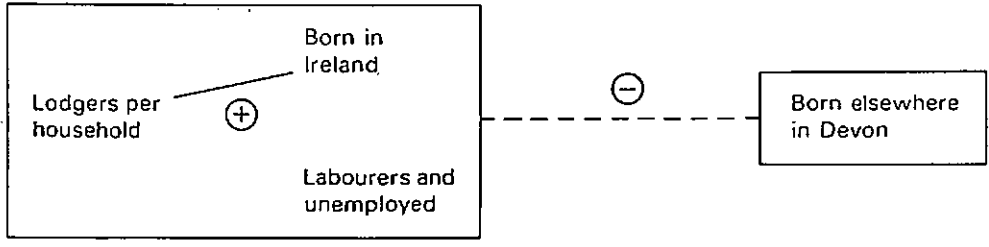
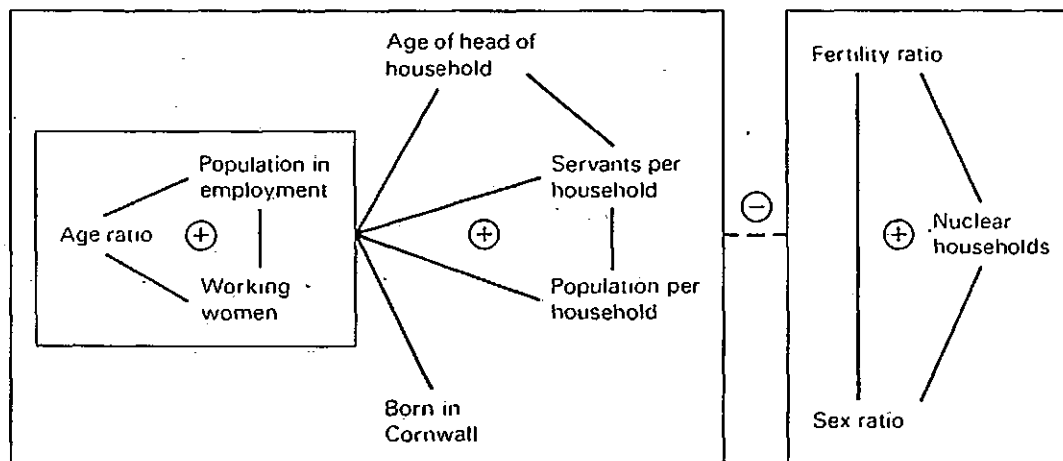


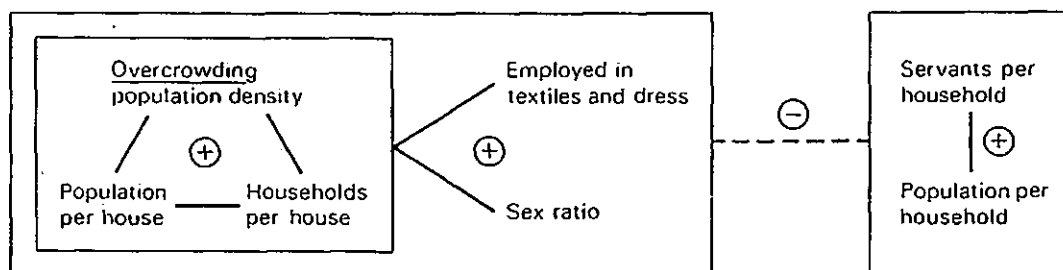
Figure 9.1: Principal Components Analysis of the 1851 data: correlation bonds of high-loading variables.



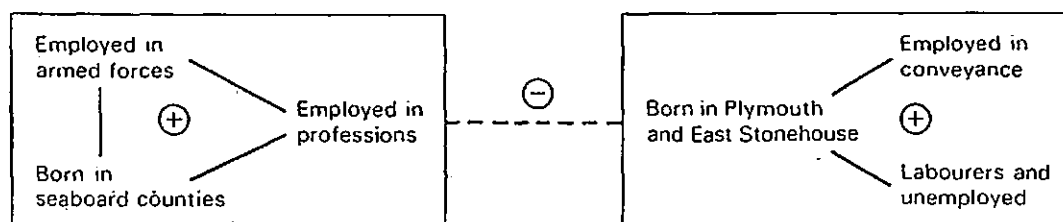
Component One.



Component Two.



Component Three.



————— Significant at 0.01 level or better  
 - - - - - Significant at least at 0.05 level

Figure 9.2: Principal Components Analysis of the 1871 data: correlation bonds of high-loading variables.

TABLE 9.4: 1851 Component Correlation Matrices

COMPONENT ONE

	Sex ratio	Fert. ratio	Pop. density	H-h/ house	Pop./ house	Textiles & dress	Servs. /H-h	Size of H-h
Sex ratio	x	.53	.49	.59	.68	.28	-.65	-.03
Fertility ratio	.53	x	.39	.48	.46	.43	-.59	-.14
Population density	.49	.39	x	.78	.70	.55	-.58	-.54
Households per house	.59	.48	.78	x	.93	.75	-.78	-.54
Population per house	.68	.46	.70	.93	x	.70	-.69	-.24
Textiles & dress	.28	.43	.55	.75	.70	x	-.65	-.41
Servants/ household	-.65	-.59	-.58	-.78	-.69	-.68	x	.51
Size of household	-.03	-.14	-.54	-.54	-.24	-.41	.51	x

COMPONENT TWO

	Professional class	Employed in defence	Seaboard counties	Employed in production	Locally born
Professional class	x	.77	.39	-.35	-.47
Employed in defence	.77	x	.31	-.40	-.34
Born in seaboard co	.39	.31	x	-.22	-.45
Employed in production	-.35	-.40	-.22	x	-.17
Locally born	-.47	-.34	-.45	-.17	x

COMPONENT THREE

	Fertility ratio	Employed in conveyance	Locally born	Population employed	Working women	Born in Cornwall
Fertility ratio	x	.51	.23	-.46	-.62	-.21
Employed in conveyance	.51	x	.26	-.14	-.26	-.04
Locally born	.23	.26	x	-.01	-.15	-.58
Population employed	-.46	-.14	-.10	x	.60	.26
Working women	-.62	-.26	-.15	.60	x	.39
Born in Cornwall	-.21	-.04	-.58	.26	.39	x

COMPONENT FOUR

	Widowed heads	Solitary households	Female heads	Nuclear households	Employed in production
Widowed heads	x	.08	.37	-.17	-.24
Solitary households	.08	x	.46	-.58	-.10
Female heads	.37	.46	x	-.39	-.21
Nuclear households	-.17	-.58	-.39	x	.29
Employed in production	-.24	-.10	-.21	.29	x

COMPONENT FIVE

	Lodgers	Labourers/ unemployed	Born in Ireland	Elsewhere in Devon
Lodgers	x	.20	.26	-.25
Labourers & unemployed	.20	x	.20	-.13
Born in Ireland	.26	.20	x	-.31
Elsewhere in Devon	-.25	-.13	-.31	x

Approximate significance limits: .40+ 99.9%  
 .32-.39 99%  
 .23-.31 95%

TABLE 9.5: 1871 Component Correlation Matrices

COMPONENT ONE

	Age ratio	Pop. empl'd	Age of head	Working women	Servs/ H-h	Size H-h	Cornish born	Fert. ratio	Sex ratio	Nuclear H-h
Age ratio	x	.72	.81	.63	.42	.22	.26	-.73	-.51	-.44
Population employed	.72	x	.61	.60	.33	.26	.28	-.58	-.26	-.29
Age of head	.81	.61	x	.56	.28	.19	.11	-.54	-.45	-.46
Working women	.63	.60	.56	x	.57	.34	.37	-.64	-.63	-.33
Servants/ household	.42	.33	.28	.57	x	.63	.20	-.64	-.59	-.10
Size of household	.22	.26	.19	.34	.63	x	.10	-.38	-.26	.08
Born in Cornwall	.26	.28	.11	.37	.20	.10	x	-.26	-.28	-.23
Fertility ratio	-.73	-.58	-.54	-.64	-.64	-.38	-.26	x	.56	.31
Sex ratio	-.51	-.26	-.45	-.63	-.59	-.26	-.28	.56	x	.43
Nuclear households	-.44	-.29	-.46	-.33	-.10	.08	-.23	.31	.43	x

COMPONENT TWO

	Pop./ house	H-h/ house	Pop. density	Sex ratio	Textiles & dress	Servs/ H-h	Size of H-h
Population per house	x	.95	.58	.54	.29	-.73	-.46
Households per house	.95	x	.62	.53	.35	-.77	-.64
Population density	.58	.62	x	.43	.38	-.52	-.44
Sex ratio	.54	.53	.43	x	.18	-.59	-.26
Textiles & dress	.29	.35	.38	.18	x	-.30	-.45
Servants/ household	-.73	-.77	-.52	-.59	-.30	x	.64
Size of household	-.46	-.64	-.44	-.26	-.45	.64	x

COMPONENT THREE

	Profess. class	Empl'd in defence	Seaboard counties	Locally born	Empl'd in conveyance	Labourers/ unemployed
Professional class	x	.81	.35	-.44	-.36	-.51
Employed in defence	.81	x	.27	-.27	-.15	-.35
Born in seaboard co	.35	.27	x	-.47	-.34	-.35
Locally born	-.44	-.27	-.47	x	.45	.43
Employed in conveyance	-.36	-.15	-.34	.45	x	.20
Labourers & unemployed	-.51	-.35	-.35	.43	.20	x

Approximate significance limits: .39+ 99.9%  
 .30-.37 99%  
 .21-.29 95%

TABLE 9.6: Eigenvalues of first five components for 1851 and 1871

1851:	percentage variance	cumulative percentage
Component One	24.5	24.5
Component Two	11.7	36.2
Component Three	9.0	45.3
Component Four	8.1	53.4
Component Five	7.0	60.4

1871:	percentage variance	cumulative percentage
Component One	27.9	27.9
Component Two	11.5	39.4
Component Three	10.6	50.1
Component Four	5.9	56.0
Component Five	5.6	61.6

distribution of the female population in determining the social geography of mid-19th century Plymouth. There were two major kinds of female employment: domestic service and dressmaking. The former typically comprised young, unmarried women, the latter (which will often have been former servants) were more mature, married women. The truth of this is borne out by the correlation matrix wherein these two occupations are negatively correlated while those employed in textiles and dress correlates positively with the fertility ratio.

This component, therefore, is clearly socio-economic and closely interwoven with the spatial pattern of overcrowding. Figure 9.3, a map of the component scores for Component One, confirms that the most overcrowded enumeration districts were those to the north and west of Sutton Harbour (the oldest part of the town), the northern part of Stonehouse, and areas of newer housing northwest of Sutton.

Component Two (see Figure 9.4a) accounted for nearly twelve percent of the total variance and may be described as the forces factor. Armed

1851: Component One

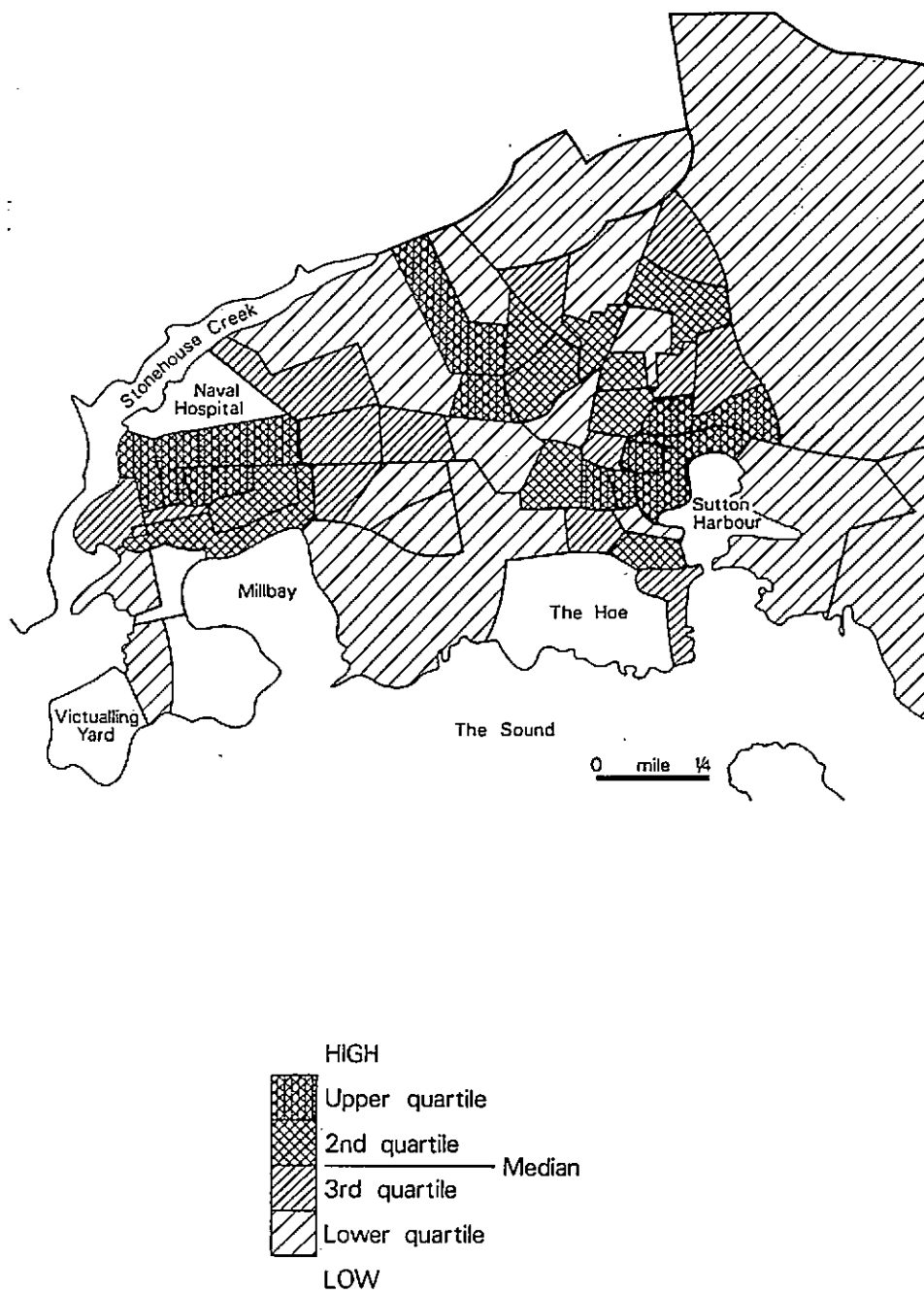
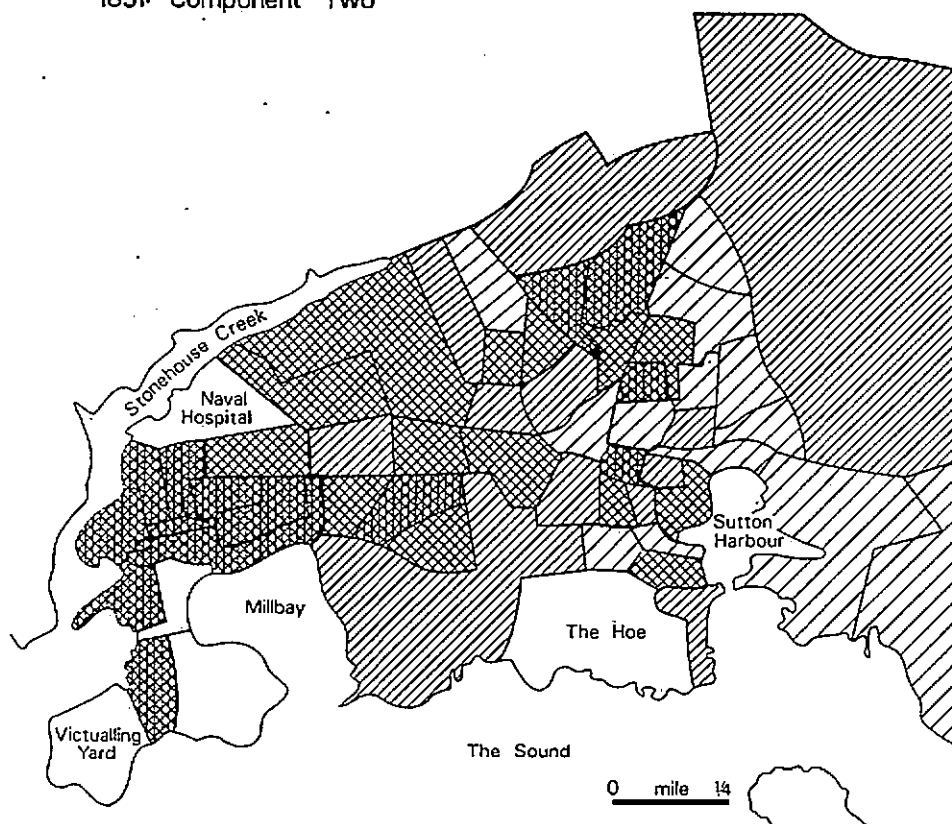


Figure 9.3: Scores on Component One, 1851, identifying the poorer, more densely-populated and overcrowded districts of Plymouth and Stonehouse.

1851: Component Two



1851: Component Three

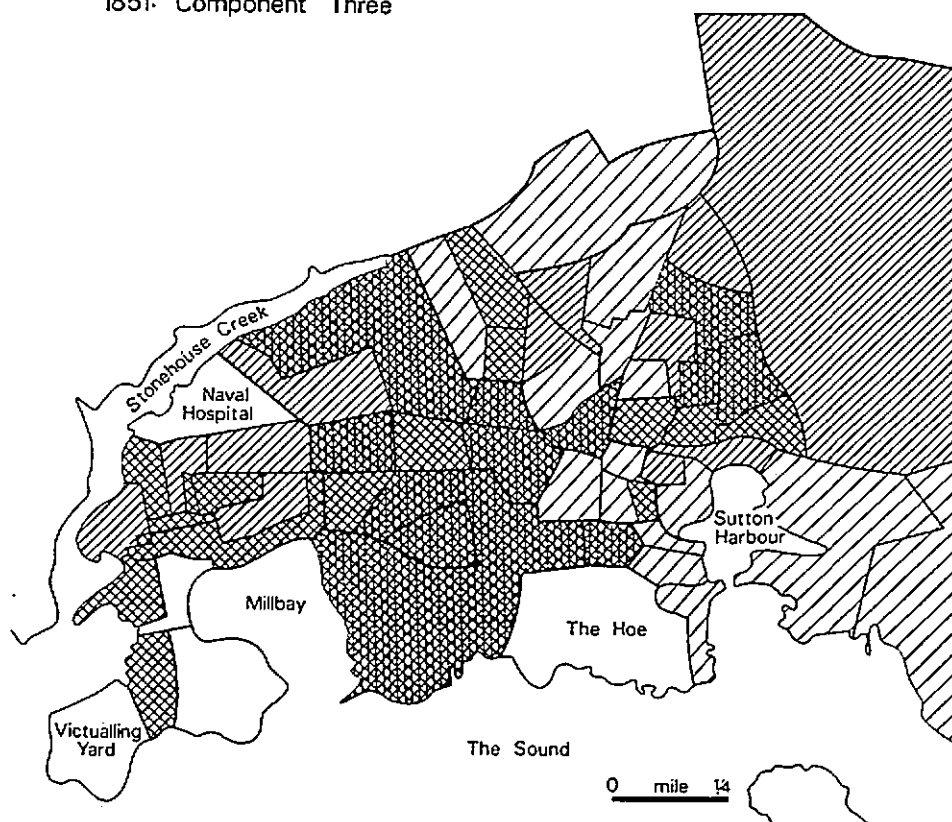


Figure 9.4: (a) Scores on Component Two, 1851, identifying the distribution of the impact of the forces' presence in Plymouth and Stonehouse enumeration districts. (b) Scores on Component Three, 1851, highlighting the distribution of the female population.

forces employment formed part of the professional occupational class and so loads positively with this variable. However, positive correlation with those born in seaboard counties was unexpected, though not wholly unremarkable; it has previously been suggested that migrants to Plymouth from seaboard counties were frequently employed in the fishing industry, clearly there was a naval connection also, though curiously the seaboard variable correlates more strongly with the overall professional class than the forces element within it.

These three variables correlated negatively with locally-born inhabitants and also those employed in productive industries. There was, however, a weak negative correlation between the latter two variables (less than 5% significance).

Component Three highlights the female population. While the distribution of servants did not figure greatly in this factor, it did have some influence representing a sizeable proportion of women in employment and of Cornish in-migrants, and it is this variable which may be regarded as explaining the strong correlation between working women and Cornish-born inhabitants. It is only to be expected that working women will have correlated positively with the total employed population. The strongest negative correlation occurred between working women and the fertility ratio - in keeping with the interpretation of Component One and the importance of domestic service as a female occupation.

A strong positive correlation between people employed in conveyance and the fertility ratio may seem a little surprising at first glance; in fact, this connection probably comprised families whose livelihood came from the merchant navy sector of the local economy (some ten percent of the working population in 1851) of which the greatest

number were seamen. The weaker connection with locally-born people simply reflects the long-standing tradition of sea-faring trade in the town.

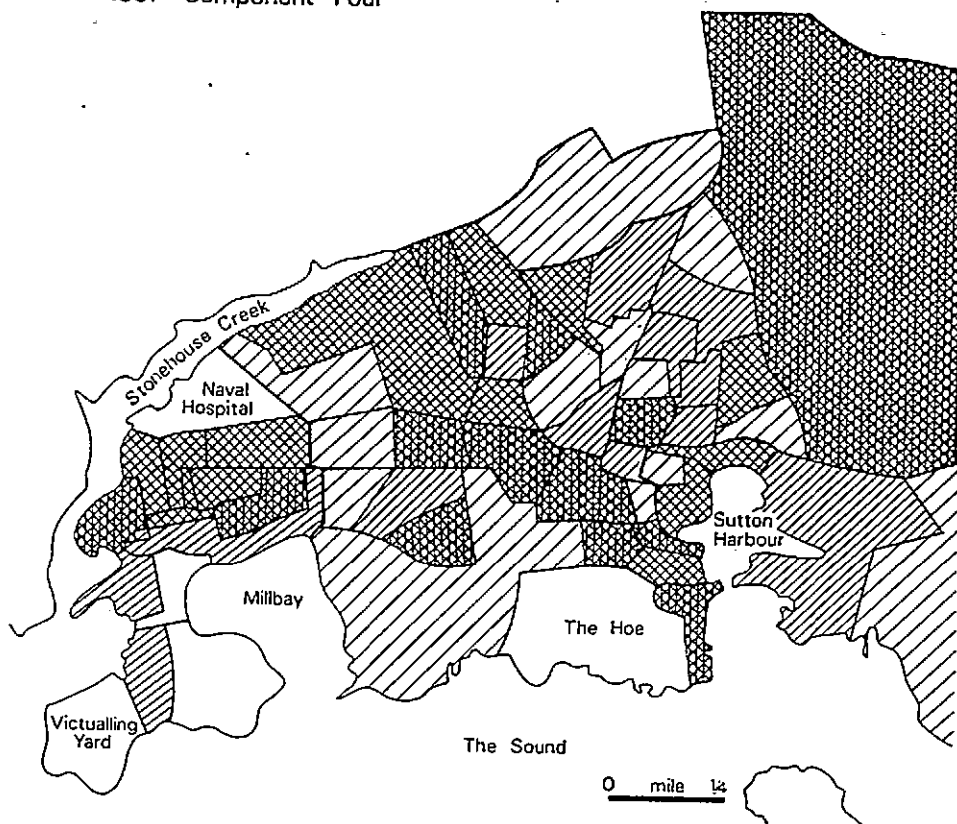
Essentially this component is that of working women and explains nine percent of variance. The distribution map of component scores (Figure 9.4b) presents a striking contrast to that of the scores on Component One, the enumeration districts most affected were less-densely populated, containing larger houses and more prosperous households. While domestic service did not rank as one of the highest loaded variables for this factor, it did evidently influence the distribution of other variables.

Component Four is a fairly straightforward family status distinction but it explains only a further eight percent of the total variance. Single-person households are positively correlated with households with female or widowed heads (which are, of course, closely correlated) and differently distributed from nuclear households which were characteristically supported by men employed in production industries - though this last variable is likely to be significant by virtue of its dominance as a form of employment in the sample. This difference in distribution of household type in all probability reflects a difference in the nature of available accommodation (see Figure 9.5a).

While the variables may be expected to relate to each other in this fashion, it is perhaps remarkable that the distributions of nuclear and solitary households should account for so much difference in distribution. A glance at the ranked list of variable loadings on this component shows working women and locally-born inhabitants fairly highly placed, and these were positively correlated with solitary



1851: Component Four



1851: Component Five

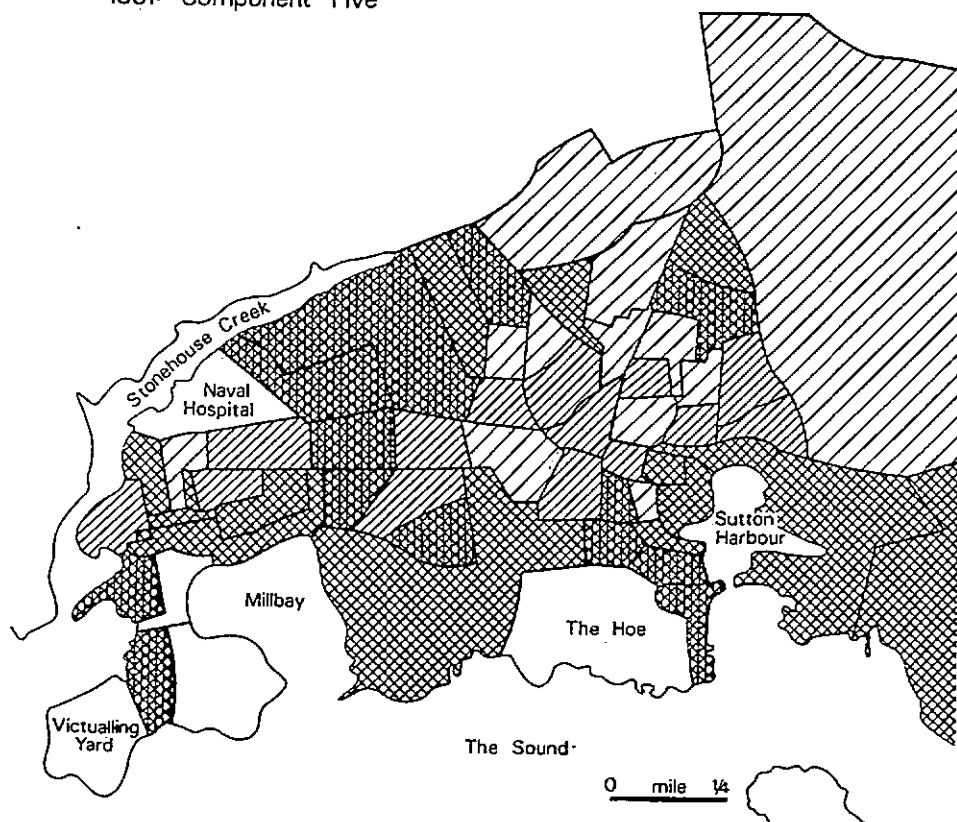


Figure 9.5: (a) Scores on Component Four, 1851, identifying the distribution of the family status component in Plymouth and Stonehouse enumeration districts. (b) Scores on Component Five, 1851, showing the distribution of the Irish population.

households, while Irish-born residents correlated with nuclear households, indicating an underlying influence of birthplace on this factor. As has already been seen, there were marked differences in the distributions of population according to birthplace.

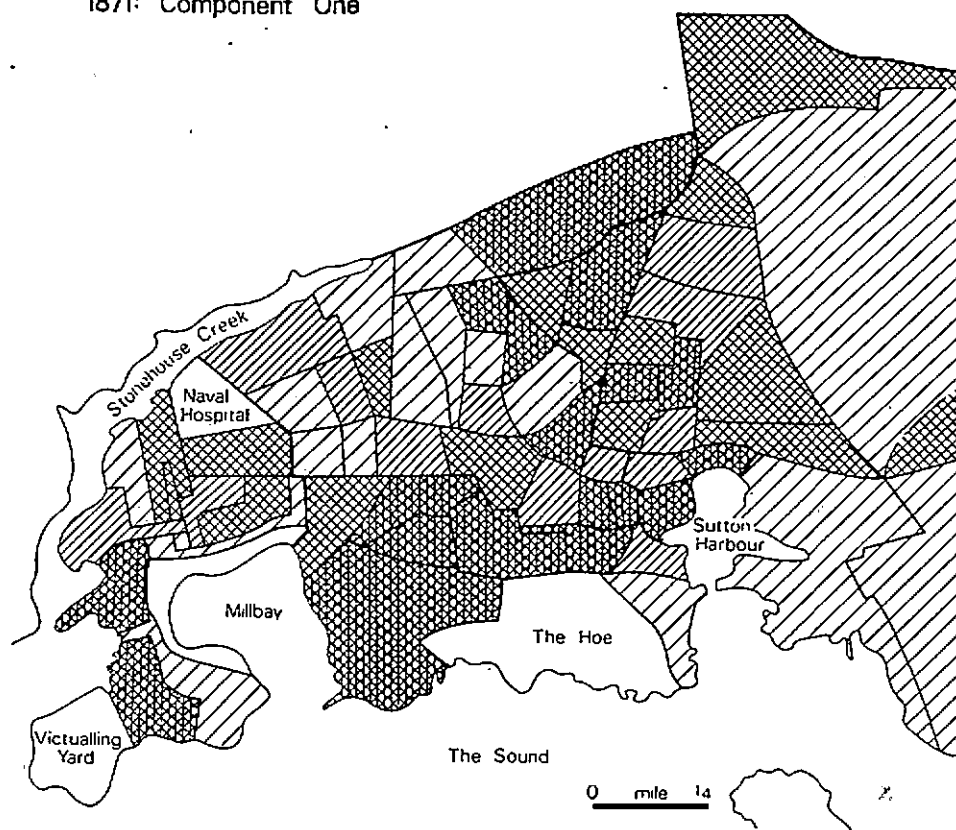
The explanatory power of components becomes progressively weaker after the extraction of Component Five (accounting for seven percent of variance). Yet this component can be identified, in part, as that of the Irish contingent, generally employed in labouring and living in cramped rented accommodation (see Figure 9.5b).

### 9.1.3 Principal component analysis of the 1871 data

As predicted earlier in this chapter, the principal component analysis of the 1871 census data indicates that some change occurred in the spatial patterns of population distribution in the twenty-year period.

Component Two (Figure 9.6b) and Component Three (Figure 9.7) are directly comparable with Components One and Two for 1851, concerned with population density and the armed forces respectively, but a new and rather complex first component emerges to explain nearly twenty-eight percent of variance. In Component One for 1871 (see Figure 9.6a), seven high-loading variables (Table 9.3) were positively inter-correlated, and three were very strongly correlated with the other four variables: the age ratio, the number of people in employment, and the number of working women (the servants per household variable was also highly loaded). Together these seven variables may be identified as indicative of the more affluent

1871: Component One



1871: Component Two

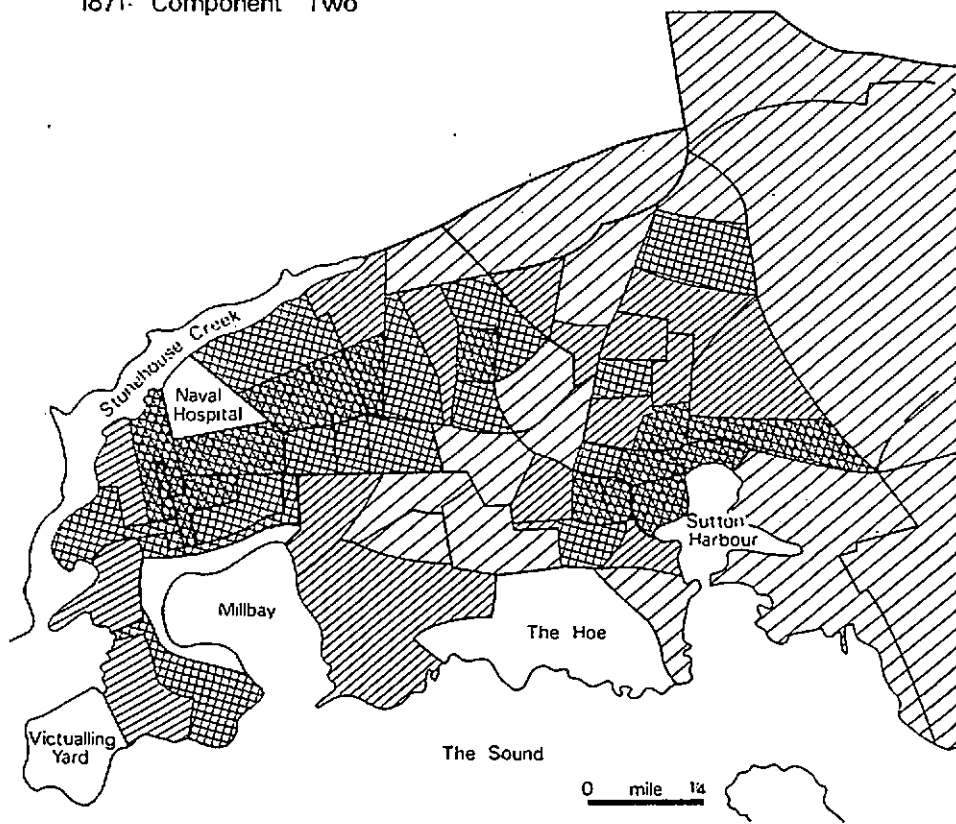


Figure 9.6: (a) Scores on Component One, 1871, identifying the more prosperous districts of Plymouth and Stonehouse.  
(b) Scores on Component Two, 1871, identifying the poorer, more densely-populated districts.

1871: Component Three

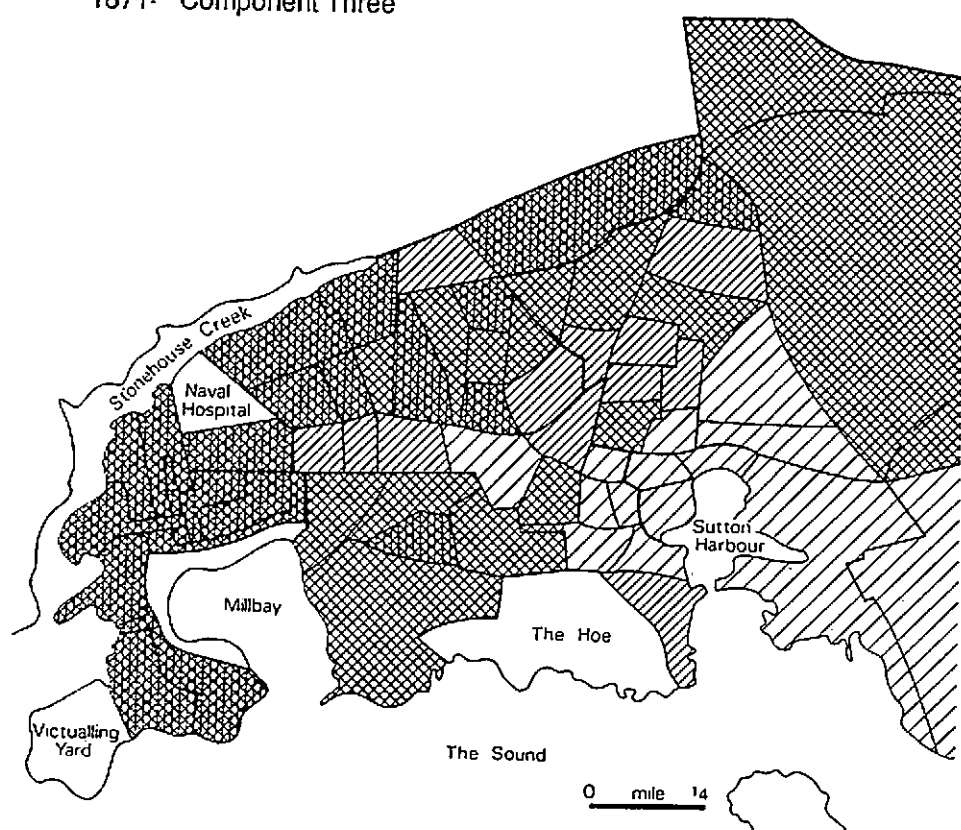


Figure 9.7: Scores on Component Three, 1871, showing the distribution of the impact of the forces' presence in Plymouth and Stonehouse enumeration districts.

households. The variables are all negatively correlated with the distribution of nuclear households which displays close correlations with the fertility ratios and the sex ratios. What may be concluded from this complicated matrix is the importance, yet again, of the female population, particularly the two dominant groups comprising unmarried servants and married mothers. The distributions of these two groups were strikingly and significantly different since their presence also dominates the second component.

The remaining components extrapolated in the analysis of the 1871 data displayed much simpler aspects of Plymouth's population distribution, with high loadings concentrated among a small number of variables, and together accounted for over twenty percent of variance. Component Four very clearly comprised a positive correlation between single-person households and female heads of household, both negatively correlated with nuclear households. Component Five demonstrated a relationship between those employed in textiles and dress and those employed in production against the proportion of lodgers and the size of household (which indicates that size of household is not purely an 'affluent' variable).

#### 9.1.4 Some implications of the principal component analyses

The component analyses raise a number of questions both individually and in comparison. In 1851 the dominant variables of the first component indicate that the most significant distribution was that of the poorer population living in more densely populated housing. This distribution was still of importance in 1871 but had been superseded

apparently by that of the more affluent. Although, at first glance, this interpretation is compelling, it is really too simplistic. The 19th century saw a huge extension of domestic service not only in the homes of the rich but also among the middle classes wherein the solitary 'maid-of-all-work' became an indispensable member of the household. It may be argued, therefore, that the primary component for 1871 reflects the improved socio-economic status of the middle classes, the entrepreneurial sector.

Three implications of this statistical change in emphasis of the governing variables and their correlations for the spatial patterns apparent in mid-19th century Plymouth and Stonehouse may be identified:-

(1) with the flow of in-migration at least decreasing and in parts actually reversed over the twenty-year period, the population was becoming more settled: migrant families were becoming established in the local economy and the general prosperity of the two towns is inferred to have risen;

(2) the most prosperous families were moving away from the town centre to the new suburbs beyond the town boundaries; hence while this group figured prominently as a feature of Component One for 1851, they were of less importance in 1871 when they were significantly placed in Component Two. In addition, this common component explained nearly 25 percent of the total variance in the first census year studied but only 11.5 percent of variance in the latter census year;

(3) the forces factor is similarly demoted, but it should be noted that the difference in explained variance fell by only one percent (from 11.7 to 10.6) and thus the importance of the forces presence in the two towns continued much as before.

Overall it would appear that, with the cessation of immigration,

the population became more integrated and homogeneous. Yet one characteristic of the homogeneity was, despite all efforts to alleviate the problem, an extension of the overcrowding and consequent social distress. So strong was the pressure of population in a limited area that even new housing was overcrowded as soon as it was inhabited. The choropleth maps illustrate the changing social geography very clearly. In particular, comparison between 1851 Component One and 1871 Component Two shows the increasing incidence of overcrowding and the contraction of the less-crowded, better-off areas, in keeping with the release of estate land for house-building. Comparison between 1851 Component Two and 1871 Component Three displays an intensification of forces personnel in the western areas with a movement away from Sutton Harbour as activities were extended and concentrated around Millbay.

#### 9.2.1 Pattern, process and form: an appraisal of Social Geography

In the post-war years, the empirical study of spatial variations in social phenomena has predominated, the quantitative work carried out in the 1960s and 1970s provided valuable detail of Victorian social and spatial structure to set alongside contemporaries' own recorded perceptions of their cities. But the usefulness of these studies was limited, most were basic descriptions of medium-sized, British industrial cities and rarely attempted to incorporate philosophical and theoretical developments in urban history or modern social geography (Pooley & Lawton, 1988). The question arose, therefore, as to how well these studies represented British urban experience. There

has been a comparative drought in terms of research publications in the 1980s, a retrenchment "as the limitations of much earlier work have been realised but relatively little that is innovative has been attempted" (Pooley & Lawton, 1988).

In the 1970s, historical geographers sought to reconstruct the spatial structures of Victorian towns and cities and compare them with model cities proposed by Sjoberg (1960), Burgess (1925), Hoyt (1939) or Vance (1971). Broadly, the object was to ascertain whether the town being studied could be classified as pre-industrial, modern-industrial, or in transition or 'emerging' (Warnes, 1973). While a pre-industrial town exhibited little residential segregation, a modern town or city would have a clear pattern of segregation (Pooley, 1979b) and, according to social area theory, was defined as one in which socio-economic status, family status and ethnic status were uncorrelated and displayed different spatial patterns (after Shevky & Bell, 1955). Keen to establish the modernity of Victorian cities, geographers (such as Shaw, 1977; Dennis, 1976) "frantically searched" for signs of the increasing residential segregation that was "expected to accompany industrialisation, specialisation and alterations in social structure" (Dennis, 1982). Given the limitations of the census, it was probably inevitable that statistical analyses produced separate dimensions that fitted with social area theory (Dennis & Prince, 1988).

Some writers have stressed the transitional nature of Victorian cities (Goheen, 1970; Timms, 1971; Warnes, 1973; Fox, 1979; Gordon, 1979), highlighting the differences between 19th- and 20th-century cities; even cross-sectional studies at a single date have assumed that Victorian cities were in transition (Cartér & Wheatley, 1978). The transitional stage might be characterised by two contrasting types



of high-status area, the old centre and the new suburb - a combination of pre-industrial and modern models (Shaw, 1980). The mid-19th century was Cardiff's "industrial 'take-off' phase" when it developed from a small market town into a considerable commercial port (Lewis, 1979). By the 1870s, patterns of segregation were emerging which might be described as modern, although Lewis considered that the appellation 'modern' was not appropriate until late in the 19th century. Plymouth experienced similar forces causing change: the growth of port traffic, population growth rates, a higher than average population per house ratio (though much higher in Plymouth than in Cardiff), and consequential overcrowding and insanitary conditions. However, Cardiff's trade was based upon coal and iron, Plymouth had much more varied imports and exports plus the sizeable fishing industry.

Others writers have identified modern characteristics in Victorian towns (Shaw, 1977; Pritchard, 1976) or have suggested that larger industrial towns developed clear patterns of residential differentiation by the mid-19th century making them more similar than dissimilar to modern towns (Lawton & Pooley, 1976; Cannadine, 1977). Pooley (1982) accepted that Liverpool could be interpreted either as a modern industrial city or as a transitional Victorian city, "depending on the preferred theory and scale of analysis", and Carter (1983) observed that "much of the controversy is based on semantics rather than reality". Distinctive residential areas could be identified in mid-19th century Liverpool and the urban structure and residential segregation of manual and non-manual 'working-class' populations did closely resemble that found in 20th-century towns.

Certainly the results of these studies together present a rather confused picture which cannot be explained simply in terms of

different towns developing segregation patterns on different timescales. Ward (1975, 1976, 1980) has argued most strongly that, despite segregation at the extremes of society, a subtle mix of groups and classes was more characteristic of the Victorian city than the formation of distinct residential areas. Yet he conceded that, at the street and block level, separated social, occupational and migrant groups did occur in even the smallest towns. In the Gorbals area of Glasgow annuitants and paupers lived in adjacent streets (Robb, n.d.), a classic "front street-back street" dichotomy (Carter, 1983); such evidence supports the view that segregation always existed but what changed during the 19th century was the scale at which it operated.

Studying Victorian Wolverhampton, which experienced a similar population growth pattern to Plymouth, Shaw (1977) identified a late pre-industrial city in 1871. But the two places are not otherwise comparable, Wolverhampton was, by 1851, "a former market town gathering to itself the factories and problems of an important manufacturing town", Plymouth had its factories but manufacturing was never a major component of the local economy. Carter & Wheatley (1977), considering the spatial socio-economic patterns in Aberystwyth, 1850-1870, when the railway came to the town, concluded that the decline of the inner areas was not on the same scale as in industrial towns but that the inversion of the pre-industrial patterns was in progress after 1850. The same kind of cause and effect was observed in Plymouth: the proximity of Millbay railway station was a prime reason to move for the Gifford family (see Chapter Five).

If the Plymouth findings are compared with the Sjoberg/Burgess model, its morphological evolution, based on map evidence alone, indicates the classic reversal during the 19th century but in a timespan extending considerably beyond that of this census-based

analysis. The principal component analyses seem to suggest that Plymouth was actually becoming less segregated by 1871, contrary to transition theory expectations, but this conclusion would mask the more pertinent observation that the scale of social separation was changing. Logically, there was a transition from pre-industrial to modern urban structure in 19th-century Plymouth and the mid-Victorian period, studied here, was probably too buried in the middle of that transition to allow the reliable identification of specific characteristics.

In the 1980s, the usefulness of the "dichotomous classification of socio-geographical patterns" has been questioned, thus Ward (1983) described this framework for Victorian urban society as "highly simplified and somewhat misleading", and hypotheses of transition, based on the concept of a continuum of urban residential change, may have "obscured our understanding of socio-spatial change more than they have enlightened it" (Dennis, 1982). There is a danger in using theoretical models which become "straitjackets into which reality must be forced" (Dennis, 1984); since different forces will be operating in different places then, possibly, no hard and fast theory can be formulated (it may be an inevitable corollary when dealing with 'soft facts' which may in themselves be open to different interpretation). In addition, there is an inherent problem in applying 20th-century models of urban development to the study of 19th-century towns: they do not take account of the ideology and perception and consequent behaviour of Victorian contemporaries.

Pooley and Lawton (1988) justifiably described the debate over the modernity of Victorian cities as "illusory and distracting, leading to an over-emphasis on pattern at the expense of process". An inherent problem was that different processes worked to produce modern patterns

of residential separation, as comparison of British and North American experience has shown (Cannadine, 1977). Clearly, urban historical research had to reject this "somewhat sterile and static approach" (Pooley, 1982) and focus on the processes of change operating in Victorian cities to explain observed patterns of residential segregation and mobility (Dennis, 1982). While there were few, if any, socially-exclusive residential areas, less distinct levels of segregation must have had some influence on Victorian urban society (Pooley, 1984). Cannadine (1982), echoing Harvey (1975), focused on the key issue, simply, what are the processes connecting patterns and form? In the 1980s, work on residential differentiation has become increasingly concerned with the meaning and experience of segregation rather than its measurement (Dennis & Prince, 1988). Several writers have identified processes and aspects of Victorian urban life which influenced residential development and which, therefore, require more detailed investigation (Dennis, 1982, 1984; Johnson & Pooley, 1982; Pooley, 1982; Carter, 1983; Carter & Lewis, 1983; Dennis & Prince, 1988; Pooley & Lawton, 1988):-

(1) The Victorian era saw changes in political control and, as economic and social forces interacted to shape a city's social geography, government and institutions clearly had an effect through health and housing legislation. Environments were moulded by the political, religious and, also, aesthetic beliefs held by designers and patrons.

(2) Pre-existing patterns of landownership explained the "development of certain types of urban area, and the emergence of characteristic residential and industrial zones" (Kellest, 1969). The decisions of developers and the control of leaseholders also influenced the growth and characteristics of built-up areas.

(3) Environmental quality varied greatly in Victorian cities with regard to housing, sanitation, water-supply, pollution, noise and congestion. Relief, drainage and flood risk, factories and railways, and population density were all motivating forces in decisions to migrate; the more deleterious aspects were spatially and socially concentrated in inner-city, low-status areas. This affected Victorian perception of residential districts, the evaluation of development land, the type of property built, and the value of housing.

(4) Individual decision-making, based upon contemporary images of residential areas, affected the development of residential separation. Victorian observers believed their cities to be segregated, yet there is confusion among geographers as to the extent of residential differentiation. Cannadine (1982) identified the two concepts of objective (concerned with income, occupation, status, and ethnicity) and subjective (stressing contemporary mental maps) residential differentiation.

(5) The urban housing market was closely linked to population mobility, most dwellings were privately rented which gave control to landlords. Few Victorians bought their homes, they could not borrow the necessary capital and so they could easily move into different accommodation better adjusted to changing income and family needs (Burnett, 1978). In this way, life-cycle and socio-economic status remained linked and did not become separate dimensions operating independently of each other.

