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Views of smoke in England, 1800- 1830

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Abstract

This thesis explores urban smoke and its nuisances in Georgian England, especially focusing on the period, 1800-1830. During this period, a number of English towns experienced accelerated industrialisation and many of them first experienced air pollution. In 1821, Michael Angelo Taylor, MP, passed a parliamentary bill on smoke abatement, Taylor's Act. Although it has generally been believed that the Act did not have much of a social impact, this thesis argues that the Act diffused the usage of smoke abatement technology and triggered dozens of legal cases.

The geographical focus of this thesis is Leeds and London. The Leeds case study examines the Leeds smoke abatement campaign and the smoke nuisance court case against Benjamin Gott, a leading merchant/ manufacturer in Leeds. It shows that the confusion over the effectiveness of smoke abatement technology represented the main difficulty in the smoke abatement campaign. The court case between the Duke of Northumberland and Clowes represents an example of the London nuisance cases in the 1820s. After the introduction of the steam press, the printing business became a polluting business. Because the plaintiff was the aristocrat, the case was interpreted as a class issue between aristocrat and middle-class printer. However, it was the Duke's servants who suffered most from the nuisance and the case shows more complex class politics.

This thesis also explores smoke nuisance caused by conventional smoke-producing industries in London, waterworks and brickmaking. Some water companies adopted smoke abatement technology but the confusion over the effectiveness of the technology can be observed in London, too. Taylor's Act did not directly influence brickmaking business but it could cause nuisance to its neighbours, especially nurseries and gardens.

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Abbreviations

AC: Alnwick Castle

AC/BP: 'Brief for the Plaintiff' stored at Alnwick Castle

AC/BPR: 'Brief for the Plaintiff on the Reference' stored at Alnwick Castle

AC/FO: 'Further Observations' stored at Alnwick Castle

AC/TR: two-volume trial record stored at Alnwick Castle

CLSA: Camden Local studies and Archives Centre

CSPD: Calendar of State Papers Domestic

GM: The Gentleman's Magazine

HA: Hackney Archives

HMC: Reports of the Royal Commission on Historical Manuscripts

MHL: The Manuscripts of the House of Lords

ICE: Institution of Civil Engineers

LI: The Leeds Intelligencer

LM: The Leeds Mercury

LMA: London Metropolitan Archives

MC: The Morning Chronicle

MP: The Morning Post

PP: Parliamentary Papers

RSA: The Royal Society of Arts

TNA: The National Archives

UL: University of Leeds

WYAL: West Yorkshire Archives Leeds

WYAW: West Yorkshire Archives Wakefield

Chapter 1 Introduction

English towns experienced accelerated industrialisation in the end of eighteenth century and early nineteenth century. Although eighteenth-century England was already industrialised, smoky industries were often located in the countryside. Steam engines were used in mines across the country, while the factory system emerged in rural areas. Except for some notable examples such as London, Newcastle and Sheffield, however, English towns were not very smoky until the end of the eighteenth century.

Towards the end of the eighteenth century, textile mills began to be built in northern towns where coal was cheaply available. Urban industrialisation was possible partly due to two technical innovations which Watt's steam engine achieved. They were the improved fuel efficiency and rotary motion. As a result of improved fuel efficiency, steam engines could be used in towns. The rotary motion of steam engines replaced waterwheels which had limited the possible location of mills along streams. As a result, these northern towns suddenly became smoky.

This thesis explores urban smoke and its associated nuisances in Georgian England, especially focusing on the period, 1800-1830. During this period, some towns which were already smoky became smokier and many northern towns first experienced air pollution. However, most literature on air pollution history focuses on the Victorian period, when English industrial towns were infamously smoky. The transitional period has not received much attention so far.

This thesis argues that the sudden change in urban air accompanied the emergence of the idea of smoke abatement. In 1821, a bill concerning smoke nuisance was passed into an act by Michael Angelo Taylor, MP (this act is hereafter referred to as 'Taylor's Act' or 'the Act'). Taylor lived at Whitehall, London, and was angered by the London smoke in his house and London parks. After Taylor decided to abate the smoke nuisance, he examined several different types of

smoke abatement apparatus in the Select Committee on Steam Engines and Furnaces (1819 and 1820) (hereafter referred to as the Select Committee). Josiah Parkes' apparatus impressed not only Taylor but also other supporters of the bill. Without the technology, especially Parkes', the passage of the Act would not have been possible.

Although it was generally believed that the Act did not have much of a social impact, this thesis argues that the Act diffused the usage of smoke abatement technology and triggered dozens of legal cases. The Act presupposed the practicability of smoke abatement technology which was believed to greatly reduce coal smoke from steam engines. The real change which the Act introduced was the reduction of financial burden for smoke nuisance prosecutions by forcing polluters to pay the cost of prosecution when the polluter lost the case. However, the main goal of plaintiffs was usually to force factory owners to install the smoke abatement technology and the Act actually encouraged the introduction of such technology. The development of smoke abatement technology, Taylor's Act, and smoke nuisance trials were a sequence of events in the early nineteenth century.

1-1 Geographical focus

The geographical focus of this thesis is limited to urban areas. Although industrial sites such as Coalbrookdale was enveloped in smoke already in the eighteenth century, smoke nuisance conflicts mainly took place in urban areas in the 1820s. I also limit the scope of this thesis to coal smoke, though smoke could be produced by many other materials. Wood and peat were the sources of smoke in the countryside. The smokiness of Scottish and Irish blackhouses, for example, is sometimes mentioned by travellers through these regions. Smoke was one of the important emblems of battles and destructive fires. However, because the main focus of this thesis is the consequences of Taylor's Act and smoke nuisance, references to smoke are limited to urban coal smoke.

In order to examine Georgian urban smoke nuisance, this thesis focuses on Leeds and London. While the Leeds case study gives a picture of smoke nuisances caused by large scale factories in one Northern industrial town, the London case studies demonstrate the extent and impact of smoke nuisances caused by the smaller scale enterprises, for example, waterworks, breweries, printers and brickmakers.

Leeds was one of the Yorkshire towns which were exceptionally active in terms of smoke abatement in the 1820s. Although most industrial towns had a few manufactories which installed smoke abatement apparatus in the 1820s, Leeds went so far to establish a smoke abatement committee and the committee started prosecution against five manufacturers who were reluctant to install the apparatus.

Unlike Leeds, London had already been a smoky town since the seventeenth century due to the industrial use of coal in breweries, brickmaking and lime-burning as well as domestic consumption of coal. Although steam engines increased the amount of London smoke, the change was not as sudden and drastic as in Leeds. London did not experience the smoke abatement campaign in the 1820s except for fragmental and private efforts to abate nuisances from a specific source. However, it does not mean that London did not experience the same level of smoke nuisance as Leeds. Rather, London was too large to make a collective effort to abate smoke nuisance.

1-2 Trial records, newspaper articles and visual images

Literature on air pollution history has tended to suggest that the social impacts of Taylor's Act were minimal (Brimblecombe 1987; Ashby and Anderson 1981) mainly because references to smoke nuisance are not found in archival sources such as records of local authorities and voluntary societies. The only known source concerning the smoke abatement campaign in the 1820s is Parliamentary Papers including parliamentary debates on the bill and two published reports from the Select Committee (1819 and 1820).

This thesis argues that Taylor's Act had a more significant social impact than assumed and draws on a range of archival sources such as trial records, newspaper articles and visual images to support this. Smoke nuisance trial records in particular tell us much about smoke nuisance in early nineteenth-century English towns. The two main case studies in this thesis are based on two substantial trial records, *Rex v. Gott and others*, and *the Duke of Northumberland v. Clowes*. These two conflicts took place in Leeds and Charing Cross, London respectively, and reveal the different geographies of smoke nuisance. The content of each trial record includes witnesses' testimonies on the smoke nuisance, geographical description on smoke producing industries in the neighbourhood and chronological description on the development of the smoke nuisance conflict. In-depth examination of these legal records and reconstruction of the smoke nuisance conflicts also reveals much about Georgian smoke nuisance and smoke abatement efforts.

Although trial records were informative sources, it has only been possible to identify two examples. Newspaper articles, however, reveal the existence of other smoke nuisance cases in the 1820s. This shows that the abovementioned trials were not isolated events but examples of other smoke nuisance conflicts during the period. Moreover, the newspaper articles show that residents in Leeds held a meeting on smoke abatement despite the lack of such description in local authorities' record.

In addition to legal records, newspaper articles and other manuscripts, visual images including oil paintings, watercolours and caricatures represent important sources in this thesis. Although visual images are often mentioned in air pollution history literature, in-depth examination is rare in the field. These visual images tell us much about contemporary perceptions and representations of coal smoke.

1-3 Aim and Objectives

This thesis has three main objectives. The first objective is to explore the early nineteenth-century smoke abatement campaign. This thesis will show that Taylor's Act was influential enough to trigger a local smoke abatement campaign and smoke nuisance trials. The second objective is to explore the historical geographies of smoke nuisance. Geographies of smoke nuisance conflicts were important to understand their contexts. In addition, this thesis explores perceptions and representation of coal smoke in visual images. The final objective is to explore how discourses of smoke functioned during the abatement campaign. In pursuing these objectives it has been necessary to explore across a range of subjects including the development of smoke abatement technology, medical views of smoke, parliamentary debates, smoke nuisance trials, newspaper reports, smoke depiction in watercolours and caricatures. In the following section, these three objectives will be explored in further detail.

1-3-1 The early nineteenth-century smoke abatement campaign

Although there is considerable literature on British air pollution history, most of the work focuses on the Victorian period or later due to the intensity of the smoke nuisances and smoke abatement movement by this stage. Peter Brimblecombe's *The Big Smoke* (1987) is one of a few exceptions which covers the Georgian period as well as earlier and later periods, but it does not provide a detailed picture of early nineteenth-century smoke nuisance. In fact, air pollution historians have not appreciated impacts of Taylor's Act so far. For example, Brimblecombe writes that 'It was so weak, however, that it probably had little effect on the air pollution in London (p101)'. It is doubtful that Taylor's Act materially reduced smoke nuisance as Brimblecombe argues but this thesis will argue that it was not 'weak' in terms of social impacts. In fact, dozens of smoke nuisance cases in the 1820s have not been dealt with by scholarly works on English legal history. McLaren (1983) examines English common law of

nuisance during the period 1770-1870 and suggested that 'On the average in a ninety-year period there were one or two actions for air pollution every ten years (p160)'.

This thesis will reveal that Taylor's Act triggered dozens of smoke nuisance cases across Yorkshire and London. The Act was very influential in Yorkshire, where the smoke abatement campaign took place. In addition, the act also encouraged manufacturers to install smoke abatement technology. Although it is difficult to evaluate the material reduction of smoke amount after the passage of Taylor's Act, it is indisputable that efforts were made to abate the smoke nuisance.

In addition to the consequences of Taylor's Act, this thesis will provide a picture of smoke perceptions and smoke nuisances in eighteenth-century England. Due to the general lack of references to smoke in eighteenth-century writings, existing literature on Georgian urban history only provides a fragmental picture of Georgian air pollution usually by quoting some travellers' writings. As a result, existing literature sometimes gives an impression that Georgian towns were generally very polluted and people were highly conscious of air pollution. In contrast, references to smoke nuisances in the eighteenth century are rare and often made by travellers from abroad. The scarcity of available materials makes it difficult to reconstruct a picture of eighteenth-century smoke nuisance but early nineteenth-century materials including trial records in the 1820s help to provide a picture of Georgian smoke nuisance.

1-3-2 Historical geography of smoke nuisance

Most works on air pollution history and Georgian urban history are written by history scholars. This thesis will introduce a geographical perspective to the subjects. Two geographical arguments will be introduced: the urban geography of nuisance and the iconographies of smoke.

The former argument is important because polluting industries were not evenly scattered over a Georgian town. For example, industries

were often located in the riverside, where water and transportation were easily accessible. Prestigious residential areas and industrial area were often segregated but conflicts could happen when the boundary was blurred. Therefore, it was not necessarily true that more polluted areas experienced more conflicts. Smoke nuisance and conflict involves rather complex geographies. The geography of nuisance tended to attract attention during smoke nuisance trials because defendants generally argued that it was not only their works which emitted much smoke but also other industries in the neighbourhood. Maps and a plan were produced for the two trials which this thesis deals with. The geographical perspective is necessary to understand these conflicts.

This thesis not only examines material landscape of smoke nuisance but also iconographies in visual images. Smoke is often depicted in Georgian industrial images. For example, J.M.W. Turner often included smoke in his watercolours and oil-paintings of industrial towns, locomotives and steam boats. Smoke was one of the iconographies of industry. However, literature on these visual images has not specifically focused on smoke so far. This thesis will argue that the depiction of smoke can be more than the simple iconography of industry. The amount and colour of smoke could show the artist's view of industrial development.

When interpreting smoke depiction, caricatures are another important source. This thesis will focus specifically on George Cruikshank's caricatures. While most fine art depicting industrial towns in the early nineteenth century present these towns as something celebratory, caricatures depicted different aspects of Georgian town, such as dirtiness and corruption. Similarly, unlike most smoke clouds depicted in fine art, smoke clouds in these caricatures are black rather than white. The examination of smoke depictions in urban views and caricatures shows the different perceptions of smoke during the period.

1-3-3 Discourse analysis

The final objective is to examine how discourses concerning smoke abatement were created and functioned. As the literature review chapter will argue, recent works on environmental history tend to conduct discourse analysis without using the term, discourse per se. In addition, cultural geographers often pay much attention to discourses though they often use the term 'narrative' and 'view' instead of discourse. In this sense, discourse is not an uncommon concept.

Discourse analysis will be used to demonstrate how discourses functioned during smoke abatement campaign and smoke nuisance trials. This is slightly different from a genealogical approach which often describes discourses as given and taken-for-granted. Rather, the focus will be on how smoke abatement discourse and anti-smoke abatement discourse were created.

In order to do so, this thesis will adopt the analytic methodology which is often used in the field of the geography of knowledge. Literature on the geography of knowledge often focuses on the formation or modification processes of scientific truth. This literature tends to examine the processes by focusing on the scientific practices of specific sites such as laboratories. In other words, they tend to conduct in-depth analysis of specific sites whose time and spatial expansion is very limited. Although it is not always possible to adopt the method due to the availability of source materials, part of the case studies in this thesis adopt the method in order to reveal the formation process of smoke abatement discourse.

By introducing discourse analysis to environmental history, this thesis will also explore distortions and assumptions which smoke abatement discourse implies. This focus will also show that discourse that promoted smoke abatement was so powerful that it succeeded in suppressing arguments against it, including those voiced by manufacturers. In this sense, the argument is different from existing

literature on air pollution history, which tends to focus on descriptions of the emerging smoke abatement discourse being pitched against conventional and more influential anti-smoke abatement discourse. It will be argued that in Georgian contexts, anti-smoke abatement discourse emerged after smoke abatement discourse rather than the other way round.

1-4 Structure of the thesis

This thesis consists of eight chapters. After this Introduction, relevant literature will be examined, which will be followed by methodology. Then, four empirical chapters follow. Chapter 4 explores general smoke perceptions during the Georgian period and chapter 5 examines Leeds smoke abatement campaign. Chapter 6 and 7 are London case studies. Chapter 6 focuses on smoke nuisance trial, the Duke of Northumberland v. Clowes. Chapter 7 deals with two shorter case studies in London, one is about brickmaking at St Pancras and the other is concerning Lambeth Waterworks. Now, I will briefly introduce these chapters.

Chapter 2: Literature review

This chapter will examine literatures of five disciplines which are relevant to this thesis. They are landscape and visual culture, geography of knowledge, Georgian urban history, environmental history and air pollution history. Most of the scholarly works in these subject areas are examined not only because of their direct relevance to Georgian smoke abatement but also due to their importance in terms of providing a theoretical framework and analytical methodology. Therefore, some sections deal with not only literatures on Georgian period but also literatures focusing on other time periods.

Chapter 3: Methodology

Chapter 3 will explore the methodologies I adopted when identifying and analysing texts and visual images. Firstly, recent developments in academic debates on archives as a basis of historical research will

be examined. It is generally argued that archival materials are not an objective representation of the past. However, most arguments are made in order to overcome the distortion and archival materials are undoubtedly the most important sources to reconstruct the past. This chapter will then examine discourse analysis. Finally, I will introduce the archival materials this thesis used, including smoke nuisance trial records, newspaper articles, parliamentary papers, journals and visual images.

Chapter 4: Smoke in the Long Eighteenth Century

This chapter will explore the general perception of smoke throughout the Georgian period. There are three sections in the chapter, Georgian smoke iconography, medical views of smoke, and the development of 'smoke consumption' technology. Georgian smoke iconography section will explore eighteenth-century smoke perceptions, especially London smoke. Even during the eighteenth century, London smoke perception seems to have changed. Medical views of smoke section will argue that medical specialists generally denied the negative impact of coal smoke for human health throughout the eighteenth century. Finally, this chapter will examine the development of smoke abatement technology, specifically "smoke consumers". In the first half of the section, the premium offered by the Royal Society for the Encouragement of Arts, Manufacturers and Commerce (hereafter referred to as the Royal Society of Arts) from 1768 onwards and letters in response to the premium will be examined. The latter half of the section will examine the smoke abatement apparatus presented to the in the Select Committee.

Chapter 5: Industrial smoke in Leeds

This chapter will examine the Leeds local smoke abatement campaign in the 1820s. After the passage of Taylor's Act in 1821, local smoke abatement committee was formed in Leeds to force manufacturers to install smoke abatement technology in their factories. One of the leading figures who launched the campaign was Edward Baines, the

editor of provincial newspaper, *The Leeds Mercury*. *The Leeds Mercury* printed articles which emphasised the efficiency of smoke abatement technology. However, when the local committee decided to prosecute five local manufacturers blaming them for failing to install the technology, one of five manufacturers, Benjamin Gott became determined to confront the smoke abatement campaign. This chapter will examine the geography of smoke nuisance conflict around Gott's factory as well as functions of smoke abatement discourse.

Chapter 6: A printer versus the peer

This chapter will examine nuisance trial between the Duke of Northumberland and William Clowes, a printer. The conflict started when Clowes introduced a steam press for his business, which was adjacent to the Duke's Northumberland House at Charing Cross, London. At the time, the Northumberland House household mainly consisted of employees of the Duke because the ducal family was staying in their country estate. Therefore, it was servants and employees of the Duke who suffered from noise as well as black smoke and soot. During the trial, witnesses for the Duke, mainly consisted of servants, provided descriptions on the nuisances. This chapter will examine the micro geography of smoke nuisance in Northumberland House. In addition, this chapter will also examine how radical newspapers tried to incorporate the event into radical discourse by describing the Duke as the powerful aristocrat persecuting a diligent printer.

Chapter 7: Waterworks and brickmaking

This chapter consists of two short case studies based on images. A caricature drawn by George Cruikshank will be examined in each case study. The first case study of Lambeth will deal with *Salus Populi Suprema Lex* (1832), which depicts Thames water polluted by sewage. The main focus of the satire is Southwark Water works whose intake is in the middle of polluted Thames. Therefore, this case study deals

with waterworks, though the focus is on Lambeth Waterworks instead of Southwark Waterworks due to the availability of archival materials. In fact, waterworks installed steam engines earlier than most other urban industries and they were conventional smoke producing industry. This case study not only deals with smoke nuisance caused by waterworks but also problems relating to the industry such as water quality and road maintenance under which water pipes were laid.

The second case study of St Pancras will deal with *London going out of Town* (1829), which depicts robot builders who are expanding London suburbs. Because Cruikshank depicted a brick clamp and tile kilns as the vanguard of London expansion, this case study will focus on brickmaking industry around St Pancras. Brickmaking around London were temporary business before building development finished. In other words, Cruikshank's depiction of brickmaking business as the vanguard of London expansion was not merely a metaphor.

1-5 'Smoke nuisance'

Before proceeding to the next chapter, it is necessary to explain why this thesis uses the term 'smoke nuisance' instead of air pollution. The condition of nineteenth-century towns which covered by coal smoke can be termed as air pollution in modern sense. However, the term did not appear during the Georgian period and it was 'smoke nuisance' at the time. In fact, smoke nuisance had slightly different implications. Although air pollution in a modern sense implies damage to health and environmental impacts, smoke nuisance was just that - a 'nuisance'. Impacts to human health were not yet established medical knowledge. In addition, while air pollution implies invisible pollution as well, smoke nuisance only meant nuisance caused by visible black smoke and soot. The usage of term is also connected with the issue of how English law dealt with smoke problems. Due to the lack of special legislation, the nuisance caused by coal smoke was settled by the concept of nuisance within the common law. The

nuisance concept not only provides legal foundation for water pollution problems but problems such as obstacles to transportation.

In other cases, I sometimes use terms which were not used during the period. For example, I often mention 'smoke abatement technology' but smoke abatement was not a Georgian term. Similarly, 'smoke abatement campaign' and 'Leeds smoke abatement committee' were not the terms which were actually used. However, these terms are used here because there are no appropriate alternatives. 'Smoke consumption', which was the contemporary term for 'smoke abatement technology', is not a familiar term for modern readers. As for 'smoke abatement campaign' and 'Leeds smoke abatement committee', no established names existed as far as I am aware. Although differences in terminology imply that Georgian smoke nuisance was very different from modern air pollution, Georgian smoke abatement efforts were the beginning of the modern efforts to abate air pollution. In fact, they were probably one of the earliest examples of environmental campaign.

Chapter 2 Literature review

In dealing with early nineteenth-century smoke nuisance, this thesis is concerned with varieties of matters, including technology, arts, urban geography and laws. This chapter, therefore, examines literature on landscape and visual culture, geography of knowledge, urban history as well as environmental history and air pollution history.

The first section explores literature on landscape and visual culture for two reasons. The first is that one of the central sources for this thesis is visual imagery and it is necessary to show how geographers and historians have dealt with these materials. This thesis especially refers to urban and industrial views and caricatures, and this section will examine scholarly works on landscape, especially the Georgian industrial landscape and early nineteenth-century caricatures. The second reason this section examines works on landscape is that the methods to read landscape have much implication to the analysis of smoke abatement campaign. Cultural and historical geographers argue that landscape and visual images reflect power relations and ideologies of the society. The arguments are key to one of this thesis's main claims that cultural views are integral part of smoke abatement politics.

The second section explores literature on geography of knowledge. As the section on landscape and visual images, literature on geography of knowledge is interesting in two ways. One reason is that this thesis deals with knowledge and technology. The other reason is that the theoretical development of the sub-discipline provides an interesting view point to the understanding of smoke abatement campaign. Work on the geography of knowledge tends to focus on the construction or modification processes of scientific knowledge and this section will show that similar methodology can be used to interpret the discourse construction and modification processes.

The third section explores literature on urban history, especially focusing on urban improvement. 'Improvement' is a key concept to understand changes in the urban landscape during Georgian period. After examining the wider usage of the term, especially within the contexts of agriculture and estate management, this section will explore existing arguments on Georgian urban improvement. In addition, this section will also explore works on urban industry and economy.

The fourth section explores scholarly work on environmental history, focusing specifically on political environmental history. This section will examine the recent emphasis of cultural aspects by political environmental historians. I refer to this phenomenon 'the cultural turn' of political environmental history and this thesis can be positioned within the context, too. Because the following section will focus on air pollution history, this section focuses on sanitation, water pollution and waste management history.

The final section explores literature on air pollution history. The section shows that there is a gap in the air pollution history works in terms of Georgian smoke nuisance. Therefore, this section will mainly explore how scholars deal with Victorian air pollution history. Despite the difference in time period, the way these authors explore cultural views and politics of smoke nuisance has much implication to this thesis. In addition, this section examines legal history works on nuisance law, which deal with smoke nuisance cases, too.

By examining these literatures I will position this thesis within a scholarly framework and thus demonstrate the contribution of my research to these historical and geographical fields.

2-1 Landscape and visual culture

Visual images are important sources of this thesis in two different ways. They show contemporary images of material landscape, like the modern use of photographs. However, at the same time, visual images provide a distorting view reflecting contemporary social and

cultural views. In other words, while visual images on smoke could provide evidence on geographical and material information on smoke emissions, visual images could also provide information on contemporary ideas of smoke, for example, on whether smoke had positive or negative implications. The latter way to analyse visual images has developed since a few decades ago and this section will first examine literature on this subject, especially in landscape studies. Secondly, this section will examine scholarly work on visual images of Georgian industries, which is the most relevant art genre that this thesis deals with. Finally, this section will deal with early nineteenth-century caricatures, which is the main focus of Chapter 7.

2-1-1 Landscape

One of the central arguments of landscape studies is that a landscape is not a neutral creation but reflects the social and cultural contexts of a particular site. Landscape studies have two different genealogies. One genealogy emphasises the material aspects of landscape, for example, the development of settlements as well as agricultural, industrial and commercial sites. The other genealogy is often called 'a way of seeing', which was established in Britain (Duncan 1995 p414). This branch often examines visual images, especially landscape paintings, watercolours and engravings. In addition, other sources such as poetry, fiction, travel literature and landscape garden are also examined from a similar point of view (Mitchell 2002). The attention paid to landscape gardens shows that scholars in this branch do not ignore the material aspects of landscape.

The origin of 'a way of seeing' landscape theory can be positioned within a tradition of cultural Marxist interpretation (Wylie 2007), typically seen in a work of Raymond Williams (1975) though he examines literature not visual images. Another influential work in this tradition is John Barrell (1980) *The dark side of the landscape*. Barrell examined how the depiction of rural poor in Georgian paintings was shaped, focusing on three artists, Thomas Gainsborough, George Morland and John Constable. For example, Barrell argues that in the

late eighteenth century, one of the primary functions of rural life descriptions in paintings and poetries was to distinguish between the worthy recipients of charity and unworthy poor. The rich could relieve themselves from moral questions knowing that 'beggars are ragged only through idleness (p77)'. The perception of the rural poor is reflected in individual artist's depiction of poor people. For example, Constable dealt with the harsh reality of the poor by obscuring their expression and by distancing them in his paintings.

Barrell's argument emphasises the social elite's need to distort and conceal the harsh reality. Wylie (2007) argues that Denis Cosgrove and Stephen Daniels established this interpretation in geography. Cosgrove (1985) examines the emergence of landscape in the context of Italian Renaissance. He argues that the use of linear perspectives in landscape paintings resonates with skills based on geometry for land survey and map making, which were the tools to control land:

one of the consistent purposes of landscape painting has been to present an image of order and proportioned control, to suppress evidence of tension and conflict between social groups and within human relations in the environment (p58).

As Wylie argues, Daniels (1985) presents a similar view:

Narrative as a form of historical interrogation can recover the conflicts and hardships which so often constitute the making of landscapes and which the conventional idea of landscape, with its implications of harmony and peace, seems to deny (p155).

However, despite the similarity in presenting cultural Marxist interpretation here, works by Daniels are generally not easily positioned in the cultural Marxist tradition. What Daniels often emphasises is the plurality of narratives in particular visual images. For example, in his book, *Fields of Vision* (1993), he states that 'I will emphasize the fluency of landscape, not its fixity, its poetics as well

as its politics. An apparently simple picture of a country scene may yield many fields of vision (p8)'.

In the first chapter of *Fields of Vision*, iconographies of St Paul's are chronologically examined. Rebuilt after the Great Fire of 1666, it was 'seen as a symbol of national as well as civic renewal and ascendancy (pp. 18-9)'. During the war against Napoleonic France 'the Cathedral was renewed as a belligerent patriotic spectacle (p20)'. It was the centre of the metropolis for imperial Britain throughout the nineteenth century and, then, became a symbol of national survival and renewal in the context of WWII.

Daniels not only explores iconographies of particular objects chronologically, but he also examines various narratives in particular visual images. In Chapter 2 of the book, he examines Joseph Wright's *Arkwright's Cotton Mills by Night* (c. 1782-3). Daniels reads from Wright's painting not only the success in Arkwright's cotton spinning but also spectacle and fantasy as well as the contemporary interest in geology.

In fact, Daniels' focus on the plurality of narratives can be seen as an early example of a shift in this branch of landscape studies. In the 1990s the emphasis of landscape theory shifted away from 'a way of seeing'. It was a shift from the stress on 'the façade-like quality of cultural manifestations, such as landscape, and thereby to focus upon 'unmasking' the more-or-less systematic operation of structures of power and authority behind such façades' to 'more multifaceted cultural movements, debates and practices in which landscape circulates both materially and symbolically, for example debates over citizenship, identity, health, planning and ethical conduct generally (Wylie, 2007 p95)'.

One of the leading figures in the shift was David Matless. He explores varieties of national and geographical identity in his *Landscape and Englishness* (1998). By examining various subjects such as hiking, dancing, fitness, organism, naturalism, suburban community and

town planning, Matless shows varieties of Englishness which defined different approach to landscape between the inter-war and post-war periods. Identity and morality are among the main theoretical focuses.

The distorting and concealing function of landscape is still one of the main theoretical pillars of landscape studies. It is now argued that landscape conceals the inconvenient reality originated not only from class difference but also from ideologies such as imperialism and sexism. For example, W.J.T. Mitchell (2002) claims that landscape is not an invention of Western culture as generally argued. He argues that the similar tradition in China and Rome suggests that landscape is a convenient tool to naturalise the evil and violence written on the land, which is usually the conduct of imperialism.

The main implication of these literatures to this thesis is the idea that culture is politics. Culture is not merely a static background on which politics take place. As will be examined later, air pollution historians tend to emphasise cultural views of smoke, such as smoke as a symbol of prosperity, but these authors deal with these cultural views as ones which were already there when the Victorian smoke abatement movement started. When political efforts to abate smoke failed, it is sometimes explained that the efforts failed because there were conventional cultural views which oppose smoke abatement. However, if we take the arguments in landscape studies into account, these cultural views could be interpreted as political tools, which were maintained with effort.

2-1-2 Industrial landscapes

The main theme of this thesis is urban coal smoke during Georgian period. Because coal smoke was one of the elements of Georgian industrial landscapes, I want to explore literature on such landscapes, here. Barrie Trinder (1982) *The making of the industrial landscape* is a comprehensive work on British industrial development especially focusing on material landscape. The main features of the Industrial Revolution such as the cotton mill, the narrow canal, the iron railway

and the Boulton and Watt steam engine, mostly appeared between 1750 and 1790 (p52). The change in the physical landscapes also changed perceptions and representations of them. 'During the second half of the eighteenth century mines and manufactures were seen in a new light—as objects of curiosity, as sources of national wealth, as picturesque vistas which could inspire horror in the same way as mountains or rocky seashores (p53)'. One of the significant changes during the period is the emergence of cotton mills. Richard Arkwright not only introduced the water frame and the powered machine for spinning cotton yarn but also established factory system:

Arkwright's significant skill lay in the organization of production, in his combination in a single building of several machines which transformed raw cotton—carding, roving and spinning it—into yarn which could be used by a weaver. He solved many of the problems which arose when large numbers of people were concentrated in one building by installing warm-air heating and columns of lavatories within the staircase blocks or turrets of his mills. As an aid to gaining acceptance for the revolutionary notion that his employees should work regular hours, most of his mills were topped with a cupola containing a bell to summon them to work (p62).

His cotton mill in Nottingham was horse-powered but he set up water-powered mill at Cromford in Derbyshire in 1771. It became a curiosity as Daniels (1993) shows. Similarly, mining and smelting of metal ores created industrial landscape during the period. Coalbrookdale is a typical example of such landscape. The most detailed work on physical landscape around Coalbrookdale is Alfrey and Clark (1993), which is a work on industrial archaeology, dealing with industrial sites, mines and settlements.

Landscape studies not only deal with the material landscape but also perceptions and representations of landscape. Rudolf Beck (2004) examines how English poets dealt with the industrial subjects during the early stage of the industrial revolution. He argues that there was

a shift from an industrial georgic to an industrial sublime. Although 'industrialism in its early stages did not attract much attention from poets', when it did, poets utilised Virgilian georgic to write about mines, forges, foundries or textile mills until well into the 1770s (p17). Beck argues that the increasing tensions which was an result of emerging new commercial and industrial society was one of the causes of industrial georgic's demise as a major literary genre (p27). By examining John Holland's Sheffield Park (1820) he argues that poets began to focus on aesthetic aspect of industry:

Holland manages to turn his encounter with an industrial landscape exclusively into a sublime experience. ... Although Holland does refer to manufacturing processes (the production of cast iron and steel), mines and machinery (steam engines, to be specific), he is no longer interested in them because they might serve as appropriate symbols of 'virtuous toil' as in the traditional georgic, or because their scientific and technological aspects appeal to them. He is only interested in them insofar as they provide an exciting aesthetic, quasi-natural experience. The overall effect is no longer panoramic, as in the georgic, but dynamic, theatrical and—if the term be permitted—'cinematic' ... (p31).

Most industrial views which this thesis deals with emphasise aesthetic aspects of landscape as Beck's argument on poetry. Though the industrial subject was rather an exception in oil paintings as in poetry, artists such as Joseph Wright, Philip James de Loutherbourg and J. M. W. Turner are known for their interests in this. This thesis deals with industrial views by, for example, Loutherbourg and Turner, and I now explore how cultural and historical geographers deal with these three artists' industrial views.

In addition to Daniels (1993) who deals with Wright's paintings as abovementioned, other scholars have written about his paintings on the industrial sublime. Fraser (1988) explores Wright's scientific and industrial paintings in connection with his acquaintance with members

of the Lunar Society, especially John Whitehurst, a geologist. He argues that the light in *A Philosopher Lecturing on the Orrery* is a light of enlightenment and it implies that Wright's paintings on industrial subject are optimistic. Graciano (2005) also writes about Wright's Derbyshire landscape and Whitehurst's geology. Solkin (2003) examines Wright's pictures on smithies and iron forges between 1771 and 1773. Unlike the popular depiction of blacksmiths as comical figures, Wright endowed 'industry with the visual character of sublimity, making the activity of the forges look mysterious, powerful, and awe-inspiring (p184)'.

Daniels (1992) finds similar subjects and composition in Loutherbourn's *Coalbrookdale by Night* (1801) and Wright's *Arkwright's Mill*. He situates the painting 'in a variety of overlapping discourses and practices, including theatre design, technical drawing, political economy, tourism, alchemy, and freemasonry (p196)'. For example, he sees an apocalyptic subject in *Coalbrookdale by Night* as he finds Rosicrucian theatre in *Arkwright's Mill*. Similarly, both pictures display British fire-power, in other words, British economical, industrial as well as imperial power.

Turner is one of a few painters who depicted early nineteenth-century industrial towns. Rodner (1997) argues in his book on Turner's industrial paintings that industry rarely attracted contemporary artists' interest:

Artists of the earlier part of the nineteenth century tended, with few exceptions, to embrace a "celebratory" attitude toward selected aspects of the urban environment, resulting in paintings and engravings that revealed generally clear vistas, sparkling facades, and informative detail; these works almost uniformly omitted significant reference to recent mechanization and the characteristic industrial and domestic fogs that plagued the metropolis (p124).

Though Turner was one of the exceptional artists who depicted smoky urban landscapes, he was optimistic about industry. 'In his steam paintings Turner came to welcome industrialism, arguing for the serious consideration of machines as worthy subjects for art. ... Turner never questioned the Industrial Revolution's rightful place in early nineteenth-century life (*ibid* p2)'. Similarly, Berg (1997) argues that '[Turner] painted cities and industry in a manner parallel to Adam Smith's analysis of "the great commerce" (p129)'. Nevertheless, these authors also point out the negative impacts of industrialism. Although Daniels (1993) basically agrees with optimistic reading of Turner's industrial subjects, he also sees ambiguity. 'Turner's *Leeds* is not an entirely cheerful celebration of commercial progress and civic pride (p123)'. Figures in the foreground of *Leeds* 'do not regard the spectator [of landscape] at all; each is absorbed in the effort of their occupation (p123)'.

Although these literatures on Turner's industrial paintings mention the industrial, this thesis will provide more detailed analysis of smoke depiction. For example, authors often quote foreign travellers to show the smokiness of industrial town but this thesis will argue that foreign travellers' records do not necessarily reflect inhabitants' perception of smoky atmosphere. In fact, the interpretations of Turner's perception of smoky town are slightly different among scholars (Daniels 1986; Rodner 1997; Hill 2008) and I believe that detailed examination of smoke depiction can provide additional material to interpret Turner's perception of urban industrialisation.

2-1-3 Caricatures

If landscape invisibly supports a dominating ideology, caricatures often highlights conflicts between powerful ideologies. Therefore, it is probably natural that the negative depiction of industrial smoke first appeared in the genre of caricature rather than in the optimistic views of industrial landscape, as will be examined in this thesis.

One of the popular themes of mid nineteenth-century caricature was 'the March of Intellect'. One of the classical texts on Georgian caricature, Dorothy George (1967) *Hogarth to Cruikshank* describes it as follows:

Two related themes pervade the second quarter of the century: 'the March of Intellect' or 'of Mind', and mechanical invention. Both are combined in 'March' prints—the phrase recurs in newspapers, speeches, verse, and caricature captions. In the prints it stands for learning and luxuries for the masses (to the neglect of their work), and in general for a sceptical attitude to 'progress' (p177).

As George puts it, 'the March of Intellect' prints sometimes deal with mechanical invention and the steam power was often a main theme in such prints. Because smoke was often associated with the steam power, Chapter 7 will deal with these prints, too.

Although the mainstream of 'the March of Intellect' prints present a sceptical attitude, these were exceptions. B. E. Maidment (2001) points out that though the main stream of the interpretation was the satirical presentation of educated working class in connection with its potential threat, it was not the only story-line:

Educated dustmen might be represented as eighteenth-century comic proletarian grotesques, as politically motivated challengers of the status quo, or as legitimate, even heroic, warriors in the battle for social progress (p54).

Similarly, Hancher (2000) examines 'March of the Intellect In the Butchering Line', which drew on butcher's complaint about his gentrified wife and daughters. According to Hancher, 'the March of Intellect' can be positioned within the wider change in printing business, which made prints widely available even among working class people.

In fact, this thesis deals with an introduction of the steam press to the printing business, which resulted in smoke nuisance. The

introduction of steam press was one of the changes which made prints widely available in terms of class as well as national geography. *The Penny Magazine* (1832-1845) was the symbolic publication utilised these changes in printing business. Celina Fox (1988) examines graphic journalism in the 1830s and 1840s focusing on publishers and engravers as well as visual images. She points out that the preface to the first volume of *The Penny Magazine* refers to the recent boons of machine printing and stereotyping as well as the improved communication between the capital and the country 'through the use of steam-boat, canal, railway, quick van, and stage coach and mail', which enabled the cheap publications and their diffusion (p143). The direct motivation to publish *The Penny Magazine* was to provide a solution for middle-class fear about 'the March of the Intellect'. 'The middle class reformers in general, ... based all of their calculations on the simple but unproven assumption that 'good' reading matter would drive out the 'bad' (p137)'.

The authors who deal with 'the March of Intellect' prints tend to focus on 'learning and luxuries for the masses'. This thesis, however, deals with another theme of the prints- technological and mechanical development. Smoke plumes in these prints and in industrial and urban views tell us much about perceptions and representations of smoke, industry and technology at the time. The difference in these two art genres sometimes presents a difference in smoke representations.

2-2 Geography of knowledge

The smoke abatement campaign in the 1820s was not possible without the existence of smoke abatement technology. The evaluation of the technology's practicability was the key to the both the arguments that supported and opposed the campaign. Arguments presented by these two sides were contradictory and in order to understand the phenomenon, literature on history of science and geography of knowledge are helpful.

The common theme within this discipline is the doubt about the assumption that scientific knowledge was always neutral and universal, which could automatically reveal the truth by itself. 'Through the 1970s and 1980s, ... historians began taking science down from its elevated level of cognitive purity to the concrete conditions of institutions, organizations, politics, public concern, and vested interests (Rupke 2011 p440)'. Geography is the key to the development of the discipline. James Secord (2004) argues that 'historians of science have developed superb techniques for placing science in local settings of time and place (p657)'. The leading geographer in the field is David N. Livingstone. In his book, *Putting science in its place* (2003), he clarified ongoing arguments into three geographical questions; site, region and circulation.

In terms of the question on region, Livingstone points out that scientific cultures reflect regional differences. The typical example of the regional culture of science is the different acceptance of Darwinism in different countries and cities. Livingstone (2011) explores how Darwin's theory of origin accepted or not accepted at scientific and religious circle in different cities in Ireland. The works on acceptances of scientific theories emphasise the importance of local cultural, religious and intellectual contexts where these theories migrated.

Questions on site and circulation are directly related to this thesis's arguments. Before examining these questions, it is necessary to examine credibility issues because credibility is the key to the arguments on site and circulation. In fact, this thesis will argue that the contested scientific credibility on the effectiveness of smoke abatement technology was the central issue on the confusion over smoke abatement campaign.

Steven Shapin explores Robert Boyle's experimental science, noting fundamental issues on credibility and testimony. Shapin argues that the establishment of experimental science in c. 1660 created new mechanics of science. Before c. 1660 'one could expect the absolute

certainty of *demonstration*, exemplified by logic and geometry (1984 p483)':

By contrast, the English experimentalists of the mid-seventeenth century increasingly took the view that all that could be expected of physical knowledge was *probability*, thus breaking down the radical distinction between 'knowledge' and 'opinion'. Physical hypotheses were provisional and revisable ... (*ibid*).

Traveller's stories on natural history and foreign phenomenon were integrated into the scientific knowledge within new system of credibility. The management of credibility is necessary to establish knowledge collection networks, one of its centre was the Royal Society. For example, 'Practical evaluation of scientific testimony pervasively relied upon the recognition of integrity and disinterestedness in the source (Shapin 1994 p226)'.

Shapin argues that Boyle and the experimental scientists of the Royal Society not only collected knowledge but also established experimental science by managing scientific credibility. The result of experiment confirmed by eye-witnesses could be constituted as a matter of fact. This process can be considered to be site and circulation issues according to Livingstone's terminology. The process can be interpreted as a migration of knowledge from the private laboratory to a site of demonstration.

The most important point in site issues is that each site has a different culture and practice in terms of knowledge production. Scientific knowledge is a product of specific site such as laboratories, fields, botanical gardens and hospitals (Livingstone 2003). The success of experiment's replication, or circulation of experimental knowledge, heavily depends on replication of site culture. 'The repetition of a trial relies on the transmission of craft skills which cannot be completely specified in explicit instructions and must be acquired through shared culture (Schaffer 1992 p334)'. It means that less complicated experiments are more easily replicated. Pancaldi

(2002) shows that simple structure and easy replicability of voltaic battery encouraged quick spread of its experiments across Europe. However, the specific skills are not very visible to witnesses and audiences because demonstrations are needed to be dramatised. '[T]he smooth public performance obscures the untidiness behind the scenes; the vagaries of nature are caged, as one observer puts it, "in thick walls of faultless display" (Livingstone 2003 p25)'. This thesis will show that the demonstration of smoke abatement technology at a London brewery confirmed the effectiveness of the technology, which enabled the passage of Taylor's Act. It is important to take the dramatising efforts into account in interpreting the demonstration.

Although demonstrations could construct scientific knowledge, it needed to be written on papers in order to circulate the knowledge within wider scientific communities. By naming witnesses and stipulating their qualifications, it was possible to give more credibility to a report on experiments (Shapin 1984 p489). In addition, Boyle could facilitate replication of experiments by reporting detailed experimental protocols. However, Shapin argues that the most important way to multiply witnesses was 'virtual witnessing', which produces an image of an experimental scene in a reader's mind (*ibid* p491). For example, Boyle inserted an engraving of his original air-pump as an appendix to the *New Experiments*. It was not 'a picture of the 'idea' of an air-pump but of a particular existing air-pump (*ibid* p492)'.

Sibum (1995) explores problems in transferring site specific experimental science into printed texts in his case study on James Joule's 'mechanical value of heat'. Joule's experiments were needed to be conducted privately because of the disturbing effects of body radiation and he could only report his experiments. Joule conducted experiments in a private laboratory using his skills to avoid potential errors. By replicating Joule's experiment himself, Sibum enumerates necessary skills which were not specified in Joule's report. In Joule's paper published in *Philosophical Transactions* in 1850, not only these

specific skills 'but even the machine which was needed to perform the experiment, was not explained sufficiently well nor given in a complete picture (p104)'. For example, the shape of the suspension of the pulleys was drawn in a way that little doubt on potential friction effect would be raised. These issues on scientific texts are relevant to the analysis of publications on smoke abatement technology.

Sibum not only poses an issue on an experiment and its publication but also makes it clear that Joule's skill was necessary to the knowledge production. In fact, self-discipline could be an issue when arguing knowledge production. For example, scientific disciplines such as observational astronomy, geography, natural history, surveying, meteorology, hydrography, and medicinal botany need travelling to obtain knowledge. However, distance raises a question on credibility. In addition to maps, pictures and photographs which were used to record distant phenomena, disciplining of observers provides credibility. '[T]he simplest way of guaranteeing the trustworthiness of knowledge collected far away is to ensure that observations are carried out by properly trained eyewitnesses (Livingstone 2003 p148)'.

The issue of self-discipline is not only relevant to science which involves travelling but also relevant to uniform control. For example, Merriman (2005) examines the role of self-government of drivers to maintain the road safety in mid twentieth century. Similarly, Ogborn (1998) provides an account how an exciseman actively self-fashioned himself, which was necessary to construct the network of bureaucracy. The issue on self-discipline directly relates to this thesis in terms of introduction of the smoke abatement technology. The effective use of the technology was often associated with a question on self-discipline of an engine man.

The arguments within geography of knowledge fields are obviously relevant to the smoke abatement campaign when dealing with smoke abatement technology and medical opinion on coal smoke. In addition, this sub-discipline could have wider implications to air pollution history. In most geographical works dealing with science, the central

focus is usually on the scientific or intellectual community. However, air pollution history and environmental history not only deal with the intellectual community but also politicians' views and also lay opinions. As will be examined in the next chapter on methodology in connection with Bruno Latour's *The pasteurization of France*, the popularization process of scientific findings outside of scientific community is often the key to the success in hygiene and environmental campaigns. This thesis will argue that this popularization process can be interpreted using arguments presented within the fields of geography of knowledge, such as credibility, testimonies and site culture.

2-3 Urban history

2-3-1 Population growth and improvement

During the long eighteenth century (the period mainly governed by Hanoverian monarchs), English society became more urban. In 1700 about a quarter of the population lived in urban area and by 1840 nearly half the population lived in urban area. Throughout the period, London was far larger than any other English towns and cities but the difference between London and other towns had slightly lessened during the period. In terms of provincial towns, the growth of manufacturing towns was notable in the early nineteenth century. While major towns such as Norwich, Bristol, Newcastle, Exeter and York were provincial centres of social and economic lives and most of them were major ports in 1700, major towns in 1841 such as Liverpool, Manchester, Birmingham, and Leeds were mostly located in industrial north. The urban population itself rapidly increased during the period. For example, London's population was above 500,000 in 1700, which almost doubled in 1800 and became more than two million in 1841 (Sweet 1999; Ellis 2001).

The long eighteenth century not only saw the growth of urban population but also saw the change in urban management. It is generally called urban improvement. However, the relation between the urban population growth and urban improvement was not simple.

Jones and Falkus (1990, originally 1979) argue that urban improvement preceded urban growth by focusing on southern market towns. They show that although London was often the first place to introduce improvements due to its sheer size and problems caused by its population, the southern market towns, which experienced only slight population growth during the period, eagerly imitated these improvements. While only 15 Improvements Acts were obtained by industrial towns between 1736 and 1799, market towns and non-industrial ports obtained 110 Improvements Acts during the period. They conclude that it was 'civic consciousness' and the prosperity of provincial market towns which facilitated the investment in urban improvement.

Despite the argument made by Jones and Falkus, Ellis (2001) maintains the story line that the population growth and the economic expansion led to a deterioration in the urban environment and also facilitated urban improvements, though the point made by Jones and Falkus is reflected by putting Georgian urban improvement in the context of newly developed aesthetic consideration. The contradiction seems to be solved when considering that many northern manufacturing towns developed their manufacturing sectors in the early nineteenth century. Many manufacturing towns whose prosperity mainly relied on textile production introduced the factory system and steam engines only from the 1790s (Trinder 2000). As Wilson's examination of the Leeds merchant community during the Georgian period (1971) shows, the textile trade, not production itself, was the main source of prosperity in eighteenth-century Leeds. Therefore, it is very likely that northern industrial towns became active in urban improvement after the 1790s. For example, Turner (1994) shows that Manchester established a new police commission in 1792 by the Police Act, which was one of the forms of Improvement Acts. This commission superseded the Court Leet in control of most public services including 'the management of fire service, watch, traffic, street lighting, scavenging and cleansing' and dominated Manchester local government until incorporation in 1838

(p304). Similarly, literatures on Leeds local politics usually focus on the period after the 1830s. For example, Derek Fraser's works on the politics over churchwardens, Poor Law and water supply focuses on mid nineteenth century. Leeds politics were relatively stable within its corporation until the early 1830s and it suggests that the change in urban management mainly took place after its industrialisation. As Jones and Falkus (1990) argue in terms of London, northern industrial towns seem to have resorted to urban improvement when urban problems became obvious.

2-3-2 Georgian urban improvement

Before further examining Georgian urban improvement, it is necessary to locate urban improvement in the contexts of wider Georgian improvement. In fact, the early usage of the term in the seventeenth century was primarily agrarian (Slack 1999 p80). Estate management in the countryside especially utilised the concept. For example, drainage and change in crop rotation were parts of agricultural improvements which were conducted in order to increase the value of estates. Apart from agricultural usage, transportation systems such as the construction of turnpike roads and canals were also improvement, which could increase the economic value of estates, too (Seymour et al. 1998; Daniels et al. 1999). In addition, improvement also meant the change in the aesthetic aspects of estates.

Despite the comprehensiveness of the term, improvement was sometimes a contested term. For example, Humphry Repton complained that 'the term had been reduced to a narrowly financial one, destroying that delicate blend of patrician interests Repton's own improvements were designed to enhance (Daniels and Seymour 1990 p499)'. In *Mansfield Park*, Jane Austen 'puts the word 'improvement' into the mouths of moral delinquents who wish to wantonly alter estates, to erase their long evolved and finely detailed social and aesthetic topography (*ibid* p500)'.

The degree of contestation over improvement differed depending on its context. Wilmot (1990) examined eighteenth-century agricultural literature and points out that the concept of 'improvement' in those literatures was generally identified with the 'Public Goods'. 'In the agricultural literature ... an elision is effectively made between landed estate improvement and economic, social, cultural and moral improvement in general (p40)'. Similarly, Slack (1999) and Burns and Innes (2003) consider the term 'improvement' less contested in the political context, especially compared with the term, 'reform'. Thus, the term, improvement, was used quite differently in various fields.

The urban environment was one of the fields in which the term, improvement, was often applied. Urban improvement can be divided into two types; private and public. The former is the improvement which was a result of accumulated changes made by individuals. The typical example was the formation of Georgian brick townscape. Jones and Falkus (1990) explore the replacement of wooden buildings with brick and tile buildings in the late seventeenth century and first half of the eighteenth century as an example of private urban improvement. They argue that the uniform townscape was often the results of the large-scale reconstruction of buildings after fires, which facilitated the construction of brick and tile buildings.

Dana Arnold (2005) explores early nineteenth-century change in London landscape, mainly focusing on large-scale development. She argues that the ruling elite brought their country estates' public display of taste, wealth and status into the metropolis, which resulted in stylistic and uniform streets and squares as well as the incorporation of gardens into the townscape. One of Arnold's case studies is Bloomsbury, newly developed streets in the north of London in the neighbourhood of St Pancras. Main landowners of the area were the Duke of Bedford and the Foundling Hospital and the large-scale speculative builder and architect, James Burton and S. P. Cockerell enabled the coherent planning. Although the stylistic and uniform streets were not the result of a fire as in the case of late

seventeenth century, large-scale development created an aesthetic townscape. This large-scale development not only resonates with estate management in terms of aesthetic aspect, but also in terms of economic considerations, especially long-term financial planning (p33).

While new housing development was often private improvement, re-development of townscape was usually a public enterprise. Arnold also examines the development of Regent Street. In addition to aesthetic aspects, it was an attempt of the state to create 'a north-south axis that bisected the metropolis (*ibid* p81)' partly employing compulsory purchase of land required. By creating a north-south axis, the travelling time between the Regent Park and Charing Cross was reduced by one-third. It not only facilitated the traffic but also had strategic meaning to control the metropolis.

Public urban improvements were usually brought by commissioners, appointed under an improvement act, which was a private act of parliament for an individual town (Reed 2000 p625). Jones and Falkus (1990) point out that although the details of urban improvement were much different from town to town, what Georgian urban improvement mainly changed was the responsibility of urban management. For example, paving and repairing, as well as lighting the street fronting houses were usually the responsibilities of individual householders before urban improvement, but such management became commissioned to paid officials and agency by local authorities. Similar changes took place not only in street management but also in cleaning streets, policing, water supply and sewage management. Moreover, during the second half of the eighteenth century, rate-levying powers and the improvement activities tended to be vested not in the traditional corporate and parish authorities, but in bodies of trustees, especially in improvement commissioners with names such as street commissioners, paving commissioners, or lamp commissioners. In order to found these bodies of trustees with revenues, private acts of

parliament for individual towns were usually obtained. It was because there were few corporations which had enough traditional revenue for the improvement (p137).

Jones and Falkus (1990) and Ellis (2001) appreciate Georgian improvement's general success. Streets were widened and lit with oil lamps or gas lights and water supply and sewage system was established. Of course, there were some difficulties. The success of improvements often depends on the enthusiasm of individual commissioners. Ellis points out that especially when a property was threatened, it was difficult to gain widespread support for public interests even from public-spirited citizens. Similarly, improvements were promoted unequally in Georgian towns. In addition to the difference in the progress of improvement between the areas for the rich and the poor, difference between new and old towns could be observed (Ellis 2001 p100). Moreover, improvements in the acts were not equally treated. Some improvements such as lighting were eagerly and quickly introduced into the main towns though often limited to the main streets, but varieties of clauses in improvement acts were not necessarily fully fulfilled (*ibid* p101).

Ellis argues that although Georgian urban improvement succeeded to some extent, 'the scale and pace of urban growth had simply outstripped the rate of improvement (*ibid* p105)'. However, if we take a close look, it is not necessarily such a simple story. Improvement sometimes changed urban culture and it could cause a problem. In fact, Ellis herself points out that the common sewers and newly available water-closets brought new environmental hazards (*ibid* p102).

Shoemaker (2004) examines orders and disorders in Georgian London public spaces, especially streets. The key change in legislation was the introduction of paid watchmen in London streets. However, Shoemaker argues that because of the employment of watchmen, Londoners became indifferent to the control of public spaces. Even when a crime took place, they no longer actively participated in the

capture and punishment of culprits. He claims that London's public spaces became more orderly during the eighteenth century not only because of top-down civilising process as usually argued but also because of the change in urban culture, especially among the lower classes. 'Londoners decided to avoid the mob and keep their interpersonal disputes private' in the late eighteenth century (p290).

Emily Cockayne (2007) examines urban filth, noise and stench between mid seventeenth and mid eighteenth centuries. In terms of the change in urban environment during the period, she points out that 'This is no simple story of progression (p231)':

Bodies and minds swiftly became used to improved conditions and wanted more. Previously overlooked nuisances were noticed as the threshold of decency changed. ... Some developments did create a more unpleasant environment. For example industrial expansion led to greater exposure to pollutants in many urban areas (*ibid*).

Cockayne argues that the central concern of the civic authorities in the seventeenth century was stench and infection and it shifted into passage and obstacles in the eighteenth century. In fact, 'A lack of genuine concern about pollution and contamination (in food, water and the environment) was evident throughout the period (*ibid* p244)', and therefore, despite the relevance of urban improvement to the argument of air pollution as a general context, eighteenth-century urban improvement was often nothing to do with the smoke abatement itself.

This thesis will argue that new infrastructure, which was introduced to improve the urban life, sometimes accompanied unexpected problems. Therefore, improvement was sometimes necessary in order to solve these problems caused by other improvement. In fact, the introduction of the steam engine, which was a key event in urban industrialization and deterioration of urban air quality, was also a part of general improvement.

2-3-3 Urban economy and industry

Although early nineteenth century northern industrial towns were well-known for their textile factories and metal-works, other Georgian towns did not necessarily lack manufacturing function. As Trinder (2000) argues 'Manufacturing for the population of a hinterland is a basic urban function (p806)'. There were shoemakers, tailors, cabinet makers and blacksmiths in towns and many of them appears to have experienced no kind of revolution between 1700 and 1840 (*ibid*). Similarly, trades using large and specialised buildings such as malting, corn milling and tanning were commonly seen in market towns.

From this view point, London was a manufacturing town. Schwarz (1992) *London in the age of industrialisation: entrepreneurs, labour force and living conditions, 1700-1850* analyses the 1851 census and argues that 'in 1851 the largest sector of employment was manufacturing, employing over 373,000 persons, thereby making London the largest manufacturing town in the country (p11)'. Barnett (1998) analyses fire insurance policies in order to examine industrial structure of London. As with Schwarz, Barnett argues that London was a major manufacturing centre and he emphasises the variety of trades as well as the variety in their scales. In terms of geography, some trades were located in particular places such as 'silk in Spitalfields and later Bethnal Green, tanning in Bermondsey and watches in Clerkenwell' but most trades were spread across the metropolis (p220). One of the focuses of Chapter 7, brickfields were located on the urban fringes of London (Trinder 2000).

Though towns always had manufacturing sectors as part of their functions, some towns attracted manufacturers far more than ordinary towns. Trinder (2000) categorises manufacturing towns mainly into three; textile towns, coalfield towns and metalworking towns. In the coalfield towns such as Newcastle-upon-Tyne and Sunderland, coal-using industries such as lime-burning, glass-making, salt-making and pottery manufacture were developed. In addition to these old coalfield towns, the development of canals and railways

usually in the third quarter of the eighteenth century made some towns abundant in cheap coal. These towns/ cities including Liverpool, Manchester, Birmingham, Coventry, Sheffield and Leeds were to develop into typical northern industrial towns and coal-using industries also flourished in these towns. Metalworking towns such as Sheffield and Birmingham were towns of small workshops during the long eighteenth century. Though a steam engine was first used for grinding as early as 1786 in Sheffield, '[it] did not cause dramatic change in the form of urban industry' and most enterprises were still small scale in 1840 (*ibid* p819).

Unlike coalfield towns and metalworking towns, textile towns became smoky only in the late eighteenth century. In terms of the urban industrialisation of a textile town, two unpublished PhD theses submitted to the University of Leeds in the 1970s provide very detailed information and analysis. These theses, M. F. Ward (1972) E. J. Connell (1975) provide a very detailed urban geography of Leeds industry by identifying basic information on individual factories. Their efforts to identify every factory in Leeds made their works valuable information sources of Leeds manufactories. In terms of geography, Ward and Connell reveal that most industries were located along the Aire and the stream of Sheepscar, which resulted in the rough formation of industrial belt around Leeds except for the north. Because coal was transported from the coal pit to the southern part of Leeds, coal-using industries such as potteries and foundries were concentrated in the south.

The development of urban areas during the urban industrialisation in Leeds is also examined by Beresford (1988). While Ward and Connell focus on the development of industrial buildings, Beresford focuses on the development of residential houses in Georgian Leeds. As its title, *East End, West End* suggests, Beresford explores the development of respectable residential area for middle-class in the west of Leeds and the development of houses for working class in east side. This geography of urban development is similar to London, probably partly

because the similarity in wind direction and a river current. However, because London was far larger than Leeds, 'Wealthy areas, with their intensive and seasonal demands for labour, generated their own poor hinterlands (Schwarz 1990 p329)'.

From the late eighteenth century onwards, the accelerated urban industrialisation increased the amount of smoke in northern industrial towns and cities as well as London. This thesis will argue that urban geography, especially the distribution of industrial areas and residential areas, is the key to analyse the smoke nuisance conflicts. Smokier atmosphere did not necessarily mean more conflicts.

2-4 Environmental History

2-4-1 Political environmental history

In his much quoted review article on environmental history, McNeill (2003) categorise environmental history into three varieties; material, cultural/ intellectual and political. According to the categories, this thesis deals with cultural and political environmental history.

Sörlin and Warde (2007) lament the lack of influence on history and other disciplines from the field of environmental history. They argue that sociological works by Ulrich Beck and Anthony Giddens caught the attention of policy makers in terms of environment, and their works shows that 'the concerns of environmental historians may be, potentially, much closer to the mainstream of thought in the social sciences and humanities than they might have expected (p121)'. They also point out the need to 'consider the roles of *knowledge* and *science* in relation to environmental politics (*ibid* p124)'.

McNeill (2003) also considers the roles of knowledge and science could be considerable. He criticises the largest-scale debate within cultural/intellectual variety of environmental history for its over generalised causal relationship between a religio-cultural tradition and environmental impact. Rather, he argues that 'Where intellectual and cultural environmental history makes its strongest contributions, to

my mind, is in mid-level generalizations that concern the impact of specific ideas or sets of ideas (p8)'.

Uekoetter (1998) argues that political environmental history could present a positive approach to environmental history. He criticises the tendency to illustrate history as negative progress, which often happens when historians focus on environmental degradation. Then, he criticises the rhetoric of 'on the one hand' and 'on the other hand':

The authors acknowledge positive aspects of the process of modernisation, but in doing so, they apparently feel compelled to add that the same process also created severe environmental problems. In this way, gains and losses are juxtaposed, but not discussed any further (p35).

As a solution, Uekoetter propose 'an organisational approach', which is basically political environmental history in McNeill's categories. The aim of the approach is to provide 'a useful analytic tool for understanding environment-related behaviour in modern history' by tracing 'the process of organising responses to perceived environmental problems (*ibid* p39)'. Uekoetter subdivides the process into six stages. Firstly, an environmental problem is defined:

As the second stage, the focus is on the possibilities for solving or mitigating the problem that existed within the scope of the actors. Naturally, these possibilities are not static; the process of organising environmental reform may frequently induce a search for new paths. Therefore, the range of reformative options stands in close connection with the third stage, the organisation of political support for reform. ... The fourth stage follows the political struggle about implementing the protagonists' proposals and ends with the decision in favour of one (or several) of the reformative options. The implementation of reform occurs at the fifth stage of the organisational process, and finally the sixth stage deals with the practical consequences and the impact of these changes (*ibid* p40).

Uekoetter's arguments concerning the possibilities of political environmental history are convincing. However, what may be called a 'cultural turn' of political environmental history has occurred in the last twenty years or so, which will be examined in the next section, and it makes Uekoetter's six-stage process unsatisfactory.

Despite its possibility, it should be noted that political environmental history is usually only possible for modern history, especially from the nineteenth century. For example, literature on filth and noise history which deal with earlier period, are less political than cultural. Emily Cockayne (2007) *Hubbub: filth, noise & stench in England, 1600-1770* deals with urban environmental and sanitation problems. She explores these problems such as bed bugs, dirt, noise, smoke and smell by quoting contemporary diarists and authors. It is true that perceptions of these problems are not only cultural matters but also political matters, but they were not necessarily seen as environmental issues at the time (p244).

Similarly, work on noise in history tends to focus on the cultural and social implications of noise. For example, Garrioch (2003), dealing with early modern European urban soundscape, argues that silence as well as sound was 'a privilege of authority (p18)'. Bailey (1996) also explores noise and silence in Victorian society. He argues that silence was the sound of authority, as well as disengagement, evasion and resistance. Even Payer (2007), the work dealing with modern 'antinoise campaign' in Vienna between 1870 and 1914, emphasises cultural and social perceptions of noise compared with literature on modern sanitation history and air pollution history which will be examined in the following sections. Although technological solutions such as suspensions for vehicles and rubber tires had frequently been proved successful, Payer concludes that 'When calling for individual reforms, antidin advocates often had been forced to admit defeat. However, by changing public awareness of the acoustic environment, their endeavors influenced not only the way that urban space was to be restructured, but also how this space was to be

perceived and used by the people living in the city (p790)'. As will be examined in Chapter 6, noise nuisance was difficult to abate compared with smoke nuisance.

2-4-2 The Cultural turn in Environmental History

More and more political environmental history deals with cultural politics. The pioneering comprehensive work on sanitation and pollution history is Anthony Wohl (1983) *Endangered Lives: public health in Victorian Britain*. It provides an account of the slow but gradual development of sanitation regulation as well as regulation concerning air pollution, water pollution and industrial diseases. It deals with both the culture and politics of these subjects. For example, in terms of class, the poor were blamed for their ignorance and insanitary practices but 'To many workmen cleanliness, after all, represented a surrender to middle-class pressures, to 'bourgeoisification' (p69)'.

Bill Luckin (1986) *Pollution and Control: a social history of the Thames in the nineteenth century* deals with water pollution in connection with sewage treatment and medical and lay theories on water-borne diseases. He points out that it was difficult to establish the view that water as medium to transmit some epidemics. Events which seemed to support the hypothesis that water transmitted some epidemics were sometimes deployed as confirmation of the primacy of atmospheric factors (p84). Luckin argues that 'there was no inevitable or incremental movement from 'ignorance' to 'enlightenment' (*ibid* p96)'. This confusion over causes of disease influenced sewage management. Luckin's argument shows that Uekoetter's six-stage process abovementioned does not necessarily work well. Uekoetter argues that an environmental problem first defined, and then, solutions are sought, followed by the politics to choose a solution. However, the confusion over the medical theory shows that the definition of problem directly influences the nature of the solutions proposed, and the definition itself is a politics.

Christopher Hamlin (1998) also shows how the definition of a problem is influential. Hamlin revised conventional evaluation of Chadwick's sanitary reform by arguing that the reform prevented poverty from becoming an issue. The claim that sanitary reform was the panacea for urban problems prioritized the construction of sewage despite the importance of other factors such as food, work and chronic disease. These works show that the story-line, which presents the definition of a problem and a possible solution, was the key to the Victorian sanitation politics.

Other recent work on political environmental history also emphasises this aspect. Nicholas Goddard (1996) explores how misplaced optimism about the potential worth of sewage as agricultural fertilizer was developed during the Victorian period. Urban protagonists believed that sewage could be transformed into a resource if they succeeded in carrying the sewage to agricultural fields. Although farmers soon recognised the impracticability of such scheme, urban protagonists could not easily abandon the scheme and largely ignored a number of operational problems. This case study suggests that once a story-line was established, it was often difficult to abandon it even when grave difficulties were found.

Tim Cooper (2008) deals with two different concepts on waste disposal between 1900 and 1950. Cooper argues that before 1914 'Concerns about hygiene, and the image of dust-destruction as a modern, progressive technology, fed into growing criticism of recycling as an incomplete means of disposal (p715)'. According to Cooper, it was 'refuse revolution' consisted of professionalization and municipalisation of waste disposal. However, wartime experience rediscovered the potential of waste as resources. Recycling technologies were developed but it was mostly not profitable in post-war Britain. Cooper also ascribes the failure of recycling scheme after the war to the cultural attitudes established by the 'refuse revolution'. '[I]n the wake of war it quickly became apparent that public perceptions remained strongly rooted in a view of waste as something

that needed to be got rid of quickly, and the attitudes of the 'refuse revolution' reasserted themselves (p731)'.

Cooper examines the culture and story-line of the 'refuse revolution' and how this caused difficulties in recycling, while Romain Garcier (2010) explores how manufacturers disabled the concepts of water pollution in nineteenth-century France at the time when no technically or economically sensible solutions were available. The appearance of the idea of water pollution meant that the phenomenon became visible. '[B]y weeding out the sources of complaints or buying silence, the industry took pollution out of the public and political debate and thus contributed to turning industrial waste flows into something that common sense would see as wholly normative (p142)'.

It is interesting that these three case studies, Goddard (1996), Cooper (2008) and Garcier (2010), share a condition that there was no easy remedy for a problem. Therefore, it was a key to form a public opinion, or discourse, to promote a remedy, as will be examined in next chapter. The understanding of cultural views is necessary to interpret environmental politics.

2-5 Air pollution history

Early literature on air pollution history focused on politics and policy, and from the 1990s, cultural aspects have also been emphasised. Most authors on air pollution history cover the Victorian period and afterwards because smoke abatement movement was activated during the period. Even though their time period is irrelevant to this thesis, this section examines scholarly works on air pollution history in order to show the change in methodology and provide a picture of the development of smoke abatement movement after 1830.

2-5-1 Smoke politics and culture

One of the early works on the subject of smoke in history is by Ashby and Anderson (1981). It deals with the formation process of British air pollution regulation especially focusing on its parliamentary politics from the nineteenth century to the 1970s. Ashby and

Anderson give a picture of slow but steady progress in air pollution regulation with steadily maturing public opinions on the air pollution issue. Brimblecombe (1990) also discussed how civic administration of York controlled air pollution in the second half of the nineteenth century.

Ashby and Anderson (1981) reveal that a technical matter of policy and regulation was key to the success of air pollution regulation. Difficulty in coping with smoke is compared with the relative success in the Alkali Act (1863). The Alkali Act laid down an emission standard of hydrochloric acid from alkali works and the regulation was possible owing to the remedy, washing gases with a stream of water. The principle of the Alkali Act was that the Alkali inspectors seek a cooperation from manufacturers rather than forcing them to remedy the pollution and an emission standard will be established only when technology provided reliable remedies. However, it was difficult to apply the method to coal smoke partly because of difficulties in presenting remedies, monitoring smoke emission and setting an emission standard.

Despite the emphasis on legislation and regulation, Ashby and Anderson mention the importance of cultural and social narratives. They argue that 'in the 1880s there was already a best *known* means to abate smoke from domestic hearths' but British people's preference to visible frame discouraged its application (p64). Ashby and Anderson's 'sociological obstacles' were explored by later air pollution historians, especially Mosley (2001).

The cultural turn of air pollution history started probably with Peter Brimblecombe *The Big Smoke* in 1987. Brimblecombe is a researcher on atmospheric chemistry and his speciality probably enabled the integration of several academic methodologies, not only historical account of air pollution politics. In addition to today's science such as climatology, chemistry and medicine, his study employed historical materials and literatures to integrate cultural, social and scientific aspects of air pollution. *The Big Smoke* is also exceptional in terms of

time period. It covers the period from medieval times to the 1970s. For example, Brimblecombe explores John Evelyn's pamphlet, *Fumifugium* (1661), which enumerated the negative impacts of coal smoke in London and proposed remedies. Brimblecombe examined some contemporaries who possibly influenced Evelyn's atomistic description on coal smoke's impact on human health.

Another piece which deals with *Fumifugium* is Jenner (1995). It emphasises the fact that Evelyn's pamphlet was published soon after the Restoration, and it was dedicated to the king. Jenner argues that *Fumifugium* has been misinterpreted as simply an early concern for environment, and 'it was a highly political text centrally concerned with Charles II's recent Restoration (p536)'. Jenner recounts how a dark cloud, sometimes a cloud of smoke itself represented falsehood, injustice and ignorance, in the Restoration period, whereas light represented justice, the sun, and the monarchy. Denton (2000) supports Jenner's emphasis on the political context, from the view point of a printer's intention and the imprimatur of *Fumifugium*.

Although Brimblecombe (1987) and Jenner (1995) deal with early cultural and political history on air pollution, most authors focus on the period from the nineteenth century onwards. In fact, 'pollution' is relatively a new term. Rome (1996) discusses the term mainly in American context (1865-1915) and points out that the term 'air pollution' was hardly used in its modern sense before the 1930s. Before the Civil War (1861-65) the term 'pollution' had moral implications, and in the second half of the nineteenth century it was used to describe the contamination by organic wastes. Air pollution caused by coal burning was usually described as 'the smoke nuisance', or 'the smoke problem', 'the smoke evil' and sometimes 'the smoke plague' (p6). Similarly, *Environmental History* published a few more works on air pollution though mainly in the American context. Stradling and Thorsheim (1999) compared American and British efforts to control air pollution (1860-1914) and Flanagan (2000) deals

with air pollution in Pittsburgh, from the context of civic movement, class and gender issues.

Mosley (2001) sheds a new light on the air pollution history by focusing on cultural and social narratives of smoke in Victorian and Edwardian Manchester. Mosley first examines how the culture and society was influenced by physical and material aspect of smoke and soot. Plants decorating public spaces were selected according to tolerance to the smoke. Suburban nurseries regularly provided fresh plants which replaced dying plants in urban environment. Elliott *et al.* (2011) also provides descriptions how plants were affected by urban smoke at the time. Conifers were more vulnerable to smoke than deciduous trees because they could not renew their leaves. Trees in the Derby Arboretum were affected by smoke from the adjacent industrial areas but no effort was made to abate the smoke.

After examining the impacts of smoke on urban life, Mosley (2001) explores several cultural narratives of Victorian smoke. Mosley argues that two opposite narratives can be seen in Victorian Manchester; 'wealth and well-being' and 'waste and inefficiency'. 'Wealth and well-being' shows positions of manufacturers as well as working class people. Smoking chimneys of factories indicated flourishing trade as well as employments and rising living standards. Similarly, in terms of domestic fires, traditional open fireplace was associated with 'the notion of human warmth, signifying love, friendliness, and a sympathetic, comfortable environment (p76)'. In addition, smoke was considered as disinfectant for infectious bad air. The other narrative was 'waste and inefficiency', which reflected beliefs of a 'middle-class, educated and professional elite (p89)'. Mosley argues that the narrative was made through the anti-pollution activism. Activists argued that smoke consuming devices and well-trained stokers could achieve saving on coal bills for manufacturers, in addition to saving on the costs of cleaning, washing and all other efforts to combat soot. When the fact that coal was not unlimited resources were noticed, 'readers of newspapers and magazines were regularly bombarded by

representations of the belching chimney as indicative of wasted money, energy, and natural resources (p96)'. Urban smoke was also associated with the physical, mental and moral degeneration of British city-dwellers and it posed a question about the future of the empire.

Mosley argues that compared to dominating 'wealth and well-being' narrative, 'waste and inefficiency' story-lines failed to recruit enough supporters. I will present, however, slightly different relationship between these two narratives in the context of Georgian smoke nuisance. In the early stage of smoke abatement campaign, it seems that 'wealth and well-being' narrative was rediscovered and strengthened in order to counter the emerging narrative of 'waste and inefficiency'.

One of the most recent additions to the body of literature on British air pollution history is Peter Thorsheim (2006) *Inventing pollution*. Despite its claim to cover the period since 1800, the focus is the Victorian period onwards. Thorsheim examines varieties of cultural views on smoke. It reveals that cultural views presented by Mosley (2001) have many variations in each category. Then, Thorsheim proceeds to the chronological accounts on smoke abatement. Even though basic storyline is not very different from Ashby and Anderson (1981) and Mosley (2001), Thorsheim also includes issues mostly neglected by air pollution activists. For example, gas promoted as a clean alternative to coal caused serious pollution in the process of production. Another example is that the goal of air pollution activism was to remove the black smoke but it did not necessarily solve the problem of sulphur dioxide.

Cultural views tend to be one of the main focuses of air pollution history. Of course, there are other aspects in air pollution politics and next section will examine legal actions and laws concerning air pollution.

2-5-2 Legal history and the common law

Although legal actions could have been one of the important ways to solve smoke nuisance, authors on British air pollution history do not deal with the issue substantially. Mosley argues that the Victorian smoke abatement campaign was rather a failure especially in terms of legal actions:

However, at a time when the science of smoke prevention was becoming better understood, the laws prohibiting air pollution were weakened rather than strengthened, slowing the adoption and development of innovative, cleaner technologies. Furthermore, the increasing use of the doctrines of 'prior appropriation of land' and 'social-cost balancing' by Britain's judiciary resulted in heavy industry becoming concentrated in specific districts, such as factory-dominated Ancoats, where polluters could be shielded from 'ruinous' law suits (Mosley 2001 p184).

Works on legal history basically support Mosley's view. They argue that the common law of nuisance could not effectively cope with Victorian industrial expansion. Brenner (1974) examines the common law of nuisance in the 1850s and 1860s including air and water pollution¹. Brenner argues that before the mid nineteenth century, a plaintiff only needed to show that he had been injured by the defendant's conduct regardless of the importance or necessity of the defendant's activity. It had a zoning function because polluting industries could be closed down and forced to move. However, the consideration of 'the importance of the offending activity and the manner in which the defendant carried it on (p410)' started to invade in mid century. Brenner also argues by examining *St. Helen's Smelting Co. v. Tipping* case in 1865 that when industrial rather than

¹ When arguing about common law of nuisance, it is important to understand that most plaintiffs seek monetary compensation for the caused damages rather than the suspension of industrial operation. It was because the process was simpler and there was no requirement that the parties be freeholders. Of course, it was possible for a plaintiff to seek an injunction in equity, but this was rare (Brenner 1974).

small-scale nuisance was the issue, the acknowledgement of damage was very strict.

The other main literature on nuisance law history is McLaren (1983). He examines English common law of nuisance during the period 1770-1870 including nuisances concerning air and water. He basically agrees with Brenner in terms of the change in legal doctrines. Until the end of the eighteenth century, 'the predominant thought was that a plaintiff, especially a residential occupier, had a pre-eminent claim to protection (p169)'. However, there was 'a shift to a doctrine of prior appropriation (*ibid* p171)'. If a polluting industry had already started its operation before a plaintiff came or the residential character of the neighbourhood established, the defendant was entitled to protection. A trend back to the older and stricter notions of responsibility started in the 1830s until the 1850s brought a further period of reassessment, which was the introduction of reasonableness.

Although McLaren agrees with Brenner that English common law of nuisance could not cope with industrial expansion very well, McLaren does not ascribe it to the flaw in legal theory as Brenner does. Rather he argues that one principle did not dominate the period between 1770 and 1870 and judges show different opinions from one another. Instead of flaws in legal theory, McLaren points out that the cost, difficulty in establishing a clear link between pollutant's activity and damage, and other social obstacles, caused the dearth of nuisance cases during the period.

Although arguments made by McLaren and Brenner are helpful to understand legal history on air pollution, there are two problems with their interpretations. One is the negligence of other issues, especially the development of air pollution abatement technology though it is understandable considering their legal interest. The other problem deserves more attention. The central assumption of McLaren's article, and in fact, other work on nineteenth-century air pollution legal cases is that 'On the average in a ninety-year period there were one or two actions for air pollution every ten years (McLaren 1983 p160)' in the

courts of the Common Law. Based on the assumption that the number of air pollution cases was limited in the nineteenth century, McLaren and Brenner set a research question, why did not the common law of nuisance work better despite its potential? However, this thesis will show that dozens of plaintiffs resorted to the common law of nuisance at least in the 1820s.

In fact, recent work by Leslie Tomory (2012) reveals that 'gas companies were repeatedly named in nuisance lawsuits that they lost, forcing them to modify the worst aspects of their pollution' during the period between 1812 and 1830, in contrast to the claims by historians that 'there was hardly any legal action, in the courts or by Parliament, taken against industrial polluters, and almost none of these was successful (p29)'. Tomory argues that the reason why lawsuits against gas companies have been neglected by historians is because 'These cases did not appear in any published law reports (p35)'. Instead of published law reports, Tomory reveals the existence of lawsuits mainly based on contemporary newspaper reports. As next chapter on methodology will argue, similar phenomenon can be observed concerning smoke nuisance cases. However, Tomory still supports the argument that nuisance litigation was rare during the period, especially for industrial pollution apart from gas companies' cases. Despite Tomory's claim, this thesis will show that gas companies were not actually an exception in terms of experience of nuisance trials.

Manchester seems to be the first town to have made efforts to abate smoke including legal actions. Bowler and Brimblecombe (2000) deal with police commissioners' involvement in smoke abatement in early nineteenth-century Manchester and the prosecutions at Manchester's Court Leet. This work specifically focuses on policies and politics. Future researchers may examine cultural aspects of the early efforts and may reveal how Manchester inhabitants developed the idea of smoke abatement.

In terms of Manchester Court Leet, Mosley (2001) also reveals that it was active in dealing with smoke nuisance in 1801. Although most ancient local courts had died out in England by the time, the Court Leet of the Manor of Manchester survived until 1846. However, it was active in smoke nuisance cases only for a short period:

Between 1802 and its last meeting in 1845 the Lord's Court prosecuted, on average, just one or two smoke nuisance cases yearly, with the fines it imposed becoming progressively lighter over the decades (p137).

This phenomenon, sudden enthusiasm for legal actions which died out quickly, was similar to what happened during the 1820s. It suggests that Ashby and Anderson's argument on 'the danger of relying on prosecutions' has some relevance. They point out that 'zeal to prosecute would have created a spirit of opposition among manufacturers which could have alienated the trade against the whole idea of abating pollution (Ashby and Anderson 1981 p39)'. This thesis will explore this phenomenon and show that the smoke abatement movement was not linear process. Success was not necessarily followed by another success.

2-5-3 Smoke nuisance in Georgian urban history

Compared to the accumulation of literature on nineteenth and twentieth-century air pollution, there are relatively few works on the air pollution focusing on Georgian period. One of few works which covering the period is Brimblecombe (1987), as abovementioned. In addition to literature on air pollution history, Georgian urban history sometimes includes descriptions on smoke nuisance.

Sweet (1999) deals briefly with air pollution in the context of Georgian urban history and gave examples of smoke nuisances from the late eighteenth to early nineteenth centuries:

Visitors to towns such as Bristol, Birmingham, Liverpool and Swansea always commented adversely on the pall of smoke which

hung over these places. Although the Liverpool doctor, William Moss, in his *Medical Survey of Liverpool*, proclaimed the antiseptic qualities of the effluvia of coal and sulphurous smoke, he was fighting a rearguard action. More typical was the visitor to Bristol who deplored the 'great number of glass houses, whose high chimneys look like so many towers, and whose continual smoke not only darkens the city, but also conveys a very noxious effluvia to the inhabitants' (p89).

Similarly, Thomas (1983) provides a short description of smoke nuisance. It gives examples of nuisance descriptions from Sheffield, Newcastle and Oxford. These descriptions give the impression that urban inhabitants were well aware of smoke nuisance throughout the Georgian period. However, Sweet's examples are all from early nineteenth century except for Moss's book, and this thesis will show that urban population was relatively indifferent toward smoke nuisance in the eighteenth century. A comprehensive account of the Georgian smoke nuisance is needed to contextualise these individual references to smoke at the time.

Although air pollution historians tend to focus predominantly on Victorian air pollution, some authors mention Michael Angelo Taylor's smoke abatement act in 1821, which is the focus of this thesis. For example, Brimblecombe (1987) and Ashby and Anderson (1981) mention the Act, but their evaluation of the Act is not high. Ashby and Anderson (1981) provide a five-page summary of Taylor's act mostly based on parliamentary papers:

There is no way to tell whether Taylor's Bill made any difference to the pall of smoke over England. Parkes, speaking twenty years later, said that it had 'frightened the manufacturers; and for a while it frightened them into the adoption of my plan; the pressure from without (if I may say so) produced some good to me, and to them too...' So locally—and perhaps particularly in London—the new law may have had some visible effect but only as a deterrent; it was not put to the test in the courts, ...(pp. 5-6).

Similarly, Brimblecombe writes that 'It was so weak, however, that it probably had little effect on the air pollution in London (p101)'. This view is generally adopted by historians. A recent example is Leslie Tomory (2012) who describes the act as 'a minor and ineffective act (p30)'. These descriptions cast doubt on the impacts of Taylor's Act not only in terms of material reduction of smoke but also in terms of real social impact.

However, the main argument in this thesis is that Taylor's Act had social impacts which were manifested in terms of Yorkshire smoke abatement meetings, smoke nuisance cases and also debates over and the implications of the installation of smoke abatement technology. Basically, however, the point is made that the Act is not likely to have noticeably reduced the urban smoke per se. By examining smoke nuisance during the period, however, this thesis hopes to provide a more detailed picture of Georgian urban smoke nuisance.

2-6 Conclusion

This chapter has explored literature in several sub-disciplines. This has helped contextualise the smoke abatement campaign in the 1820s. For example, the early nineteenth-century smoke abatement campaign has not been properly explored yet, and this thesis will argue that the generally accepted claims that Taylor's Act (1821) had little social impact and the early nineteenth century saw few lawsuits concerning smoke nuisance, should be revised. In this sense, it will shed a new light to air pollution history and also Georgian urban history.

In addition, the thesis will contribute to the further development of political environmental history by introducing theories and analytical methods developed in other disciplines such as landscape studies and the geography of knowledge. Work on the relationship between cultural narratives and politics developed in landscape studies and work on the importance of credibility, place and site in knowledge

production help to frame the phenomena observed in the smoke abatement campaign in the 1820s.

Chapter 3 Methodology

This chapter is divided into two sections. The first will explore arguments made by historians and geographers on the use of archives and will present an outline of the analytical method this thesis will employ. The methodological arguments on archives have been accumulated by geographers partly because of the notion that archives are sites of knowledge production. Therefore, it is generally argued that it is important to take note that archives are not neutral sites where knowledge is produced and stored. In addition, texts are not neutral productions and they also conceal politics. This section will also examine two sorts of discourse analyses in order to clarify what this thesis wants to achieve.

The latter half of this chapter will explore methodologies used in dealing with each of the sources used in this thesis. The development of digital resources as well as two substantial records on smoke nuisance trials greatly facilitated the research for this PhD project. In addition, this thesis will use visual images as one of the important sources of research.

3-1 Methods of analysis

3-1-1 Archives as sites of knowledge production

Archival materials are the foundation of historical research. Osborne (1999) argues that the archive 'functions as a sort of bottom-line resource in the carving-out of claims to disciplinarity (p53)'. Historical research almost always relies on archival sources to explore the past. However, despite their necessity in historical research, it should be noted that archival sources are not necessarily an unproblematic foundation of research.

In fact, 'Many scholars ... have come to understand the historical record, whether it consists of books in libraries or records in archives, not as an objective representation of the past, but rather as a selection of objects that have been preserved for a variety of reasons

(which may include sheer luck) (Manoff 2004 p14)'. There are two main arguments over the archival construction. One argument is that archival collection reflects political power and the other is that archival collection is a result of haphazard accumulation of records.

Michel Foucault is often cited as a theoretical foundation for the former claim (For example, Hamilton, Harris and Reid (2002)). This claim is often made in connection with colonial as well as national archives. For example, 'Postcolonial scholarship has demonstrated how the colonial archive was shaped by the aims of its creators (Manoff 2004 p16)'. However, this claim is often made in order to overcome the distortion. Not only postcolonial subjects but also feminism adopts the strategy. 'In women's studies, for example, a considerable amount of scholarship has been devoted to redressing the limits of the official record (*ibid* p15)'

Although the claim that the construction of archives reflects political power is true enough, it does not explain every aspect of archive construction. Withers (2002) argues that 'I do not see the archive as a straightforward expression of power. It is, at least in my experience, the result of contingency, of the haphazard accumulation of 'stuff' ...rather than of pre-ordained governmental scrutiny (p305)'. Rubbish, waste and mass-produced products are often considered to be valueless but its collection could be valuable in the future. They are valueless according to the value regime which is adopted in most archives such as 'a respect for the 'official' (documents produced by public bodies), a recognition of individual creativity (the notes of novelists, the prints of well-known photographers), and a need to document the key events in a place's history (the newspaper clipping files) (Cresswell 2012 p174)'. Although the value regime certainly reflects political power, valueless materials and records could be brought into the archival storage by haphazard processes.

Archival collection which reflects past political and social power does not necessarily have a strong impact on current academic debates. Morin (2010) examines the unpopularity of Charles Patrick Daly's

papers among modern geographers. Daly was a well-known nineteenth-century geographer, the president of the New York-based American Geographical Society for thirty five years but modern scholars have not shown much interest in him. Because Daly was not a minor figure who needs to be rediscovered from distorted archival records, Morin argues that 'Daly's unpopularity seems mostly to do with views of him as uninteresting or irrelevant to geographers today (p537)'.

What Morin argues can be applied to this thesis. Two of three case studies in this thesis heavily rely on trial records created for a successful merchant/manufacturer, Gott, and a powerful and rich aristocrat, the Duke of Northumberland. It is true that these records are now available because they were created and stored for powerful figures, especially in the case of the Duke's trial records. However, it is also true that these records are almost neglected by scholars except for short references to them². The neglect is probably inevitable in the case of the Duke's trial because the trial record is stored in a private collection at Alnwick Castle in Northumberland. However, in the case of Gott's trial, the record is stored in a public archive and the existence of the record is known. It is likely that the trial record would have attracted more attention if it was created for the prosecutors rather than the polluter, Gott.

Even though these trial records were created for a particular side of the parties, it does not necessarily mean that this thesis will only reconstruct the claim made by the particular parties. The trial records directly and indirectly show their opponents' views, too, and these views are also important when examining causes of successes and failures of the first air pollution abatement campaign. Osborne (1999) argues that 'The archive is there to serve memory, to be useful, but its *ultimate* ends are necessarily indeterminate (p55)'. Rose (2000) writes about her disagreement with an archival catalogue's

² Beresford (1988), Clowes (1953), Daniels (1981) briefly refer to these trials.

description over the interpretation of photographic collections and says that 'For a researcher too wants to make meaning, wants to tell a story about what the archive holds that has not already been told; that is the point of going there after all (p565)'. The trial records tell far more than original owners' claims. The bias in these records can be used to present a picture of smoke nuisance conflicts in the 1820s.

3-1-2 Textual analysis and discourse analysis

It may be argued that textual analysis gained importance with the recognition that representations and images dominate our culture. ... Texts are inescapably political, and an engagement with them is about effecting change, perhaps through elaborating new meanings or perhaps by representing resistance to dominant narratives (Aitken 2005 p234).

Textual analysis is based on an idea that texts do not mirror reality but reflect hidden power politics and ideologies. Typical examples of these ideologies are imperialism, sexism and capitalism. Therefore, Marxism, feminism and post-colonialism are often used as a tool to interpret texts. Many researchers further argue that the texts which are distorted by power politics and ideologies are also the reality, which can eventually influence social, political, cultural and material realities.

This argument on textual analysis resonates with the landscape studies explored in the previous chapter. One of the principal arguments of landscape studies is that landscape tends to conceal the negative aspects of dominating ideology. It means that the basic ideas of textual analysis can be applied to visual images, too. In fact, one of the several metaphors for landscape is 'text':

The text of landscape conveys and cements certain ideological narratives about the organisation of society and relationships between culture and nature. 'Reading', therefore, is not an innocent, free or whimsical activity. Instead the metaphor of landscape-as-text calls attention to ways in which particular,

dominant readings are expressed and reproduced by powerful cultural elites (Wylie 2007 p72).