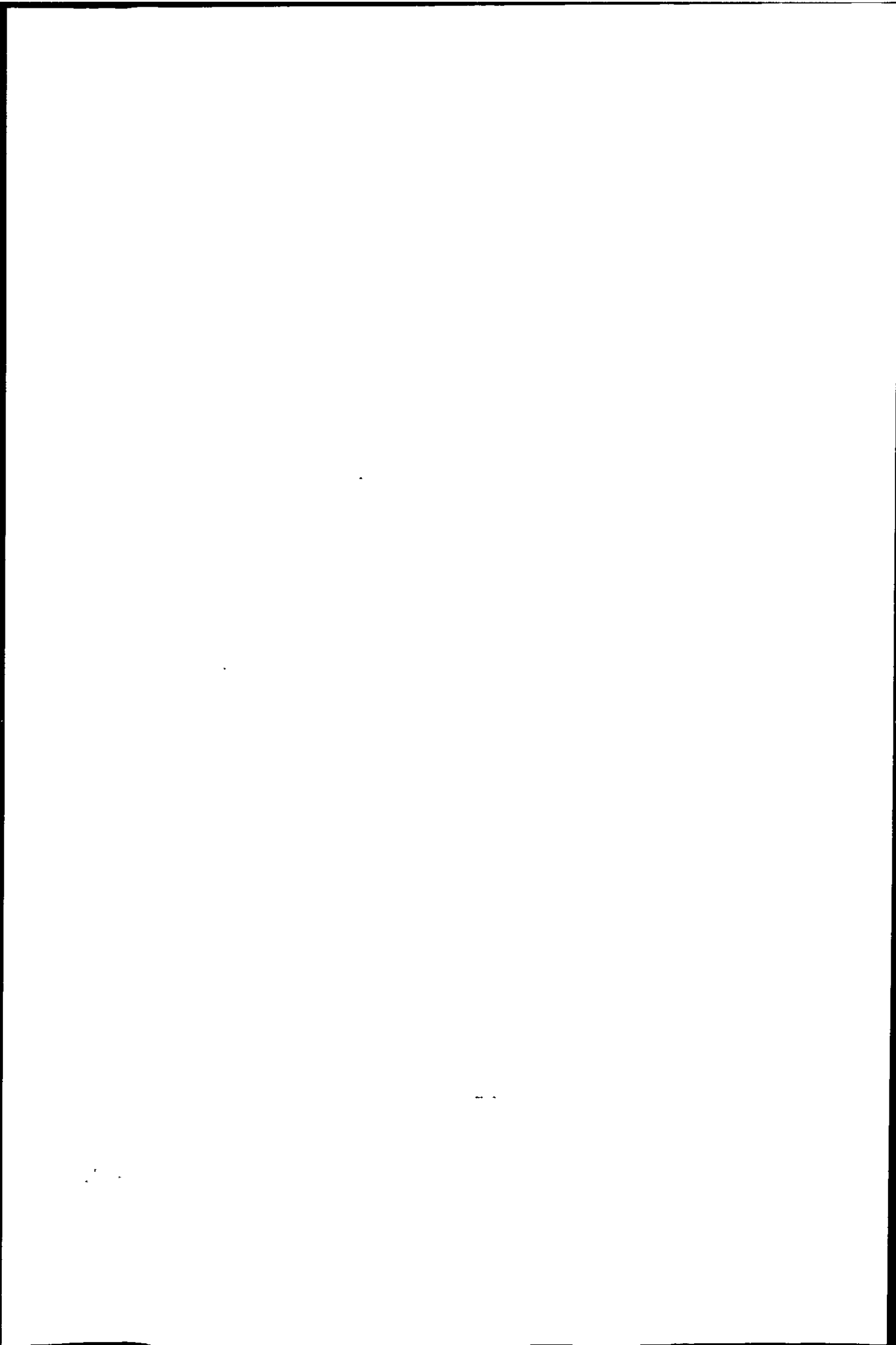
(6) Mobility was an important feature in 19th-century urban change but it was not a complete explanation. In Liverpool high rates of intra-urban residential mobility were found among lower-status households in the "family-building stage of the life-cycle" (Pooley, 1979), and in Cardiff both household composition and family life-cycle

characteristics were associated with the residential differentiation of birthplace groups (Williams, 1979). The inference is that life-cycle characteristics were more dominant than ethnic status in determining residential location; since certain life-cycle characteristics are also typical of migrants, birthplace may be more symptomatic than causative in residential separation.

(7) Population growth was the "significant driving force" in Victorian demographic change and the inter-mixing of people from different ethnic origins (Carter, 1983). In combination with the high rates of population turnover, the social composition of relatively small areas became heterogeneous and also "potentially ephemeral" (Ward, 1983). In Leeds, population growth caused a westward relocation of many merchants and also an eastward expansion with "rows, yards and courts of cottage property" (Ward, 1980), a pattern repeated throughout the country and clearly seen in Plymouth.

(8) Changes in industry and commerce affected the development of residential patterns in the Victorian city; Shaw's work on Wolverhampton (1977, 1979) showed the emergence of a high-quality residential sector repelled by industry and attracted towards open land. The aspirations, social characteristics and residential choice of the population were influenced by the structure and location of employment and the operation of labour markets. Occupation remained a dominant cause of areal differences during the mid-19th century; Pooley (1984) cites the dock labour force in Liverpool who needed to live close to their workplace due to the system of employment. In Plymouth links have been identified between maritime employment and the incidence of absentee heads of household, and between an imbalance in sex ratios and a high incidence of domestic service.

(9) The relationship between class consciousness and residential



segregation is a complex and constantly-evolving factor in urban social structure. The division of labour, the development of class consciousness and the desire for upward mobility contributed to significant changes in Victorian society. Well-paid artisans were adopting middle-class values and clerical employees, the lower middle class, were moving to homogeneous districts to maintain their status. These trends had clear ramifications for the development of residential segregation.

Such an agenda is clearly multi-disciplinary, requiring input from history, sociology, economics, political science, demography, psychology and ecology, as well as geography. Pooley & Lawton (1988) recognised the contribution which has already been made by urban historical geographers who have described spatial patterns of social phenomena and investigated the social, economic and political processes shaping these patterns. But the full impact of these processes and patterns on local people and on the structural processes which shaped Victorian cities has yet to be determined.

Descriptive studies of the main dimensions of Victorian urban structure and residential distributions of social classes and migrant groups are important preliminary exercises, but such work should be expanded to investigate the processes which caused residential segregation to develop, "the complex economic and social forces which affected individual residential location" (Pooley, 1982). Cannadine (1982) stated that geographers, when evolving general theories of the city, should relate the social structure of the city to the spatial form which the city assumes. Researchers are still seeking an embracing theory, a model which will encapsulate the processes which produce both spatial form and social patterns, despite possibly the only consensus that no two towns shared the same experiences, "none of



the theories or hypotheses yet propounded is satisfactory" (Cannadine, 1982). Pooley (1982) strongly advocated that the geographical interpretation of historical data should be undertaken within a carefully-formulated theoretical framework. He suggested that theories developed to investigate processes causing residential separation in modern urban areas would provide a good starting point.

Dennis (1984), however, is dubious about developing the 'clear and more coherent body of theory' advocated by Johnson and Pooley (1982), and even less enthusiastic about Fraser and Sutcliffe's (1983) hope for "a general theory of urban geography which advances significantly beyond that of the Chicago school". A good deal of urban geographical theory has been borrowed from other disciplines but a general theory would presumably emphasise the significance of location. Cannadine (1982) came to the speculative conclusion that either there is no connection at all between spatial and social patterns, or there might be links but they are relatively unimportant, or there is a connection but the lines of causality run both ways. Ultimately the solution lies in further research into the relationship between pattern and process, and "such work requires a much wider range of quantitative and qualitative sources than have been conventionally used by social geographers" (Pooley & Lawton 1988).

#### 9.2.2 Methodology: some conclusions

Pooley (1979b) suggested that many of the interpretational differences on the fundamental spatial structure of the Victorian city stem from the way in which the data have been handled. This research project

has employed established statistical techniques to investigate the social geography of mid-Victorian Plymouth and Stonehouse; while it was not intended to test the effectiveness of these techniques, their limitations have been apparent and several methodological problems are, therefore, considered here.

There are problems inherent in the data sources available for the investigation of links between pattern, process and form, and the significance of residential differentiation. Data on individuals from the census manuscripts enable the identification of spatial patterns of social characteristics, while nominal record linkage techniques, employing the census plus directories, rate books and poll books, have been used elsewhere to investigate process (Pooley, 1984). As was noted in Chapter Two, these sources also contain valuable information on individuals and families which is overlooked in multivariate analysis. Also, while the manuscript census recorded a great deal on family and household structure, occupation and birthplace, it contains nothing about housing conditions and so the emphasis of research has been on the morphology of the social environment at the expense of the morphology of the built environment (Dennis & Prince, 1988).

The processes of urban change must have operated over a longer timespan than might be inferred from the emphasis of many studies which have concentrated on the 1851, 1861 and 1871 censuses, covering too short a period to expect much change; there were important technological and political developments earlier and later in the 19th century (Dennis, 1979; Carter & Wheatley, 1979). Evidence has indicated that the larger the town or city and the earlier they experienced rapid population growth and industrialisation, the sooner they developed characteristically modern, residentially segregated social areas. Further work is required, therefore, on the early 19th

century and also on the late-Victorian and Edwardian eras (Pooley, 1982; Dennis, 1982).

The absence of a consistent taxonomy in the analyses of Victorian towns and cities (Ward, 1983) has been frequently acknowledged as a major cause of apparent contradictions between some analyses of Victorian towns and cities. The main 'problem area' is the choice of means employed to assign individuals to class or status groups and this was discussed at some length in Chapter Two. There was no consensus among Victorians as to the definition of class or status in their society but this should not diminish the importance of contemporary opinion and perceptions for "our attitudes to segregation or our class-consciousness may not correspond with those of our forefathers" (Dennis, 1979). Many writers have followed Armstrong's (1972a) lead and used the 1951 Classification of Occupations to assign socio-economic status to 19th-century occupations but, of course, the application of this 20th-century scheme takes no account of Victorian perception. Even within the 19th century, it is likely that social structure altered sufficiently to render fixed status classifications inappropriate at some point (Dennis, 1984). Cowlard (1979), recognising the importance of contemporary perception, devised an eighteen-class scheme to identify social (class) areas in Wakefield, West Riding, "as distinctive milieux in the contemporary mind".

The most frequently used spatial framework, the census enumeration district, is unsatisfactory; it is generally too large and often combines two or more markedly different types of residential area. An alternative arbitrary grid gives more objective, equally-sized units and has been employed by Goheen (1970), Tansey (1973), and Shaw (1977, 1979). The problem of sub-areal framework definition "lies behind much of the apparent contradictory evidence" on 19th-century towns;

the enumeration district proved suitable for cities like Liverpool but it has been suggested that smaller towns like Chorley require a smaller areal framework to measure spatial differences (Pooley, 1979b).

Segregation existed at a variety of scales in Merthyr Tydfil and Carter and Wheatley (1980) concluded that overall generalisations about segregation in the 19th-century city were quite meaningless unless scale was specified; size, growth rate and functional character all affected the degree of segregation. Furthermore, the scale of segregation could change and such change might have had repercussions on class-consciousness and inter-class relations. The influence of scale on segregation was also tested by Ward (1980): residential patterns by social strata at several spatial scales in mid-19th century Leeds indicated that descriptions of early Victorian cities as dichotomous were misleading, in fact Ward found evidence that the level of residential differentiation actually diminished during the mid-Victorian period.

Principal component analysis has been used in this study to identify types of urban sub-area in Plymouth which may provide a sampling frame for the study of specific problems. Factor analysis was used here to aid description of the social fabric of the city and, more importantly, to suggest future areas of detailed research. The selection of variables is crucial to the outcome of component analyses. While the list of variables which may be obtained from the 19th-century censuses do compare favourably with factorial ecologies of modern towns (Rees, 1972), there are deficiencies with regard to "small-area statistics on housing quality and value, demographic variables indicating vital trends, residential mobility, health, education and income" (Pooley, 1979b). Variables were selected for

the component analyses in this study with regard to their representative nature, with the intention of covering all the principal facets of the mid-19th century population; in addition, variables which displayed little or no visible differentiation in distribution were excluded. The final choice was considered to be comparable with variable lists commonly employed in other factorial analyses.

The influence of the female population upon the Plymouth analyses is striking and perhaps requires further investigation than has been possible within the limits of this project. Plymouth attracted short-distance migrant young women in common with other towns and cities in Victorian times, but in addition, had a much higher proportion of households in which, by virtue of the sea-going economic base, the male head was absent. Also the forces presence maintained a sizeable population of prostitutes, seven out of every thousand women were known prostitutes, an incidence not found in the inland industrial towns of the North and Midlands, for example. The importance of the female population in determining the social geography of Plymouth and Stonehouse implies either that women had a more important role in these towns, or that studies of other towns and cities, by selecting different variables, may not have been capable of yielding similar insights.

Lawton and Pooley (1976), in their study of the social geography of Merseyside, wrote:

"...the involvement of women and children in the workforce was undoubtedly under-represented in the census and will be very different in a port town like Liverpool, which has restricted opportunities for female employment than in a textile town like Manchester." (SSRC Report)

They included two measures of servants (who were predominantly female) in their 35 variables: number of servants per family (nuclear and extended) and resident domestic servants as a percentage of total population; this study used one such measure: number of servants per household. Both analyses included sex ratio and measures of working women, however, the Plymouth project also entered the fertility ratio (and age ratio, against population by age groups 0-4, 0-14, 15-64, and 65 and over for Liverpool) and the number of female heads of household into the analysis.

It may be contended that when women are in the majority in a population, the selection of only two variables which may be regarded as involving gender differentiation might hinder the outcome of analysis. The results of the Plymouth investigation, with four 'female' variables, suggest that this majority group has a rather more significant impact upon the social geography of urban areas than other studies have indicated. It has not been possible to investigate this contention beyond brief comparison of various studies in the course of this research project, clearly detailed statistical tests are required to measure fully the effect of variable choice in factorial analyses and the consequences for urban ecology.

Lawton (1972) noted the inter-disciplinary nature of Victorian studies and welcomed the consequent "fusion of methodology, and conceptual and analytical techniques". He identified a three-fold contribution by geographers to the analysis of social and spatial change in an evolving society: in spatial analysis for individual cities of various themes; in comparative studies of the social patterns within cities; and in case studies from which to derive a broader understanding of the processes of 19th-century urbanisation. There has been criticism

that "geographers describe social patterns without attempting to understand the society that creates those spatial forms" (Pooley & Lawton, 1988). Notwithstanding Gregory's (1978) observation that "to concentrate on a universal spatial logic... is to obscure the mediations which have made human geography a distinctly human science", there are two problems inherent in the "new era of growth and vitality" of which Pooley and Lawton talk:

(1) it requires a substantial non-geographical element. Yet geographers should not lose sight of their spatial roots, their primary role should be to determine the incidence of phenomena in space; and

(2) it requires co-operation between the disciplines of geography, history, sociology, political science, and even economics and psychology, the consequent demand for teamwork will restrict the work possible within the structure of individual research.

Geographers seeking to analyse segregation should be "more discriminating in their selection of an appropriate research methodology" (Dennis, 1980), particularly, it is advisable to use more diverse contemporary sources in addition to the purely statistical census. Jackson (1981), concluded that more comparative or regional studies are needed, applying similar methodologies and working at different scales, before more general statements about 19th-century social area developments can be made. More towns and cities need to be empirically investigated and over a wider timespan in order to assess the full significance of residential separation (Pooley, 1984). But the greatest need is for an agreed methodological framework, with special regard to taxonomy and variable choice in order to gain comparability between studies; this is by no means a new idea but it has yet to be realised.

### 9.3 A review of the research and further areas for investigation

This thesis sought to recover the evidence about Plymouth's mid-19th century social geography as fully as possible, using both statistical data and qualitative information to reconstruct the spatial patterns that characterised the mid-Victorian town and to identify the processes and patterns of change which were occurring. The census-based investigation, discussed in the preceding chapters, of the social geography of mid-Victorian Plymouth and Stonehouse has established the character of population growth, the patterns of migration, and the changing residential structure of the two towns, and has thus been able to identify some of the processes which were producing urban change. The primary aim of this thesis, to provide an analysis of the growth of the towns and enable future comparison with the social geographies of other towns, has been accomplished. In particular, this thesis has presented the results of a substantial analysis of the 1851 and 1871 censuses, thereby establishing the basic characteristics of the population and revealing the proportional contributions of in-migration and natural increase to the local demographic growth.

Research concentrated on an important peak in population growth which occurred in Plymouth between 1841 and 1861 but other periods of rapid population increase remain to be investigated in a similarly detailed manner (namely 1801 to 1811, 1821 to 1831, and 1881 to 1901).

Although no detailed examination has been made here of the growth and development of neighbouring Devonport, or Stoke Damerel Registration District, it should be noted that this adjacent group of small settlements experienced a similar pattern of growth and coalescence to that found in Plymouth and Stonehouse and there is evidence that



Devonport also suffered the same kinds of consequences such as overcrowding and a poor health record (Chiswell, 1984). The dominance of the Royal Dockyard would, of course, be a central feature of any socio-geographic investigation of Devonport.

The birthplace status of the inhabitants of Plymouth and Stonehouse has been established and the relationship between the origins and characteristics of in-migrants has been explored, establishing in detail the source of the towns' migrational increase. This thesis has also revealed evidence of out-migration and hence the need for a detailed study of migration from Plymouth to the rest of Britain and abroad, especially during the latter half of the 19th century. In addition, the migration patterns of specific groups of workers, such as shipbuilders or fishermen, would also prove a useful further line of inquiry.

Information on the urban morphology of the two towns has been collated in order to describe the physical setting for population growth. The incidence of speculative building and its impact has been briefly discussed and, although it was not within the limits of this project to explore the workings of Plymouth's Victorian building trade, a more detailed study could well form the basis of a future project. The suburbanisation of the surrounding parishes was also briefly investigated but here too more detailed work remains to be done. Some evidence of intra-urban migration has been presented and there is clearly scope for more research into the residential mobility of the Plymouth population. Particular attention has been given to population density and its consequences, especially with regard to public health issues. The development of urban management and control in response to the growing awareness of the problems of overcrowding and disease among the less fortunate, and the incidence of self-help

and mutual aid, are also areas for further historical research which could well reveal valuable information for those seeking to reconstruct more fully the social geography of Victorian towns and cities.

This research project has described the occupational status of the inhabitants of mid-Victorian Plymouth and identified the principal areas of economic activity in keeping with its aims to present a social geography of the town. No attempt was made, however, to present an economic analysis although the complexity of economic life in mid-19th century Plymouth revealed here does, of course, beg fuller investigation. Directory evidence was used to identify the distribution of certain occupational groups but, owing to the complexities involved, no comparison has yet been made between these distribution patterns and those of other data sources; again, this represents a possible line of future research. Also the distribution of wealth and the prosperity of the population could prove to be a worthwhile subject for investigation. In the second chapter the value of occupational returns in social stratification was discussed and this continues to be a subject for debate and, no doubt, further research.

A good deal of work remains to be done on retailing at the local scale; while the broad sequence of development has been identified, change, which was determined by unique local conditions, occurred at different rates in different towns. The importance of retailing as a particular element in the economy, the society and the morphology of a town such as Plymouth has been suggested, although this thesis has provided only a small piece to the larger picture yet to be completed.

The contribution of women to the local economy has also received special attention in this thesis, justified by reference to the

considerable differences in local sex ratios during the study period. There is a need for further comparative research to determine how great an effect substantially different sex ratios may have had on the socio-economic life of Victorian communities in general.

In this final chapter, explanations have been advanced for the different patterns of distribution of census-derived variables occurring in mid-Victorian Plymouth and Stonehouse, culminating in the application of principal component analysis to confirm and summarise the major elements in the changing social geography of the two towns. The effect of variable choice in factor analysis was briefly considered and this revealed another future line of research: namely, to test the Plymouth analyses against those carried out elsewhere, possibly by re-running the Plymouth analyses but using variables chosen by other authors. Further research could seek to clarify the variables most pertinent to analyses of Victorian social geographies and apply different combinations of these variables to a number of urban areas; in this way the effect of variable choice upon the results of such analyses may be identified.

This thesis has completed a valuable preliminary survey of the social geography of mid-Victorian Plymouth and East Stonehouse but a number of important research questions remain to be answered. Principally, the research so far has revealed the descriptive patterns of population characteristics, the 'shapes in society' of the two towns. Some information has been presented concerning the spatial form of mid-19th century Plymouth, although further work is needed, particularly with regard to housing development and tenure, to discover fully the 'shapes on the ground'. Evidence has been advanced to explain the processes operating to produce both social and spatial forms and the changes that affected them. Earlier research interest

in urban historical geography has focused upon the processes of change, the links between social and spatial forms, and it has been suggested that students of 19th-century towns and cities should concentrate on investigation of the social and economic forces which govern residential distribution. Yet, in all studies, the main descriptive dimensions of urban structure must first be established and then explained and interpreted. It is proposed, therefore, that this thesis has laid the foundations for future research on the geography of 19th-century Plymouth.

In summary, three general aims were indicated at the beginning of this thesis and it may be concluded that each has been substantially achieved. Firstly, the main causes of Plymouth's population growth have been shown to be in-migration for the first part of the mid-19th century study period, followed by natural increase as the migrational flow abated and, in part, reversed. The primary consequence of population growth was shown to be severe overcrowding, with averages in excess of those found in mid-Victorian London or Liverpool. This produced considerable urban stress and ill-health necessitating the first steps towards sanitary improvement in Plymouth. Underlying this growth was the economic attraction of the three towns of Plymouth, Stonehouse and Devonport to labour and to capital.

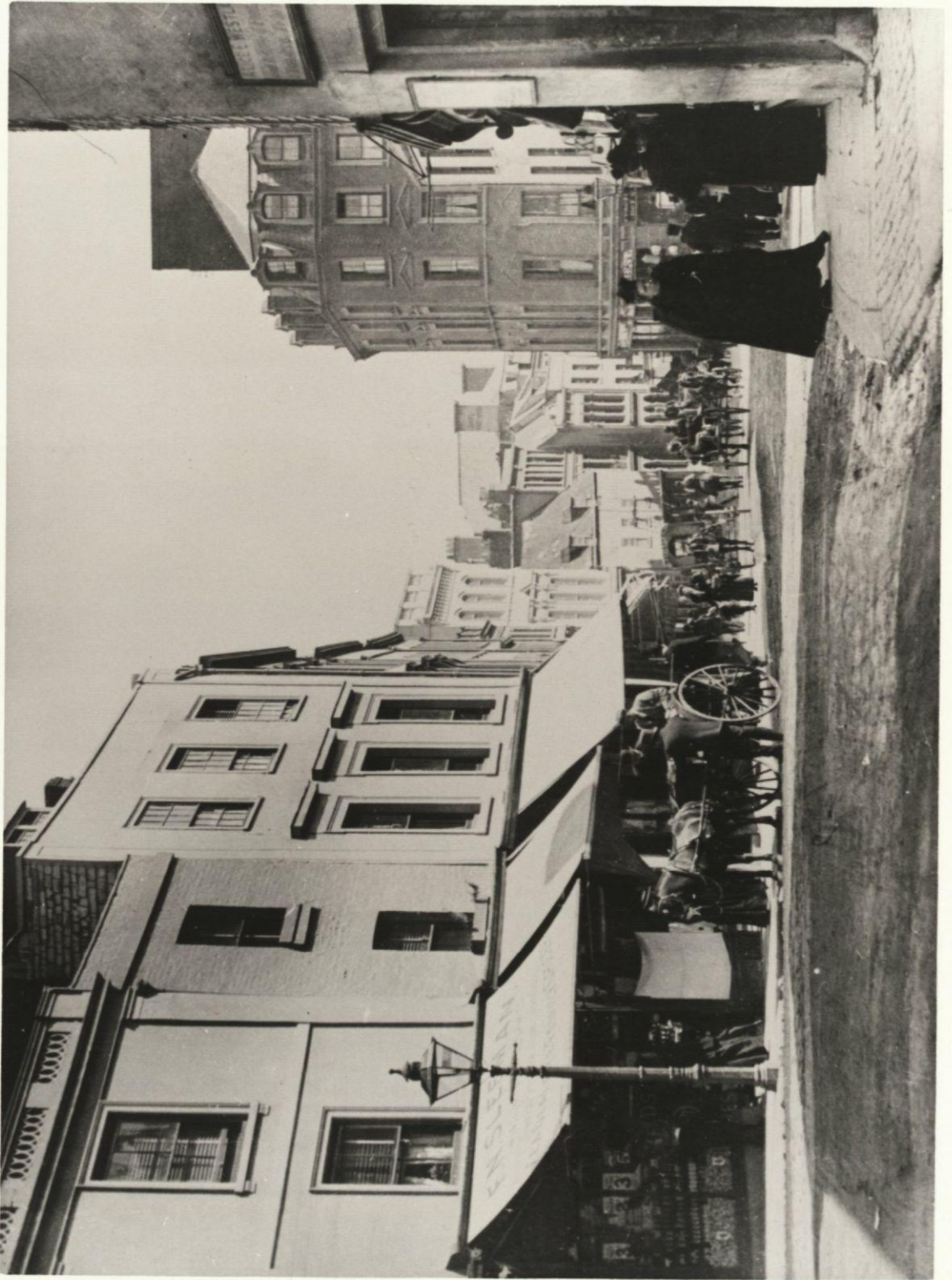
Secondly, the processes of change, already identified by other authors and which help to explain observed patterns, were clearly identified in Plymouth. Migrational and natural change have been mentioned above but, also, as a consequence of urban growth and as the supply of available building land was exhausted, in keeping with other towns and cities of the time, mid-Victorian Plymouth exhibited suburban growth and new housing moved beyond its boundaries. Economic development, in tandem with national trends, also produced

morphological change in the town as Plymouth's industrial districts developed and its retail centre moved to new and more convenient streets (Plate 9A). Plymouth's role as a port was enhanced by the improvement of harbour facilities and the extension of the railway. The key processes of change operating in Plymouth were those involving demographic and physical growth, and the socio-geographic patterns which emerged were all subject to the impact of this growth.

Finally, the changing spatial structure of Plymouth and Stonehouse - a contiguous urban unit by the 1870s - has thus been established and its contributing elements have been identified. It has been shown that the social character and composition of the population varied markedly from place to place within the two towns. Parts of mid-Victorian Plymouth were overcrowded and insanitary, yet it was also a place of opportunity for many migrants from rural Devon and Cornwall and other parts of the British Isles. As a port, Plymouth represented a vital link between Britain and the world (Plate 9B), and as a market, the town regularly drew together the inhabitants of the countryside from miles around. Plymouth was a lively, thriving, many-faceted and cosmopolitan town, it grew in common with many other Victorian towns and cities, subject to the same social processes, and it grew as uniquely as its geography allowed.

Plate 9A: Old Town Street c1895, taken by Rugg Monk, looking south from the junction with Saltash Street. This busy commercial street led down into Plymouth town bringing traffic from the direction of Tavistock.







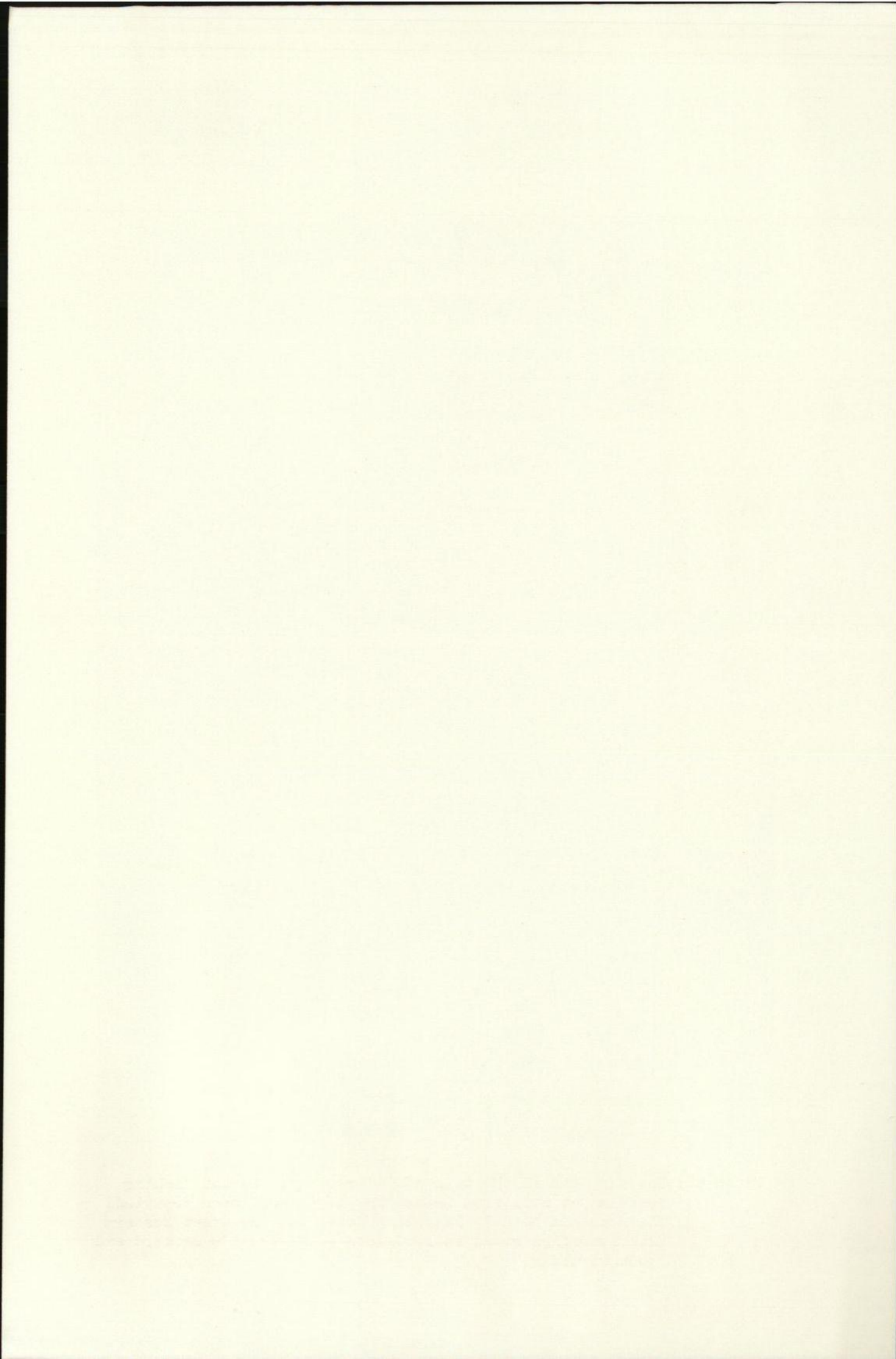
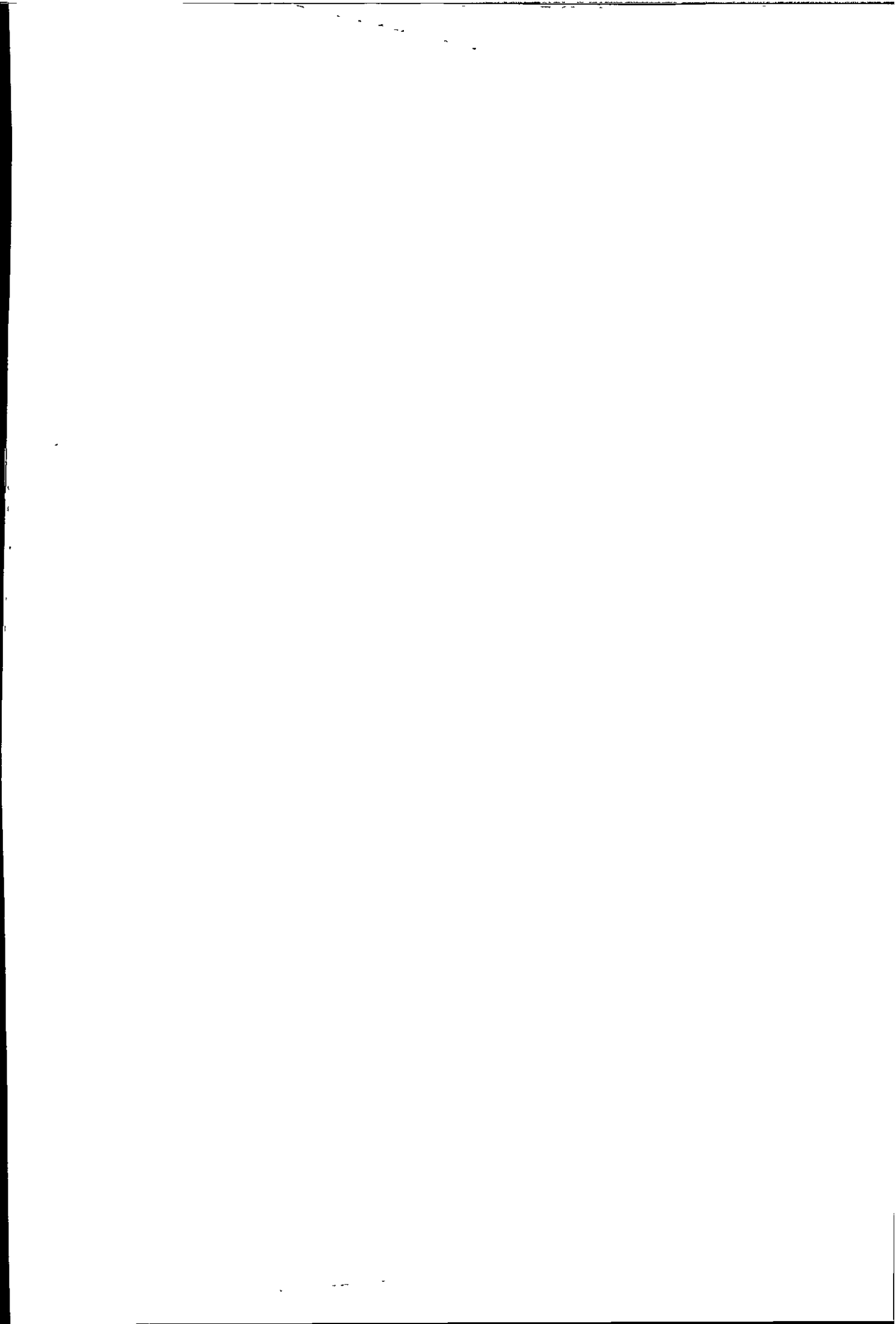
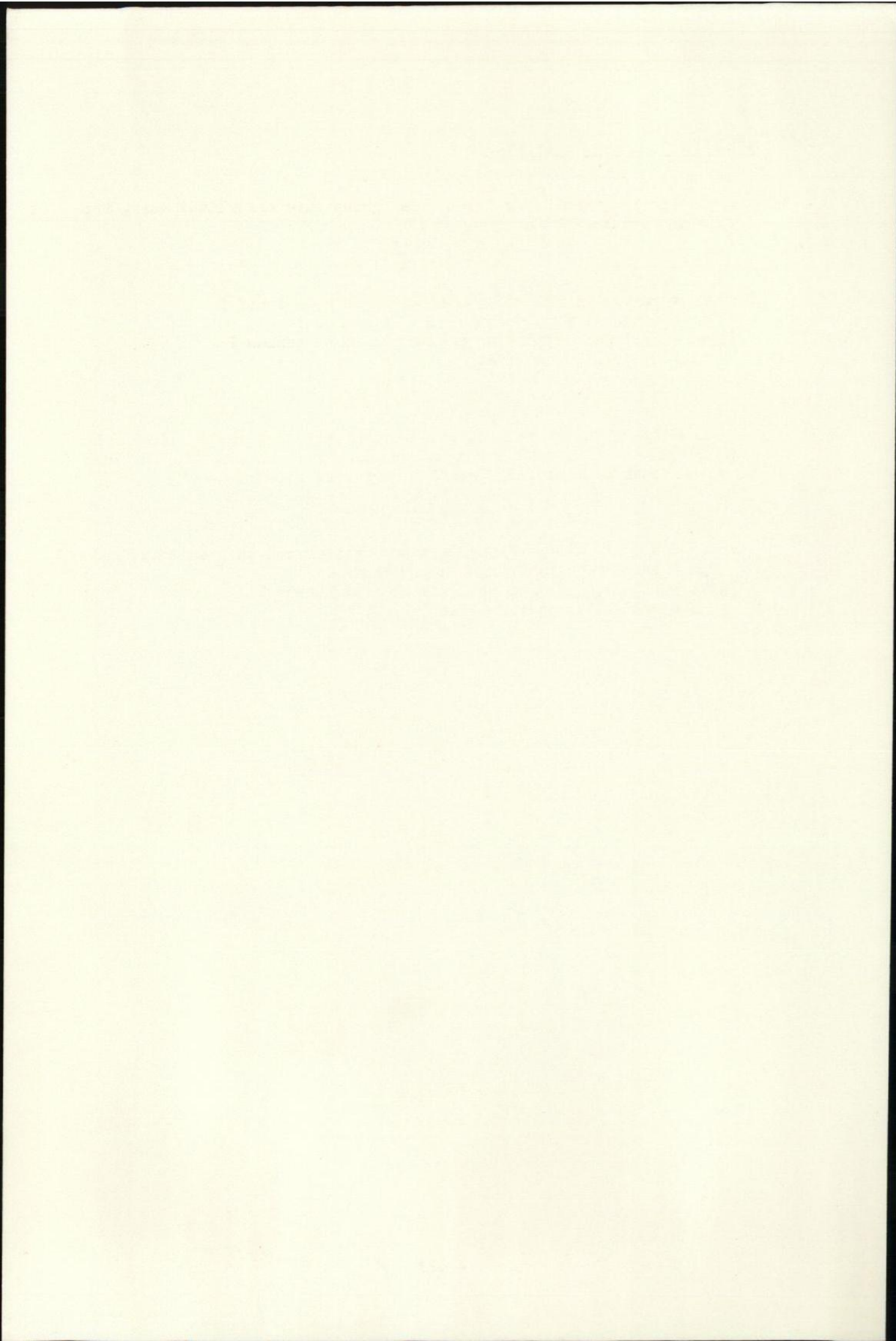


Plate 9B: The Barbican at the turn of the century. Common fishing vessels set sail from where "The Mayflower" once departed. The Seamen's Bethel, Brunswick Hotel and the Great Western Railway Office stand as monuments to Plymouth's seaward and landward trade.





Steamer from which Mayflower departed  
Plymouth, N. H. 1873.



APPENDIX A: Analysis of ages

(1) National ratios for each age group are calculated using the following formula:-

$$R = \frac{P_{ix+t}}{P_{ix}}$$

Where R = ratio for age group a between censuses 1 and 2

P<sub>ix</sub> = national population aged a at census 1

P<sub>ix+t</sub> = national population aged a plus t at census 2

t = the census interval

(2) Expected survivors in each age group are subtracted from the population actually enumerated in each age group in census 2 in order to obtain estimates of net migration using the formula:-

$$M = P_{jx+t} - R (P_{jx})$$

Where M = net migration for age group a between census 1 and census 2

P<sub>jx</sub> = local population aged a at census 1

P<sub>jx+t</sub> = local population aged a plus t at census 2

R = national survival ratio



APPENDIX C: Employment statistics

TABLE A1: Male and Female Employment by Occupational Order

	1851		1861		1871	
	males	females	males	females	males	females
I Government	611	7	764	6	707	12
Defence	3354	.	4245	.	4433	.
Learned profs.	570	260	657	400	639	398
II Wives	.	10810	.	13167	.	16049
Domestic service	429	3385	506	3700	610	4353
III Merchantile	438	95	537	137	865	342
Conveyance	1658	13	2392	7	2364	11
IV Agriculture	377	130	349	123	338	64
Animals	650	4	665	1	393	5
V Production	2724	244	3293	286	3298	283
Textiles & dress	1580	2908	1681	4012	1513	3608
Food & drink	1131	261	1344	343	1339	324
Animal substances	145	11	184	7	183	19
Vegetable subs.	375	12	479	32	399	64
Minerals	882	34	959	40	889	31
VI Labourers, etc.	1496	179	1711	277	2553	231
Independent	129	927	120	691	149	1026
Total*	13195	8470	15641	10062	16239	10771
Percentage+	60.9	39.1	60.9	39.1	60.1	39.9

\* Excluding wives

+ Percentage of total workforce, male and female, excluding wives

Source: Published census data.



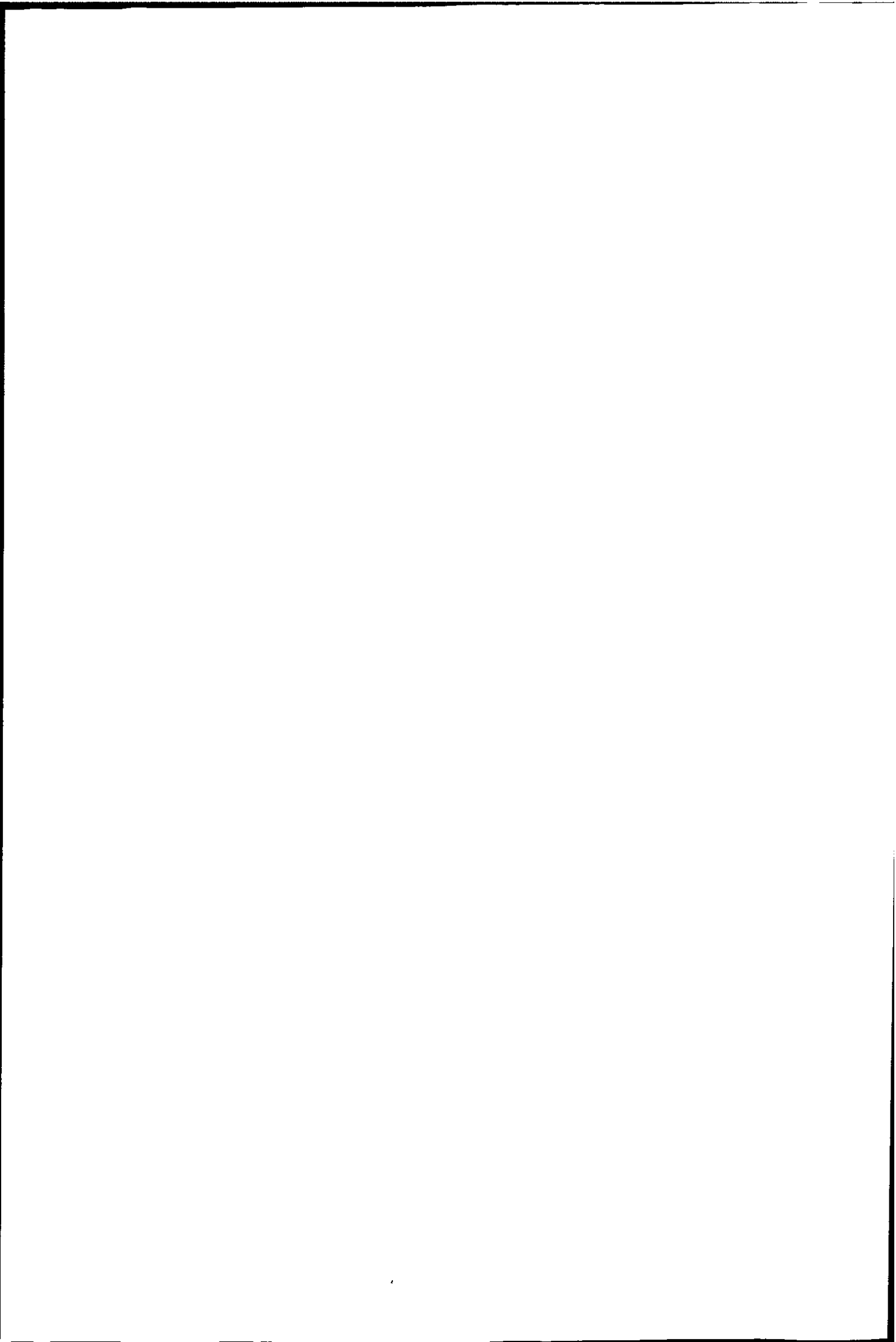


TABLE A2: Employment by enumeration district, 1851

Enumeration District	Sample population	Percentage working*	Female workers+	Industrial class"	
Charles	01	58	36.2	27.6	16.0
	02	76	44.7	7.9	66.7
	03	81	46.9	17.3	51.3
	04	125	48.0	16.0	65.1
	05	140	40.0	15.0	69.0
	06	149	40.9	16.8	47.7
	07	168	45.2	18.5	61.7
	08	131	39.7	16.0	51.9
	09	83	48.2	28.9	44.2
	10	60	45.0	31.7	34.4
	11	77	52.0	32.5	41.9
	12	70	45.7	20.0	42.4
	13	119	42.0	16.8	42.3
	14	97	36.1	16.5	30.2
	15	105	40.0	15.2	60.5
	16	88	39.8	19.3	25.0
	17	113	33.6	15.9	40.0
	18	103	36.9	14.6	46.7
St Andrew	01	207	43.0	12.1	47.2
	02	67	43.3	19.4	22.6
	03	94	47.9	25.5	39.6
	04	159	42.1	13.8	54.4
	05	137	34.3	13.1	53.6
	06	111	48.7	24.3	51.7
	07	94	56.4	28.7	40.7
	08	126	38.9	10.3	47.1
	09	76	47.4	25.0	30.0
	10	61	52.5	29.5	21.9
	11	25	28.0	8.0	14.3
	12	179	43.0	20.7	60.7
	13	173	47.4	18.5	56.0
	14	149	43.0	12.1	67.2
	15	127	44.1	18.1	50.0
	16	122	50.8	23.0	34.9
	17	171	42.7	25.7	20.5
	18	150	38.7	15.3	44.3
	19	143	42.7	12.6	39.7
	20	102	40.2	13.7	51.2
	21	79	48.1	17.7	59.0
	22	64	45.3	26.6	36.4
	23	55	27.3	9.1	33.3
	24	184	35.3	8.2	19.4
	25	131	42.0	19.1	33.9
Stonehouse	01	95	45.3	23.2	17.4
	02	123	48.0	26.0	25.0
	03	126	41.3	25.4	37.3
	04	145	37.9	12.4	54.6
	05	181	39.8	21.6	43.6
	06	144	43.8	18.1	45.5
	07	196	36.7	16.3	51.9
	08	108	34.3	21.3	23.4
Whole area	5947	45.1	18.2	44.3	

\* Excluding occupational orders (4) and (17)

+ Percentage of sample population

" Percentage of working population

Source: Sample population data.

TABLE A3: Employment by enumeration district, 1871

Enumeration District	Sample population	Percentage working	Female workers	Industrial class	
Charles	01	64	26.6	1.6	41.2
	02	194	40.7	14.4	36.1
	03	111	49.6	21.6	46.6
	04	132	53.8	24.2	37.0
	05	157	33.8	8.9	41.8
	06	87	36.8	27.6	6.7
	07	98	38.8	19.4	23.1
	08	103	39.8	31.1	12.8
	09	242	40.9	18.6	40.4
	10	152	46.1	15.8	40.8
	11	124	40.3	14.5	46.2
	12	104	45.2	20.2	38.8
	13	102	47.1	22.6	35.8
	14	127	44.9	18.9	57.4
	15	158	43.7	22.2	48.7
	16	117	54.7	27.4	56.9
	17	91	45.1	19.8	52.3
	18	127	44.1	25.2	32.8
	19	135	48.2	28.2	39.1
	20	105	41.9	23.8	48.0
St Andrew	01	184	38.0	19.0	54.9
	02	188	42.6	14.4	35.0
	03	128	44.5	16.4	45.0
	04	195	35.4	17.4	36.0
	05	118	32.2	9.3	35.7
	06	112	33.9	17.0	31.8
	07	163	41.1	14.1	54.9
	08	151	35.8	17.9	54.2
	09	110	47.3	21.8	61.8
	10	147	38.8	13.6	45.8
	11	144	47.9	16.0	50.7
	12	110	44.6	24.6	45.1
	13	208	40.9	15.4	50.6
	14	181	38.1	13.3	31.9
	15	129	34.9	15.5	43.5
	16	144	43.1	20.1	42.9
	17	81	48.2	24.7	22.0
	18	95	59.0	37.9	8.3
	19	120	45.0	23.3	22.0
	20	121	49.6	39.7	14.9
	21	131	39.7	16.8	55.8
	22	152	50.7	25.0	51.8
	23	158	37.3	12.0	57.6
	24	65	52.3	23.1	35.3
	25	80	47.5	35.0	12.2
	26	103	45.6	22.3	32.7
	27	71	39.4	14.1	51.7
	28	119	42.0	22.7	50.0
	29	100	42.0	15.0	46.5
	30	102	48.0	10.8	48.8
	31	130	30.8	11.5	17.8
Stonehouse	01	130	34.6	21.5	30.9
	02	134	44.0	20.9	24.6
	03	129	48.8	24.0	22.1
	04	137	43.8	15.3	41.9
	05	215	41.9	21.9	43.9
	06	165	40.6	19.4	27.3
	07	222	30.2	14.4	22.2
	08	207	46.9	16.9	42.4
Whole area	7909	44.8	19.1	39.1	

Source: Sample population data.