Therefore, Wylie argues that the role of cultural geographers is to reveal the structure which reproduces the power relations and to provide alternative reading. In this sense, textual analysis and visual analysis resonate each other.

Though this thesis generally uses textual analysis to interpret source materials, it especially utilises discourse analysis, which can be positioned within the range of textual analysis. Doel (2010) deals with discourse analysis in his introductory chapter on textual analysis:

A discourse is a specific constellation of knowledge and practice through which a way of life is given material expression. It engenders a discourse-specific (i.e. partial and relative) incarnation of the world that tends to become both naturalized and taken for granted. When writers draw attention to these material and immaterial constellations of knowledge and practice, they usually do so in terms of the social and spatial power struggle between 'dominant discourses' on the one hand and 'discourses of resistance' on the other. Discourse analysis discloses how this constellation of knowledge and power is structured, and situates it within its appropriate social, cultural and geo-historical context (pp. 490-1).

Doel refers to Allen and Pryke (1994) as a good example of discourse analysis. They explore how the space of the City of London is dominated by the coded practices of financial sector though they do not use the term, discourse, in the paper. The paper argues that spatial codes of other workers such as cleaners, catering workers, and night guards are 'excluded from the formal representations of [financial sector's] space (p471)'.

Doel's description on discourse analysis suggests that that there are roughly two types of discourse analysis. Allen and Pryke's point that the space is experienced differently by each group of workers should

be noted, but what this thesis intend to do using discourse analysis is slightly different from it. While Allen and Pryke examine coded practices, or mundane practices, some scholars examine discourses which encourage policy change as will be examined later. Both discourse analyses are derived from Foucault's methodology but the former is more strictly Foucauldian. Therefore, I now want to briefly examine discourse analysis which focuses on mundane practices.

3-1-3 Discourse as a mundane practice

Foucault deals with the concept of discourse as one of the main subjects in *The Archaeology of Knowledge*. In discussing the discourse of madness, he notes:

The unity of discourses on madness would not be based upon the existence of the object 'madness', or the constitution of a single horizon of objectivity; it would be the interplay of the rules that make possible the appearance of objects during a given period of time: objects that are shaped by measures of discrimination and repression, objects that are differentiated in daily practice, in law, in religious casuistry, in medical diagnosis, objects that are manifested in pathological descriptions, objects that are circumscribed by medical codes, practices, treatment, and care (1972 pp. 32-33).

According to Foucault, madness is not a concept that exists because there is such a conditions, 'madness'. Madness is rather shaped by 'measures of discrimination and repression', which is embodied in mundane practices, law and medical theory. Discourses on madness enable the existence of madness. Nick Fox, a sociologist, argues that 'For Foucault, the term 'discourse' referred both to the historically contingent sets of practices (for instance, the practices which constitute clinical medicine) which limit human actions and what may be thought, *and* to the theoretical concept which accounts for the fact that humans actually do act and think in line with these 'regimes of truth' (for instance, that people do—by and large—co-operate with a

clinical gaze which turns them into patients) (1998 p417)'. Although Foucault later emphasised the positive aspect of power, his discourses are generally understood as suppressive. He focuses on the power emanating from mundane practices which govern what can be said and done (Power 2011). Therefore, Foucault's discourses are often understood in relation with the institutions such as hospitals, schools and prisons.

If what Allen and Pryke (1994) examined in relation to the financial space of the City of London can be interpreted as discourse analysis, their analysis is Foucauldian. Similarly, Pratt (1999) examines discourses on Filipina domestic workers in Vancouver, which are suppressive mundane practices. However, most discourse analysis which examines policy change is slightly different from Foucault's methodology. In fact, my methodology is more close to what Bruno Latour examined in *The Pasteurization of France*, a similarly which I discuss below.

3-1-4 Discourses which encourage policy change

Although I interpret Bruno Latour's methodology in *The Pasteurization of France* (1988) as discourse analysis here, it is not generally considered as discourse analysis. Latour is usually labelled as one of the founders of the Actor-Network theory. However, I argue that the discourse analysis which examines policy change resonates with what Latour explored in *The Pasteurization of France*. In the work, Latour describes how one of the founders of medical microbiology, Louis Pasteur's trust was used to promote hygienists' intention:

What the microbe and the transformation of microbiology into a *complete* science did was to make long-term plans of sanitization *indisputable*. They offered, literally, a real guarantee of municipal investments. How could the hygienists convince city councils to throw themselves, for instance, into a public drainage program if there were still any dispute "in high places" as to its harmlessness? ... We now see why the hygienists placed so much

trust in Pasteur, rejected all controversy about him, and generalized his results (pp. 54-55).

In order to promote hygienists' reform, which was one of the new policies, it was necessary to make the plan indisputable utilising Pasteur's authority, and this process can be interpreted as discourse creation process.

Interestingly, the subject Latour deals with in *The Pasteurization of France* is very similar to works examined in environmental history section in the previous chapter. Hygiene and environmental policies are needed to be promoted with a support of scientific authority because it does not produce obvious monetary profit. The particularity of the theme became clear when compared to innovative engineering machineries which potentially produce profit. These machineries do not need to be forced for factory owners because it is their choice to take a risk and use money to try one or not. However, a potential solution to environmental problems and hygiene problems often needs to be supported by public opinion and movement to enforce it.

In fact, discourse analysis on policy change is widely used in the field of environmental policy and politics. For example, Dryzek (1997) analyses four environmental discourses; environmental problem solving, survivalism, sustainability and green radicalism. It shows that this kind of discourse is interpreted as narrative, whose power sometimes changes policies. Of course, this kind of discourse analysis is not only limited to environmental policy field. The change in agricultural policy (Dixon and Hapke 2003) and the introduction of 'third way' politics (Haylett 2001) can be examined using it.

Discourse analysis in environmental studies presents a different understanding of environmental politics from conventional environmental studies. For example, Hajer (1995) examines the politics of acid rain using discourse analysis. He argues that 'the new environmental conflict should not be conceptualized as a conflict over

a predefined unequivocal problem with competing actors pro and con, but is to be seen as a complex and continuous struggle over the definition and the meaning of the environmental problem itself (pp. 14-5)'. In other words, Hajer argues that the definition of an environmental problem often implies possible solution and the definition itself has power. This view is very different from Uekoetter's six-stage process examined in the previous chapter. As mentioned, Uekoetter presents a view that an environmental problem is first defined, and then, different institutions search for a possible solutions for the defined problem and make a struggle over the solution options. Uekoetter's six-stage process seems to be useful for policy makers. Discourse analysis reveals different aspect of environmental politics and as examined in the literature review, recent works on environmental history and hygiene history tend to adopt similar approaches.

However, work on environmental discourses tends to adopt a slightly different approach to my own. They often deal with different environmental discourses and analyse the interrelations among such environmental discourses (Mühlhäusler and Peace 2006; Benjaminsen and Svarstad 2008). Unlike these works, I am interested in the relations between an environmental discourse and an anti-environmental discourse in modern sense. This thesis focuses on antagonism between discourses than similarities and coalition.

Despite my attention to differences in discourse analysis in order to clarify my position so far, fundamental ideas of discourses are generally shared. Barnes and Duncan (1992) argue that 'discourses are both enabling as well as constraining':

they determine answers to questions, as well as the questions that can be asked. More generally, a discourse constitutes the limits within which ideas and practices are considered to be natural; that is, they set the bounds on what questions are considered relevant or even intelligible. These limits are by no means fixed, however.

This is because discourses are not unified, but are subject to negotiation, challenge and transformation (p8).

In fact, it seems that two different discourse analyses can be applied to different stages of policy change in terms of environmental policy. For example, in order to maintain air quality, it is necessary to establish bureaucratic system of monitoring and controlling pollution in addition to the technology which enables such bureaucratic system. In other words, in order to maintain air quality, it is necessary to incorporate proper sets of technology and conducts as mundane practices to institutions and everyday life. This argument resonates with discourse analysis on mundane practices but it cannot be applied to the emerging stage of air pollution history. In fact, such bureaucratic systems and technologies were unthinkable for early nineteenth-century smoke abatement campaign and they are not at all mentioned in this thesis. It seems that in the early stage of environmental policy formation, it is necessary to create discourse, or narrative, which has a power to form a public opinion. This chapter now moves on to an examination of the sources, which made it possible to conduct discourse analysis.

3-2 Sources

The main sources this thesis used were trial records, visual images, newspaper articles, Parliamentary Papers and several contemporary pamphlets. This section examines the particular sources and the methodologies adopted in dealing with them.

3-2-1 Trial records

Trial records are rich sources for social history. For example, criminal cases can be effectively used to reconstruct the lives of social groups whose records are often not left in the forms of letters, diaries, and biographies (for example, Vickery 2009; Shoemaker 2004). Although this thesis deals with nuisance cases which do not directly involve underrepresented social classes, most witnesses of these cases are from working classes, especially servants. Witnesses tell juries and

judges about their views of smoke as well as fraction of their lifestyles. As a result, it has been possible to present a picture of smoke nuisance from different points of view.

However, trial records do raise particular problems as a source of historical research. Claims from a plaintiff and a defendant were often contradictory as would be expected but because of this it is of course difficult to confirm what actually happened. Strange (1998) explores Canadian capital case files and argues that it is not possible to reconstruct the truth. What she has done concerning a case of infanticide was the reconstruction of narratives from different point of views. One view was that unmarried young female servant was seduced by an ill intentioned married man and forced by him to abandon her baby and the other view was that a happy family was torn because of a bad woman:

File contents allow historians to trace how various players attributed meanings to particular aspects of cases, both those that emerged during trials and those previously undisclosed (p33).

A similar strategy is adopted by Davis (1987) when he examines royal letters of pardon and remission in sixteenth-century France. Davis argues that he focuses on fictional aspects of these letters, or 'the crafting of a narrative (p3)'. This thesis will employ a similar strategy to interpret the trial records and focused on the reconstruction of both narratives claimed by a plaintiff and a defendant.

However, it is also important to reconstruct what really happened based on both sides' claims. Indeed, it is not completely impossible to reconstruct the actual events and evaluate the validity of each party's claim to some extent. For example, it is not unreasonable to assume that a witness's detailed description of factual observation without objection and obvious doubt is not a lie, though could be exaggerated or misunderstood. If a similar observation has been made by another witness, the observation carries more credibility. By showing grounds

for evaluation, such as quotes from multiple witness's observations, I was able to evaluate each party's claim.

The main materials of this thesis draw on two substantial trial records; *Rex v. Gott and others* and *The Duke of Northumberland v. Clowes*. These legal records were private records created for a defendant in the former case and a plaintiff in the latter case. Instead of focusing on legal argument as legal history, this thesis will examine the contexts of each case with reference to, for example, the level and scale of industrialisation, the geography of the smoke nuisance, the social status of plaintiffs and defendants. The circumstantial information on each trial tells us much about early nineteenth-century smoke nuisances.

This approach is possible because these two trial records are substantial legal documents created for Gott and the Duke. Most legal history works usually examines legal manuscripts and books on leading cases. Compared to these materials, the two trial records provide detailed information on the case. Gott's papers are stored in two boxes and the Duke's papers are in one box. In fact, this amount of materials is far more than the official trial records stored in The National Archives and local records offices.

The character of the two trial records examined in this thesis differ from each other. The trial record created for Gott in Leeds is mainly composed of attorney's notes on possible witnesses' interviews, drafts of brief based on possible witnesses' interviews and the completed brief. They were originally in an attorney's possession and now stored in West Yorkshire Archives. There is evidence supporting Gott, with a few exceptions which were potentially disadvantageous and were not actually used at the trial. One of the main advantages of this material is that it is possible to show opinions on the smoke nuisance from different people through different kind of information sources. The trial records not only include testimonies from different witnesses, mainly Gott's workers and neighbours but also include different levels of legal documents' drafts, which made it possible to reconstruct the

selection of pieces of evidence by attorneys. In addition, a bias towards Gott can be balanced, to some extent, by the transcript of the trial stored at the Special Collections in the University of Leeds. This printed transcript is not a full transcript of the trial but records testimonies from witnesses against Gott. In addition, a local newspaper, *The Leeds Mercury*, reported the local smoke abatement campaign, which shows the claims by plaintiffs.

Gott's trial record was hand-writing. While briefs, which were written as formal legal documents, were relatively easy to read, notes which were not neatly written were challenging to decipher, especially for a non-English-native speaker.

The existence of Gott's trial record is well known among researchers but the records have not been fully examined. One of the key pieces of literature on Leeds history, Beresford (1988) *East End, West End* refers to the trial record and the online catalogue of West Yorkshire Archives contains the information on the record. However, manuscripts stored in two boxes lack reference numbers other than the one attached to the whole item. It means that these manuscripts have not fully examined at least by modern scholars and archivists so far.

On the other hand, the existence of the Duke's trial record has not been widely known to researchers. It is stored in the archive at Alnwick Castle, a residence of the Duke of Northumberland:

The archives of the Duke of Northumberland at Alnwick Castle form one of the largest archival holdings in private ownership in the country. The records range in date from the 12th century to the present, and the bulk of them document the management of the estates belonging to the Percys, comprising title deeds, rentals, surveys, mapping, manor court papers, legal papers and accounts (Alnwick Castle website).

Because it is a private archive, there is no online catalogue, and therefore, I first knew the existence of the trial record only after I

made inquiry to the archive. The trial record created for the Duke of Northumberland is mainly composed of four documents: 'Brief for the Plaintiff', 'Brief for the Plaintiff on the Reference', 'Further Observations' and two-volume trial transcript. Briefs, basic legal documents, are held in both trial records of Gott and the Duke, but the main difference is that the Duke's trial records do not include any attorney's notes and drafts. The Duke's trial record is the finished product given to the customer. 'Brief for the Plaintiff' was created first, and then, 'Brief for the Plaintiff on the Reference' is made. The two-volume trial transcript is supposed to be word-by-word record of the trial based on short-hand record, which includes casual conversations among lawyers, the judge and juries. 'Further Observations' are created and submitted after the trial. These four documents make a reconstruction of the chronological changes in views of Duke's side.

The Duke's trial record is especially interesting because most witnesses for the Duke were the Duke's servants and employees. As abovementioned, some scholars examine legal records in order to give a picture of lower-class life, which is not recorded in most archival materials. Similarly, the Duke's legal documents are created mainly based on testimonies given by lower-class people, which reveal their reaction to smoke nuisance.

The biggest problem in the Duke's trial record is the lack of the plaintiff's voice. Unlike Gott's trial records, whose bias could partly be balanced by the other sides' claims, in the case of the Duke's trial record, the defendant's view is only available through letters quoted, cross-examinations at the trial and the final speech by defendant's barrister recorded in the trial transcript. There are no other manuscripts which show the defendant's view. Therefore, it should be noted that the case study is written mainly from the view point of plaintiff despite my efforts to balance the plaintiff's claim by picking factual comments.

In addition to smoke nuisance trial records, other related materials such as the third Duke's letter books, plans of the Northumberland

House (1853) and account books stored in the Collections and Archives department at Alwick Castle have been utilised³. It was a pleasant surprise to find out that the duke's letter book contains a short letter from Clowes, the defendant whose steam engine annoyed the Northumberland Household.

The trial records are rich information sources of early nineteenth-century smoke nuisance. The range of witnesses' social origins and the detailed descriptions of smoke nuisance and smoke abatement efforts are helpful to give a picture of smoke abatement campaign in the 1820s.

3-2-2 Newspapers

The development of digital newspaper archives made it possible to identify dozens of smoke nuisance cases in the 1820s. Although two sets of detailed trial records are available, it is necessary to contextualise each case within other smoke nuisance cases. It was found out that these two court cases were not exceptions in terms of smoke nuisance cases.

I relied on the digital newspaper sources including '19th Century British Library Newspapers', 'Burney Collection: 17th-18th Century Newspapers' and 'The Times Digital Archive' when collecting articles on urban coal smoke. Though not all Georgian newspapers are digitised, leading London newspapers are available and *The Leeds Mercury* is also digitised from the publication of 1807. I conducted search for the word 'smoke' in these newspapers.

Newspaper articles on smoke nuisance are sometimes the only available sources of particular events. For example, records on Leeds Quarter Sessions, which are stored in West Yorkshire Archive Service, Leeds branch, are missing for the relevant period of this thesis, and

³ The plans of Northumberland House are very interesting. For example, though the plan of the basement floor is not used in this thesis, it includes storage of various food, wine, coal and water closets, which revealed much about servants' life in Northumberland House.

newspaper articles are the only sources to show that several smoke nuisance trials were initiated at the time. Similarly, most newspaper articles on London smoke nuisance cases are the most detailed sources on the cases.

When analysing these newspaper articles, it is important to know how newspapers reported court trials. One of few examples of such literature is Barfoot (1996). Barfoot examines how a treason trial which took place at Maidstone, Kent, was reported in London in 1798 and reveals that three newspapers, *The Times*, *The Morning Chronicle* and *The Morning Post* shared the account of the trial. In other words, articles of three newspapers were written based on one transcript of the trial. Similar phenomenon is observed concerning a smoke nuisance trial. The similarity of reports on the court case, the Duke of Northumberland v. Clowes between *The Morning Chronicle* and *The Times* shows that their articles are edited based on one transcript. However, Barfoot could not reconstruct how newspaper editors arranged it. 'There remains the central mystery of the reporter: what kind of arrangements were made to ensure that all three newspapers, at greater or shorter length and with slight variations only, printed the same account of the trial? (ibid p50)' However, the similarity in newspaper reports is not the phenomenon which is always observed. In addition, it does not mean that newspapers did not reflect their views when reporting court trials because newspaper editors edited the transcript respectively.

Because newspaper articles reflected editors' views, articles published in different newspapers can be compared in order to present a balanced picture. Several London newspapers including *The Times*, *The Morning Chronicle*, *The Morning Post*, *The Examiner* and *The Standard* are digitised. Though *The Leeds Mercury* is the only contemporary Leeds newspaper digitised now, I also examined the microfilm of *The Leeds Intelligencer*, in order to examine the difference between Whig and Tory newspapers.

Unlike London, Leeds experienced the smoke abatement campaign and its local newspapers played a key role in promoting the campaign. When provincial newspapers were established in the early eighteenth century, they did not print local news because local people were assumed to know it. However, by 1790s 'Provincial papers were used to express provincial opinions and to advertise and record the events, such as meetings, petitions, and demonstrations, that constituted the crucial process by which such opinions could be articulated and developed in order to produce an impact, both locally and nationally (Black 1991 pp. 160-1)'. The impact of provincial newspapers was wider than imagined on the basis of their titles. '[P]rovincial newspapers were regional rather than local in their nature (*ibid* p166)'. In fact, *The Leeds Mercury* and *The Leeds Intelligencer* were read not only at Leeds but also in many West Riding towns (Thornton 2009). As a result, these Leeds newspapers were influential concerning smoke abatement campaign in Yorkshire. Leeds local newspapers are not mere records of local news but primary sources of Leeds smoke abatement campaign.

3-2-3 Visual images

This thesis uses visual images as one of the main sources. Although literature on history usually insert visual images between texts and refer to those images only very briefly, literatures on landscape studies tell us that those images can be rich source of contemporary representation and perception. As we have seen, power relations and narratives are hidden in visual images. For example, Aitken and Craine (2005) write that 'Since the 1990s, the traditional visuality of cultural geography has been questioned by a forceful critique that highlights the neglect of *power relations* that are imbedded within maps, landscapes, paintings and movies (p251)'.

Bartram (2010) writes that the interpretation of visual images involves three areas of concern: production of the image, image aesthetics and interpreting audience. Production of the image raises questions concerning its producer. Important questions include the

producer's identify and social background as well as a commissioner's identify and social background. In terms of image aesthetics, it is important to consider 'colour, composition, atmosphere, angle of view, perspective (p136)'. Other questions include 'how does the image relate to other cultural images and ideas?' and 'How does the visual image relate to specific cultural genres? (*ibid*)' Unlike these two areas of concern, Bartram argues that audience interpretation requires painstaking research, but it is still possible to 'make inferences about the intended audiences (*ibid*)'.

This thesis deals with several visual images created by well-known artists such as J. M. W. Turner, George Scharf and George Cruikshank. Biographies and scholarly works on their production are available and it is possible to compare visual images drawn by the same artist in case of these well-known artists. Though it is sometimes difficult to identify an artist and collect information on less known artists, it is often fruitful to compare visual images on similar themes and subjects because the comparison could reveal particularity of individual image. For example, Chapter 5 examines views of Leeds from a distance and argues how different artists depicted plumes of smoke.

In order to identify relevant images, digital archives on visual images are often useful. As in the case of newspapers and books, there are some websites including the British Museum's collection online and Collage, images from Guildhall Art Gallery and London Metropolitan Archives. In addition, books on arts tend to contain many visual images, which are usually publication based on particular exhibition, and they are also useful to identify relevant images.

Though all empirical chapters deal with visual images, Chapter 7 especially focuses on the iconography of smoke in visual images. How the production of visual images was commissioned is a key to the interpretation of some images in Chapter 7. One of the main focuses of Chapter 7, George Cruikshank's *Salus Populi Suprema Lex* (1832) was commissioned when a cholera epidemic broke out in London. In

addition, the image should be interpreted within a wider context of Thames water quality controversy at the time. Similarly, when a visual image is inserted in a pamphlet, it is an integral part of the message which the pamphlet conveys.

One of the basic methods to analyse visual images is to examine them with information obtained from other sources such as texts and maps. Contemporary large-scale maps are necessary to identify buildings depicted in visual images. For example, Richard Horwood's London maps published in 1799, 1813 and 1819 in 32 sheets are helpful for examining visual images of London. The choice of view point and composition sometimes reveals artist's intention, which is sometimes not obvious only from the image itself. This is especially important when interpreting the iconography of smoke because plumes of smoke were often ignored or modified in Georgian visual images.

This comparison to the material landscape is especially useful to interpret landscape paintings, watercolours and engravings. As we have seen, landscape tends to conceal social conflicts and it is one of the main objectives for researchers to reveal the concealed power struggle. On the other hand, caricatures are depicted in order to make a particular social conflict obvious. Therefore, it is important to read artist's claim depicted in the image. Though landscape arts often employ iconographies, caricatures more heavily use them. The most typical example is the iconographic use of clothing to show each figure's occupation, religion and social status. Of course, smoke plumes were also used iconographically, and one of the objectives of this thesis is to show the iconography of smoke during the period.

Visual images not only include paintings and watercolours but also maps. Though maps could be used in order to interpret textual and other visual information, maps are also an object of interpretation. Especially, in connection with court cases, a map was often a necessary tool to fight at the courts. For Gott's trial, a detailed map was produced in order to show industrial buildings around Gott's

manufactory. Despite its usefulness to understand the geographical information, it should be noted that the map was produced to prove Gott's claim that nuisance had been increased due to the sudden development of industrial buildings in the neighbourhood. As Harley (1988) argues, the politics of power is often hidden in maps and it is possible that some facts which do not support Gott's claim might have been omitted from the map, though I could not find evidence of any obvious distortion.

In the legal papers of the Duke of Northumberland, a plan of Northumberland House is included. However, the plan is very simple and not very helpful in terms of understanding the plan of the house. During the trial, a model of Northumberland House was brought to the court and it was used to show rooms mentioned by witnesses. Unfortunately, the model is not included in the collection. Still, the detailed plans of Northumberland House which were drawn in the mid-century show the location of each room. Horwood's large-scale London map is also helpful to identify the rough location of workshops mentioned during the trial such as smiths and a plumber. The identified locations of smiths, a plumber and bakeries show that the implication made by Clowes' barrister that other polluting industries could have polluted Northumberland House was rather unreasonable. As this example shows, it is important to compare the information obtained from texts and maps because it could reveal possible distortions.

3-2-4 Parliamentary Papers

Parliamentary papers are generally important information sources for nineteenth-century historical research (Ogborne 2010 p94).

Parliamentary papers which this thesis mainly refers to include two reports from the Select Committee on Steam Engines and Furnaces published in 1819 and 1820 and Parliamentary debates on Taylor's act (1821).

These refer to other sources. For example, because Taylor mentioned Lambeth Waterworks in his parliamentary speech, I examined the administrative papers of the water company. The research revealed that the water company willingly tried to abate its smoke nuisance. Similarly, information obtained from other materials sometimes facilitated the better understanding of Parliamentary Papers. For example, two breweries mentioned by Taylor in his speech are also mentioned during the court case, the Duke of Northumberland v. Clowes, which means that these two breweries were well-known for their smoke in London.

3-2-5 Contemporary books, pamphlets and journals

A search was conducted through Eighteenth Century Collections Online (ECCO) and Google Books, too. In addition, Josiah Parkes' pamphlet on his smoke abatement apparatus (1822) is held in the British Library. It contains a description of his apparatus and letters from his customers praising the effectiveness of his apparatus. Although it is known that Parkes played a key role in the passage of Taylor's Act, his pamphlet has not been properly examined so far. Parkes' pamphlet and parliamentary papers seems to be almost only information sources on his smoke abatement technology. Letters from his customers are especially important to understand the acceptance of his smoke consuming apparatus.

3-2-6 Other archival materials

In addition to trial records abovementioned, I also utilised a variety of archival materials in this thesis. Chapter 7 will show that Lambeth Waterworks Company adopted smoke abatement technology. The company's records are stored in the London Metropolitan Archives, which house collections 'relating to the City of London, and to the Greater London area' and that 'are of London-wide significance (London Metropolitan Archives website)'. The availability of Lambeth Waterworks Company's records for the early nineteenth century is good even compared with other London water companies. Its records consist of varieties of administrative records including documents

relating to stock and share. I examined three administrative/management minutes whose periods are relevant to my research, and fortunately, found short references to smoke nuisance abatement in all of them. Despite its shortness, it was the only case which I could identify references to smoke abatement in administrative and management records of businesses. It is probably because Lambeth Waterworks Company was a joint-stock company which had a semi-public character at the time and needed to record almost all decisions made by individual committees.

Chapter 4 will examine a premium on the smoke consuming technology offered by the Royal Society of Arts. The Society's archives 'provide a wealth of information about its history. They include minutes, correspondence, reports, drawings, prints, photographs and other printed and visual material (RSA website)'. The visit to the archive revealed that several pieces of correspondence on the subject are available.

3-3 Conclusion

This chapter examined materials this thesis utilised. This chapter also showed that discourse analysis is a useful tool to examine environmental campaigns. Though discourse analysis can mean two different analytical approaches, this thesis will adopt the one often used in environmental studies. This approach examines how narratives, which include the definition of a particular problem and possible solutions, encourage policy changes. I believe this approach can facilitate an understanding of the early nineteenth-century smoke abatement campaign.

Chapter 4 Smoke in the Long Eighteenth Century

This chapter will explore how iconographies, medical knowledge and technologies concerning coal smoke were developed from the late seventeenth century to the early nineteenth century. Although no notable national-level effort was made to abate the smoke nuisance until Taylor's parliamentary campaign, the views of smoke that developed in the eighteenth century were the foundations of the smoke abatement campaign in the 1820s. This chapter will explore different views of smoke in literature, travel journals, medical works and scientific journals.

The first part of this chapter will examine the perceptions of coal smoke in Georgian England. London had been associated with smoke from as early as the seventeenth century and John Evelyn's pamphlet on London's smoke nuisance (1661) is often quoted by historians as an example of early dissent over smoke. However, Evelyn's opinion was not the most widely accepted view of London smoke and the iconography of London smoke had changed during the eighteenth century. In addition to London, some provincial towns and industrial sites were also associated with smoke. In the second half of the eighteenth century, the industrial sublime became a genre of aesthetic landscape and industrial smoke was one of the key elements of such landscape. It shows that smoke was not necessarily negative element of landscape during the period.

The second part will examine medical views of coal smoke. This thesis deals with nuisance problems, not health problem per se because the unwholesomeness of coal smoke was not generally supported by medical experts in the 1820s. Conventionally, medical experts had a view that coal smoke was wholesome because it was disinfectant. Though Evelyn argued in his pamphlet that coal smoke was unwholesome and some eighteenth-century physicians supported the view, the main stream of the medical theory was that smoke was not unwholesome throughout the period.

The final part of the chapter will examine the technological development of smoke abatement, namely smoke consumption. The idea of smoke consumption, or complete combustion in modern phrase, had already existed in the first half of the eighteenth century but the realisation of the idea needed to wait until the turn of the century. For example, the Royal Society of Arts offered a premium for the technology from 1767 but without much outcome. However, when the practicability of the technology was known, smoke consumption technology would be the key to the smoke abatement campaign in the 1820s. Several inventors presented their plans to the Select Committee (1819 and 1820) chaired by Taylor. Among several proposed smoke consumers, Joseph Parkes' plan was generally considered to be the best. The experiment of Parkes' plan at a London brewery became the convincing evidence to show the effectiveness of smoke consumption technology.

4-1 Georgian smoke iconography

4-1-1 Seventeen-century smoke nuisance

England has a long history of coal use. In the medieval period lime-makers and smiths had long used coal. Because the domestic use of coal was not spread, coal smoke from such industry, especially the lime industry, was found quite offensive. Coal use expanded into the other industries and was used in domestic fires between the mid sixteenth century and the seventeenth century (Hatcher 1993 p5).

John Evelyn's pamphlet on London's smoke nuisance, published in 1661, reflected the sudden increase of coal consumption in London. Evelyn pointed out the seriousness of smoke nuisance in London, its impact on the health of Charles II and London inhabitants, and the damaging effects on buildings and plants. In the end, he proposed remedies against the smoke, including the removal of polluting trades such as breweries and lime-making from London, as well as planting fragrant plants. In fact, some efforts were made during the seventeenth century to remove these polluting trades from London,

especially from the vicinity of the Royal Palace. For example, in 1623-4, the House of Lords passed the bill 'concerning brewhouses in and about London and Westminster', which tried to ban breweries from burning coal around Westminster though the bill was rejected at the House of Commons (HMC third p29). During the reign of Charles I, more compulsory measures were taken to remove the nuisance. Some brewers in Westminster forced into a bond not to use coal, but the policy was unpopular. In fact, in the early 1640s, after Charles I was taken from the power, some brewers petitioned for the alleviation (TNA, PC2/43 pp. 239-40; CSPD 1635-36 p161; HMC forth p54; MHL, vol. XI, new series pp. 382-4). Similarly, the realization of Evelyn's proposal to remove polluting trades from London was attempted twice after the publication of the pamphlet, but the attempts failed in both occasions.

Even after Evelyn problematised coal smoke in London, coal production and consumption rapidly increased. Table 4-1 shows the increase during the Georgian period. The coal consumption increased fivefold from three million tons in 1700 to fifteen million tons in 1800. Then, it doubled to thirty million in 30 years. Domestic fires were the major sector of the coal consumption throughout the period, ranging from a low of 35.5 % in 1800 to a high of 47.6 % in 1700. Salt making was the major industry to consume coal in 1700 but the iron industry's consumption increased rapidly to 18.6 % in 1830 (Flinn 1984).

Despite the rapid increase in coal consumption, the general silence in smoke nuisance between the 1670s and the 1810s seems to suggest that smoke abatement did not attract much attention in eighteenth-century England. Until Michael Angelo Taylor began the parliamentary campaign against smoke in 1819, national-level efforts to abate the smoke nuisance did not take place in England.

4-1-2 The Industrial Sublime

The scarcity of eighteenth-century references to smoke nuisance does not necessarily mean a lack of references to coal smoke. In fact, some English towns were already smoky in the early eighteenth century. For example, Daniel Defoe mentions coal smoke several times in *A tour thro' the whole island of Great Britain* (1724-26). He saw a cloud of smoke from salt making works, at least sixteen miles from Newcastle. He added that 'The Situation of the Town to the Landward is exceeding unpleasant, and the Buildings very close and old, ... which, together with the Smoke of the Coals, makes it not the pleasantest Place in the World to live in (vol. II p660)'. Similarly, Aberystwyth in west Wales was enriched and populous because of coal and lead mines but 'a very dirty, black, smoaky Place' as if the people lived in the coal or lead mines (vol. II, p458). Sheffield was the town of smiths and its 'Houses dark and black, occasioned by the continued Smoke of the Forges, which are always at work (vol. II p590)' and another Yorkshire town, Barnsley, which was eminent for iron and steel production, was 'as black and smoaky as if they were all Smiths that lived in it (vol. II p592)'. These towns mentioned by Defoe as smoky towns were involved in metal production or coal mining. It shows that mines and metal industries were the main sources of coal smoke in provincial towns before the late eighteenth-century introduction of steam engines to urban factories.

In fact, the description of smoky towns had not changed very much throughout the eighteenth century. Charles Dibdin, actor and composer, mentioned coal smoke in the entries on Sheffield, Coalbrookdale and Newcastle-under-Lyme in addition to London, in his *Observations on a tour through almost the whole of England, and a considerable part of Scotland* (1801-1802). Dibdin emphasised physical annoyance when he wrote about coal smoke. For example, Dibdin's description on Sheffield, which was also associated with smoke by Defoe, provides more details in smoke annoyance:

Towards these hills the very inhabitants remove themselves to imbibe the fresh air, and it is curious enough to see the number of little boxes, of about fourteen feet square each, surrounded by gardens about four times as big as their shops, where these whittle-makers retire on a Sunday, to inhale a mixture of atmospheric air and the fumes of tobacco, by way of eradicating the effects of the soot and sulphur which have strangled respiration in the course of the week. To say the truth, nothing can be more annoying than the perpetual smoke in SHEFFIELD from the forges, nor more dismal than the appearance of the houses in consequence (Dibdin 1802 vol. 2, p275).

Although Dibdin was annoyed by coal smoke, he also emphasised that the town was economically prosperous due to its industry.

Unlike Sheffield, Coalbrookdale was a newly developed industrial site in the eighteenth century. It became one of the symbolic places of British industrial prosperity especially from the second half of the eighteenth century. The prosperity of Coalbrookdale started when Abraham Darby moved to Coalbrookdale in 1708 and established an iron industry there. The history of the Coalbrookdale Company was the sequence of innovation. Abraham Darby I and John Thomas, who worked for Abraham, accomplished casting iron⁴. Abraham also started to smelt iron ore with coke instead of charcoal, and later, Abraham Darby II introduced steam engines to draw up water. Although water power was necessary to blast the furnace, the stream was small and the water level of the pool affected the rate of operation. Steam engines which drew up water from a lower pool enabled recycling water and the furnace there could be operated almost all the time. Abraham Darby II also discovered how to make suitable pig iron for the production of bar iron using coal⁵.

⁴ Hannah Rose's account of the Darbys, the Religious Society of Friends.

⁵ Darby's account, Shropshire Archives

These innovations increased the consumption of coal. Although ironworks were originally considered to be smoke producing industries, the addition of coking and steam engines increased the coal consumption. The visual image of Coalbrookdale during the period almost always depicts smoke. Two engravings by Francois Vivares in 1758 drew plumes of smoke from the coal coking heaps and the iron furnace (Plate 4-1). The central features of two oil paintings by William Williams in 1777 are a plume of smoke from a steam engine.

From a twenty-first century perspective, descriptions of Georgian Coalbrookdale were surprisingly silent about its smoke nuisance. Few visitors wrote about the nuisance, but Dibdin exceptionally mentioned the annoyance:

It was our intention I remember to stay all night, but this was impossible, for the day was insufferably hot, and the prodigious piles of coal burning to coke, the furnaces, the forges, and other tremendous objects emitting fire and smoke to an immense extent, together with the intolerable stench of the sulphur, approached very nearly to an idea of being placed in an air-pump. We were therefore glad enough to get away and sleep at SHEFNAL (Dibdin 1802 vol. 2, p311).

Because of fires and smoke from furnaces, forges and steam engines, Coalbrookdale was often associated with hell. P.J. De Louthembourg's *Coalbrookdale by Night* (1801) depicts the hellish aspect of the region very well (Plate 4-2). Dibdin wrote that 'COALBROOK-DALE wants nothing but Cerberus to give you an idea of the heathen hell (*ibid*)'.

While early visual images by Francois Vivares (1758) and William Williams (1777) depicted green landscape surrounding the iron work, Louthembourg almost excluded these surrounding landscapes. In fact, the pollution seems to have been deteriorated Coalbrookdale's environment by the late eighteenth century:

Vegetation here is feeble and scanty, as in all countries where there are mines; ... The Trees are few in this valley, they are stunted in their growth, and bare of leaves; ... The birds, that animate and enliven country scenes, fly from this bleak and barren spot (*The Aberdeen Magazine*, 1788-1790 Vol. 2, p823).

Descriptions of the environmental deterioration at Coalbrookdale were rare partly because it was something of a curiosity. The smoke and fire at Coalbrookdale were one of aesthetical components of advanced technology, national prosperity and hellish sublime (Daniels 1992).

4-1-3 London smoke

Margaret Cavendish, Duchess of Newcastle wrote that her husband was pleased to see the smoke of London when he returned from his exile in 1660 and arrived as far as Greenwich (Cavendish 1667 p85). Although plumes of smoke from ordinary houses were rarely depicted in seventeenth-century London views, one of the exceptions, Wenceslaus Hollar's *Winter* in the series 'The Four Seasons' (1643-4) shows that smoke was actually one of the iconographies of London, especially in winter (Plate 4-3).

The association between smoke and London seen in early eighteenth-century newspapers sometimes had positive implications. For example, the fictional reporter of *the Spectator*, Mr Spectator, was teased by his friend 'who has not lived a Month for these forty Years out of the Smoke of *London*' about his alleged inclination to the country life (*The Spectator* 31/7/1711). This friend teased him that '[his] Speculations begin to smell confoundedly of Woods and Meadows (*ibid*)'. Mr Spectator himself was fed up with the meddling nature of country neighbours. A poem on tobacco printed in *The London Evening Post* provided similar example. 'Ladies, when Pipes are brought, affect to swoon, They love no Smoke, except the Smoke of Town (*London Evening Post* 29/11/1735)'. The usage of smoke in these contexts is to provide the picture of prosperous and sophisticated London as commercial and political centre.

Apart from these symbolic and general associations between London and smoke, there were few detailed descriptions of London smoke during the eighteenth century. Still, foreigners' travel records and diaries provide pictures on London smoke. As Roy Porter put it, 'visitors were astonished by the great smoke, and none dismissed London fog as a media artefact, a foolish bit of local folklore (1996 p34)'. For example, Pehr Kalm, a Swedish traveller, recorded the view from St Pauls in 1748:

From the highest gallery ... of this tower was a matchless view on all sides if only the air had got to be clear, but the thick coal smoke, which on all sides hung over the town, cut off the view in several places (Kalm 1892 p26).

Interestingly, Kalm blamed domestic fires for inefficient consumption of fuel. He provided detailed observations on the fire-places and room temperature:

The room which the people lived in had a fire in it the whole day from morning till night, although most of the heat went away through the chimney, because in London they neither use a spjäll, nor know what a spjäll is, for which reason also there is no name for it in the whole of the English language (*ibid* p7).

Kalm wrote that Swedish fire-places were built in the same way as British fire-places except for the existence of a spjäll, or a damper, which kept warmth in a room (*ibid* p235). Although Kalm ascribed the inefficiency of British domestic fires to the absence of a damper, his observation also suggests that the British people's preferences to fire-places caused the inefficiency, too. Kalm made the observation of room temperature in London, which was always below 10° Cel. in February. In Norway, he made a similar observation in a large hall, which was warmed by a little iron stove twice a day. 'When it was warm enough in the hall, the thermometer stood at 19° or 20° Cels. ... but when it fell to 15°, 14°, or 13° Cels. ... we thought it was tolerably cold and chilly (*ibid* p7)'. In his home country, Sweden,

rooms were also maintained above 10° Cel. Unlike Northern countries on the Continent, the British preferred fire-places to stoves. In addition to the symbolic status of fire-place in houses, the British believed in ventilation. Fire-places facilitated the exchange of air, which resulted in fleeing warmth⁶. Kalm wrote that the doors of a room were seldom shut in Britain, especially in taverns and inns (*ibid* p288). It shows the difference between the Swedish, who kept the warm air in a room, and the British, who were more concerned about the ventilation. However, when British writers wrote about the smoke nuisances during the Georgian period, they almost always blamed industrial fires without any references to the inefficiency of domestic fires.

In the first half of the eighteenth century, the association between London and smoke often included positive implications and it was usually foreign travellers who recorded complaints of coal smoke. However, smoke began to have negative implications even for British people in the second half of the century. The association between London and smoke during the period was often made in order to praise the joy of country life, leaving London life behind. Similarly, the association was sometimes used to attack Londoners. For example, a letter printed in *St. James's Chronicle* argued against Londoners' complaint of expensive food. The writer claiming himself a friend to farmers, wrote that the complaint should have made from people 'who have never been out of the Smoke of the City long enough to have their Eye-sight cleared, and to distinguish Wheat from any other Corn ... (*St. James's Chronicle* 29/1/1765)'.

Toward the end of the century, the association became overall negative. A poem printed on *The Morning Post* in 1791 showed the contempt for the London life:

⁶ Mosley argues that 'it was widely believed that the open fireplace actually helped to safeguard the people's health by providing much-needed ventilation of the home environment' in Victorian and Edwardian Britain (Mosley 2003 p3).

When gold augments the rich man's store,
Voracious still, he grasps at more;
Smoke, noise, and cities please;
But may I now in towns appear;
Ye gentler Fates, propitious hear,
And grant me rural ease! (MP 21/9/1791)

In fact, smoke was not only a part of negative iconography London, but also a nuisance at least for a few writers. When Evelyn's *Fumifugium* was reprinted in 1772, a new four-page preface was written for it. This preface seems to have been the most detailed description of eighteenth-century London smoke. Here, the writer did not at all blame domestic fire, but only blamed smoke producing industries. The writer added new polluting industries; glass-houses, foundries, sugar-bakers and waterworks, to Evelyn's list of seventeenth-century polluting industries; brewers, dyers, soap-boilers and lime-burners.

Similarly, John Gwynn mentions two specific smoke nuisances in *London and Westminster Improved* (1766). When arguing for the improvement in the Queen's palace, or Buckingham Palace, Gwynn pointed out that Chelsea waterworks' steam engine was situated in an inconvenient place. Smoke from the waterworks and hovels such as Queen's Row poured into the palace. Similarly, brick-kilns and hospitals were 'intolerable nuisances which should be removed (p11)'. As for the Mansion House in the City, Gwynn wrote that 'When this edifice [of the Mansion House] was erected, the opposite houses in Walbrook poured the smoke of their chimneys into the Lord Mayor's apartments, and the citizens had not spirit enough, until a long time afterwards, to remove this intolerable nuisance (*ibid* pp. 101-2)'. It is a rare example of the blame placed on domestic fire rather than industries.

While Gwynn proposed the removal of these specific smoke nuisances, the anonymous editor of the reprint of John Evelyn's *Fumifugium* proposed a different kind of solutions for London smoke. Although the

editor proposed the removal of trades such as sugar-makers, glass-makers and brewhouses from the vicinity of London, he also proposed to force smoke producing trades to construct higher chimneys as a transitional regulation. In addition, the editor suggested one more proposal, which was the 'premium'. The editor was likely to be inspired by the Royal Society of Arts, which was established in 1754 to facilitate the practical technologies and science by offering premiums for new inventions and findings. The remedy proposed by the anonymous editor reflected eighteenth-century faith in technological advancement:

A method of charring sea-coal, so as to divest it of its Smoke, and yet leave it serviceable for many purposes, should be made the object of a very strict enquiry; and Premiums should be given to those that were successful in it (1772 p. v).

In fact, the Royal Society of Arts had already offered a premium for complete combustion technology to solve a smoke nuisance issue. However, the absence of the reference to the premium in the preface to *Fumifugium* shows that it was not well-known enough to attract the anonymous editor's attention.

4-1-4 Smoke observed from a distance

[L]ike an entrance into a large city, after a distant prospect. Remotely, we see nothing but spires of temples, and turrets of palaces, and imagine it the residence of splendor, grandeur, and magnificence; but, when we have passed the gates, we find it perplexed with narrow passages, disgraced with despicable cottages, embarrassed with obstructions, and clouded with smoke (Gwynn 1766 front page).

This is a quote from Samuel Johnson printed on the title page of Gwynn's *London and Westminster Improved*. Originally, Johnson wrote this part to describe the disappointment in meeting and talking to an author compared to the joy felt when reading the same author's book (Johnson 1751 p113). Similarly, eighteenth-century experience

of smoke tended to be different depending on whether a writer was inside of the smoke or outside.

Observations of industrial smoke from a distance often accompanied a positive commentary. William Gilpin, landscape painter, sometimes praised the effect of smoke in landscapes. Gilpin considered that large-scale forges and furnaces could give the woody landscape grandness. '[V]olumes of thick smoke, thrown up at intervals from an iron-forge as its fires receive fresh fuel, add double grandeur to the scene (Gilpin 1800 pp. 40-41)'. For Gilpin, variety is an essential part of landscape paintings and smoke could give such variety in landscapes (Gilpin 1792; 1800).

Similarly, Dorothy Wordsworth welcomed smoke in Scottish landscape in her travel journal. The landscape could be prosaic during the long journey. Smoke of cottages not only gave variety to the landscape but also showed the sign of human activity (Wordsworth 1941 p243). In addition, town smoke from the distance could create a romantic atmosphere. When she had a view of Edinburgh from Arthur's Seat, she saw a cloud of black smoke over the town:

The Castle rock looked exceedingly large through the misty air: a cloud of black smoke overhung the city, which combined with the rain and mist to conceal the shapes of the houses, an obscurity which added much to the grandeur of the sound that proceeded from it. It was impossible to think of anything that was little or mean, the goings-on of trade, the strife of men, or every-day city business; the impression was one, and it was visionary, like the conceptions of our childhood of Bagdad or Balsora when we have been reading the Arabian Nights' Entertainments (*ibid* pp. 385-6).

Thus, aesthetic descriptions of smoke from a distance were commonly seen in eighteenth-century writings, especially in travel literatures. Smoke was one of the components of industrial sublime as well as the sign of civilisation in wastelands. Though these writers should have experienced unpleasant urban or industrial air, it was usually

ignored in their descriptions. In fact, comments on smoke nuisances by British writers were rare in the eighteenth century. As a result, the iconographies of smoke in eighteenth-century England were mostly positive, probably apart from its association with London. In fact, plumes of coal smoke from urban chimneys were seen as a distinctive British component of landscape. Dorothy Wordsworth described the town, Lanerik in Scotland in the following way. 'The town showed a sort of French face, and would have done much more, had it not been for the true British tinge of coal-smoke (*ibid* p219)'.

4-2 Medical views of smoke

4-2-1 Opposing medical narratives

One of the reasons why eighteenth-century writers rarely depicted smoke with negative implications can be probably ascribed to medical views. Physicians conventionally regarded smoke as a disinfectant and this view was consistently maintained throughout the eighteenth century despite occasional voices dissenting the view.

The view of coal smoke as a disinfectant is evident as early as Restoration England. John Evelyn emphasised the unwholesomeness of London coal smoke. However, physicians had different opinions on the matter. Evelyn wrote that 'the Colledge of Physicians esteem it [the coal smoke] rather a preservation against Infections, than otherwise any cause of the sad effects which I have enumerated (Evelyn 1661 p13)'. In fact, a physician, Humphrey Brooke corrected lay people's belief that smoke was unwholesome in 1650:

as if in this City of *London* amidst thick fumes & Sulphurious Vapors from the Sea-coal, we could not enjoy our Health: In these cases Opinion is more our Mistris then Reason: which whilst we are pleading for, we can content our selves with the Smoak of Narcotick Tobacco (1650 pp. 68-9)

Considering that it was usually believed that fire and smoke was a disinfectant, it was natural for physicians to believe that coal smoke

was no exception. For example, during the Great Plague in 1665, nitre, tar and rosin were burnt as disinfectant, often upon coal fires. Of course, fumigating was a reasonable way to deal with vermin, which could be effective in preventing plague from entering a house (Bell 2001 pp. 22, 93-4; Porter, 1999, pp. 50-1). Similarly, people who advocated smoking in the seventeenth century also counted fuming effects as a reason why tobacco could cure diseases (Pollard 2004 p39).

In *Fumifugium*, Evelyn described how coal smoke damaged human health. The air passed into the lungs after respiration, goes to the heart and it is communicated to the whole body, spirits and humours (Evelyn 1661). This description was based on conventional medical theory of body but he also introduced atomism to explain how the smoke influenced human health. '[A] great quantity of volatile Salts, which being very sharp' spoils and destroys all things which it touches (*ibid* p12).

John Graunt, political mathematician, considered that coal smoke could cause health problems probably influenced by *Fumifugium*. In *Observations upon the Bills of Mortality* (1662), Graunt compared the bills of mortality between London and the countryside. He argued that London in 1662 was less healthy compared to the past:

I inclined [sic] to believe, that London now is more unhealthfull, then heretofore, ... chiefly, because I have heard, that 60 years ago few Sea-Coals were burnt in London, which now are universally used. For I have heard, that Newcastle is more unhealthfull then other places, and that many People cannot at all endure the smoak of London not onely for its unpleasantness, but for the suffocations which it causes (p70).

However, William Petty, Graunt's friend and also a political mathematician, adopted the conventional medical theory that coal smoke was a disinfectant. Because Petty was also a physician, it was probably inevitable. Petty maintained that London air was more

wholesome than Paris. London had a better environment because fuels were cheaper and the fuel in London, coal, was 'an wholesome sulphurous Bitumen (1699 p116)'.

In the 1730s and the 1740s, two Scottish physicians asserted that coal smoke in London was unhealthy. John Arbuthnot (bap. 1667-1735) published *An essay concerning the effects of air on human bodies* in 1733 and wrote that cities are less healthy than the countryside due to its air, diets and the lack of exercise. 'We find by Experience, that Asthmaticks cannot bear the Air of hot Rooms and Cities where there is a great deal of Fuel burnt, except in Summer, when the Consumption of Fuel is less (p108)'. Arbuthnot was asthmatic and this observation could be based on his personal experience.

Visitors to London sometimes suffered from coughs when they entered London. Kalm provided a description of his first-hand experience:

To a foreigner, and one unused to it, this coal-smoke was very annoying ... for it affected the chest excessively, especially at night. I found in my own case that however free I was from cough when I now and again went into London from the country, I got one always as soon as I had been there a day, which never failed to be the case, ... but as soon as I left London, and had been two days out in the country, I lost my cough (1892 p138).

According to Kalm, even Englishmen who lived in the countryside experienced similar cough in London. However, people who 'had been for a time in London' no longer show such reaction to the London air (*ibid*)'. Kalm's suggestion probably illustrates one of the reasons why Londoners were generally indifferent to London smoke.

Another physician, who wrote about coal smoke's unwholesomeness was John Armstrong, who took a medical degree at the College of Edinburgh. He referred to the London air in his blank-verse georgic, *The Art of Preserving Health*:

Fly the rank city, shun its turbid air;
Breathe not the chaos of eternal smoke
And volatile corruption, from the dead,
The dying, sickning, and the living world
Exhal'd, ...
Did not the acid vigour of the mine,
Roll'd from so many thundring chimneys, tame
The putrid salts that overswarm the sky;
This caustick venom would perhaps corrode
Those tender cells that draw the vital air (1744 pp. 5-6)

Despite the publication of these works, the idea that coal smoke was a disinfectant and, therefore, healthy was maintained in medical works. For example, anonymous work titled *A new discovery of the nature of the plague* (1721) argued that the air of Naples were unwholesome due to its population. However, the sulphurous smoke from Mount Vesuvius abated the unwholesomeness to some extent. '[H]ad it not been for the Sulphurous and *bituminous* Particles, scattered through the Body of Air, there had been the Loss of as many Thousands more (p46)'. According to the work, though the smoke of London was not much as Naples and it was not as helpful as smoke of Mount Vesuvius, yet, it purified the air (*ibid* p47).

Thus, medical professions generally supported the idea of smoke as a disinfectant when they wrote about smoke by chance. In fact, when they wrote about the quality of air, their focus tended to be on miasma and stinking effluvia originating from animal or human bodies. Fumigation was considered to be effective to cure these miasmas and vapours. Although Londoners should have observed or heard about the phenomenon that people from the countryside or foreign countries coughed a lot during their stay in London, the persuasiveness of the phenomenon was not necessarily sufficient to completely overturn the medical view that smoke was a disinfectant.

4-2-2 Local medical experts' view on industrial smoke

In the second half of the eighteenth century, the level of understanding of the air and the atmosphere was advanced. Meteorological instruments such as the spiral thermometer, hygrometer, eudiometer, and the atmospheric electrometer, developed after 1775 and some of them were tried in connection with medical interests though they were not necessarily useful in the sense (Zuidervaart 2006). William Cullen (1710-90), a lecturer in chemistry at Glasgow and Edinburgh Universities, taught 'philosophical chemistry' and his students further advanced the understanding of gases and participated in the phlogiston debate (Taylor 2006 pp. 477-8).

One of the principle figures in late eighteenth-century debates of the air was Joseph Priestley. He used nitrous-air apparatus in order to gauge air's fitness for breathing (Sumner 2001). Similarly, Dr. Thomas Beddoes, a member of the Lunar Society of Birmingham as was Priestley, explored pneumatic treatments for respiratory diseases (Levere 2007). Still, Eddy (2004) argues that investigation on air was less than experiments on Earth, Salt, Fire, Water and Metal (p396). In fact, despite the interest in basic components of the air, coal smoke attracted little attention by chemists and physicians.

Vladimir Janković (2010) argues in his work on Georgian medical theories that the control of the space immediately outside of bodies against unstable outdoor environment became a principle to maintain health during the period. In terms of air, his focus is on indoor ventilation and he argues that the ventilation technology enforced the medical view that ventilation was necessary for healthy environment. In this sense, it is probably natural that medical experts paid little attention to outdoor coal smoke when a possible technological solution was not generally known. Janković argues that 'social practice and expectations shaped medical analyses on the effects of external stressors on bodies and the population at large (*ibid* p151)'.

In fact, descriptions of coal smoke by late eighteenth-century medical experts shows that they were much influenced by social contexts and individual authors' intentions though the basic argument is usually based on conventional medical views examined in the previous section. In 1784 a surgeon in Liverpool, William Moss, published *A familiar medical survey of Liverpool*. Moss examined the healthiness of the town in the book. He basically supported the conventional view that coal smoke was a disinfectant:

For coal smoke, like that from *copper*, although unfavourable to vegetation, is not so, in a moderate quantity, to the human body; on the contrary, it becomes in large towns, in some respects, even salutary; as, from the sulphur which it contains, it is antiseptic, having the power of preparing the body to resist the power, as well natural as accidental, of malignant contagious diseases (p37).

However, Moss also admitted that coal smoke was not good for asthmatics, and moreover, he wrote that smoke from brick-kilns and salt-works was unwholesome and not good for inhabitants' health. Still, he considered that these impacts were limited. For example, brick-kilns were chiefly confined to the north end of the town, so 'they may easily be avoided by those who are particularly affected by them (*ibid*)'. Overall, he defended Liverpool's reputation with local pride.

In medical books, medical experts sometimes contest the 'unreasonable' or 'groundless' understanding of lay people. As mentioned previously, Humphrey Brooke corrected lay Londoner's belief that coal smoke was unwholesome in 1650. Similarly, Moss argued that the opinion that an oil house was infecting the air of Liverpool was chiefly imaginary because 'it does not appear, from philosophical reasoning and experience, to produce any bad effect (*ibid* p31)'. Copper works were considered to be 'remarkably baneful' but they were perfectly harmless though disagreeable and unpleasing because the wives and children of the workmen looked healthy (*ibid* p35).

About twenty years later, Thomas Percival (1740-1804), Manchester physician and a promoter of public health, published a book, *Medical ethics*. He was a Unitarian physician, who moved to Manchester in 1767 and lived there for the rest of his life. In his book, Percival argued against the view that coal smoke was unwholesome. He began the section admitting that manufactories which produced lots of smoke was a nuisance for their neighbours 'And the proprietors should be compelled, by law, to diminish this evil, as much as possible, by the adoption of the improved methods of burning fuel, which have been lately invented (1803 p234)'.

In fact, Manchester seems to have been the first town in Britain introducing smoke consumption clause in its improvement act (1792) and local smoke abatement campaign was probably created in the late 1790s. Although Percival supported the campaign itself, he could not accept the understanding that smoke was unwholesome. '[T]he people of Birmingham, Sheffield, Newcastle, and Manchester, towns which are often enveloped in smoke, from the nature of their respective manufactures, seem to suffer no abridgment in the general duration of life, as it subsists in crowded places, which can be ascribed exclusively to this cause (*ibid* p235)'.

Percival gave two pieces of evidence against smoke's unwholesomeness and both of them were the observations at Coalbrookdale. One of them was about the lady who 'undertook a journey for the recovery of health, after a severe attack of asthma, to which she was often incident (*ibid*)'. The lady and her husband arrived at Coalbrookdale on Sunday evening at eight 'when all the fires were fresh lighted for working the furnaces' and 'A thick smoke pervaded the whole valley (*ibid*)'. However, though her husband was alarmed with the danger of suffocation, 'she experienced no difficulty of breathing' and spent the night there (*ibid* p236).

In order to obtain more information on the subject, Percival wrote to Mr. Edwards, a surgeon at Coalbrookdale to inquire about the impact

of smoke on human health at Coalbrookdale. The letter answering Percival's question denied such impact:

I have never observed that asthmas, and other pulmonic affections, are more frequent in the Dale than elsewhere, but rather the contrary ... Old colliers, indeed, and such as work in iron, stone-mines, and lime-rocks, are very subject, in the decline of life, to coughs and shortness of breath, especially hard drinkers; but in other respects the inhabitants are remarkably healthy, ... the smoke arising from coal and iron not being so prejudicial as from the copper-works, in Cornwall [*sic*] and other parts (*ibid* p237).

Though Mr. Edwards considered that old colliers suffered from coughing, inhabitants of Coalbrookdale were 'remarkably healthy'. In addition, sadly, the short life of colliers was mainly ascribed to drinking. The testimony by local surgeon of Coalbrookdale, which was well known for its smoke, enhanced the credibility of the claim that coal smoke was not unwholesome.

4-2-3 Physicians' testimonies at the Select Committee

The majority of medical experts claimed that smoke was not unwholesome during the eighteenth century. However, this view was not widely shared with people outside of the medical circle. When Michael Angelo Taylor started his parliamentary campaign in 1819, he repeatedly referred to the unwholesomeness of smoke. 'Steam-engines were at present so numerous in many places, that the smoke which issued from them clouded the atmosphere, and endangered the lives of his majesty's liege subjects'⁷. Taylor even found two physicians to give evidence on the unwholesomeness of smoke in the Select Committee on Steam Engines and Furnaces. However, these physicians could not present incontrovertible evidence supporting their argument.

⁷ Hansard (1819) Vol.XL. 976

Edward Roberts, a physician living in Bloomsbury square, London, could not provide solid proof of coal smoke's unwholesomeness:

Do you observe that those parts of the town which are more infested with smoke, are less healthy than those which are more free from it?—I cannot speak of any very prominent instance; but I have considered that it was so, in more families than one.

...

Do you think the general health of the population of the metropolis, in those parts most exposed to this increase of smoke, has deteriorated within that period?—Yes, I think so (PP (HC) 1819 (574) p8).

Roberts's explanation lacks evidence and authority which could construct credibility. Roberts obviously knew it himself. His answers were ambiguous. Although he provided the explanation how coal smoke damage human health partly based on conventional medical theory, it is doubtful if other medical experts found it convincing:

air so loaded with impurities, cannot be so respirable as is necessary to the health of the population. From this cause, the air loses its elasticity, and cannot be properly ventilated (*ibid*).

Compared with Roberts, George Leman Tuthill of Soho Square succeeded in giving general evidence to support his argument. He pointed out London's mortality had been higher than the countryside, sick people's rapid recovery from illness during short stays in the countryside, and the influence of London fog on asthmatic people. Tuthill ascribed the root cause of unwholesomeness of smoke to carbonaceous matter in the air and carbonic acid gas.

However, these descriptions were general references than unarguable evidence. As with Roberts, Tuthill could not effectively produce counter-arguments. For example, when asked about the difference in mortality between London and other European capitals, he did not have the answer. He was also asked if he knew 'particular instances of persons healths suffering by living in the neighbourhood of any of

the engines referred to' and he denied (*ibid* p11). In addition, Tuthill was asked about the water quality's impact on human health and he admitted its impact. Even though it was generally understood that urban areas were less healthy than the countryside, the possible causes were many and the mortality rate alone could not prove the unwholesomeness of smoke.

Georgian science and medicine could not prove the unwholesomeness of coal smoke. Even though it was completely acceptable to express the view that smoke is unwholesome, it was a different matter to claim that smoke was unwholesome when prosecuting smoke producing neighbours. Therefore, the smoke issue was based on nuisance, rather than any particular health problem.

4-3 Development of 'smoke consumption'

4-3-1 The Society of Arts

When the smoke abatement campaign was raised in the 1820s, the key technology which enabled the campaign was 'smoke consumption'. 'Smoke consumption' was the technology of complete combustion in modern words, though the phrase, complete combustion, did not exist at the time. When Michael Angelo Taylor introduced a bill to the parliament, the goal of the bill was to force proprietors of steam engines to adopt 'smoke consumers'. Although the main achievement of Taylor's Act (1821) was the encouragement to start smoke nuisance cases by making manufacturers to pay the prosecution costs when they would lose a case, the act assumed that manufacturers who adopted a smoke consumer could avoid a prosecution. Without the technology, Taylor could not introduce the bill, and in fact, it is very likely that he did not think about legislation because such legislation would only result in the destruction of manufactories.

The concept of smoke consumption was relatively new. However, a similar phrase had appeared in the premium offered by the Royal Society of Arts dating back to 1768. The Royal Society of Arts was

founded in 1754 'to increase economic wealth and to raise national prestige in the arts' by offering encouragements such as 'medals and financial rewards for developments of practical value to trade and industry (Chambers 2007 p314)'.

The Society first offered the premium on smoke consumption in 1768 but the phrase used by the Society was not exactly 'smoke consumption'. On 5th March 1768 a committee was held at the Strand office of the Royal Society of Arts and it was agreed to create new premium on 'destroying smoak'. The agreed advertisement was as follows:

For the best Account of a Method of destroying Smoke ascertained by proper Experiments in or at the end of Chimnies of fires belonging to large Works or fire Engines, in order to prevent Annoyance, to be produced, on or before the first Tuesday in February 1769, a Gold Medal⁸.

The advertisement specifies that the premium was only offered for industrial furnaces and steam engines. Although the description suggests that the complete combustion was in the minds of the committee members, the part, 'in or at the end of Chimnies', shows that the intended technology was slightly different that which was developed in the early nineteenth century. Early nineteenth-century smoke consuming apparatus was devised to facilitate complete combustion in furnaces or by regulating the feeding of fuel, not in the end of chimneys.

It is difficult to identify what encouraged the society to introduce the premium for 'destroying smoak'. However, the phrase, 'consuming smoak' appeared as early as the late seventeenth century. The phrase appeared in the article published in *The Philosophical Transactions*, the publication by the Royal Society. It was one page article titled 'An Account of an Engine that consumes Smoak, shown

⁸ RSA, Premium Committee Minutes, 1767-68 p17

lately at St. Germans Fair in Paris (Vol. 16, 1686-92, p78)'. It was invented by Mr. Dalesme, engineer. Although it was called an engine, it was a domestic open fire-place (Plate 4-4). Though the end of the pipe looks like a chimney, the whole apparatus was supposed to be located in a room. The article explained that when smoke passed the pipe, the hot pipe consumed smoke and it shows that the basic idea of the machine was the complete combustion. In fact, the idea that hot pipes would facilitate the complete combustion was the key of smoke consumption technology in the 1820s. However, the smoke consumption apparatuses in the 1820s had hot flues in furnaces, and they were usually not part of chimneys. Rather, the invention by Dalesme well corresponds with the description of the premium advertisement, 'in or at the end of Chimnies'. The coincidence suggests that the premium was influenced by Dalesme's invention. Although Dalesme's invention was too old for the committee members of the Royal Society of Arts, the article was reprinted a few times in the eighteenth century⁹.

The premium, possibly influenced by Dalesme's invention, was offered every year but it did not attract many responses. Because the early Royal Society of Arts emphasized polite arts and agriculture, rather than chemistry, manufacturers and mechanics (Chambers 2007), it could have been inevitable that 'Destroying smoak' which was categorized as chemistry, attracted few responses. The premium was not widely known and the expectation was not at all high. In fact, the first available letter sent to the Royal Society of Arts on 'Destroying smoak' in 1774 claimed that the concept 'destroying smoak' itself was impracticable. '[S]moak consisting of the small volatile particles of combustible substances, decomposed by the action of fire; and which therefore can, I apprehend, only be conveyed away in the most commodious manner (RSA

⁹ Five-volume compilation of the philosophical transactions, entitled *the philosophical transactions and collections* (1732 vol. 3, p638); ten-volume *Memoirs of the Royal Society* (1738-41, vol. 2, p405); GM (1754).

PR/MC/105/10/319)'. The writer, naming himself as SK, wrote about the way to discharge smoke from chimney instead of the complete combustion. The committee's intention had not been understood by potential inventors.

One year later, another letter on the subject arrived at the Society. The letter claimed that the writer sent a drawing of his machine though it is not available now. However, the machine seems to have been planned to be attached at the top of chimneys and it was very likely that the machine was planned to facilitate the discharge of smoke. The letter reveals that the machine was tested out at the chemical laboratory at the University of Cambridge and it succeeded to facilitate the discharge of smoke. Although the author of the letter, JD, shows his understanding of the concept of smoke consumption or fuel saving, by presenting a calculation that the steam engine of Chelsea Waterworks consumed more coal than the steam engine used at the coal mines near Valenciennes, his invention itself does not appear to have been about complete combustion (RSA PR/MC/105/10/318).

In 1786 the Society received two letters each from Richard Bobbit and John Derbyshire. Although Derbyshire's letter did not make clear what kind of invention he made, Bobbit's basic idea was again the facilitation of smoke discharge¹⁰. Up to the almost end of the eighteenth century, the premium could not attract effective invention to reduce the amount of smoke. In the late eighteenth century, Benjamin Thompson, or Count Rumford, was famous for his Rumford Stove. He claimed that he modified over 250 fireplaces in London in two months in 1796. However, his improvement rather focused on ventilation rather than complete combustion, and it does not seem that Thompson's interest in domestic heating directly encouraged the development of smoke consuming technology (Thomas 1999).

¹⁰ RSA PR/MC/105/10/215; PR/MC/105/10/222

The society finally received a letter based on the idea of complete combustion in 1798. Samuel Gaskell of Warrington submitted an article entitled 'A Mode of Burning Smoke':

From the late improvements in Chemistry, it appears that Combustion is the union of Oxygen Gas or vital air with Combustible matter & that this union cannot take place except the Combustible matter is considerably heated, As smoke is combustible the whole of it must be burned if it is sufficiently heated & so much oxygen Gas is brought into Contact with it ... (RSA PR/MC/105/10/240).

Gaskell provided the detailed description of the furnaces which could burn smoke. Gaskell wrote that he tried the furnace in his dyeworks and the trial succeeded. It was 'advantageous to the person who makes use of it as well as to the public as it can be put in practise with little or no expence & is attended with a considerable saving in fuel (*ibid*)'.

Interestingly, despite this letter sent to the Society, Gaskell's invention was made without the encouragement by the premium. He wrote that he found out about the premium offered by the Society at the previous night he wrote the letter, and he did not have time to consult the transactions of the Society in details. It shows that he first constructed the furnace to satisfy his own need. It was an individual need rather than the encouragement of learned society, which motivated Gaskell to invent the furnace. Although Gaskell's invention sounds promising, he did not receive a premium.

In fact, the premium was dropped from the Society's premium list in 1802. The premium reappeared in 1819, obviously influenced by Taylor's campaign¹¹. It seems that the premium by the Society failed to directly influence the invention of smoke consumers despite its early attention to the concept.

¹¹ RSA Minutes of various Premium Committees (1801-1802) p102; Minutes of the Society (1818-1819) p269

4-3-2 Manchester's local act

Despite the premium offered by the Society, the first attempt to abate the smoke nuisance using technological advancement had nothing to do with the Royal Society of Arts. The first smoke abatement attempt seems to have been made at Manchester. The smoke abatement clause in Manchester's Improvement Act, or Police Act (1792) appears to have been the first smoke abatement clause. After 1792, similar clauses were introduced to other towns' local improvement acts, and finally in 1821, the national act on smoke abatement was introduced.

The smoke abatement clause of the Manchester Improvement Act (1792) stated that manufacturers should construct high chimneys in order to disperse smoke, and also, it stated that manufacturers should construct 'the Fire Places and Chimnies thereof in such Manner as most effectually to consume the Smoke arising therefrom, provided they do not infringe on any Patent'.

Some evidence suggests that the patent mentioned by the clause was James Watt's. A book published in 1813 had the following description:

In the year 1791, the steam engines on Watt's construction at Manchester, consumed the smoke: the public complained that no method was adopted by the owners of other steam engines, and by the dyers in and near that town, to produce the same effect in their furnace-fires (Coxe and Cooper 1813 p6).

Although Manchester's early smoke abatement campaign is out of scope of this thesis, some sources provide limited information on the campaign. For example, it was the Manchester Board of Health which started the campaign and eleven proprietors of steam engines were fined in the sum of £100 each for not consuming smoke around 1801¹².

¹² *The Monthly Magazine* 1798, Vol.VI, p69; 1801, Vol.XII, p76

Apart from the smoke abatement clause in local improvement acts, there is no evidence that the smoke abatement campaign spread over other regions. For example, Bradford's Improvement Act (1803) had a smoke abatement clause regulating the height of chimneys and making manufactures consume smoke. The clause made it clear that manufacturers will be fined when they failed to abate their smoke nuisance. However, available evidence from Yorkshire smoke abatement only refers to Bradford's smoke abatement campaign in the 1820s. In fact, several local improvement acts including those in Birmingham (1812), Glasgow (1814), Belfast (1816) and Sheffield (1818) introduced smoke abatement clauses, but apart from Manchester, these clauses do not seem to have been effectively enforced before Taylor's Act (1821). The national smoke abatement campaign only occurred in the 1820s, triggered by Michael Angelo Taylor.

4-3-3 Parliamentary debates and smoke consumers

Michael Angelo Taylor (bap. 1757-1834) was a Whig politician. He was baptized at St Martin-in-the-Fields, Westminster, and appears to have spent most of his life in the metropolis though he also had a country house in Yorkshire, first at Park Hill, Bawtry, and then at Ledston Hall. He was the only child of Sir Robert Taylor, architect, and he obtained a life interest in £100,000 when his father died in 1788. He was first returned to parliament as MP for Poole in 1784 and kept a seat at parliament as a MP for Aldeburgh, and then Durham until 1802. In 1806 he returned to parliament as a MP for Rye, then Ilchester, Poole, Durham and Sudbury. His achievement includes Metropolitan Paving Act (1817) and he was also involved in the controversy over London water companies.

Although it is not clear how Taylor came up with the idea of smoke abatement, he was annoyed by London smoke at his house at Whitehall as well as during his walks at St. James's Park and the Hyde Park. In addition, as a Member of Parliament, Taylor should have been involved with the legislation process of local improvement

acts, including Manchester (1792), which had the clause of smoke consumption. Taylor himself referred to unidentified court case in which the defendant was required to show 'that he had used all the means in his power to prevent the nuisance complained of' in his first speech at the House of Commons concerning smoke nuisance on 8th June 1819¹³.

Taylor noticed that the technology, 'smoke consumption', would be the key to the legislation. At the same speech he said that:

[Taylor] had made inquiries of those who were best capable of judging whether or not this was practicable, and all the artists whom he had consulted agreed in thinking it might be easily accomplished¹⁴.

Following Taylor's speech, it was agreed to set up a select committee on the issue.

The Select Committee was held almost a week after Taylor's first speech on the issue. The witnesses who gave evidence were mostly inventors of steam consumers. Inventors presented different plans of furnaces, but basic ideas were shared by them. Joseph Gregson, who described himself as a surveyor of the defects of buildings, presented a furnace plan (Plate 4-5). Three principles of Gregson's plan show the typical ideas of smoke consumers:

1st, By causing all the smoke, after it has arisen from the fire, to return into the heat of the fire before it enters into the flue or chimney, and so be consumed; 2dly, By putting on no more fuel at any one time than the smoke of which can be so consumed, and that without opening the furnace door for the purpose; 3dly, By supplying every fire with air, in order to counteract the effect of those winds that operate against the draft (PP (HC) 1819 (574) p5).

¹³ Hansard (1819) Vol.XL, 976

¹⁴ *ibid*

As Gregson described, most smoke consumers were constructed under three basic principles: hot flues where smoke passed through and was consumed, regular supply of adequate amount of fuel, and the regulation of air passage. In Gregson's plan, smoke would circulate and be consumed within the flue around the boiler, indicated as 'A' in his plan (Plate 4-5). However, the second principle was dependent to the care of enginemen in his plan.

Another engineer, William Brunton, presented to the committee an apparatus to overcome the dependency on enginemen's skills. Plate 4-6 is a plan of William Brunton's apparatus. Though the basic ideas were not very much different from Gregson's, it was far more complex. Coal is fed to the furnace automatically by the hopper and roller on the top of the apparatus. The grate revolves by waterpower. The supply of coal is automatically regulated to supply proper amount of coal:

the cock, through which the water is discharged upon the wheel, is regulated by the damper-regulator commonly in use, so that when the steam is high, the discharge of water on the wheel is diminished, and consequently the speed of the grate and the introduction of the coal are also diminished (*ibid* p23).

Brunton also suggested that the supply of air can be regulated with the same way as the supply of coal. The main idea behind these devices is that the supply of coal and air should be regulated automatically. The performance of the apparatus should not be affected by the skills of the firemen.

The revolving grate in Brunton's apparatus had another function, the flue to consume smoke. '[T]he coal always falls upon that part of the grate opposite to the flue, so that the smoke in passing towards the chimney, must go over the grate where the fire is in the highest ignition (*ibid* p24)'. Another advantage of the revolving grate, as well as hopper and roller to feed coal was that there was no need to open fire door to feed fuel and stir the fire, and thus cool air would not

enter to the furnace. The revolving grate and the device to feed coal were not an exceptional apparatus to consume smoke. The report from the Select Committee attached six inventors' plans of steam consumers and two of them including Bruntons' had a revolving grate and three of them had a coal feeding device.

Although several plans of smoke consumers were presented to the Select Committee in 1819, newspapers' reports of Taylor's efforts were short. Newspapers only reported what were spoken at the House of Commons, and no inventors' names or plans were mentioned. The keywords were 'Taylor' and 'smoke consumption'. Anyway, Taylor did not have much time to conclude the issue during the Session and it was reported that Taylor would continue the inquiry in the next Session.

In the following year, one more keyword was added when newspapers reported Taylor's effort. It was Josiah Parkes' name and his apparatus to consume smoke. In fact, it was Parkes' apparatus which enabled Taylor's act. Parkes was a member of a worsted manufacturer family at Warwick and they employed a steam engine of about twenty six h.p.. His first motivation to reduce the amount of smoke was for his company's benefit. After the introduction of bleaching, they found that their drying-ground was affected by smoke and it was the original motivation of his invention. Parkes made an effort to invent a method to reduce coal smoke for about six years (PP (HC) 1820 (244) p5).

Taylor visited Parkes's factory and was very much satisfied with the effectiveness of his apparatus. Therefore, Taylor's first speech to the parliament in 1820 was mainly devoted to description of Parkes' apparatus. *The Morning Chronicle* printed a detailed description of what Taylor saw during his visit to Parkes' manufactory:

there were three furnaces, all of which were constructed so as to consume their own smoke, and he could add that these furnaces were constructed at as small an expence as the ones generally in

use, and that they were worked with a less consumption of fuel by one fourth. If, on entering Mr. Parkes's establishment, any gentleman was asked to point out the position of the great furnaces, he would be at a loss to discover them, so efficiently had the experiment been carried into practice. There was not more smoke from these furnaces than from a common chimney. In order to be fully satisfied, he himself [Taylor], at his visit, endeavoured to create a smoke, but was unable (3/5/1820).

Parkes' smoke consumer was completely different from other plans in terms of feeding. In 1822 Parkes published a pamphlet on his smoke consumer, mostly consisting of praising letters from his customers. He wrote that once 'the fuel for the day's use is supplied to the boiler', 'the fire continues sufficiently active, without disturbance, until four or five and frequently until six o'clock in the afternoon (Parkes 1822 p7)'. Therefore, they usually needed to feed the fire only once a day. Although other smoke consumers usually planned to feed very frequently and regularly, Parkes achieved complete combustion by making furnace closed for almost all day.

During his speech, Taylor prepared three more witnesses of MPs, who talked about the effectiveness of Parkes' apparatus based on their direct observations at Parkes' factory at Warwick. Taylor's first speech in 1820 was made on 2nd May, and about three weeks later, a trial of Parkes' apparatus was made at the Brewery of Barclay and Co in Southwark in the presence of several politicians including Earl of Rosslyn, Earl of Harewood, Kirkman Finlay, Mr Peploe, Henry Monteith, Mr S. Turner and Mr Tancred. Earl of Rosslyn, Earl of Harewood, Kirkman Finlay and Henry Monteith were all MPs or had been. In addition, Finlay and Monteith owned large textile mills in Scotland. The experience succeeded in the presence of these respectable witnesses. It was reported that '[they] all expressed their perfect conviction, that by this easy, cheap, and certain means, all the evils complained of by the establishment of manufactories requiring furnaces may be removed (MP 25/5/1820; MC 24/5/1820).'

In London, breweries had been mainly blamed for the smoke nuisance since the seventeenth century, and Barclay and Co was one of the large-scale breweries. In addition, the experiment took place in London, which means that there were far more witnesses than the several gentlemen named. Of course, the testimony of these several influential people alone gave significant credibility to the effectiveness of Parkes' apparatus, but inhabitants of London could easily witness the result if they wanted to, unlike Parkes' factory in Warwick.

Despite Taylor and Parkes' efforts to provide credibility for the technology, doubts concerning the effectiveness of the technology were expressed during the parliamentary debate. On 7th May 1821, about a dozen of MPs made a speech on the subject. Some of them supported the bill and the effectiveness of the technology while others requested the amendment claiming that the technology was not well enough to be forced. Buxton's speech was the typical example against the bill:

Mr. *Buxton* regretted that he was under the necessity of opposing the bill. The plan had been tried in many instances and had completely failed. Nothing could be more fallacious than such experiments. It had succeeded in Messrs. Barclay's brewery, but with a very great additional consumption of fuel. But with an engine constituted as his (Mr. Buxton's) was, it was quite impossible to carry it into effect. He hoped his hon. friend would postpone the bill for a year or two. If not, he would move as an amendment, that the bill be committed upon this day six months¹⁵.

Here, even the effectiveness of Parkes' apparatus in Barclay's brewery in London, where the demonstration was conducted with several politicians in attendance, was called into question.

In fact, Buxton's speech appears to have relied on false rumour. C. Calvert made his speech before Buxton and stated that he read a

¹⁵ Hansard (1822) Vol. V 535

printed paper which mentioned that the apparatus used in Barclay and Perkins had completely failed. In order to prove that it was a false rumour, Calvert read a letter from one of the proprietors of the brewery, Mr Perkins, asserting the effectiveness of Parkes' apparatus. A similar false rumour was observed in Halifax, as will be examined in Chapter 7, and the evaluation of Parkes' apparatus was confused at the time.

In addition to Buxton, there were some MPs who opposed the bill. It was recorded that Colonel Wood stated that because he was representing a manufacturing county, 'he felt it his duty to oppose the proceeding any further with the bill in its present shape' and Alderman Wood¹⁶ requested that Cornwall should be the exception to the clause¹⁷. The reference to Cornwall is obviously made in connection with local tin and copper mining industries. Though these opinions easily give an impression that they were tainted by local interests, they also show manufacturers' concerns. For example, General Gascoyne read a letter from the large scale manufacturers at Liverpool stating that 'the new plan increased not only the smoke, but the quantity of requisite fuel'¹⁸. These opinions show the confusion and concern among manufacturers.

Still, the opposition was not the majority. Eighty three MPs voted for the original motion submitted by Taylor, and twenty nine for amendment. In general, Taylor succeeded to in gaining credibility for the technology, smoke consumption, with his speech and the experiment at Barclay and Co. However, the doubt on the effectiveness of smoke prevention lingered. This was not without reason. For example, the success of Parkes' apparatus was reported and seen as an example of smoke consuming technology in general,

¹⁶ Because Mr. Wood cannot be identified, it is difficult to examine whether he had any connections with Cornwall or not.

¹⁷ *ibid* 537

¹⁸ *ibid* 537-8

but it was not necessarily so. Parkes' smoke consumer was considered to be the best apparatus for many contemporary people, but many other smoke consumers were also invented and sold as we will examine in Chapter 5. These other smoke consumers were not necessarily effective. In addition, though Parkes must have paid much attention to the installation of his apparatus at Barclay and Co., the difficulty in amending existing furnaces in other manufactories should have caused ineffectiveness to some extent. The experience at Barclay and Co. should have been made under the best conditions, but the best performance could not necessarily be repeated at the general use of smoke consumers. This confusion over smoke consumer's effectiveness will be explored further in the following chapters.

The bill was eventually passed into an Act on 28th May 1821 (2 Geo. IV cap. XLI). Although the act was amended to make an exception of steam engines and furnaces solely used for mining and smelting in the mining area, it certainly triggered dozens of indictments in urban areas.

4-3-4 Provincial Towns and Taylor's Act

Although the case studies which will be explored in the following chapters mostly deal with these complex consequences of Taylor's Act (1821), most provincial towns did not experience much agitation over smoke abatement. In Newcastle, whose prosperity was mainly based on coal production, two manufactories adopted Parkes' smoke consumers. The lead works of Locke, Blackett and Burnett introduced the apparatus in December 1821. *The Newcastle Courant* praised the simplicity and the fuel saving effect of Parkes' apparatus (15/12/1821). Burnett wrote to Parkes three months after the installation that Parkes' plan was a complete success:

Notwithstanding, therefore, the peculiar cheapness of our fuel, we have no hesitation in stating that the expenses incurred by applying your patent to our engine, will be returned to us in less

than three years, from the savings we are now making in labour, coals, and cast-iron work, we have the satisfaction to find that we have relieved our neighbours and ourselves from a filthy nuisance, now liable to indictment (Parkes 1822 p30).

The Newcastle Courant's report ended with the sentence asking other manufacturers to install smoke consumers. '[I]t is surprising that no other establishment in Newcastle, but that of Messrs Locke, Blackett, and Co. has yet taken any measures for avoiding the penalties of an act of parliament, which is imperative on them to consume their own smoke (15/12/1821)'. However, except for the soap manufactory of Doubleday and Easterby which installed Parkes' apparatus soon after the first report of smoke consumer in Newcastle, smoke consumers did not attract much attention there (*The Newcastle Courant* 22/12/1821; Parkes 1822 p33).

In Glasgow, Henry Monteith, one of the gentlemen who attended the experiment at the Brewery of Barclay and Co., installed Parkes' apparatus in his textile mills. He was especially pleased with the result in one of his factories at Blantyre. His letter to John Parkes, brother of Josiah, showed similar circumstances of Glasgow to Newcastle, reflecting the cheapness of coal. 'The price of coal with us is so moderate, that the saving of fuel was less an object than the removal of the nuisance; but even in this respect I consider the saving as amply recompensing us for the trouble and expense we have been at (Parkes 1822 p32)'. Monteith wrote that many other manufacturers adopted the same plan, which meant Parkes', after observing Monteith's success. In addition, inspired by smoke consumer installation by Monteith, two letters by a reader were printed in the *Glasgow Herald* in August 1821. The letters praised the success of Parkes' apparatus at Monteith's factory and asked other manufacturers to install the smoke consumers (13/8/1821; 24/8/1821).

However, Glasgow was not completely saved from the smoke nuisance at the time. Four years later, James Cleland, statistician and

civic administrator, published a letter to Lord Provost of Glasgow on smoke consumption. Cleland wrote that:

I now take the liberty of directing your attention to the almost insufferable nuisance which has of late years been brought on our City, by clouds of thick smoke emanating from the chimneys of Steam Engines, to the great injury of the health and comfort of the inhabitants, and the deterioration of their property (Cleland 1825 p3).

Obviously, the installation of smoke consumers by Monteith in 1821 did not create as many followers as expected. What Cleland recommended to install this time was not Parkes' plan, but Wakefield's. John Wakefield was also an inventor of a smoke consumer. His letter on his smoke consumer was added to the appendix to the report from the Select Committee in 1819 and he also attended the Select Committee as a witness in 1820. Wakefield's smoke consumer was especially popular in Manchester, installed by several manufacturers there. When Cleland visited Manchester he was impressed by Wakefield's apparatus. It resulted in the publication of the letter to Lord Provost of Glasgow with testimonies on effectiveness of Wakefield's apparatus by inhabitants of Manchester.

Cleland's interest in smoke consumption was also reported by the local caricature magazine, the *Glasgow Looking Glass*. This was published fortnightly in 1825-6 and 19 instalments were published in total. Plate 4-7 is the lithograph on Cleland's letter. Dense smoke pours into the neighbourhood of the factory. Nothing can be seen except for the smoke and the people trying to avoid the smoke. Birds have fallen from the sky and the tree is dead. The future of Glasgow provides an optimistic picture of smoke consumption. The neighbourhood of the factory has lots of green plants. A grapevine winds around the engine chimney with ripe grapes and a bird incubate its eggs at the top of the chimney, though this bird nest is too optimistic considering even the best smoke consumer at the time produced smoke when firing fuel:

Consumption of Smoke.—We have much pleasure in observing that our indefatigable Mr. Cleland (indefatigable in every thing that tends to promote the interest of the City of Glasgow, and the comforts of its inhabitants) has turned his attention to that most desirable object the *Consumption of Smoke*. We strongly recommend Mr. Cleland's pamphlet, and our little representations to the attention of our *Smoking Friends* (*Glasgow Looking Glass* Vol. 1, No. VIII, 17/9/1825)

Like these two examples, Newcastle and Glasgow, most industrial towns appear to have seen a few manufacturers who installed smoke consumers after the passage of Taylor's Act. Of course, some towns were more enthusiastic about smoke consumption and some others were less so. As will be examined in later chapters, Yorkshire towns saw a local smoke abatement campaign and London saw several court cases concerning smoke nuisance. Still, letters from Parkes' customers and newspaper reports show that even in a town where inhabitants did not launch local smoke abatement campaigns, some manufacturers voluntarily installed smoke consumers.

4-4 Conclusion

Compared with the multiple attempts made to remove polluting trades from the vicinity of the Royal Palace in London in the seventeenth century, the eighteenth century lacks such efforts. Unlike seventeenth-century attempts which were made using the royal power for the purpose of preserving the health and comfort of the royal family, the lack of evidence suggests that Hanoverian monarchs did not try to abate smoke. In fact, seventeenth-century attempts to remove polluting trades from London, especially Westminster, were very different from the smoke abatement campaign in the 1820s, which was for middle classes. In addition, smoke abatement was attempted not only around the Royal Palace but in many industrial towns in the 1820s.

In the first half of the eighteenth century, the association between London and smoke tended to have positive implications. London was sophisticated and prosperous compared with the countryside. However, in the second half of the century, the association became negative. The joy of country life, leaving London smoke behind, was a common expression. Despite the shift in smoke iconographies in London, the image of smoke was an important element of industrial sublime, especially in the second half of the eighteenth century and early nineteenth century. Written descriptions and visual images of Coalbrookdale, one of the major industrial sites, emphasised the aesthetic aspect of smoky landscape. On the other hand, descriptions of smoke annoyance were quite rare.

In terms of medical views of smoke, there were two narratives. On the one hand, it was believed that coal smoke was wholesome because it was a disinfectant against vapours issued from animal and vegetable matters. On the other hand, it was believed that coal smoke was unwholesome because asthmatics suffered from breathing in air which was contaminated by the smoke. Most medical experts believed the former narrative, and it was almost impossible to give unarguable evidences to support the latter argument. Although it was generally accepted that the urban environment was unhealthy, it was difficult to differentiate the separate effect of coal smoke from other possible causes such as water, diets and living environment.

Smoke consuming technology development meant that coal smoke was now seen as a problem and became the key to legislation. Although the Royal Society of Arts had offered a premium for the similar invention, it was rather individual manufacturers' need and initiative which developed the technology. Because of the smoke consuming technology, Michael Angelo Taylor could pass the bill which would encourage urban inhabitants to take manufacturers into the courts for their smoke nuisance. Taylor's Act encouraged some public-spirited manufacturers to voluntarily install smoke consumers but in order to force reluctant manufacturers to install smoke

consumers, lawsuits were also necessary. The next two chapters will deal with these lawsuits which took place after the passage of the act.

Chapter 5 Industrial smoke in Leeds

Leeds was a typical example of northern industrial towns which suddenly became smoky at the beginning of the nineteenth century. The change was due to accelerated urban industrialisation, especially the introduction of steam engines to the factory system. Following its eighteenth-century prosperity as a commercial centre of woollen textiles, early nineteenth-century Leeds attracted factory based textile production. Large textile mills and steam engine chimneys became a key feature of Leeds landscape. Not only industrial buildings but also residential areas were built and development blurred the boundary between them. The first three sections in this chapter will provide the contexts of early nineteenth-century Leeds smoke abatement campaign by exploring; eighteenth-century views of Leeds; the accelerated industrialisation at the turn of the century; and early nineteenth-century views of smoky Leeds. The fourth section will examine the first smoke nuisance trial in Leeds, which took place before Taylor's parliamentary campaign.

When Taylor's parliamentary campaign was reported, it raised a hope among some inhabitants that the smoke nuisance could be abated without interfering with economic activities. The fifth section will explore how local newspapers, *The Leeds Mercury* and *The Leeds Intelligencer* reported Taylor's parliamentary campaign and advertised smoke abatement technology. While newspapers reported the effectiveness of the technology, some manufacturers found out that some apparatus was not practical. The sixth section will examine the confusion over the effectiveness of the technology.

Following other Yorkshire towns' smoke abatement campaign, Leeds inhabitants also held a meeting. The seventh section will examine its supporters' social backgrounds and in addition, it briefly examines the ongoing smoke nuisance litigations which were talked about at the meeting. However, Leeds inhabitants were less interested in the

litigations which were preferred by a person outside of the Leeds community.