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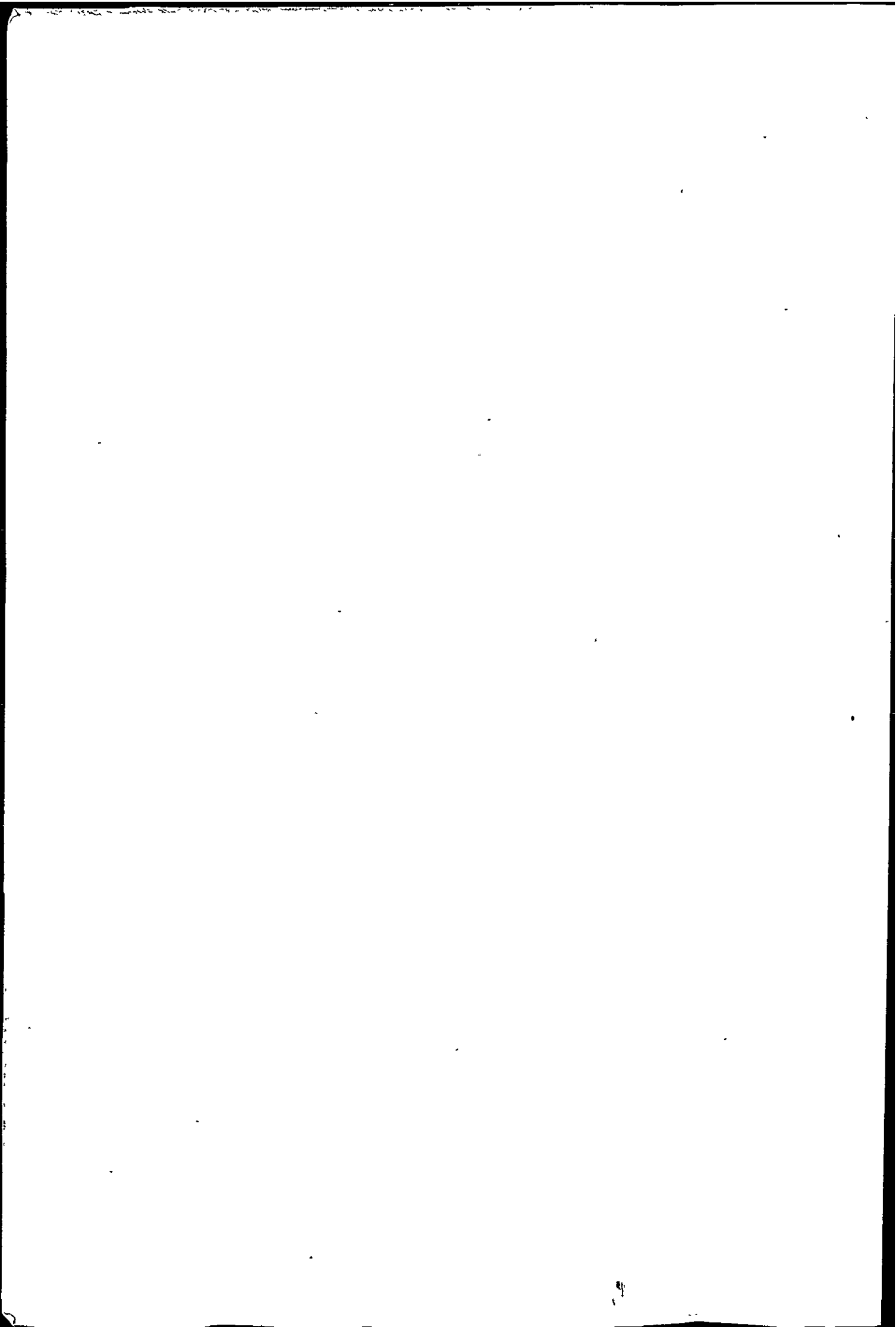
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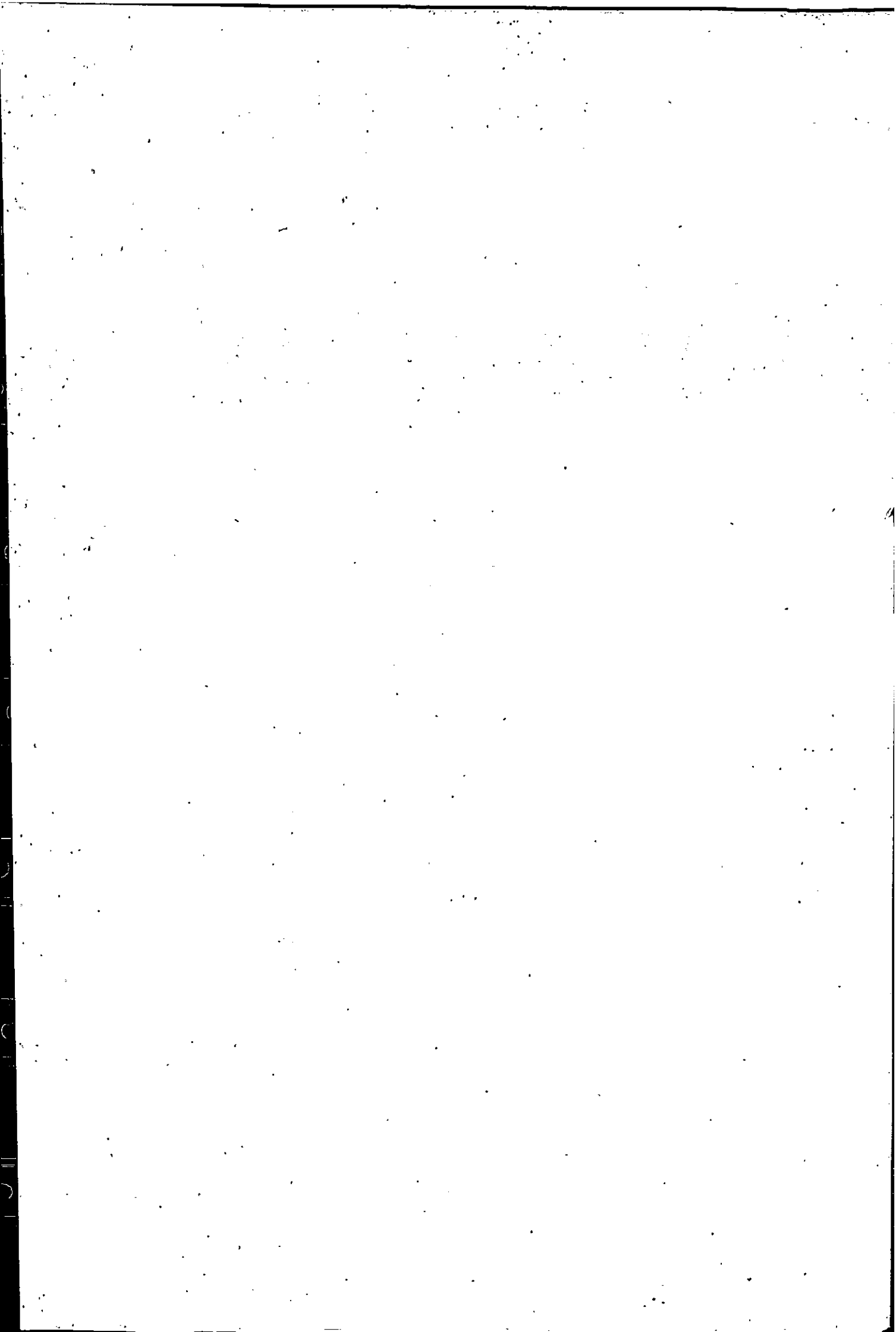
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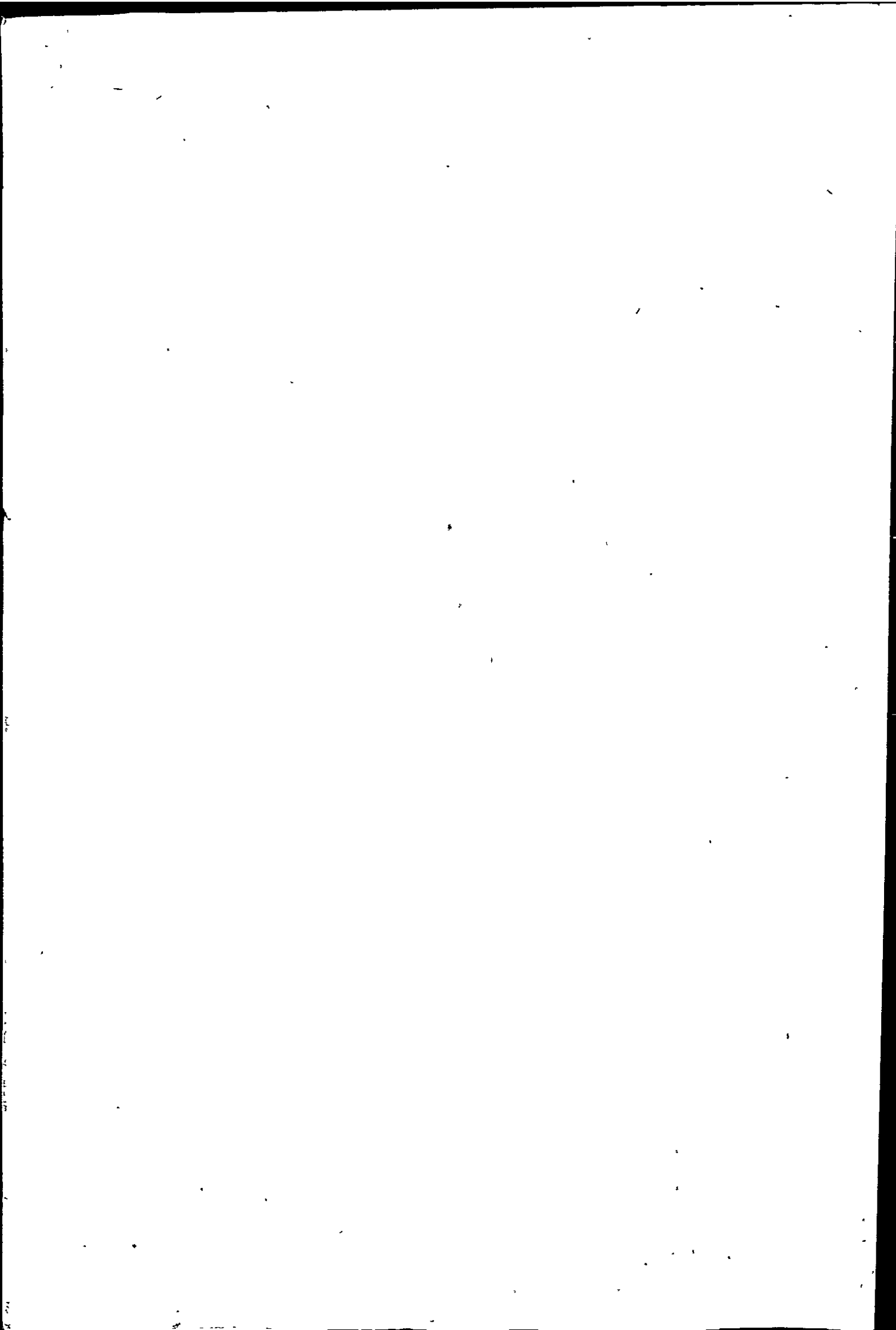
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#### Abbreviations

- EPEH: Exeter Papers in Economic History  
 JRSS: Journal of the Royal Statistical Society  
 Trans IBC: Transactions of the Institute of British Geographers



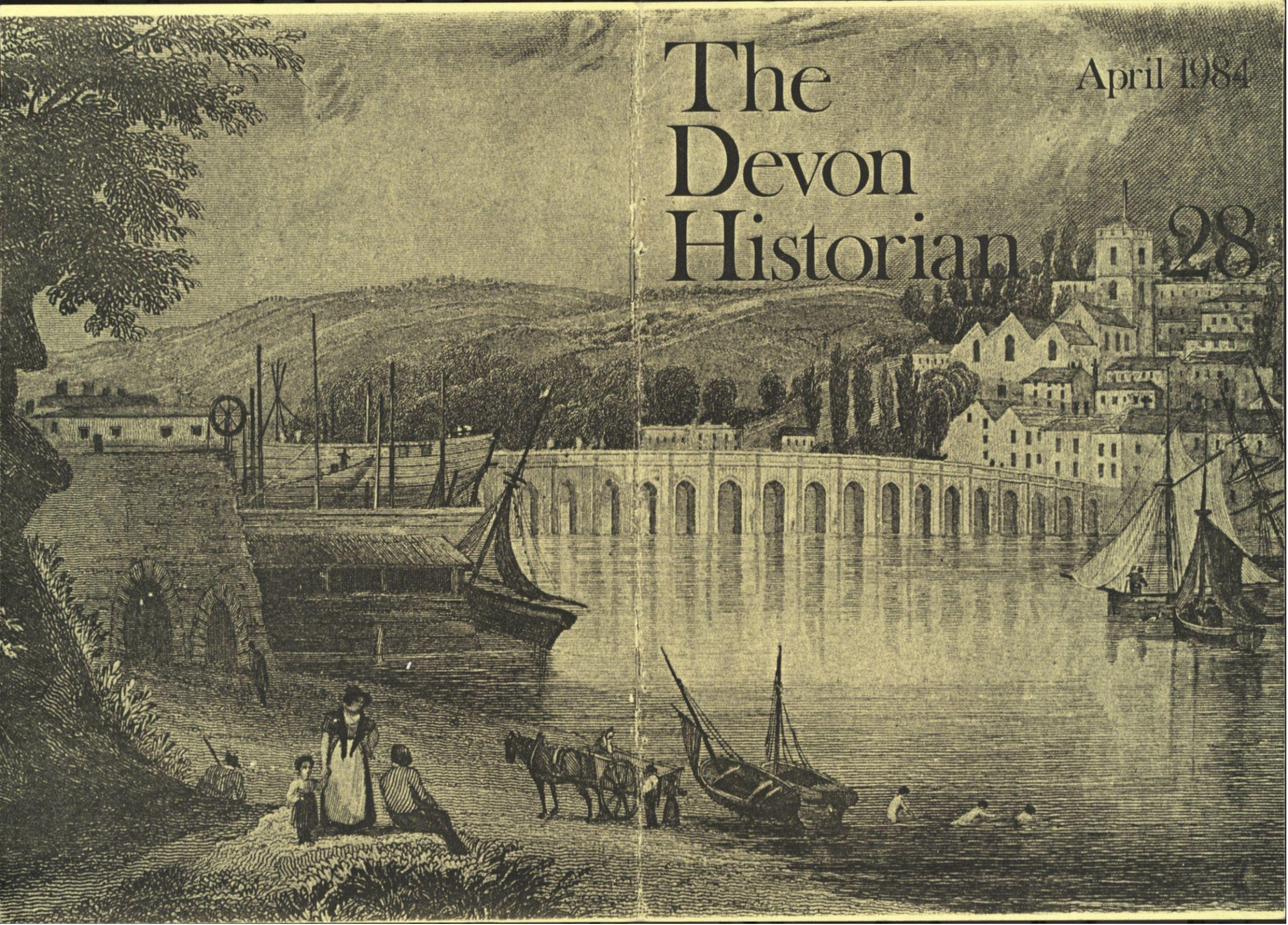




# The Devon Historian

April 1984

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PLYMOUTH POLYTECHNIC  
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- (19) A recent useful study of domestic service in nineteenth-century Exeter by Jane Emerson appeared in *Devon Historian*, vol 25, 1982, pp 10-14.
- (20) There were only 57 males to every 100 females amongst the Cornish born, this compares with 74 amongst the Devon-born in-migrants and 83 amongst the native population of Plymouth.
- (21) In the 1871 census a group of women in Newport Street were specifically recorded as prostitutes but this was not a usual practice amongst the enumerators. Under the terms of the Contagious Diseases Act local police forces were required to return the number of brothels in urban areas and figures for Plymouth in the 1880s disclose that there were 500 women in 'Greater Plymouth' resident in brothels at that time. See: Walkowitz, J. 'The making of an outcast group: Prostitutes and working women in nineteenth century Plymouth and Southampton' in *A Widening Sphere: Changing roles of Victorian Women* ed by Martha Vicinus, Indiana UP, 1977 pp 72-93.

## MIGRATION AND THE SOCIAL GEOGRAPHY OF MID-NINETEENTH CENTURY PLYMOUTH

Mark Brayshay & Vivien Pointon

Mid-nineteenth century Plymouth was indisputably Devon's most cosmopolitan town. (1) Birthplaces recorded in the censuses from 1851 onwards reveal a remarkable diversity of origins and, although the evidence does not directly include information about the routes by which these in-migrants made their way to Plymouth (2), there can be little doubt that the rich mixture of their various backgrounds and experience added considerably to the prosperity and development of the town in Victorian times.

Migration to Plymouth of course contributed to the prodigious growth in total population. In 1801 the census recorded 19,447 people in Plymouth and Stonehouse; by 1851 the population was 64,200, and by the close of the century it stood at 122,747. Thus, in the course of only a hundred years there had been a six-fold increase and Plymouth had become a city in all but name. (3) But migration boosted demographic growth not simply in absolute terms, but also by enhancing the town's potential for natural increase, since young adults between the ages of 20-35 years tend always to be the most mobile group in any society, and they certainly dominated the ranks of in-migrants to Plymouth during the last century. (4)

Although the town grew physically, its rate of areal expansion, and the increase in the urban housing stock, failed to keep pace with the demands of a growing population. The inevitable consequence was a level of overcrowding and a degree of environmental blight in certain parts of Plymouth which were amongst the worst to be found anywhere in Britain. (5) Ineffective urban management was partly to blame and corrective measures were slow to take effect, but despite these serious defects in Plymouth's physical fabric, nothing seemed to have seriously impaired the economic success of the town. Industries based upon imports were particularly prosperous. (6) Chemicals, for example, supported local fertiliser-, soap-, and starch-making factories; while timber, grain and hides were used in furniture- and boat-building, biscuit-baking, brewing, distilling and tanning. (7) Plymouth was also a key retail centre and served as a major livestock market for West Devon and East Cornwall. The proximity of the Royal Dockyard and the presence of the armed forces in the town created a constant need for a wide range of goods and services, bringing considerable benefits to the local economy. Even Plymouth's preponderance of 'navy wives' made a significant economic contribution. Their skills as dressmakers and shirt-makers were not only well-known locally but had been recognised further afield. London businesses sent work down to Plymouth because they could depend on the quality of 'garments made up in the town'. (8)

Job opportunities in Plymouth must therefore have acted as a powerful magnet, attracting migrants in large numbers from the rest of Devon, from Cornwall and a host of other origins. In 1842 the government established an emigration depot in Plymouth and this brought welcome extra trade to local ship brokers, victuallers and retailers. (9) Moreover, in the aftermath of the potato famine, the depot was used to accommodate thousands of Irish people on their way to the colonies; though many seem to have progressed no further than Plymouth. Steamers provided

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The following numbers of *The Devon Historian* can be obtained for £1.00 (plus postage) from Mrs S. Stirling, Devon & Exeter Institution, 7 The Close, Exeter: Nos. 1-6, 8-10, 12-14, 17-21, 24-26. Also available (all prices plus postage): *Devon Newspapers*, 60p; *Index to Devon Historian 1-15*, 20p; *Devon Bibliography 1980* (=DH-No. 22), 50p; *Devon Bibliography 1981*, 60p.

The Hon. Secretary, Mr John Pike, 82 Hawkins Avenue, Chelston, Torquay, would be glad to acquire copies of *The Devon Historian* Nos. 7, 11, 15, 16, 23 which are now out of stock.

a regular link with the Irish ports of Belfast, Dublin and Cork and by 1851 a permanent Irish-born community was well-established in a small area to the north of Millbay Docks

### The Origins of Plymouth's Migrants

While the patterns of migration to many other provincial towns in Victorian Britain has been carefully studied, (10) very little detailed work has been carried out on Plymouth. For instance, almost nothing has been written so far about where in the town the in-migrants lived. Still less has been said about the kind of employment they found in Plymouth, and there has been no real exploration of whether a pattern of residential and social segregation similar to that observed elsewhere in mid-nineteenth century Britain had emerged in this West Devon town. (11) Few historians would deny that answers to these questions are crucial to a better understanding of the evolution of Plymouth's social and physical structure, but to secure them demands a detailed and painstaking study of sources like the mid-Victorian manuscript census returns (12)

To these ends a sample of data has been extracted from the 1851 (and 1871) census enumerators books for Plymouth and Stonehouse as the basis of a much larger study of the social geography of the towns, but part of that computerised data file is used here in this article about migration (13) Of course the census only records an individual's birthplace and not his personal migration history. Some people enumerated in Plymouth on census night would have arrived in the town only after numerous moves to other places. The data we have are therefore only an imperfect surrogate. Nevertheless, even though we must focus on 'life-time' migration, the partial picture this yields is still immensely valuable (14)

A cursory perusal of the published census data shows that the principal birthplaces of the inhabitants of Plymouth and Stonehouse were, in rank order of numerical importance, Devon, Cornwall, Ireland, London, Somerset, Overseas origins, Hampshire, Kent, Gloucester, Wales, and 'Islands in the British Seas' (Table 1). Although it is not possible from *published tables* to distinguish how many of the Devon-born people were actually natives of Plymouth, the 'ten-per-cent' sample drawn from the manuscript census return for 1851 suggests that 42.5% of the inhabitants of the town were in fact Plymothians by birth. Table 1 indicates therefore that of the combined 1851 population of Plymouth and Stonehouse of 64,200, approximately 36,908 people were not natives of the town. In effect, well over half of her population consisted of 'in-migrants'

Inevitably, the most numerous group of migrants was drawn from origins closest to Plymouth. Thus Devon and Cornwall parishes alone accounted for 40.0% of the town's 1851 population. Indeed, distance may be cited as a key factor explaining the overall pattern of migration to Plymouth not simply from relatively local sources, but from more distant origins as well. However, as the distance increases, the simplicity of the pattern tends to be distorted. The influence of 'intervening opportunities' such as the attractions of a rival town and the varying availability of some convenient means of transport are both factors which help to explain why some sources appear to have contributed more migrants to Plymouth by 1851 than other places situated the same distance away. Of course, the population size of the 'sending area' also had an effect on the numbers of people from that area eventually making their way to Plymouth. Thus the presence in Plymouth of more than 1,200 people born in London was probably as much a reflection of

character, the divisions between rich and poor became more sharply focussed. The process of social sifting and sorting which produced such divisions owes much to the arrival of migrants. The tendency of some groups to cleave together in tight-knit communities produced in Plymouth a new social mosaic which exerted a profoundly important effect on the evolution of the town in Victorian times

### Footnotes:

- (1) Modern Plymouth is a union of three towns: Plymouth, East Stonehouse and Devonport. This study refers to Plymouth and East Stonehouse, but not to Devonport which was administratively separate from Plymouth until 1914.
- (2) It is possible in many cases to fill in some details about the movements of an in-migrant from the various birthplaces of children born to the family and recorded in the manuscript census. At best, however, such information is likely to be only an erratic guide to any intervening moves.
- (3) Even when the Three Towns were legally joined in 1914, Plymouth was still only a County Borough. City status was not achieved until 1928.
- (4) For example 41% of the Cornish-born, 36% of the Irish-born and 33% of the 'Seaboard Counties' migrants were in this age group in the 1851 census of Plymouth.
- (5) See Brayshay, M and V Pointon 'Local politics and public health in mid-nineteenth-century Plymouth', *Medical History*, 1983, vol 27: 162-78.
- (6) William White, *History, Gazetteer and Directory of Devonshire*, Sheffield, 1850 pp 652-3.
- (7) See also *Post Office Directory of Devonshire*, London, 1956, p 22.
- (8) By 1889 *Kelly's Directory of Devonshire* (p 367) comments 'it may be noted as a matter of interest that a considerable part of the costumes displayed in the great London warehouses of Peter Robinson, Whiteley and others, are made in Plymouth'.
- (9) Brayshay, M 'Government assisted emigration from Plymouth in the nineteenth century', *Rep Trans Devon Ass Advmt Sci*, vol 112: 185-213.
- (10) Other researchers have published studies of towns including York, Preston, Nottingham, Chorley, St Helens, Wigan, Wakefield, Swansea, Cardiff, Merthyr Tydfil and Liverpool, to name but a few.
- (11) A good recent summary of work in this field is Johnson, J H and C G Pooley, *The Structure of Nineteenth Century Cities*, Croom Helm, 1982.
- (12) Of course a range of other sources need to be consulted as well. Directories, rate books, newspapers, contemporary maps and many other documents yield information which can be integrated with census evidence to reconstruct the structure of a town.
- (13) This larger study is the subject of Vivien Pointon's PhD thesis which is in preparation.
- (14) The term 'life-time' migration is commonly used by urban historians to mean a count of people whose place of enumeration on census night was different from their stated place of birth.
- (15) The larger projects are well documented. See for example Gill, C *Plymouth: A new history* vol 2. David & Charles, 1979. Plymouth's Local Board of Health was responsible for installing a new sewerage system and for numerous street improvement projects after 1854. See note 5.
- (16) See note 5. The General Board of Health correspondence in the Public Record Office contains further information about Plymouth's unhealthy districts and the squalor of the Irish quarter.
- (17) Seaboard Counties comprise 27 counties of England and Wales which have a sea coast, plus Anglesey and the offshore islands. Inevitably some origins (e.g. Kent, Hampshire, Somerset, Dorset and Pembroke) occurred much more frequently than others, but for the purposes of this article the whole group is considered as a single source.
- (18) Only the Plymouth (Watch) Rate Book for 1869-70 survives but this is nevertheless adequate to yield comparative indices for the various districts of the town.

unattached women as well. Prostitution was common in Plymouth as it was in Portsmouth and Southampton and although neither the 'notes for guidance' nor the propriety of the Victorian census enumerators allow us any clear picture of the true number of women so employed, the occasional use of a euphemism in the 'occupations' column of the record does confirm their presence in the town. (21)

Predictably the map showing the distribution of migrants from so-called 'seaboard counties' (which includes Anglesey and the other offshore British Islands) is less well defined. (Figure 4). However, the hint of a concentration in the area around Millbay Dock does reflect the origins of many migrants in other dockyard towns and ports. Moreover, while many would have been unskilled labourers at the daily beck-and-call of the wharfingers, others possessed skills which afforded them greater prosperity and enabled them to meet the higher rents of newer housing on the northern edge of the town. Thus a secondary concentration can be picked out in those areas. There were people from Chatham, Portsmouth, Sheerness, Pembroke and the Channel Islands in these areas of Plymouth and the census of 1871 showed not only a substantial increase in the number of migrants from these sources but also a higher level of residential segregation.

#### Occupations

So far the relationship between the birthplaces and the occupations of Plymouth's in-migrants has only been touched upon where it seemed to explain their residential distribution. The detailed pattern of employment revealed in the analysis of the 1851 manuscript census is too complex to enable a satisfactory description to be attempted here, but the much-simplified breakdown of occupations shown in Table 2 does make one important point very clear. People from different origins displayed markedly different occupational compositions. As referred to earlier, the Irish were dominated by general labourers, while the Cornish contained the largest percentage of domestic servants. As might be expected, those migrants born in 'seaboard counties' tended to be employed either in the 'professions, army, navy, or government service' or in industries (especially those connected with the docks). Plymouth's Devon-born inhabitants were well-represented in all the major occupation groups, but dominated the town's manufacturing industry. Thus, in seeking to explain the pattern of migration to mid-nineteenth century Plymouth shown by the manuscript census returns, it is important to add to the list of factors already considered earlier in this article the demand in the town for particular skills. Migrants tended to be drawn from areas where such skills were in abundance and so added to the growing prosperity and development of the town.

#### Conclusion

Migration clearly played a key role in shaping the social geography of Plymouth during the last century. This article has argued that inhabitants of the town from different origins not only exhibited different occupational structures, but also different residential distributions. The social and demographic composition of the various migrant groups also differed, and while these patterns did not remain static from one census to the next, analysis of later enumerations has tended to confirm that the broad contrasts described in this short article tended to persist. Nineteenth-century cities generally were rapidly becoming 'multi-cellular' in social

Table 1 -- Ranked Birthplaces of Plymouth Inhabitants 1851

	Plymouth	East Stonehouse	Total	Combined Rank	Percentage of Total Population
Natives of Plymouth & Stonehouse	—	—	27,292*	(1)	42.5
Rest of Devon	—	—	19,123*	(2)	29.8
(Devon total)	38,415	8,000	46,415)		
Cornwall	5,180	1,599	6,779	(2)	10.6
Ireland	1,792	424	2,216	(4)	3.5
London	1,215	228	1,443	(5)	2.2
Somerset	747	384	1,131	(6)	1.8
Foreign	752	134	886	(7)	1.4
Hampshire	560	160	720	(8)	1.1
Kent	360	96	456	(9)	0.7
Gloucester	320	95	415	(10)	0.6
Wales	283	121	404	(11)	0.6
Islands †	276	54	330	(12)	0.5
(Remainder)	2,321	684	3,005)		
Totals =	52,221	11,979	64,200		

Source: Published Volumes of 1851 Census: 10 per cent sample.

\* These figures are estimates derived from the 10% sample drawn from the manuscript census data. This suggested that 41.2% of the Devon-born group were born outside Plymouth and Stonehouse.

† Dominated by the Channel Islands.

the capital's massive population as any particular attraction which this West Devon town may have held for such people. Nevertheless, Plymouth's accessibility by coastal steamer does seem to have been a key influence in encouraging substantial migration from other ports and seaboard counties of the British Isles. (Figure 1).

A clear picture of the effects of all these factors (distance, population size of the 'sending area', intervening opportunities, and means of travel) emerges when

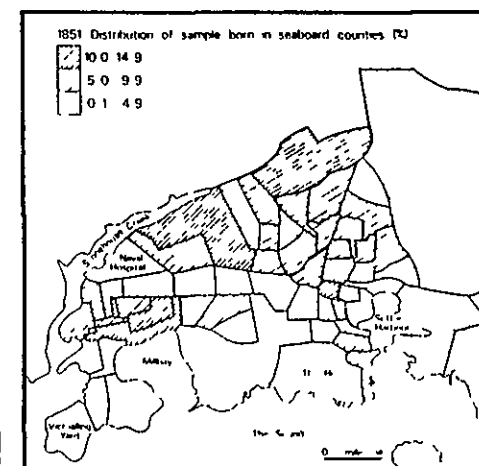
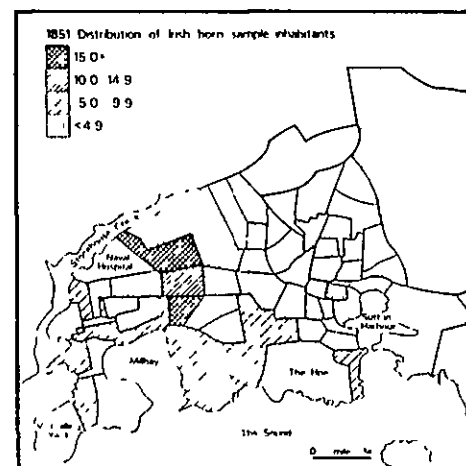
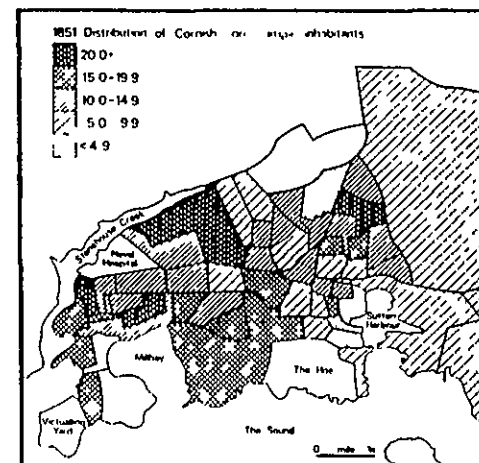
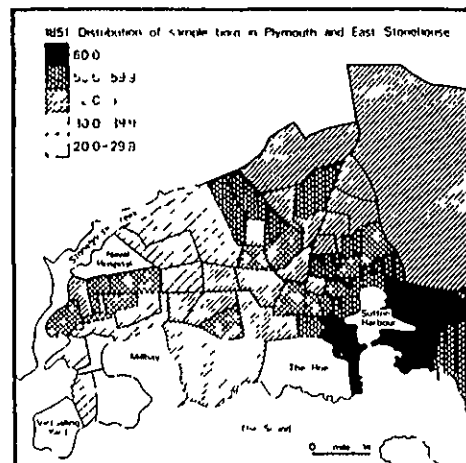
the rate of migration to Plymouth from each parish in Devon and Cornwall is mapped for the census year 1851. (Figure 2) The dominance of origins situated very close to Plymouth was clearly very little affected either by their relative size or by any slight variation in distance. Intervening opportunities for migrants from Kingsbridge, Modbury or Saltash for instance were very few and the means of travel to Plymouth was readily available. Further afield, however, those parishes well-served by a regular road transport connection (Figure 3) or with a relatively large population tended to contribute proportionately more migrants than neighbouring parishes situated at a similar distance from Plymouth.

Although the precise motives of individual migrants can rarely be recovered from surviving evidence, we may speculate on the importance of the lines of communication which must have helped the would-be migrant to make a decision to move. The carters and van drivers who regularly plied the routes between Plymouth and other parts of the South West not only provided a kind of *ad hoc* removal service for ordinary people, but would also have been a valued source of gossip and information about life in the town, the job opportunities and the accommodation possibilities that Plymouth could offer. The same must also have been true of the crews of the steamboats operating in and out of Plymouth. Thus, especially in the pre-railway age, the horse-drawn wagon, coach or van played a social role almost equal in importance to their acknowledged economic role in shaping the emerging geography of provincial towns like Plymouth.

#### Plymouth's Irish Community

The contribution of Irish immigrants to the building of Britain's infrastructure has become a commonplace of history and in Plymouth the labourers who recorded, for example, County Cork or County Kildare as their place of birth in the census almost certainly found work on the great civil engineering projects of the day. An almost unbroken series of developments created a constant demand for labour: the building of the Breakwater across Plymouth Sound, the development of Millbay Docks and the construction of the South Devon Railway not only profoundly changed the face of the town, but also attracted migrant workers in their hundreds. Other, more modest building activities also flourished as much-needed housing was erected on the periphery of the town, new roads were installed, new sewers laid and civic buildings were extended and developed (15).

Although the 2,216 Irish people in Plymouth only represented 3.5% of the town's 1851 population, they were a highly segregated group. Figure 4 shows that the bulk of the Irish were concentrated in just two census enumeration districts. Their homes in places like Victory Court were amongst the least salubrious in Plymouth and, as a group, the Irish were more overcrowded than any other. Moreover, the manuscript census returns recorded a disproportionately large number of Irish households headed by a widow – perhaps reflecting the short life-span of manual labourers in Victorian times. Certainly, Plymouth's Irish quarter was dealt repeated heavy blows by epidemic disease in the 1840s and early 1850s (16). One blackspot in the cholera epidemic of 1849 was Quarry Court. Two years later the census enumerators found 16 separate households comprising 95 individuals crowded into only six houses. But this was by no means the worst example. In Stonehouse Lane there was a single house containing 9 families totalling 65 people, of whom some 49 were Irish born.



The shading refers to the percentages in each Enumeration District born in the places identified on the map.

Figure 4 – The residential distribution of migrant groups in Plymouth, 1851.

But an excess of females over males was not only a feature of the Cornish-born residents of Plymouth in 1851. In keeping with ports in general, all groups in the town tended to contain more women than men (20). The wives and families of men serving onboard ships of the Royal and Merchant Navy account for much of this imbalance, but the census also reveals an unusually large number of single,

### Other Groups of Migrants

While no other group matched the Irish in their residential segregation, an analysis of the distribution of migrants from Cornwall, and from origins including other ports and 'seaboard counties' (17) did reveal important variations. (Figure 4). The map showing the pattern of Cornish-born residents in Plymouth indicates relatively large concentrations in enumeration districts of high social status. The census evidence clearly shows that the prosperous, well-to-do people of Plymouth—defined by measures such as 'servant-owning', occupation, and the rateable value of their housing (18)—tended to cluster in particular areas of the town. Since there were almost twice as many female migrants from Cornwall as there were male, the vast majority of these women being aged between 20-35 years, their residential pattern in Plymouth almost certainly reflects their occupations. Table 2 shows that of those Cornish migrants stating an occupation in the census, 28.7% were employed in domestic service. It appears therefore that Cornish girls came to Plymouth to find work as servants in the middle-class homes of the town and many would have secured their posts through the network of servants' registries which were well-established by the middle of the century. (19)

Table 2 – Occupational Classification of Plymouth's Migrants, 1851

Birthplace:	Occupation Group:						Total Sample n = 2,292
	1	2	3	4	5	6	
Devon	121 7.0%	309 17.9%	176 10.2%	31 1.8%	934 54.2%	152 8.8%	1723 (100%)
Cornwall	26 7.5%	100 28.7%	23 8.0%	11 3.2%	149 42.8%	34 9.8%	348 (100%)
'Seaboard Counties'	30 21.0%	17 11.9%	30 21.0%	—	53 37.1%	13 9.0%	143 (100%)
Ireland	14 17.9%	15 19.2%	2 2.6%	—	17 21.8%	30 38.5%	78 (100%)

#### Key:

1. Professions, Army and Navy, Government Service.
2. Domestic Service.
3. Commerce and Transport.
4. Agriculture.
5. Industry and Manufacturing.
6. General Labourers.

Based on the Census Classification of Occupations.

Source: 10% sample from 1851 Census.

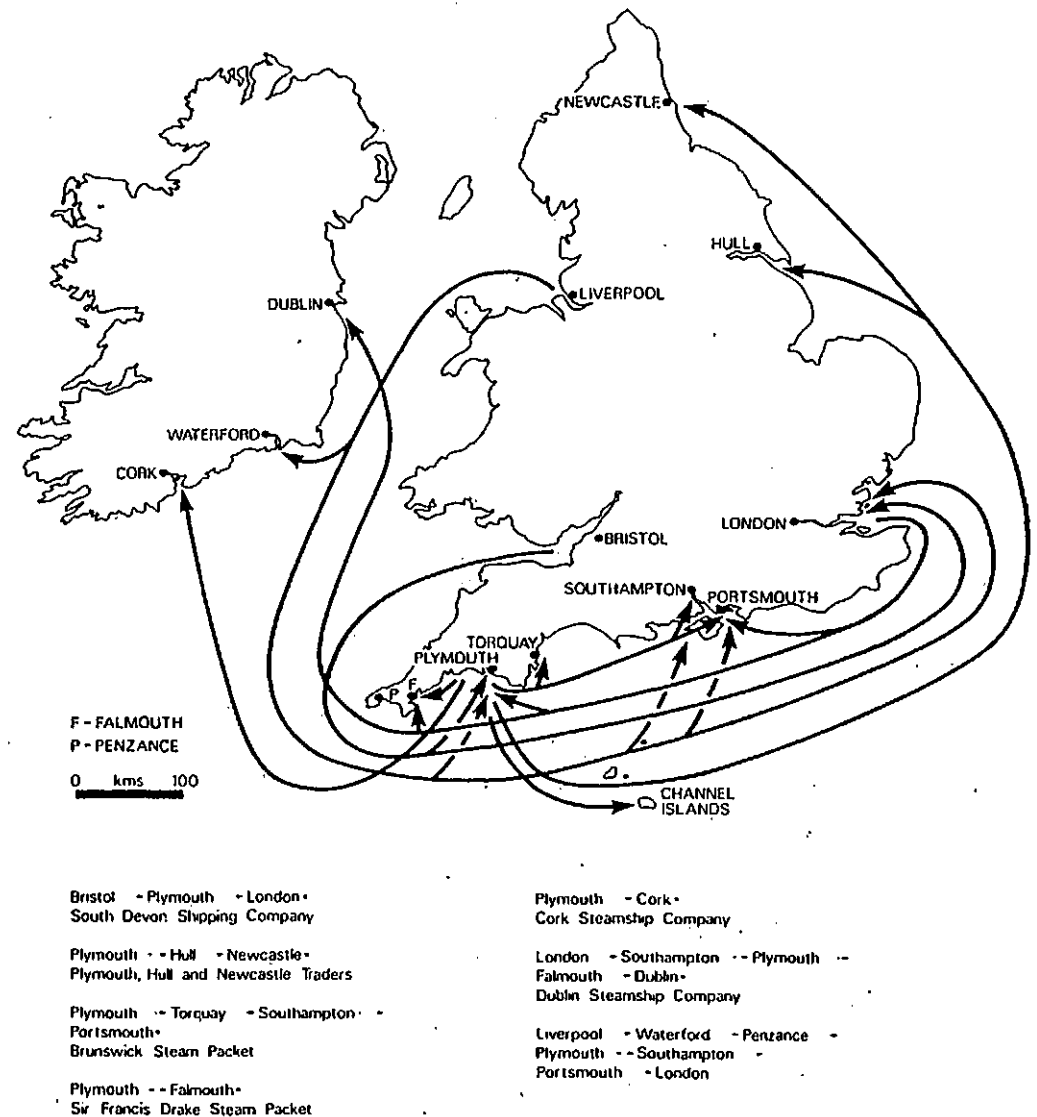
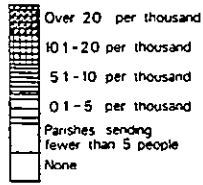


Figure 1 – Coastal links between Plymouth and other ports. Compiled from the 1856 Post Office Directory.

Migrants as a rate per thousand of the sending parish population



0 kms 20

8

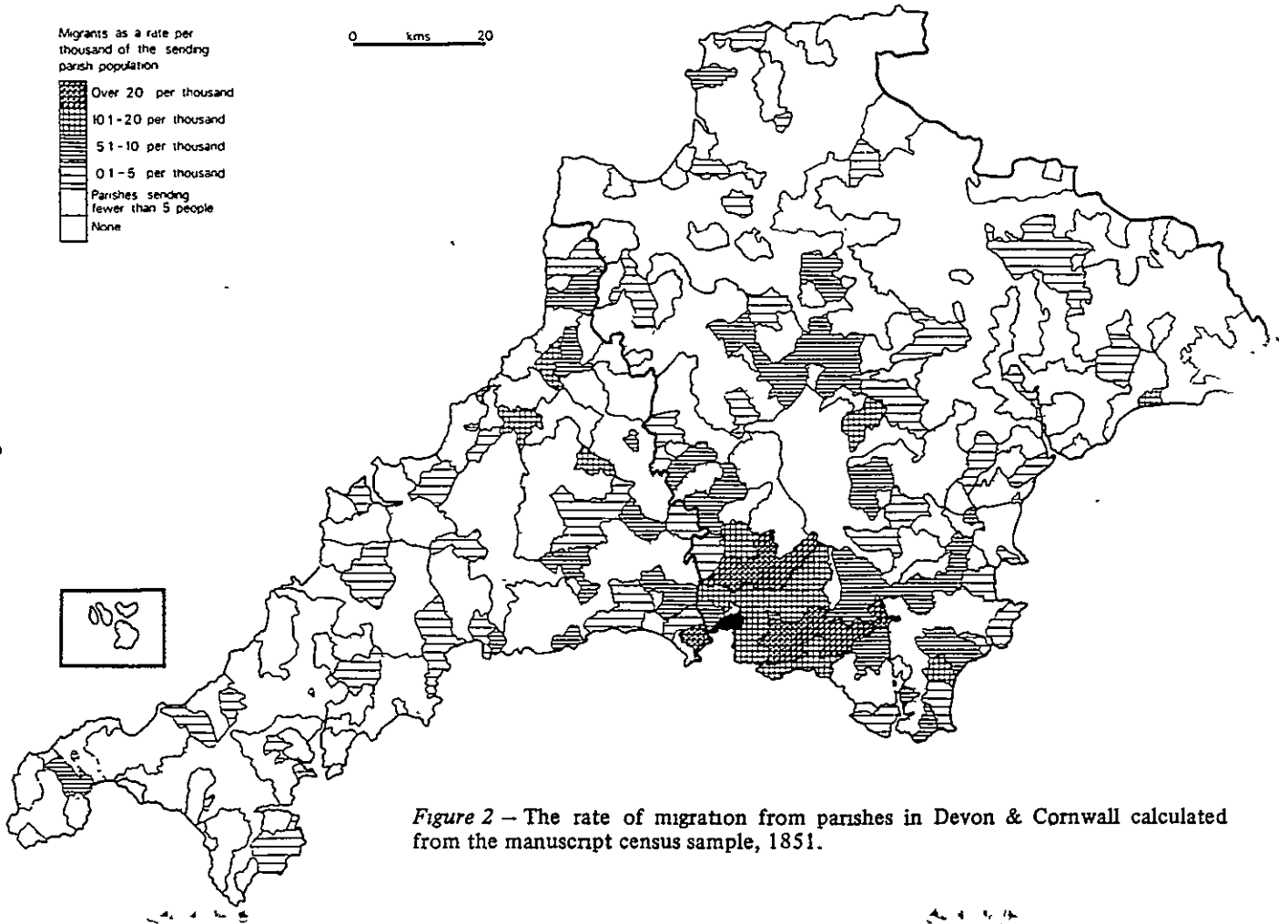
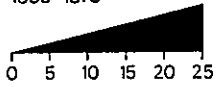


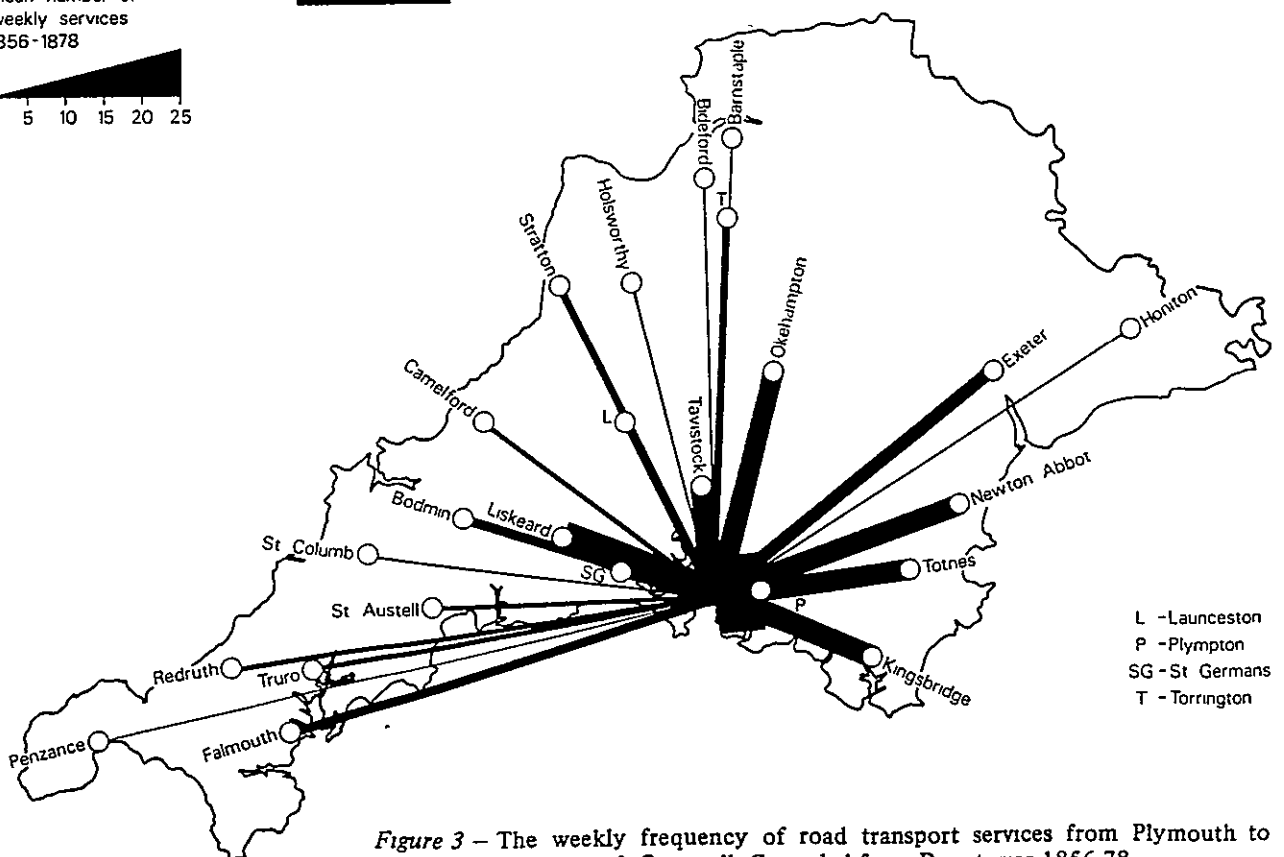
Figure 2 - The rate of migration from parishes in Devon & Cornwall calculated from the manuscript census sample, 1851.

Mean number of weekly services 1856-1878



0 kms 25

6



L - Launceston  
P - Plympton  
SG - St Germans  
T - Torrington

Figure 3 - The weekly frequency of road transport services from Plymouth to destinations in Devon & Cornwall. Compiled from Directories 1856-78

# LOCAL POLITICS AND PUBLIC HEALTH IN MID-NINETEENTH-CENTURY PLYMOUTH

55 00 584

by

MARK BRAYSHAY AND VIVIEN F. T. POINTON\*

## INTRODUCTION

IN the mid-nineteenth century, Plymouth ranked as one of Britain's most unhealthy towns.<sup>1</sup> Overcrowding was as bad as that encountered in all but the most pernicious blackspots of London, Liverpool, or Manchester.<sup>2</sup> Between 1841 and 1850, the rate of mortality had averaged twenty-five per thousand, a figure as high as the worst of the nation's industrial cities<sup>3</sup> (Table I). Rapid population growth was an experience that Plymouth shared with a great many other English towns in the early years of Queen Victoria's reign.<sup>4</sup> So too was the failure of the outmoded urban administrative bodies to cope with the new kinds of problems created by this unprecedented growth.

Public health issues and agitation for local political reform inevitably became interlinked in provincial towns.<sup>5</sup> Plymouth was no exception. As the old ruling élite tried to protect their threatened monopoly of local civic institutions, a tide of criticism about their handling of public health matters provided an ideal outlet for the increased political awareness of Plymouth's new breed of activists.<sup>6</sup> Derek Fraser has argued that the mid-nineteenth-century political activist "pitched his tent in whatever battlefield was open to him".<sup>7</sup> For six momentous years, public health was Plymouth's

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Abbreviations: Parliamentary Papers (PP); Public Record Office (PRO); Devon Record Office (DRO); General Board of Health (GBH).

<sup>1</sup> Modern Plymouth comprises the three formerly separate towns of Plymouth, East Stonehouse and Devonport (or Plymouth Dock). In the nineteenth century Plymouth and East Stonehouse had already coalesced but Devonport was still separate, both physically and administratively (see map). In this article the name Plymouth refers to Plymouth and East Stonehouse, but not to Devonport.

<sup>2</sup> W. J. Odgers, *A report on the sanitary conditions of Plymouth*, 1847, p. 29.

<sup>3</sup> R. Rawlinson, *Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage and supply of water, and the sanitary condition of the inhabitants of the Borough of Plymouth*, Plymouth, 1852, p. 6.

<sup>4</sup> For a general study of urban growth see B. T. Robson, *Urban growth: an approach*, London, Methuen, 1973, pp. 45-90.

<sup>5</sup> See D. Fraser, *Urban politics in Victorian England*, Leicester University Press, 1976, ch. 7; E. Gaudie, *Cruel habitations: a history of working-class housing 1780-1918*, London, Allen & Unwin, 1974, ch. 11.

<sup>6</sup> C. E. Welch, 'Municipal reform in Plymouth', *Reports and Transactions of the Devonshire Association for the Advancement of Science*, 1964, 96: 318-338. Local politics in Plymouth depended on personalities and local events rather than on national politics. The labels "Whig" or "Tory" are too sharp to be appropriate in Plymouth.

<sup>7</sup> Fraser, *op. cit.*, note 5 above, p. 9.



### *The Peckham Health Centre*

that they were concerned with medical services rather than with health services. Commenting specifically on the White Paper's proposals regarding the establishment of health centres, the reviewer wrote

A real Health Service must surely concern itself first with the way people live, with town and country planning, houses and open spaces, with diet, with playgrounds, gymnasia, baths and halls for active recreation, with workshops, kitchens, gardens and camps, with the education of every child in the care and use of his body, with employment and the restoration to the people of the right and opportunity to do satisfying creative work. The true 'health centre' can only be a place where the art of healthy living is taught and practised: it is a most ominous and lamentable misuse of words to apply the name of what is and should be called a 'medical centre'.<sup>39</sup>

A similar theme was taken up in a 'Target for Tomorrow' pamphlet on health published in 1944, which concluded with a call for a "planned campaign for social and positive health" and "health overhauls" for the whole population.<sup>40</sup>

In the end, it was Williamson and Pearse's inability to compromise that proved their undoing. In the case of the Peckham Health Centre, new trends in social medicine and epidemiology were dismissed because their primary concern was with ways of measuring disease rather than with what they saw as the more fundamental issue of what it was that should be measured, in Williamson's words "the proof of the pudding is in the eating, not in the statistics of the pudding".<sup>41</sup> Williamson and Pearse's refusal to change their research methods made it impossible for the Peckham Centre to obtain grants from the major charitable trusts. Similarly, Williamson's belief in the need for payment of weekly subscriptions made it impossible for the Centre to be absorbed into the NHS. Thus in 1950, the near-bankrupt Centre was sold to the LCC, which continued to operate its recreational facilities under the auspices of an evening educational institute. It is perhaps a final irony that in 1958 the medical direction of the Centre was finally resolved with the opening of a new GP diagnostic centre with x-ray and laboratory facilities and physiotherapy unit in the St Mary's Road building.