The goal pursued by Leeds smoke abatement campaign was to make sure that local manufacturers installed smoke abatement apparatus. In order to achieve the goal, it was necessary that unwilling local manufacturers were forced to install the apparatus, which meant prosecutions. Five manufacturers were taken into the court by the local committee but only Benjamin Gott had a determination to go through the full legal process. The eighth section will examine the politics before the trial, for example, how the case was removed from the Leeds Borough Session to the Court of King's Bench in York. The ninth section will explore Gott's claim that industrial and residential buildings had been developed between Gott's factory and the town and it was not Gott's factory which caused a nuisance. Based on the legal documents, chronological and geographical development of smoke nuisance in the neighbourhood of Gott's factory will be examined.

Even though manufacturers were respected and important members of Leeds elite community, the narrative of smoke abatement permeated local newspapers. In fact, manufacturers did not openly oppose the smoke abatement campaign at first, which belies the notion that they were invariably opponents of environmental concerns. The tenth section will examine the flaw in this smoke abatement discourse, which became obvious after smoke nuisance trials. After examining how unwholesomeness of smoke was dealt with during and after smoke abatement campaign in Leeds in the eleventh section, this chapter finally examines how a new iconography of smoke began to be formed as a counter-narrative to smoke abatement discourse in the twelfth section.

5-1 Eighteenth-century views of Leeds

The prosperity of Leeds in the eighteenth century was mostly due to its function as a commercial town rather than an industrial town.

Although the finishing process of woollen textile was an important economic sector of the town, it was merchants who had these workshops in the outbuildings of their houses. The developments of cloth halls, the market places of woollen textile, symbolically show the importance of the woollen textile trade for Leeds.

Before cloth halls were erected, Briggate was the main street for textile trade. When Daniel Defoe visited Leeds, he was impressed by the ordered cloth market held on Tuesdays and Saturdays (Defoe 1968). In 1719-11, first cloth hall was built in Kirkgate for undyed cloth and it was called White Cloth Hall (for the locations, see Plate 5-1). The first White Cloth Hall was replaced by larger White Cloth Hall located in Meadow Lane, on the south bank of the Aire in 1755-6 and replaced again by grand White Cloth Hall in the Calls on the east side of the town in 1775-6. In 1756-8, a Coloured Cloth Hall for dyed cloth was erected at the end of Boar Lane, near Mill Hill. Cloth halls were the source of civic pride as well as the practical means to keep the status of its commercial centre. In fact, neighbouring towns also built large halls in order to attract the trade away from Leeds (Grady 1980 p179).

As the importance of white cloth halls shows, it was the merchants' sphere to manage the finishing process of cloth production. Before the introduction of steam engines and the factory system, three different spaces were involved with the production of woollen cloth from the raw wool. Firstly, the raw wool was brought into a mill. Dust and the fragments of dyestuffs, if it had been already dyed, were eliminated, and fibres are straightened. Clothiers undertook the spinning and weaving processes. After scouring in urine and pigs' dung in order to remove oil and grease, the cloth went back to the mill for fulling or felting. Finally, merchants supervised dyeing and finishing, including shearing¹⁹ in their workshops, which were outbuildings of their own houses (Morris 1990 pp. 65-8). Woollen cloths

¹⁹ A process to remove surface irregularities in a napped fabric.

were also dyed at specialised dye-houses, which were the main smoke-producing industries in Leeds. Dye-houses were generally located along the River Aire or the Sheepscar, a stream which flowed into the Aire in the east of the town, probably due to the availability of water (Wilson 1980 p25; Ward 1972 p28).

Eighteenth-century views of Leeds were usually drawn from the east or the south. It means that the face of the town in those views was around the Aire or the Sheepscar. The composition suggests that there should have been dye-houses in the nearest edge of the town but those views rarely depicted smoke. For example, *The Prospect of Leeds from the Knostrop Road* by Francis Place (1715) is the view from the east, and Sheepscar runs in the middle distance (Plate 5-2). However, there is no sign of smoke in the prospect. Similarly, in Samuel and Nathaniel Buck's *South East Prospect of Leeds* (1745), smoke is not depicted. As with the eighteenth-century London views, the focus of these views were townscapes, and smoke plumes which could disturb the prospects was basically unnecessary. In addition, the scale of smoke plume during the period was probably too small to be depicted in panoramic views.

The exceptional depiction of smoke plumes can be seen in a seventeenth-century view of Leeds. *The Prospects of the Two Most Remarkable Towns in the North of England for the Clothing Trade, viz. Leeds ... and Wakefield* (c1680) was engraved based on a sketch by William Lodge, whose parents were from Leeds merchant families (Plate 5-3). It was a rare example of smoke depiction in Leeds before the nineteenth century. Leeds town in *The Prospect* was drawn from the west. In the view, there are at least seven relatively large plumes of smoke around Briggate and two small puffs of smoke emitted from buildings in the town as well as two plumes of smoke in the foreground. It shows the atmosphere of a busy cloth trade town.

William Lodge appears to have been interested in the depiction of smoke in the urban landscape. In the engraving of Wakefield, there is a house emitting smoke in the right end of the view. The counterpart

can be seen in the prospect of Leeds in the same place, right end of the view. A relatively large plume of smoke is emitted from 'The antique Chappell on y Bridge' in the middle distance, which was used for commercial purposes during the period. There are at least five other small puffs of smoke in the prospect. In addition to these two views of Yorkshire towns, Lodge's engraving, *View of Monument's west side and adjacent buildings* (c1676) also depicts plumes of smoke around the monument of Great Fire in London (Plate 5-4). As mentioned in Chapter 4, smoke columns from ordinary houses were rarely depicted even in London views in the seventeenth century. However, for William Lodge, smoke was something naturally depicted in the prospect of Leeds, as well as in views of Wakefield and London.

Although smoke rarely appeared in eighteenth-century visual images of Leeds, smoke was associated with Leeds by John Dyer in *the Fleece* (1757):

And ruddy roofs, and chimney-tops, appears,
Of busy Leeds, up-wafting to the clouds
The incense of thanksgiving: all is joy;
And trade and business guide the living scene (Dyer 1757 p100)

As in Lodge's view, the image of smoke here is lively and positive. It was an iconography of prosperity.

However, apart from Lodge's rare interest in depicting smoke in his engravings, smoke had not been associated with the views of Leeds until the early nineteenth century when the number of steam engines rapidly increased. The watercolour by Robert Riddell, *Leeds from Beeston Hill* (c1795) only shows two clear plumes of smoke (Plate 5-5). The viewpoint was from Beeston Hill, the south of Leeds, somewhere near to the viewpoint of Turner's *Leeds* (1816) (Plate 5-6). Although the watercolour is dated 1795, the sketch was drawn earlier, considering the lack of the tower of St Paul's church at Park Square, erected in 1792 in the west of the town and the lack of tall chimney in Gott's Bean Ing Mill. Two smoke sources in *Leeds from*

Beeston Hill were from Hunslet Hall Pottery and Leeds Pottery, both located in Hunslet²⁰ (Hill 2008). However, apart from these two plumes of smoke, there are no visible smoke plumes in the view. In fact, though at least several steam engines should have been installed in Leeds mills in 1792, the overall impression of Riddell's watercolour is green, with red brick buildings interspersed (Ward 1972 p48). In about two decades, Leeds would be covered with smoke as Turner's watercolour shows (Plate 5-6).

5-2 Urban industrialisation

From the late eighteenth century steam engines and the factory system were introduced to the urban area. Leeds was rapidly industrialised, and at the same time, population rapidly increased. In 1775 it had a population of over 30,000 and it was already probably the seventh largest town in England. In 1801 the population was over 50,000 and it was sixth largest town, and in 1831 the population became more than 120,000 (Morgan 1980).

One of the keys to the industrialisation of Leeds was the availability of cheap coal. In 1795 Dr. John Aikin (1747-1822) attributed the prosperity of Leeds to the availability of coal. 'That part of the parish which lies south of the Aire abounds in coal; and to the cheapness of this indispensable mineral, the flourishing state of the manufactory is to be attributed (Aikin 1795 p576)'. Similarly, Richard Warner wrote in 1802 in his account of his tour of the northern countries that availability of coal was one of the advantages of Leeds manufactories (Warner 1802 p240). The price of coal in Leeds was cheap compared even with Birmingham and Manchester between 1800 and 1830 (Nuvolari and Verspagen 2009 p700). It was due to the monopoly of Middleton colliery in the second half of the eighteenth century and the following competition among several suppliers. The monopoly started

²⁰ Hunslet as well as Holbeck were villages in the south shore of the Aire, which was the out of Leeds Township before 1835. These two villages attracted industrial buildings, especially potteries and foundries, due to the availability of coal.

when an Act to construct a wagon-way between the colliery and Leeds was obtained in 1758. In return, it was promised that 23,000 tons of coal per year would be delivered to Leeds township for 60 years at a price of 50.3d per ton (Rimmer 1955 p48). Middleton is about three miles south from Leeds and it had obvious disadvantages in distance and transport compared to other collieries in Beeston and Hunslet. Due to the wagon-way, the transportation cost fell (Griffin 2005 p85). The price of coal carried from Middleton colliery had risen a few times since then, in 1779, 1793 and 1803. Still, the coal sales at Leeds Staith were about 30,000 tons in the 1760s and had doubled about 1800 (Rimmer 1955 pp. 54-5). Middleton colliery lost its monopoly in the nineteenth century, and the peak of the coal sales at Leeds Staith was about 100,000 tons in 1814 (*ibid* p54-5). Leeds consumed 250,000 to 300,000 tons a year in 1830. Almost half of the coal, between 109,296 and 157,872 tons, was consumed by steam engines about 1830 (*ibid* p50).

The introduction of steam power started so as to supply water for water powered mills in Leeds as other districts in the country. Although the use of steam engines started in the early eighteenth century, they were mostly used in mines to pump water up. The only steam engine used in mid-century Leeds appears to have been an engine for the waterworks. The waterworks were located near Leeds Bridge and they were steam powered as early as 1750 (Heap and Brears 1993 p23).

The first Leeds manufacturer who erected a steam engine appears to have been Pym Nevins. He was a cloth manufacturer and installed a steam engine in his Hunslet mill in 1789²¹. John Marshall's flax mill in Holbeck also installed the power after 1792. These engines were merely to pump up water for the water wheels. The first textile industry which installed rotative steam power appears to have been Richard Paley's cotton mill in Mill Street near Marsh Lane, at the East

²¹ However, according to the work on the industry in the south Leeds, Connell (1975), Pym Nevins started his mill in 1790.

side of the town (Ward 1972 pp. 38-9, 406). Later, in 1796, Boulton and Watt claimed that the steam engine installed at Paley's another mill, Bank Top Mill, infringed patent rights, and Paley agreed to replace it with one of Soho manufacture. It was claimed that it would reduce fuel consumption and save the company £150 a year (*ibid* p167).

Ward (1972) believes that Young's account that 6-7 steam engines were at work in Leeds in 1792 was an underestimate, but the total was probably not more than 10 (p48). According to Farey (1827) there were about 20 steam engines, 270 h.p. at the end of the eighteenth century, while in Manchester there were about 32 steam engines, 430 h.p. in total (p654). Ward gives the breakdown of 20 steam engines in Leeds:

Ten of these were of Boulton and Watt manufacture, installed in six cotton mills, three woollen mills, and one flax mill. Of the remainder one, at least, was in a dyehouse, probably either Sayner's (Hunslet) or Holroyd's (Sheepscar), and the others at Leeds Pottery and a few small concerns (Ward 1972 pp. 48-9).

In 1824, there were 129 steam engines, 2,318 h.p. in Leeds and its vicinity, and in 1830 the steam power in Leeds further increased to 4,048 h.p. by 225 steam engines (*ibid* p86). Thus, the number of steam engines and their coal consumption rapidly increased in early nineteenth-century Leeds.

The textile industry was at the forefront of technological innovation. New technological development had already been introduced in the processes of flax-spinning in the 1790s in Leeds. Woollen manufacture and flax-spinning were the boasts of the town. Prominent examples were John Marshall's flax mill and Benjamin Gott's woollen mill and these large textile mills became the landmarks of industrial Leeds. Marshall's flax mill was built in 1791 at Holbeck, on the south bank of the Aire. It was first powered by a water wheel and the water was raised by a steam engine (Rimmer 1960 p35). It

was replaced by a 20 h. p. Boulton & Watt engine in 1792. One more mill was built in 1795, burnt down and rebuilt in 1796. It was powered by a Boulton & Watt 28 h. p. engine (Connell 1975).

Gott's mill was called Bean Ing, which was built in 1792-3. Benjamin Gott (1762-1840) was one of the key figures in the early manufacturing history of Leeds. He succeeded as a manufacturer of woollen cloth as well as a woollen merchant. He was a son of well-to-do civil engineer and became a woollen merchant by apprenticeship. He was apprenticed to a firm of Leeds cloth merchants, Wormald and Fountaine, and became a junior partner of the firm. From at least 1790, Gott was the driving force of the firm (Heaton 1931 pp. 46-8). Even though Gott was a merchant, he embarked upon manufacture, which would supplement the supply of cloth. Because Leeds cloth merchants enjoyed gentlemanly life and were considered to have higher social status than manufacturers, Gott identified himself as a merchant rather than a manufacturer. Still, it is true that his factory gave him wealth. Bean Ing Mill was built in 1792 in the midst of the field on the west of the town, and a 40 h.p. engine was ordered from Boulton and Watt (*ibid* pp. 51-2). It was one of the largest mills in Leeds. By 1800 Bean Ing employed over 1,000 people (*ibid* p54).

Although these large mills were the symbols of Leeds industrialisation, the change from the traditional industry to the factory system was limited. There was little machine spinning in the woollen industry before 1820 and weaving was basically a hand operation during the period. Moreover, the textile production from the factory system was also limited. 'In 1797 production from Gott's mill amounted to 3,690 pieces, the same number as at Knowsthorpe Mill and less than at Kirkstall, both of which served the domestic system (Ward 1972 p55)'.

The early nineteenth century was still the beginning of the development of the factory system, especially in the urban areas. The main industry during the eighteenth century such as cloth finishing was still important. At the turn of the century, there were many finishing workshops and dyehouses, along with the small number of

large-scale factories which operated almost all processes of textile production in one factory, such as Gott's mill and Marshall's flax mills.

Still, small-scale workshops were gradually industrialised themselves. By 1835, many workshops were powered and the gig-mill²² were in common use. Such innovations were adopted especially in the boom year of 1824-5 (*ibid* p67). Dyers had also installed steam engines, though usually small. 25 steam engines had been installed in dyehouses in Leeds by 1824 (*ibid* p69). These finishing works become a source of smoke nuisance, too.

5-3 Smoky ring around the town

This section will first explore urban geography of Leeds in the early nineteenth century. Then, it will examine views and panoramas of early nineteenth-century Leeds focusing on their composition and representations of smoke.

The location of industry in Leeds hadn't changed very much between 1700 and 1830. There were no options for water powered mills except for these sites along streams. Steam engines also needed water to produce steam. Another consideration was the availability of coal. Transportation cost of coal after the Leeds staith could be high either by using carts or water transport (Ward 1972 p236). Therefore, coal consuming industries such as potteries and foundries tended to be situated on the south of the town, especially around Hunslet and Holbeck (*ibid* pp. 237-8, 239).

Thus, Georgian Leeds was surrounded by industries but the inner town generally lacked smoke producing industry. The centre of the town, the square area bounded by Briggate, Boar Lane, the Headrows and Park Row was occupied by commercial users (*ibid* p178). This square area is the middle left part in Jefferys' plan (1770), mostly unoccupied by buildings then (Plate 5-1). Some parts of old town, including Kirkgate, Swinegate and Mill Hill as well as North Street,

²² A machine to raise the nap of fabric.

were the principal area of workshop industries, though a few factories were also built at the early stage of the industrial development (*ibid* p179). Large textile mills tended to be located in the periphery of the industrial belt surrounding the town, due to the availability of land (*ibid* p181,7). However, the north of the town did not have the industrial belt due to the lack of water source and relative difficulty to obtain coal. Dr. John Aiken wrote that 'Not a single manufacturer is to be found more than one mile east, or two north, of Leeds; nor are there many in the town of Leeds, and those only in the outskirts (Aikin 1795 p573)'.

While Leeds was industrialised, its population increased and housing development was ongoing. As Beresford (1988) explores in *East End, West End*, respectable residential area for middle-class was developed in the western Leeds and houses for the working class were concentrated in the eastern Leeds. The development of Park Estate in the western Leeds started in the 1760s and two squares had been developed by the early nineteenth century. Until the area became too smoky because of the erection of industrial buildings in the further west, the Park Estate was the genteel address for Leeds middle-class. Its prestige was gradually taken over by Woodhouse Lane in northwest, the elevated area around Leeds township.

Views of Leeds in the 1820s and 1830s generally present positive images of industrial Leeds. In fact, early nineteenth-century artists usually chose viewpoints where they could emphasise industrial aspects of the town. As abovementioned, the main two views of Leeds during the eighteenth century, Francis Place's *The Prospect of Leeds* in 1715 and Samuel and Nathaniel Buck's *South East Prospect of Leeds* in 1745 were drawn from the east of the town. It was probably due to the importance of the Aire in the views of Leeds during the eighteenth century. However, the Aire ceased to be essential for early nineteenth century views. Robert Riddell's view from Beeston Hill in the 1790s had already lacked the grand presence of the Aire, and Turner's view from the similar viewpoint to Riddell's

does not provide a clear view of the Aire. In Turner's view, the Aire runs beyond the factories and the view gives not more than a glimpse of the river. Instead of the Aire, the main focus is the industrial buildings and the smoke. For example, the most prominent mill in the centre is Benyon's flax mill in Hunslet. It was a large mill employed 560 hands and the watercolour shows an engine chimney emitting a long plume of smoke (Hill 2008). Other prominent factories in the view are Marshall's flax mills on the left, one of them emitting a plume of smoke, too.

Similar compositions can be seen in other Leeds views in the 1820s and 1830s. Alphonse Dousseau's view (1827-31) and Robert Buttery's *Leeds from Beeston Hill* (1833) are also from the south, from where it is difficult to show the presence of the Aire, but more importantly, it depicts the thick wall of industry and smoke between the town and the viewpoint (Plate 5-7 and 5-8). Artists' intentions become clear considering that they appear to have avoided drawing a view from the north, where the industrial wall did not exist.

Even though industry was indispensable for early nineteenth-century Leeds views, smoke in these views rarely spread enough to hide most part of the town. In other words, most views only give the controlled depiction of smoke in order to give the whole view of the town. In the view by Dousseau, a French artist who lived in Leeds between 1823 and 1831 (Hill 2008 p152), the most prominent industrial buildings are chimneys of Hunslet Crown Glass works. Beyond the glasswork's chimneys, two kilns of pottery and an engine chimney are seen. Other prominent industrial buildings in the view are pottery kilns. On the other hand, engine chimneys are not given much attention, which could have been intentional. Unlike Leeds's usual wind direction as shown in Turner's watercolour, the east wind is blowing. The moderate wind does not disperse much smoke, which makes the town view clearer. Buttery's view includes dozens of engine chimneys. The tower of St Paul's, and the spire of the Trinity Church in the centre are almost confused with high chimneys at the first sight.

Though the amount of smoke is controlled, these engine chimneys and large mills are drawn as something to be shown with pride for the families in the foreground.

Although some views seem to give gloomy aspects of industrial Leeds at first sight, they are actually celebrating images of Leeds. For example, Charles Cope's *View of Leeds from the East* (c1826) is a close view of the town (Plate 5-9). In this view, the viewpoint itself is in the midst of the industrial area. The view is similar to Turner's *Leeds* in terms of the depiction of smoke cloud which obscures the townscape. The effect of the light and ascending smoke make it uplifting not merely gloomy.

Early nineteenth-century Leeds was surrounding by industry and smoke except for north. Artists chose viewpoints which could include industry and smoke in the foreground, which means that smoke was necessary part of Leeds views. Those views do not give an impression that smoke cloud over the town was negative. However, industrial smoke could have caused a nuisance for its neighbours. The next section will examine the first smoke nuisance lawsuit in industrial Leeds.

5-4 The first conflict over smoke in Leeds

The first major conflict over smoke nuisance in Leeds was at Mill Hill. This was on the northern bank of Aire branch, separated from it by a weir. Mill Hill was near the commercial centre of the town but also the very edge throughout the eighteenth century. At the western end of Mill Hill, a Manor House was located and in the second half of the eighteenth century it was the residence of Wilson family, who owned the manor expanding in the west side of the town (See Plate 5-11 for the location). After Christopher Wilson, who inherited the estate in 1789, they were absentee landlords (Beresford 1988 pp. 134, 148). Christopher's son, Christopher, inherited the estate in 1792 and he intended to sell the Manor House contrary to his father's will. He

obtained sanction from the House of Lords to sell the property, which resulted in an Act (1803):

from the great Increase of Manufacturing Trades of late Years, and particularly from the Erection and Construction of a great Number of Fire Engines, and other Erections for carrying on the Manufactures, the said House, heretofore used as a Mansion-House, would be a very unhealthy Place of Residence, and in no Respect eligible for the said *Christopher Wilson*, who is wholly unconnected with Trade: But such a House, and the whole of the said Property within the said Parish of *Leeds*, would sell to great Advantage to Persons engaged in the Trade and Manufactures of the Place (WYAL WYL 160/58/32).

The sale of the house was not easy and it was let to Benjamin and Samuel Winter in 1806 (Burt 1995). According to the evidence given in the later smoke nuisance case, *Winter v Nussey* in 1811, the Winter family moved to the house in 1805 and found the environment 'tho' near so busy a town as Leeds, airy and healthy (LM 27/4/1811)'.

Before Nussey erected his dye-house, there had already been some smoke producing buildings in the neighbourhood of the Manor House. In fact, the plaintiff, Winter himself was a merchant, who had a 'glossing shop, or press-shop'²³ twenty yards northward away from the house. Hannah Nettleton, a housemaid of the Winters said that when the wind was from the north, smoke came from chimneys of Winter's shop. In addition, there were some dye-houses including Dixon's, Lumley's and Appleyard's, on the eastward. Mary Ann Winter, daughter, told that 'there were factories in Swinegate, and south of it, sending out great quantities of smoke, but there were intervening buildings which prevented it from coming into the Plaintiff's garden (LM 27/4/1811)'. Because wind generally blew from the west in Leeds, these buildings were not the main sources of nuisance. Another

²³ The high-quality cloths were pressed with hot plates by merchants in the end of finishing process (Morris 1990 p66).

possible source of smoke was Marshall's flax mill but Mary Ann denied the possible nuisance from the mill. 'Marshall's dye-house was on the opposite side of the river and too distant to give any annoyance (*ibid*)'.

The area between the branch of the Aire and the mainstream was clear field when the Winters moved into the house, as the comparison between the plan in 1792 (Plate 5-10) and the plan in 1814 (Plate 5-11) gives the idea. Although there were some mills and dye-houses around the house, the family were not annoyed by smoke. The garden was not as pure as those in the country, but it was pleasant enough.

Then, in 1808, George Nussey built a dye-house on the opposite side of the Aire branch, thirteen yards away from the Manor House, spending £3000 for it. Before it was built, Winter warned Nussey that 'an action would be commenced against him' if he would build a dye-house despite his warning (LM 27/4/1811). Nussey, nonetheless, built the dye-house, with a steam engine and eleven chimneys. One of the chimneys, an engine chimney, was very large and 'as high as the house [the Manor House], and the other ten not taller than the drawing-room windows (*ibid*)'. It means that the land on Manor House was higher than the dye-house's, and as a result, the chimneys of dye-house were as high as Manor House's windows. They smoked whole day except night, sometimes all of chimneys, sometimes just some of them.

The smoke rolled against the house in volumes; and though the windows had been closed for weeks together, the soot and filth penetrated into them, and completely spoiled all the furniture, and injured the paint of the house, changing cleanliness and neatness into filth and nastiness (*ibid*).

Fruit and vegetables in their garden were also spoilt and some of the trees nearest to the dye-house were killed. Hannah Nettleton, a

housemaid, had to clean the rooms and needed to wash vegetables and fruit four or five times.

This case indicates that it was more about the location of the polluting industry rather than its size which made it a legal conflict. Although other dye-houses were not very smaller than Nussey's, they were already there when Winter moved into the house and did not directly pollute the house. The area had already attracted industrial buildings as Wilson noticed in 1803. Winter, he himself had a workshop, could tolerate the deterioration of the air quality then, but the fumigating smoke was a different matter.

The nuisance in this case was indisputable. Parke, a lawyer for Nussey, stated in the end of the trial that 'it has been suggested, and we think very reasonably, that a verdict should be taken for the plaintiff, which would establish his right (Bartholoman 1811 p145)'. However, both plaintiff and defendant agreed that Nussey should not be ruined, in other words, they should find a way to reconcile their interests without removing Nussey's dye-house. The agreement was that Nussey would conduct experiments to reduce the amount of smoke for six months.

Because the nature of experiments was not at all discussed, it is not certain whether smoke consumption was in their mind or not. However, Nussey appears to have known the difficulty in reducing the smoke amount. His lawyer persisted in appointing a third person to judge whether Nussey would have done what he could do or not, though the claim was not accepted (*ibid* p145). It is not certain what extent was known about the smoke consuming technology in Leeds then. One of the features of Boulton and Watt's engine was the saving of fuel after all, and the clauses in Manchester's Improvement Act (1792) as well as Bradford's Improvement Act (1803) could have been known. Still, the report of *The Leeds Intelligencer* totally lacked the reference to the experiments Nussey was supposed to conduct, which shows that the possibility of reducing the smoke amount was not generally believed or known in Leeds in 1811 (LI 25/03/1811).

Still, almost ten months after the verdict of the case, a newspaper advertisement for 'New Discovery in Burning Smoke' was printed by local flax spinners and machine makers, Proctor and Marsden. The advertisement was addressed to local manufacturers using steam engines. It claimed that Proctor and Marsden in Hunslet Lane, 'have invented, and used at their Mill for some time past, a Method, by the Use of which the large Quantity of Smoke generally issued from Engine Chimnies, is decreased to the small Quantity issued from the Chimnies of common Dwelling-Houses (LM 25/1/1812)'. Interestingly, it was the only advertisement for smoke abatement apparatus which appeared in *The Leeds Mercury* until Taylor started the parliamentary campaign in 1819 (See Table 5-1). The timing and the general lack of such advertisement at the time implies that Proctor and Marsden developed the method inspired by the case, *Winter v. Nussey*.

Despite the advertisement, the possibility of abating smoke was not generally known until Taylor started his parliamentary campaign in 1819. For example, a letter from a reader of *The Leeds Mercury* was printed in 1818. It argues that the maintenance of pavement could be improved unlike 'Smoke and soot in abundance', which were 'evils inseparable from our situation (LM 8/8/1818)'. The writer of the letter did not expect that there was a way to abate smoke without interfering with economic activities. Proctor and Marsden's smoke burner was not generally known among Leeds inhabitant and it was Taylor's parliamentary campaign that they noticed the possibility of smoke consuming technology.

5-5 Newspaper reports and advertisements on smoke abatement

The first report of Taylor's campaign in Leeds appeared on 6th May 1820 in *The Leeds Mercury* and on 8th May 1820 in *The Leeds Intelligencer*. These were the two main local papers in eighteenth and early nineteenth century Leeds. This section will examine how Leeds local newspapers reported Taylor's parliamentary campaign and advertised smoke abatement technology.

The Leeds Mercury was 'a weak, ineffective, and failing paper with a limited circulation and few political views' and it was Tory, not Whig before Edward Baines started his apprenticeship in 1795 and eventually took over it in 1801 (Thornton 2004 p40; Thornton 2009). Baines was supported by a group of local Whigs, which set out to establish a Whig newspaper in Leeds. He was influential enough to be elected as a MP after thirty years of editorship. Unlike the stable editorship of *The Leeds Mercury*, the ownership of Tory *Leeds Intelligencer* changed a few times around the period. *The Leeds Intelligencer*, founded in 1754, had been run and edited by the Wrights until 1815. From 1815 a journalist George Mudie was the editor until it was sold to William Gawtress, Thomas Kirkby and Thomas Inchbold in 1818, and it changed its ownership again in 1822. These two newspapers had different opinions in big political events and the accusations made against each other tended to be harsh (Thornton 2004). However, in terms of smoke nuisance, considerable differences in opinion cannot be seen though Baines' *The Leeds Mercury* showed more zeal for the campaign.

Although Taylor started his campaign in 1819, it seems that the campaign was first overlooked by Leeds local newspapers. They started to report his campaign in the following year. On 8th May, *The Leeds Intelligencer* reported that '[Taylor] pledged himself to establish, that the great nuisance which rendered London, Manchester, Birmingham, Liverpool, and other great manufacturing places, uninhabitable, might be remedied (LI 8/5/1820)'. This sentence, that great cities were almost became uninhabitable, was laughed at by MPs present because it sounded as exaggeration. However, it was not a laughable statement for most Leeds inhabitants. Interestingly, *The Leeds Mercury* added Leeds to the list of the industrial towns mentioned by Taylor, which doesn't seem to have appeared in the original speech (Hansard 1820 Vol. I 50).

Although these two local newspapers did not show considerable differences in the smoke nuisance problem, *The Leeds Mercury's*

article was full of enthusiastic language, which was typical in editorials of Edward Baines. He started that 'We are glad to find that the patriotic efforts of Mr. M. A. TAYLOR, to remove the increasing and almost intolerable nuisance, arising from the smoke of Steam Engines and Furnaces, with which the air of this and all the other manufacturing towns of the kingdom is at present contaminated, are likely to be crowned with success (LM 6/5/1820)'. In Leeds it was the very first announcement that smoke and soot, which had been supposed to be inseparable from industry, could be removed. Baines hoped that 'there is public spirit enough' in the owners of manufactories, dyehouses and furnaces in Yorkshire and other counties (*ibid*). These references to Yorkshire and Leeds in the article show Baines' intention to introduce the parliamentary debate to local politics.

The smoke consuming technology played the key role in Taylor's parliamentary campaign, and the technology was also a key of local newspaper articles. Baines' article on Taylor's campaign mentions the expense to install such apparatus:

It is stated that furnaces for steam-engines, &c. on the principle of Mr. Josiah Parkes' invention, are constructed at as small an expense as the those generally in use, and that they are worked with less consumption of fuel by one-fourth. It is probable, however, that some expense may attend the alteration of the steam-engine and other furnaces already erected: but that is an obstacle which no man, who has a proper regard to the public health and comfort, will suffer to stand in the way of the removal of this pestilential nuisance (LM 6/5/1820).

What is surprising was that these confident sentences were almost all based on one report of the parliamentary debate. Baines could not draw on any direct observations on the effectiveness of Parkes' apparatus in this stage, and newspaper reports on smoke consuming technology relied on Taylor's convincing speech with three MP's testimonies.

A week later, two newspapers printed an identical article on local manufacturer's installation of the technology. It was reported that Marshall's steam engine furnaces 'are constructed upon such a principle as to create little more annoyance than as many common kitchen chimnies' and the Leeds public baths, which was under construction, would have a smoke burner (LM 13/5/1820; LI 15/5/1820). John Marshall's mill was one of the landmarks of industrial Leeds and he owned three mills in 1820. Three mills used five steam engines, 205 h.p. in total (Table 5-2). As his name appeared in the case, *Winter v Nussey*, Marshall's large mills could attract attention when the smoke abatement would be an issue. Therefore, this declaration in local newspapers could be a strategic move by Marshall²⁴.

At the end of May, an article on the successful experiment of Parkes' plan in London brewery appeared in two Leeds newspapers. Later, some manufacturers in Leeds adopted Parkes' plan. For example, a few months later, John Parkes, Josiah's father, visited Leeds and installed Josiah's smoke consuming apparatus for Hirst and Bramley. At the same time, it was reported that Titley, Tathams and Walkers would adopt Parkes' apparatus soon. Two years later, Josiah Parkes himself visited Leeds to sell his patent (LM 2/9/1820, 28/10/1820, 28/9/1822).

However, not only established inventions but also local inventor's smoke consumers would be one of the options for Leeds manufacturers. When Parkes' experiment in a London brewery was reported at the end of May, the account of the smoke consuming plan of Mr Davies of Dukenfield near Knutsford was printed, too. Two Leeds newspapers reported that Martin Cawood and son, brass and

²⁴ Seven years later, one of John Marshall's sons sent a letter to his father writing that he saw a particular smoke burner in Manchester. He wrote that the reputation of the smoke burner was good and it was worth trying (UL MS 200/17/8).

iron foundries in Leeds, adopted Davies' plan to their foundry. In fact, Cawood's intention was to sell the improved plan of Davies in Leeds, which was realised in the following year. *The Leeds Intelligencer* reported that Cawood's foundry succeeded in abating the smoke amount. 'The emission of the smoke, is now scarcely more than from a common fire; and the contrast with the black and dense volumes of vapour which issue from the neighbouring furnaces, is very striking (LI 29/5/1820)'. The principle of Davies' plan was as follows:

The person attending the engine, should, before supplying the furnace with coal, push the fire forward, then lay the coals on the place from whence the fire was pushed, and immediately close the door to within about an inch and a half of the bottom: the air rushing through the part left open, has the effect of burning the smoke completely. A little smoke will rise while the coals are laying on, but the moment the door is put down, and left as before stated, very little smoke can be seen: the door may be closed in about a minute (LM 27/5/1820).

Baines commented about the plan and said that while the plan was simple and efficient, the defect of the plan was that the efficiency of it depends on an engine man. He feared that 'a person who is accustomed to breathe an atmosphere of smoke below, will not be unremittingly careful to prevent its puffing out in columns from above (*ibid*)'. He suggested that the apparatus should be self operating.

Cawood's foundry sold the improved plan in the following year. In 1821, advertisements appeared in two newspapers, which said that Martin Cawood and Son finally could announce to the public the accomplishment of William Prichard's patent apparatus. It seems that it was Prichard who improved Davies' plan and Cawood was selling Prichard's apparatus. The advertisement pointed out that inventions concerning the smoke consumption so far had been a difficulty in admitting air and lacked proper air adjusting device. This deficit lessened the power of engines. '[T]his has generally proved fatal to their Adoption, and, in many Instances, where they have been

erected at considerable Expense, they have been abandoned (LM 18/8/1821)'. Prichard's apparatus, therefore, provided a self regulating apparatus.

Prichard's plan was actually adopted by several Leeds manufacturers. Cawood printed names of manufacturers who had already adopted the apparatus in the advertisements. According to the advertisements, Benjamin Gott & Sons, William Carr & Sons, T. & J. Bischoff & Co. and John Rothery & Co. adopted it and the change was happening at Edward Hudson & Co., too. These names show that some manufacturers including Benjamin Gott were willing to try the new smoke abatement technology, which was advertised as a win-win solution for the smoke nuisance.

5-6 The confusion over the technology

Although some manufacturers willingly tried smoke consumers, it was not the end of the story. Smoke consumers did not necessarily function as planned and the failure could cause further expense for manufacturers. This section examines the confusion over the smoke abatement technology among Leeds manufacturers.

Benjamin Gott, who adopted Prichard's apparatus, experienced stoppage in his factory due to the problems with the smoke consumer and he decided not to install such an apparatus anymore. The failure of Prichard's apparatus was the direct cause of the trial against Gott later in 1824. Interestingly, the inventor, William Prichard, was an engineer employed by Benjamin Gott himself and he was dismissed by Gott in c. 1822. Gott's attorneys produced instructions for cross-examination of witnesses and it provides the reason why Prichard was dismissed:

His first offence was a connivance at fraud on the part of some of the Workmen;—his second, for which he was discharged was a breach of trust in making improper communications to some

Manufacturers who were about to succeed Defendants in the occupation of another Mill near Leeds²⁵.

Although the reliability of this personal attack is open to question, it was believed that Prichard allowed sawyers to overcharge Gott, caused damage in the sale of fixture and gas apparatus and allowed Cawood to overcharge Gott for iron purchase. As for the accusation concerning sawyers, Gott's attorneys also prepared a very detailed description by Isaac Land, one of the sawyers. Land had left the work at Gott's mill due to the fear of being found out, six months before the interview. Land mainly blamed his partner, Dean, for the fraud. However, as for Prichard, Land believed that Prichard was too simple to allow Dean to measure and never took a note by himself. It is difficult to reconstruct what happened between Bean Ing and Prichard but one thing is certain, which is that Prichard was dismissed due to these charges and it was before the indictment.

Anyway, Gott tried Prichard's apparatus and experienced much stoppage. 'It was constantly out of order, and there was seldom a week without repairs or alterations taking place' while repair of the fireplaces was needed less than once in six months before Prichard's plan was adopted²⁶. This kind of problem seems to have been common for smoke consuming apparatus and it was actually advertised that Prichard's apparatus overcame this problem. The advertisement claimed that the apparatus would work for years without repair. However, it was possible that not only Gott but also Bischoffs experienced some kind of difficulty with Prichard's

²⁵ WYAL, WYL160/116, Instructions for Cross-examination of Witnesses for the Prosecution p4

²⁶ *ibid*, Mr John Dixons Evidence, Instructions for Cross-examination of Witnesses for the Prosecution p6.

apparatus. T. & J. Bischoff once adopted Prichard's plan but appeared in the advertisement for Parkes' plan again in 1823²⁷.

It is difficult to judge whether Prichard's apparatus was practical or not. In contrast to Gott's claim, some articles printed in *The Leeds Mercury* later in the 1840s described Prichard's plan as effective. A letter to the editor of *The Leeds Mercury* wrote that 'The most effective application in use here is the patent taken out by Mr. Prichard, our townsman' due to its simplicity and its independent effectiveness from a 'firer' (LM 10/6/1843).

Still, it was also true that Prichard's smoke consuming apparatus caused frequent stoppage of Gott's work, which involved costs. After trying Prichard's plan, Gott arrived at the conclusion that 'upstart speculative patents' were too risky:

This object [reduction of smoke] however desirable is not to be attempted by idle experiments and quackeries such as is the Fashion to extol in the present day—The Patents now in use in various parts of the Kingdom have all in their turn been proved wholly inefficient and some of them worse than useless, by causing an enormous expense in the continual refitting of the Boilers besides an incalculable loss in the stoppage of the works. ... When any better plan is found and proved by experience, the Defendants will very readily adopt it—but till then having at least as much practical science themselves as many of these upstart speculative Patentees, they decline throwing away their time and money upon mere idle speculation²⁸

However, newspapers' reports on smoke consuming devices were always enthusiastic and provided a description of their success. These articles usually ended with encouragement for other manufacturers to

²⁷ It is possible that Bischoffs had another steam engine to adopt smoke consuming device, but, it is also possible that they had a problem with Prichard's plan, and choose well established Parkes' plan for the second time.

²⁸ WYAL, WYL160/116 Brief for the Defendants p11.

adopt the devices (for example, LM 31/3/1821). One rare occasion when doubts on smoke consuming devices and questions on the installation cost appeared in newspapers was the report of parliamentary debate held on 7th May 1821. About a dozen of MPs made a speech on the subject as examined in the previous chapter. Some of them supported the bill as well as the effectiveness of the technology while some of them requested the amendment claiming that the technology was not reliable enough for legislation. Interestingly, *The Leeds Mercury's* report of this debate was compiled in a way to support the smoke consuming technology. It summarised the opposition in the first half of the article and then presented supporting opinion on the rest of the article. The support and the opposition was actually almost alternately expressed in the Parliament. Because the votes were divided (83 were for original motion and 29 were for amendment), *Leeds Mercury's* compilation was reasonable. Still, it is also true that manufacturers' concern was belittled and was not carefully examined in the newspaper.

A similar structure can be seen in other articles mentioning manufacturers' concern about the practicability of smoke consumers. *The Leeds Mercury* dealt with the subject on 22nd July and refuted manufacturers' claim:

It has often been urged in extenuation of the nuisance created by the suffocating smoke from steam-engine chimnies, that no plan has yet been discovered, by which this evil could be removed; and this plea, if well founded, would be entitled to due consideration; but it is not well founded. Several plans have been devised, many of them calculated to diminish the dense clouds in which manufacturing places are now so frequently involved; and we have the authority of one of the first manufacturing houses in Leeds, (Messrs. Benyon & Co.²⁹) for saying, that by the application of the

²⁹ Thomas Benyon was the former partner of Marshall and he bought land on Meadow Lane to build his mill in 1803. It is highly possible that Marshall's former engineer's company, Fenton, Murray & Wood installed Parkes'

smoke burning apparatus of Messrs. Parkes, they have ... completely succeeded in freeing the neighbourhood of their works from the annoyance (LM 22/6/1822).

The basic structure of this article is shared by the report on the parliamentary debate. When the doubts and questions were raised, it was always followed by the strong support for the smoke abatement. Although the article seems to present a balanced view by examining both sides, what it actually argues is that the reasoning given by manufacturers who opposed the smoke abatement was not well founded and not based on irrefutable evidence.

Similarly, later, in December 1822, a letter appeared in *The Leeds Mercury* from Thomas Roberts, a corn miller on Water lane, south of Leeds. He recommended Parkes' plan based on his observations on different smoke consumers in Leeds and his own experience on using several plans. He could save fuel to four fifth using Parkes' plan. However, in the process, 'like many Others, I have tried several different Schemes, which involved me in Expenses and Trouble (LM 21/12/1822)'. What happened to Gott obviously happened to Roberts, too, but he did not stop trying smoke consumers until he found the practical one. When writing a letter to *The Leeds Mercury* readers, he intended to clear up the confusion over the smoke consumers by naming the most effective apparatus. He strongly recommend the use of Parkes' patent 'as, by its Means, the Employers of Steam Engines will not only completely remove the Nuisance of their Smoke, but also materially benefit themselves and diminish the Labour of their Firemen (*ibid*)'. Roberts' letter resonates with the general tone adopted by *The Leeds Mercury*. By these articles, readers of *The Leeds Mercury* should have formed firm opinion that manufacturers who opposed smoke abatement are behaving unreasonably and are giving a poor excuse about not installing a smoke consumer. In other

apparatus for Benyon & Co because they also provided other materials including iron building materials and steam engines (Connell 1975 appendix no. 50).

words, *The Leeds Mercury* successfully created a local discourse that manufactures should install smoke consumers because it is a win-win solution for manufacturers and inhabitants.

5-7 The Leeds Smoke abatement campaign

The smoke abatement campaign spread through several cities in Yorkshire as well as Liverpool after Taylor's Bill was passed into an act. The first seems to have been in York. 'We hear that the proprietors of the steam-engines in York are about to be indicated, for the purpose of abating the nuisances arising from these engines not being constructed so as to consume their own smoke (LM 2/2/1822)'. Wakefield and Bradford also began a campaign. On 15th February, 'a representation, signed by a great number of the principal inhabitants of Wakefield, was presented to the magistrates at the Court-house there, requesting the enforcement of ... Mr. Taylor's act' and manufacturers who owned furnaces and engines received a notice which said that unless adopting a smoke consuming apparatus, prosecutions would start at the next quarter sessions (LM 2/3/1822). In April 1822, 23 indictments had been preferred against the proprietors of steam engines at Bradford. Reflecting the increase of smoke cases in the West Riding Quarter Sessions, a printed form specially made for the smoke nuisance indictments under Taylor's Act was used for the indictment procedure, at least as early as October 1822 (Plate 5-12).

Generally, newspaper articles on Yorkshire towns' smoke abatement campaign were short and manufacturers' possible difficulty was not at all focused. Accumulation of these short articles on success stories could have led Leeds inhabitants to consider smoke consumers to be an easy solution unless they were informed by manufacturers about the possible difficulties.

Following the smoke abatement campaign in other Yorkshire towns, the smoke abatement meeting of inhabitants of Leeds was held in 16th September, 1822. An advertisement was posted on the same

day by the name of Mayor, Lepton Dobson, on *The Leeds Intelligencer* to request a meeting with the list of 66 inhabitants who supported the campaign. The advertisement announced that the meeting would be held at twelve o'clock Monday at the Court House. It shows that the meeting was aimed at the middle class³⁰, who had flexible schedules. The meeting was regarded as of public and official nature, considering the venue and Mayor's involvement, though it was not an official commission set by an improvement act.

The list of supporters shows that their addresses were mostly in the township: eleven in the Park Estate and sixteen in the old town including Albion Street and Briggate³¹. Some of the addresses in the old town such as Briggate were business addresses while Park Estate addresses were home addresses. Seven supporters had addresses at the north including Woodhouse estate, which was the newer residential area than the Park Estate. There are only a few people whose addresses were industrial south and east: three from Hunslet Lane, south of Leeds, and three from the east side of the town. Thus, most people supporting the meeting had addresses in the western residential area or in the old town.

As for their occupations, most of them were categorised as merchants. Later reports by *The Leeds Intelligencer* talk about 'the absence of all the great proprietors of steam engines (LI 23/9/1822)'. There were seventeen merchants including one spirit merchant and a wholesale grocer, but most of them were textile merchants. Three wool-staplers, four drapers were also relating textile industry. Others included two physicians, a surgeon, a solicitor, five printers and booksellers including Edward Baines, two accountants, saddle and harness maker, a jeweller and a mason. Only two of them were categorised as

³⁰ *The Leeds Intelligencer* also printed a small article on the coming meeting and said that 'We trust the attendance will be respectable (LI 16/9/1822)'.

³¹ Baines's directory in 1822 was used to identify the addresses. However, only 44 out of 66 individuals and businesses could be identified and it was not without uncertainty because the list only provides names.

merchants and manufacturers. One brass and iron foundry was also named.