#### ACKNOWLEDGEMENTS

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<sup>39</sup> 'White Paper reviewed VI By an urban practitioner', *Lancet*, 1944, i 443

<sup>40</sup> J M Mackintosh, *The nation's health*, 'Target for Tomorrow' series, No 5, London, Pilot Press, 1944, pp 11-28, 56, 64

<sup>41</sup> Halley Stewart Trust Archives, correspondence, Williamson to P Winfrey, 21 January 1951

### *Local politics and public health in mid-nineteenth-century Plymouth*

local political battlefield and when, in 1854, the fighting was ended, a new regime gained control, more accountable and considerably more sensitive than the body which had been swept away.

While it could be argued that local public health issues might have been sufficient in themselves to precipitate the kind of political change achieved in Plymouth and elsewhere in the mid-nineteenth century, there can be little doubt that the influence and work of Edwin Chadwick provided a vital national context within which local squabbles were resolved.<sup>8</sup> It was Edwin Chadwick who, after years of work devising a new Poor Law, turned his attention to the question of public health. With the same energy and singlemindedness he had shown in exposing the weakness of the old Poor Law system, Chadwick assembled a battery of evidence about health and living conditions in Britain, which not only shocked, but also outraged the nation. The publication in 1842 of his *Report on the sanitary condition of the labouring population* was one of the most influential and far-reaching Blue Books of the whole Victorian era.<sup>9</sup> Ultimately, Chadwick's efforts led to the Public Health Act of 1848 which, though it fell well short of the compulsory new public health administration he had campaigned for, nonetheless gave local pressure groups a new weapon with which to fight their own separate battles for reform. In Plymouth, the Act prompted one of the most acrimonious political arguments in the long history of the town.

TABLE I POPULATION AND MORTALITY IN PLYMOUTH, 1841-50

<i>Year</i>	<i>Population*</i>	<i>Deaths</i>	<i>Death Rate (per thousand)</i>
1841	38,110	829	21.75
1842	39,693	1,107	27.89
1843	41,277	887	21.49
1844	42,860	1,022	23.85
1845	44,430	749	16.86
1846	46,026	1,030	22.38
1847	47,609	1,148	24.11
1848	49,193	1,268	25.78
1849	50,776	1,876	36.95
1850	52,359	1,363	26.03
Total	452,333	11,279	24.94

*Note*

In the seven years before the cholera epidemic of 1849, Plymouth's mortality rate averaged 23 per thousand. Thus, even without the impact of cholera mortality on the death rate there were sufficient grounds for a General Board of Health Inquiry.

\*These are Registrar General Estimates at 31 December.

Sources: Rawlinson Report, 1853; *Plymouth and Devonport Weekly Journal*, 29 January 1852; *Odgers Report*, 1847.

The principal objective of the 1848 Public Health Act was the establishment of a

<sup>8</sup> Gauldie, *op. cit.*, note 5 above, p. 131-141.

<sup>9</sup> D. Fraser, *Power and authority in the Victorian city*, Oxford, Blackwell, 1979. Edwin Chadwick, *Report on the sanitary condition of the labouring population of Great Britain* (1842), edited by M. W. Flinn, Edinburgh University Press, 1965.

General Board of Health appointed to encourage and co-ordinate a network of new, local boards which, it was hoped, would soon be formed in all the towns in the country. These Local Boards of Health were to assume responsibility for ensuring adequate and efficient water supply, sewage, and refuse disposal systems, and, through the appointment of local medical officers, to oversee all matters related to public health. The fundamental flaw in the legislation was that it was not made compulsory.<sup>10</sup>

The wrangle in Plymouth over whether to adopt the terms of the 1848 Act was not unique. It was matched by similar disputes elsewhere. In their first major report early in 1854, the General Board of Health were able to name only 284 towns that had formally requested the application of the Act, and a mere 182 had completed the necessary legal process by December 1853.<sup>11</sup> While the number of new requests was said to be increasing, many of the towns making an application to the Board either already possessed a relatively good public health record, or they were very small in population and were unlikely to be able to afford the measures necessary for improvement. In large towns the situation was rather different. Although some like York, Southampton, Dover, and Coventry had very readily adopted the Act, others became notorious for their stubborn resistance.<sup>12</sup> Birmingham, Newcastle, and Hull, for example, all used a ploy that became fairly common practice in the 1850s wherever vested interests stood to forfeit either political power or control of civic finances should Chadwick's arrangements be applied in their borough. The tactic employed was to frustrate the introduction of a new board of health in the town by substituting, or perhaps merely revising, an existing local act of Parliament which legislated on matters such as urban water supply, drainage, and refuse removal.<sup>13</sup> These local acts were rarely sufficiently comprehensive to cope with the mounting sanitary deficiencies of Britain's growing towns and, moreover, they were often excessively costly to local ratepayers. But they were a way of preserving local political power in the hands of those accustomed to wielding it and they eliminated any prospect of interference by the General Board of Health in local matters.

The anti-Public Health Act lobby in Plymouth tried to promote two local bills in order to circumvent the need to adopt Chadwick's controversial new measures. One was yet another revision of the town's "Improvement" Act, while the other was a specific attempt to remedy the woefully inadequate local water supply arrangements.<sup>14</sup> Indeed, a relentless and hostile campaign against the 1848 Public Health Act was waged for almost six years, during which time the appalling conditions in Plymouth steadily deteriorated.<sup>15</sup>

Local politics in provincial towns were everywhere in the melting-pot in mid-Victorian times, and a number of notable case studies have already been published by

<sup>10</sup> Public Health Act 1848, 11 & 12 Vict. Cap. 63

<sup>11</sup> PP (1854), vol. XXXV, *Report of the General Board of Health, 1848-54*, pp. 42-43

<sup>12</sup> *Ibid.*, p. 43

<sup>13</sup> *Ibid.*, p. 44. See also J. Smith, *Report to the General Board of Health on a preliminary enquiry into the sewerage, drainage, and supply of water, and the sanitary condition of the inhabitants of the town and borough of Kingston upon Hull, 1850*

<sup>14</sup> PRO, MH 13/144 fo. 960/53, Stevens to Commissioners, 25 March 1853

<sup>15</sup> See for example PRO, MH 13/144 fo. 1189/53, Cookworthy to Commissioners, 15 April 1853, fo. 1579/53, Martin to General Board of Health, 23 May 1853, fo. 8/54, 'Deaths from Cholera' November and December 1853

### *Local politics and public health in mid-nineteenth-century Plymouth*

other writers.<sup>16</sup> But very little attention has so far been paid to Plymouth, and the aim of this paper, therefore, is to examine public health reform and its links with local political change in this West Devon town with problems as severe as the more notorious cities of industrial Britain.

#### THE GROWTH OF PLYMOUTH

The key to Plymouth's health problems lay in its mushrooming population growth, which leapt from only 16,040 in 1801 to more than 52,000 by 1851 (Table II). Moreover, between 1841 and 1851 the town grew by the addition of over 1,600 people a year. This reflected large-scale migration into Plymouth from West Devon and Cornwall due not only to the lure of the apparent opportunities afforded by the town, but also to the low agricultural wages then prevalent in the South West and the closure of tin and copper mines which drove people from the surrounding districts.<sup>17</sup>

Unfortunately this massive influx of people was not matched by the building of new houses, and serious overcrowding resulted. Large houses vacated by the middle classes in the old commercial core of Plymouth were subdivided and multi-occupied by the working classes to an extent where conditions became a scandal. Claremont Street, for example, housed 614 people in only sixty dwellings. New Street, near the Barbican, contained twenty-three houses and 598 people – an average of twenty-six to each dwelling. In three cases a staggering sixty-six, seventy-five, and ninety-one persons were found sharing a house. Other blackspots included Basket Street, where there were more than twenty people per house; Stillman Street with thirteen, and Lower Street with fifteen. Indeed, in one court off Lower Street there were 171 people in six houses, none of which was drained, and all shared a single stand-pipe for their supply of water.<sup>18</sup>

TABLE II. POPULATION GROWTH IN PLYMOUTH 1801–1901

	<i>Population</i>	<i>% Change</i>
1801	16,040	
1811	20,803	29.7
1821	21,591	3.8
1831	31,080	43.9
1841	36,520	17.5
1851	52,221	43.0
1861	62,599	19.9
1871	68,833	10.0
1881	73,863	7.3
1891*	84,253	14.1
1901	107,636	21.0

Sources: Census Reports 1801–1901.

\*There were boundary changes between the 1881 and 1891 censuses.

<sup>16</sup> For example, B. D. White, *A history of the Corporation of Liverpool*, Liverpool, 1951; J. Toft, 'Public health in Leeds in the nineteenth century', MA thesis, University of Manchester, 1966; C. Gill, *History of Birmingham*, Oxford University Press, 1952; D. Large, and F. Round, *Public health in mid-Victorian Bristol*, Bristol, Bristol Branch of the Historical Association, 1974.

<sup>17</sup> See J. Gerrard, *Book of Plymouth*, Plymouth, 1982.

<sup>18</sup> Odgers, op. cit., note 2 above, p. 14.

Part of the problem was an acute shortage of suitable building land. The expansion of Plymouth was impeded by several large private estates that encircled the town. Land was only slowly released to speculative builders and often on unfavourable leasehold terms that encouraged the erection of only the cheapest and most inferior types of dwelling.<sup>19</sup> Some sites in the town were simply too steep to be used for house-building, others were too marshy. And in a town where casual dock labour was a key form of employment, working men were often reluctant to live too far from the wharfingers' pitches and thereby risk losing the chance of being hired.

As a growing port, nineteenth-century Plymouth acquired a cosmopolitan population that set it apart from the rest of Devon and Cornwall. As the depot for colonial emigration sponsored by the government, Plymouth hosted large groups of Irish en route to Australia, Canada, and elsewhere.<sup>20</sup> Steamers provided regular contact with both Belfast and Cork and by 1851 a permanent Irish community was well established in one of the least salubrious parts of Plymouth.<sup>21</sup> Imports including chemicals, timber, grain, and hides supported local industries like candle-, soap- and starch-making, furniture- and boat-building, biscuit-baking, brewing, distilling, and tanning. Plymouth also served as a major livestock market for a large tract of Devon and Cornwall. Thus huge numbers of "Devon Ruby" cattle were driven through the streets into the heart of the town, where the slaughterhouses and butchers were kept busy. Indeed, cowkeeping was common throughout Plymouth in the nineteenth century,<sup>22</sup> and, while the practice ensured a supply of fresh dairy produce, the effect of keeping farm animals in domestic premises lining narrow, undrained streets can have done little to improve the health record of the town.

#### PLYMOUTH'S IMPROVEMENT COMMISSIONERS

In April 1824, a local Act of Parliament dating back to 1770 had been amended for the third time "for better paving, lighting, cleansing, watching and improving the town and borough of Plymouth in the county of Devon, and for regulating the Police thereof, and for removing and preventing nuisances and annoyances therein"<sup>23</sup> The amendments comprised clauses that established a freshly mandated commission empowered to order the building of public drains, the construction and cleansing of private drains, and the watering and cleansing of streets in the town. On the face of it, Plymouth ought to have been a clean and healthy borough. There were, however, a number of operational difficulties. First, the Commissioners had no power to insist on the installation of adequate drainage for new development.<sup>24</sup> Ironically, therefore, most of the ill-drained and thus unhealthy areas of the town were on the periphery where new housing was being erected at break-neck speed as soon as land became available.<sup>25</sup> Second, the establishment of Plymouth Town Council under the terms of

<sup>19</sup> C Gill, *Plymouth a new history*, Newton Abbot, David & Charles, 1979, vol 2, p 146-148

<sup>20</sup> M Brayshay, 'Government-assisted emigration from Plymouth in the nineteenth century', *Reports and Transactions of the Devonshire Association for the Advancement of Science*, 1980, 112 185-213

<sup>21</sup> Gill, *op cit*, note 19 above, p 149

<sup>22</sup> Kelly's Directory of 1856 reveals that there were more than sixty cowkeepers in Plymouth

<sup>23</sup> PRO, MH 13/144 fo 8003/49, Corporation of Guardians of the Poor of Plymouth to Alexander Bain, Assistant Secretary to GBH, 25 October 1849

<sup>24</sup> PRO, MH 13/144 fo 3923/53, Plymouth Improvement Commissioners to GBH, 7 April 1853

<sup>25</sup> Odgers, *op cit*, note 2 above, p 16

### *Local politics and public health in mid-nineteenth-century Plymouth*

the Municipal Corporations Act of 1835 had led to divided jurisdiction.<sup>26</sup> For, although the Act had allowed for local improvement commissioners to surrender their powers to the new councils after 1835, in Plymouth this had not happened. Thus while the town's water supply was controlled by the Council, other "improvement" matters remained the concern of the Commissioners.<sup>27</sup> A third problem in Plymouth was that by the 1850s most of the Town Council and the Commission were effectively self-elected for life. Though this charge was vehemently denied by both authorities when it was exposed in a government report in 1853, the facts were plain.<sup>28</sup> A certain number of town councillors were automatic members of the Commission, and they simply co-opted their friends to complete the number. Thus, the persons presiding in the town's most powerful administrative bodies could easily ensure their re-election or reappointment to office, and the faces were said "hardly ever to change".<sup>29</sup>

Although there may have been some mismanagement of funds, there is little documentary evidence to suggest any corruption. Local newspapers contained oblique accusations that suggested that some commissioners blocked attempts to require houseowners to improve badly drained, insanitary properties in the worst parts of town because as landlords themselves of these multi-occupied slums, such action would have inflicted a new, unwelcome expense upon their own purses.<sup>30</sup> Certainly, many commissioners were practising solicitors. And solicitors in Victorian times often managed their clients' funds by investing in property. However, it is hard to be sure about the motives of individual commissioners and the real difficulty seems to have been one of approach and not bad intention. Thus, instead of ensuring that all new houses were properly serviced when they were erected, the Commission installed sanitation here and there when the local outcry about conditions became loudest, and at considerable cost to the ratepayers.<sup>31</sup> While none of the new local boards of health in England levied a rate of more than 6d (2½p) in the pound in 1853, the Commission in Plymouth already expected one shilling (5p) and hoped for 1s 3d (7p).<sup>32</sup> Moreover, they had borrowed heavily on the security of the rates. Together the Corporation and the Improvement Commission in Plymouth owed £67,518 by 1852. But the town had precious little to show for it.

Neither local authority was prepared to concede the need for any major reform in the way the town's affairs were run, however, and they simply viewed it as a matter of extending the powers they already possessed. But local pressure for more radical change was nevertheless mounting, and one of the key factors was the report published by the Rev. W. J. Odgers.<sup>33</sup>

#### THE ODGERS REPORT

One immediate effect of the publication in 1842 of Chadwick's report on the

<sup>26</sup> PRO, MH 13/144 fo. 3923/53, Rawlinson to GBH, 21 October 1853.

<sup>27</sup> *Ibid.*

<sup>28</sup> PRO, MH 13/144 fo. 1170/53, Whiteford to GBH, 14 April 1853.

<sup>29</sup> PRO, MH 13/144 fo. 1579/53, Martin to GBH, 27 May 1853.

<sup>30</sup> *Plymouth and Devonport Weekly Journal*, 15 November 1849, p. 2.

<sup>31</sup> See *ibid.*, 25 October 1849, 16 August 1849, 17 May 1849.

<sup>32</sup> PRO, MH 13/144 fo. 4467/53, Rawlinson to GBH, 21 October 1853.

<sup>33</sup> Odgers, *op. cit.*, note 2 above.

sanitary conditions of the labouring population was to give a boost to the recently formed Health of Towns Association.<sup>34</sup> Branches were soon formed in provincial towns and, following the example set by Liverpool a year earlier, Plymouth's leading Liberal town councillor, George Soltau, called a public meeting at the Mechanics' Institute in 1846 to discuss the subject of public health. The most important outcome was the foundation of the Plymouth branch of the Health of Towns Association, which launched the *Plymouth Health of Towns Advocate* as a periodical on the model of similar publications produced with success elsewhere. Although the *Plymouth Advocate* flopped, it did provide the stimulus for one of the most comprehensive public health investigations to be carried out anywhere in Britain. This took the form of a detailed two-year survey co-ordinated by the Rev. W. J. Odgers (Secretary of the new association), who published his findings on the 'Sanitary Condition of Plymouth' in November 1847. Odgers's survey team was supported by voluntary contributions in its study of drainage, refuse removal, water supply, ventilation, the "physical and moral evils from want of sanitary regulation", and the economic costs and benefits of sanitary improvement.<sup>35</sup>

As a Unitarian Minister the Rev. Odgers was daily in contact with Plymouth's slum-dwellers. Although it is hard to piece together a reliable picture of this tireless local campaigner, there can be little doubt of his influence. He seems to have modelled himself upon the famous Dr William H. Duncan, who did so much to draw attention to public health issues in Liverpool, and while Odgers was not a medical man himself, his studies of health matters were no less meticulous.<sup>36</sup> Odgers was equally at home in championing the rights of Plymouth's sizeable Jewish community, visiting the sick and dying in areas of the town where few middle-class people would have ventured, and in addressing the Plymouth Athenaeum or Mechanics' Institute on the subject of the works of Charles Dickens.<sup>37</sup> He was, therefore, both an intellectual and a radical – and he was singularly successful in making the civic establishment extremely uncomfortable. Nevertheless, he was lampooned and derided in a steady flow of anonymous letters published in the local press between 1846 and 1852. Odgers invariably responded with clever, often withering counter-argument.<sup>38</sup>

While the only immediate result of his efforts was the opening of public wash-houses in Hoegate Street in 1850, and despite the press criticism of his report by opponents of public health reform in Plymouth, Odgers's survey was crucial in throwing open the debate in the town.<sup>39</sup> Chadwick's national survey was perhaps too global, too far removed from local circumstances to stir many ordinary Plymouthians, but the news that their own town was more overcrowded and unhealthy than Liverpool, Manchester, or Nottingham brought a flood of indignation, shock, and outrage.

Odgers's report recognized the special drainage problems posed by Plymouth's

<sup>34</sup> *Ibid.*, p. iv

<sup>35</sup> *Ibid.*, p. v

<sup>36</sup> W. M. Frazer, *Duncan of Liverpool*, London, Hamish Hamilton Medical Books, 1947

<sup>37</sup> *Plymouth and Devonport Weekly Journal*, 1 January 1849, 15 March 1849, 28 December 1848

<sup>38</sup> *Ibid.*, 7 December 1848, 25 January 1849

<sup>39</sup> See, for example PRO, MH 13/144 fo 897/53, fo 5249/52, and fo 960/53

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coastal site. Large areas were marshy and some streets were actually below sea level at high tides. Thus, basements in Lockyer Street were often flooded with stagnant water from nearby marshes, and in Bath Street some houses were below water level. Union Street and the Octagon – constructed on land reclaimed from the sea to link Plymouth with the neighbouring town of Stonehouse – lay below sea level at higher tides, and the cellars of houses that lined this route were gradually filled with water.<sup>40</sup> Street drains, where they existed, were often inadequate, in fact only 1,763 houses in the town (out of a total of 4,930) were linked to any kind of drainage system. Moreover, there were more than 2,200 houses with neither a privy nor a water closet. “For want of privies, the people use a tub, which is kept in the house and even in the room where a family of 10 or 12 persons eat, cook and sleep, which is often kept unemptied for days together.”<sup>41</sup> Indeed, it had become the practice in Plymouth, particularly in the area of the docks, to allow “night soil” to accumulate in heaps until there was a sufficient load to sell as manure to the farms of the Tamar Valley. Odgers declared that many Plymouthians were “living on vast dung heaps”.<sup>42</sup>

Much was made at the time of the injurious effects of the noxious gases and vapours given out by decaying refuse. It was a common belief that the miasma, or foul air, itself could spontaneously cause disease. In fact, the accumulations of filth contaminated the town’s water supply to the point where dysentery and diarrhoea became endemic. Odgers’s surveyors had noted that the subsoil and foundations beneath houses had often become “perfectly saturated” from nearby cesspools.<sup>43</sup> Living conditions like these must have weakened the population and left them prey to a range of acute infectious diseases as well as chronic wasting diseases like tuberculosis (Table III).

During the 1840s Plymouth experienced serious outbreaks of scarlet fever and smallpox. Whooping-cough regularly claimed the lives of a number of its young victims, and diseases like dysentery and diarrhoea were endemic. Each year, there were between twenty and thirty deaths due to diseases of the bowel; mostly very young or elderly people, but these figures mask the much larger number of sufferers who were weakened by these illnesses, but did not die. As Table III shows, only in 1846 was Plymouth relatively free from some acute infectious disease, and chronic illnesses like tuberculosis took a steady, year by year, toll. But when cholera struck in 1849, the rate of mortality reached a new peak, caused genuine terror and added fresh, significant impetus to the local public health campaign.

#### CHOLERA, 1849

In the earlier cholera epidemic in 1832, there were 1,031 recorded deaths in the three towns of Plymouth, Stonehouse, and Devonport.<sup>44</sup> Some 779 victims of the

<sup>40</sup> Odgers, *op. cit.*, note 2 above, p. 14.

<sup>41</sup> *Ibid.*, p. 19.

<sup>42</sup> *Ibid.*, p. 21.

<sup>43</sup> *Ibid.*, p. 20.

<sup>44</sup> See Gill, *op. cit.*, note 19 above, p. 149. The basis of diagnosis altered between 1832 and 1848. G. R. Larks, ‘Plymouth Medical Society in the nineteenth century’, unpubl. address to Plymouth Medical Society 23 January 1968, MS. Plymouth Local History Library Collection. In 1832, cholera was confined to the Sutton Pool area of Plymouth.



TABLE III MORTALITY DUE TO INFECTIOUS DISEASES, 1841-50

Year	ZYMOTIC DISEASES							OTHER CAUSES			Totals
	Smallpox	Scarlet fever	Croup	Whooping-cough	German measles	Influenza	Diarrhoea and dysentery	Cholera	Respiratory diseases*	Others	
1841	47	72	5	10	1	—	11	2	238	443	829
1842	47	238	2	29	17	—	27	6	255	486	1,107
1843	63	6	4	26	18	1	27	5	247	490	887
1844	25	10	12	24	41	2	25	5	312	566	1,022
1845	9	2	5	17	15	1	25	—	216	459	749
1846	—	1	5	2	26	—	56	—	353	587	1,030
1847	18	—	1	65	36	40	52	2	318	616	1,148
1848	177	18	12	37	19	—	46	22	nd	937	1,268
1849	2	25	17	15	20	3	55	819	nd	920	1,876
1850	3	197	4	59	9	—	66	7	nd	1,018	1,363
Totals*	391	569	67	284	202	47	390	868	1,939	6,522	11,279
Average	39	57	7	28	20	5	39	87	277	652	1,128

\*Mostly Respiratory Tuberculosis

nd = no data

The term "zymotic" was used to refer to acute infectious diseases

Sources *Plymouth and Devonport Weekly Journal*, 19 October 1848, 15 January 1852, 29 January 1852, also PRO MH 13, Plymouth Public Dispensary data

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disease died in Plymouth. For a time, there was a fear that the whole population would be engulfed, but the outbreak was largely confined to the lower classes living in the old inner core of the town around Sutton Pool. By affecting only the poorest sections of the population, the political edge was knocked off the impact of the disease. Largely unaffected by the epidemic, the middle classes quickly forgot the threat.

In 1849, circumstances were different. This time cholera claimed 1,894 lives from amongst the people who contracted the disease in the three towns.<sup>45</sup> There were 3,360 cases and 819 deaths in Plymouth alone. Moreover, while most deaths occurred in the slum areas of the town, newer middle-class suburbs took their share. The Rev. Odgers must have derived a kind of grim satisfaction. The conditions he had exposed two years earlier had helped to produce exactly the disaster he had predicted.

At first, local newspapers had confidently assured their readers that although other towns were afflicted by cholera, Plymouth was likely to escape.<sup>46</sup> But in November 1848, there was a scare when a convict ship, the *Cadet*, bound for Hobart Town, put into Plymouth because one of the prisoners on board had contracted cholera. The victim was Margaret Farrell, aged twenty-four, who died within hours and was buried at sea out near the Eddystone Reef.<sup>47</sup> Public anxiety died down, only to be aroused again in June 1849 when the *American Eagle*, an emigrant ship from Portsmouth, bound for New York, anchored in the sound after six of her passengers had died of cholera during the channel voyage.<sup>48</sup> In all, there were almost fifty cases on board the *Eagle*, but no more fatalities. Plymouth's Port Admiral, Sir William Hall Gage, arranged for disposal of the bodies at sea and the transference of the remaining passengers to quarantine vessels which were anchored off the Hoe. But reports came in that cholera had broken out in the tiny fishing villages of Newton Ferrers and Noss Mayo, only eight miles from Plymouth and panic in the town increased.<sup>49</sup>

In the days and weeks which followed, Plymouth held its breath. For a time no new cases appeared. The local press carried endless quack remedies and appeals by townspeople to "clear up the burial grounds" or "remedy the evils of stagnant cess pools".<sup>50</sup> Early in July, however, it was becoming clear that the disease was taking hold (Table IV). It began to deal its fatal blows in the slum areas, but in the weeks that followed, few districts were safe. A grim peak was reached during the week of 11–18 September, when eighty-seven people died and more than 360 new cases of cholera/choleraic diarrhoea were diagnosed. Thereafter, the epidemic began to decline, but not before whole families had been wiped out (Figure 1).

At the height of the cholera scare, Plymouth's Improvement Commissioners established a temporary board of health, but by December 1849 there was already talk of disbanding it and returning to the status quo.<sup>51</sup> In any case, the local board had been largely ineffectual.

<sup>45</sup> *Plymouth and Devonport Weekly Journal*, 13 December 1849.

<sup>46</sup> *Ibid.*, 14 June 1849.

<sup>47</sup> *Ibid.*, 30 November 1848.

<sup>48</sup> *Ibid.*, 7 June 1849, p. 4.

<sup>49</sup> *Ibid.*, 26 July 1849, p. 5.

<sup>50</sup> *Ibid.*, 5 July 1849; 12 July 1849; 19 July 1849.

<sup>51</sup> *Ibid.*, 20 December 1849.

TABLE IV PEAK CHOLERA WEEKS IN PLYMOUTH JULY-OCTOBER 1849

	Cholera	Cholerae diarrhoea	Total	Deaths
4-11 July } 11-17 July }	nd	nd	364	81
17-24 July	58	168	226	47
24-31 July	31	109	140	24
31 July-7 August	75	164	239	29
7-14 August	155	176	331	81
14-21 August	132	200	332	72
21-28 August	122	165	287	62
28 August-4 September	94	183	277	45
4-11 September	118	205	323	63
11-18 September	210	150	360	87
18-25 September	89	106	195	60
25 September-2 October	36	107	143	25
13 weeks totals	1,120	1,733	3,217	676

nd = no data

Note

Between 5 June when cholera was introduced by the visiting ship *American Eagle* and Christmas 1849, there had been 819 deaths recorded in Plymouth

Sources *Plymouth and Devonport Weekly Journal*, 16 and 23 August 1849, 6, 13, 20, and 27 September 1849, 4 October 1849, Plymouth Public Dispensary data

Unable to make an impression on either the Plymouth Improvement Commission or the town's Corporation, many individual townspeople complained direct to the General Board of Health.<sup>52</sup> Surviving letters all carry the same message Plymouth was fast disappearing under its own filth, and conditions were desperate. In December, the Board received a memorial (petition) from the ratepayers of Plymouth. Signatures were collected by H C Martin, a retired army captain whose efforts almost certainly precipitated the subsequent actions of the General Board of Health. But Captain Martin was attacked by the letter-writers in the Plymouth press.<sup>53</sup>

We hear a great deal about the forced application of this Act [Public Health Act] to our own Borough the Prime Mover is one Captain Martin - a recent *comer-in*, whose last abode it is said, and I can readily believe it from his goings-on here, he gave a vast deal of trouble to his neighbours and afterwards left them to settle the account, and to get out of their difficulties the best way they could  
11 October 1849

Many who were cajoled by Captain Martin and his tail to sign the memorial to the Central Board of Health now regret it. They say they did not exactly understand the result consequent upon the presentation of this memorial. There appears to be a storm gathering and the Captain may yet be considerably damaged for the prominent part he has taken at the bidding of a few arrant knaves. It is a great misfortune for the poor old Captain that he should 'lend a willing ear' to the evil spirits that have led him on. Now, he must take care upon the forthcoming enquiry, that he is not completely smashed to ATOMS!  
18 October 1849

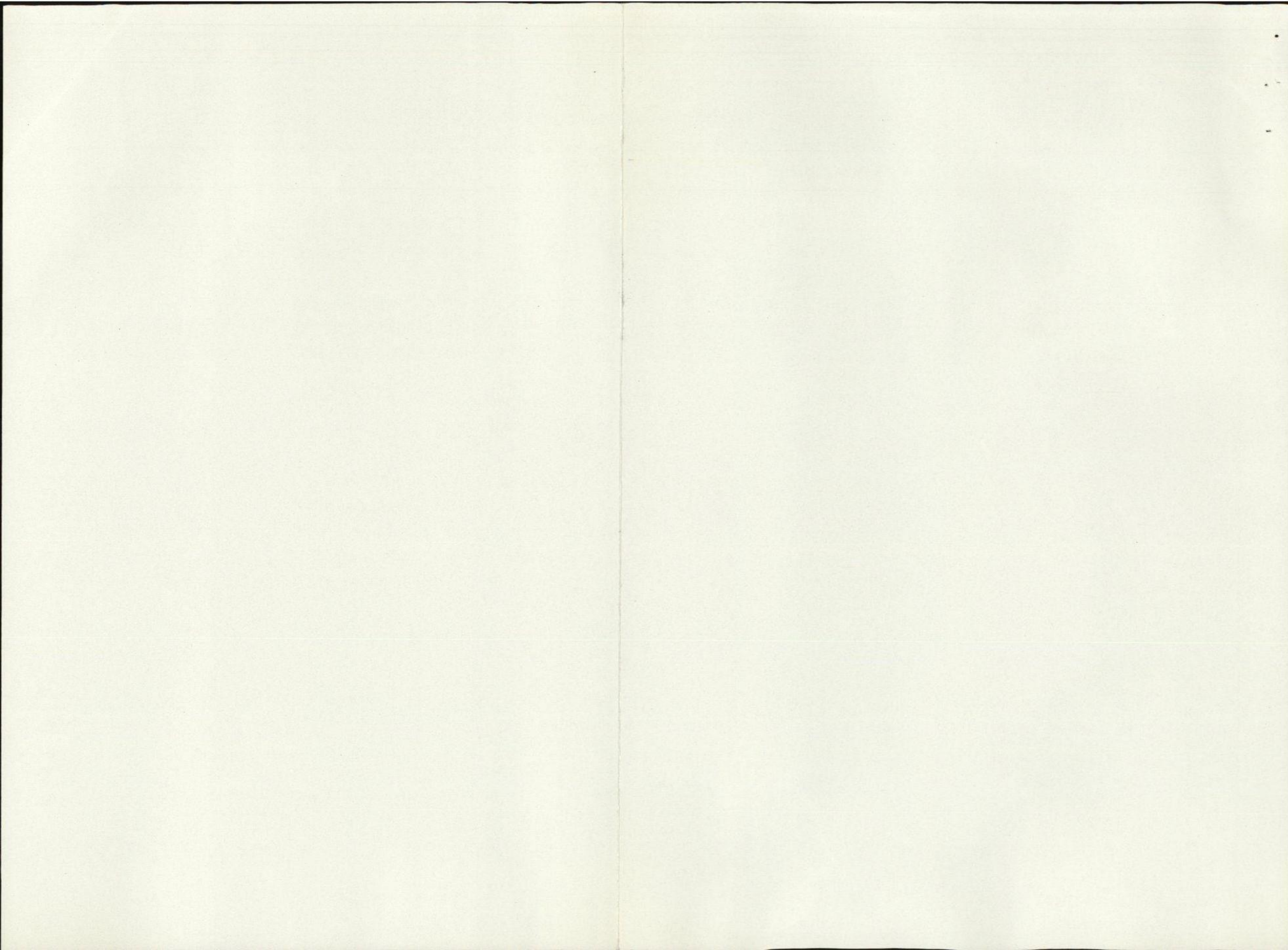
While there is no mistaking the meaning of these comments, Captain Martin's peti-

<sup>52</sup> PRO, MH 13/144 fo 5249/52, Memorial from the ratepayers of Plymouth to the GBH December 1849

<sup>53</sup> *Plymouth and Devonport Weekly Journal*, 11 and 19 October 1849



Plymouth c. 1860. (Reproduced by courtesy of Devon Library Services.)



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Cholera Cases in Plymouth July - October 1849

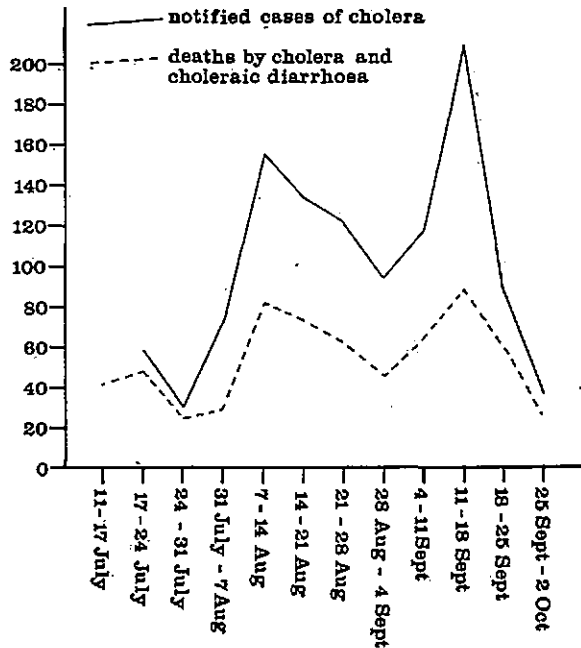


Figure 1.

tion had already been despatched and the wheels were in motion in London. Under the terms of the Public Health Act of 1848 a group of ratepayers equivalent to ten per cent of their total number could bypass the local authorities in their town and make their own direct appeal to the General Board of Health to have the 1848 Act applied to them. Moreover, in certain circumstances, the Board could insist that the Act was adopted.<sup>54</sup> Where the local level of mortality had averaged twenty-three per thousand over the previous seven years, the terms of the Act allowed for its immediate application to the locality in question. The ratepayers' memorial was therefore able to make its appeal by satisfying both conditions under which the Board could step in. Their reaction was immediately to appoint Robert Rawlinson as Superintendent Inspector of Plymouth with authority to investigate the sewerage, drainage, water supply, and sanitary condition of the town.<sup>55</sup> It was a bitter pill for the Improvement Commissioners to swallow; their Chairman, William Mortimer, opened a correspondence with the General Board and later with the Local Government Act office, which was to last until at least the late 1860s. His opposition was unflinching, and by January 1867 his letters were no longer even acknowledged. Each was viewed as just "another of Mr Mortimer's regular tirades against the Board".<sup>56</sup>

<sup>54</sup> Public Health Act 1848, 11 & 12 Vict. Cap. 63.

<sup>55</sup> See note 52. Reply to the Ratepayers of Plymouth.

<sup>56</sup> PRO, MH 13/145 fo. 276/67, Mortimer to the GBH; minuted to this effect by the Secretary.

THE RAWLINSON INQUIRY

Robert Rawlinson was employed by the General Board of Health in the wake of the cholera epidemic as a kind of roving inspector. It was his job to conduct detailed local inquiries into public health matters and to report back to the Board in London. Before coming to Plymouth in January 1852, Rawlinson presided over similar inquiries in Birmingham (1849) and Bradford (1851)<sup>57</sup> Thus his reputation arrived in the South West well ahead of him, and there is no doubt that the Board's Inspector was regarded with a certain awe and commanded considerable respect in Plymouth.

The inquiry opened on 15 January, all the important local figures assembled, including the Rev. Odgers, William Mortimer, and Captain Martin. Local interest was intense, as Rawlinson took evidence and made his pronouncements. Opponents of the Public Health Act tried hard to sustain their case. For instance, Plymouth's Superintendent Registrar, Mr Pridham, argued that Irish inhabitants and seamen who happened to die in Plymouth falsely inflated the town's average mortality rate. Rawlinson's response was magisterial, "Far from the presence of Irish and other unfortunates in Plymouth being an excuse for the town's appalling health record, this was just the very reason why an enquiry was necessary and why further powers must be obtained"<sup>58</sup>

Captain Martin, who had been vilified without mercy in the press, was praised by Rawlinson for his efforts in alerting the General Board of Health to Plymouth's problems. In response, Martin made the following harrowing comment "When the Cholera was very bad in Quarry Court, I went there with Mr Wright and Dr Budd and we found seven men dead in one room, while there were many others there, some ill and some well, and one of the latter was broiling a piece of pork"<sup>59</sup> The Rev. Odgers presented files of evidence and data to the Inspector, together with new information that amounted to a resurvey of streets examined in 1847, so that changes that had occurred in the intervening five years could be assessed. Most tellingly, Odgers was able to show that in so-called bad streets, not only were there more cases of cholera in 1849, but also a greater fatality rate from the disease<sup>60</sup>

On 20 January Rawlinson went to inspect the slums of Plymouth for himself; what he found was apparently too grim to be reported in the press. He left Plymouth to prepare his controversial report, which he presented to the General Board of Health at the end of 1852<sup>61</sup> It amounted to an uncompromising and comprehensive indictment of the inefficiency and incompetence of both the Plymouth Town Council and the Plymouth Improvement Commissioners. The divided jurisdiction exercised by these two public bodies was identified as a principal obstacle to reform. Furthermore, Rawlinson alleged that Plymouth's public health problems were attributable, in part, to the "vicious constitution of the body of Commissioners"<sup>62</sup> The challenge was clear, and neither local authority liked it. Their reaction was vehement and sustained.

<sup>57</sup> R. Rawlinson, *Report to the General Board of Health on the Borough of Birmingham*, 1849, PRO, MH 13/27 Rawlinson's Report on street improvements in Bradford, 3 February 1851

<sup>58</sup> *Plymouth and Devonport Weekly Journal*, 15 January 1852, p. 8

<sup>59</sup> *Ibid.*

<sup>60</sup> *Ibid.*, 22 January 1852, p. 2-3

<sup>61</sup> Rawlinson, *op. cit.*, note 3 above

<sup>62</sup> See also PRO, MH 13/144 fo 1189/53, Cookworthy to the GBH, 15 April 1853

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By April 1853, the Improvement Commissioners had prepared their response to Rawlinson's report. A statement covering some eighteen pages was sent to the General Board of Health. They entirely refuted Rawlinson's findings.<sup>63</sup> But they were prepared to acknowledge that their own powers had been too limited and they announced their intention of promoting a Plymouth Improvement Bill and a Plymouth Waterworks Bill as a remedy. Soon afterwards, the objections of the Town Council to Rawlinson's report were received in London.<sup>64</sup> This time the emphasis was on the detailed figures and calculations contained in the report. Certainly the Council did seem to have uncovered some slight numerical discrepancies but the main thrust of the argument about Plymouth's woeful public health record remained unimpaired.

#### THE ADOPTION OF THE PUBLIC HEALTH ACT

Plymouth ratepayers had formed a committee by 1853, and its new chairman, ex-Town Councillor Thomas Stevens, began to press the Board again in a fresh attempt to obtain local adoption of the terms of the 1848 Public Health Act.<sup>65</sup> In March, a second petition was submitted, which indicated the scale of opposition to the two proposed local bills that had been designed to thwart those who wanted the Act applied. Some 5,400 townspeople recorded their opposition to the Waterworks Bill and the Improvement Bill, which were seen as window-dressing measures that would not mean any significant improvement in the sanitary condition of Plymouth.<sup>66</sup> A month later, the Ratepayers' Committee began collecting information on the experience of other towns that had adopted the 1848 Act. Reaction in Exeter, Rugby, Tottenham, Launceston, Leamington, Wolverhampton, Derby, Southampton, Wigan, Gateshead, Salisbury, and York indicated that Chadwick's arrangements would cost only around £100 in legal expenses, while Plymouth's local bills were certain to cost £3-£4,000.<sup>67</sup>

By now, the General Board had accepted the evidence and was convinced that the Public Health Act of 1848 should be applied in Plymouth: "The Board are painfully aware of the defective sanitary condition of Plymouth and earnestly hope that the inhabitants may before long be enabled to apply the provisions of the Public Health Act to remedy the serious sanitary evils from which they are suffering."<sup>68</sup> But although a draft provisional order for the application of the Act to Plymouth had been prepared by September 1852, its progress was halted when there was a fresh outbreak of cholera in the town. The number of victims did not approach the scale of the 1849 epidemic, but there can be little doubt that the connexion between the incidence of the disease and bad conditions was clear again. Most of the cases this time were confined to the Irish quarter in St Andrew's sub-district, but they were sufficient to prompt the Commissioners to re-establish their temporary, independent local board of health, to appoint an "Inspector of Nuisances" (to clear away some of the filth), and to "take

<sup>63</sup> PRO, MH 13/144 fo. 1082/53, Commissioners to the GBH, 7 April 1853.

<sup>64</sup> PRO, MH 13/144 fo. 1170/53, Whiteford to the GBH, 14 April 1853.

<sup>65</sup> PRO, MH 13/144 fo. 960/53, Stevens to the GBH, 25 March 1853.

<sup>66</sup> *Ibid.*

<sup>67</sup> PRO, MH 13/144 fo. 962/53, Stevens to the GBH, 4 April 1853.

<sup>68</sup> PRO, MH 13/144 fo. 1579/53, GBH to H. C. Martin, 27 May 1853.



active measures to counteract the progress of the disease".<sup>69</sup> One Plymouth resident complained to Lord Palmerston about the town's cemeteries. As in 1849, graves were being re-used and the putrefying remains of earlier interments were being exposed when cholera victims were buried. Palmerston speedily referred the matter to both the General Board of Health and to the Plymouth Town Council.<sup>70</sup> In a matter of days, the latter had responded with characteristically sharp words: "If Plymouth is in a deplorable sanitary condition let the General Board of Health answer for the results of its destructive interference with the efforts of the local authorities to effect improvement."<sup>71</sup>

But Palmerston's intervention may well have been decisive. When a new provisional draft order for the application of the 1848 Act to Plymouth was issued in February 1854, the town council gave it their approval. Even the opposition of the Plymouth Improvement Commissioners was muted. They reiterated their earlier objection to the allegation that the two local authorities were in conflict, but they also realized that the battle was now lost.<sup>72</sup> Parliament approved the incorporation of Plymouth under the terms of the Public Health Act in July 1854, and within weeks a permanent local board of health was being formed.<sup>73</sup>

#### AFTERMATH PLYMOUTH'S BOARD OF HEALTH

The antagonisms provoked during the long, bitter campaign over the Public Health Act in Plymouth took years to heal. In the short term, this made the work of the new local board of health more difficult. Even so, the scale of their efforts is still impressive.<sup>74</sup> Sewage disposal, paving streets with flagstones, and street-widening were amongst their early priorities.<sup>75</sup> Work on an entirely new sewerage scheme was begun, which eventually received the approval of the General Board in August 1855. Costs were to be met by mortgaging the rates, and construction work began the following year.<sup>76</sup> Under the terms of the Lands Clauses Consolidation Act of 1845, the Plymouth Board of Health framed a steady stream of provisional orders for the compulsory purchase of property to enable street improvements to be carried out.<sup>77</sup> Hundreds of houses were demolished. It is ironic that initially this made overcrowding even worse, but the development of suburbs to the north and north-west of the town gradually eased the problem.<sup>78</sup>

By the end of the decade, the local board was administering public baths and wash-houses recently purchased from the Ratepayers Committee and refurbished at a cost

<sup>69</sup> PRO, MH 13/144 fo 8/54, W Pridham to GBH, 2 January 1854

<sup>70</sup> PRO, MH 13/144 fo 3923/53, T J Buswarva to Lord Palmerston, minuted by Palmerston and referred to the GBH

<sup>71</sup> *Ibid.*, Bampton to the GBH, 8 October 1853

<sup>72</sup> PRO, MH 13/144 fo 1036/54, Eastlake to the GBH, 14 March 1854, also fo 1061/54, 16 March 1854

<sup>73</sup> PRO, MH 13/144 fo 3327/54, Public Health Act Incorporation of Plymouth, 31 July 1854

<sup>74</sup> See, for example, PRO, MH 13/144 fos 668/55, 719/55, 1890/55 and 3126/55

<sup>75</sup> PRO, MH 13/144 fo 5031/54, Eastlake to the GBH, 5 October 1854, fo 5283/54, Eastlake to the GBH 17 October 1854, fo 107/55, Eastlake to the GBH 9 January 1855

<sup>76</sup> PRO, MH 13/144 fo 3287/55, GBH to Eastlake, 22 August 1855, and fo 3339/55 Hodge to Eastlake, 25 August 1855

<sup>77</sup> PRO, MH 13/145 fo 1238/61, see also *Western Daily Mercury*, 19 November 1864

<sup>78</sup> PRO, MH 13/145 fo 1894/66, Plymouth Local Board of Health to the GBH, 30 June 1866

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of over £4,000.<sup>79</sup> Public parks were being cared for, including a new one formed on land once belonging to the Royal Ordnance on Plymouth Hoe. The wages of special Hoe policemen were included in the budget for the park.<sup>80</sup> The location of slaughterhouses in the town was also under review, along with the siting of a number of other offensive trades.<sup>81</sup> It had been recognized fairly quickly, however, that the powers of local boards were still somewhat limited – especially with regard to building standards. Plans for any new development had to be approved by the Board but, while it was possible to insist on changes in the position and size of drains, it was harder to force builders to alter proposed street alignments.<sup>82</sup> As early as 1855 an attempt was made to regulate the heights of buildings in Plymouth.<sup>83</sup> Several local developers objected, and the matter was referred to the General Board who ruled that, strictly speaking, the Act did not provide local boards with this particular power, although their reply suggests that Plymouth should at least make the attempt.<sup>84</sup>

Local documentation reveals the conscientious approach of the Plymouth Board of Health in such matters as nuisance removal (particularly the keeping of pigs in unsuitable premises) and street cleansing.<sup>85</sup> Regulations on minimum street widths were established whereby no new streets could be less than thirty feet, and no back lane less than fourteen feet wide.<sup>86</sup> Many applications were rejected because they failed to comply with these rules. A house-to-house survey of water supply arrangements was begun, and eventually resulted in a vastly improved service.<sup>87</sup> The board even undertook the complete rationalization of house numbering and street labelling in Plymouth.<sup>88</sup>

Robert Rawlinson had declared in his report that Plymouth's "natural climate – pronounced by physicians to be conducive to health – is by neglect allowed to become poisonous".<sup>89</sup> After so long a period of neglect, it is no surprise to find that remedies were slow to take effect, but steady improvement began to occur in 1854.<sup>90</sup>

### CONCLUSION

The accepted view of the 1848 Public Health Act is that it was more important for introducing the *concept* of public health in Britain rather than for any lasting practical effect.<sup>91</sup> At national level this seems a fair assessment, but it tends to ignore the impact

<sup>79</sup> PRO, MH 13/144 fo. 3126/55, Eastlake to Sir Benjamin Hale, 4 August 1855.

<sup>80</sup> PRO, MH 13/144 fo. 541/55, GBH to Eastlake, 9 February 1855.

<sup>81</sup> PRO, MH 13/145 fo. 267/61, Rev. A. H. Greaves to Home Secretary, 14 February 1861.

<sup>82</sup> See, for example: DRO P4/A1 Plymouth Local Board of Health, Minutes of Proceedings, 9 March 1855; 4 June 1855; 2 August 1855.

<sup>83</sup> PRO, MH 13/144 fo. 719/55, F. W. Pym to the GBH; fo. 720/55, GBH to Eastlake, 23 February 1855; fo. 805/55, Eastlake to the GBH, 27 February 1855.

<sup>84</sup> *Ibid.*, fo. 804/55, GBH to Eastlake, 28 February 1855.

<sup>85</sup> DRO P4/A1, Plymouth Local Board of Health, Minutes of Proceedings: Inspector of Nuisances, 12 April 1855.

<sup>86</sup> *Ibid.*, 4 June 1855.

<sup>87</sup> *Ibid.*, Sanitary Committee Proceedings, 31 January 1855.

<sup>88</sup> *Ibid.*, Special Committee on Street Numbering, Proceedings, 2 July 1856.

<sup>89</sup> Rawlinson, *op. cit.*, note 3 above.

<sup>90</sup> Certainly by the late 1870s, Plymouth had achieved a lower mortality rate than many other cities of comparable size. At 14.6 per thousand it was appreciably lower than Manchester (21) or Newcastle (23).

<sup>91</sup> See F. B. Smith, *The people's health, 1830–1910*, London, Croom Helm, 1979, pp. 200–201.

of the Act on local government in provincial towns. This study has shown how a local battle over the adoption of the 1848 Act in Plymouth led to fundamental changes in the management of urban affairs.<sup>92</sup> The power of petitions and well-organized protest was tested on the public health issue and proved effective. But Plymouth was not unique, the same kind of dénouement has been observed elsewhere, though more studies will be needed before a full picture emerges. One clear conclusion to be drawn from this study, is the key significance of public health in the political debate of mid-Victorian Plymouth.

#### SUMMARY

Mid-nineteenth century Plymouth was one of the country's most unhealthy towns. Cholera in 1832 and in 1849 was destructive, but the wastage of human life due to contaminated water supplies and bad housing was even more significant. Yet the local authorities opposed the application of the 1848 Public Health Act. They were afraid of losing political power in the borough, and waged a six-year campaign of resistance. But an outcry for the Act came from the ratepayers' association as well as private individuals. This detailed case study of Plymouth's quest to adopt the 1848 Act throws important light on the role of local politics in influencing public health in provincial towns in the middle of the last century.

<sup>92</sup> By 1860, a range of legislation that applied locally had been established by the Plymouth Local Board of Health on matters such as lodging-houses, slaughterhouses, open spaces, street widths, and access. Even so, Plymouth did not have a Medical Officer of Health until 1890 when Dr F. M. Williams was appointed to the post under the terms of the 1888 Local Government Act.

derived orthogonal (that is, at right angles) to the first, thereby accounting for a further proportion of the original variance. This exercise may be repeated until all the variance has been explained.\*

The original variables which have the highest loadings on (i.e. are most highly correlated with) the component are identified in order to determine the nature or character of each of the derived principal components. Each of the areal units (in this case, enumeration districts) for which the original input variables were measured can be assigned a component score, which is the sum of the products of the component loading and the original data value for each variable for that area. These component scores can then be mapped to define the areal structure of the component, that is, its spatial distribution pattern.

Twenty-nine census variables, measured for each enumeration district, were selected as described in Chapter Two and are listed again in Table 9.1. Examination of these variables individually has indicated that their distribution patterns were more sharply differentiated in 1851 than in 1871, in other words, segregation levels were diminishing.+ One expectation, therefore, was that the principal component analysis for 1871 would reveal a rather different social structure from that derived for 1851. The processes of change

\* Principal component analysis can produce the same number of components as there were original variables but only the first few components are usually examined because they will normally account for most of the variation. This method also assumes that all the variance is explained by the data in the analysis (Conway & Haynes, 1973).

+ A problem which affects the initial stages of the analysis and stems from the distributional characteristics of the input data is the normality assumption in components models: "While transformations are applied to fit the data to some model assumption, they may also drastically alter the relationships among the variables" (Clark, 1973). Clark found that different treatments of the normality assumption produced widely different results. For this reason, transformations were not employed in the Plymouth analyses.

TABLE 9.1: Variables used in the principal component analyses

1. Sex ratios of whole population
2. Age ratios of sample population
3. Fertility ratios of sample population
4. Mean age of heads of sample households
5. Percentage of widowed heads of sample households
6. Nuclear families as percentage of sample households
7. Single-person households as percentage of sample households
8. Number of servants per sample household
9. Number of lodgers per sample household
10. Percentage of female heads of sample households
11. Population densities for whole population
12. Population per inhabited house for whole population
13. Population per household for whole population
14. Number of households per inhabited house for whole population
15. Percentage of sample population in employment
16. Women in work as percentage of sample population
17. Percentage of sample employed in professional occupations
18. Percentage of sample employed in the armed forces\*
19. Percentage of sample employed in conveyance\*
20. Percentage of sample employed in art and mechanic production\*
21. Percentage of sample employed in textiles and dress\*
22. Percentage of sample employed as labourers or unemployed\*
23. Percentage of sample born in Plymouth and East Stonehouse
24. Percentage of sample born in the rest of Devon
25. Percentage of sample born in Cornwall
26. Percentage of sample born in seaboard counties
27. Percentage of sample born in Ireland
28. Uninhabited houses as percentage of total housing stock
29. Houses under construction as percentage of total housing stock

\* Occupational orders containing five percent or more of the total employed and showing irregular pattern of distribution.

in Plymouth seem to have operated at remarkable speed; social structure appears to have been extraordinarily fluid and the multi-factor analysis described below seeks to clarify these changing patterns.

There were three stages to the interpretation of the principal component analysis of the mid-19th century data for Plymouth and Stonehouse:

(1) The variables which loaded most strongly on each component were identified to determine what aspects of the social structure of Plymouth and Stonehouse were explained by each component. The highest

loading variables for each component are listed in Tables 9.2 and 9.3.

(2) The correlations between those original variables identified in stage (1) were examined in order to shed more light on the real nature of the component. Figures 9.1 and 9.2 show the correlation bonds constructed for the highest loading variables on the principal components, and Tables 9.4 and 9.5 present the correlation matrices pertaining to these figures.

(3) The component scores were mapped for each of the major components in the Plymouth and Stonehouse enumeration districts for 1851 and 1871. Figures 9.3-9.7, therefore, show the areas most affected by the highest loading, positively correlated variables for each principal component.

#### 9.1.2 Principal component analysis of the 1851 data

Component One clearly identifies the poorer, more densely-populated and, consequently, overcrowded enumeration districts, although this component explains only about a quarter of total variance (Table 9.6). Four variables measured aspects of density of population: population density (number of people per acre), population per house, households per house, and population per household. The first three were strongly positively correlated in both census years, while the latter correlated negatively. Component One demonstrated that this difference reflected a socio-economic distinction - high population per household values being found frequently in more affluent areas, thus correlating positively with the number of servants per household.

It is particularly interesting to note the importance of the

TABLE 9.2: 1851 Component loadings from varimax rotated factor matrix

Component One

Households per house	.88161
Population density	.78038
Employed in textiles and dress	.77689
Population per house	.74286
Sex ratio	.58468
Fertility ratio	.40864
Size of household	-.78311
Servants per household	-.83124

Component Two

Professional class	.85839
Employed in defence	.83642
Born in seaboard counties	.68928
Employed in production	-.45705
Locally born	-.58200

Component Three

Population in employment	.75041
Working women	.73844
Born in Cornwall	.69084
Locally born	-.44352
Employed in conveyance	-.46139
Fertility ratio	-.47670

Component Four

Female heads of household	.77085
Single-person household	.72090
Widowed heads of household	.48671
Employed in production	-.42164
Nuclear household	-.71564

Component Five

Lodgers per household	.76298
Born in Ireland	.75294
Labourers and unemployed	.62916
Born elsewhere in Devon	-.52927

TABLE 9.3: 1871 Component loadings from varimax rotated factor matrix

Component One

Age ratio	.87306
Population in employment	.85488
Age of head of household	.80502
Working women	.76595
Servants per household	.62629
Size of household	.50337
Born in Cornwall	.46294
Nuclear households	-.45972
Sex ratio	-.53754
Fertility ratio	-.78588

Component Two

Population per house	.89664
Households per house	.88786
Population density	.75735
Sex ratio	.50470
Employed in textiles and dress	.41721
Size of household	-.53079
Servants per household	-.56797

Component Three

Professional class	.90386
Employed in defence	.87400
Born in seaboard counties	.67540
Labourers and unemployed	-.50553
Employed in conveyance	-.53005
Locally born	-.58248

Component Four

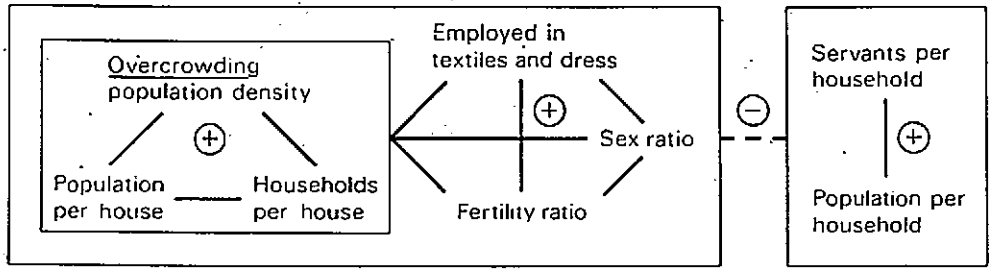
Single-person households	.87978
Female heads of household	.67600
Nuclear households	-.73788

Component Five

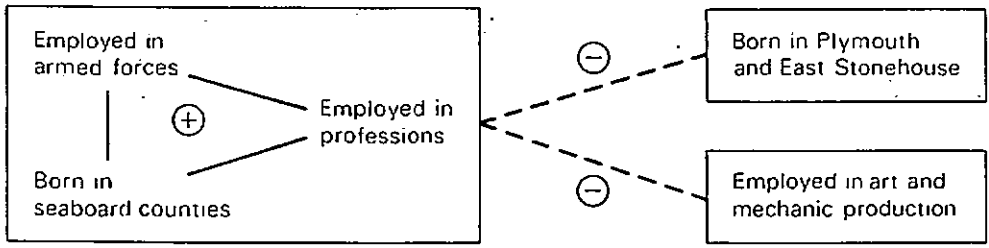
Lodgers per household	.53923
Size of household	.42748
Employed in production	-.55366
Employed in textiles and dress	-.69553



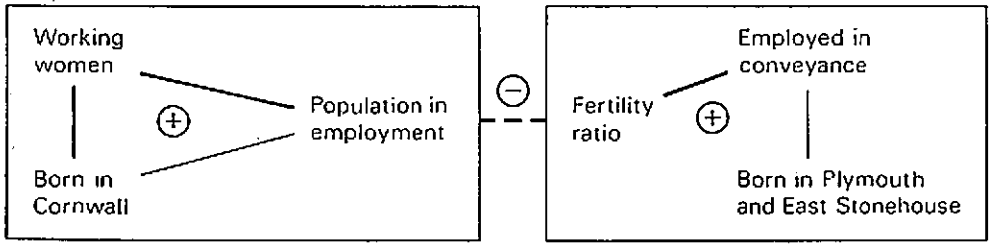
Component One:



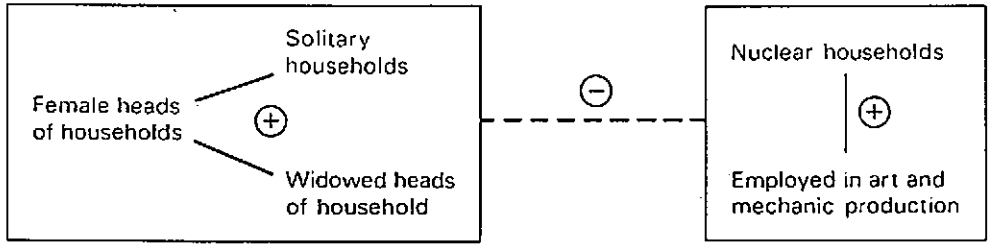
Component Two:



Component Three:



Component Four:



Component Five:

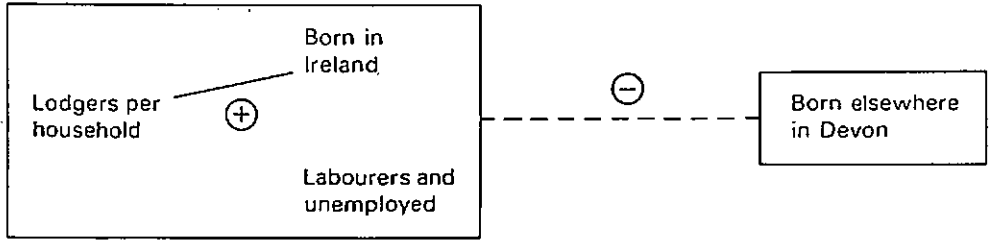
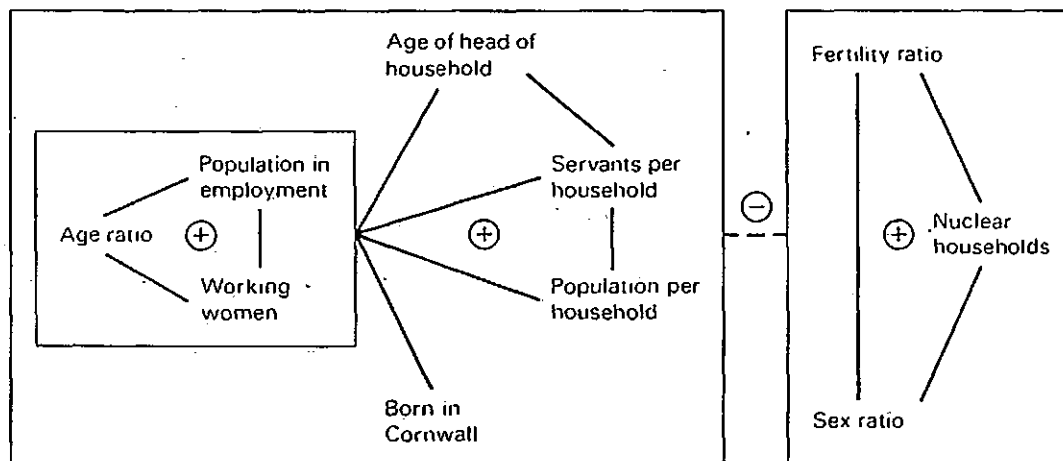
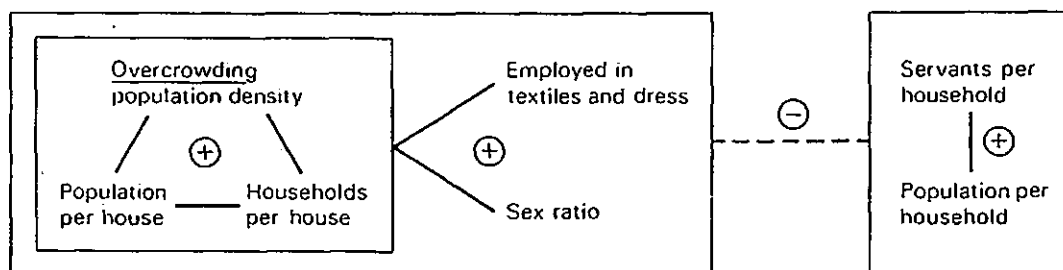


Figure 9.1: Principal Components Analysis of the 1851 data: correlation bonds of high-loading variables.

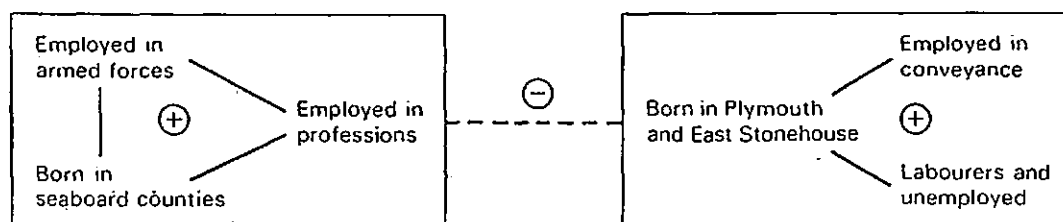
Component One.



Component Two.



Component Three.



————— Significant at 0.01 level or better  
 - - - - - Significant at least at 0.05 level

Figure 9.2: Principal Components Analysis of the 1871 data: correlation bonds of high-loading variables.

TABLE 9.4: 1851 Component Correlation Matrices

COMPONENT ONE

	Sex ratio	Fert. ratio	Pop. density	H-h/ house	Pop./ house	Textiles & dress	Servs. /H-h	Size of H-h
Sex ratio	x	.53	.49	.59	.68	.28	-.65	-.03
Fertility ratio	.53	x	.39	.48	.46	.43	-.59	-.14
Population density	.49	.39	x	.78	.70	.55	-.58	-.54
Households per house	.59	.48	.78	x	.93	.75	-.78	-.54
Population per house	.68	.46	.70	.93	x	.70	-.69	-.24
Textiles & dress	.28	.43	.55	.75	.70	x	-.65	-.41
Servants/ household	-.65	-.59	-.58	-.78	-.69	-.68	x	.51
Size of household	-.03	-.14	-.54	-.54	-.24	-.41	.51	x

COMPONENT TWO

	Professional class	Employed in defence	Seaboard counties	Employed in production	Locally born
Professional class	x	.77	.39	-.35	-.47
Employed in defence	.77	x	.31	-.40	-.34
Born in seaboard co	.39	.31	x	-.22	-.45
Employed in production	-.35	-.40	-.22	x	-.17
Locally born	-.47	-.34	-.45	-.17	x

COMPONENT THREE

	Fertility ratio	Employed in conveyance	Locally born	Population employed	Working women	Born in Cornwall
Fertility ratio	x	.51	.23	-.46	-.62	-.21
Employed in conveyance	.51	x	.26	-.14	-.26	-.04
Locally born	.23	.26	x	-.01	-.15	-.58
Population employed	-.46	-.14	-.10	x	.60	.26
Working women	-.62	-.26	-.15	.60	x	.39
Born in Cornwall	-.21	-.04	-.58	.26	.39	x

COMPONENT FOUR

	Widowed heads	Solitary households	Female heads	Nuclear households	Employed in production
Widowed heads	x	.08	.37	-.17	-.24
Solitary households	.08	x	.46	-.58	-.10
Female heads	.37	.46	x	-.39	-.21
Nuclear households	-.17	-.58	-.39	x	.29
Employed in production	-.24	-.10	-.21	.29	x

COMPONENT FIVE

	Lodgers	Labourers/ unemployed	Born in Ireland	Elsewhere in Devon
Lodgers	x	.20	.26	-.25
Labourers & unemployed	.20	x	.20	-.13
Born in Ireland	.26	.20	x	-.31
Elsewhere in Devon	-.25	-.13	-.31	x

Approximate significance limits: .40+ 99.9%  
 .32-.39 99%  
 .23-.31 95%

TABLE 9.5: 1871 Component Correlation Matrices

COMPONENT ONE

	Age ratio	Pop. empl'd	Age of head	Working women	Servs/ H-h	Size H-h	Cornish born	Fert. ratio	Sex ratio	Nuclear H-h
Age ratio	x	.72	.81	.63	.42	.22	.26	-.73	-.51	-.44
Population employed	.72	x	.61	.60	.33	.26	.28	-.58	-.26	-.29
Age of head	.81	.61	x	.56	.28	.19	.11	-.54	-.45	-.46
Working women	.63	.60	.56	x	.57	.34	.37	-.64	-.63	-.33
Servants/ household	.42	.33	.28	.57	x	.63	.20	-.64	-.59	-.10
Size of household	.22	.26	.19	.34	.63	x	.10	-.38	-.26	.08
Born in Cornwall	.26	.28	.11	.37	.20	.10	x	-.26	-.28	-.23
Fertility ratio	-.73	-.58	-.54	-.64	-.64	-.38	-.26	x	.56	.31
Sex ratio	-.51	-.26	-.45	-.63	-.59	-.26	-.28	.56	x	.43
Nuclear households	-.44	-.29	-.46	-.33	-.10	.08	-.23	.31	.43	x

COMPONENT TWO

	Pop./ house	H-h/ house	Pop. density	Sex ratio	Textiles & dress	Servs/ H-h	Size of H-h
Population per house	x	.95	.58	.54	.29	-.73	-.46
Households per house	.95	x	.62	.53	.35	-.77	-.64
Population density	.58	.62	x	.43	.38	-.52	-.44
Sex ratio	.54	.53	.43	x	.18	-.59	-.26
Textiles & dress	.29	.35	.38	.18	x	-.30	-.45
Servants/ household	-.73	-.77	-.52	-.59	-.30	x	.64
Size of household	-.46	-.64	-.44	-.26	-.45	.64	x

COMPONENT THREE

	Profess. class	Empl'd in defence	Seaboard counties	Locally born	Empl'd in conveyance	Labourers/ unemployed
Professional class	x	.81	.35	-.44	-.36	-.51
Employed in defence	.81	x	.27	-.27	-.15	-.35
Born in seaboard co	.35	.27	x	-.47	-.34	-.35
Locally born	-.44	-.27	-.47	x	.45	.43
Employed in conveyance	-.36	-.15	-.34	.45	x	.20
Labourers & unemployed	-.51	-.35	-.35	.43	.20	x

Approximate significance limits: .39+ 99.9%  
 .30-.37 99%  
 .21-.29 95%

TABLE 9.6: Eigenvalues of first five components for 1851 and 1871

1851:	percentage variance	cumulative percentage
Component One	24.5	24.5
Component Two	11.7	36.2
Component Three	9.0	45.3
Component Four	8.1	53.4
Component Five	7.0	60.4

1871:	percentage variance	cumulative percentage
Component One	27.9	27.9
Component Two	11.5	39.4
Component Three	10.6	50.1
Component Four	5.9	56.0
Component Five	5.6	61.6

distribution of the female population in determining the social geography of mid-19th century Plymouth. There were two major kinds of female employment: domestic service and dressmaking. The former typically comprised young, unmarried women, the latter (which will often have been former servants) were more mature, married women. The truth of this is borne out by the correlation matrix wherein these two occupations are negatively correlated while those employed in textiles and dress correlates positively with the fertility ratio.

This component, therefore, is clearly socio-economic and closely interwoven with the spatial pattern of overcrowding. Figure 9.3, a map of the component scores for Component One, confirms that the most overcrowded enumeration districts were those to the north and west of Sutton Harbour (the oldest part of the town), the northern part of Stonehouse, and areas of newer housing northwest of Sutton.

Component Two (see Figure 9.4a) accounted for nearly twelve percent of the total variance and may be described as the forces factor. Armed

1851: Component One

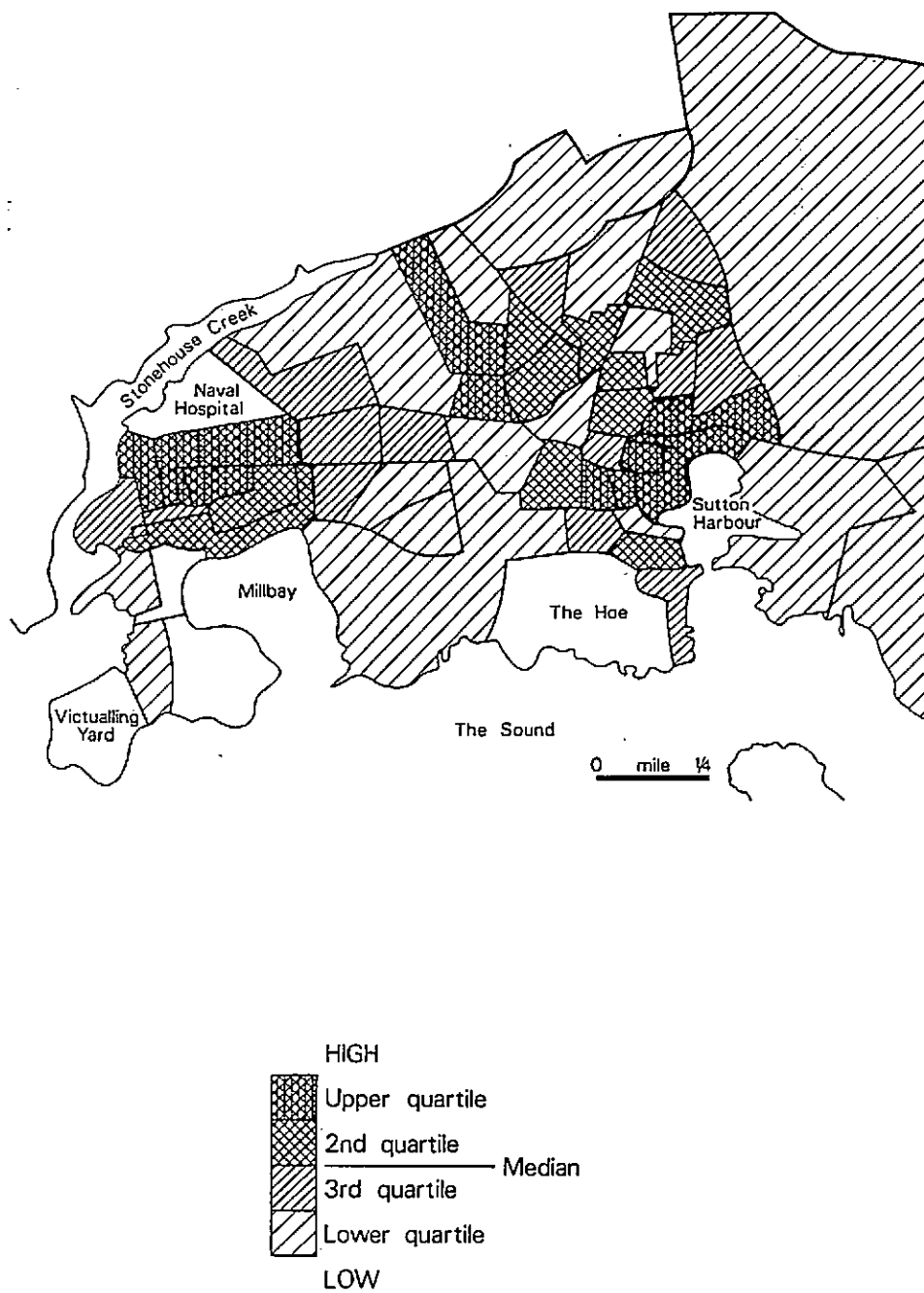
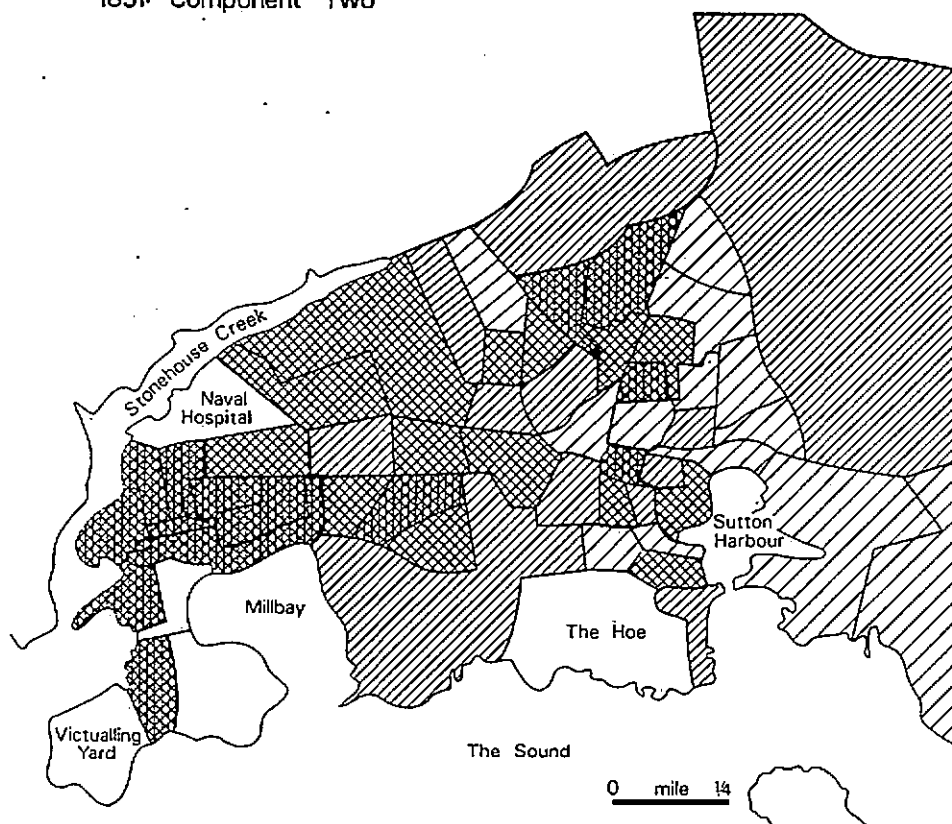


Figure 9.3: Scores on Component One, 1851, identifying the poorer, more densely-populated and overcrowded districts of Plymouth and Stonehouse.

1851: Component Two



1851: Component Three

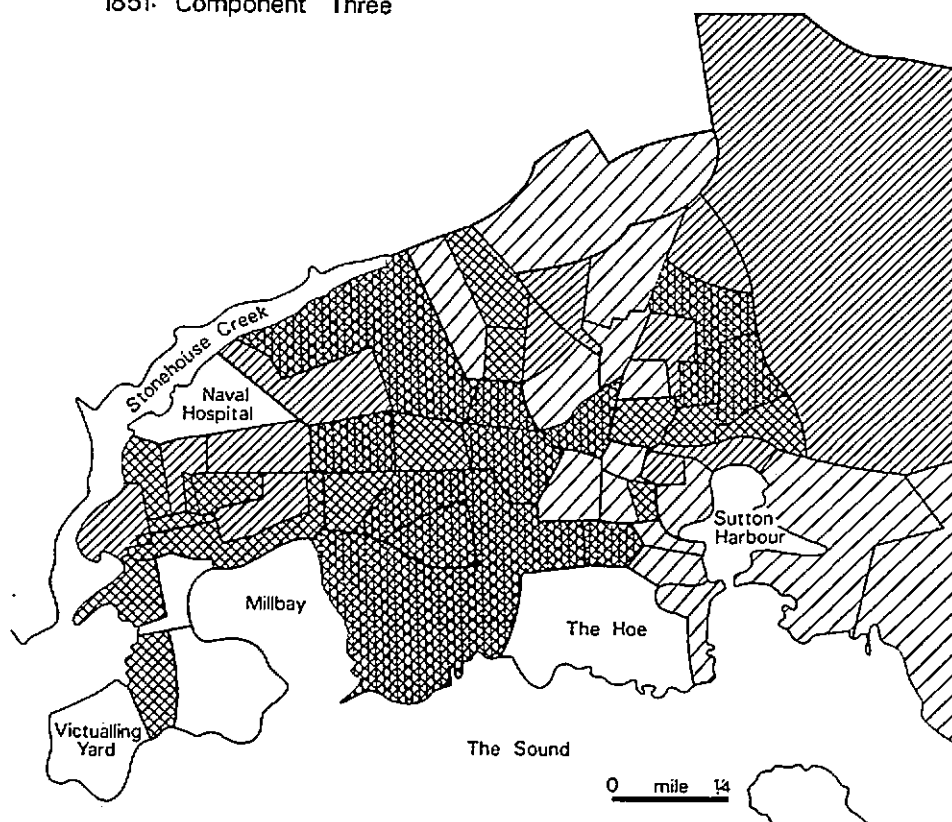


Figure 9.4: (a) Scores on Component Two, 1851, identifying the distribution of the impact of the forces' presence in Plymouth and Stonehouse enumeration districts. (b) Scores on Component Three, 1851, highlighting the distribution of the female population.

forces employment formed part of the professional occupational class and so loads positively with this variable. However, positive correlation with those born in seaboard counties was unexpected, though not wholly unremarkable; it has previously been suggested that migrants to Plymouth from seaboard counties were frequently employed in the fishing industry, clearly there was a naval connection also, though curiously the seaboard variable correlates more strongly with the overall professional class than the forces element within it.

These three variables correlated negatively with locally-born inhabitants and also those employed in productive industries. There was, however, a weak negative correlation between the latter two variables (less than 5% significance).

Component Three highlights the female population. While the distribution of servants did not figure greatly in this factor, it did have some influence representing a sizeable proportion of women in employment and of Cornish in-migrants, and it is this variable which may be regarded as explaining the strong correlation between working women and Cornish-born inhabitants. It is only to be expected that working women will have correlated positively with the total employed population. The strongest negative correlation occurred between working women and the fertility ratio - in keeping with the interpretation of Component One and the importance of domestic service as a female occupation.

A strong positive correlation between people employed in conveyance and the fertility ratio may seem a little surprising at first glance; in fact, this connection probably comprised families whose livelihood came from the merchant navy sector of the local economy (some ten percent of the working population in 1851) of which the greatest



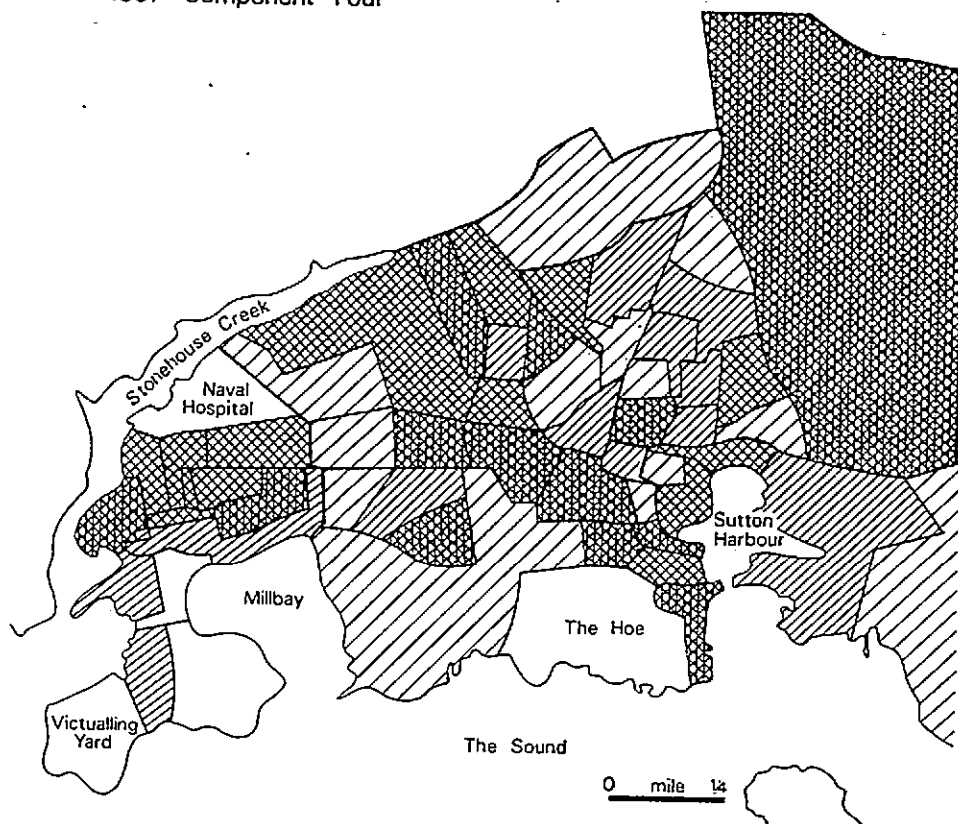
number were seamen. The weaker connection with locally-born people simply reflects the long-standing tradition of sea-faring trade in the town.

Essentially this component is that of working women and explains nine percent of variance. The distribution map of component scores (Figure 9.4b) presents a striking contrast to that of the scores on Component One, the enumeration districts most affected were less-densely populated, containing larger houses and more prosperous households. While domestic service did not rank as one of the highest loaded variables for this factor, it did evidently influence the distribution of other variables.

Component Four is a fairly straightforward family status distinction but it explains only a further eight percent of the total variance. Single-person households are positively correlated with households with female or widowed heads (which are, of course, closely correlated) and differently distributed from nuclear households which were characteristically supported by men employed in production industries - though this last variable is likely to be significant by virtue of its dominance as a form of employment in the sample. This difference in distribution of household type in all probability reflects a difference in the nature of available accommodation (see Figure 9.5a).

While the variables may be expected to relate to each other in this fashion, it is perhaps remarkable that the distributions of nuclear and solitary households should account for so much difference in distribution. A glance at the ranked list of variable loadings on this component shows working women and locally-born inhabitants fairly highly placed, and these were positively correlated with solitary

1851: Component Four



1851: Component Five

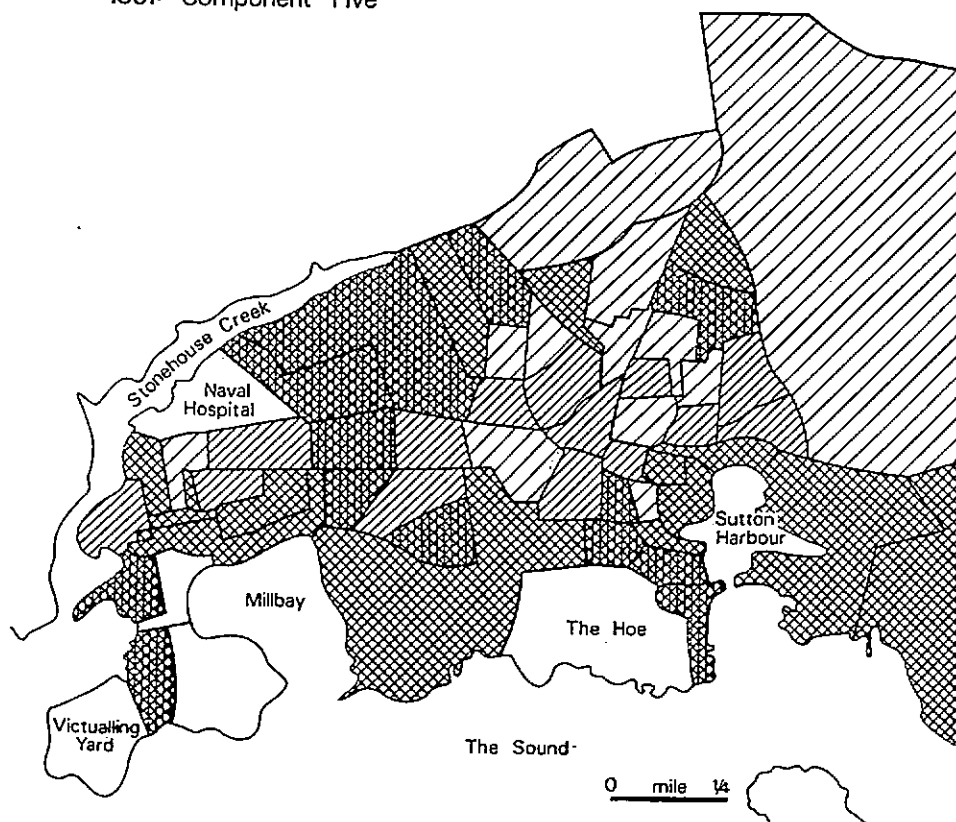


Figure 9.5: (a) Scores on Component Four, 1851, identifying the distribution of the family status component in Plymouth and Stonehouse enumeration districts. (b) Scores on Component Five, 1851, showing the distribution of the Irish population.

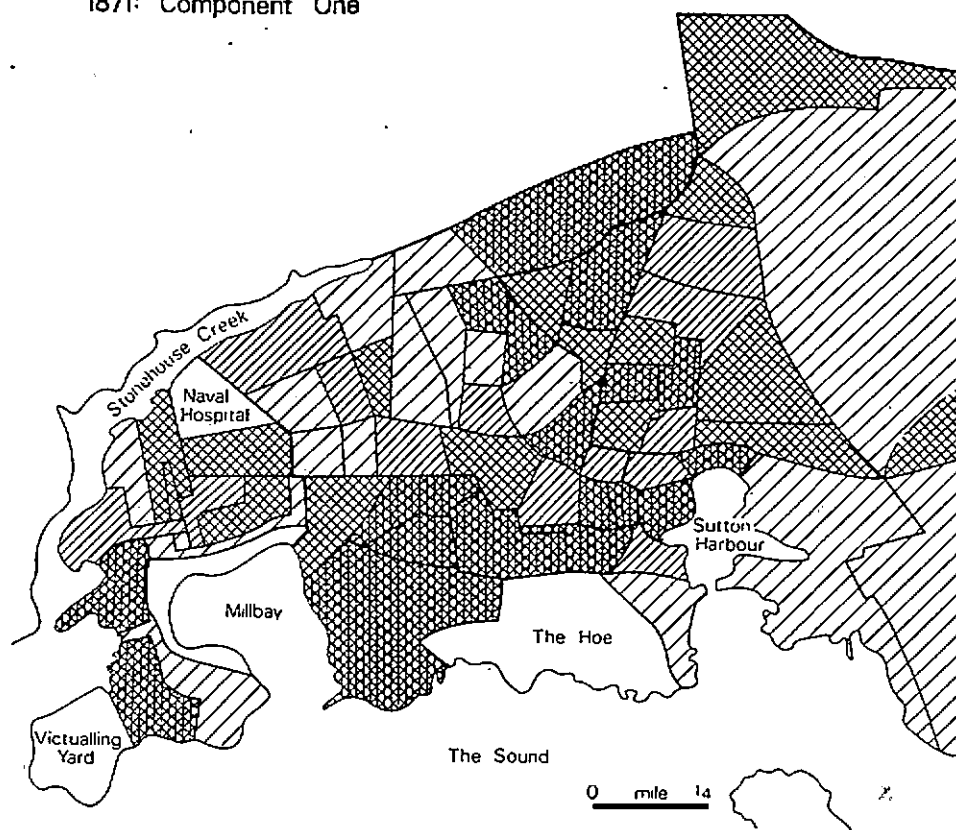
households, while Irish-born residents correlated with nuclear households, indicating an underlying influence of birthplace on this factor. As has already been seen, there were marked differences in the distributions of population according to birthplace.

The explanatory power of components becomes progressively weaker after the extraction of Component Five (accounting for seven percent of variance). Yet this component can be identified, in part, as that of the Irish contingent, generally employed in labouring and living in cramped rented accommodation (see Figure 9.5b).

### 9.1.3 Principal component analysis of the 1871 data

As predicted earlier in this chapter, the principal component analysis of the 1871 census data indicates that some change occurred in the spatial patterns of population distribution in the twenty-year period. Component Two (Figure 9.6b) and Component Three (Figure 9.7) are directly comparable with Components One and Two for 1851, concerned with population density and the armed forces respectively, but a new and rather complex first component emerges to explain nearly twenty-eight percent of variance. In Component One for 1871 (see Figure 9.6a), seven high-loading variables (Table 9.3) were positively inter-correlated, and three were very strongly correlated with the other four variables: the age ratio, the number of people in employment, and the number of working women (the servants per household variable was also highly loaded). Together these seven variables may be identified as indicative of the more affluent

1871: Component One



1871: Component Two

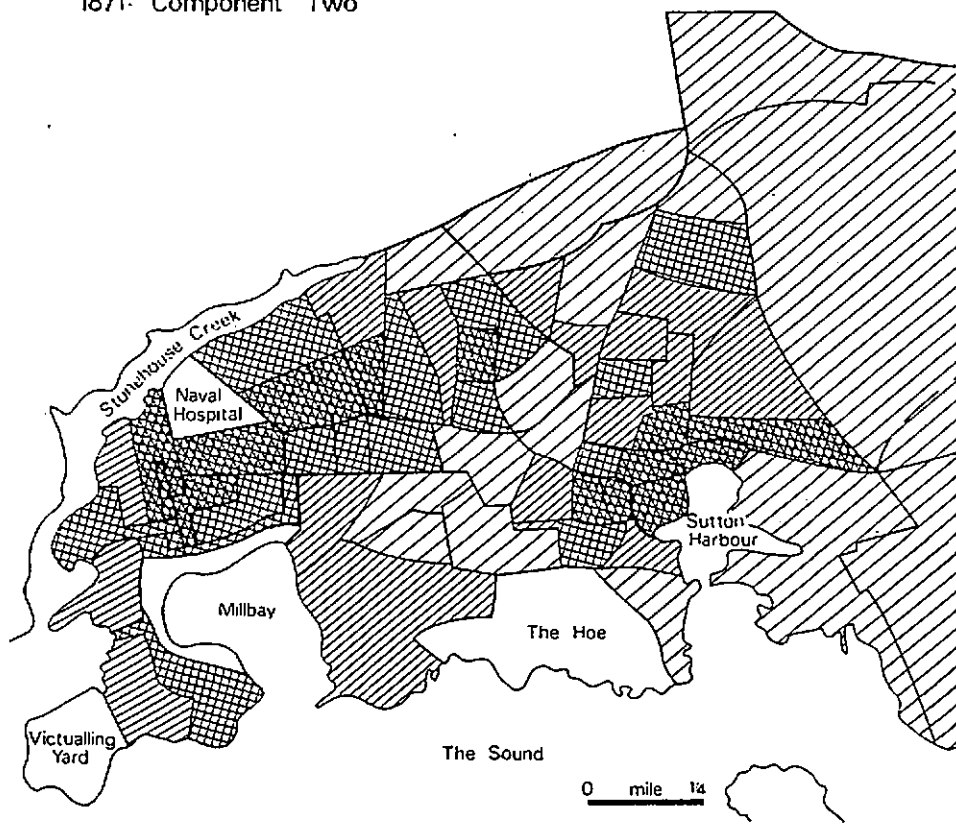


Figure 9.6: (a) Scores on Component One, 1871, identifying the more prosperous districts of Plymouth and Stonehouse.  
(b) Scores on Component Two, 1871, identifying the poorer, more densely-populated districts.

2

1871: Component Three

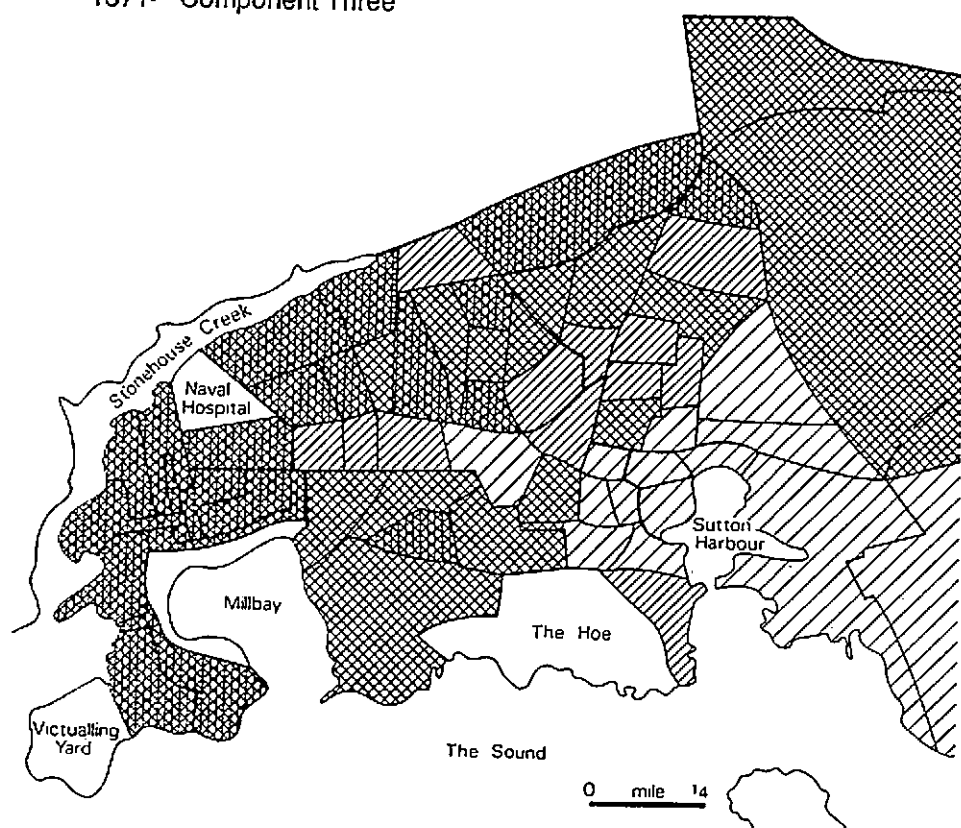


Figure 9.7: Scores on Component Three, 1871, showing the distribution of the impact of the forces' presence in Plymouth and Stonehouse enumeration districts.

households. The variables are all negatively correlated with the distribution of nuclear households which displays close correlations with the fertility ratios and the sex ratios. What may be concluded from this complicated matrix is the importance, yet again, of the female population, particularly the two dominant groups comprising unmarried servants and married mothers. The distributions of these two groups were strikingly and significantly different since their presence also dominates the second component.

The remaining components extrapolated in the analysis of the 1871 data displayed much simpler aspects of Plymouth's population distribution, with high loadings concentrated among a small number of variables, and together accounted for over twenty percent of variance. Component Four very clearly comprised a positive correlation between single-person households and female heads of household, both negatively correlated with nuclear households. Component Five demonstrated a relationship between those employed in textiles and dress and those employed in production against the proportion of lodgers and the size of household (which indicates that size of household is not purely an 'affluent' variable).

#### 9.1.4 Some implications of the principal component analyses

The component analyses raise a number of questions both individually and in comparison. In 1851 the dominant variables of the first component indicate that the most significant distribution was that of the poorer population living in more densely populated housing. This distribution was still of importance in 1871 but had been superseded

apparently by that of the more affluent. Although, at first glance, this interpretation is compelling, it is really too simplistic. The 19th century saw a huge extension of domestic service not only in the homes of the rich but also among the middle classes wherein the solitary 'maid-of-all-work' became an indispensable member of the household. It may be argued, therefore, that the primary component for 1871 reflects the improved socio-economic status of the middle classes, the entrepreneurial sector.

Three implications of this statistical change in emphasis of the governing variables and their correlations for the spatial patterns apparent in mid-19th century Plymouth and Stonehouse may be identified:-

(1) with the flow of in-migration at least decreasing and in parts actually reversed over the twenty-year period, the population was becoming more settled: migrant families were becoming established in the local economy and the general prosperity of the two towns is inferred to have risen;

(2) the most prosperous families were moving away from the town centre to the new suburbs beyond the town boundaries; hence while this group figured prominently as a feature of Component One for 1851, they were of less importance in 1871 when they were significantly placed in Component Two. In addition, this common component explained nearly 25 percent of the total variance in the first census year studied but only 11.5 percent of variance in the latter census year;

(3) the forces factor is similarly demoted, but it should be noted that the difference in explained variance fell by only one percent (from 11.7 to 10.6) and thus the importance of the forces presence in the two towns continued much as before.

Overall it would appear that, with the cessation of immigration,



the population became more integrated and homogeneous. Yet one characteristic of the homogeneity was, despite all efforts to alleviate the problem, an extension of the overcrowding and consequent social distress. So strong was the pressure of population in a limited area that even new housing was overcrowded as soon as it was inhabited. The choropleth maps illustrate the changing social geography very clearly. In particular, comparison between 1851 Component One and 1871 Component Two shows the increasing incidence of overcrowding and the contraction of the less-crowded, better-off areas, in keeping with the release of estate land for house-building. Comparison between 1851 Component Two and 1871 Component Three displays an intensification of forces personnel in the western areas with a movement away from Sutton Harbour as activities were extended and concentrated around Millbay.

#### 9.2.1 Pattern, process and form: an appraisal of Social Geography

In the post-war years, the empirical study of spatial variations in social phenomena has predominated, the quantitative work carried out in the 1960s and 1970s provided valuable detail of Victorian social and spatial structure to set alongside contemporaries' own recorded perceptions of their cities. But the usefulness of these studies was limited, most were basic descriptions of medium-sized, British industrial cities and rarely attempted to incorporate philosophical and theoretical developments in urban history or modern social geography (Pooley & Lawton, 1988). The question arose, therefore, as to how well these studies represented British urban experience. There

has been a comparative drought in terms of research publications in the 1980s, a retrenchment "as the limitations of much earlier work have been realised but relatively little that is innovative has been attempted" (Pooley & Lawton, 1988).

In the 1970s, historical geographers sought to reconstruct the spatial structures of Victorian towns and cities and compare them with model cities proposed by Sjöberg (1960), Burgess (1925), Hoyt (1939) or Vance (1971). Broadly, the object was to ascertain whether the town being studied could be classified as pre-industrial, modern-industrial, or in transition or 'emerging' (Warnes, 1973). While a pre-industrial town exhibited little residential segregation, a modern town or city would have a clear pattern of segregation (Pooley, 1979b) and, according to social area theory, was defined as one in which socio-economic status, family status and ethnic status were uncorrelated and displayed different spatial patterns (after Shevky & Bell, 1955). Keen to establish the modernity of Victorian cities, geographers (such as Shaw, 1977; Dennis, 1976) "frantically searched" for signs of the increasing residential segregation that was "expected to accompany industrialisation, specialisation and alterations in social structure" (Dennis, 1982). Given the limitations of the census, it was probably inevitable that statistical analyses produced separate dimensions that fitted with social area theory (Dennis & Prince, 1988).