On following Saturday, 21 September, another advertisement was printed in *The Leeds Mercury* this time³². The advertisement gave the resolution of the meeting with six points. First point shows the resolution to abate the nuisance in Leeds, and the second point confirms the effectiveness of smoke consumption: 'several Plans have been adopted, by which the Consumption of Smoke, where they are used, is so far effected as to prevent these Engines from being any longer a Nuisance, to the Neighbourhoods where they happen to be situated (LM 21/9/1822)'. And thirdly it criticised manufacturers for failing to adopt the proper measure and disregarding the public health and comfort.

Due to the absence of the manufacturers it appears that no persuasive opposition was presented at the meeting. According to the later report from *The Leeds Intelligencer*, Mr Holdsworth of Wakefield stated at the meeting that although he was greatly prejudiced against the litigation process due to his doubt over the possibly of smoke consumption, he was now convinced that the technology was practical (LI 23/9/1822). The success stories in other industrial and neighbouring towns also encouraged the discussion. Mr Tottie stated that in Manchester and Bradford the nuisance had been greatly abated and 'he saw no reason why it should not be done in Leeds (*ibid*)'. Two months previously, *The Leeds Mercury* described the success of Bradford smoke abatement and wrote that:

Though the numerous manufactories in that place are in a state of great activity, there is not thrown up by all the steam engine furnaces in that town, in the course of a day, as much smoke as is

³² The choice of newspapers for the advertisements was probably due to the dates of issue: *The Leeds Intelligencer* issued every Monday and *The Leeds Mercury* issued every Saturday.

emitted from one of the engines in Leeds in a single hour (LM 27/7/1822).

Other towns' success stories are often mentioned as one of the facts which supported the validity of smoke abatement campaign. However, it is difficult to evaluate the degree of success because only a few people referred to the visible reduction in the amount of smoke. One of them was a barrister for the local smoke abatement committee, Mr. Maude. He stated during the trial against Gott that Bradford's reduction in smoke was quite considerable and other Yorkshire towns such as Wakefield, Barnsley and Sheffield also achieved visible reduction (UL MS 193/193 p17). Anyway, based on such evidence the meeting decided to form a committee in order to enforce the provisions of Taylor's Act.

The fourth point was the list of committee members, 24 names from eight divisions of the town. Ten names out of 24 were on the previous list posted in *The Intelligencer*, but fourteen names were new. The political orientations of these supporters seem to have been evenly distributed. Supporters in the two lists printed in *The Leeds Mercury* and *The Leeds Intelligencer* were examined with the Poll Book of 1832 election, and the voting behaviour of 28 individuals can be identified (Table 5-3). Because the number of people whose voting behaviour is reasonably identified is limited, the number is not very meaningful. Still, there is no evidence to believe that political orientation was influential in connection with the involvement of Leeds smoke abatement campaign.

There are a few prominent names in the two lists. One was Edward Baines with the name of John Baines, his brother. Michael Thomas Sadler would be elected as Tory MP in 1829 and sponsored the Ten Hours Bill to reduce the hours of labour for children (Fraser 1980 pp. 275-6). Sadler was a linen merchant and an Evangelical paternalist. 'Brought up as a devout Methodist, he identified himself publicly with the extreme Tory-Anglican interest (*ibid* p276)'. He opposed the Reform Bill and never spoke on slavery, but obtained radical support

by adopting factory reform. John Clapham is likely to be a Whig Dissenter and a wealthy woollen merchant, supported for the Reform Act locally with Edward Baines (*ibid* p275). Thus, in terms of prominent names, the smoke abatement campaign was supported by both Tory and Whig.

The fifth point of the advertisement published in *The Leeds Mercury* was about the intention of prosecutions. They warned manufacturers if they would neglect to consume their smoke despite the future notice, they would be prosecuted. The final point was the request for subscription.

Unlike *The Leeds Mercury*, which did not provide much information about the meeting apart from abovementioned advertisement, *The Leeds Intelligencer* printed long and relatively detailed minutes of the meeting on 23rd September. According to the minutes on the paper, Mr Tottie stated that:

This meeting was to appoint a committee for the purpose of enforcing this act—a much better course, than that any individual should come forward to prosecute his neighbour (LI 23/9/1824).

It seems that people hesitated to directly prosecute factory owners, who were also respectable members of the Leeds society. This statement was actually said with ongoing prosecutions in his mind. At the time, John Smith Jackson and Robert Herries of the Bank, east Leeds, and Peter and Thomas Willans, Thomas and Benjamin Hogg, Peter and Richard Ripley and Leonard Forster of Holbeck were under prosecution. Herries, Willans', Hoggs, and Ripley had steam engines, 24 h.p., 40 h.p., 30 h.p., and 24 h.p. respectively. Herries was a flax spinner and Willans', Hoggs and Ripley were cloth manufacturers. Leonard Foster had two malt-kilns (Ward 1972 p402; Connell 1975 appendix). This process was initiated by John Pemberton Heywood of Wakefield, who was a chairman at the West Riding Sessions held at Wakefield and Leeds (GM 1836 vol. V New Series p102). Heywood stated that:

he had been a petitioner for two years for their smoke to be consumed, whose petition had been most contemptuously treated: the grievance had got to such an extent, that Holbeck was scarcely habitable, and that nothing would grow. He said he had gone into the fields when the hay-makers were at work, and in consequence of such an excess of smoke, they looked like so many Chimney Sweepers, and recommended them, immediately, to adopt the same plan as their neighbour, Mr. Benyon (LI 28/10/1822).

Although *The Leeds Intelligencer* reported that Heywood initiated the prosecution, London newspapers reported in the previous year that the Marquess of Hertford intended to start an indictment against manufacturers. 'The Marquess of Hertford has given notice to his tenants at Holbeck, near Leeds, who work steam engines, that if they do not speedily take measures to consume their own smoke, he will put in force the provisions of the late Act of Parliament to compel them to do it (MC 22/8/1821)'. An agent of the Marquess was reported as J.P. Heywood (MP 27/8/1821). Interestingly, *The Leeds Mercury* did not report the Marquess's involvement and names of factory owners who were prosecuted. Possibly, commercial and industrial interests in Leeds were not very comfortable with outsiders' involvement.

At the trials of these prosecutions initiated by Heywood, the judgement was suspended and it was decided that if 'effectual means for destroying the smoke had been adopted' within a month, and two month trial proved that the means were satisfactory for prosecutors and the committee, the court would inflict only a nominal fine (LM 26/10/1822). Otherwise, the court would inflict very heavy fine. It was also recommended to manufacturers to adopt a plan, 'the efficiency of which had been well-established' such as Parkes' 'rather than risk the expense of adopting one which might prove of no utility, and which failure would, of course, subject them to additional expense (*ibid*)'.

Although the consequences of the trial are not known, the lack of information suggests that these manufacturers adopted smoke consumers soon. At the same time, the local smoke abatement committee also started its campaign and persuaded other manufacturers to adopt smoke consumers. However, not all of them were persuaded into the adoption and another set of indictments was to be taken place.

5-8 The politics of lawsuits

In 1823, five manufacturers in Leeds, who did not adopt smoke consumers despite the committee's persuasion, were brought to court. Three defendants, Benjamin Gott, Scarth³³, and George³⁴ were reported in the newspapers. It was claimed that the selection of manufacturers who would be indicted was done mainly considering the amount of smoke produced and their mills' locations.

'[Manufacturers who would be prosecuted] were selected without any distinction of persons, or any degree of partiality, or any consideration but which was the greatest nuisance (UL MS 193/193 p4)'.

Four out of five defenders chose to avoid the full legal proceedings by adopting smoke consumers and only Benjamin Gott chose to go through the full legal process. As stated previously, Gott tried his engineer, Prichard's smoke consumer and experienced stoppages at his factory. Gott intended to show 'the utter folly of the present schemes for burning smoke and the ruin which their adoption must entail on the manufacturing Interests of the Country'³⁵. Effective or not, installing a smoke consuming apparatus and avoiding a legal

³³ Scarth seems to have been the owner of Mill Garth Mill, located in the East or North East divisions of Leeds.

³⁴ George seems to have been Thomas George, who built a dyework in Kirkstall Road in 1825. The offensive building is likely to have been a dye-house with 6 h.p. steam engine, which he owned at the Isle of Cinders (Ward 1972 p356).

³⁵ WYAL, WYL160/116 Brief for the Defendants p3.

conflict could have been an option and it was the choice of the majority of Leeds manufacturers who were under the threat, in other words a notice of litigation. Later, it was stated that nine tenths of the manufacturers adopted measures which were satisfactory to the local smoke abatement committee (LM 23/10/1824). This figure was the much improvement from the report in October 1822:

From a report just made by the committee for promoting the consumption of smoke in this town and neighbourhood, it appears, that we have, in the township of Leeds, ninety steam-engines; about fifty of which are entirely without burners, about thirty with inefficient burners, and not more than ten or twelve with efficient burners (LI 7/10/1822).

It is certain that many manufacturers adopted smoke consuming plans in 1822 and 1823, but there is no other evidence supporting the abovementioned figure that nine tenths manufacturers adopted satisfactory apparatus. It is probably safe to assume that some of the manufacturers might have pretended to install effective smoke consuming technology. Gott, however, had the determination to openly argue the practicability of smoke consuming technology.

Gott's case was first initiated in Leeds Borough Sessions with other four cases. However, Gott was afraid that the jury of the Leeds Borough Sessions were prejudiced against his argument because they were inhabitants of Leeds³⁶. Gott applied to move the case from the Leeds Borough Session to Westminster. Instead of Westminster, the case was removed to the Court of King's Bench in York. Gott was especially nervous about Benjamin Sadler, brother of Michael Thomas Sadler. Benjamin Sadler was the mayor of Leeds in 1822 after Lepton Dobson's mayoralty, and one of the magistrates in 1824. Because Benjamin Gott was also one of the aldermen, they were friends.

³⁶ WYAL, WYL160/116 Brief for the Defendants p14, Copy Defts affid to remove Indictment by Certiorari, Copy further affid of Defendants to obtain certiorari.

When they discussed the smoke issue before the litigation, Gott admitted to Sadler that he was causing nuisance. In the court, however, Gott needed to argue that his mill didn't cause nuisance. In instructions for cross-examination prepared by Gott's solicitors, it was stated that:

If however [Sadler] is brought to disclose any thing that has passed between him and Defendants and which he may choose to construe into an admission of the Nuisance he may be allowed to state it his own way; and then he asked whether all that passed was not in the strictest manner confidential and under the profession of friendship with a View on his part to effect a compromise between the parties— ... [Benjamin Gott] disavowed all concessions and simply stated his Willingness to adopt any plan for burning smoke which the Committee might suggest provided they would indemnify him against loss, in case of its failure, but that he would not try idle experiments at his own risk³⁷

At this stage, the Leeds inhabitants and some of manufacturers arrived at a consensus that Parkes' plan was effective. The committee appears to have tried to persuade Gott to adopt Parkes' plan. However, Gott did not have any intention paying extra costs for the new trial.

Another manufactures' trial seems to have confirmed Gott's fear about the smoke abatement campaign. After he obtained a writ of certiorari to remove the case from Leeds, John Hardy, a recorder of Leeds since 1806 made the following remark in the trial against another manufacturer:

It is not sufficient for the Defendant to say he has done all he can do; many persons have submitted to Indictments and have adopted measures which have been satisfactory—Are you

³⁷ *ibid*, Instructions for Cross-examination of Witnesses for the Prosecution p3.

(addressing Counsel) prepared to say he has done that which upon the faith of his having submitted to its being a Nuisance, shews that he has abated that Nuisance? Unless he has done that, we cannot treat him as incurring a mere nominal punishment but a substantial one, and if the Nuisance is not abated he will be liable to be indicted from time to time, to receive such substantial punishment as the Court may direct, and if not then abated, it must resort to the absolute abatement of the Nuisance, by ordering the property to be prostrated however valuable it may be³⁸

Hardy's opinion was quite extreme compared with articles printed at local newspapers. Baines, for example, understood the importance of the manufactory. In fact, the claim that it was possible to abate smoke nuisance without interfering with economic activities was the key to the local smoke abatement campaign. This 'fiction', probably from the viewpoint of Gott, was important to attract support for local smoke abatement committee. In this sense, Hardy's argument went to the extreme pursuing the absolute reduction of smoke. However, actually, Hardy was realistic enough not to rely on the 'fiction' that smoke consuming technology was a win-win solution. Still, when the 'fiction' prevailed, Hardy's opinion was regarded extreme, and Gott probably feared this extreme opinion. Considering the sudden emergence of the smoke abatement discourse and its influence, this remark could have alarmed manufacturers about the future course of the local public opinion.

When Gott decided to go through full legal proceedings, it was the local committee which tried to avoid the full confrontation at the court. After the case was removed to York from Leeds, it was claimed by the committee that the smoke produced by Gott's mill had been considerably reduced and it was asked to stop the proceeding of the litigation. At the same time, the committee asked Gott to pay the

³⁸ *ibid*, Brief for the Defendants p14, underlined by Gotts' solicitors.

costs incurred by the litigation³⁹. However, according to Gott, the reduction of smoke was simply not true because he had not changed anything about his fireplaces. Gott considered it as an insult and refused the payment. The action in York was inevitable to settle the issue⁴⁰.

It is impossible to confirm whether Gott's smoke emission was reduced or not because claims from two sides are completely contradictory. In the legal papers prepared by Gott's solicitors, there is a record of questioning William Forbes, gardener, in his garden on 12 March 1824. According to Forbes, Gott's mill had smoked less for two months⁴¹. Other witnesses including Benjamin Sadler also gave evidence of similar nature (UL MS 193/193).

There are some possible interpretations. Gott's engineman could have been especially careful of firing after the initiation of litigation. Or, prosecutors and supporters could have been under the illusion that Gott produced less smoke. In either case, it is certain that the committee desperately wanted to avoid the full-scale confrontation and extra expense in York. In fact, for them, the threat to resort to litigation was only a means to force manufacturers to install smoke consumers. The strategy worked very well at first. Manufacturers did not have a choice but install the apparatus. However, in order to confront the local public opinion, Gott determined to use money and time, which the local committee was not prepared to spend. At the same time, Gott's decision to remove the case from Leeds shows the significant influence of the smoke abatement campaign in Leeds. It was the sudden change from the year 1811 when smoke was inseparable from manufacturing.

³⁹ It was claimed that the same request for legal fees was made for other manufacturers, who was once prosecuted but whose indictments were dropped afterward.

⁴⁰ *ibid*, pp. 12-13; LM 23/10/1824.

⁴¹ *ibid*, William Forbes' interview

5-9 Bean Ing and smoke nuisance

In addition to the ineffectiveness of smoke consumers, Gott also defended himself by claiming that the main cause of smoke nuisance was the newly erected factories, not his own factory which was in the midst of the field in the 1790s. In fact, houses and factories had been built in the open field between Gott's factory and the town in a few decades and the boundary between industrial area and residential area had been blurred. This section will examine the development of industry and residential areas in the neighbourhood of Gott's factory geographically and chronologically.

Gott's mill was erected in 1792. It was located next to John Close's dye-house, which had been there since about 1767. Before Close occupied the dye-house it was a manufactory for worsted stuffs as well as a dye-house. Close's dye-house produced lots of smoke and the erection of Gott's mill further increased the amount of smoke. In fact, Close's dye-house was the largest in Leeds. According to John Wilson, who used to lead coals from canal to the dye-house, Close's dye-house consumed 20 wagons of coals, in other words 50 tons, in a week⁴². Holdsworth, a barman at the Wellington Bridge, remembered that before Gott's mill was built, Close had a white long horned cow grazed in tenter croft and it used to get exceedingly black with smoke. A dairyman was frequently obliged to wash the cow⁴³. John Spencer, a brickmaker stated that Close's dyehouse produced five times as much smoke as Gott's⁴⁴. Although the reliability of Spencer's figure is doubtful because Gott's high chimney effectively dispersed the smoke, Spencer's description of smoke emitted from the dye-house is

⁴² According to Marshall's general notebook, a wagon in Leeds was 2 and a half tons (UL MS 200/57).

⁴³ WYAL, WYL160/116 Brief for the Defendants p19.

⁴⁴ *ibid*, p23.

impressive. 'At a little distance the works looked like one large Fire, the buildings were low and were almost lost in smoke'⁴⁵.

Gott only tried one smoke consumer, Prichard's, but it is also true that Gott improved its fire place which resulted in saving fuel a couple of decades previously. In c. 1799 Gott adopted a plan to heat his dyeing and scouring vessels by steam under the direction of Boulton and Watt. 40 vessels were heated by individual fireplaces but after the alteration they are heated by two fires 'which are made mutually to consume as far as possible each others smoke'⁴⁶. These fire-places were constructed based on Watt's 'patent for consuming smoke'⁴⁷, and Gott claimed that his fire-places were always constructed on the principle of Watt's patent except for the time when Prichard's plan was tried.

However, information is confused about who did the alteration and when it was. Gott's claim was that it was Gott who did the reduction but some witnesses' evidence show that it was Close, the owner of dye-house, which would be integrated into Gott's mill in c. 1808. Joseph Littlewood, who apprenticed for John Close, stated that Close had at least 40 chimneys from different furnaces and fires, and William Close, son of John, made an alternation to heat his dyeing vessels by steam. '[T]he whole of the smoke from the reduced number of Fires [was] thrown into one larger Chimney which is now made use of by Defendants'⁴⁸. George Gath, Gott's engine man, gave the evidence that Close installed 'what was called a smoke burner & he recollects M^r Close saying to him one day "How is it you make less smoke than I do who have got one of these New Smoke Burner"?'⁴⁹ If

⁴⁵ *ibid.*

⁴⁶ *ibid*, p6.

⁴⁷ Obviously, this was not regarded as an acceptable smoke consumer by the Leeds smoke abatement committee.

⁴⁸ *ibid* p16.

⁴⁹ *ibid* Instructions for Cross-examination of Witnesses for the Prosecution p7.

William Close adopted a smoke burner before the integration of the work into Gott's, it was a quite early adaptation in Leeds. On the other hand, William Holdsworth, Leeds Toll Bar Keeper, who married a niece of John Close, stated that when Close's work was integrated to Gott's, there was a reduction of chimneys and fireplaces. His evidence supports Gott's claim that it was Gott who conducted the reduction. Anyway, chimneys were integrated into one high chimney and witnesses approved the effectiveness of the plan.

However, a higher chimney could have caused nuisance to the houses further away than the immediate neighbourhood. Joseph Littlewood, who apprenticed for Close, originally stated that due to the height of the present chimney of Gott's, 'the more distant Houses may be more annoyed than formerly'⁵⁰. This statement was problematic in connection with Gott's basic claims and it was deleted in the final version of 'Brief for the Defendants'.

Gott's side claimed that the complaint of the nuisance was recently made not because of Gott's smoke but because houses and industrial buildings were built in the former open fields. Although Close's work produced lots of smoke, it was not a great nuisance for residential areas when the work was located in the midst of milking pasture and meadow lands⁵¹. Ann Briggs, who had lived in Lisbon Street near Gott's mill for 14 or 15 years until she moved from there one year before the trial, stated that 'the Air when she first came to live there used to be uncommonly fine and pure indeed they always considered they lived in the Country, her house being surrounded by green fields on every side'⁵².

Although Gott's mill was in the midst of fields, the open ground was gradually built up with houses and mills. In order to prove that

⁵⁰ *ibid* Evidence of Joseph Littlewood, Defts Proofs p2.

⁵¹ *ibid* Brief for the Defendants p24.

⁵² *ibid* p29.

industries and residential houses had been erected since the erection of Gott's mill, Gott's side prepared a map. Plate 5-13 is a map based on the printed map of Giles, Netlam and Francis (1815). The sheet is expanded to the left to include the area of half a mile from Gott's mill, and the addition were hand written, not printed. The red colour indicates the building erected after 1792. Plate 5-14 is a plan used in the trial and the revised version of Plate 5-13. It focuses on the area within a quarter mile from Gott's mill and part of the area half a mile from the mill. Buildings coloured black had been there for more than 40 years, buildings marked with faint lines had been erected prior to Gott's mill, which was built in 1792, and red buildings had been erected after 1792. The chronology of development was important, because Gott's side claimed that if the inhabitants came to the area already polluted, the claim of nuisance were not supposed to be admitted.

Bingley was the nominal prosecutor of the Gott smoke nuisance case and Gott's solicitors collected evidence to disprove the claim of nuisance by him. Some witnesses said that the neighbourhood of Bingley was annoyed by George's mill rather than Gott's. Thomas George⁵³ erected a mill in West street in 1815-16, which would be taken by Sheepshanks in c. 1817 (Ward 1972 p367). John Waite, a cloth dresser who worked for Mr Hague, the former occupier of Bingley's house, gave the evidence. According to Waite, Gott's mill did not annoy them, but Mr Hague said when George's mill was erected that 'he should be obliged to leave the place [because] the smoke he was sure would harm him'. Waite believed that Hague left the house due to the nuisance⁵⁴. Robert Haigh, a gardener who had rented a large garden next to Bingley's garden, also stated that

⁵³ Thomas George was probably one of the five manufacturers who were indicted by the committee. Because he built dyeworks in 1825 at Spring Gardens, Kirkstall road, it is possible that he moved his mill from the Isle of Cinder to Kirkstall road, which was far from residential area.

⁵⁴ WYAL, WYL160/116 Brief for the Defendants p33.

though Gott's mill was not a nuisance, after George's mill was erected his garden was very much injured⁵⁵. There were some other mills between Bingley's house and Gott's mill. In addition to George's, Wright's press shops, a paper mill and Glover's extensive mill were there⁵⁶.

Because the wind generally blew from the west in Leeds, the claim that Bingley's house was not annoyed by Gott's mill sounds reasonable. For example, it was claimed that 'the wind for more than $\frac{3}{4}$ th of the year, blows from the West and South West in that part, so that the smoke from Defendants' works cannot come near [Bingley] whose house is nearly due North of the Mill and more than a quarter of a mile distant'⁵⁷. However, this claim on wind direction also suggests that Park Estate, which was located in the east of Gott's mill could have been affected by the smoke from Bean Ing even though Park Estate was not within a quarter mile circle.

The development of the Park Estate started quite early, from 1767. The immediate west side of Leeds was first developed. The older square consisted of Park Row, South Parade, East Parade and Coloured Cloth Hall (see Plate 5-10 for the locations). In Plate 5-11, South Parade, Coloured Cloth Hall and General Infirmary next to the Coloured Cloth Hall, were coloured black, indicating that 40 years had passed since they were built (Beresford 1988). Further west from the square, the Park Square is located and half of the buildings on the square were coloured grey, indicating buildings built before 1792. Most of the other buildings including manufactories on the plan have red colour, built after 1792. As Gott's side claimed during the trial, new industrial buildings as well as residential houses had been erected within ten years before the indictment.

⁵⁵ *ibid* p32.

⁵⁶ *ibid* Instructions for Cross-examination of Witnesses for the Prosecution p1.

⁵⁷ *ibid* Brief for the Defendants p10.

As abovementioned, a relatively large portion of the smoke abatement committee's supporters resided in Park Estate. Naturally, some witnesses against Gott had houses in Park Estate. In order to prove that these witnesses were not annoyed by Gott's mill, Gott's solicitors prepared to cross-examine them pointing out that there are other smoke sources in the immediate neighbourhood of Park Estate. For example, William Gatliff resided in Park Place and it was prepared to cross-examine him that 'for some years past many brick-kilns have been made and used immediately in front & at the End of Park Place and that the Inconvenience to those houses is of very modern date' and Gatliff himself had his press shot behind the Park Square 'which makes a great deal of smoke and is a much greater Nuisance to that square'⁵⁸. Besides, Brown's dry-house and Beckett's dry-house are situated near the Park Square⁵⁹. However, it is not unlikely that Gott's smoke, not smoke from nearer factories, annoyed Park Estate. William Forbes had his garden probably between Park Square and Bischoff's mill, which was located in the east of Bean Ing. He stated that though smoke from Bischoff's mill went over his garden, smoke emitted by Gott's mill, which was further away than Bischoff's, reaches there⁶⁰. Considering the height of chimneys, Forbes's argument is not overall unlikely.

Among manufactories in the neighbourhood, Sheepshanks' mill had already installed a smoke burner. However, the effectiveness of the burner installed by Sheepshanks was doubted by witnesses for Gott. George Wilson, labourer who had worked for the Westgate Colliery near Wakefield, said that based on his observation on smoke emitted from several mills including Sheepshanks's, Gotts', the paper mill, Glovers and Bischoffs, 'it was very little use spending money in

⁵⁸ WYAL, WYL160/116 Instructions for Cross-examination of Witnesses for the Prosecution p5.

⁵⁹ *ibid* Mr Bingley's cross-examination.

⁶⁰ *ibid* William Forbes' interview.

burning patents as they seemed to do very little good⁶¹. Holdworth, a barman at the Wellington Bridge, also observed that 'There are some Mills about, which I understand use the Burning Patents, and they are in fact the Mills which make more smoke than any other'⁶². Holdworth also stated that:

The Bean Ing Chimnies emit as all the others do most smoke at the first firing in the morning, but I never see any considerable quantity of smoke come from them at any subsequent part of the day—While most of the Neighbouring Mills appear to be refreshing their fires almost every 40 minutes⁶³

However, based on the observation record of smoke from neighbouring mills in the legal papers, Sheepshanks's mill seems to have smoked less than other mills. By comparing recorded dates with other mill's observations, it appears that Sheepshanks' mill smoked less than other mills such as Glovers, Calverts and the paper mill, if assuming that Sheepshanks' mill did not undergo stoppage of the work (Table 5-4)⁶⁴. Probably because the result contradicts Gott's claims, the observation record was not submitted as evidence.

Despite the conflicting claims from both sides, it is true that industrial buildings and smoke suddenly increased in the area between Gott's mill and the Park Square. The relative lack of smoke around the Park Estate⁶⁵ in Turner's watercolour in 1816 also suggest that Turner reflected the real distribution of smoke clouds in his view (Plate 5-6).

⁶¹ *ibid* Defts Proofs p4.

⁶² *ibid* p5.

⁶³ *ibid*.

⁶⁴ Unfortunately, it only records the dates when mills' chimneys smoked very badly and it does not say anything about dates when chimneys did not smoke. Furthermore, it appears that observation was conducted not every day but every other day or less than that.

⁶⁵ On the left hand side of the watercolour, the white tower of St Paul's church with small dome and a cross on the top can be seen. The church was located in the Park Square.

Similarly, a newspaper article confirms that the sudden increase of industrial buildings around Gott's mill deteriorated air quality. On 5th August 1822 *The Leeds Intelligencer* printed an article entitled 'public improvements' which was on the removal of the shambles and the necessity of a market in Leeds discussed at the vestry meeting. At the very end, the following paragraph was added:

Within the last three or four years, no less than three dryhouses have been erected close to the west side of Park-square, hitherto with impunity, which has caused the proprietors of one of them, during the past week, to commence erecting a steam engine.— This, we doubt not, will put the finishing stroke to nuisances in that quarter (LI 5/8/1822).

These arguments over the chronology of development show that this smoke nuisance case was the boundary issue. Late eighteenth and early nineteenth-century expansion of residential and industrial sites blurred the boundaries between them and the legal processes were one of the means to re-mark the boundary.

Of course it was easier and more practical for rich people to move to the suburbs. In fact, Benjamin Gott resided in Armley Park to the west of Leeds from 1816. Before the age of omnibus, only people who were rich enough to keep their own carriage and horses could live in suburbs. Besides, as Gott's sons were responsible most of the running of the business when Gott moved into Armley Park, it was not very practical to live in the suburbs for people who needed to commute to the town. For middle-class inhabitants not to mention working class people, it was impossible to move outside the industrial belt at the time. While Gott's factory was causing a nuisance for many Leeds inhabitants, Gott himself enjoyed purer air in the estate located in the windward direction of industrial buildings. Moreover, the view from the estate featured Bean Ing emitting smoke (Daniels 1981). In this sense, the conflict reflected imbalance of power and available resources between rich manufacturer and middle-class inhabitants.

From the 1820s, rich residents in the Park Estate started to migrate to other areas. Still, in the 1830s, Park Estate's reputation was not totally tainted. In the 1830s middle-class residents such as merchants, manufacturers, professional men and their widows and unmarried daughters were concentrated at Mill Hill and the Park Estate (Morris 1990 p39). Walter Hook, moving into the vicarage in Park Square in 1838, found the environment pleasant enough. 'There were no buildings at that time on the opposite side of the road; the situation was airy and pleasant; within easy reach of the heart of the town, yet not so near as to be overwhelmed by the smoke of its multitudinous factories and mills (quoted in Stephens 1879 p369)'. Thus, the change was not rapid and it was not very visible in 1830, but residential area near the town centre had gradually lost its value. In 1842, James Holdforth believed that 'property within the action of smoke is certainly greatly deteriorated in value' and his house at the West End had halved in value since 1803 (quoted in Ward 1972 p176).

However, it was not only the residential area which was forced to change. The later concentration of industry along Kirkgate road and the south Leeds was probably partly encouraged by the threat of indictment as well as the consideration of the availability of land and water resources.

5-10 A paradox in the smoke abatement discourse

Gott and his sons obtained the verdict of not guilty in the end. The judge who was present at the trial, John Bayley, gave his opinion on the case later though the case was decided by juries not the judge. The reasoning of Bayley, a justice of King's Bench, was that because Gott's steam engine was operated for twenty years, the case was not indictable unless 'it be upon the principle of criminal neglect to adopt means to render it less obnoxious (LM 8/5/1824)'. Gott's side provided the evidence that they tried some means to reduce the

amount of smoke. Therefore, John Bayley did not consider the case as a criminal neglect case⁶⁶.

Gott's trial could potentially raise a doubt on the smoke abatement campaign. Gott could now confidently claim that the Leeds smoke abatement committee asked something impossible and the committee did not properly appreciate manufacturers' difficulties. In fact, the conflict did not end even after the verdict. Benjamin Gott and his sons were ordered to pay the sum of £254, the prosecution cost, probably the local committee's. The order was signed by eight magistrates of the borough of Leeds. Gotts rejected the order and the conflict went into the Leeds borough quarter sessions again. However, the situation was awkward. Most of the magistrates who were present at the court were involved in the case. The court consisted of eight magistrates, who were a mayor, a recorder and six aldermen. Only the recorder and one alderman did not sign the order. The court tried to give a fair opinion and John Hardy, the recorder, only spoke during the session. Still, Gott's side is likely to have considered the decision unfair. Although Gott's side applied for the opinion of the Court of King's Bench, it was refused and Gott and his sons were directed to pay fifteen pounds (LM 23/10/1824).

It was another smoke nuisance trial in the 1820s which further damaged the consistency of smoke abatement discourse. The defendant, John Ellis, erected his steam engine two or three years before his trial on 8th May 1824. His mill was located on the north-east side of the Park Square (See Plate 5-13). Due to the wind direction, the smoke from the mill annoyed the inhabitants of the Square. For example, Thomas Kirkby, the inhabitant, stated that 'smoke is emitted every four or five minutes all the day (LM 8/5/1824)'.

⁶⁶ However, it cannot be said that John Bayley's reasoning was the standard legal view on smoke nuisance cases. Bayley himself admitted that his opinion was not shared by another justice, George Sowley Holroyd (LM 8/5/1824).

What was different from Gott's case was that the indictment was brought by the inhabitants of the Park Square, not the smoke abatement committee. The reason why the committee did not directly pursue the case seems to be clear. John Ellis's son stated that they adopted Johnson's smoke consumer from the start of their works. It was Baines who recommended them to adopt the apparatus. Because the smoke abatement committee's goal was to make manufacturers adopt a smoke consuming apparatus, Ellis was not supposed to be indicted. However, the location of Ellis's mill was too close to the Park Square. It is natural for the inhabitants to think that if they could not do anything only because the mill owner installed a smoke consumer, what worth the smoke abatement campaign had. The situation revealed the contradiction of smoke abatement discourse, which assumed that smoke consuming technology was panacea.

Although reactions to Ellis's case don't seem to be recorded, the case seems to demonstrate the naivety of smoke abatement discourse from a sceptic's point of view. For manufacturers who experienced the difficulties in smoke consumers, Ellis was the victim of wrong assumption that smoke abatement technology was effective. Even though Ellis was forced to spend £30 to install the technology, he was still indicted.

5-11 'Smokes are good for man'

When M. A. Taylor's parliamentary campaign and local meetings were reported, a common phrase to describe the smoke producing manufactures was that they were disregarding 'the public health and comfort (for example, LM 6/5/1820; 27/5/1820; 27/4/1822; 21/9/1822)'. This combination was convenient because coal smoke's ill effects on health were not something which could be proved. Still, it was acceptable for lay people to simply say that coal smoke was unwholesome and newspaper reports sometimes used such a sentence. For example, *The Leeds Mercury* asked manufacturers to direct their attention to 'the removal of the prevailing evil, which, by its blighting influence upon vegetation, shows but too clearly what

must be its effects upon the constitution of every man, woman, and child, whose misfortune it is to be obliged to breathe this impure atmosphere (LM 6/5/1820)'. However, even this sentence by *The Leeds Mercury* needed to combine the ill effects on health with the visible influence on vegetation. This section will examine how the unwholesomeness of smoke was dealt with at the trial against Gott and afterword.

During the trial against Gott, similar consideration to the newspaper reports on Taylor's campaign can be seen. When the nuisances by Gott's smoke were enumerated, visible inconveniences were focused. Gardens and vegetation were affected, neighbours had a trouble with drying clothes and textiles, and 'Even persons going along the highway were incommoded by the smoke, and were frequently obliged to hold their breath until they get through the dense column of smoke which crossed the road (LM 10/4/1824)'. The last point sounds trivial but it was one of the main claims by prosecutors because they needed to prove that the nuisance was public nature rather than private one, affecting only neighbours. The obvious difficulty in claiming such inconveniences was that they did not sound serious enough. One of the strategies employed by the prosecutors was the references to the working class's difficulty. Unlike middle class people, they could not choose where they work and where they live. '[L]et us endeavour to protect the labouring classes at home, from the miseries which attended a life continually spent in the midst of a sulphureous [*sic*] and pestilent atmosphere (UL MS 193/193 p5)'.

It appears that people felt that smoke must be unwholesome, but medical men's opinion was authoritative. Prosecutors were prepared for medical experts' opinion, which could disprove the unwholesomeness of coal smoke:

I am told, they have discovered some doctors, who have formed an opinion that certain smokes are not at all unwholesome.—(A *laugh*.) In short, that they are good for man.—That cleanliness is not a virtue;—that it is not conducive to health; and that to have

one's throat, and nostrils, and lungs crammed with soot and sulphur for 24 hours at a time is rather a good thing,—(*a laugh*,)—and about as salutary (some of them will say) as smoking tobacco—(*Laughter*) (*ibid* p6).

As the word 'laughter' shows, it was commonly accepted that the coal smoke was unwholesome. However, the alleged medical specialist's opinion that coal smoke was not unwholesome was not directly challenged, but the point of an argument was immediately diverted to the obvious nuisance to laundry and gardens.

The actual medical opinions Gotts' side presented were by respected local surgeons of Leeds General Infirmary. Mr Chorley, senior surgeon, stated that:

Witness does not consider the health of the Inhabitants affected by this increase of smoke and is quite sure that the smoke from Defendants Mill is not prejudicial to the health of Neighbourhood—Does not think smoke in its simple state unmixed with the vapours of deleterious Ingredients and in the quantities usually made in Manufacturing Towns to be generally unfavourable to health—Is of opinion that the central part of Leeds is much more unhealthy than the Neighbourhood of Defendants Mill—the smoke being there very much greater in quantity, and mixed with the noxious effluvia arising from a crowded population⁶⁷

Chorley expressed a typical view of medical profession that coal smoke is not unwholesome, and vapour from a crowded living environment is more problematic. Chorley's opinion was completely supported by second surgeon to the General Infirmary, Mr Hey. He thought that '[the charge that] the Air in the Neighbourhood of Defendants' Mill is corrupted and unwholesome is quite preposterous'⁶⁸.

⁶⁷ WYAL, WYL160/116 Brief for the Defendants p25.

⁶⁸ *ibid*.

However, the book written by a surgeon several years later shows a slight change in the evaluation of Leeds air. C.T. Thackrah, another surgeon in Leeds, published a book on the healthiness of each occupation based on observation in Leeds in 1831. He pointed out that even though there were not visible and obvious symptoms, people in Leeds were affected by the impure air. However, this part is presented in connection with chemicals from manufactories. As for coal smoke, he stated that due to the low price of coals and the existence of factories, 'the air of Leeds appears to be fouler than that of other places of equal size' and added that 'The extent also of a polluted atmosphere is much greater than the public believe (Thackrah 1831 p14)'. However, Thackrah's attention was focused on the condition of gardens and plants. In fact, as for the ill effects of impure air on health, he wrote that 'The lungs, however, suffer much less from the air of towns than we should expect (*ibid* p15)'. He admitted that bronchial affections are common in Leeds but other acute diseases of chest such as pleurisy and inflammation of lungs are actually less than in agricultural areas. 'Cases of consumption also are not comparatively numerous; nor is their progress so rapid in smoky towns as in the purer air of the country and the mountains (*ibid*)'. Although he admitted that the atmosphere of certain manufactories excites consumption, his blame was placed on factories producing chemicals rather than factories simply using steam engines. Then, he shifted the focus to the crowded state of people and the ventilation. Dense population and poor ventilation were the greatest evil when the quality of air was talked about. Compared with dense population as a source of bad air, the mechanism of coal smoke's ill effects were not at all clear.

Though Thackrah's opinion on coal smoke was vague, another surgeon regarded coal smoke as unwholesome slightly later. Robert Baker, a surgeon born in York, was a poor-law surgeon in Leeds during the cholera epidemic of 1831-2 and made a sanitary report of Leeds. It was compiled in the well known Parliamentary report on sanitary condition of the labouring population by Edwin Chadwick

(1842). Here, the description of coal smoke's ill effects are very different from the above mentioned surgeons' opinions:

It has been suggested, that to the chemical changes of the atmosphere,—and in a great measure attributable to smoke,—arise the amount of small-pox which fell upon the southern migrants who were located in Yorkshire in 1836 and 1837, many of whom were affected by this malady. There is very little doubt, indeed, that this vitiated state of the atmosphere does tend to produce a great effect upon the structure of the lungs (PP (HC) 1842 (007) p357).

Baker also suggested that *phthisis pulmonalis* much contributed to the death in Leeds. These descriptions could not be expected before 1830.

After the smoke abatement campaign, some medical experts openly expressed their views that coal smoke was unwholesome. Still, the reason why coal smoke was unwholesome was not confirmed and the confusion over the unwholesomeness of smoke continued. Because of the confusion, the smoke abatement campaign in the 1820s had little involvement with medical opinions and it was a matter of nuisance.

5-12 The aftermath

It is difficult to evaluate to what extent the smoke cloud over Leeds diminished. Though there were a few comments on the actual smoke reduction by people who were involved in the smoke abatement campaign as abovementioned, travellers' descriptions on the smoky town suggest that there was no considerable reduction in smoke amount in reality. For example, Hermann von Pückler-Muskau (1785-1871), German nobleman, arrived at Leeds in the twilight of 1st October 1828. 'A transparent cloud of smoke was diffused over the whole space which it occupies, on and between several hills; a hundred red fires shot upwards into the sky, and as many towering chimneys poured forth columns of black smoke (von Pückler-Muskau 1832 p210)'.

Despite the smoke cloud over Leeds, images of smoke tended to be positive when observed from the outside of smoke cloud as examined in Chapter 4. The abovementioned description by Von Pückler-Muskau presents a positive view of Leeds. He continues that illuminated manufactories had 'a grand and striking effect' and two ancient gothic churches and the moon added romantic features (*ibid*). His description of the light from the factory windows was something similar to what Lewis Simond (1767-1831) wrote of Leeds in 1810-11. He was a native of Lyon and journeyed throughout England, Switzerland, Italy and Sicily. He gave the picture of Leeds at night:

The night had closed when we approached Leeds, and from a height, north of the town, we saw a multitude of fires issuing, no doubt from furnaces, and constellations of illuminated windows (manufactories) spread over the dark plain (Simond 1815 p76).

However, after von Pückler-Muskau took a close look at the town, his description changed considerably. The romantic town under the moonlight had gone, and he saw the unwholesome condition of the working class and the gothic churches without remarkable features. The smoke which created special effect was actually very unpleasant. '[T]he town itself, enveloped in an everlasting fog produced by the smoke, which never ceases day nor night, is the most disagreeable place you can imagine (von Pückler-Muskau 1832 pp. 212-3)'. J.G. Kohl described Leeds as 'a dirty, smoky, disagreeable town' in 1844 though he praised the improvement of manufacture there. 'I was, therefore, not sorry when, after seeing what interested me in the manufactories of Leeds, the time came for me to seat myself once more in one of those cheerful and comfortable flying-houses [train] (Kohl 1844 p103)'.

In fact, though views drawn in the 1820s and 1830s emphasised the industrial aspect of Leeds, Thomas Burras's views about 1840 hides this. Thomas Burras drew two views of Leeds in the 1840s, which depicted little smoke in the foreground. Interestingly, *A View of Leeds from the north west* (c1840) was the rare example of the Leeds view

from the north (Plate 5-15). It gives the view of a pretty looking town with the background of smoke cloud in the far south. Burras's intention to hide industrial aspect becomes clearer in connection with another Leeds view by Burras (Plate 5-16). Burras's *A View of Leeds from the west* in 1844 (Plate 5-16) surprisingly lacks smoke, compared to the numbers of chimneys. His view gives the impression of a lively town with lots of red-brick factories without giving a gloomy impression of the industrial town. The choice of viewpoint in *A View of Leeds from the north west* and the obvious lack of great industrial smoke in *A View of Leeds from the west* suggests that Burras did not approve of the smoke cloud over Leeds.

Interestingly, Burras gave supporting evidence for Gott in the trial examined in this chapter. He resided at New Road, near Gott's mill and he stated that he was not annoyed by the smoke from Gott's mill:

his windows front M^r Gott's Mill—that he considers the Neighbourhood very healthy and on that account went to live there, his profession being sedentary—that although the smoke has increased of late years, he is not annoyed by it and never had a painting spoiled or injured by it—that in Summer he generally sits with his windows open and is very watchful in case smits come into his room to see from what quarter they came and never once has had occasion to shut the windows on account of smoke from the Bean Ing Factory⁶⁹

From his evidence, it appears that he was sometimes annoyed by smoke but he considered it was not from Gott's mill, but from other industrial buildings.

While Burras expressed his disapproval of the smoky town in his views, black smoke was sometimes praised as a symbol of prosperity after the smoke abatement campaign. Though aesthetic smoke cloud

⁶⁹ WYAL, WYL160/116 Brief for the Defendants pp. 27-28.

was traditionally a symbol of economic prosperity, new iconography did not necessarily use aesthetic aspect of smoke. In 1824, an article on the reputation of Yorkshire manufacturing town, especially Bradford, was printed in *The Leeds Mercury*. It was the main Whig newspaper not only in Leeds but also in the West Riding and its readership included Bradford inhabitants:

Such is the *reputation* of our Yorkshire manufacturing towns for smoke, that we this week heard a gentleman in Manchester assert, gravely, that he had been credibly informed that at Bradford, in particular, the sun set twice a day—first below an horizon of smoke, and soon after below the natural horizon! (LM 14/2/1824)

It was the time when the smoke abatement campaign was at the peak in Yorkshire. Theoretically, this article could have produced reactions claiming that Bradford had already abated the smoke nuisance, or Bradford needed more effort to do the reduction. Instead, a poem entitled 'a defence of Bradford' was printed in the following week:

"Cloud-congregating City, like great Jove!"

Ye, who declare our Sun sets twice,
Now spare me farther trouble,
And own at once, 'tis Bradford wine
That makes your eyes see double!
Prepost'rous! say our sun sets twice!
I'll bring the veriest dunce
In these Boetian streets, to prove
He never yet set once!
Yes! busy as trade goes just now,
I'd still spare cash to bet,
That they who never see the sun,
Can never see him set!
Let others praise their clear blue skies,
We know 'tis all a joke:

Nor would we have Dan Phoebus pierce
Our canopy of smoke.
Smoke, lovely smoke! sweet token thou
Of our enriching trade!
Long, very long, dark charmer! be
Thy banner here displayed!
Talk not to us of golden suns
Or stars, save in a sonnet:
A golden sovereign's finer far,
When you've your finger on it!
Hail Bradford! highly favoured town!
Let none thy beauties slight!
Blessed with a cloud of smoke by day,
And pillar'd gas by night! (LM 21/2/1824)

This poem was not only answering the remark by Manchester gentleman but also questioning the effort to abate the smoke. Manchester gentleman's remark triggered to express the antipathy toward the ongoing smoke abatement campaign.

The iconography of smoke used in this poem was slightly different from the conventional association between smoke and prosperity. As mentioned earlier in this chapter, town smoke was already associated with prosperity as Dyer's *Fleece* shows. Besides, travellers often praised the industrial sublime of the industrial regions. However, those views of smoke were aesthetic view from outside of smoke. 'A defence of Bradford' was written from the viewpoint of Bradford inhabitant. The poem suggests that even the inconveniences caused by industrial smoke could be happily accepted as an indispensable part of Bradford life. In this sense, the iconography was new though based on conventional view that smoke was the symbol of prosperity. The timing suggests that it was the smoke abatement campaign which encouraged the emergence of such iconography around Leeds.