Some writers have stressed the transitional nature of Victorian cities (Goheen, 1970; Timms, 1971; Warnes, 1973; Fox, 1979; Gordon, 1979), highlighting the differences between 19th- and 20th-century cities; even cross-sectional studies at a single date have assumed that Victorian cities were in transition (Carter & Wheatley, 1978). The transitional stage might be characterised by two contrasting types

of high-status area, the old centre and the new suburb - a combination of pre-industrial and modern models (Shaw, 1980). The mid-19th century was Cardiff's "industrial 'take-off' phase" when it developed from a small market town into a considerable commercial port (Lewis, 1979). By the 1870s, patterns of segregation were emerging which might be described as modern, although Lewis considered that the appellation 'modern' was not appropriate until late in the 19th century. Plymouth experienced similar forces causing change: the growth of port traffic, population growth rates, a higher than average population per house ratio (though much higher in Plymouth than in Cardiff), and consequential overcrowding and insanitary conditions. However, Cardiff's trade was based upon coal and iron, Plymouth had much more varied imports and exports plus the sizeable fishing industry.

Others writers have identified modern characteristics in Victorian towns (Shaw, 1977; Pritchard, 1976) or have suggested that larger industrial towns developed clear patterns of residential differentiation by the mid-19th century making them more similar than dissimilar to modern towns (Lawton & Pooley, 1976; Cannadine, 1977). Pooley (1982) accepted that Liverpool could be interpreted either as a modern industrial city or as a transitional Victorian city, "depending on the preferred theory and scale of analysis", and Carter (1983) observed that "much of the controversy is based on semantics rather than reality". Distinctive residential areas could be identified in mid-19th century Liverpool and the urban structure and residential segregation of manual and non-manual 'working-class' populations did closely resemble that found in 20th-century towns.

Certainly the results of these studies together present a rather confused picture which cannot be explained simply in terms of

different towns developing segregation patterns on different timescales. Ward (1975, 1976, 1980) has argued most strongly that, despite segregation at the extremes of society, a subtle mix of groups and classes was more characteristic of the Victorian city than the formation of distinct residential areas. Yet he conceded that, at the street and block level, separated social, occupational and migrant groups did occur in even the smallest towns. In the Gorbals area of Glasgow annuitants and paupers lived in adjacent streets (Robb, n.d.), a classic "front street-back street" dichotomy (Carter, 1983); such evidence supports the view that segregation always existed but what changed during the 19th century was the scale at which it operated.

Studying Victorian Wolverhampton, which experienced a similar population growth pattern to Plymouth, Shaw (1977) identified a late pre-industrial city in 1871. But the two places are not otherwise comparable, Wolverhampton was, by 1851, "a former market town gathering to itself the factories and problems of an important manufacturing town", Plymouth had its factories but manufacturing was never a major component of the local economy. Carter & Wheatley (1977), considering the spatial socio-economic patterns in Aberystwyth, 1850-1870, when the railway came to the town, concluded that the decline of the inner areas was not on the same scale as in industrial towns but that the inversion of the pre-industrial patterns was in progress after 1850. The same kind of cause and effect was observed in Plymouth: the proximity of Millbay railway station was a prime reason to move for the Gifford family (see Chapter Five).

If the Plymouth findings are compared with the Sjoberg/Burgess model, its morphological evolution, based on map evidence alone, indicates the classic reversal during the 19th century but in a timespan extending considerably beyond that of this census-based

analysis. The principal component analyses seem to suggest that Plymouth was actually becoming less segregated by 1871, contrary to transition theory expectations, but this conclusion would mask the more pertinent observation that the scale of social separation was changing. Logically, there was a transition from pre-industrial to modern urban structure in 19th-century Plymouth and the mid-Victorian period, studied here, was probably too buried in the middle of that transition to allow the reliable identification of specific characteristics.

In the 1980s, the usefulness of the "dichotomous classification of socio-geographical patterns" has been questioned, thus Ward (1983) described this framework for Victorian urban society as "highly simplified and somewhat misleading", and hypotheses of transition, based on the concept of a continuum of urban residential change, may have "obscured our understanding of socio-spatial change more than they have enlightened it" (Dennis, 1982). There is a danger in using theoretical models which become "straitjackets into which reality must be forced" (Dennis, 1984); since different forces will be operating in different places then, possibly, no hard and fast theory can be formulated (it may be an inevitable corollary when dealing with 'soft facts' which may in themselves be open to different interpretation). In addition, there is an inherent problem in applying 20th-century models of urban development to the study of 19th-century towns: they do not take account of the ideology and perception and consequent behaviour of Victorian contemporaries.

Pooley and Lawton (1988) justifiably described the debate over the modernity of Victorian cities as "illusory and distracting, leading to an over-emphasis on pattern at the expense of process". An inherent problem was that different processes worked to produce modern patterns

of residential separation, as comparison of British and North American experience has shown (Cannadine, 1977). Clearly, urban historical research had to reject this "somewhat sterile and static approach" (Pooley, 1982) and focus on the processes of change operating in Victorian cities to explain observed patterns of residential segregation and mobility (Dennis, 1982). While there were few, if any, socially-exclusive residential areas, less distinct levels of segregation must have had some influence on Victorian urban society (Pooley, 1984). Cannadine (1982), echoing Harvey (1975), focused on the key issue, simply, what are the processes connecting patterns and form? In the 1980s, work on residential differentiation has become increasingly concerned with the meaning and experience of segregation rather than its measurement (Dennis & Prince, 1988). Several writers have identified processes and aspects of Victorian urban life which influenced residential development and which, therefore, require more detailed investigation (Dennis, 1982, 1984; Johnson & Pooley, 1982; Pooley, 1982; Carter, 1983; Carter & Lewis, 1983; Dennis & Prince, 1988; Pooley & Lawton, 1988):-

(1) The Victorian era saw changes in political control and, as economic and social forces interacted to shape a city's social geography, government and institutions clearly had an effect through health and housing legislation. Environments were moulded by the political, religious and, also, aesthetic beliefs held by designers and patrons.

(2) Pre-existing patterns of landownership explained the "development of certain types of urban area, and the emergence of characteristic residential and industrial zones" (Kellest, 1969). The decisions of developers and the control of leaseholders also influenced the growth and characteristics of built-up areas.

(3) Environmental quality varied greatly in Victorian cities with regard to housing, sanitation, water-supply, pollution, noise and congestion. Relief, drainage and flood risk, factories and railways, and population density were all motivating forces in decisions to migrate; the more deleterious aspects were spatially and socially concentrated in inner-city, low-status areas. This affected Victorian perception of residential districts, the evaluation of development land, the type of property built, and the value of housing.

(4) Individual decision-making, based upon contemporary images of residential areas, affected the development of residential separation. Victorian observers believed their cities to be segregated, yet there is confusion among geographers as to the extent of residential differentiation. Cannadine (1982) identified the two concepts of objective (concerned with income, occupation, status, and ethnicity) and subjective (stressing contemporary mental maps) residential differentiation.

(5) The urban housing market was closely linked to population mobility, most dwellings were privately rented which gave control to landlords. Few Victorians bought their homes, they could not borrow the necessary capital and so they could easily move into different accommodation better adjusted to changing income and family needs (Burnett, 1978). In this way, life-cycle and socio-economic status remained linked and did not become separate dimensions operating independently of each other.

(6) Mobility was an important feature in 19th-century urban change but it was not a complete explanation. In Liverpool high rates of intra-urban residential mobility were found among lower-status households in the "family-building stage of the life-cycle" (Pooley, 1979), and in Cardiff both household composition and family life-cycle

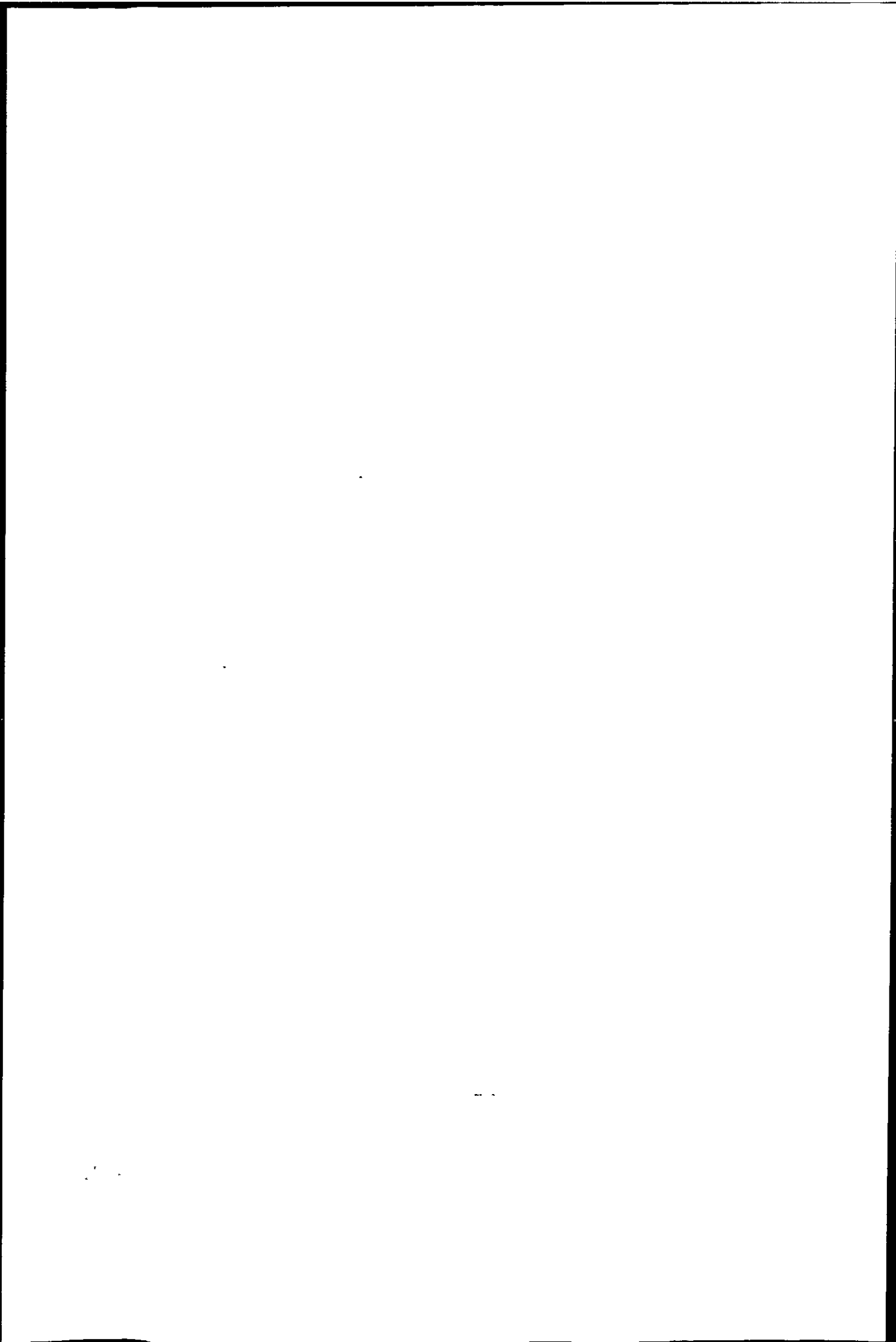
characteristics were associated with the residential differentiation of birthplace groups (Williams, 1979). The inference is that life-cycle characteristics were more dominant than ethnic status in determining residential location; since certain life-cycle characteristics are also typical of migrants, birthplace may be more symptomatic than causative in residential separation.

(7) Population growth was the "significant driving force" in Victorian demographic change and the inter-mixing of people from different ethnic origins (Carter, 1983). In combination with the high rates of population turnover, the social composition of relatively small areas became heterogeneous and also "potentially ephemeral" (Ward, 1983). In Leeds, population growth caused a westward relocation of many merchants and also an eastward expansion with "rows, yards and courts of cottage property" (Ward, 1980), a pattern repeated throughout the country and clearly seen in Plymouth.

(8) Changes in industry and commerce affected the development of residential patterns in the Victorian city; Shaw's work on Wolverhampton (1977, 1979) showed the emergence of a high-quality residential sector repelled by industry and attracted towards open land. The aspirations, social characteristics and residential choice of the population were influenced by the structure and location of employment and the operation of labour markets. Occupation remained a dominant cause of areal differences during the mid-19th century; Pooley (1984) cites the dock labour force in Liverpool who needed to live close to their workplace due to the system of employment. In Plymouth links have been identified between maritime employment and the incidence of absentee heads of household, and between an imbalance in sex ratios and a high incidence of domestic service.

(9) The relationship between class consciousness and residential





segregation is a complex and constantly-evolving factor in urban social structure. The division of labour, the development of class consciousness and the desire for upward mobility contributed to significant changes in Victorian society. Well-paid artisans were adopting middle-class values and clerical employees, the lower middle class, were moving to homogeneous districts to maintain their status. These trends had clear ramifications for the development of residential segregation.

Such an agenda is clearly multi-disciplinary, requiring input from history, sociology, economics, political science, demography, psychology and ecology, as well as geography. Pooley & Lawton (1988) recognised the contribution which has already been made by urban historical geographers who have described spatial patterns of social phenomena and investigated the social, economic and political processes shaping these patterns. But the full impact of these processes and patterns on local people and on the structural processes which shaped Victorian cities has yet to be determined.

Descriptive studies of the main dimensions of Victorian urban structure and residential distributions of social classes and migrant groups are important preliminary exercises, but such work should be expanded to investigate the processes which caused residential segregation to develop, "the complex economic and social forces which affected individual residential location" (Pooley, 1982). Cannadine (1982) stated that geographers, when evolving general theories of the city, should relate the social structure of the city to the spatial form which the city assumes. Researchers are still seeking an embracing theory, a model which will encapsulate the processes which produce both spatial form and social patterns, despite possibly the only consensus that no two towns shared the same experiences, "none of

the theories or hypotheses yet propounded is satisfactory" (Cannadine, 1982). Pooley (1982) strongly advocated that the geographical interpretation of historical data should be undertaken within a carefully-formulated theoretical framework. He suggested that theories developed to investigate processes causing residential separation in modern urban areas would provide a good starting point.

Dennis (1984), however, is dubious about developing the 'clear and more coherent body of theory' advocated by Johnson and Pooley (1982), and even less enthusiastic about Fraser and Sutcliffe's (1983) hope for "a general theory of urban geography which advances significantly beyond that of the Chicago school". A good deal of urban geographical theory has been borrowed from other disciplines but a general theory would presumably emphasise the significance of location. Cannadine (1982) came to the speculative conclusion that either there is no connection at all between spatial and social patterns, or there might be links but they are relatively unimportant, or there is a connection but the lines of causality run both ways. Ultimately the solution lies in further research into the relationship between pattern and process, and "such work requires a much wider range of quantitative and qualitative sources than have been conventionally used by social geographers" (Pooley & Lawton 1988).

#### 9.2.2 Methodology: some conclusions

Pooley (1979b) suggested that many of the interpretational differences on the fundamental spatial structure of the Victorian city stem from the way in which the data have been handled. This research project

has employed established statistical techniques to investigate the social geography of mid-Victorian Plymouth and Stonehouse; while it was not intended to test the effectiveness of these techniques, their limitations have been apparent and several methodological problems are, therefore, considered here.

There are problems inherent in the data sources available for the investigation of links between pattern, process and form, and the significance of residential differentiation. Data on individuals from the census manuscripts enable the identification of spatial patterns of social characteristics, while nominal record linkage techniques, employing the census plus directories, rate books and poll books, have been used elsewhere to investigate process (Pooley, 1984). As was noted in Chapter Two, these sources also contain valuable information on individuals and families which is overlooked in multivariate analysis. Also, while the manuscript census recorded a great deal on family and household structure, occupation and birthplace, it contains nothing about housing conditions and so the emphasis of research has been on the morphology of the social environment at the expense of the morphology of the built environment (Dennis & Prince, 1988).

The processes of urban change must have operated over a longer timespan than might be inferred from the emphasis of many studies which have concentrated on the 1851, 1861 and 1871 censuses, covering too short a period to expect much change; there were important technological and political developments earlier and later in the 19th century (Dennis, 1979; Carter & Wheatley, 1979). Evidence has indicated that the larger the town or city and the earlier they experienced rapid population growth and industrialisation, the sooner they developed characteristically modern, residentially segregated social areas. Further work is required, therefore, on the early 19th

century and also on the late-Victorian and Edwardian eras (Pooley, 1982; Dennis, 1982).

The absence of a consistent taxonomy in the analyses of Victorian towns and cities (Ward, 1983) has been frequently acknowledged as a major cause of apparent contradictions between some analyses of Victorian towns and cities. The main 'problem area' is the choice of means employed to assign individuals to class or status groups and this was discussed at some length in Chapter Two. There was no consensus among Victorians as to the definition of class or status in their society but this should not diminish the importance of contemporary opinion and perceptions for "our attitudes to segregation or our class-consciousness may not correspond with those of our forefathers" (Dennis, 1979). Many writers have followed Armstrong's (1972a) lead and used the 1951 Classification of Occupations to assign socio-economic status to 19th-century occupations but, of course, the application of this 20th-century scheme takes no account of Victorian perception. Even within the 19th century, it is likely that social structure altered sufficiently to render fixed status classifications inappropriate at some point (Dennis, 1984). Cowlard (1979), recognising the importance of contemporary perception, devised an eighteen-class scheme to identify social (class) areas in Wakefield, West Riding, "as distinctive milieux in the contemporary mind".

The most frequently used spatial framework, the census enumeration district, is unsatisfactory; it is generally too large and often combines two or more markedly different types of residential area. An alternative arbitrary grid gives more objective, equally-sized units and has been employed by Goheen (1970), Tansey (1973), and Shaw (1977, 1979). The problem of sub-area framework definition "lies behind much of the apparent contradictory evidence" on 19th-century towns;

the enumeration district proved suitable for cities like Liverpool but it has been suggested that smaller towns like Chorley require a smaller areal framework to measure spatial differences (Pooley, 1979b).

Segregation existed at a variety of scales in Merthyr Tydfil and Carter and Wheatley (1980) concluded that overall generalisations about segregation in the 19th-century city were quite meaningless unless scale was specified; size, growth rate and functional character all affected the degree of segregation. Furthermore, the scale of segregation could change and such change might have had repercussions on class-consciousness and inter-class relations. The influence of scale on segregation was also tested by Ward (1980): residential patterns by social strata at several spatial scales in mid-19th century Leeds indicated that descriptions of early Victorian cities as dichotomous were misleading, in fact Ward found evidence that the level of residential differentiation actually diminished during the mid-Victorian period.

Principal component analysis has been used in this study to identify types of urban sub-area in Plymouth which may provide a sampling frame for the study of specific problems. Factor analysis was used here to aid description of the social fabric of the city and, more importantly, to suggest future areas of detailed research. The selection of variables is crucial to the outcome of component analyses. While the list of variables which may be obtained from the 19th-century censuses do compare favourably with factorial ecologies of modern towns (Rees, 1972), there are deficiencies with regard to "small-area statistics on housing quality and value, demographic variables indicating vital trends, residential mobility, health, education and income" (Pooley, 1979b). Variables were selected for

the component analyses in this study with regard to their representative nature, with the intention of covering all the principal facets of the mid-19th century population; in addition, variables which displayed little or no visible differentiation in distribution were excluded. The final choice was considered to be comparable with variable lists commonly employed in other factorial analyses.

The influence of the female population upon the Plymouth analyses is striking and perhaps requires further investigation than has been possible within the limits of this project. Plymouth attracted short-distance migrant young women in common with other towns and cities in Victorian times, but in addition, had a much higher proportion of households in which, by virtue of the sea-going economic base, the male head was absent. Also the forces presence maintained a sizeable population of prostitutes, seven out of every thousand women were known prostitutes, an incidence not found in the inland industrial towns of the North and Midlands, for example. The importance of the female population in determining the social geography of Plymouth and Stonehouse implies either that women had a more important role in these towns, or that studies of other towns and cities, by selecting different variables, may not have been capable of yielding similar insights.

Lawton and Pooley (1976), in their study of the social geography of Merseyside, wrote:

"...the involvement of women and children in the workforce was undoubtedly under-represented in the census and will be very different in a port town like Liverpool, which has restricted opportunities for female employment than in a textile town like Manchester." (SSRC Report)

They included two measures of servants (who were predominantly female) in their 35 variables: number of servants per family (nuclear and extended) and resident domestic servants as a percentage of total population; this study used one such measure: number of servants per household. Both analyses included sex ratio and measures of working women, however, the Plymouth project also entered the fertility ratio (and age ratio, against population by age groups 0-4, 0-14, 15-64, and 65 and over for Liverpool) and the number of female heads of household into the analysis.

It may be contended that when women are in the majority in a population, the selection of only two variables which may be regarded as involving gender differentiation might hinder the outcome of analysis. The results of the Plymouth investigation, with four 'female' variables, suggest that this majority group has a rather more significant impact upon the social geography of urban areas than other studies have indicated. It has not been possible to investigate this contention beyond brief comparison of various studies in the course of this research project, clearly detailed statistical tests are required to measure fully the effect of variable choice in factorial analyses and the consequences for urban ecology.

Lawton (1972) noted the inter-disciplinary nature of Victorian studies and welcomed the consequent "fusion of methodology, and conceptual and analytical techniques". He identified a three-fold contribution by geographers to the analysis of social and spatial change in an evolving society: in spatial analysis for individual cities of various themes; in comparative studies of the social patterns within cities; and in case studies from which to derive a broader understanding of the processes of 19th-century urbanisation. There has been criticism



that "geographers describe social patterns without attempting to understand the society that creates those spatial forms" (Pooley & Lawton, 1988). Notwithstanding Gregory's (1978) observation that "to concentrate on a universal spatial logic... is to obscure the mediations which have made human geography a distinctly human science", there are two problems inherent in the "new era of growth and vitality" of which Pooley and Lawton talk:

(1) it requires a substantial non-geographical element. Yet geographers should not lose sight of their spatial roots, their primary role should be to determine the incidence of phenomena in space; and

(2) it requires co-operation between the disciplines of geography, history, sociology, political science, and even economics and psychology, the consequent demand for teamwork will restrict the work possible within the structure of individual research.

Geographers seeking to analyse segregation should be "more discriminating in their selection of an appropriate research methodology" (Dennis, 1980), particularly, it is advisable to use more diverse contemporary sources in addition to the purely statistical census. Jackson (1981), concluded that more comparative or regional studies are needed, applying similar methodologies and working at different scales, before more general statements about 19th-century social area developments can be made. More towns and cities need to be empirically investigated and over a wider timespan in order to assess the full significance of residential separation (Pooley, 1984). But the greatest need is for an agreed methodological framework, with special regard to taxonomy and variable choice in order to gain comparability between studies; this is by no means a new idea but it has yet to be realised.

### 9.3 A review of the research and further areas for investigation

This thesis sought to recover the evidence about Plymouth's mid-19th century social geography as fully as possible, using both statistical data and qualitative information to reconstruct the spatial patterns that characterised the mid-Victorian town and to identify the processes and patterns of change which were occurring. The census-based investigation, discussed in the preceding chapters, of the social geography of mid-Victorian Plymouth and Stonehouse has established the character of population growth, the patterns of migration, and the changing residential structure of the two towns, and has thus been able to identify some of the processes which were producing urban change. The primary aim of this thesis, to provide an analysis of the growth of the towns and enable future comparison with the social geographies of other towns, has been accomplished. In particular, this thesis has presented the results of a substantial analysis of the 1851 and 1871 censuses, thereby establishing the basic characteristics of the population and revealing the proportional contributions of in-migration and natural increase to the local demographic growth.

Research concentrated on an important peak in population growth which occurred in Plymouth between 1841 and 1861 but other periods of rapid population increase remain to be investigated in a similarly detailed manner (namely 1801 to 1811, 1821 to 1831, and 1881 to 1901).

Although no detailed examination has been made here of the growth and development of neighbouring Devonport, or Stoke Damerel Registration District, it should be noted that this adjacent group of small settlements experienced a similar pattern of growth and coalescence to that found in Plymouth and Stonehouse and there is evidence that

Devonport also suffered the same kinds of consequences such as overcrowding and a poor health record (Chiswell, 1984). The dominance of the Royal Dockyard would, of course, be a central feature of any socio-geographic investigation of Devonport.

The birthplace status of the inhabitants of Plymouth and Stonehouse has been established and the relationship between the origins and characteristics of in-migrants has been explored, establishing in detail the source of the towns' migrational increase. This thesis has also revealed evidence of out-migration and hence the need for a detailed study of migration from Plymouth to the rest of Britain and abroad, especially during the latter half of the 19th century. In addition, the migration patterns of specific groups of workers, such as shipbuilders or fishermen, would also prove a useful further line of inquiry.

Information on the urban morphology of the two towns has been collated in order to describe the physical setting for population growth. The incidence of speculative building and its impact has been briefly discussed and, although it was not within the limits of this project to explore the workings of Plymouth's Victorian building trade, a more detailed study could well form the basis of a future project. The suburbanisation of the surrounding parishes was also briefly investigated but here too more detailed work remains to be done. Some evidence of intra-urban migration has been presented and there is clearly scope for more research into the residential mobility of the Plymouth population. Particular attention has been given to population density and its consequences, especially with regard to public health issues. The development of urban management and control in response to the growing awareness of the problems of overcrowding and disease among the less fortunate, and the incidence of self-help

and mutual aid, are also areas for further historical research which could well reveal valuable information for those seeking to reconstruct more fully the social geography of Victorian towns and cities.

This research project has described the occupational status of the inhabitants of mid-Victorian Plymouth and identified the principal areas of economic activity in keeping with its aims to present a social geography of the town. No attempt was made, however, to present an economic analysis although the complexity of economic life in mid-19th century Plymouth revealed here does, of course, beg fuller investigation. Directory evidence was used to identify the distribution of certain occupational groups but, owing to the complexities involved, no comparison has yet been made between these distribution patterns and those of other data sources; again, this represents a possible line of future research. Also the distribution of wealth and the prosperity of the population could prove to be a worthwhile subject for investigation. In the second chapter the value of occupational returns in social stratification was discussed and this continues to be a subject for debate and, no doubt, further research.

A good deal of work remains to be done on retailing at the local scale; while the broad sequence of development has been identified, change, which was determined by unique local conditions, occurred at different rates in different towns. The importance of retailing as a particular element in the economy, the society and the morphology of a town such as Plymouth has been suggested, although this thesis has provided only a small piece to the larger picture yet to be completed.

The contribution of women to the local economy has also received special attention in this thesis, justified by reference to the

considerable differences in local sex ratios during the study period. There is a need for further comparative research to determine how great an effect substantially different sex ratios may have had on the socio-economic life of Victorian communities in general.

In this final chapter, explanations have been advanced for the different patterns of distribution of census-derived variables occurring in mid-Victorian Plymouth and Stonehouse, culminating in the application of principal component analysis to confirm and summarise the major elements in the changing social geography of the two towns. The effect of variable choice in factor analysis was briefly considered and this revealed another future line of research: namely, to test the Plymouth analyses against those carried out elsewhere, possibly by re-running the Plymouth analyses but using variables chosen by other authors. Further research could seek to clarify the variables most pertinent to analyses of Victorian social geographies and apply different combinations of these variables to a number of urban areas; in this way the effect of variable choice upon the results of such analyses may be identified.

This thesis has completed a valuable preliminary survey of the social geography of mid-Victorian Plymouth and East Stonehouse but a number of important research questions remain to be answered. Principally, the research so far has revealed the descriptive patterns of population characteristics, the 'shapes in society' of the two towns. Some information has been presented concerning the spatial form of mid-19th century Plymouth, although further work is needed, particularly with regard to housing development and tenure, to discover fully the 'shapes on the ground'. Evidence has been advanced to explain the processes operating to produce both social and spatial forms and the changes that affected them. Earlier research interest

in urban historical geography has focused upon the processes of change, the links between social and spatial forms, and it has been suggested that students of 19th-century towns and cities should concentrate on investigation of the social and economic forces which govern residential distribution. Yet, in all studies, the main descriptive dimensions of urban structure must first be established and then explained and interpreted. It is proposed, therefore, that this thesis has laid the foundations for future research on the geography of 19th-century Plymouth.

In summary, three general aims were indicated at the beginning of this thesis and it may be concluded that each has been substantially achieved. Firstly, the main causes of Plymouth's population growth have been shown to be in-migration for the first part of the mid-19th century study period, followed by natural increase as the migrational flow abated and, in part, reversed. The primary consequence of population growth was shown to be severe overcrowding, with averages in excess of those found in mid-Victorian London or Liverpool. This produced considerable urban stress and ill-health necessitating the first steps towards sanitary improvement in Plymouth. Underlying this growth was the economic attraction of the three towns of Plymouth, Stonehouse and Devonport to labour and to capital.

Secondly, the processes of change, already identified by other authors and which help to explain observed patterns, were clearly identified in Plymouth. Migrational and natural change have been mentioned above but, also, as a consequence of urban growth and as the supply of available building land was exhausted, in keeping with other towns and cities of the time, mid-Victorian Plymouth exhibited suburban growth and new housing moved beyond its boundaries. Economic development, in tandem with national trends, also produced

morphological change in the town as Plymouth's industrial districts developed and its retail centre moved to new and more convenient streets (Plate 9A). Plymouth's role as a port was enhanced by the improvement of harbour facilities and the extension of the railway. The key processes of change operating in Plymouth were those involving demographic and physical growth, and the socio-geographic patterns which emerged were all subject to the impact of this growth.

Finally, the changing spatial structure of Plymouth and Stonehouse - a contiguous urban unit by the 1870s - has thus been established and its contributing elements have been identified. It has been shown that the social character and composition of the population varied markedly from place to place within the two towns. Parts of mid-Victorian Plymouth were overcrowded and insanitary, yet it was also a place of opportunity for many migrants from rural Devon and Cornwall and other parts of the British Isles. As a port, Plymouth represented a vital link between Britain and the world (Plate 9B), and as a market, the town regularly drew together the inhabitants of the countryside from miles around. Plymouth was a lively, thriving, many-faceted and cosmopolitan town, it grew in common with many other Victorian towns and cities, subject to the same social processes, and it grew as uniquely as its geography allowed.

Plate 9A: Old Town Street c1895, taken by Rugg Monk, looking south from the junction with Saltash Street. This busy commercial street led down into Plymouth town bringing traffic from the direction of Tavistock.



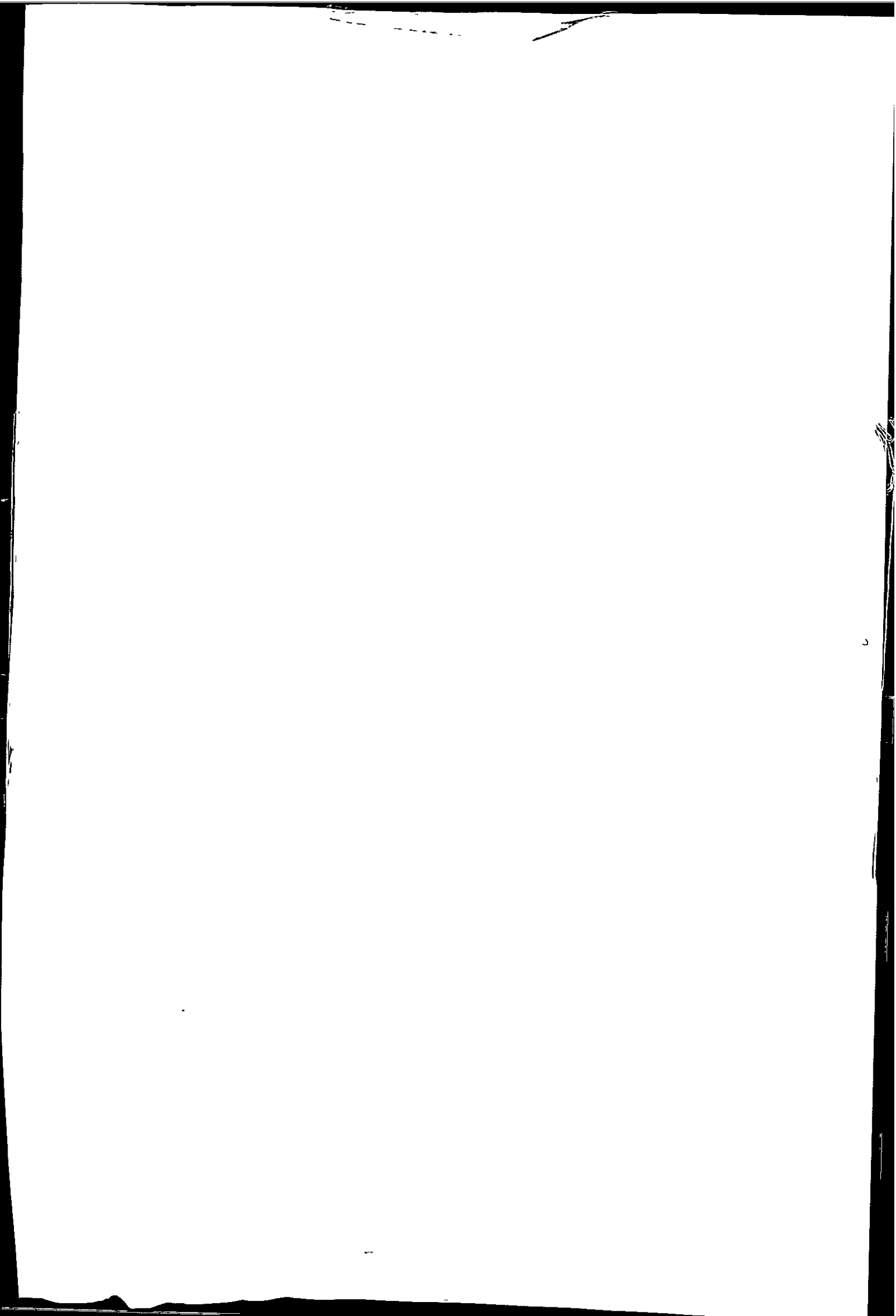
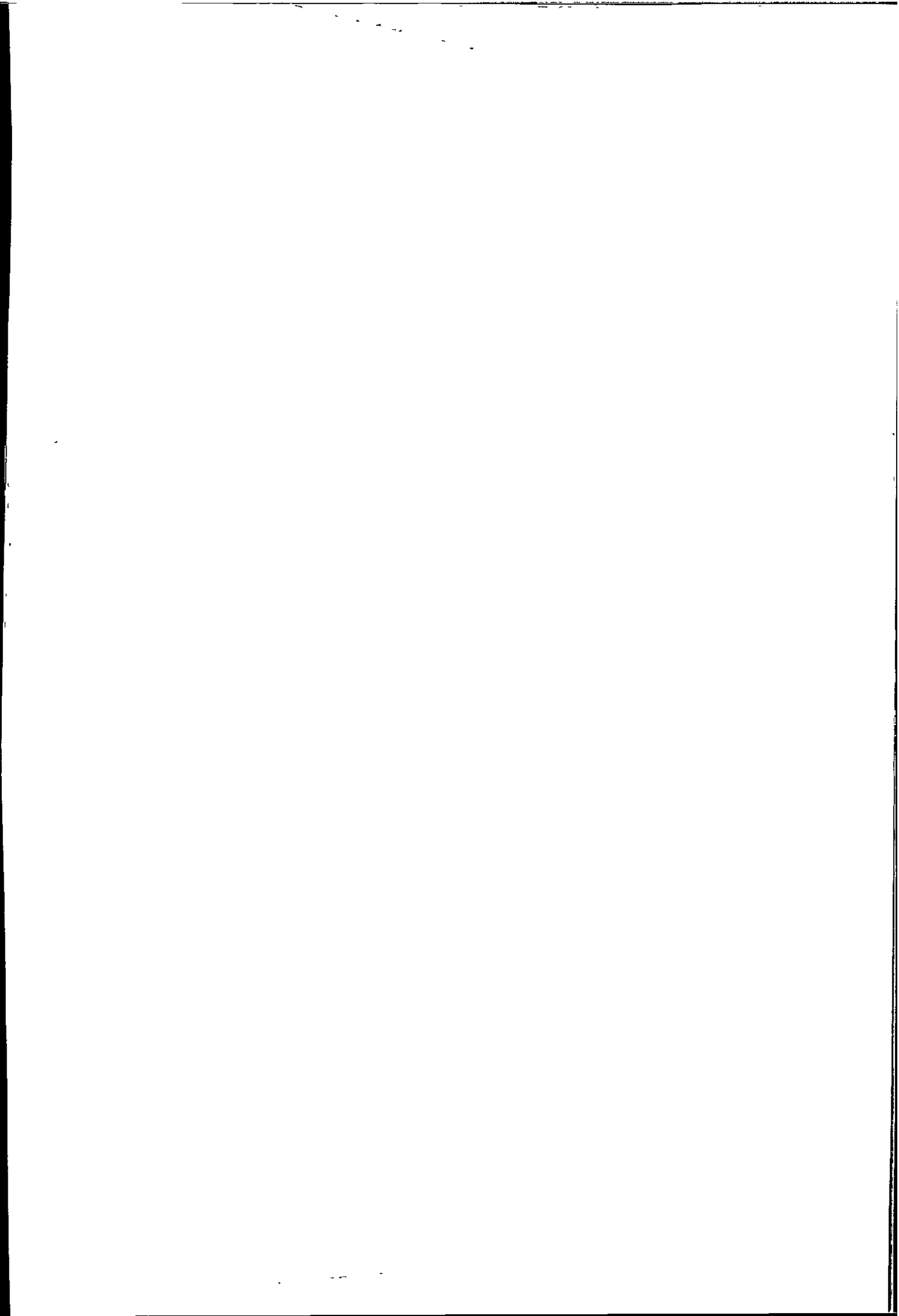






Plate 9B: The Barbican at the turn of the century. Common fishing vessels set sail from where "The Mayflower" once departed. The Seamen's Bethel, Brunswick Hotel and the Great Western Railway Office stand as monuments to Plymouth's seaward and landward trade.







APPENDIX A: Analysis of ages

(1) National ratios for each age group are calculated using the following formula:-

$$R = \frac{P_{ix+t}}{P_{ix}}$$

Where R = ratio for age group a between censuses 1 and 2

P<sub>ix</sub> = national population aged a at census 1

P<sub>ix+t</sub> = national population aged a plus t at census 2

t = the census interval

(2) Expected survivors in each age group are subtracted from the population actually enumerated in each age group in census 2 in order to obtain estimates of net migration using the formula:-

$$M = P_{jx+t} - R (P_{jx})$$

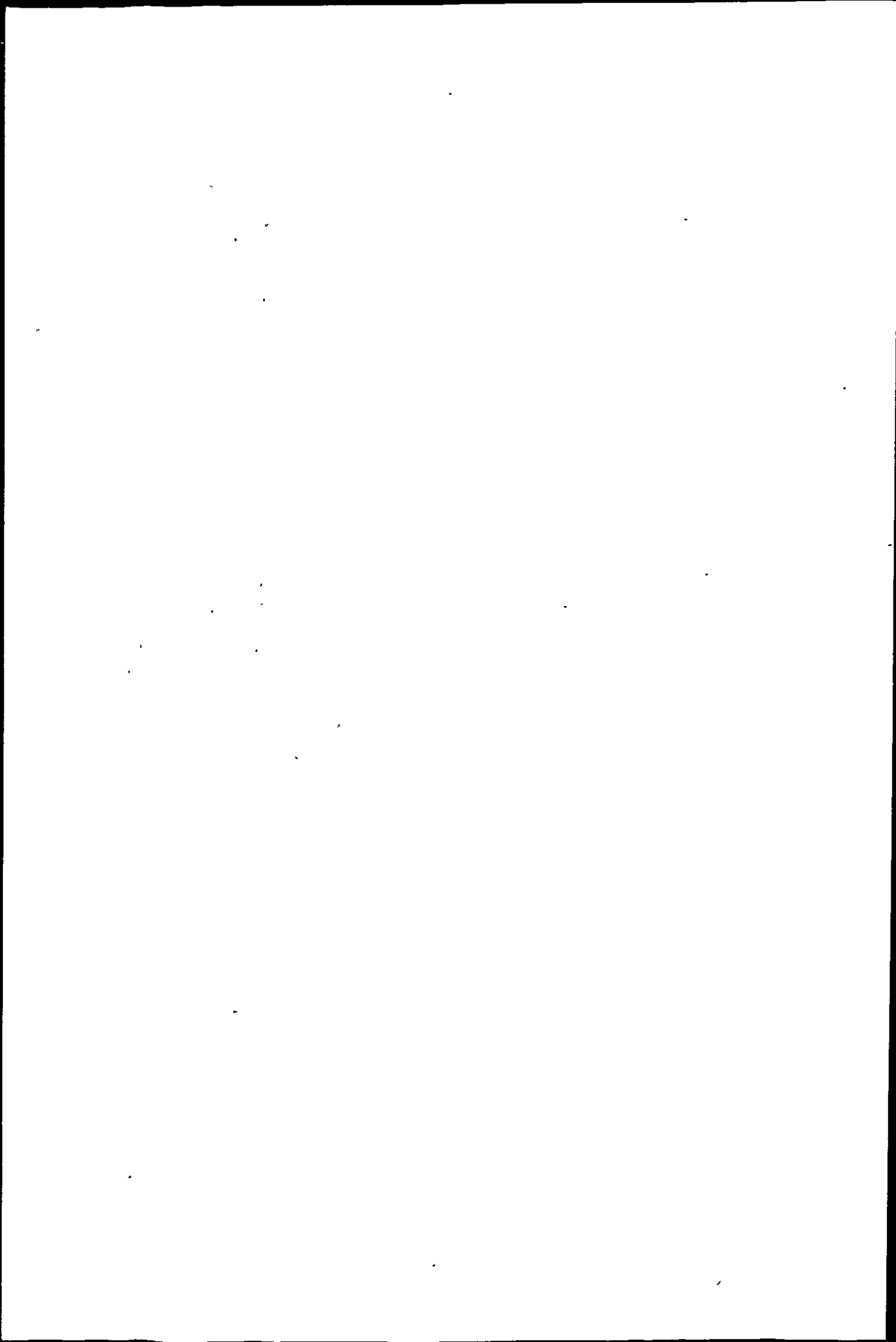
Where M = net migration for age group a between census 1 and census 2

P<sub>jx</sub> = local population aged a at census 1

P<sub>jx+t</sub> = local population aged a plus t at census 2

R = national survival ratio





## APPENDIX B: Analysis of Birthplaces

(a) Certain counties were grouped together in the analysis of census birthplace data as follows:-

Southwest counties: Dorset, Gloucestershire, Somerset, Wiltshire

Seaboard counties: Anglesey, Cardigan, Carmarthen, Carnarvon, Cheshire, Cumberland, Denbigh, Dorset, Durham, Essex, Flint, Glamorgan, Gloucestershire, Hampshire, Islands in the British Seas, Kent, Lancashire, Lincoln, London, Merioneth, Monmouth, Norfolk, Northumberland, Pembroke, Somerset, Suffolk, Sussex, Westmoreland, Yorkshire

Inland counties: Bedfordshire, Berkshire, Buckinghamshire, Cambridgeshire, Derbyshire, Herefordshire, Hertfordshire, Huntingdonshire, Leicestershire, Middlesex, Montgomery, Northamptonshire, Nottinghamshire, Oxfordshire, Radnor, Rutland, Shropshire, Staffordshire, Surrey, Warwickshire, Wiltshire, Worcestershire

Wales (other) refers to those migrants from Wales who did not give their actual county of origin.

(b) Weighted values were calculated for the numbers of migrants from each county according to the size of the sending population. These calculations provided weighted population values for each county in England and Wales (1). Weighted values were then calculated for each migrant group, by county, in Plymouth and Stonehouse (2). Finally, the weighted values were expressed per thousand of the sum of weighted values for each District in each census year (3), this made the data comparable between Districts and censuses, and the resultant values were then mapped and ranked lists of counties of birth compiled.

Formulae:-

(1) $R = \frac{P_j}{P_i} \%$	R = national population ratio per county
	$P_j$ = population per county
	$P_i$ = population, England and Wales
(2) $W = \frac{n}{R}$	W = weighted value
	n = number of people born in each county living in each District
(3) $\frac{W}{\sum W} \times 1000$	

National population ratios were calculated for Ireland and Scotland as percentages of the total United Kingdom population, and then adjusted to make them comparable with the English and Welsh counties. The total England and Wales population was determined as a percentage of the United Kingdom population and found to be 65.51% in 1851; thus the 1851 ratios for Scotland and Ireland were multiplied by 0.6551. Similarly, the 1861 ratios were multiplied by 0.6937, and the 1871 ratios by 0.7214. The correction factors for male and female ratios were, 1861: 0.6952 and 0.6923, and 1871: 0.7227 and 0.7201.

APPENDIX C: Employment statistics

TABLE A1: Male and Female Employment by Occupational Order

	1851		1861		1871	
	males	females	males	females	males	females
I Government	611	7	764	6	707	12
Defence	3354	.	4245	.	4433	.
Learned profs.	570	260	657	400	639	398
II. Wives	.	10810	.	13167	.	16049
Domestic service	429	3385	506	3700	610	4353
III Merchantile	438	95	537	137	865	342
Conveyance	1658	13	2392	7	2364	11
IV Agriculture	377	130	349	123	338	64
Animals	650	4	665	1	393	5
V Production	2724	244	3293	286	3298	283
Textiles & dress	1580	2908	1681	4012	1513	3608
Food & drink	1131	261	1344	343	1339	324
Animal substances	145	11	184	7	183	19
Vegetable subs.	375	12	479	32	399	64
Minerals	882	34	959	40	889	31
VI Labourers, etc.	1496	179	1711	277	2553	231
Independent	129	927	120	691	149	1026
Total*	13195	8470	15641	10062	16239	10771
Percentage+	60.9	39.1	60.9	39.1	60.1	39.9

\* Excluding wives

+ Percentage of total workforce, male and female, excluding wives

Source: Published census data.

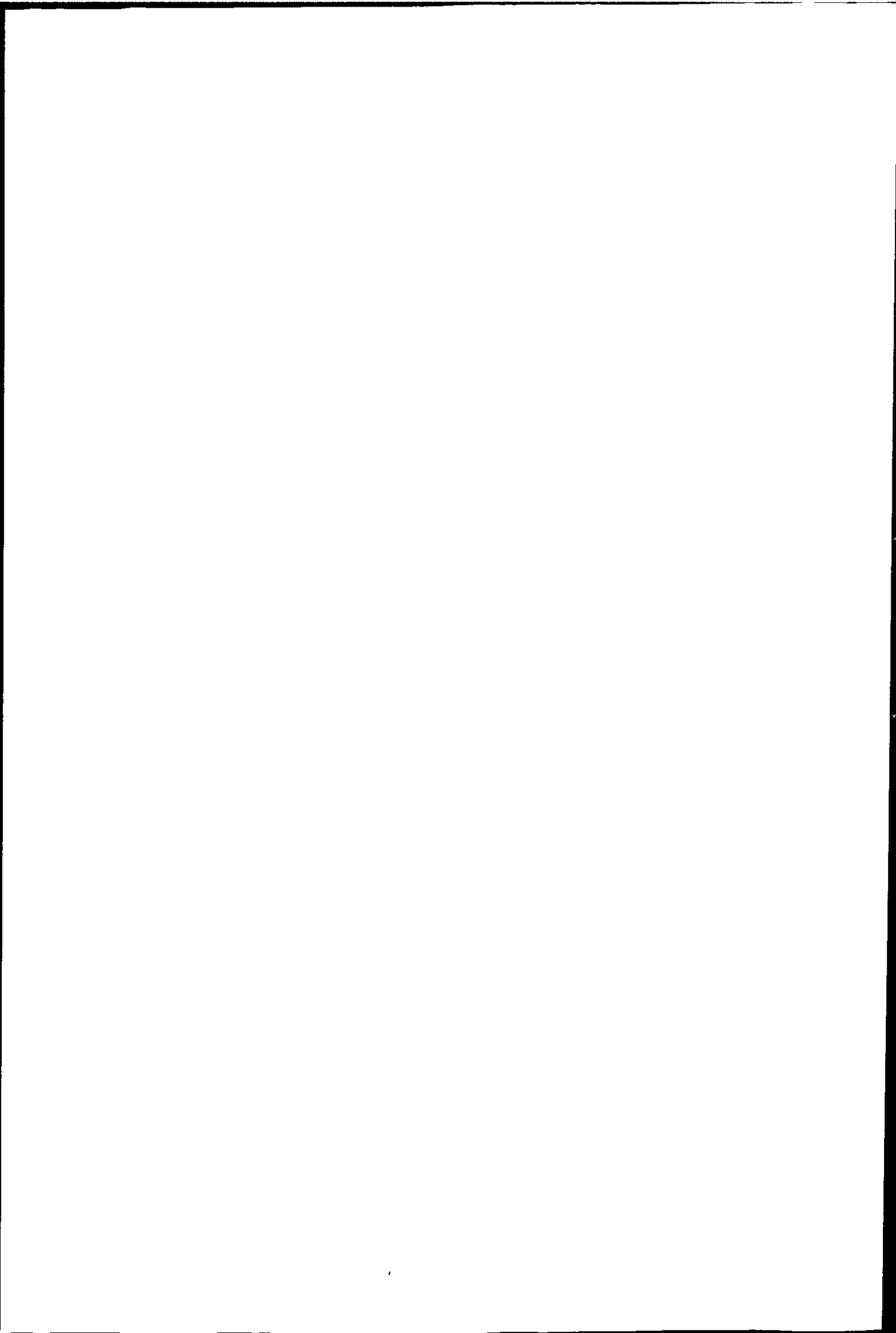


TABLE A2: Employment by enumeration district, 1851

Enumeration District	Sample population	Percentage working*	Female workers†	Industrial class"	
Charles	01	58	36.2	27.6	16.0
	02	76	44.7	7.9	66.7
	03	81	46.9	17.3	51.3
	04	125	48.0	16.0	65.1
	05	140	40.0	15.0	69.0
	06	149	40.9	16.8	47.7
	07	168	45.2	18.5	61.7
	08	131	39.7	16.0	51.9
	09	83	48.2	28.9	44.2
	10	60	45.0	31.7	34.4
	11	77	52.0	32.5	41.9
	12	70	45.7	20.0	42.4
	13	119	42.0	16.8	42.3
	14	97	36.1	16.5	30.2
	15	105	40.0	15.2	60.5
	16	88	39.8	19.3	25.0
	17	113	33.6	15.9	40.0
	18	103	36.9	14.6	46.7
St Andrew	01	207	43.0	12.1	47.2
	02	67	43.3	19.4	22.6
	03	94	47.9	25.5	39.6
	04	159	42.1	13.8	54.4
	05	137	34.3	13.1	53.6
	06	111	48.7	24.3	51.7
	07	94	56.4	28.7	40.7
	08	126	38.9	10.3	47.1
	09	76	47.4	25.0	30.0
	10	61	52.5	29.5	21.9
	11	25	28.0	8.0	14.3
	12	179	43.0	20.7	60.7
	13	173	47.4	18.5	56.0
	14	149	43.0	12.1	67.2
	15	127	44.1	18.1	50.0
	16	122	50.8	23.0	34.9
	17	171	42.7	25.7	20.5
	18	150	38.7	15.3	44.3
	19	143	42.7	12.6	39.7
	20	102	40.2	13.7	51.2
	21	79	48.1	17.7	59.0
	22	64	45.3	26.6	36.4
	23	55	27.3	9.1	33.3
	24	184	35.3	8.2	19.4
	25	131	42.0	19.1	33.9
Stonehouse	01	95	45.3	23.2	17.4
	02	123	48.0	26.0	25.0
	03	126	41.3	25.4	37.3
	04	145	37.9	12.4	54.6
	05	181	39.8	21.6	43.6
	06	144	43.8	18.1	45.5
	07	196	36.7	16.3	51.9
	08	108	34.3	21.3	23.4
Whole area	5947	45.1	18.2	44.3	

\* Excluding occupational orders (4) and (17)

† Percentage of sample population

" Percentage of working population

Source: Sample population data.

TABLE A3: Employment by enumeration district, 1871

Enumeration District	Sample population	Percentage working	Female workers	Industrial class	
Charles	01	64	26.6	1.6	41.2
	02	194	40.7	14.4	36.1
	03	111	49.6	21.6	46.6
	04	132	53.8	24.2	37.0
	05	157	33.8	8.9	41.8
	06	87	36.8	27.6	6.7
	07	98	38.8	19.4	23.1
	08	103	39.8	31.1	12.8
	09	242	40.9	18.6	40.4
	10	152	46.1	15.8	40.8
	11	124	40.3	14.5	46.2
	12	104	45.2	20.2	38.8
	13	102	47.1	22.6	35.8
	14	127	44.9	18.9	57.4
	15	158	43.7	22.2	48.7
	16	117	54.7	27.4	56.9
	17	91	45.1	19.8	52.3
	18	127	44.1	25.2	32.8
	19	135	48.2	28.2	39.1
	20	105	41.9	23.8	48.0
St Andrew	01	184	38.0	19.0	54.9
	02	188	42.6	14.4	35.0
	03	128	44.5	16.4	45.0
	04	195	35.4	17.4	36.0
	05	118	32.2	9.3	35.7
	06	112	33.9	17.0	31.8
	07	163	41.1	14.1	54.9
	08	151	35.8	17.9	54.2
	09	110	47.3	21.8	61.8
	10	147	38.8	13.6	45.8
	11	144	47.9	16.0	50.7
	12	110	44.6	24.6	45.1
	13	208	40.9	15.4	50.6
	14	181	38.1	13.3	31.9
	15	129	34.9	15.5	43.5
	16	144	43.1	20.1	42.9
	17	81	48.2	24.7	22.0
	18	95	59.0	37.9	8.3
	19	120	45.0	23.3	22.0
	20	121	49.6	39.7	14.9
	21	131	39.7	16.8	55.8
	22	152	50.7	25.0	51.8
	23	158	37.3	12.0	57.6
	24	65	52.3	23.1	35.3
	25	80	47.5	35.0	12.2
	26	103	45.6	22.3	32.7
	27	71	39.4	14.1	51.7
	28	119	42.0	22.7	50.0
	29	100	42.0	15.0	46.5
	30	102	48.0	10.8	48.8
	31	130	30.8	11.5	17.8
Stonehouse	01	130	34.6	21.5	30.9
	02	134	44.0	20.9	24.6
	03	129	48.8	24.0	22.1
	04	137	43.8	15.3	41.9
	05	215	41.9	21.9	43.9
	06	165	40.6	19.4	27.3
	07	222	30.2	14.4	22.2
	08	207	46.9	16.9	42.4
Whole area	7909	44.8	19.1	39.1	

Source: Sample population data.

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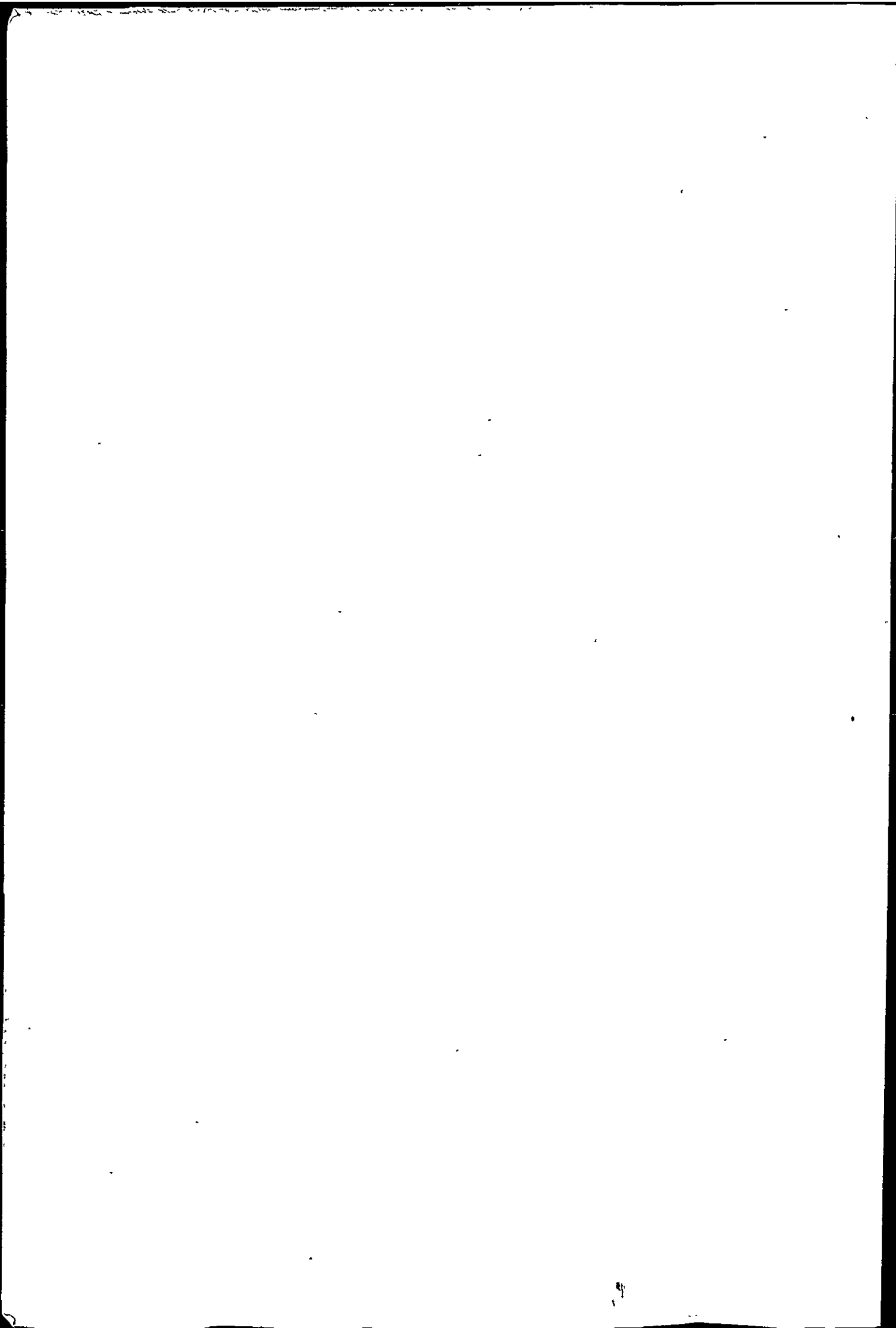
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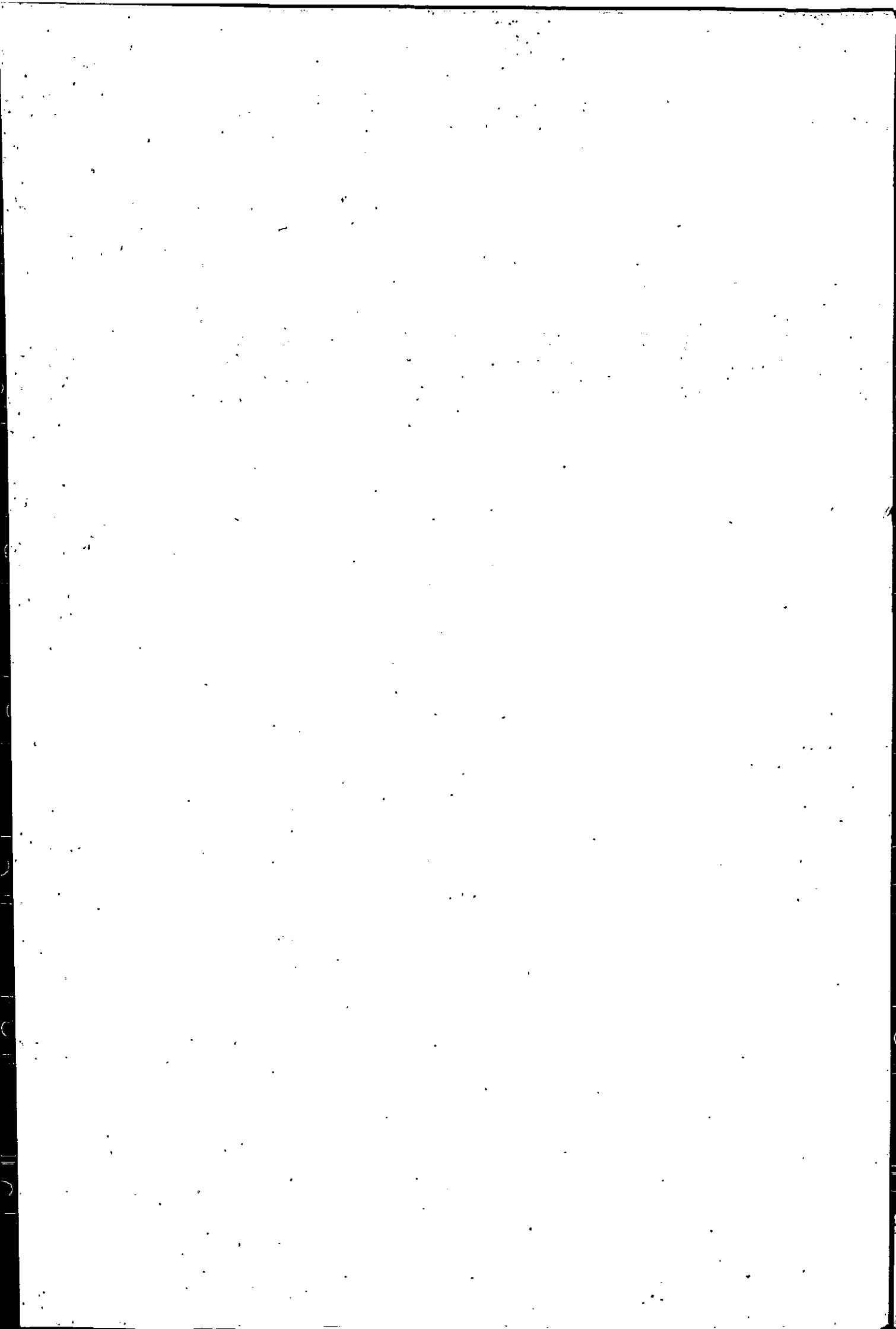
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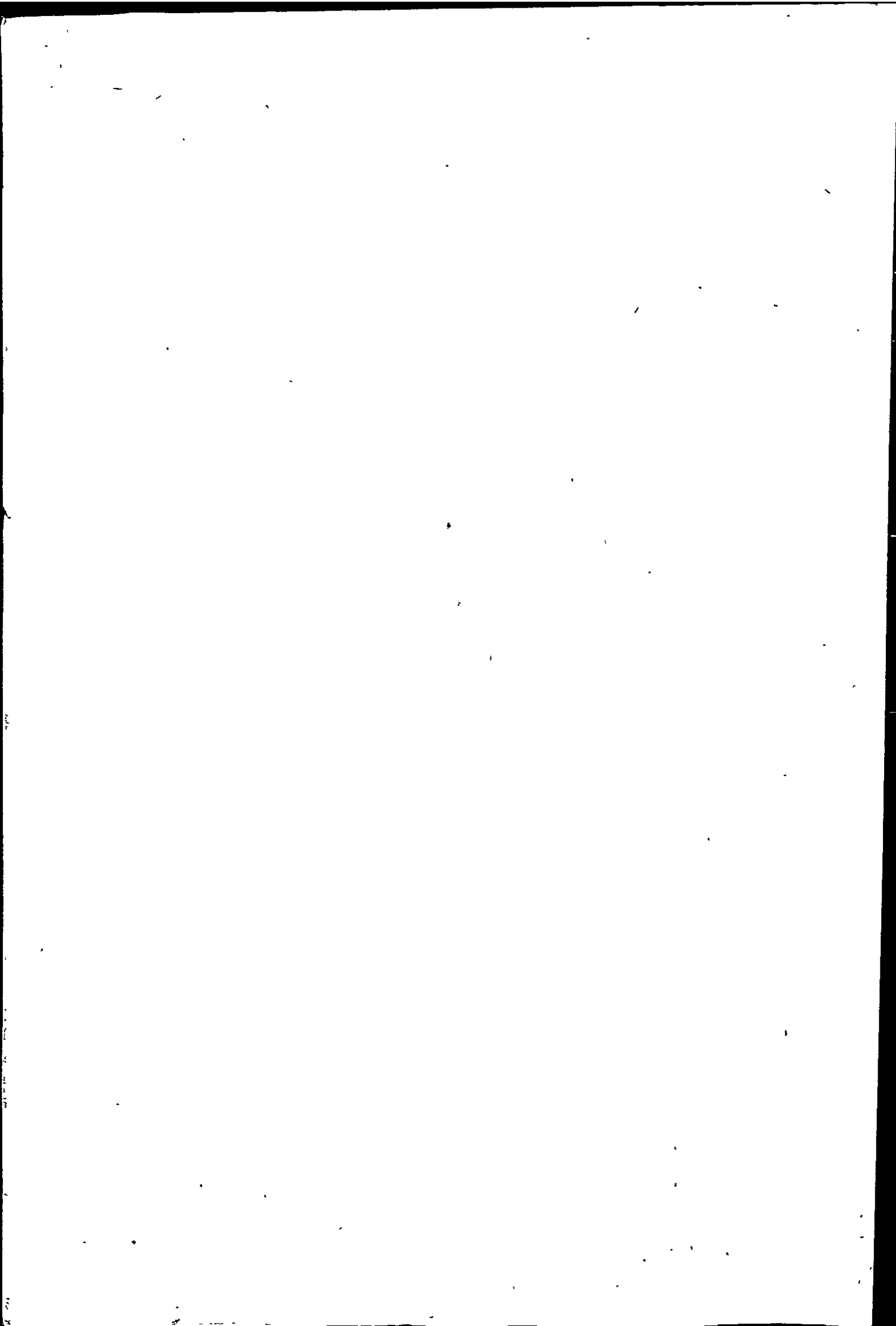
#### Abbreviations

- EPEH: Exeter Papers in Economic History  
 JRSS: Journal of the Royal Statistical Society  
 Trans IBC: Transactions of the Institute of British Geographers













- (19) A recent useful study of domestic service in nineteenth-century Exeter by Jane Emerson appeared in *Devon Historian*, vol 25, 1982, pp 10-14.
- (20) There were only 57 males to every 100 females amongst the Cornish born, this compares with 74 amongst the Devon-born in-migrants and 83 amongst the native population of Plymouth.
- (21) In the 1871 census a group of women in Newport Street were specifically recorded as prostitutes but this was not a usual practice amongst the enumerators. Under the terms of the Contagious Diseases Act local police forces were required to return the number of brothels in urban areas and figures for Plymouth in the 1880s disclose that there were 500 women in 'Greater Plymouth' resident in brothels at that time. See: Walkowitz, J. 'The making of an outcast group: Prostitutes and working women in nineteenth century Plymouth and Southampton' in *A Widening Sphere: Changing roles of Victorian Women* ed by Martha Vicinus, Indiana UP, 1977 pp 72-93.

## MIGRATION AND THE SOCIAL GEOGRAPHY OF MID-NINETEENTH CENTURY PLYMOUTH

Mark Brayshay & Vivien Pointon

Mid-nineteenth century Plymouth was indisputably Devon's most cosmopolitan town. (1) Birthplaces recorded in the censuses from 1851 onwards reveal a remarkable diversity of origins and, although the evidence does not directly include information about the routes by which these in-migrants made their way to Plymouth (2), there can be little doubt that the rich mixture of their various backgrounds and experience added considerably to the prosperity and development of the town in Victorian times.

Migration to Plymouth of course contributed to the prodigious growth in total population. In 1801 the census recorded 19,447 people in Plymouth and Stonehouse; by 1851 the population was 64,200, and by the close of the century it stood at 122,747. Thus, in the course of only a hundred years there had been a six-fold increase and Plymouth had become a city in all but name. (3) But migration boosted demographic growth not simply in absolute terms, but also by enhancing the town's potential for natural increase, since young adults between the ages of 20-35 years tend always to be the most mobile group in any society, and they certainly dominated the ranks of in-migrants to Plymouth during the last century. (4)

Although the town grew physically, its rate of areal expansion, and the increase in the urban housing stock, failed to keep pace with the demands of a growing population. The inevitable consequence was a level of overcrowding and a degree of environmental blight in certain parts of Plymouth which were amongst the worst to be found anywhere in Britain. (5) Ineffective urban management was partly to blame and corrective measures were slow to take effect, but despite these serious defects in Plymouth's physical fabric, nothing seemed to have seriously impaired the economic success of the town. Industries based upon imports were particularly prosperous. (6) Chemicals, for example, supported local fertiliser-, soap-, and starch-making factories; while timber, grain and hides were used in furniture- and boat-building, biscuit-baking, brewing, distilling and tanning. (7) Plymouth was also a key retail centre and served as a major livestock market for West Devon and East Cornwall. The proximity of the Royal Dockyard and the presence of the armed forces in the town created a constant need for a wide range of goods and services, bringing considerable benefits to the local economy. Even Plymouth's preponderance of 'navy wives' made a significant economic contribution. Their skills as dressmakers and shirt-makers were not only well-known locally but had been recognised further afield. London businesses sent work down to Plymouth because they could depend on the quality of 'garments made up in the town'. (8)

Job opportunities in Plymouth must therefore have acted as a powerful magnet, attracting migrants in large numbers from the rest of Devon, from Cornwall and a host of other origins. In 1842 the government established an emigration depot in Plymouth and this brought welcome extra trade to local ship brokers, victuallers and retailers. (9) Moreover, in the aftermath of the potato famine, the depot was used to accommodate thousands of Irish people on their way to the colonies; though many seem to have progressed no further than Plymouth. Steamers provided

### DEVON HISTORY SOCIETY PUBLICATIONS

The following numbers of *The Devon Historian* can be obtained for £1.00 (plus postage) from Mrs S. Stirling, Devon & Exeter Institution, 7 The Close, Exeter: Nos. 1-6, 8-10, 12-14, 17-21, 24-26. Also available (all prices plus postage): *Devon Newspapers*, 60p; *Index to Devon Historian 1-15*, 20p; *Devon Bibliography 1980* (=DH No. 22), 50p; *Devon Bibliography 1981*, 60p.

The Hon. Secretary, Mr John Pike, 82 Hawkins Avenue, Chelston, Torquay, would be glad to acquire copies of *The Devon Historian* Nos. 7, 11, 15, 16, 23 which are now out of stock.

a regular link with the Irish ports of Belfast, Dublin and Cork and by 1851 a permanent Irish-born community was well-established in a small area to the north of Millbay Docks

### The Origins of Plymouth's Migrants

While the patterns of migration to many other provincial towns in Victorian Britain has been carefully studied, (10) very little detailed work has been carried out on Plymouth. For instance, almost nothing has been written so far about where in the town the in-migrants lived. Still less has been said about the kind of employment they found in Plymouth, and there has been no real exploration of whether a pattern of residential and social segregation similar to that observed elsewhere in mid-nineteenth century Britain had emerged in this West Devon town. (11) Few historians would deny that answers to these questions are crucial to a better understanding of the evolution of Plymouth's social and physical structure, but to secure them demands a detailed and painstaking study of sources like the mid-Victorian manuscript census returns (12)

To these ends a sample of data has been extracted from the 1851 (and 1871) census enumerators books for Plymouth and Stonehouse as the basis of a much larger study of the social geography of the towns, but part of that computerised data file is used here in this article about migration (13) Of course the census only records an individual's birthplace and not his personal migration history. Some people enumerated in Plymouth on census night would have arrived in the town only after numerous moves to other places. The data we have are therefore only an imperfect surrogate. Nevertheless, even though we must focus on 'life-time' migration, the partial picture this yields is still immensely valuable (14)

A cursory perusal of the published census data shows that the principal birthplaces of the inhabitants of Plymouth and Stonehouse were, in rank order of numerical importance, Devon, Cornwall, Ireland, London, Somerset, Overseas origins, Hampshire, Kent, Gloucester, Wales, and 'Islands in the British Seas' (Table 1). Although it is not possible from published tables to distinguish how many of the Devon-born people were actually natives of Plymouth, the 'ten-per-cent' sample drawn from the manuscript census return for 1851 suggests that 42.5% of the inhabitants of the town were in fact Plymothians by birth. Table 1 indicates therefore that of the combined 1851 population of Plymouth and Stonehouse of 64,200, approximately 36,908 people were not natives of the town. In effect, well over half of her population consisted of 'in-migrants'

Inevitably, the most numerous group of migrants was drawn from origins closest to Plymouth. Thus Devon and Cornwall parishes alone accounted for 40.0% of the town's 1851 population. Indeed, distance may be cited as a key factor explaining the overall pattern of migration to Plymouth not simply from relatively local sources, but from more distant origins as well. However, as the distance increases, the simplicity of the pattern tends to be distorted. The influence of 'intervening opportunities' such as the attractions of a rival town and the varying availability of some convenient means of transport are both factors which help to explain why some sources appear to have contributed more migrants to Plymouth by 1851 than other places situated the same distance away. Of course, the population size of the 'sending area' also had an effect on the numbers of people from that area eventually making their way to Plymouth. Thus the presence in Plymouth of more than 1,200 people born in London was probably as much a reflection of

character, the divisions between rich and poor became more sharply focussed. The process of social sifting and sorting which produced such divisions owes much to the arrival of migrants. The tendency of some groups to cleave together in tight-knit communities produced in Plymouth a new social mosaic which exerted a profoundly important effect on the evolution of the town in Victorian times

### Footnotes:

- (1) Modern Plymouth is a union of three towns Plymouth, East Stonehouse and Devonport. This study refers to Plymouth and East Stonehouse, but not to Devonport which was administratively separate from Plymouth until 1914.
- (2) It is possible in many cases to fill in some details about the movements of an in-migrant from the various birthplaces of children born to the family and recorded in the manuscript census. At best, however, such information is likely to be only an erratic guide to any intervening moves.
- (3) Even when the Three Towns were legally joined in 1914, Plymouth was still only a County Borough. City status was not achieved until 1928.
- (4) For example 41% of the Cornish-born, 36% of the Irish-born and 33% of the 'Seaboard Counties' migrants were in this age group in the 1851 census of Plymouth.
- (5) See Brayshay, M. and V. Pointon 'Local politics and public health in mid-nineteenth-century Plymouth', *Medical History*, 1983, vol 27 162-78.
- (6) William White, *History, Gazetteer and Directory of Devonshire*, Sheffield, 1850 pp 652-3.
- (7) See also *Post Office Directory of Devonshire*, London, 1956, p 22.
- (8) By 1889 Kelly's *Directory of Devonshire* (p 367) comments 'it may be noted as a matter of interest that a considerable part of the costumes displayed in the great London warehouses of Peter Robinson, Whiteley and others, are made in Plymouth'.
- (9) Brayshay, M. 'Government assisted emigration from Plymouth in the nineteenth century', *Rep Trans Devon Ass Advmt Sci.*, vol 112 185-213.
- (10) Other researchers have published studies of towns including York, Preston, Nottingham, Chorley, St Helens, Wigan, Wakefield, Swansea, Cardiff, Merthyr Tydfil and Liverpool, to name but a few.
- (11) A good recent summary of work in this field is Johnson, J. H. and C. G. Pooley, *The Structure of Nineteenth Century Cities*, Croom Helm, 1982.
- (12) Of course a range of other sources need to be consulted as well. Directories, rate books, newspapers, contemporary maps and many other documents yield information which can be integrated with census evidence to reconstruct the structure of a town.
- (13) This larger study is the subject of Vivien Pointon's PhD thesis which is in preparation.
- (14) The term 'life-time' migration is commonly used by urban historians to mean a count of people whose place of enumeration on census night was different from their stated place of birth.
- (15) The larger projects are well documented. See for example Gill, C. *Plymouth A new history* vol 2. David & Charles, 1979. Plymouth's Local Board of Health was responsible for installing a new sewerage system and for numerous street improvement projects after 1854. See note 5.
- (16) See note 5. The General Board of Health correspondence in the Public Record Office contains further information about Plymouth's unhealthy districts and the squalor of the Irish quarter.
- (17) Seaboard Counties comprise 27 counties of England and Wales which have a sea coast, plus Anglesey and the offshore islands. Inevitably some origins (e.g. Kent, Hampshire, Somerset, Dorset and Pembroke) occurred much more frequently than others, but for the purposes of this article the whole group is considered as a single source.
- (18) Only the Plymouth (Watch) Rate Book for 1869-70 survives but this is nevertheless adequate to yield comparative indices for the various districts of the town.

unattached women as well. Prostitution was common in Plymouth as it was in Portsmouth and Southampton and although neither the 'notes for guidance' nor the propriety of the Victorian census enumerators allow us any clear picture of the true number of women so employed, the occasional use of a euphemism in the 'occupations' column of the record does confirm their presence in the town. (21)

Predictably the map showing the distribution of migrants from so-called 'seaboard counties' (which includes Anglesey and the other offshore British Islands) is less well defined. (Figure 4). However, the hint of a concentration in the area around Millbay Dock does reflect the origins of many migrants in other dockyard towns and ports. Moreover, while many would have been unskilled labourers at the daily beck-and-call of the wharfingers, others possessed skills which afforded them greater prosperity and enabled them to meet the higher rents of newer housing on the northern edge of the town. Thus a secondary concentration can be picked out in those areas. There were people from Chatham, Portsmouth, Sheerness, Pembroke and the Channel Islands in these areas of Plymouth and the census of 1871 showed not only a substantial increase in the number of migrants from these sources but also a higher level of residential segregation.

#### Occupations

So far the relationship between the birthplaces and the occupations of Plymouth's in-migrants has only been touched upon where it seemed to explain their residential distribution. The detailed pattern of employment revealed in the analysis of the 1851 manuscript census is too complex to enable a satisfactory description to be attempted here, but the much-simplified breakdown of occupations shown in Table 2 does make one important point very clear. People from different origins displayed markedly different occupational compositions. As referred to earlier, the Irish were dominated by general labourers, while the Cornish contained the largest percentage of domestic servants. As might be expected, those migrants born in 'seaboard counties' tended to be employed either in the 'professions, army, navy, or government service' or in industries (especially those connected with the docks). Plymouth's Devon-born inhabitants were well-represented in all the major occupation groups, but dominated the town's manufacturing industry. Thus, in seeking to explain the pattern of migration to mid-nineteenth century Plymouth shown by the manuscript census returns, it is important to add to the list of factors already considered earlier in this article the demand in the town for particular skills. Migrants tended to be drawn from areas where such skills were in abundance and so added to the growing prosperity and development of the town.

#### Conclusion

Migration clearly played a key role in shaping the social geography of Plymouth during the last century. This article has argued that inhabitants of the town from different origins not only exhibited different occupational structures, but also different residential distributions. The social and demographic composition of the various migrant groups also differed, and while these patterns did not remain static from one census to the next, analysis of later enumerations has tended to confirm that the broad contrasts described in this short article tended to persist. Nineteenth-century cities generally were rapidly becoming 'multi-cellular' in social

Table 1 -- Ranked Birthplaces of Plymouth Inhabitants 1851

	Plymouth	East Stonehouse	Total	Com- bined Rank	Percentage of Total Population
Natives of Plymouth & Stonehouse	—	—	27,292*	(1)	42.5
Rest of Devon	—	—	19,123*	(2)	29.8
(Devon total)	38,415	8,000	46,415)		
Cornwall	5,180	1,599	6,779	(2)	10.6
Ireland	1,792	424	2,216	(4)	3.5
London	1,215	228	1,443	(5)	2.2
Somerset	747	384	1,131	(6)	1.8
Foreign	752	134	886	(7)	1.4
Hampshire	560	160	720	(8)	1.1
Kent	360	96	456	(9)	0.7
Gloucester	320	95	415	(10)	0.6
Wales	283	121	404	(11)	0.6
Islands †	276	54	330	(12)	0.5
(Remainder)	2,321	684	3,005)		
Totals =	52,221	11,979	64,200		

Source: Published Volumes of 1851 Census: 10 per cent sample.

\* These figures are estimates derived from the 10% sample drawn from the manuscript census data. This suggested that 41.2% of the Devon-born group were born outside Plymouth and Stonehouse.

† Dominated by the Channel Islands.

the capital's massive population as any particular attraction which this West Devon town may have held for such people. Nevertheless, Plymouth's accessibility by coastal steamer does seem to have been a key influence in encouraging substantial migration from other ports and seaboard counties of the British Isles. (Figure 1).

A clear picture of the effects of all these factors (distance, population size of the 'sending area', intervening opportunities, and means of travel) emerges when

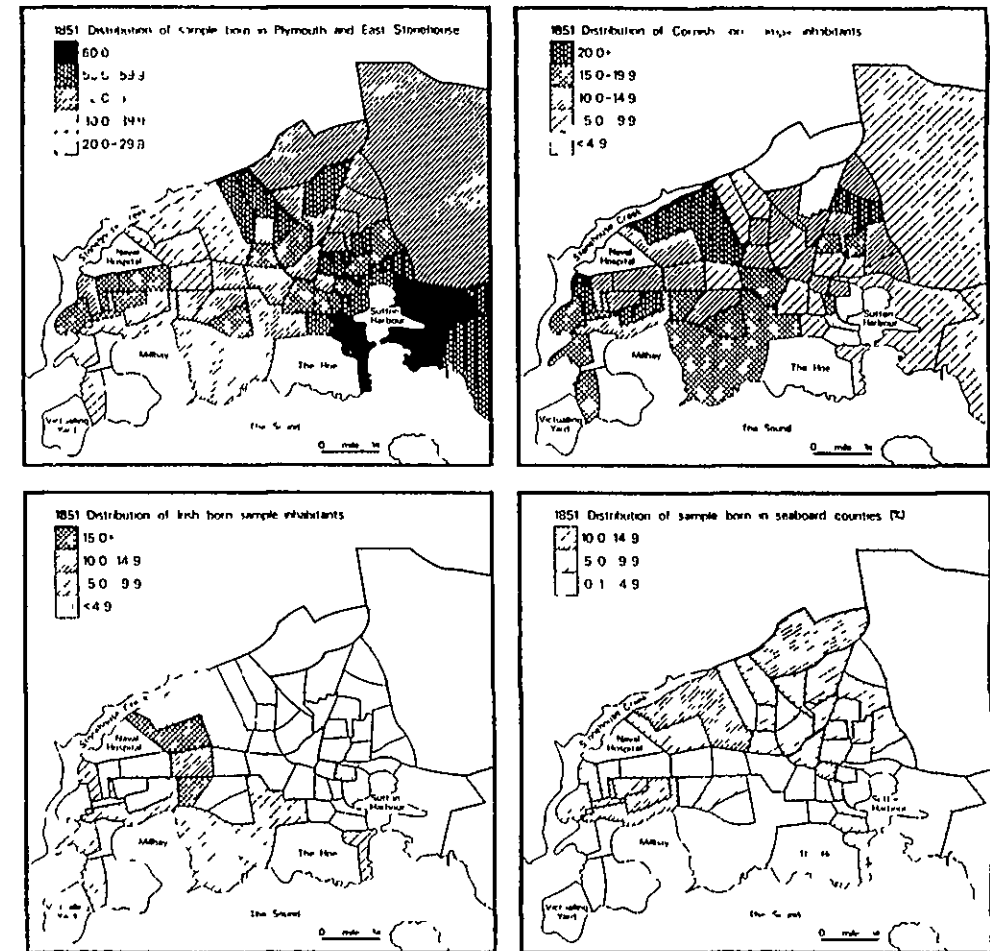
the rate of migration to Plymouth from each parish in Devon and Cornwall is mapped for the census year 1851. (Figure 2) The dominance of origins situated very close to Plymouth was clearly very little affected either by their relative size or by any slight variation in distance. Intervening opportunities for migrants from Kingsbridge, Modbury or Saltash for instance were very few and the means of travel to Plymouth was readily available. Further afield, however, those parishes well-served by a regular road transport connection (Figure 3) or with a relatively large population tended to contribute proportionately more migrants than neighbouring parishes situated at a similar distance from Plymouth.

Although the precise motives of individual migrants can rarely be recovered from surviving evidence, we may speculate on the importance of the lines of communication which must have helped the would-be migrant to make a decision to move. The carters and van drivers who regularly plied the routes between Plymouth and other parts of the South West not only provided a kind of *ad hoc* removal service for ordinary people, but would also have been a valued source of gossip and information about life in the town, the job opportunities and the accommodation possibilities that Plymouth could offer. The same must also have been true of the crews of the steamboats operating in and out of Plymouth. Thus, especially in the pre-railway age, the horse-drawn wagon, coach or van played a social role almost equal in importance to their acknowledged economic role in shaping the emerging geography of provincial towns like Plymouth.

#### Plymouth's Irish Community

The contribution of Irish immigrants to the building of Britain's infrastructure has become a commonplace of history and in Plymouth the labourers who recorded, for example, County Cork or County Kildare as their place of birth in the census almost certainly found work on the great civil engineering projects of the day. An almost unbroken series of developments created a constant demand for labour: the building of the Breakwater across Plymouth Sound, the development of Millbay Docks and the construction of the South Devon Railway not only profoundly changed the face of the town, but also attracted migrant workers in their hundreds. Other, more modest building activities also flourished as much-needed housing was erected on the periphery of the town, new roads were installed, new sewers laid and civic buildings were extended and developed (15).

Although the 2,216 Irish people in Plymouth only represented 3.5% of the town's 1851 population, they were a highly segregated group. Figure 4 shows that the bulk of the Irish were concentrated in just two census enumeration districts. Their homes in places like Victory Court were amongst the least salubrious in Plymouth and, as a group, the Irish were more overcrowded than any other. Moreover, the manuscript census returns recorded a disproportionately large number of Irish households headed by a widow – perhaps reflecting the short life-span of manual labourers in Victorian times. Certainly, Plymouth's Irish quarter was dealt repeated heavy blows by epidemic disease in the 1840s and early 1850s (16). One blackspot in the cholera epidemic of 1849 was Quarry Court. Two years later the census enumerators found 16 separate households comprising 95 individuals crowded into only six houses. But this was by no means the worst example. In Stonehouse Lane there was a single house containing 9 families totalling 65 people, of whom some 49 were Irish born.



The shading refers to the percentages in each Enumeration District born in the places identified on the map.

Figure 4 – The residential distribution of migrant groups in Plymouth, 1851.

But an excess of females over males was not only a feature of the Cornish-born residents of Plymouth in 1851. In keeping with ports in general, all groups in the town tended to contain more women than men (20). The wives and families of men serving onboard ships of the Royal and Merchant Navy account for much of this imbalance, but the census also reveals an unusually large number of single,



### Other Groups of Migrants

While no other group matched the Irish in their residential segregation, an analysis of the distribution of migrants from Cornwall, and from origins including other ports and 'seaboard counties' (17) did reveal important variations. (Figure 4). The map showing the pattern of Cornish-born residents in Plymouth indicates relatively large concentrations in enumeration districts of high social status. The census evidence clearly shows that the prosperous, well-to-do people of Plymouth – defined by measures such as 'servant-owning', occupation, and the rateable value of their housing (18) – tended to cluster in particular areas of the town. Since there were almost twice as many female migrants from Cornwall as there were male, the vast majority of these women being aged between 20-35 years, their residential pattern in Plymouth almost certainly reflects their occupations. Table 2 shows that of those Cornish migrants stating a occupation in the census, 28.7% were employed in domestic service. It appears therefore that Cornish girls came to Plymouth to find work as servants in the middle-class homes of the town and many would have secured their posts through the network of servants' registries which were well-established by the middle of the century. (19)

Table 2 – Occupational Classification of Plymouth's Migrants, 1851

Birthplace:	Occupation Group:						Total Sample n = 2,292
	1	2	3	4	5	6	
Devon	121 7.0%	309 17.9%	176 10.2%	31 1.8%	934 54.2%	152 8.8%	1723 (100%)
Cornwall	26 7.5%	100 28.7%	23 8.0%	11 3.2%	149 42.8%	34 9.8%	348 (100%)
'Seaboard Counties'	30 21.0%	17 11.9%	30 21.0%	—	53 37.1%	13 9.0%	143 (100%)
Ireland	14 17.9%	15 19.2%	2 2.6%	—	17 21.8%	30 38.5%	78 (100%)

#### Key:

1. Professions, Army and Navy, Government Service.
2. Domestic Service.
3. Commerce and Transport.
4. Agriculture.
5. Industry and Manufacturing.
6. General Labourers.

Based on the Census Classification of Occupations.

Source: 10% sample from 1851 Census.

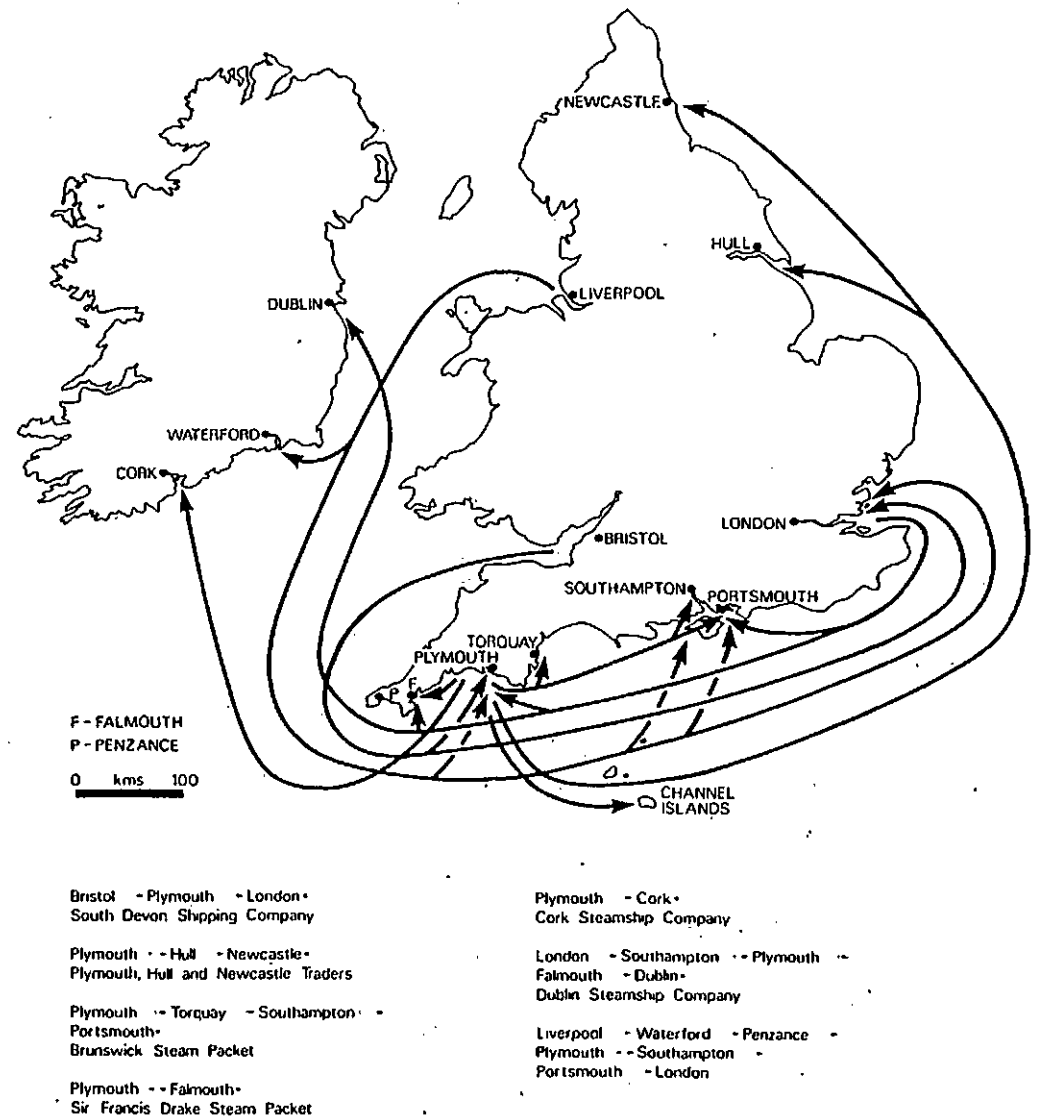


Figure 1 -- Coastal links between Plymouth and other ports. Compiled from the 1856 Post Office Directory.

8

Migrants as a rate per thousand of the sending parish population

- Over 20 per thousand
- 10.1-20 per thousand
- 5.1-10 per thousand
- 0.1-5 per thousand
- Parishes sending fewer than 5 people
- None

0 kms 20

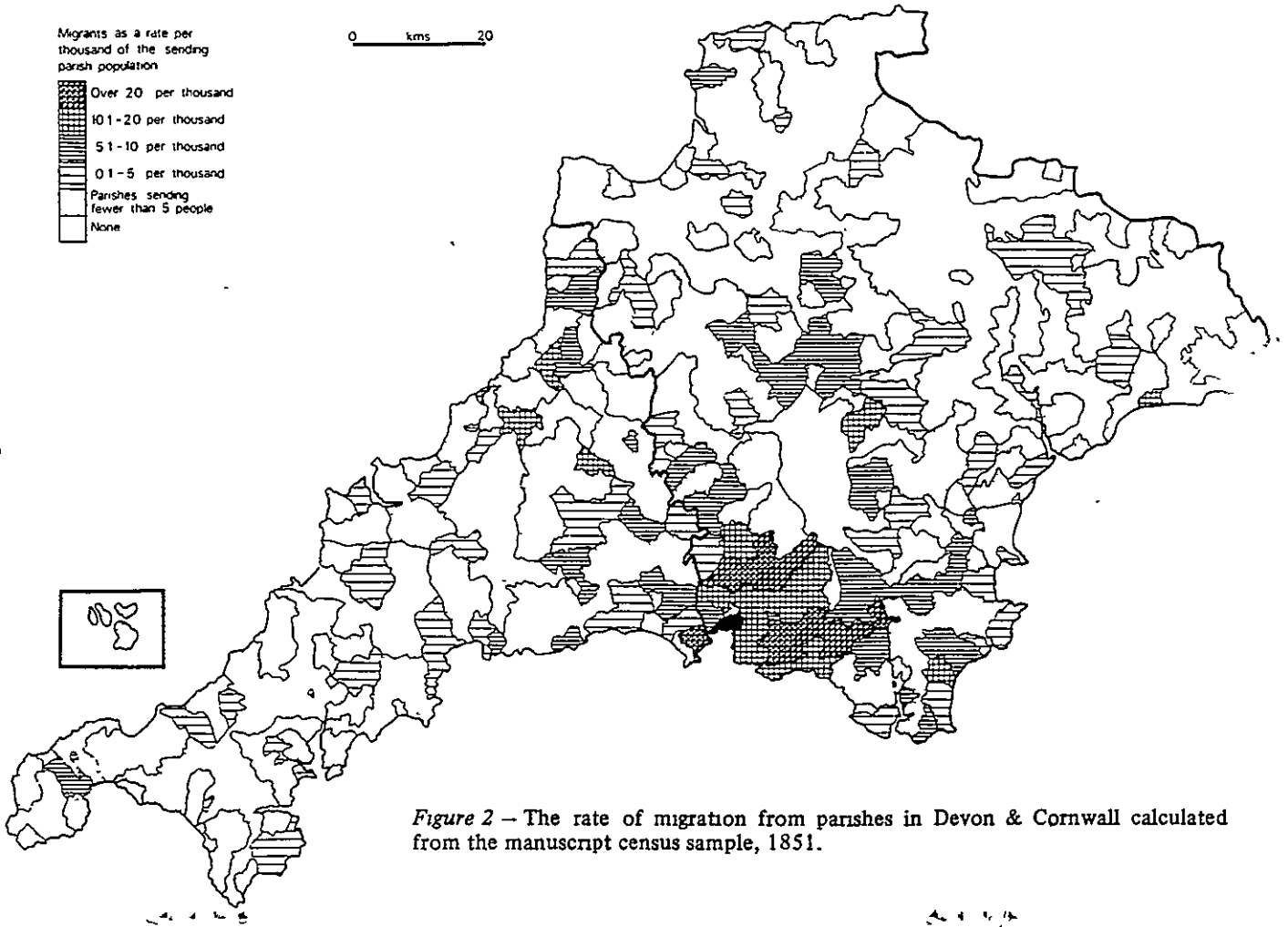
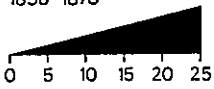


Figure 2 - The rate of migration from parishes in Devon & Cornwall calculated from the manuscript census sample, 1851.

6

Mean number of weekly services 1856-1878



0 kms 25

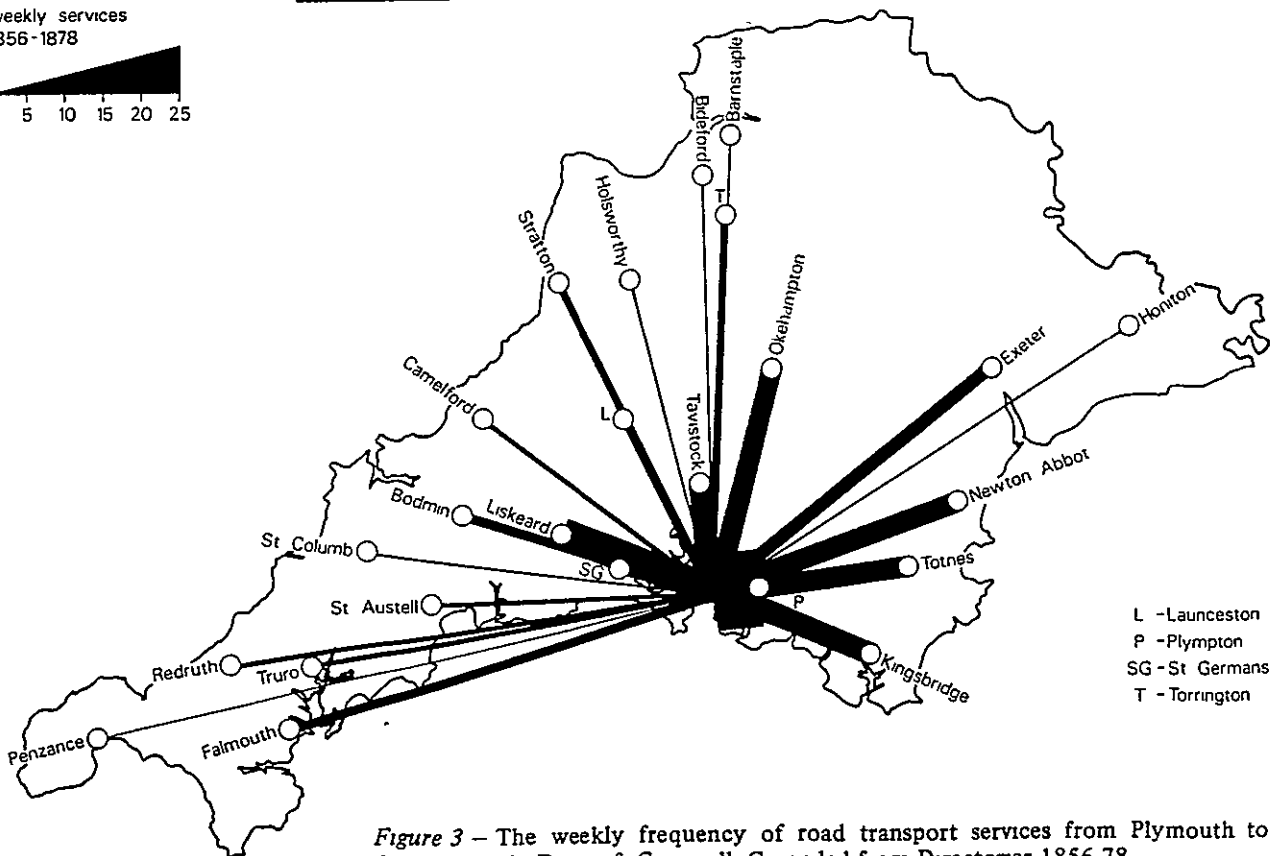


Figure 3 - The weekly frequency of road transport services from Plymouth to destinations in Devon & Cornwall. Compiled from Directories 1856-78

# LOCAL POLITICS AND PUBLIC HEALTH IN MID-NINETEENTH-CENTURY PLYMOUTH

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by

MARK BRAYSHAY AND VIVIEN F. T. POINTON\*

## INTRODUCTION

IN the mid-nineteenth century, Plymouth ranked as one of Britain's most unhealthy towns.<sup>1</sup> Overcrowding was as bad as that encountered in all but the most pernicious blackspots of London, Liverpool, or Manchester.<sup>2</sup> Between 1841 and 1850, the rate of mortality had averaged twenty-five per thousand, a figure as high as the worst of the nation's industrial cities<sup>3</sup> (Table I). Rapid population growth was an experience that Plymouth shared with a great many other English towns in the early years of Queen Victoria's reign.<sup>4</sup> So too was the failure of the outmoded urban administrative bodies to cope with the new kinds of problems created by this unprecedented growth.