The similar iconography of smoke appeared in *The Leeds Mercury* in 1828:

A STRANGER'S OPINION OF LEEDS ... The activity of this extraordinary place (Leeds) is, however, to a mere spectator, as great as ever. ...On approaching Leeds from Wakefield, the traveller beholds from a slight eminence within a mile of the town, a vast assemblage of lofty chimnies, of different shape and calibre, vomiting forth streams of smoke of every shade, from sickly white to the dense and pitchy smoke of Etna. These several masses of smoke congregate into a sort of mottled canopy, which overhangs the town, taints vegetation, and dyes the mud in the streets a deep black. On entering the streets, the astonishing bustle of Briggate recalls the idea of Cheapside or Cornhill after 'Change time. It is a wonderful place (LM 19/7/1828).

This article implies that Leeds was not 'great' for people who were not 'a mere spectator'. It is possible to interpret that phrases such as 'sickly white' and tainting vegetation are irony. Still, some inhabitants in Leeds did not take it as irony. In the opening ceremony of the new Commercial Buildings in 1829, one of the speakers stated that 'its fresh beauties may soon be obscured with the mantle of our native smoke' and people cheered at the remark (LM 31/10/1829).

Interestingly, though *The Leeds Mercury* suppressed the doubts and questions on smoke abatement discourse, this iconography which associated with local pride innocently appeared in the newspaper. This kind of iconography could not be seen in *The Leeds Mercury* before the local smoke abatement campaign and it is very likely that the iconography appeared as a revolt against the smoke abatement campaign. The iconography probably seemed neutral for the editor of *The Leeds Mercury* but it would be one of the main elements of anti-smoke abatement discourse during the Victorian period.

5-13 Conclusion

Manufacturers in Leeds faced a real threat to be indicted after the passage of Taylor's Act. Therefore, they needed to install a smoke consumer if they wanted to avoid the confrontation at the court. The

local smoke abatement campaign succeeded in terms of the installation of smoke consuming technology, which was its practical goal. Local newspapers, especially *The Leeds Mercury* became a space to maintain the story line that the smoke consuming technology was the win-win solution of smoke nuisance. Readers who only read these articles would almost inevitably think that manufacturers who refused to adopt such useful technology, which could benefit even manufacturers themselves, were pitifully prejudiced. It would be very difficult to understand why some manufacturers just ignored the convincing reports on effective smoke consumers.

However, manufacturers were not reluctant to adopt the technology at first, especially when the idea of smoke consuming technology was first permeated in Leeds local community. The problem was that there were some flaws in the smoke abatement discourse and they were gradually revealed when smoke consumers were actually tried in local manufactories. They were sometimes ineffective. Installation costs could be very expensive when a steam engine needed to be stopped for repair or when another patent needed to be tried. In addition, smoke consumers did not necessarily guarantee smoke abatement and John Ellis was taken into the court despite the installation of the apparatus.

In this situation, it was inevitable that the hostility toward smoke abatement arose. Considering these experiences in local manufactories, it was inevitable for some manufacturers to think that claims made by supporters of smoke abatement did not reflect the real observations, and were therefore, without foundations. However, from the view point of local smoke abatement committee, despite the unfortunate confusion over the effective smoke consumers, it was the manufacturers' responsibility to install the proper apparatus. The enthusiastic sentences printed in *The Leeds Mercury* such as 'No man has a right to contaminate the air which the public breathes, though he should not save any thing by keeping it pure' shows that they

could maintain the reasoning that it was manufacturers' responsibility to pay the expense because it was manufacturers' fault to cause smoke nuisances (LM 22/06/1822). However, this argument is problematic to openly claim because it would seriously damage the basic assumption that smoke consumers could abate smoke nuisances without interfering economic activities.

Interestingly, both smoke abatement campaigns and the emerging anti-smoke abatement debates maintained their own claims based on convincing observations. They sometimes ignored or distorted inconvenient facts but it seems that it was unconsciously done and claimants were not very much aware of their conducts. For example, *The Leeds Mercury* only emphasised evidence which supported their claims and ignored inconvenient evidence. Similarly, Gott's solicitors just dropped evidence which could be contradictory to their claims. However, solicitors' records show that it was done not as fabrication but as a simple selection of useful evidence.

Even though smoke abatement discourse was firmly formed in the beginning of the 1820s, anti-smoke abatement discourse was still developing at the time. Anti-smoke abatement discourse was based on a whole set of conventional ideas on smoke as a symbol of prosperity and smoke as a disinfectant in order to voice the suppressed opposition against smoke abatement. This sheds a new light on air pollution history because literature on Victorian air pollution history tends to provide an account that anti-smoke abatement discourse preceded smoke abatement discourse⁷⁰. It seems that the former became powerful toward Victorian period partly because it enabled opposition to be voiced against the latter and partly because it was based on conventional views on smoke.

⁷⁰ Smoke abatement discourse and anti-smoke abatement discourse roughly correspond respectively with Stephen Mosley's terminologies, 'waste and inefficiency' narratives and 'wealth and well-being' narratives, which were examined in Chapter 2.

Chapter 6 A printer versus the peer

Unlike Leeds, which experienced local smoke abatement campaign, Londoners did not collectively express its opposition against coal smoke. Still, several smoke nuisance court cases took place in London in the 1820s and these cases show that some Londoners wanted to abate smoke in their immediate neighbourhood. Interestingly, London smoke nuisance cases had a specific characteristic which were different from ones in Leeds. Most London smoke nuisance cases were complex, often consisting of smoke nuisance and noise. The focus of this chapter, the case of the Duke of Northumberland v. Clowes, shared this characteristic.

Northumberland House was located in the west end of the Strand, where the Strand connects with Charing Cross. William Clowes' premises, where he ran a printing business, adjoined Northumberland House. The first two sections of this chapter will provide a picture of Charing Cross during the period in order to give the context for the smoke nuisance conflict. The following section will briefly examine the plan of Northumberland House and its owners, the dukes. The fourth section will focus on the introduction of steam press in the printing business and Clowes' premises. Although a steam press was one of the innovative changes in the printing business, Clowes realised that his aristocratic neighbour would not tolerate its nuisance after he installed it. Without much negotiation, Clowes was taken into the court.

Clowes employed John Singleton Copley, the Attorney General at the time, as his barrister. Copley effectively defended Clowes and described the conflict as a class issue, while the testimonies from witnesses, mostly servants, played a key role for the duke's side to present their views. Therefore, the fifth section will briefly explore John Singleton Copley's career, and the sixth section will examine witnesses for the duke. The following three sections will examine three kinds of nuisance caused by the steam press, mainly based on

the servants' testimonies. These three nuisances were noise, smoke and soot nuisance, and water shortage. However, Clowes actually wanted to avoid the legal conflict and willingly tried remedies to abate the nuisances. The tenth section will examine Clowes' remedies and the miscommunication and misunderstanding between the Duke's side and Clowes when applying remedies.

Although Copley presented the case as a class issue, the case was actually one of several nuisance cases that took place in London in the 1820s. Especially, printers and smiths were taken into the courts for their nuisance. The eleventh section will explore these cases in order to put the case, the Duke of Northumberland v. Clowes, within the context of London smoke nuisance cases after the passage of Taylor's Act. The existence of other smoke nuisance cases, especially against printers, shows that the case's description that a powerful duke was persecuting a diligent printer was a distorted view. The twelfth section will examine how Copley presented the case as a class politics by placing the blame on the duke's employees not the duke himself. This section will also examine how a radical newspaper adopted Copley's story line and presented the case as a simple one of class politics. The final section will place the nuisances caused by Clowes' steam engine within the context of other nuisances in the neighbourhood and generally in London. As a barrister defending Clowes, Copley pointed out other nuisance sources in the neighbourhood in order to balance Clowes' nuisance. Still, Copley's cross-examination shows that Clowes' nuisance was serious enough in its neighbourhood.

6-1 Charing Cross as a key junction in London

Northumberland House was located in Charing Cross, at the west end of the Strand (Plate 6-1). Geographically, Charing Cross can be regarded as the edge of London, if counting St James's Park as open field. Still, Charing Cross was one of the key centres in London, the junction connecting Whitehall and Westminster, the traditional political centre, with the City, the traditional commercial centre, in

addition to the West End, developing centre of fashion. Three main roads, Whitehall, the Strand and Cockspur Street converged at Charing Cross (Plate 6-2).

Whitehall was and still is the political centre of London. The Whitehall Palace was erected by Henry VIII and was one of the residences of the Royal Families during the Tudor and Stuart periods. It was largely destroyed by fire on 4th January, 1697-8 and was never rebuilt as a Royal Palace. In the early nineteenth century, governmental departments such as the Admiralty and the Horse Guards were located on the east side of Whitehall. Other sites of former Whitehall Palace were Scotland Yard and Privy Gardens and it was the residences of upper classes, especially politicians. For example, Lord Liverpool's house and Michael Angelo Taylor's house were located there. The location of King's Mews in the northern part of Charing Cross, where Trafalgar Square was to be developed in the 1830s and 1840s, can be understood as the political aspect of the area. Plate 6-3 depicts a Grenadier Guard wearing a bearskin and carrying a rifle among the crowd in Charing Cross in the far left.

The Thames side of the Strand was originally the site of grand mansions, typically Northumberland House, Hungerford House, and York House. In the early nineteenth century, most mansions were replaced by streets of houses, except for Northumberland House. The Strand was an opulent and fashionable shopping street, mainly selling luxury goods. On George IV's birthday in 1827, several shops had special decorations:

Silvester, engraver, had over the Royal Arms a star, illuminated in a similar manner to the Alfred Club House.

Thomas, silversmith, mounted over the Royal Arms a magnificent star, with festoons, which had a very neat appearance.

Weiss, cutler, a G.R., with a crown at top, encircled with laurel.

Dallett, tallow chandler, on a black frame, a G.R., with a crown at top, and a IV. at bottom.

Ackermann over the Royal Arms displayed an arch, with small circles of stained glass, representing the rose, thistle, and shamrock, and surmounted by a small star... (MC 24/4/1827)

Rudolph Ackermann, whose shop is in the above list, was a publisher of colour plate books. The interior of his shop was a luxury space. Plate 6-4 shows Ackermann's library decorated with a statue, a bust and an urn. Gas lights lit the room as well as fashionable and respectable customers. In the Strand and its extension into Fleet Street, printers and publishers were concentrated including the leading London newspapers' offices. In 1820, *The Morning Chronicle*, *The Morning Post*, *The Examiner* and *Cobbett's Weekly Political Register* were printed and published at offices in the Strand or its back streets. Similarly, the office of *The Times* was in Blackfriars, around Fleet Street.

Despite its reputation as a shopping street, the north side of the Strand, especially towards Charing Cross was regarded as less fashionable. 'The north side of the Strand does not furnish us with any interesting object from Exeter 'Change down to Charing Cross (Wilkes 1815 p538)'. There were 'a vast number of bad and unsightly houses' in back streets around St. Martin's church (Hansard 1827 Vol. XV, 65). The area was almost opposite to Northumberland House with the Strand between them. The Charing Cross Improvement Bill was brought to the House of Commons in 1826 and the improvement plan included the redevelopment of the area as well as the creation of later Trafalgar Square (Plate 6-5). The main goal of the improvement was to provide 'a more convenient communication between the east and west ends of the metropolis (*ibid* 66)'. It was also intended to form a fashionable space like Regent Street, replacing unsightly houses.

Similarly, the area between Whitehall and Northumberland House was called Johnsons Court and 'all [houses in the Court were] in a state of great dilapidation' in 1795-6 (Place 1972 pp. 213, 228). William Hogarth's well-known *Night* from the 'Four Times of Day' (1738)

provides a similar image of the area. Francis Place, a radical tailor who opened a shop with his partner in 1799 at 29 Charing Cross, and soon set up his own shop at 16 Charing Cross provides the description. The houses were almost all occupied by 'common prostitutes of the most wretched discription' and there were 'a kind of public house and a Crimping house of the very worst sort (*ibid* p228)'. Young men were decoyed into the crimping house usually by prostitutes, and enlisted into the army. For example, a tragic event was reported in 1794:

George Howe, a genteel young man, was taken to a recruiting-office there, belonging to the East-India company, to be enlisted; and, upon attempting to make his escape, his hands were tied behind his back, and in that situation he was put into a garret, where he was not many minutes before he jumped from the window, and was killed upon the spot (*The Annual Register ... for the year 1794, 1799* p24).

Afterward, a crowd gathered to pull down the house and the foot guards were called in. However, in spite of the impact of the event, the crimping house in Johnsons Court appears to function only from 1793 (Barrell 2006 pp. 42-3). Place wrote that a great change took place in the area about 1798. '[T]hree of the public houses were soon afterwards converted into shops. The flags in front of the Crimping houses were taken down, and a progressive improvement took place (Place 1972 p214)'. Thus, in the early nineteenth century, when Place ran his business at Charing Cross, the area was changing⁷¹.

Charing Cross was changed into more respectable area in the early nineteenth century. For example, Charing Cross was one of the

⁷¹ Place wrote that where the crimping house was located was later occupied by Mr Clowes, a printer (1972 p228). Although it seems that the address was not exactly where the crimping house was but its next door, William Clowes opened a military bookshop at 15 Charing Cross in c. 1815 (Clowes 1953 p16).

London venues of the pillory, one of the public punishments, as the well-known etching in 1809 shows (Plate 6-6). However, the pillory was restricted to punishment for perjury or subornation after 1816 and it seems that the pillory had not used at Charing Cross in the 1820s⁷². Of course, Charing Cross sometimes still attracted a riotous mob. In 1820, when an exaggerated rumour spread in the metropolis that three battalions of the guards were in the state of mutiny, 'an immense multitude assembled opposite the royal Mews at Charing-cross, ... and at length proceeded to acts of violence, assailing every private carriage that passed, and even wounding several ladies and gentlemen (*The Annual Register ... of the year 1820*, 1822 p229)'.

Charing Cross was one of the key points in London traffic, too. There was an inn which was one of the main points of stage coach departure from London, on the north side of Charing Cross. The inn was the Golden Cross, which was purchased by William Horne (1783-1828) in 1812. He entered the coaching trade as well as inn-keeping and employed about 400 horses in 1819 (PP 1819 (509) p15). His son, Benjamin Worthy Horne further developed the business. In 1836, Benjamin was the second largest coach proprietor in London, who had five inns including the Golden Cross for the business. At the time, 28 coaches departed from the Golden Cross daily (Bates 1969 p61). Plate 6-7 shows the front of the inn with a gas light and two columns and Plate 6-3 depicts a coach entering Charing Cross from the Golden Cross.

6-2 Views of Charing Cross

Most views of Charing Cross during the period depict Northumberland House. For example, Plate 6-7 shows the grand façade of Northumberland House with a lion statue looking down Charing Cross. Two spires show the west and east edges of the building. Northumberland House was one of the features of Charing Cross as

⁷² No article can be found concerning the pillory at Charing Cross in '19th Century British Library Newspapers'.

the statue of Charles I. When a view of Charing Cross depicted other sides, the artist usually included other special features such as the pillory in Plate 6-6 and newly re-developed buildings in *Improvement, Charing Cross* (1828).

Because most views of Charing Cross show the eastern side of Charing Cross from the west, the composition of these views are not very different from one another. Despite the similarity in composition, views sometimes present very different images of Charing Cross in terms of the order in the street. For example, Plate 6-8 gives an image of an orderly street with very crowded but ordered footway. Only a wagon, a carriage, a cart and a dog as well as two women crossing the road are on the middle of the street. Similarly, Plate 6-7 presents an image of an ordered street with respectable pedestrians.

George Scharf's unfinished drawing shows rather chaotic image of Charing Cross (Plate 6-3). Interestingly, Scharf left two features of Charing Cross, the statue of Charles I and Northumberland House, unfinished. Instead, Scharf's focus is pedestrians and carriages. Unlike Plate 6-7 and 6-8, pedestrians in Scharf's drawing are not necessarily on the footways. They include not only respectable middle-class but also peddlers. There are at least five carriages on the street and the mixture of carriages and pedestrians suggest that it would be difficult for countrymen who were not used to London traffic to cross the street.

George Scharf's drawings generally provide vivid images of ordinary London life. He was a German, who arrived at London in 1816 and spent almost all of his life in London until he died at Great George Street in 1860. Unfortunately, his townscape drawing was not popular among his contemporaries and he made his living by producing drawings for scientific bodies and learned journals. Therefore, 'the vast majority of these hundreds of sketches [of streets] were purely for his own enjoyment and relaxation (Jackson 1987 p2)'.

Though Scharf's drawings tend to depict lively images of London life, the comparison between Plate 6-9 and Plate 6-10 shows the different portrayal of the same street in different situation. Plate 6-9 is a watercolour of fire fighting in the Strand and Plate 6-10 shows a fireman rolling up a hose after putting it out. The fire started at five in the morning in the shop of a sausage-maker (*ibid*). Though the same artist drew the same street, Plate 6-9 presents an impression that the Strand is old narrow street and Plate 6-10 gives a view of broad street without confusion. Despite the depiction of silversmith and its display of silverware in Plate 6-9, Plate 6-10 seems like more respectable shopping street. Though, in fact, shops in this area of the Strand were actually selling less luxury goods as abovementioned. For example, Plate 6-10 depicts a shop selling shell fish and the fire started in the shop of sausage-maker.

The comparison of these two watercolours shows that the difference in situations and composition makes the impression quite different. Of course, the depiction of the fire fighting inevitably made the scene chaotic. Similarly, Plate 6-6, depicts a scene of pillory, which attracted London mob. London crowds often actively participated in the punishment by throwing dirt, vegetables, excrement and even stones. Offenders could be killed because of the attack by the crowd and the authorities made efforts to maintain order and defend offenders. However, Shoemaker (2004) argues that some audiences lost interest in the pillory during the second half of the eighteenth century. Furthermore, improved street management made less material available to throw. In fact, though Plate 6-6 shows the considerable size of crowd and some extent of disorder, the disorder seems to be controlled. Indeed a woman in the forefront is collecting a stone or something from the ground to throw and some spectators are fighting among themselves. However, there are some spaces around the pillory and people who are not interested in the scene can pass Charing Cross without being obstructed.

Views of Charing Cross during the period generally did not include big clouds of smoke. For example, George Scharf's unfinished drawing (Plate 6-3) does not include any smoke plume. The scene of pillory (Plate 6-6) and Thomas Shepherd's view (Plate 6-7) only depict a few plumes of pale smoke from domestic chimneys. Among these views, Plate 6-8 is an exception. It depicts a considerable amount of smoke from chimneys, especially on the left. However, the original etching actually does not include this amount of smoke. The view was originally etched for Ackermann's *The Repository of Arts* (1811) and Plate 6-8 was republished by Ackermann in a series 'Select Views of London' in 1816. The colouring of two etchings is very different one another. In the original etching, though the area above chimneys were darker than other part of the sky, it was not very clear whether the dark cloud was smoke or clouds. Although the later colouring is clearer and more detailed, it is less realistic considering the imbalance between very crowded footway and little traffic in the middle of the street. The original etching and colouring focused on respectable and ordered aspect of Charing Cross, and later version strengthened the image by adding more pedestrians and one more flowerpot on the right. In fact, the smoke clouds depicted in plate 6-8 is considerable for domestic chimneys compared with the fire smoke depicted by George Scharf (Plate 6-9).

In fact, it does not seem that the shops which fronted the Strand and Charing Cross included smoke producing trades. Though shops in back streets sometimes had such workshops, shops in these main streets sold luxury goods. Still early nineteenth century Northumberland House was located on the boundary between the noisy commercial area and the quieter West End, or rather, it was left behind in the advancing commercial area.

6-3 Northumberland House and the Percys

Northumberland House was sometimes termed a palace. Considering its size and its location in the centre of the town, the term was appropriate. It was originally built in early seventeenth century and

was 'the greatest representative of the old aristocratic mansions on the Strand (Guerci 2010 p341)'.

Sir Charles Barry, an architect, was commissioned to inspect Northumberland House in view of reconstructing the south front in 1851, and produced a precise plan. Because the mansion had not altered since the refurbishment of south front interior between 1818 and 1824⁷³, the plan gives the idea of the use of space in Northumberland House in 1824 (Guerci 2008 p138). The plan of the ground floor shows that Northumberland House consisted of a quadrangle and wings in the south (Plate 6-11 and 6-12). This plan does not include the huge garden on the south side of the mansion toward the Thames, which can be seen in Horwood's map (Plate 6-2). The north front of the building faced the Strand and the east part of quadrangle adjoined Northumberland Court. Though Northumberland Court looks like it had an access to Northumberland House at its south end, it actually did not.

The space inside of the quadrangle was confusingly called the court yard. The north front of the quadrangle was mainly used by servants and south front was for grand rooms for the duke and his family. The west wing was for the large gallery/ ball room (Plate 6-13). The walls and the ceiling of the gallery were covered by large pictures and decorations. The eastern two wings were stables. The basement floors of the stable were for horses and coaches and upper stories were for servants. The courtyard between the stable wings was called the Coach Yard.

Theatrical mendicants (Plate 6-14) depicts the extremely rich second duke of Northumberland, Hugh Percy (1742-1817), with the elaborately decorated front door of Northumberland House. The obituary printed in *The Gentleman's Magazine* says that 'In ready money his Grace was for many years considered the most wealthy

⁷³ The refurbishment between 1818 and 1824 was large scale and the duke spent £100,000 for it employing only British artisans (AC/TR pp. 15-6).

man in England' with an estimated annual income not less than £80,000⁷⁴. His Wealth mainly came from coal mines in Northumberland. *Theatrical mendicants* shows John Kemble, the manager of the Covent Garden Theatre, with his brother and his sister, Sarah Siddons, begging for money for the reconstruction of his theatre after the fire of 1808. The duke is giving them a draft for 10,000 pounds. Thomas Wright, an historian and antiquary wrote that 'Kemble was unpopular with all but the aristocratic portion of his audience, to whom exclusively he was accused of paying his court (1868 p559)'. According to Wright, the newly erected Covent Garden Theatre had luxurious boxes at the expense of other seats. In addition, Kemble increased the prices: 'the pit being raised from three shillings and sixpence to four shillings, and the boxes from six shillings to seven shillings (*ibid* p560)'.

Theatrical mendicants is obviously a satire on Kemble's attitude and his connection with the aristocracy. However, it was not the only view on the duke's wealth and the obituary printed in *The Gentleman's Magazine* emphasised his generosity:

To his tenants he was a most excellent landlord; and the monument just erected by them in honour of him, will transmit to posterity the memory of his kindness and indulgence, and of their gratitude. One custom which he introduced among them cannot be too highly praised or too extensively imitated; it was that of providing for the industrious hinds of every large farm, by giving them a cottage and ten acres of land ... (GM 1817 Vol. LXXXVII, Part 2, p182).

Even though the duke was generous for his tenants in Northumberland, it was probably inevitable that he attracted sarcastic comments especially when radicalism raised a doubt about unfair class distinctions.

⁷⁴ GM 1817, Vol. LXXXVII, Part 2, p182

The duke died at Northumberland House in July 1817, a few months after his son, Hugh's marriage to Lady Charlotte Florentia Clive. *The Gentleman's Magazine* reported that 'The funeral [of the duke] excited great interest, and the neighbourhood of Charing-cross was thronged with carriages, and a great number of genteel well-dressed pedestrians (*ibid* p84)'.

After second duke's death, his son, Hugh Percy (1785-1847) succeeded to the dukedom. As many other sons of aristocrats, he was elected MP between 1806 and 1812, and then sat in the House of Lords. He was a Tory like his father. He rarely spoke in Parliament but one of the exceptions was when he made short and unfruitful attempt to turn the Slave Trade Abolition Bill into a Slavery Abolition Bill in 1807. He was very rich inheriting the dukedom and covered his wife with diamonds. He displayed his wealth when he went to Paris as Ambassador Extraordinary at the coronation of Charles X. It was this third duke who was the plaintiff against Clowes, a printer. However, his personal involvement with the smoke nuisance case was very limited. Annoyance felt by the duke was not discussed during the trial and the duke's direct voice available concerning the nuisance case is only a short letter, referring Clowes to his lawyer. The real actors of the nuisance case were the duke's servants and employees.

6-4 The Introduction of the Steam Press

William Clowes carried on his printing business in Northumberland Court. His premises were located in the south end of the Court, adjoining the duke's stable directly, and also adjoining the south east part of the quadrangle with a backyard of Clowes between them.

Clowes started his printing business in 1803 at No. 20 Villiers Street, several streets eastward from Northumberland Court (see Plate 6-2). William Winchester, a cousin of Clowes's mother, was one of the principal contractors to the government for the supply of stationery and printing, and financed Clowes to start his business. Clowes also received much work from the government via Winchester, and by

1813, Clowes was dealing directly with Government departments, too. For example, the casualty lists of the Peninsular War were printed by Clowes. He also printed for other publishers including Longmans.

Clowes greatly succeeded in building his printing business in a relatively short time. Clowes employed only one man at first but after he married Mary Winchester, a niece of William Winchester in 1804, he enlarged his work using her dowry and employed three more men. In 1807 Clowes needed to enlarge his premises and moved to No. 7 Northumberland Court, which belonged to William Winchester. Then, Clowes employed nearly twenty men and though he experienced a fire in 1815 and needed to rebuild the premises, his business continued to flourish. He could move elsewhere after the fire, 'but the comptroller of the Stationery-office pointed out the necessity of [Clowes] being near him, that [Clowes] must get a situation near the public departments (PP 1822 (607) p223)'. Consequently, he purchased the ground and rebuilt the house in the same place. However, in terms of his domestic life, his family moved to a town house in Parliament Street after the fire and a few years later, he bought a country house called Garratt's Hall at Banstead, Surrey. In addition to his printing office, Clowes opened a bookshop in Charing Cross about 1815. In a letter Clowes sent to the Duke before the trial, Clowes wrote that he was an employer of 'nearly two hundred hard working and industrious persons (AC/FO p7)'. Because it is doubtful whether 200 people could work in Clowes' printing office at Northumberland Court, it is likely that Clowes employed this number of people in his printing office, the bookshop, his town house and his country house. In twenty years, Clowes became a very successful printer.

This was the time when a newly invented steam press was introduced to the printing business. The first steam press was used for the printing of *The Times* from the issue of 29th November 1814. *The Times* reported that their machine could print no less than eleven hundred sheets in one hour (*The Times* 29/11/1814). After the first

installation of a steam press, the number of steam presses in London did not increase very rapidly and there were only eight steam presses by 1820 and nearly all were used by newspapers (Moran 1973 p123). It was a huge step for printers to introduce a steam press because it was a considerable investment and only large-scale printers could justify the investment.

In 1823 Clowes bought the house next to No. 7 Northumberland Court and enlarged the premise in order to install a steam press. The steam engine introduced by Clowes was two h.p., not a large one but a normal size for a steam press (AC/TR pp. 286, 329). The legal document submitted by the Duke's lawyers provides the direct reason of introduction:

the Steam Engine was first constructed for a special purpose (viz^t.) the printing of a New Miscellany (Knight's Quarterly Magazine⁷⁵) and M^r. Knight is understood to have advanced the funds necessary for its construction ...(BPR pp. 28-9).

It was mentioned by the Duke's side to rebut the claim made by Clowes that without the steam press, his business would be ruined. The Duke's lawyers claimed that Clowes could carry on his business without the steam press. They claimed that he would only need to employ more people because Clowes succeeded in reducing employees by nearly 30 due to the introduction of the steam press (AC/BPR p29).

Clowes' engine first operated about September 1823⁷⁶ and it caused three different sorts of nuisances to Northumberland House: smoke,

⁷⁵ Although *Knight's Quarterly Magazine* only survived until late 1824, Charles Knight later known as the publisher of the *Penny Magazine* (1832-45) aimed at a working class audience.

⁷⁶ It is uncertain exactly when the steam engine was erected. Although the majority of servants said that the steam engine started to work in September 1823, Joseph Morris and Thomas Williams stated that it was August (AC/TR p30).

noise and the shortage of water supply as will be explored later. Although Clowes tried to remedy part of these nuisances, it was impossible for him to abate all nuisances. Clowes was brought into the Court of Common Pleas in the following year. Clowes employed a very competent barrister, John Singleton Copley.

6-5 John Singleton Copley

Clowes' descendant, William Beaufoy Clowes, considered that the choice of barrister was key to Clowes not experiencing serious damage from the legal confrontation against the duke:

William Clowes might have fared badly from all this had he not employed a brilliant lawyer, Mr. Copley, the Attorney-General, who was later to win great fame as Lord Chancellor and be created Lord Lyndhurst (Clowes 1953 p23).

John Singleton Copley, later Baron Lyndhurst, was born in Boston, Massachusetts, the son of an artist. His maternal grandfather, Richard Clarke, 'was a tea merchant and one of the consignees of the tea that American patriots dumped into Boston Harbor during their notorious tea party (Lee 1994 p1)'. Due to the political situation, John, his mother and his two sisters left America and arrived in England in 1775.

Copley gained his first fame when he defended a Luddite, John Ingham, at Nottingham in 1812. Ingham was charged with writing two threatening letters to an owner of a lace factory, Mr Nunn. According to Lee, Copley won the case by pointing out a technical matter. The indictment stated that intended victims were the 'proprietors of a silk and cotton lace manufactory' but Copley revealed that there were both a separate silk lace manufactory and a separate cotton lace manufactory. 'Copley objected that these were not described correctly in the indictment. His objection was sustained, and he won an acquittal for his client (*ibid* p28)'. This case made Copley a popular hero for radicals.

In 1817, Copley took another case in which he effectively defended a radical, Dr James Watson, who was brought to trial for high treason. Watson was involved in the riot followed by a meeting at Spa Fields, where several inflammatory speeches had been delivered. Copley raised several issues such as a doubt on the character of the principal witness with implication that the witness was a government spy. Another issue raised by Copley was that 'the indictment was too extravagant in its charges (*ibid* p32)'.

Watson was charged, first, with intent to put the King to death; second, with intending to depose the King; third, with levying war against the King; and last, with conspiring to levy war in order to compel the King to change his measures. Copley declared that the Crown lawyers showed little confidence of gaining a conviction on any one of these charges (*ibid*).

Indeed, the skill to give an impression that a witness is not trustworthy and of bad character, and the skill to explore minor technical point to make the trial invalid were necessary ones for barristers⁷⁷. Copley again secured an acquittal for Watson and this victory impressed the ministry. Four months later, he was invited to side with the government in a similar case. It disappointed radicals, but Copley started to climb the ladder of success and gained his seat in the House of Commons in the following year.

Copley had already taken the status of Sergeant-at-Law⁷⁸ in 1813. The status of Sergeant-at-Law was once considered to be elite barristers, but its status had already declined in the early nineteenth

⁷⁷ Lemmings (2000) examines these skills in connection with criminal cases. '[B]arristers retained for the defence were often doing fairly simple things—throwing doubt on the identification of prisoners, undermining the credibility of witnesses, or pointing to inconsistencies between the evidence and the indictment—but even this was sometimes enough to enable men and women to escape the county goal, the convict boats, or the gallows (p222)'.

⁷⁸ Only a Sergeant-at-Law was allowed to argue the case at the Court of Common Pleas, and therefore, the barristers employed by the Duke and Clowes for the case are all Sergeant-at-Law.

century. King's Counsel including the Attorney General and Solicitor General, instead of Sergeant-at-Law, was the top barristers, then. Sergeant-at-Law rarely became King's Counsel at the time, but Copley was one of rare exceptions. Copley was appointed to be the Attorney General in 1824.

Throughout his career, Copley had a reputation for being politically inconsistent. His biographer, Lee, describes him as 'the flexible Tory', who showed his competence without emotion in each circumstance. Copley was a very competent lawyer and politician but without 'deep and long-felt convictions drove him (*ibid* p46)'. Indeed, the trial record on the Duke of Northumberland v. Clowes gives an impression that Copley attacked every possible hole of duke's claim even when Copley knew that the attacks were absurd. For example, Copley argued that the duke's claim was extravagant because there was no other court case in London concerning nuisances caused by a steam engine:

Have you ever known enquiry in the Courts of Justice from any of the Persons living in the Neighbourhood of the Steam Engines which are scattered in every part of this Metropolis? (AC/TR pp. 397)

The fact was, although it was the first case against a printer, a few cases on nuisances caused by steam engines had already taken place in the Metropolis. Copley himself was involved one of these cases. In April 1824, Champion and Green⁷⁹, vinegar manufacturers in Charles Square in the parish of St. Leonard, defended themselves at the Court of King's Bench concerning the nuisance caused by their steam engine and the purifying process of volatile spirit (MC 29/4/1824; MP 29/4/1824). Copley was the plaintiff's lawyer, who won the verdict of guilty against the defendants. The case took place about two months

⁷⁹ *The Morning Chronicle* reported the name of defendants as Chapman and another.

before the duke's case, but Copley conveniently ignored the former case when he defended Clowes.

Still, Copley's competence partly compensates for the lack of evidences for Clowes' side. The planned examination of witnesses for Clowes was not conducted because both sides accepted arbitration after witnesses for the duke were heard. Clowes' archival materials are not available and the voices representing Clowes' side in the available material are almost only from his barristers, especially Copley.

6-6 Witnesses for the Duke

For the Duke's side, however, witnesses rather than lawyers played a key role to support its claim. They provided a vivid picture of nuisances experienced in Northumberland House. Most of the witnesses for the duke were servants in Northumberland House. As Table 1 shows, half of the witnesses were directly employed by the duke. Most other witnesses were employed during the refurbishment of Northumberland House. Exceptions were Robert Henry Clive, a brother of the duchess, and two engineers who were convened to provide experts' opinion on pumps and steam engines. This section explores the characteristics of the Duke's witnesses before examining their reactions to smoke nuisance in the following sections.

The heavy dependence on servants as witnesses can be technically explained by the fact that the trial was prepared before the family actually arrived in London. The installation of the steam engine was about September 1823 and the trial took place in June 1824. The family arrived at London about half a year after the installation of steam engine, on 27th March 1824. The family stayed at their residence, Alnwick Castle in Northumberland, before they came to London. Therefore, the intention of Raine, the Duke's legal adviser, was to claim the damage by the steam engine to the property of the Duke, with the evidence provided by servants and refurbishment contractors. For example, 'Brief for the Plaintiff' which were prepared

before the trial, does not include Robert Henry Clive's name as a witness. It means that the annoyance which would be felt by the duke and the duchess was not the part of the original claim.

The ducal family's absence partly explains the fact that indoor servants such as maids and footmen were not included in witnesses for the trial. Maids or footmen who had daily contact with the family were not considered necessary as witnesses because the comfort of the family was not the issue. However, the absence of indoor servants also shows that the interior was less affected by the steam engine compared with the outside of the building. In fact, the complete absence of indoor servants gave the impression that the inside of Northumberland House was completely unaffected by the nuisance. In order to dispel the impression, evidence from several maids and indoor men servants was submitted after the trial (See Table 6-2).

Similarly, because most witnesses were employees of the duke, testimonies at the trial gave an impression that it was only the household of the duke which was affected by the nuisance. Unlike most other smoke nuisance cases in the 1820s, the duke's side accused Clowes of private nuisance rather than public nuisance, and the duke's lawyers probably did not feel the need to prove that Clowes' steam engine caused nuisance to other neighbours, too. However, Clowes' barristers utilised the situation and tried to give an impression that the household of the duke was too sensitive to the common London nuisance. Therefore, the legal document submitted after the trial included some testimonies from witnesses who lived in Northumberland Street.

In fact, it seems that Clowes prepared witnesses who lived in Northumberland Court and tried to claim that his neighbours in Northumberland Court were not annoyed by the nuisance. Because testimonies by them are not available, it is difficult to give a balanced view, but what the duke's lawyers claimed was that these inhabitants were somehow connected with Clowes and needed to be strictly

cross-examined. Though this claim by the duke's side was not balanced one considering most witnesses for the duke was also connected to the duke, mostly through employment, this claim gives some ideas of what kind of witnesses Clowes side prepared to call. For example, Mr. Sidney was a printer in Northumberland Court, and he and Clowes 'are on very friendly terms and may be said to make common cause, as they are in the habit of lending each other their Printing Presses & c. (AC/BPR p29)'. Two other witnesses also lived in Northumberland Court. According to the duke's lawyers, Pain was related to Clowes and had a relative working at Clowes' firm and Mrs. Hicks had a son who was an apprentice to the firm.

The witnesses who attended the trial were all male and most of them engaged in their work mainly outside, but there were a few exceptions. Joseph Morris was the first witness and the examination on him took longer than other witnesses. His position was described as 'resident agent' or 'servant agent'. He seems to have been the head of the servants in Northumberland House, the position usually held by a butler, but the sheer scale of the Northumberland House household seems to have required a management position. Morris had filled the position for more than 35 years (*ibid* p4). Morris lived in Northumberland Street and he also provided an evidence that his own house was also affected by Clowes' steam engine depended on wind direction. Thomas Williams was described as a clerk of Morris's office. He was to succeed to Morris's role in the later history of Northumberland House. Unlike Morris, Williams lived in Northumberland House. In addition to them, William Frederick Boyle was the private secretary to the duke. Boyle seems to have accompanied with the duke and he was not always in Northumberland House. These witnesses would have had direct contact with the duke and the duchess, compared with gardeners, porters and workers at the stables.

Other people whose status was relatively high in Northumberland House were Jonathan Parsons and William Parsons. William was the

father of Jonathan. Jonathan Parsons was described as the clerk of the works at Northumberland House during the refurbishment and William as the superintendant of the refurbishment of Northumberland House. Although these positions seem to be temporary ones, their connection with the Northumberland House household was stronger than the positions suggest. For example, after the refurbishment of Northumberland House, William Parsons was employed in superintending the works at Syon House, a country house of the family near Kew.

The list of witnesses includes a variety of servants. Michael Heim, a porter at the Stable Yard Gate was German and James M. Grath, a labourer and a watchman, was described as 'a clever well informed Irishman (AC/BP p32)'. The witnesses for the trial were chosen from gardeners, porters and stable boys. The most important witnesses among them were Michael Heim and a gardener, Joseph Williams, whose bedroom was heavily affected by the steam engine. Other witnesses were mostly chosen from people who were employed for the refurbishment. Three bricklayers, a carpenter, an upholsterer and an artist, who repaired the paintings in Northumberland House, were present at the court.

In addition, the Duke's lawyers collected testimonies from other servants and neighbours in 'Brief for the Plaintiff on the Reference' submitted after the trial (Table 6-2). A bedmaker, a carpenter and an under butler are the male servants who were newly added to the list of witnesses. Unlike other workers employed for the refurbishment, the bedmaker and a carpenter were probably directly employed by the duke. The under butler came to London with the ducal family. He was in charge of plates and slept in a pantry. The brief also include testimonies from five female witnesses. Among them, three were maids and another, Alice Underwood, was in charge for the chambers over the Stable Yard. Her daughter, Alice Elizabeth Underwood, lived with her mother and worked for Messrs. Morel & Hughes, upholsters, which undertook part of the refurbishment work in Northumberland

House. Another five witnesses were neighbours who lived in Northumberland Street. Their testimonies were added in order to show that it was not only the household of the Duke who suffered from the nuisance.

Thus, the witnesses for the Duke mostly consisted of servants and refurbishment workers. Even though the official plaintiff was the Duke, it was servants who were mostly involved with the nuisance trial. Using their testimonies, the Duke's lawyers claimed that three kinds of nuisances, noise, soot and water shortage, were caused by Clowes' steam engine. The following sections will examine the details of the nuisance.

6-7 The noise nuisance

Unlike manufactories in Leeds, Clowes' premises directly adjoined Northumberland House, and therefore, noise was one of the main nuisances claimed by the duke's side. In fact, most plaintiffs of smoke nuisance cases which took place in London in the 1820s also complained of noise, as will be examined later in this chapter. This was because most defendants in London smoke nuisance cases had their shops or workshops in premises which adjoined neighbouring dwelling houses.

Although the Northumberland House household complained of noise, due to the sheer size of Northumberland House, there were areas where the noise was heard and where it was not heard. The noise was mainly felt in the immediate vicinity of Clowes' printing office. For example, the northern end of the stable's west wing was directly adjoining Clowes' premises and this area was one of the noisy spots (Plate 6-11). In the quadrangle, the area most near to Clowes' premises was the passage connecting the quadrangle to the stable though there was a backyard between the passage and Clowes' printing office. In addition, the ante-dining room⁸⁰, which was located in the southeast corner of the quadrangle, adjoining the passage, and

⁸⁰ In Plate 6-4, the room is named as small dining room.

the grand staircase, northward from the ante-dining room, were the areas where the noise was especially problematic.

Michael Heim, porter at the stable yard, and John Walker, a gardener, were the ones who were most annoyed by the steam engine. It was because their bedroom's wall was adjoining Clowes' premises. Their room was on the first floor of the stable, above a coach house on the basement floor and the laundry on the ground floor (AC/TR p121; see Plate 6-11 and 6-12). Heim stated that when the engine first operated, it worked from seven in a Saturday night to seven in the following morning and he could not sleep at all. He described the noise as something like a threshing machine, and according to Walker, it was a kind of rumbling noise. In addition to the noise, the room and beds were shaken. The second time when the engine worked was about a fortnight later. The engine started to work from seven at night to one in the morning. He could not sleep again. The frequency of such an experience was about once a week since that time and he claimed during the trial in June 1824 that the steam engine still awaked him when it worked during the night. It was not only sleep the engine disturbed, but also when Walker was ill in April 1824, he could not rest because the engine shook him in his bed. It seems that Heim and Walker did not move from their bedroom before and after the trial. The legal document submitted after the trial states that they heard a great noise and were shaken when they were in chairs on Saturday the 20th November 1824 (AC/TR pp. 98-9, 124, 147-8; AC/BPR p31).

If Heim and Walker's bedroom was noisy, it can be naturally assumed that the room below, the laundry, should be noisy, too. However, because no female servants gave evidence at the court, the noise at laundry was not at all mentioned during the trial. The legal document submitted after the trial includes five female witnesses' testimonies and three of them referred to the noise at laundry. Mary Finney, a house maid, told that the noise was very loud in the laundry on Wednesday evening, the 24th November 1823, until half past eight.

According to Ann Morris, a still room maid, 'it appeared quite to shake the Laundry (AC/BPR p37)'. The room below the laundry was a coach house but no testimony can be found concerning noise there probably because it was not a kind of room where workers constantly stayed.

Unlike these rooms in the stable, the south side of the quadrangle was the area for the ducal family. It was because the south side was the quietest area of the mansion, removed from the traffic on the Strand. According to the witnesses, the noise of carriage was not heard around there. The duke and the duchess usually used the ante-dining room and the room above, the ante-drawing room, during evening and dinner time when they did not have large parties.

The only upper-class witness, Robert Henry Clive, brother of the duchess, was 'in the constant habit of going to Northumberland House' since the ducal family came to London on 27th March 1824 (AC/TR p133). Clive described the noise at the ante-dining room and ante-drawing room as a rumbling noise and it was 'Enough to induce [him] to stop the conversation which [he] had been engaged in' and 'cause during conversation a remark to be made that "the Steam Engine is at work"' though it was not loud enough to prevent people from hearing one another (AC/TR pp. 134, 139, 142, 144). He also considered it was not loud enough to prevent people from sleeping especially when they were tired (*ibid* pp. 145-6). Possibly, the noise at the ante-dining room was less loud than Heim and Walker's bedroom because there is a backyard and the passage between Clowes' printing office and the ante-dining room. Still, the 'Brief for the Plaintiff' says that the duke and the duchess gave up the use of the ante-dining room and ante-drawing room (AC/BP p13).

It is difficult to judge whether the noise was too severe to generally disturb people's comfort or not. Elizabeth Heybourn's opinion was that it was 'very unpleasant & enough to disturb a person's comfort (AC/BPR p38)'. Mary Finney, a house maid, first noticed the noise in the ante-dining room and 'it was a loud rumbling noise enough to disturb a person in that room (*ibid* p37)'. Considering that no

witnesses say that the noise was loud enough to disturb conversation, the extent of the noise in Northumberland House seems to have been something which could be annoying when a person was alone and tried to rest, as Heim and Walker in their bedroom.

Similarly, William Grant, an under butler, who came to London with the ducal family in March, was disturbed his sleep. He was in charge of plates, and therefore, he had his bed in a pantry, which was located in the basement floor, under the ante-dining room. '[A] loud rumbling noise which appeared to Witness like the roaring of a great fire, accompanied with a vibration or shaking—It disturbed Witness's rest for several nights (*ibid* p36)'.

Apart from these rooms which were near to Clowes' premises, noise was generally not heard. Hamilton Smith Day, an artist, was employed to restore some of the pictures in Northumberland House, especially in the ball room. The ball room was located in the west wing, the opposite side of the stable. When asked about the noise, Day stated that he only heard the noise in the ante-dining room and it was uncomfortable enough. 'Certainly I should not like to have remained for any great length of time there (AC/TR p328)'. Similarly, Thomas Williams, a clerk, heard the noise only around the grand staircase, 'ante-room' and the passage.

However, during the night, it seems to have been the different matter. Interestingly, William Piggott, a night porter, heard the noise in October on the western side of Northumberland House. It was eleven at night and he described it as 'Very loud (*ibid* p310)'. It was later added that it was 'on the first night of its starting when it was peculiarly loud (AC/BPR p23)'. His testimony suggests that the noise was heard farther from Clowes' premises sometimes at night. If so, it is also possible that the duke and duchess's bedroom which was on the western side of the quadrangle was noisy at night⁸¹. However,

⁸¹ The plan (1851) shows only the duchess's bedroom. Here, I presume the couple shared their bedroom.

nothing was said concerning the inconvenience experienced by the couple and it is not certain whether they were annoyed by the noise or not.