Public health issues and agitation for local political reform inevitably became interlinked in provincial towns.<sup>5</sup> Plymouth was no exception. As the old ruling élite tried to protect their threatened monopoly of local civic institutions, a tide of criticism about their handling of public health matters provided an ideal outlet for the increased political awareness of Plymouth's new breed of activists.<sup>6</sup> Derek Fraser has argued that the mid-nineteenth-century political activist "pitched his tent in whatever battlefield was open to him".<sup>7</sup> For six momentous years, public health was Plymouth's

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Abbreviations: Parliamentary Papers (PP); Public Record Office (PRO); Devon Record Office (DRO); General Board of Health (GBH).

<sup>1</sup> Modern Plymouth comprises the three formerly separate towns of Plymouth, East Stonehouse and Devonport (or Plymouth Dock). In the nineteenth century Plymouth and East Stonehouse had already coalesced but Devonport was still separate, both physically and administratively (see map). In this article the name Plymouth refers to Plymouth and East Stonehouse, but not to Devonport.

<sup>2</sup> W. J. Odgers, *A report on the sanitary conditions of Plymouth*, 1847, p. 29.

<sup>3</sup> R. Rawlinson, *Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage and supply of water, and the sanitary condition of the inhabitants of the Borough of Plymouth*, Plymouth, 1852, p. 6.

<sup>4</sup> For a general study of urban growth see B. T. Robson, *Urban growth: an approach*, London, Methuen, 1973, pp. 45-90.

<sup>5</sup> See D. Fraser, *Urban politics in Victorian England*, Leicester University Press, 1976, ch. 7; E. Gaudie, *Cruel habitations: a history of working-class housing 1780-1918*, London, Allen & Unwin, 1974, ch. 11.

<sup>6</sup> C. E. Welch, 'Municipal reform in Plymouth', *Reports and Transactions of the Devonshire Association for the Advancement of Science*, 1964, 96: 318-338. Local politics in Plymouth depended on personalities and local events rather than on national politics. The labels "Whig" or "Tory" are too sharp to be appropriate in Plymouth.

<sup>7</sup> Fraser, *op. cit.*, note 5 above, p. 9.

### *The Peckham Health Centre*

that they were concerned with medical services rather than with health services. Commenting specifically on the White Paper's proposals regarding the establishment of health centres, the reviewer wrote

A real Health Service must surely concern itself first with the way people live, with town and country planning, houses and open spaces, with diet, with playgrounds, gymnasia, baths and halls for active recreation, with workshops, kitchens, gardens and camps, with the education of every child in the care and use of his body, with employment and the restoration to the people of the right and opportunity to do satisfying creative work. The true 'health centre' can only be a place where the art of healthy living is taught and practised: it is a most ominous and lamentable misuse of words to apply the name of what is and should be called a 'medical centre'.<sup>39</sup>

A similar theme was taken up in a 'Target for Tomorrow' pamphlet on health published in 1944, which concluded with a call for a "planned campaign for social and positive health" and "health overhauls" for the whole population.<sup>40</sup>

In the end, it was Williamson and Pearse's inability to compromise that proved their undoing. In the case of the Peckham Health Centre, new trends in social medicine and epidemiology were dismissed because their primary concern was with ways of measuring disease rather than with what they saw as the more fundamental issue of what it was that should be measured, in Williamson's words "the proof of the pudding is in the eating, not in the statistics of the pudding".<sup>41</sup> Williamson and Pearse's refusal to change their research methods made it impossible for the Peckham Centre to obtain grants from the major charitable trusts. Similarly, Williamson's belief in the need for payment of weekly subscriptions made it impossible for the Centre to be absorbed into the NHS. Thus in 1950, the near-bankrupt Centre was sold to the LCC, which continued to operate its recreational facilities under the auspices of an evening educational institute. It is perhaps a final irony that in 1958 the medical direction of the Centre was finally resolved with the opening of a new GP diagnostic centre with x-ray and laboratory facilities and physiotherapy unit in the St Mary's Road building.

#### ACKNOWLEDGEMENTS

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<sup>39</sup> 'White Paper reviewed VI By an urban practitioner', *Lancet*, 1944, i 443

<sup>40</sup> J M Mackintosh, *The nation's health*, 'Target for Tomorrow' series, No 5, London, Pilot Press, 1944, pp 11-28, 56, 64

<sup>41</sup> Halley Stewart Trust Archives, correspondence, Williamson to P Winfrey, 21 January 1951

### *Local politics and public health in mid-nineteenth-century Plymouth*

local political battlefield and when, in 1854, the fighting was ended, a new regime gained control, more accountable and considerably more sensitive than the body which had been swept away.

While it could be argued that local public health issues might have been sufficient in themselves to precipitate the kind of political change achieved in Plymouth and elsewhere in the mid-nineteenth century, there can be little doubt that the influence and work of Edwin Chadwick provided a vital national context within which local squabbles were resolved.<sup>8</sup> It was Edwin Chadwick who, after years of work devising a new Poor Law, turned his attention to the question of public health. With the same energy and singlemindedness he had shown in exposing the weakness of the old Poor Law system, Chadwick assembled a battery of evidence about health and living conditions in Britain, which not only shocked, but also outraged the nation. The publication in 1842 of his *Report on the sanitary condition of the labouring population* was one of the most influential and far-reaching Blue Books of the whole Victorian era.<sup>9</sup> Ultimately, Chadwick's efforts led to the Public Health Act of 1848 which, though it fell well short of the compulsory new public health administration he had campaigned for, nonetheless gave local pressure groups a new weapon with which to fight their own separate battles for reform. In Plymouth, the Act prompted one of the most acrimonious political arguments in the long history of the town.

TABLE I POPULATION AND MORTALITY IN PLYMOUTH, 1841-50

<i>Year</i>	<i>Population*</i>	<i>Deaths</i>	<i>Death Rate (per thousand)</i>
1841	38,110	829	21.75
1842	39,693	1,107	27.89
1843	41,277	887	21.49
1844	42,860	1,022	23.85
1845	44,430	749	16.86
1846	46,026	1,030	22.38
1847	47,609	1,148	24.11
1848	49,193	1,268	25.78
1849	50,776	1,876	36.95
1850	52,359	1,363	26.03
Total	452,333	11,279	24.94

*Note*

In the seven years before the cholera epidemic of 1849, Plymouth's mortality rate averaged 23 per thousand. Thus, even without the impact of cholera mortality on the death rate there were sufficient grounds for a General Board of Health Inquiry.

\*These are Registrar General Estimates at 31 December.

*Sources: Rawlinson Report, 1853; Plymouth and Devonport Weekly Journal, 29 January 1852; Odgers Report, 1847.*

The principal objective of the 1848 Public Health Act was the establishment of a

<sup>8</sup> Gauldie, *op. cit.*, note 5 above, p. 131-141.

<sup>9</sup> D. Fraser, *Power and authority in the Victorian city*, Oxford, Blackwell, 1979. Edwin Chadwick, *Report on the sanitary condition of the labouring population of Great Britain* (1842), edited by M. W. Flinn, Edinburgh University Press, 1965.

General Board of Health appointed to encourage and co-ordinate a network of new, local boards which, it was hoped, would soon be formed in all the towns in the country. These Local Boards of Health were to assume responsibility for ensuring adequate and efficient water supply, sewage, and refuse disposal systems, and, through the appointment of local medical officers, to oversee all matters related to public health. The fundamental flaw in the legislation was that it was not made compulsory.<sup>10</sup>

The wrangle in Plymouth over whether to adopt the terms of the 1848 Act was not unique. It was matched by similar disputes elsewhere. In their first major report early in 1854, the General Board of Health were able to name only 284 towns that had formally requested the application of the Act, and a mere 182 had completed the necessary legal process by December 1853.<sup>11</sup> While the number of new requests was said to be increasing, many of the towns making an application to the Board either already possessed a relatively good public health record, or they were very small in population and were unlikely to be able to afford the measures necessary for improvement. In large towns the situation was rather different. Although some like York, Southampton, Dover, and Coventry had very readily adopted the Act, others became notorious for their stubborn resistance.<sup>12</sup> Birmingham, Newcastle, and Hull, for example, all used a ploy that became fairly common practice in the 1850s wherever vested interests stood to forfeit either political power or control of civic finances should Chadwick's arrangements be applied in their borough. The tactic employed was to frustrate the introduction of a new board of health in the town by substituting, or perhaps merely revising, an existing local act of Parliament which legislated on matters such as urban water supply, drainage, and refuse removal.<sup>13</sup> These local acts were rarely sufficiently comprehensive to cope with the mounting sanitary deficiencies of Britain's growing towns and, moreover, they were often excessively costly to local ratepayers. But they were a way of preserving local political power in the hands of those accustomed to wielding it and they eliminated any prospect of interference by the General Board of Health in local matters.

The anti-Public Health Act lobby in Plymouth tried to promote two local bills in order to circumvent the need to adopt Chadwick's controversial new measures. One was yet another revision of the town's "Improvement" Act, while the other was a specific attempt to remedy the woefully inadequate local water supply arrangements.<sup>14</sup> Indeed, a relentless and hostile campaign against the 1848 Public Health Act was waged for almost six years, during which time the appalling conditions in Plymouth steadily deteriorated.<sup>15</sup>

Local politics in provincial towns were everywhere in the melting-pot in mid-Victorian times, and a number of notable case studies have already been published by

<sup>10</sup> Public Health Act 1848, 11 & 12 Vict. Cap. 63

<sup>11</sup> PP (1854), vol. XXXV, *Report of the General Board of Health, 1848-54*, pp. 42-43

<sup>12</sup> *Ibid.*, p. 43

<sup>13</sup> *Ibid.*, p. 44. See also J. Smith, *Report to the General Board of Health on a preliminary enquiry into the sewerage, drainage, and supply of water, and the sanitary condition of the inhabitants of the town and borough of Kingston upon Hull, 1850*

<sup>14</sup> PRO, MH 13/144 fo. 960/53, Stevens to Commissioners, 25 March 1853

<sup>15</sup> See for example PRO, MH 13/144 fo. 1189/53, Cookworthy to Commissioners, 15 April 1853, fo. 1579/53, Martin to General Board of Health, 23 May 1853, fo. 8/54, 'Deaths from Cholera' November and December 1853

### *Local politics and public health in mid-nineteenth-century Plymouth*

other writers.<sup>16</sup> But very little attention has so far been paid to Plymouth, and the aim of this paper, therefore, is to examine public health reform and its links with local political change in this West Devon town with problems as severe as the more notorious cities of industrial Britain.

#### THE GROWTH OF PLYMOUTH

The key to Plymouth's health problems lay in its mushrooming population growth, which leapt from only 16,040 in 1801 to more than 52,000 by 1851 (Table II). Moreover, between 1841 and 1851 the town grew by the addition of over 1,600 people a year. This reflected large-scale migration into Plymouth from West Devon and Cornwall due not only to the lure of the apparent opportunities afforded by the town, but also to the low agricultural wages then prevalent in the South West and the closure of tin and copper mines which drove people from the surrounding districts.<sup>17</sup>

Unfortunately this massive influx of people was not matched by the building of new houses, and serious overcrowding resulted. Large houses vacated by the middle classes in the old commercial core of Plymouth were subdivided and multi-occupied by the working classes to an extent where conditions became a scandal. Claremont Street, for example, housed 614 people in only sixty dwellings. New Street, near the Barbican, contained twenty-three houses and 598 people – an average of twenty-six to each dwelling. In three cases a staggering sixty-six, seventy-five, and ninety-one persons were found sharing a house. Other blackspots included Basket Street, where there were more than twenty people per house; Stillman Street with thirteen, and Lower Street with fifteen. Indeed, in one court off Lower Street there were 171 people in six houses, none of which was drained, and all shared a single stand-pipe for their supply of water.<sup>18</sup>

TABLE II. POPULATION GROWTH IN PLYMOUTH 1801–1901

	<i>Population</i>	<i>% Change</i>
1801	16,040	
1811	20,803	29.7
1821	21,591	3.8
1831	31,080	43.9
1841	36,520	17.5
1851	52,221	43.0
1861	62,599	19.9
1871	68,833	10.0
1881	73,863	7.3
1891*	84,253	14.1
1901	107,636	21.0

Sources: Census Reports 1801–1901.

\*There were boundary changes between the 1881 and 1891 censuses.

<sup>16</sup> For example, B. D. White, *A history of the Corporation of Liverpool*, Liverpool, 1951; J. Toft, 'Public health in Leeds in the nineteenth century', MA thesis, University of Manchester, 1966; C. Gill, *History of Birmingham*, Oxford University Press, 1952; D. Large, and F. Round, *Public health in mid-Victorian Bristol*, Bristol, Bristol Branch of the Historical Association, 1974.

<sup>17</sup> See J. Gerrard, *Book of Plymouth*, Plymouth, 1982.

<sup>18</sup> Odgers, op. cit., note 2 above, p. 14.

Part of the problem was an acute shortage of suitable building land. The expansion of Plymouth was impeded by several large private estates that encircled the town. Land was only slowly released to speculative builders and often on unfavourable leasehold terms that encouraged the erection of only the cheapest and most inferior types of dwelling.<sup>19</sup> Some sites in the town were simply too steep to be used for house-building, others were too marshy. And in a town where casual dock labour was a key form of employment, working men were often reluctant to live too far from the wharfingers' pitches and thereby risk losing the chance of being hired.

As a growing port, nineteenth-century Plymouth acquired a cosmopolitan population that set it apart from the rest of Devon and Cornwall. As the depot for colonial emigration sponsored by the government, Plymouth hosted large groups of Irish en route to Australia, Canada, and elsewhere.<sup>20</sup> Steamers provided regular contact with both Belfast and Cork and by 1851 a permanent Irish community was well established in one of the least salubrious parts of Plymouth.<sup>21</sup> Imports including chemicals, timber, grain, and hides supported local industries like candle-, soap- and starch-making, furniture- and boat-building, biscuit-baking, brewing, distilling, and tanning. Plymouth also served as a major livestock market for a large tract of Devon and Cornwall. Thus huge numbers of "Devon Ruby" cattle were driven through the streets into the heart of the town, where the slaughterhouses and butchers were kept busy. Indeed, cowkeeping was common throughout Plymouth in the nineteenth century,<sup>22</sup> and, while the practice ensured a supply of fresh dairy produce, the effect of keeping farm animals in domestic premises lining narrow, undrained streets can have done little to improve the health record of the town.

#### PLYMOUTH'S IMPROVEMENT COMMISSIONERS

In April 1824, a local Act of Parliament dating back to 1770 had been amended for the third time "for better paving, lighting, cleansing, watching and improving the town and borough of Plymouth in the county of Devon, and for regulating the Police thereof, and for removing and preventing nuisances and annoyances therein"<sup>23</sup> The amendments comprised clauses that established a freshly mandated commission empowered to order the building of public drains, the construction and cleansing of private drains, and the watering and cleansing of streets in the town. On the face of it, Plymouth ought to have been a clean and healthy borough. There were, however, a number of operational difficulties. First, the Commissioners had no power to insist on the installation of adequate drainage for new development.<sup>24</sup> Ironically, therefore, most of the ill-drained and thus unhealthy areas of the town were on the periphery where new housing was being erected at break-neck speed as soon as land became available.<sup>25</sup> Second, the establishment of Plymouth Town Council under the terms of

<sup>19</sup> C Gill, *Plymouth a new history*, Newton Abbot, David & Charles, 1979, vol 2, p 146-148

<sup>20</sup> M Brayshay, 'Government-assisted emigration from Plymouth in the nineteenth century', *Reports and Transactions of the Devonshire Association for the Advancement of Science*, 1980, 112 185-213

<sup>21</sup> Gill, *op cit*, note 19 above, p 149

<sup>22</sup> Kelly's Directory of 1856 reveals that there were more than sixty cowkeepers in Plymouth

<sup>23</sup> PRO, MH 13/144 fo 8003/49, Corporation of Guardians of the Poor of Plymouth to Alexander Bain, Assistant Secretary to GBH, 25 October 1849

<sup>24</sup> PRO, MH 13/144 fo 3923/53, Plymouth Improvement Commissioners to GBH, 7 April 1853

<sup>25</sup> Odgers, *op cit*, note 2 above, p 16



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the Municipal Corporations Act of 1835 had led to divided jurisdiction.<sup>26</sup> For, although the Act had allowed for local improvement commissioners to surrender their powers to the new councils after 1835, in Plymouth this had not happened. Thus while the town's water supply was controlled by the Council, other "improvement" matters remained the concern of the Commissioners.<sup>27</sup> A third problem in Plymouth was that by the 1850s most of the Town Council and the Commission were effectively self-elected for life. Though this charge was vehemently denied by both authorities when it was exposed in a government report in 1853, the facts were plain.<sup>28</sup> A certain number of town councillors were automatic members of the Commission, and they simply co-opted their friends to complete the number. Thus, the persons presiding in the town's most powerful administrative bodies could easily ensure their re-election or reappointment to office, and the faces were said "hardly ever to change".<sup>29</sup>

Although there may have been some mismanagement of funds, there is little documentary evidence to suggest any corruption. Local newspapers contained oblique accusations that suggested that some commissioners blocked attempts to require houseowners to improve badly drained, insanitary properties in the worst parts of town because as landlords themselves of these multi-occupied slums, such action would have inflicted a new, unwelcome expense upon their own purses.<sup>30</sup> Certainly, many commissioners were practising solicitors. And solicitors in Victorian times often managed their clients' funds by investing in property. However, it is hard to be sure about the motives of individual commissioners and the real difficulty seems to have been one of approach and not bad intention. Thus, instead of ensuring that all new houses were properly serviced when they were erected, the Commission installed sanitation here and there when the local outcry about conditions became loudest, and at considerable cost to the ratepayers.<sup>31</sup> While none of the new local boards of health in England levied a rate of more than 6d (2½p) in the pound in 1853, the Commission in Plymouth already expected one shilling (5p) and hoped for 1s 3d (7p).<sup>32</sup> Moreover, they had borrowed heavily on the security of the rates. Together the Corporation and the Improvement Commission in Plymouth owed £67,518 by 1852. But the town had precious little to show for it.

Neither local authority was prepared to concede the need for any major reform in the way the town's affairs were run, however, and they simply viewed it as a matter of extending the powers they already possessed. But local pressure for more radical change was nevertheless mounting, and one of the key factors was the report published by the Rev. W. J. Odgers.<sup>33</sup>

#### THE ODGERS REPORT

One immediate effect of the publication in 1842 of Chadwick's report on the

<sup>26</sup> PRO, MH 13/144 fo. 3923/53, Rawlinson to GBH, 21 October 1853.

<sup>27</sup> *Ibid.*

<sup>28</sup> PRO, MH 13/144 fo. 1170/53, Whiteford to GBH, 14 April 1853.

<sup>29</sup> PRO, MH 13/144 fo. 1579/53, Martin to GBH, 27 May 1853.

<sup>30</sup> *Plymouth and Devonport Weekly Journal*, 15 November 1849, p. 2.

<sup>31</sup> See *ibid.*, 25 October 1849, 16 August 1849, 17 May 1849.

<sup>32</sup> PRO, MH 13/144 fo. 4467/53, Rawlinson to GBH, 21 October 1853.

<sup>33</sup> Odgers, *op. cit.*, note 2 above.

sanitary conditions of the labouring population was to give a boost to the recently formed Health of Towns Association<sup>34</sup> Branches were soon formed in provincial towns and, following the example set by Liverpool a year earlier, Plymouth's leading Liberal town councillor, George Soltau, called a public meeting at the Mechanics' Institute in 1846 to discuss the subject of public health. The most important outcome was the foundation of the Plymouth branch of the Health of Towns Association, which launched the *Plymouth Health of Towns Advocate* as a periodical on the model of similar publications produced with success elsewhere. Although the *Plymouth Advocate* flopped, it did provide the stimulus for one of the most comprehensive public health investigations to be carried out anywhere in Britain. This took the form of a detailed two-year survey co-ordinated by the Rev. W. J. Odgers (Secretary of the new association), who published his findings on the 'Sanitary Condition of Plymouth' in November 1847. Odgers's survey team was supported by voluntary contributions in its study of drainage, refuse removal, water supply, ventilation, the "physical and moral evils from want of sanitary regulation", and the economic costs and benefits of sanitary improvement<sup>35</sup>.

As a Unitarian Minister the Rev. Odgers was daily in contact with Plymouth's slum-dwellers. Although it is hard to piece together a reliable picture of this tireless local campaigner, there can be little doubt of his influence. He seems to have modelled himself upon the famous Dr William H. Duncan, who did so much to draw attention to public health issues in Liverpool, and while Odgers was not a medical man himself, his studies of health matters were no less meticulous<sup>36</sup>. Odgers was equally at home in championing the rights of Plymouth's sizeable Jewish community, visiting the sick and dying in areas of the town where few middle-class people would have ventured, and in addressing the Plymouth Athenaeum or Mechanics' Institute on the subject of the works of Charles Dickens.<sup>37</sup> He was, therefore, both an intellectual and a radical – and he was singularly successful in making the civic establishment extremely uncomfortable. Nevertheless, he was lampooned and derided in a steady flow of anonymous letters published in the local press between 1846 and 1852. Odgers invariably responded with clever, often withering counter-argument<sup>38</sup>.

While the only immediate result of his efforts was the opening of public wash-houses in Hoegate Street in 1850, and despite the press criticism of his report by opponents of public health reform in Plymouth, Odgers's survey was crucial in throwing open the debate in the town.<sup>39</sup> Chadwick's national survey was perhaps too global, too far removed from local circumstances to stir many ordinary Plymouthians, but the news that their own town was more overcrowded and unhealthy than Liverpool, Manchester, or Nottingham brought a flood of indignation, shock, and outrage.

Odgers's report recognized the special drainage problems posed by Plymouth's

<sup>34</sup> *Ibid.*, p. iv

<sup>35</sup> *Ibid.*, p. v

<sup>36</sup> W. M. Frazer, *Duncan of Liverpool*, London, Hamish Hamilton Medical Books, 1947.

<sup>37</sup> *Plymouth and Devonport Weekly Journal*, 1 January 1849, 15 March 1849, 28 December 1848.

<sup>38</sup> *Ibid.*, 7 December 1848, 25 January 1849.

<sup>39</sup> See, for example PRO, MH 13/144 fo 897/53, fo 5249/52, and fo 960/53.

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coastal site. Large areas were marshy and some streets were actually below sea level at high tides. Thus, basements in Lockyer Street were often flooded with stagnant water from nearby marshes, and in Bath Street some houses were below water level. Union Street and the Octagon – constructed on land reclaimed from the sea to link Plymouth with the neighbouring town of Stonehouse – lay below sea level at higher tides, and the cellars of houses that lined this route were gradually filled with water.<sup>40</sup> Street drains, where they existed, were often inadequate, in fact only 1,763 houses in the town (out of a total of 4,930) were linked to any kind of drainage system. Moreover, there were more than 2,200 houses with neither a privy nor a water closet. “For want of privies, the people use a tub, which is kept in the house and even in the room where a family of 10 or 12 persons eat, cook and sleep, which is often kept unemptied for days together.”<sup>41</sup> Indeed, it had become the practice in Plymouth, particularly in the area of the docks, to allow “night soil” to accumulate in heaps until there was a sufficient load to sell as manure to the farms of the Tamar Valley. Odgers declared that many Plymouthians were “living on vast dung heaps”.<sup>42</sup>

Much was made at the time of the injurious effects of the noxious gases and vapours given out by decaying refuse. It was a common belief that the miasma, or foul air, itself could spontaneously cause disease. In fact, the accumulations of filth contaminated the town’s water supply to the point where dysentery and diarrhoea became endemic. Odgers’s surveyors had noted that the subsoil and foundations beneath houses had often become “perfectly saturated” from nearby cesspools.<sup>43</sup> Living conditions like these must have weakened the population and left them prey to a range of acute infectious diseases as well as chronic wasting diseases like tuberculosis (Table III).

During the 1840s Plymouth experienced serious outbreaks of scarlet fever and smallpox. Whooping-cough regularly claimed the lives of a number of its young victims, and diseases like dysentery and diarrhoea were endemic. Each year, there were between twenty and thirty deaths due to diseases of the bowel; mostly very young or elderly people, but these figures mask the much larger number of sufferers who were weakened by these illnesses, but did not die. As Table III shows, only in 1846 was Plymouth relatively free from some acute infectious disease, and chronic illnesses like tuberculosis took a steady, year by year, toll. But when cholera struck in 1849, the rate of mortality reached a new peak, caused genuine terror and added fresh, significant impetus to the local public health campaign.

#### CHOLERA, 1849

In the earlier cholera epidemic in 1832, there were 1,031 recorded deaths in the three towns of Plymouth, Stonehouse, and Devonport.<sup>44</sup> Some 779 victims of the

<sup>40</sup> Odgers, *op. cit.*, note 2 above, p. 14.

<sup>41</sup> *Ibid.*, p. 19.

<sup>42</sup> *Ibid.*, p. 21.

<sup>43</sup> *Ibid.*, p. 20.

<sup>44</sup> See Gill, *op. cit.*, note 19 above, p. 149. The basis of diagnosis altered between 1832 and 1848. G. R. Larks, ‘Plymouth Medical Society in the nineteenth century’, unpubl. address to Plymouth Medical Society 23 January 1968, MS. Plymouth Local History Library Collection. In 1832, cholera was confined to the Sutton Pool area of Plymouth.

TABLE III MORTALITY DUE TO INFECTIOUS DISEASES, 1841-50

Year	ZYMOTIC DISEASES							OTHER CAUSES			Totals
	Smallpox	Scarlet fever	Croup	Whooping-cough	German measles	Influenza	Diarrhoea and dysentery	Cholera	Respiratory diseases*	Others	
1841	47	72	5	10	1	—	11	2	238	443	829
1842	47	238	2	29	17	—	27	6	255	486	1,107
1843	63	6	4	26	18	1	27	5	247	490	887
1844	25	10	12	24	41	2	25	5	312	566	1,022
1845	9	2	5	17	15	1	25	—	216	459	749
1846	—	1	5	2	26	—	56	—	353	587	1,030
1847	18	—	1	65	36	40	52	2	318	616	1,148
1848	177	18	12	37	19	—	46	22	nd	937	1,268
1849	2	25	17	15	20	3	55	819	nd	920	1,876
1850	3	197	4	59	9	—	66	7	nd	1,018	1,363
Totals*	391	569	67	284	202	47	390	868	1,939	6,522	11,279
Average	39	57	7	28	20	5	39	87	277	652	1,128

\*Mostly Respiratory Tuberculosis  
nd = no data

The term "zymotic" was used to refer to acute infectious diseases

Sources: *Plymouth and Devonport Weekly Journal*, 19 October 1848, 15 January 1852, 29 January 1852, also PRO MH 13, Plymouth Public Dispensary data

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disease died in Plymouth. For a time, there was a fear that the whole population would be engulfed, but the outbreak was largely confined to the lower classes living in the old inner core of the town around Sutton Pool. By affecting only the poorest sections of the population, the political edge was knocked off the impact of the disease. Largely unaffected by the epidemic, the middle classes quickly forgot the threat.

In 1849, circumstances were different. This time cholera claimed 1,894 lives from amongst the people who contracted the disease in the three towns.<sup>45</sup> There were 3,360 cases and 819 deaths in Plymouth alone. Moreover, while most deaths occurred in the slum areas of the town, newer middle-class suburbs took their share. The Rev. Odgers must have derived a kind of grim satisfaction. The conditions he had exposed two years earlier had helped to produce exactly the disaster he had predicted.

At first, local newspapers had confidently assured their readers that although other towns were afflicted by cholera, Plymouth was likely to escape.<sup>46</sup> But in November 1848, there was a scare when a convict ship, the *Cadet*, bound for Hobart Town, put into Plymouth because one of the prisoners on board had contracted cholera. The victim was Margaret Farrell, aged twenty-four, who died within hours and was buried at sea out near the Eddystone Reef.<sup>47</sup> Public anxiety died down, only to be aroused again in June 1849 when the *American Eagle*, an emigrant ship from Portsmouth, bound for New York, anchored in the sound after six of her passengers had died of cholera during the channel voyage.<sup>48</sup> In all, there were almost fifty cases on board the *Eagle*, but no more fatalities. Plymouth's Port Admiral, Sir William Hall Gage, arranged for disposal of the bodies at sea and the transference of the remaining passengers to quarantine vessels which were anchored off the Hoe. But reports came in that cholera had broken out in the tiny fishing villages of Newton Ferrers and Noss Mayo, only eight miles from Plymouth and panic in the town increased.<sup>49</sup>

In the days and weeks which followed, Plymouth held its breath. For a time no new cases appeared. The local press carried endless quack remedies and appeals by townspeople to "clear up the burial grounds" or "remedy the evils of stagnant cess pools".<sup>50</sup> Early in July, however, it was becoming clear that the disease was taking hold (Table IV). It began to deal its fatal blows in the slum areas, but in the weeks that followed, few districts were safe. A grim peak was reached during the week of 11–18 September, when eighty-seven people died and more than 360 new cases of cholera/choleraic diarrhoea were diagnosed. Thereafter, the epidemic began to decline, but not before whole families had been wiped out (Figure 1).

At the height of the cholera scare, Plymouth's Improvement Commissioners established a temporary board of health, but by December 1849 there was already talk of disbanding it and returning to the status quo.<sup>51</sup> In any case, the local board had been largely ineffectual.

<sup>45</sup> *Plymouth and Devonport Weekly Journal*, 13 December 1849.

<sup>46</sup> *Ibid.*, 14 June 1849.

<sup>47</sup> *Ibid.*, 30 November 1848.

<sup>48</sup> *Ibid.*, 7 June 1849, p. 4.

<sup>49</sup> *Ibid.*, 26 July 1849, p. 5.

<sup>50</sup> *Ibid.*, 5 July 1849; 12 July 1849; 19 July 1849.

<sup>51</sup> *Ibid.*, 20 December 1849.

TABLE IV PEAK CHOLERA WEEKS IN PLYMOUTH JULY-OCTOBER 1849

	Cholera	Cholerae diarrhoea	Total	Deaths
4-11 July } 11-17 July }	nd	nd	364	81
17-24 July	58	168	226	47
24-31 July	31	109	140	24
31 July-7 August	75	164	239	29
7-14 August	155	176	331	81
14-21 August	132	200	332	72
21-28 August	122	165	287	62
28 August-4 September	94	183	277	45
4-11 September	118	205	323	63
11-18 September	210	150	360	87
18-25 September	89	106	195	60
25 September-2 October	36	107	143	25
13 weeks totals	1,120	1,733	3,217	676

nd = no data

Note

Between 5 June when cholera was introduced by the visiting ship *American Eagle* and Christmas 1849, there had been 819 deaths recorded in Plymouth

Sources *Plymouth and Devonport Weekly Journal*, 16 and 23 August 1849, 6, 13, 20, and 27 September 1849, 4 October 1849, Plymouth Public Dispensary data

Unable to make an impression on either the Plymouth Improvement Commission or the town's Corporation, many individual townspeople complained direct to the General Board of Health<sup>52</sup> Surviving letters all carry the same message Plymouth was fast disappearing under its own filth, and conditions were desperate In December, the Board received a memorial (petition) from the ratepayers of Plymouth. Signatures were collected by H C Martin, a retired army captain whose efforts almost certainly precipitated the subsequent actions of the General Board of Health But Captain Martin was attacked by the letter-writers in the Plymouth press.<sup>53</sup>

We hear a great deal about the forced application of this Act [Public Health Act] to our own Borough the Prime Mover is one Captain Martin - a recent *comer-in*, whose last abode it is said, and I can readily believe it from his goings-on here, he gave a vast deal of trouble to his neighbours and afterwards left them to settle the account, and to get out of their difficulties the best way they could  
11 October 1849

Many who were cajoled by Captain Martin and his tail to sign the memorial to the Central Board of Health now regret it They say they did not exactly understand the result consequent upon the presentation of this memorial There appears to be a storm gathering and the Captain may yet be considerably damaged for the prominent part he has taken at the bidding of a few arrant knaves It is a great misfortune for the poor old Captain that he should 'lend a willing ear' to the evil spirits that have led him on Now, he must take care upon the forthcoming enquiry, that he is not completely smashed to ATOMS!  
18 October 1849

While there is no mistaking the meaning of these comments, Captain Martin's peti-

<sup>52</sup> PRO, MH 13/144 fo 5249/52, Memorial from the ratepayers of Plymouth to the GBH December 1849

<sup>53</sup> *Plymouth and Devonport Weekly Journal*, 11 and 19 October 1849







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Cholera Cases in Plymouth July - October 1849

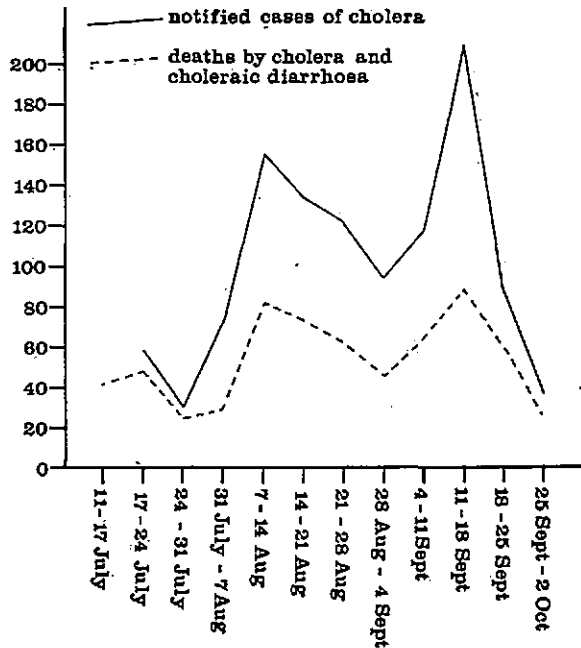


Figure 1.

tion had already been despatched and the wheels were in motion in London. Under the terms of the Public Health Act of 1848 a group of ratepayers equivalent to ten per cent of their total number could bypass the local authorities in their town and make their own direct appeal to the General Board of Health to have the 1848 Act applied to them. Moreover, in certain circumstances, the Board could insist that the Act was adopted.<sup>54</sup> Where the local level of mortality had averaged twenty-three per thousand over the previous seven years, the terms of the Act allowed for its immediate application to the locality in question. The ratepayers' memorial was therefore able to make its appeal by satisfying both conditions under which the Board could step in. Their reaction was immediately to appoint Robert Rawlinson as Superintendent Inspector of Plymouth with authority to investigate the sewerage, drainage, water supply, and sanitary condition of the town.<sup>55</sup> It was a bitter pill for the Improvement Commissioners to swallow; their Chairman, William Mortimer, opened a correspondence with the General Board and later with the Local Government Act office, which was to last until at least the late 1860s. His opposition was unflinching, and by January 1867 his letters were no longer even acknowledged. Each was viewed as just "another of Mr Mortimer's regular tirades against the Board".<sup>56</sup>

<sup>54</sup> Public Health Act 1848, 11 & 12 Vict. Cap. 63.

<sup>55</sup> See note 52. Reply to the Ratepayers of Plymouth.

<sup>56</sup> PRO, MH 13/145 fo. 276/67, Mortimer to the GBH; minuted to this effect by the Secretary.

THE RAWLINSON INQUIRY

Robert Rawlinson was employed by the General Board of Health in the wake of the cholera epidemic as a kind of roving inspector. It was his job to conduct detailed local inquiries into public health matters and to report back to the Board in London. Before coming to Plymouth in January 1852, Rawlinson presided over similar inquiries in Birmingham (1849) and Bradford (1851)<sup>57</sup> Thus his reputation arrived in the South West well ahead of him, and there is no doubt that the Board's Inspector was regarded with a certain awe and commanded considerable respect in Plymouth.

The inquiry opened on 15 January, all the important local figures assembled, including the Rev. Odgers, William Mortimer, and Captain Martin. Local interest was intense, as Rawlinson took evidence and made his pronouncements. Opponents of the Public Health Act tried hard to sustain their case. For instance, Plymouth's Superintendent Registrar, Mr Pridham, argued that Irish inhabitants and seamen who happened to die in Plymouth falsely inflated the town's average mortality rate. Rawlinson's response was magisterial, "Far from the presence of Irish and other unfortunates in Plymouth being an excuse for the town's appalling health record, this was just the very reason why an enquiry was necessary and why further powers must be obtained"<sup>58</sup>

Captain Martin, who had been vilified without mercy in the press, was praised by Rawlinson for his efforts in alerting the General Board of Health to Plymouth's problems. In response, Martin made the following harrowing comment "When the Cholera was very bad in Quarry Court, I went there with Mr Wright and Dr Budd and we found seven men dead in one room, while there were many others there, some ill and some well, and one of the latter was broiling a piece of pork"<sup>59</sup> The Rev. Odgers presented files of evidence and data to the Inspector, together with new information that amounted to a resurvey of streets examined in 1847, so that changes that had occurred in the intervening five years could be assessed. Most tellingly, Odgers was able to show that in so-called bad streets, not only were there more cases of cholera in 1849, but also a greater fatality rate from the disease.<sup>60</sup>

On 20 January Rawlinson went to inspect the slums of Plymouth for himself; what he found was apparently too grim to be reported in the press. He left Plymouth to prepare his controversial report, which he presented to the General Board of Health at the end of 1852.<sup>61</sup> It amounted to an uncompromising and comprehensive indictment of the inefficiency and incompetence of both the Plymouth Town Council and the Plymouth Improvement Commissioners. The divided jurisdiction exercised by these two public bodies was identified as a principal obstacle to reform. Furthermore, Rawlinson alleged that Plymouth's public health problems were attributable, in part, to the "vicious constitution of the body of Commissioners"<sup>62</sup> The challenge was clear, and neither local authority liked it. Their reaction was vehement and sustained.

<sup>57</sup> R. Rawlinson, *Report to the General Board of Health on the Borough of Birmingham*, 1849, PRO, MH 13/27 Rawlinson's Report on street improvements in Bradford, 3 February 1851

<sup>58</sup> *Plymouth and Devonport Weekly Journal*, 15 January 1852, p. 8

<sup>59</sup> *Ibid.*

<sup>60</sup> *Ibid.*, 22 January 1852, p. 2-3

<sup>61</sup> Rawlinson, *op. cit.*, note 3 above

<sup>62</sup> See also PRO, MH 13/144 fo. 1189/53, Cookworthy to the GBH, 15 April 1853

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By April 1853, the Improvement Commissioners had prepared their response to Rawlinson's report. A statement covering some eighteen pages was sent to the General Board of Health. They entirely refuted Rawlinson's findings.<sup>63</sup> But they were prepared to acknowledge that their own powers had been too limited and they announced their intention of promoting a Plymouth Improvement Bill and a Plymouth Waterworks Bill as a remedy. Soon afterwards, the objections of the Town Council to Rawlinson's report were received in London.<sup>64</sup> This time the emphasis was on the detailed figures and calculations contained in the report. Certainly the Council did seem to have uncovered some slight numerical discrepancies but the main thrust of the argument about Plymouth's woeful public health record remained unimpaired.

#### THE ADOPTION OF THE PUBLIC HEALTH ACT

Plymouth ratepayers had formed a committee by 1853, and its new chairman, ex-Town Councillor Thomas Stevens, began to press the Board again in a fresh attempt to obtain local adoption of the terms of the 1848 Public Health Act.<sup>65</sup> In March, a second petition was submitted, which indicated the scale of opposition to the two proposed local bills that had been designed to thwart those who wanted the Act applied. Some 5,400 townspeople recorded their opposition to the Waterworks Bill and the Improvement Bill, which were seen as window-dressing measures that would not mean any significant improvement in the sanitary condition of Plymouth.<sup>66</sup> A month later, the Ratepayers' Committee began collecting information on the experience of other towns that had adopted the 1848 Act. Reaction in Exeter, Rugby, Tottenham, Launceston, Leamington, Wolverhampton, Derby, Southampton, Wigan, Gateshead, Salisbury, and York indicated that Chadwick's arrangements would cost only around £100 in legal expenses, while Plymouth's local bills were certain to cost £3-£4,000.<sup>67</sup>

By now, the General Board had accepted the evidence and was convinced that the Public Health Act of 1848 should be applied in Plymouth: "The Board are painfully aware of the defective sanitary condition of Plymouth and earnestly hope that the inhabitants may before long be enabled to apply the provisions of the Public Health Act to remedy the serious sanitary evils from which they are suffering."<sup>68</sup> But although a draft provisional order for the application of the Act to Plymouth had been prepared by September 1852, its progress was halted when there was a fresh outbreak of cholera in the town. The number of victims did not approach the scale of the 1849 epidemic, but there can be little doubt that the connexion between the incidence of the disease and bad conditions was clear again. Most of the cases this time were confined to the Irish quarter in St Andrew's sub-district, but they were sufficient to prompt the Commissioners to re-establish their temporary, independent local board of health, to appoint an "Inspector of Nuisances" (to clear away some of the filth), and to "take

<sup>63</sup> PRO, MH 13/144 fo. 1082/53, Commissioners to the GBH, 7 April 1853.

<sup>64</sup> PRO, MH 13/144 fo. 1170/53, Whiteford to the GBH, 14 April 1853.

<sup>65</sup> PRO, MH 13/144 fo. 960/53, Stevens to the GBH, 25 March 1853.

<sup>66</sup> *Ibid.*

<sup>67</sup> PRO, MH 13/144 fo. 962/53, Stevens to the GBH, 4 April 1853.

<sup>68</sup> PRO, MH 13/144 fo. 1579/53, GBH to H. C. Martin, 27 May 1853.

active measures to counteract the progress of the disease".<sup>69</sup> One Plymouth resident complained to Lord Palmerston about the town's cemeteries. As in 1849, graves were being re-used and the putrefying remains of earlier interments were being exposed when cholera victims were buried. Palmerston speedily referred the matter to both the General Board of Health and to the Plymouth Town Council.<sup>70</sup> In a matter of days, the latter had responded with characteristically sharp words: "If Plymouth is in a deplorable sanitary condition let the General Board of Health answer for the results of its destructive interference with the efforts of the local authorities to effect improvement."<sup>71</sup>

But Palmerston's intervention may well have been decisive. When a new provisional draft order for the application of the 1848 Act to Plymouth was issued in February 1854, the town council gave it their approval. Even the opposition of the Plymouth Improvement Commissioners was muted. They reiterated their earlier objection to the allegation that the two local authorities were in conflict, but they also realized that the battle was now lost.<sup>72</sup> Parliament approved the incorporation of Plymouth under the terms of the Public Health Act in July 1854, and within weeks a permanent local board of health was being formed.<sup>73</sup>

#### AFTERMATH PLYMOUTH'S BOARD OF HEALTH

The antagonisms provoked during the long, bitter campaign over the Public Health Act in Plymouth took years to heal. In the short term, this made the work of the new local board of health more difficult. Even so, the scale of their efforts is still impressive.<sup>74</sup> Sewage disposal, paving streets with flagstones, and street-widening were amongst their early priorities.<sup>75</sup> Work on an entirely new sewerage scheme was begun, which eventually received the approval of the General Board in August 1855. Costs were to be met by mortgaging the rates, and construction work began the following year.<sup>76</sup> Under the terms of the Lands Clauses Consolidation Act of 1845, the Plymouth Board of Health framed a steady stream of provisional orders for the compulsory purchase of property to enable street improvements to be carried out.<sup>77</sup> Hundreds of houses were demolished. It is ironic that initially this made overcrowding even worse, but the development of suburbs to the north and north-west of the town gradually eased the problem.<sup>78</sup>

By the end of the decade, the local board was administering public baths and wash-houses recently purchased from the Ratepayers Committee and refurbished at a cost

<sup>69</sup> PRO, MH 13/144 fo 8/54, W Pridham to GBH, 2 January 1854

<sup>70</sup> PRO, MH 13/144 fo 3923/53, T J Buswarva to Lord Palmerston, minuted by Palmerston and referred to the GBH

<sup>71</sup> *Ibid.*, Bampton to the GBH, 8 October 1853

<sup>72</sup> PRO, MH 13/144 fo 1036/54, Eastlake to the GBH, 14 March 1854, also fo 1061/54, 16 March 1854

<sup>73</sup> PRO, MH 13/144 fo 3327/54, Public Health Act Incorporation of Plymouth, 31 July 1854

<sup>74</sup> See, for example, PRO, MH 13/144 fos 668/55, 719/55, 1890/55 and 3126/55

<sup>75</sup> PRO, MH 13/144 fo 5031/54, Eastlake to the GBH, 5 October 1854, fo 5283/54, Eastlake to the GBH 17 October 1854, fo 107/55, Eastlake to the GBH 9 January 1855

<sup>76</sup> PRO, MH 13/144 fo 3287/55, GBH to Eastlake, 22 August 1855, and fo 3339/55 Hodge to Eastlake, 25 August 1855

<sup>77</sup> PRO, MH 13/145 fo 1238/61, see also *Western Daily Mercury*, 19 November 1864

<sup>78</sup> PRO, MH 13/145 fo 1894/66, Plymouth Local Board of Health to the GBH, 30 June 1866

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of over £4,000.<sup>79</sup> Public parks were being cared for, including a new one formed on land once belonging to the Royal Ordnance on Plymouth Hoe. The wages of special Hoe policemen were included in the budget for the park.<sup>80</sup> The location of slaughterhouses in the town was also under review, along with the siting of a number of other offensive trades.<sup>81</sup> It had been recognized fairly quickly, however, that the powers of local boards were still somewhat limited – especially with regard to building standards. Plans for any new development had to be approved by the Board but, while it was possible to insist on changes in the position and size of drains, it was harder to force builders to alter proposed street alignments.<sup>82</sup> As early as 1855 an attempt was made to regulate the heights of buildings in Plymouth.<sup>83</sup> Several local developers objected, and the matter was referred to the General Board who ruled that, strictly speaking, the Act did not provide local boards with this particular power, although their reply suggests that Plymouth should at least make the attempt.<sup>84</sup>

Local documentation reveals the conscientious approach of the Plymouth Board of Health in such matters as nuisance removal (particularly the keeping of pigs in unsuitable premises) and street cleansing.<sup>85</sup> Regulations on minimum street widths were established whereby no new streets could be less than thirty feet, and no back lane less than fourteen feet wide.<sup>86</sup> Many applications were rejected because they failed to comply with these rules. A house-to-house survey of water supply arrangements was begun, and eventually resulted in a vastly improved service.<sup>87</sup> The board even undertook the complete rationalization of house numbering and street labelling in Plymouth.<sup>88</sup>

Robert Rawlinson had declared in his report that Plymouth's "natural climate – pronounced by physicians to be conducive to health – is by neglect allowed to become poisonous".<sup>89</sup> After so long a period of neglect, it is no surprise to find that remedies were slow to take effect, but steady improvement began to occur in 1854.<sup>90</sup>

### CONCLUSION

The accepted view of the 1848 Public Health Act is that it was more important for introducing the *concept* of public health in Britain rather than for any lasting practical effect.<sup>91</sup> At national level this seems a fair assessment, but it tends to ignore the impact

<sup>79</sup> PRO, MH 13/144 fo. 3126/55, Eastlake to Sir Benjamin Hale, 4 August 1855.

<sup>80</sup> PRO, MH 13/144 fo. 541/55, GBH to Eastlake, 9 February 1855.

<sup>81</sup> PRO, MH 13/145 fo. 267/61, Rev. A. H. Greaves to Home Secretary, 14 February 1861.

<sup>82</sup> See, for example: DRO P4/A1 Plymouth Local Board of Health, Minutes of Proceedings, 9 March 1855; 4 June 1855; 2 August 1855.

<sup>83</sup> PRO, MH 13/144 fo. 719/55, F. W. Pym to the GBH; fo. 720/55, GBH to Eastlake, 23 February 1855; fo. 805/55, Eastlake to the GBH, 27 February 1855.

<sup>84</sup> *Ibid.*, fo. 804/55, GBH to Eastlake, 28 February 1855.

<sup>85</sup> DRO P4/A1, Plymouth Local Board of Health, Minutes of Proceedings: Inspector of Nuisances, 12 April 1855.

<sup>86</sup> *Ibid.*, 4 June 1855.

<sup>87</sup> *Ibid.*, Sanitary Committee Proceedings, 31 January 1855.

<sup>88</sup> *Ibid.*, Special Committee on Street Numbering, Proceedings, 2 July 1856.

<sup>89</sup> Rawlinson, *op. cit.*, note 3 above.

<sup>90</sup> Certainly by the late 1870s, Plymouth had achieved a lower mortality rate than many other cities of comparable size. At 14.6 per thousand it was appreciably lower than Manchester (21) or Newcastle (23).

<sup>91</sup> See F. B. Smith, *The people's health, 1830–1910*, London, Croom Helm, 1979, pp. 200–201.

of the Act on local government in provincial towns. This study has shown how a local battle over the adoption of the 1848 Act in Plymouth led to fundamental changes in the management of urban affairs.<sup>92</sup> The power of petitions and well-organized protest was tested on the public health issue and proved effective. But Plymouth was not unique, the same kind of dénouement has been observed elsewhere, though more studies will be needed before a full picture emerges. One clear conclusion to be drawn from this study, is the key significance of public health in the political debate of mid-Victorian Plymouth.

#### SUMMARY

Mid-nineteenth century Plymouth was one of the country's most unhealthy towns. Cholera in 1832 and in 1849 was destructive, but the wastage of human life due to contaminated water supplies and bad housing was even more significant. Yet the local authorities opposed the application of the 1848 Public Health Act. They were afraid of losing political power in the borough, and waged a six-year campaign of resistance. But an outcry for the Act came from the ratepayers' association as well as private individuals. This detailed case study of Plymouth's quest to adopt the 1848 Act throws important light on the role of local politics in influencing public health in provincial towns in the middle of the last century.

<sup>92</sup> By 1860, a range of legislation that applied locally had been established by the Plymouth Local Board of Health on matters such as lodging-houses, slaughterhouses, open spaces, street widths, and access. Even so, Plymouth did not have a Medical Officer of Health until 1890 when Dr F. M. Wilhams was appointed to the post under the terms of the 1888 Local Government Act.