During the daytime most of the building was unaffected by the noise and due to this, a private secretary to the duke, William Frederick Boyle, whose office was in the north west corner of Northumberland House, had little to say at the trial. He only talked about a large quantity of smoke coming from the direction of Clowes' premises. It was thick dense smoke. However, he saw the smoke only once and '[his] observation was instant (AC/TR p323)'.

Thus, the noise caused by the steam engine affected the area almost immediately adjoined Clowes' premises. The area affected by the noise included both the ducal family's space and the servants' space. However, it was two male servants in addition to an under butler who were most affected by the noise because they had their beds near Clowes' premises.

6-8 Soot annoyance

Unlike the noise, which only heard and felt by people in Northumberland House, the impact of soot could be seen on plants and on the building. This section will examine how Clowes' steam press damaged the property of the duke, which was the main claim by the duke's lawyers, and how this affected servants' life.

It is interesting that one of the witnesses, James Reeves, had an experience of working at the garden for Elliott, brewer. Elliott's brewery was big enough to be mentioned by Michael Angelo Taylor at his parliamentary speech. According to Reeves, soot at Elliott's brewery was not so much as in Northumberland House (AC/TR pp. 163-8). Though Reeves' remark seems to have been exaggerated, other witnesses also considered Clowes' chimney produced as much smoke as breweries. For example, Thomas Williams stated that the smoke from Clowes' chimney was as much as the Cannon Brewery at

Knightsbridge, which was another brewery Taylor mentioned at the parliament.

The area most affected by the soot and smoke was the outside of the buildings. One of the places which was most affected by the soot was the garden. According to witnesses, plants in the huge garden of Northumberland House flourished before the erection of the engine, but from October 1823 onwards the smoke and the soot hindered plants from growing. Some plants were even killed. The obvious evidence of the damage to the garden was the difference between plants sheltered and unsheltered by a wall. Around the southern extremity of the stable wing, there was a wall in the garden. The wall hindered soot from reaching the plants including lime, sycamore, holly and laurel. Although plants sheltered by the wall were healthy, plants near the wall but unsheltered by it were not. Their leaves were sickly (AC/TR pp. 155-7).

Soot was injurious to plants, so gardeners washed soot away from plants. They used watering engine for the purpose in Northumberland House:

Q. Now have you any means—by means of any Engine of Watering the Plants M^r. Walker?

A. Yes Sir and it is a very great convenience[,] if it weren't for it I don't know what I could do; I could not do at all—

...

Q How do you mean that you could not do at all—what would become of the Plants and flowers?

A. Why[,] they would die sir on account of the blacks⁸² and those that came from the Chimneys (*ibid* p149)

The engine here means a pipe with holes, a very basic structure to sprinkle water. James Reeves, a gardener, gave the evidence before

⁸² It seems that 'blacks' was the term for London soot. The legal documents show that witnesses and lawyers all used the term and London newspapers also used the term when reported smoke nuisance cases.

the trial that gardeners 'had considerable more work to do in watering and washing the Plants in consequence than before the smoke covered them with blacks in this way—It has obliged them to work an hour or 2 later in the Eveng (AC/BP p30)⁸³'.

In addition to the damage to the garden, soot accumulated in the grounds and the buildings. Robert Grieve, a principal porter, observed the soot on the court yard. It was 'similar to seeing a room after a Chimney had been just swept' and he could even write his name with his finger on it (AC/TR p301-2). Joseph Morris said that 'I have seen the paving to my office very black—covered with black substances as well as the yard adjoining near to my office—that also covered with black substances (*ibid* p38-9)'. A little soot had been accumulated on the court yard before the erection of the engine but 'not in such large quantities (*ibid* p307)'.

In addition to the ground, the soot also accumulated on the roof of the building. Jonathan Parsons was asked about the water channels in relation to the accumulation of soot on the roof:

Q. Has there been any accumulation in the Channels for the Water to pass off?

A. Not to distinguish it[.] I think because we often clean them out (AC/TR p189)

Parsons did not notice any problem with the water channels, but William Ruff, bricklayer, stated that soot and other matter were congealed by the wet and 'running into the cistern head (*ibid* p288)'. This cistern head was taking the water from the top of the building and '[the soot] would have stopped it up if it had not been cleared

⁸³ However, longer working hours were not mentioned during the trial and I cannot exclude the possibility that the statement was slightly exaggerated.

(*ibid* p289)'. Therefore, without cleaning, the soot would possibly have caused problems to the water channels⁸⁴.

Another inconvenience caused by the soot was to laundry. There were three testimonies in total, which claimed that their clothes were blackened. Because all witnesses who made the claim talked about their own washing, most other clothes were possibly outsourced in Northumberland House. For example, William Webb, who worked at the stable, stated that when he washed his white livery breeches and hung them to dry over night, they were covered by soot in the following morning (*ibid* pp. 341-44). This testimony was very similar to the one by William Grant, the under butler, whose breeches and waistcoats were covered with soot when he hung out them to dry. Similarly, Alice Elizabeth Underwood gave her evidence:

It has not been quite so annoying lately but Witness has frequently seen it beat down into the Stable Yard and the Blacks have blown into the Laundry in such quantities whilst Witness has been ironing as to compel her to shut down the Window and in fact to wash some things over again (AC/BPR p40).

Alice Elizabeth was not a maid at Northumberland House, and she only lived with her mother there. Therefore, her washing was very likely to have been private one. Despite the nature of the laundry, it was true that Clowes' steam press caused considerable inconvenience in terms of washing clothes in Northumberland House.

Despite servants' inconvenience, the direct claim made by the duke's side in the case was the damage to the property of the duke. For example, it was claimed that the exterior wall of Northumberland House changed its colour. About a month after window frames were freshly painted, they become black and discoloured. In order to prove that the change was caused by Clowes' steam engine, the duke's side

⁸⁴ Still, Clowes' barrister, Copley, pointed out that it was not like that they increased the frequency of cleaning the cistern.

also prepared evidence by a surveyor, Joseph Wigg, that the west side of the quadrangle was especially discoloured (*ibid* pp. 314, 345).

Due to the absence of indoor servants, examinations at the court gave an impression that the inside of the building was unaffected by the soot. For example, the screen attached to the lantern of the grand staircase attracted some attention during the trial:

A. Perhaps it is necessary to explain that when the Window is opened it is protected in the inside by a fine wire gauge so far as to protect the blacks from going into the house: in that case when the Window is open you find a vast accumulation of blacks on the Wire and on the cill [*sic*]*—*If the Wire was not there it would then blow into the stair case and cover the whole of the Marble stairs*—*
Q. I would ask whether the Wire effectually excludes these blacks or whether you are or not partially visited by them?

A. Certainly but not one thousandth part to what we should without them (AC/TR pp. 189-90)

Although the lantern of the grand staircase had a screen, other windows did not have such a convenient device. Therefore, other windows were usually shut after Clowes started to operate his steam press. This practice also gave an impression that the inside of the building was not damaged from the soot.

However, the soot was, actually, not always hindered by windows from invading Northumberland House. The duke's lawyers obviously wanted to renew the impression given at the court by submitting testimonies from indoor servants after the trial. According to Elizabeth Heybourn, even the grand staircase was once so covered with soot that 'you could almost write your name in it (AC/BPR p38)'. George Druid, an upholsterer, stated that 'The Grand Stair case was so much affected by the Blacks & smoke that it required sweeping every two days (AC/FO p18)'. The soot also affected the pantry. When William Grand, an under butler, was drying the silver plate at the pantry, the soot came in. He was obliged to rewipe the plate and

shut the window (*ibid* p36). Mary Finney was charged with cleaning the ante-dining room and large dining room, the room next to the former room. These rooms were very much covered with smoke after the erection of the steam engine (*ibid* p37). The furniture was safe because it was kept covered up, but otherwise, Heybourn considered that it would have been spoilt (*ibid* p39).

Apart from impacts to ducal family's space, the smoke and soot could directly cause troubles for servants by entering their rooms. Heim, whose room adjoined Clowes' premises, stated that the soot fell like 'a small shower of snow (AC/TR p101)'. This comparison of soot to snow, except for its colour, was made by other witnesses such as William Ruff (*ibid* p294). Heim observed it 'A good many times' and he was obliged to go upstairs to shut his window in order to prevent blacks flying into his room (*ibid* p102). Similarly, Robert Grieve once closed his room's door in order to prevent the smoke from coming in February 1824 (*ibid* p303). However, though Heim's window sills were covered with soot inside and out, he did not talk about any annoyances caused by the soot in his room. It suggests that his room was relatively unaffected or Heim was not very sensitive to the small amount of soot (*ibid* p105).

As will be examined later, Clowes used coke and adopted a smoke consumer in order to abate the smoke nuisance. The amount of smoke was greatly reduced to as much as ordinary chimney smoke, possibly except for when they fire the furnace (*ibid* pp. 107, 125). According to Heim, it seems that Clowes light a fresh fire twice a day, seven in the morning and two in the afternoon. Heim described this smoke as 'a very thick black stinking smoke (*ibid* p130)'.

Testimonies at the trial gave the impression that the frequency of the nuisances felt by the witnesses was low, because witnesses tried to provide accurate dates when they gave the accounts. At the end of the trial, Copley gave a long speech defending Clowes. At one point, he argued that every witness observed black smoke issued from Clowes' chimney only a few times:

There is not one witness who has ventured to say he ever observed it more than two or three times—...Not one of them ventured to say more than a minute and a half—not more than a minute & a half! (*ibid* p421)

After the trial, the duke's side decided to record the time black smoke issued. John Walker, a gardener, was in charge of the record keeping and Table 6-3 shows the result. It perfectly shows the pattern of smoke issued from a steam engine chimney with a steam consumer. Although the black smoke issued usually for only several minutes⁸⁵, the engine worked sometimes six days a week.

6-9 Water supply

Another key nuisance caused by the steam engine was water shortage. When Clowes erected a steam engine, he dug a well to supply water for his boiler (AC/TR pp. 308-9). Before Clowes dug his well, the duke's well did not suffer from water shortage but Clowes' well started to cause the problem when the steam engine worked for a long time:

I observed that when the Steam Engine has been at work all night or a night and a day, the Water was gone—if the Steam Engine rested of a Sunday or Sunday night, then we had plenty of Water on Monday but if it works all day of Monday or great part of the Monday night then we have no Water again on Tuesday morning (*ibid* pp. 184-5).

After hearing similar testimonies from several witnesses, the judge confirmed that the water shortage of the duke's well was caused by Clowes' well. However, because the duke's well was relatively new, it was judged that the water right had not been established for the

⁸⁵ Actually, Copley himself admitted in the same speech at the end of the trial that Clowes emitted black smoke eight minutes per day before Clowes started to use coke. Eight minutes per day was quite an accurate figure based on a diary kept by Clowes' men for three or four months.

duke⁸⁶. The duke's well was dug in the stable yard in 1818 (AC/TR pp. 117-9; AC/BP p43).

Although the exclusive water right had not been established, it was true that Northumberland House's well was affected by the construction of the steam engine. Due to the water shortage, Northumberland House entered into a contract with the New River Waterworks for water supply (AC/TR pp. 185-6). In addition, Jonathan Parsons stated that:

In consequence of this failure of the Pumps Witness was obliged to introduce a pipe of soft Water into the yard for the use of the Workmen and to construct a larger Cistern for the supply of that, with a Water Closet which was being built (AC/BP p34).

The source of the water for the pipe Parsons referred to could be the New River Waterworks but it was not clarified.

Although the phenomenon that a well went dry due to the erection of a steam engine was not reported in other smoke nuisance court cases, one of the witnesses confirmed that he observed similar phenomenon in other places. Joseph Spicer, a well digger, who was employed in digging the duke's well, talked about other two examples. When a brewer at Wandsworth dug a well, it drew water from a well belonging to Mr Rucker of Wandsworth Hill, nearly three-quarter miles away. Another example was a saw mill in St Martins Lane in the neighbourhood of Northumberland House. When Spicer dug a well for six h.p. steam engine, it drew off the water from the wells of brewers in Castle Street, Cambe, Delafield & Co, about a quarter a mile away (AC/FO pp. 14-5). The introduction of steam engines caused the shortage of water resources in some places.

⁸⁶ The issue on the establishment of water rights caused a prolonged legal argument at the trial, because lawyers were unheard of the issue concerning a well and groundwater. In the end, the Chief Justice decided to accept the water rights of a river, which means that water rights would be established after twenty years since the beginning of water use.

6-10 Remedies adopted by Clowes

When Clowes was notified that his steam engine caused these nuisances to Northumberland House, he did not think that these nuisances were an inevitable by-product which should be tolerated by his neighbours. Rather, probably partly due to the social status and power of the duke, Clowes tried almost every possible remedy to abate the nuisances though except for the removal of the steam engine. This section will examine the remedies Clowes adopted and the miscommunication and misunderstanding between the printer and the duke's side when negotiating possible remedies.

Clowes did not inform the duke about the introduction of the steam press beforehand and the Northumberland House household first knew its introduction when servants heard the noise. When Joseph Morris knew the erection of steam engine, he soon wrote a letter to the duke asking his instruction. Morris received an answer from J. Raine, who was a legal adviser of the duke and happened to be at Alnwick Castle when the duke received Morris's letter. The letter reveals that Raine and the duke misunderstood the situation and thought that Clowes only intended to erect a steam engine. The instruction for Morris was to stop the erection of the steam engine and the letter shows that the duke had no intention to tolerate the annoyance caused by the steam engine. 'Pray represent in the strongest terms the absolute necessity of his abandoning all idea of so perilous an experiment. For the moment that any annoyance is produced which must very soon inevitably take place the Duke will bring his action and nothing short of prostration can afford effectual redress (AC/BP p10)'. The letter says that in case Clowes would erect a steam engine, a prosecution would be followed, making Joseph Morris as one of the prosecutors.

The first communication between the duke's side and Clowes' side was between Joseph Morris and Clowes⁸⁷. Morris informed Clowes of the extent of the nuisances:

I saw the Defendant—he came to me or met me in the street, and I told him this would be a very great nuisance—He came to my office and I went down and pointed out the windows and places where the noise was to be very distinctly heard...He then was aware of the noise and he asked me what he could do—he would be very glad to do any thing to obviate the inconvenience that arose from this steam engine and asked me whether if he put other windows at the back of the Duke's windows—whether that would not answer the purpose of preventing this noise—I told him I could not give him any advice upon the subject—I must leave it entirely to himself (AC/TR pp. 31-32)

Although the duke had no intention to satisfy himself other than the removal of a steam engine from the beginning, Clowes proposed remedying the situation. The removal of a steam engine was not an acceptable solution for Clowes, and proposing other remedies was all what Clowes could.

Clowes' proposal to 'put other windows at the back of the Duke's windows' was realized as double windows. However, it caused trouble because Clowes attached additional windows to the windows of Northumberland House without notification. After the duke's household realized that Clowes had fastened down the windows and they could not open them anymore, Clowes was asked to remove them (*ibid* p58). It is surprising that Clowes attached additional windows without being noticed by the Northumberland House staff, or more likely, some members of the staff noticed but just did not know that it had not be approved. According to Morris, the double windows

⁸⁷ It is not clear whether this communication took place after Morris received the letter from Raine or not.

were not effective after all: the noise was abated 'In a very small degree (*ibid* p32)'.

Possibly after the addition of windows, Clowes' foreman, Parker visited Northumberland House and Morris showed the passage, one of the places where Northumberland House staff most complained of the noise. Although Parker admitted that they heard the noise, he did not think 'it was such as to constitute a nuisance (*ibid* p34)'. This remark and the remedy of double windows shows that printers and the Northumberland House household had different cultures. For the foreman who handled the steam engine, the noise in the passage was nothing, but it was the terrible noise in Northumberland House which enjoyed a quiet environment before. Attaching additional windows over the existing windows of Northumberland House, which made the windows closed forever, was a reasonable remedy for Clowes, but it was unthinkable trespass for the duke's side.

The first communication and the trouble afterwards tell us some of the difficulties both sides faced. When Clowes was informed by the agent of the duke that he was causing nuisances, he showed his eagerness to abate the problem. However, his eagerness was hindered by the limited means and bad communication. Available remedies for the noise were very much limited and ineffective. Furthermore, the first meeting shows that Morris was not vested with authority to negotiate with Clowes.

The later communication between the duke's side and Clowes' side, mainly between lawyers, also shows a difficulty. In 22nd November 1823 W. H. Morris⁸⁸, the duke's attorney, sent a letter to Clowes about the intention of prosecution. The letter says that unless the nuisance caused by Clowes' steam engine would be removed, legal proceeding would be adopted (AC/FO p3). Clowes immediately replied asking to specify 'the disturbance and annoyance (*ibid* p4)'. However, Clowes did not receive any reply. On 9th January the following year,

⁸⁸ He was probably Joseph Morris's son.

Clowes suddenly received a notice of action on a plea of trespass. Clowes wrote a letter saying that he had not received any reply for the previous letter and the legal proceeding was unnecessary.

W. H. Morris replied that though he intended to reply Clowes' inquiry earlier, he took others' advice not to so because Clowes 'had been frequently informed by Mr Parsons, and my father of the nature of such Nuisance (*ibid* p5)'. W. H. Morris wrote in the same letter that he was in the early stage of his professional career, probably as an excuse for the decision, not to send a reply.

Having been disappointed with the duke's lawyers, Clowes directly sent a letter to the duke. The letter seems to be the second one sent to the duke because the duke's letter book previously records a short letter to Clowes which referred Clowes to the duke's lawyer, Mr Raine:

The Duke of Northumberland has to acknowl^e the receipt of M^r Clowes's letter of the 9th inst^t and must refer him to Jonathan Raine Esq^r, 33 Bedford Row, for any information respecting the Proceedings to remove the nuisance which M^r Clowes has erected adjoining North^d House (AC, DNP MS 69A/14, 16/1/1824).

The second letter to the duke was a long letter which insisted the absurdity of two accusations made by the duke's lawyers. The validity of these two accusations would be argued later during the trial. One accusation was 'that some Water flowed from [Clowes'] premises into an adjacent Coach house (AC/FO p6)'. However, in fact, the water leaked through a hole which was made by the duke's servants. The other accusation seems to be about the double windows but Clowes claimed that the window itself should not be made in the first place because it was the trespass. As for other problems caused by the steam engine, Clowes wrote that he only received very partial information about the specific of the matter and the duke's lawyer, Mr Raine, gave him no opportunity of removing any ground of complaint

(*ibid*). There is no evidence that Clowes received a reply from the duke.

In addition to double windows, Clowes possibly tried one more remedy concerning noise, but what could have been done by Clowes is not clear from the available materials. It is also possible that nothing had been done, but Heim stated that two or three months before the trial the noise became smaller to be 'the sound of a muffled Drum' though Heim added that the noise was still inconvenient (AC/TR p102). The only possibility which can be suggested by the trial records is that they reduced the speed of the steam press. Bryan Donkin, an engineer, stated that when the Jury inspected Clowes' premises, the printing machine worked at a slow pace, which produced less noise (*ibid* p329).

Clowes needed to abate not only noise but also the smoke and soot. It seems that Clowes tried three different remedies for smoke and soot, a smoke consumer, coke and a higher chimney. Interestingly, the first remedy taken by Clowes concerning smoke was a smoke consumer. Clowes installed it around October. The timing suggests that Clowes installed the smoke consumer soon after he heard the complaint. Some witnesses talked about the reduction of the smoke and soot nuisance. It seems that the amount of smoke was greatly reduced to as much as ordinary chimney smoke, except for when they fire the furnace. For example, Michael Heim stated that there was less smoke and less blacks since some months ago (*ibid* pp. 107, 125). Another remedy, the use of coke, was also effective. Copley stated that the use of coke started in February (*ibid* p422). However, the duke's side demanded a more permanent remedy due to the fear that Clowes might resume using coal after the trial.

Whether a higher chimney was actually erected or not, and if so, when, is a little uncertain because the only evidence referring to the chimney was from the duke's witnesses. According to Joseph Morris, there was only one flue through which smoke ascended at first. 'They have raised the chimnies higher and the smoke issues through either

four or five flues' about six weeks before the trial⁸⁹ (*ibid* p61). Morris thought that Clowes constructed the flues to disperse the smoke and the alteration seems to have been effective to some extent (*ibid* pp. 63-4).

Clowes tried almost all measures to abate the nuisances, especially noise and smoke. It shows that Clowes was willing to abate the nuisances caused by his steam engine as far as remedies were available. The fact that Clowes started to use coke in February after he received a notice of action on a plea of trespass suggests that he was desperate to avoid the trial. However, this case involved three sorts of nuisances and it was almost impossible to abate all nuisances. Since Taylor's parliamentary campaign, smoke and soot could be abated to some extent, if not perfectly. However, other two nuisances were not easily remedied. As for the use of groundwater, water supply from water companies could have been one solution. However, as will be examined in the next chapter, quality and quantity of water supply from water companies could be unsatisfactory during the period. Noise was more problematic because it had no effective solution than distance. The removal of the engine was the only solution if solution was sought.

Thus, the legal confrontation was inevitable in this case in hindsight. Still, Clowes was unfortunate in terms of bad communication with the duke's side. Especially, he was not given the opportunity to directly negotiate the issue with the duke. Of course, lawyers usually dealt with legal issues as in Gott's case. However, Gott, as a member of Leeds local community, had the opportunity to talk about the issue before the case brought into the court. In the case against Clowes, daily communication between the duke and Clowes did not exist due to the considerable difference in social status. Besides, the duke was a member of the aristocracy, who had plural interests, including politics, estate management and a life as a person of distinction. The

⁸⁹ The end of April or the beginning of May 1824.

duke's letter book shows that he often received numbers of letters in a day. Therefore, the reply as follows must have been inevitable to preserve his life:

The Duke of Northumberland has to acknowledge the receipt of M^r. Guthrie's Letter of Yesterday's date, and must refer him to M^r. Peyton as The Duke has made it an invariable rule never to transact any business relating to his Estate but thro' the medium of his Agent (AC, DNP MS 69A/14, 12/5/1824).

Naturally, the duke employed many experts and staff to deal with these interests, and was not directly involved with the legal case against Clowes. The duke's side started the legal proceeding in January 1824, before the duke arrived at Northumberland House in the end of March (AC/TR p393). The decision to resort to the legal proceeding was made without the duke's personal evaluation of the nuisance.

6-11 London smoke and noise nuisance cases

After the passage of Taylor's Act, other smoke and noise nuisance court cases took place around London in the 1820s. This section will examine these cases, especially the lawsuits against printers and smiths in order to put the Duke of Northumberland v. Clowes in the context of other nuisance cases.

Before the trial between the duke and Clowes took place in the Court of Common Pleas in June 1824, two court cases concerning steam engines was already reported in London. In June 1823, the trial against Simmonds⁹⁰ and Walker, cotton manufacturers in Goodman's fields, took place at the Court of King's Bench (MC 18/7/1823; 18/11/1823) (Plate 6-1). After they were convicted, they put in 'affidavits, stating that they had used every exertion in their power to abate the nuisance, by the introduction of patent smoke consumers, &c. and added, that they were ready to avail themselves of any

⁹⁰ According to the report of *the Morning Chronicle*, it is 'Symmons'.

further suggestion for the removal of the evil complained of (MC 18/11/1823)'. Though how the conflict ended was not reported, it is clear that they tried remedies to abate nuisances.

In April 1824, Copley himself was involved the case at the Court of King's Bench against Champion and Green⁹¹, vinegar manufacturers, whose steam engine and the purifying process of volatile spirit caused nuisance (MC 29/4/1824; MP 29/4/1824). While the cotton manufactory in Goodman's fields was located in densely built area of the East London near the Tower of London, the vinegar manufactory was located at the developing north edge of the town (Plate 6-1). These two cases show that the Duke was not the first person who sought a legal solution for the nuisances caused by steam engines. Of course, it cannot be denied that the duke was rich and powerful enough not to hesitate at the idea of litigation when there were not many precedents.

In addition to these cases concerning steam engines, steam presses became an issue since the Duke of Northumberland v. Clowes. Two more cases took place in the Strand and Fleet Street in the following year. Copley defended printers in these two cases probably because his defence of Clowes was impressive. Interestingly, one of the cases was against the proprietor of *The Morning Chronicle* and *The Observer*, William Innell Clement. Therefore, it was probably inevitable that *The Morning Chronicle* reported these two cases focusing on the claims of printers' sides.

In the case, Salmon v. Bensley, which had taken place four months earlier than the trial against Clement, the main focus of *The Morning Chronicle's* report was the necessity of steam engines to London businesses, especially printing. As a result, it did not provide much description about nuisance itself:

⁹¹ *The Morning Chronicle* reported the name of defendants as Chapman and another.

The ATTORNEY-GENERAL ... contended that a verdict in this instance for the plaintiff would have the effect of not only ruining the defendant, by preventing his carrying on his business at all, but that it would entirely put a stop to all workmanship carried on in the Metropolis, in which steam was in any respect made use of It was absolutely necessary that the trade of printing should be carried on in the metropolis, to afford the convenience of quick and repeated communication between the press & editors & authors, and if the defendant were driven by a verdict from his present premises, where could he possibly establish his business in London? (MC 21/1/1825)

Even though *The Morning Chronicle* wanted to claim that printers needed to have their premises in convenient places in London, the introduction of steam presses changed the printing business into a trade unsuitable to adjoin residential houses. The worst part of the nuisances was the noise, especially because printers tended to work at night. Bentley, for example, owned two engines. The noise 'continued with little intermission through the 24 hours, with the exception of Sunday (*The Times* 21/1/1825)'. As for the smoke, it was claimed that although the smoke was issued from the high chimney and it doesn't fill the plaintiff's rooms immediately, 'the blacks ... were beaten down the lower chimnies by the wind, and covered his furniture (*ibid*)'.

Thomas Bentley's printing premises were at Bolt Court, Fleet Street, and it was claimed that it was industrial area 'in the immediate neighbourhood of the great Gas-works in Dorset-street, and of several other engines of superior power to its own (*ibid*)'. However, the City of London Gas Light and Coke Company had already experienced legal proceedings in November 1815. Smoke including 'saline effluvia' became an issue in the case (MC 20/11/1815). Although polluting industries located around the area, residents not necessarily tolerated nuisances.

The Jury returned a verdict for the plaintiff in the case, *Salmon v. Bensley*, but with a nominal damages, one shilling. Lord Chief Justice of the King's Bench, Charles Abbott, stated that:

a verdict for the plaintiff would destroy a most important and useful establishment, yet it was clear, in law and justice, that if a person did that which was a nuisance to the house of another, the owner of such house had a right to complain, and could by law compel an abatement of the nuisance; and in this instance a verdict for the plaintiff would not destroy the defendant's business, but only compel him to remove the engine further from the plaintiff's house (MC 21/1/1825).

Thomas Bentley obviously moved from the premises immediately after the trial because another printer, Mills, moved into the premises and was taken into the court for nuisances caused by steam presses again in 1828. It suggests that prosecution could sometimes remove the polluting trade from its neighbourhood, but it did not guarantee the removal of all similar trades.

About four months later, the proprietor of *The Morning Chronicle*, William Innell Clement, was taken to Court. The printing office was located on the Strand again. The printing office introduced two horse-power steam engine in the summer of 1824, probably after the trial against Clowes. The plaintiff, a linen draper, and his family were prevented from sleeping by its noise. 'The time when, ... the evil was most felt, was from two to five o'clock in the morning; but commenced earlier on Saturday evening, when the *Observer* was printed (*The Times* 31/5/1825)'. According to the report by *The Morning Chronicle*, 'The defendant, ..., did every thing in his power to remove the evil complained of (MC 31/5/1825)'. The printing machinery was removed to the basement and relieved most neighbours from the noise except the plaintiff, who claimed that 'the nuisance was *concentrated*, in consequence of relieving the other neighbours (*ibid*)'. In order to abate the smoke nuisance, Clement installed a smoke consumer. Clement also tried to remove the source

of complaint by buying the plaintiff's house because Watson became the only neighbour who complained of the nuisance after remedies were introduced. However, they could not agree on the price (*ibid*). The verdict was for the plaintiff with £60 damages.

Although London newspapers reported only abovementioned smoke nuisance cases concerning steam engines in the 1820s, there were several other nuisance cases against smiths. For example, Rawlins, whitesmith, annoyed his neighbour and was taken into the Court of King's Bench, in December 1824. Rawlins erected his forge around Christmas 1823 on No. 16 Ebury Square, Pimlico. The nuisances annoyed a surveyor, Wilson. The noise of hummers started at six in the morning until seven at night. As in the trial against Clowes, the extent of noise was difficult to measure. While lawyers for plaintiffs described the noise as intolerable, lawyers for defendants derived evidence from witnesses to show that noise was tolerable. During the cross-examination, a female servant, one of the witnesses, told that 'the noise, bad as it was, never woke her when asleep (*The Times* 10/12/1824)'. The smoke was also a nuisance but it had been abated before the trial. The verdict was for the defendant because it was proved that the nuisances, especially noise, was not serious enough for lodgers of the neighbouring houses to move out. In addition, though the plaintiff claimed that Rawlins was a blacksmith, he was actually a whitesmith, a trade generally considered less polluting.

In the case, Cocks⁹² v. Peachy in December 1827 at the Court of King's Bench, the similar combination of smoke and noise was seen. The contested place was the fashionable area, Princes Street, Hanover Square. A smith and founder, Peachy, erected his forge and a foundry and the plaintiff, a music-seller, was annoyed by hammering noise from four in the morning to ten at night, sometimes

⁹² The name of plaintiff was reported differently on each newspaper. *The Morning Chronicle* reported it as Cox, *the Morning Post*, Coxe, and *the Times* and *the Standard*, Cocks (all published in 14/12/1827). His name was actually Robert Cocks (Lambeth Archives, IV/39/17, 3/10/1832)

until twelve at night (MC 14/12/1827; *The Standard* 14/12/1827). In addition, iron-loaded carts produced great noise. The trade also caused smoke nuisance. Neighbours could not open their windows 'on account of the smoke and the large blacks or flakes of soot which were blown into the houses, and seriously injured the furniture and clothes in them (MC 14/12/1827)'. As most other defendants of smoke nuisance cases in London, Peachy made efforts to abate the nuisances. According to witnesses, the problems of smoke and soot were greatly solved by the use of coke instead of coal, in addition to the use of cowls on the flues to prevent soot from flying. As for the noise, Peachy tried remedies as follows:

the defendant had erected two wooden fenders to prevent his carts from striking against the plaintiff's walls and so creating a vibration and concussion in his house. He had, likewise, raised to a considerable height the wall which divided the two houses at the back (*The Standard* 14/12/1827).

Though newspaper reports do not give much information on the consequence of the remedies, it should have been impossible to abate all noises. The verdict was for the plaintiff, with damages forty shillings.

A similar case also took place in the following year at the Court of Common Pleas between an ironmonger, who had a forge on King Street, St. James's and a plaintiff who kept a lodging house (MC 12/6/1828; *The Times* 12/6/1828). Again, noise, smoke and soot were the problems. Whether Pratt, the ironmonger, tried to remedy the nuisances or not is unknown from newspaper reports. In the end, the Jury returned the verdict for the plaintiff, with one shilling damage. A quite similar case, *Grant v. Jones* and another, took place in December 1828. The case was between 'gas apparatus filters and brass manufacturers' who caused nuisances including smoke, smell and noise, and a plaintiff, a rope and bed-sacking manufacturer in Grafton Street, Soho. The verdict was the exactly same as the former

case; the verdict for the plaintiff with one shilling damage (MP 19/12/1828).

These court cases show that it was too simple to label the case, the Duke of Northumberland v. Clowes, as a mere class issue. The plaintiffs of these court cases were middle-class inhabitants. In addition, four out of six London court cases concerning steam engine nuisances reported in the 1820s were against printers as the first half of this section examined. This figure shows that printers at first did not realise that the introduction of a steam press changed their trade into a polluting one, which could not be carried on in the residential area. Still, these newspaper reports show most of these printers, manufacturers and smiths who were taken into the court tried to abate nuisances as much as possible in order to avoid the court confrontation.

6-12 Class politics and a radical newspaper

Though the case, the Duke of Northumberland v. Clowes, was not necessarily a class issue in the context of smoke and noise nuisance in London, it was criticised by a radical newspaper as one. This section will examine how this interpretation was made first by Copley and next by *The Examiner* though the direct blame was often placed on the duke's men, not the duke himself.

The duke's intention to seek the complete removal of nuisances was very much criticised by one of the radical newspapers of the day, *The Examiner*, as an example of aristocratic ridiculousness and oppressiveness. It first reported the case as 'frivolous and vexatious (*The Examiner* 13/6/1824)':

The Court of Common Pleas was occupied all yesterday with the case of the Duke of NORTHUMBERLAND v. Mr. CLOWES, the Printer, of Northumberland-court. ...the complaint of the Duke is, that his palace is annoyed by its smoke and noise. —We were in Court for some time, and our impression was, that the complaint was "frivolous and vexatious;" but this the verdict will decide (*ibid*).

The Examiner was a highbrow sixteen-page weekly, established in 1808 and sold a little over 2,000 copies a week at first. It was edited by Leigh Hunt and printed by his brother John. By 1812, it sold as many as 8,000 copies and then down to 2,500 when Leigh Hunt gave up the editorship in 1821 and again increased its readership in the 1830s. 'Subscribers often handed their copies over to their friends, creating pockets of *Examiner* readers throughout Britain (Harling 1996 p1160)'.

In hindsight, *The Examiner's* article was not necessarily balanced. However, it is probably fair to say that the aristocratic reasoning used by the duke's side was provocative enough at first. 'Brief for the Plaintiff' submitted before the trial stated that the outcome of the case would influence the future segregation of industry from residential area with aristocratic implication:

Indeed the decision of this case will form one of the most important principles on which depend the very existence and constitution of one part of the Town being set apart for the residence of one class of the public—the nobility and Gentry—and another for the carrying on of the manufacturers and commerce of the Mechanic and operative classes (AC/BP p16).

The location of Northumberland House was also proudly justified, which should have been approved by upper-class but should have caused irritation to the radical middle-class:

It has been said on the part of the Defendant that Charing Cross is not a fit residence for a Duke, being principally tenanted by the trading and operative part of the Community; but it should be recollected that it was not always so, and that at the time the Plt's [Plaintiff's] princely residence was erected by his noble ancestors; ...and because Northumberland House did not follow the fate of other noble mansions in the Strand, of being pulled down and made the site of streets, it does not follow that the lineal Descendant of the Percies, so famed in British history, should give

up his patrimonial mansion to make way for the introduction of Steam Engines and other similar nuisances (*ibid* pp. 17-18).

Despite the rhetoric, the duke's lawyer certainly realised the danger that these statements could present. In the same document, it is stated that Copley 'will no doubt commence by describing this action as an attempt at oppression on the part of a rich and powerful nobleman against a poor humble individual (*ibid* p15)'. In fact, Serjeant Vaughan, lawyer for the duke, refrained from mentioning aristocratic causes when he made the opening speech at the trial. Rather, he stated that the duke had as much right as others to defend his benefits. Everyone was equal before the law, and a large property should not affect the principle. The only exception was when Vaughan referred to the intention of the duke to keep Northumberland House for posterity, but with more careful language as well as slightly less pride than in 'Brief for the Plaintiff' (AC/TR pp. 27-28)⁹³.

As the duke's lawyers expected, Clowes' barrister, John Singleton Copley, employed an effective strategy of presenting the conflict as a class issue. After all the witnesses for the duke were examined, Copley started his long speech by expressing his anxiety respecting the result of the cause:

My Client and the Noble Plaintiff contend on terms of great inequality—great inequality in point of influence—great inequality in point of wealth—great inequality with respect to the stake for which they are contending... (AC/TR p382).

A competent barrister probably would not ignore the significant disadvantage in power and Copley was definitely a competent barrister. The duke definitely enjoyed the class privilege and it was the time when the doubt on such inequality arose. However, if we closely look at Copley's argument, different class politics can be

⁹³ Despite the duke's wish, the house was to be demolished in 1874, after the purchase by the Metropolitan Board of Works.

observed under the surface class politics between the aristocracy and the middle-class printer.

Although Copley took the strategy to describe the conflict as a class issue, the duke himself had almost no direct involvement with the case. The ducal family had not arrived at London until the end of March, about three months before the trial. In addition, the communication with Clowes' side was almost always made by the duke's employees. As a result, the brunt of criticism was borne by the duke's employees.

In fact, Copley sometimes made it clear that he was not attacking the duke but people around him. He inserted a sentence that 'but do not suppose I am making an attack on the Duke for one moment' a few times during his speech (AC/TR p409). This strategy was reasonable also because it was safer to blame agents and employees rather than the duke himself.

Copley, for example, blamed the agent of the duke for not allowing Clowes' side to inspect Northumberland House:

the agents of the noble Duke—not with his knowledge or concurrence or his consent that these agents refused us that admission for the purpose of depriving us of that fair Testimony ...
(*ibid* p404)

Subsequently, it was reported by *The Examiner* that the permission was not given to Clowes to examine the kitchen of the Northumberland House 'though the object was to find a remedy for any *real* inconvenience caused by the defendant's printing-machine (*The Examiner* 20/6/1824)'.

The request by Clowes' side for inspection was made in February 1824 though the request was not the one specific for the kitchen inspection. Clowes' attorney, Henry Rice, wrote a letter asking to give Clowes' surveyors permission 'to judge of the noise complained of' and to investigate other complaints (AC/FO p9). However, Rice only

received a reply from W. H. Morris, the duke's attorney, saying that 'such leave can only be given by His Grace (*ibid*)'. Rice, therefore, sent a letter to the duke applying for an inspection. The reply is not available and it is likely that the duke did not send a reply. Thus, it is possible to say that the duke was involved in the decision not to allow Clowes' surveyors to inspect Northumberland House, but it was the duke's agent who was blamed for the decision. Of course, it is very likely that Clowes' side was frustrated at the agents of the duke, who were generally not vested with the authority, and the lack of active involvement by the duke.

Another example the Duke's man was blamed for his conduct was concerning a trespass issue. When Clowes tried to abate the noise by attaching an outer window to the windows of Northumberland House, the duke's side accused Clowes of trespass. To balance the claim, Clowes' lawyers claimed that the duke's side also trespassed Clowes' premises:

His Grace has opened a new light where none existed before which must be stopped up—Has enlarged and altered other lights which if allowable at all must be reduced to their original form—Has raised his Building towards the Deft so high as to exclude his light and air and must reduce it to its former height—Has encroached in erecting his Building (if Evidence of the old Inhabitants be correct) some space on Defts Ground and must set it back—Has placed a Watercourse to overhang the Defts Ground which must be removed—Has broke thro' the Boundary fence Wall of Defts premises leaving them open and exposed which must be closed forthwith (*ibid* pp8-9).

Among the claims of trespass in the list, the last claim on the hole broken through the boundary wall became a big issue. It seems that the duke's side first complained of water flowing from Clowes' premises. However, Clowes' side found that the water flowed because a hole was made through the wall by the duke's men. Clowes' side considered the conduct to be an example of improper behaviour by

the duke's men. Copley utilised the issue as much as possible even suggesting that it was due to the hole that the noise was heard in Northumberland House.

During the trial, it was revealed that it was Jonathan Parsons, clerk of the works at Northumberland House, who instructed servants to make the hole. Parsons claimed that the hole was made in order to inspect the source of nuisance. According to Parsons, he instructed to make a hole on the heated wall, where the boiler was supposed to be situated on the other side of the wall. In his words, it was done 'to satisfy [his] own curiosity to see what was on the other side (AC/TR p186)'.

The newspaper reports on the issue seem to have been distorted to emphasise the question of morality. The reports of *the Times* and *The Morning Chronicle* are as follows⁹⁴ :

Mr. Jonathan Parkins [sic], ... He was the person who broke a hole through the Duke's wall, which divides the Duke's premises from the engine-house of the defendant. The steam-engine of the defendant was adjoining the outside of the wall. Some time after the wall was perforated, the boiler of the defendant boiled over, and the water flowed through the hole into the Duke's stables. The ATTORNEY-GENERAL—You should not have made the hole (*The Times* 14/6/1824; MC 14/6/1824).

Actually, this description does not correspond with the trial record very well. The trial record was made based on the short hand record and it is supposed to be word-by-word record, including lawyers' casual conversation during the trial. According to the trial record, the question, 'who made a hole', was the matter that Copley was very much interested in. He asked Michael Heim that 'Pray who was it that dug a hole through the Wall (AC/TR p119)'. John Walker, a gardener, and James M. Grath, a watchman, were asked similar questions at

⁹⁴ These two newspapers' articles are partly exactly the same.

cross-examination (*ibid* pp. 159, 177-8). However, when Parsons was asked the question, it was not at the cross-examination. It was the duke's counsel who asked the question and Parsons was not blamed for the conduct as in the newspaper reports. It is possible that Copley interrupted the examination, but such interruption is not recorded in the trial record (*ibid* pp. 186-8).

Newspapers such as *The Times*, *The Morning Post* and *The Morning Chronicle* did not openly express their opinions but only provided summaries of the trial. However, their editing reflected their views, as expected. The Tory *Morning Post* printed a relatively short article supporting the duke's argument. The report of *The Times* was, overall, relatively balanced in terms of the description of claims by both sides, but abovementioned part of the article shows that exaggeration and rhetoric could distort the report.

Unlike these newspapers which provided objective reports on nuisance case despite their bias, the article on *The Examiner* emphasised the class issue. *The Examiner's* article on the court case had the same structure as Copley's speech and shows Copley's influence:

We understand that Mr. Clowes over and over again deprecated law proceedings; but the Duke and his advisers would be content with nothing else, except unconditional submission to their unreasonable demands. ... And if it should be found that the Duke's advisers have goaded him to this ungenerous and unwise course, it would be indeed well if *they* could be made to bear a portion of the cost. ... if the Duke of Northumberland knew of some of the proceedings of his people, he *ought* to feel ashamed of them (*The Examiner* 20/6/1824).

Due to Copley's strategy to attack the duke's agent, *The Examiner's* article did not directly attack the duke but his lawyers and the legal profession in general. Here, *The Examiner* slightly adjusted the interpretation and introduced an attack against the lawyers, which did

not appear in Copley's speech. The nuisance case went through two stages of interpretation, first by Copley and next by *The Examiner's* editor, and became one of the materials to support radical cause. It ended its article referring to the lion statue on the Strand front of Northumberland House:

From all we can learn, it should seem that the only sign of magnanimity discoverable,—on this occasion at least,—about Northumberland-house, was that so boldly exhibited in the Lion outside the mansion. Animals of quite another description were most plainly discoverable within (*ibid*).

Thus, the duke's employees were blamed for their immoral conduct but it was not only Clowes' side which resorted to the morality question. It was argued by the duke's lawyers that Clowes tried to hide the nuisances caused by his steam press during the visit by the jurors. Jurors visited Clowes' premises and Northumberland House on the 1st June, two weeks before the trial. In the morning, some witnesses for the duke saw four servants of Clowes cleaning the printing shop for about two hours (AC/TR p114). The duke's side claimed that Clowes instructed cleaning of the printing shop to show jurors Clowes' premises without damage from smoke and soot. However, though the blame was similar nature to the ones directed to the duke's employees, the person who was blamed was Clowes, not four men who actually cleaned the building. While Clowes was in his printing office and it was assumed that he instructed his employees' conducts, the duke was absent and it was assumed that his managing staff was responsible for the immoral conduct.

Thus, there was a complex class politics in this smoke nuisance case. Although Clowes' barrister, Copley, tried to describe the nuisance case as a powerless printer against the powerful and rich aristocrat, the direct target for the blame was the duke's agents. Moral questions were raised concerning the employees' behaviour. Because it was mainly them who conducted the blamed acts, it was probably reasonable to accuse them. However, it is also true that considering

the social status of the duke, it was far easier to blame the people around him than the duke himself.

6-13 Nuisance to which everyone acquiesced

London had been associated with smoke as early as the seventeenth century as examined in Chapter 4. Copley defended Clowes by pointing out that it was not only Clowes' printing office which caused nuisance but also other smoke-producing premises in the neighbourhood. This section will examine other smoke and noise nuisance sources in the neighbourhood of Northumberland House based on Copley's cross-examination.

The deterioration of air quality in Georgian London was caused by not only industrial fires but also domestic fires. Although each domestic fire issued only small amount of soot compared with industrial fires, the number of domestic fires made them one of the pollution sources. However, domestic fires were not the target of prosecution or complaint because everyone produced such smoke and the amount of smoke issued from each chimney was not as much as black smoke issued from smoke producing industries. William Ruff's evidence shows the general notion of domestic fires in terms of smoke nuisance in early nineteenth-century London:

Q. Do not all the chimneys in London deposit blacks?

A. Furnace Chimnies do—

Q. Do not other chimnies?

A. Not so much—

Q. Do not Kitchen Chimnies?

A. No not in such a great quantity (*ibid* p291)

Copley not only pointed out that general domestic chimneys could issue smoke but also raised doubts as to the chimneys of Northumberland House. The kitchen chimney of Northumberland House was large and located near the Grand Staircase's skylight, and Clowes' windows. It was only about six feet to the skylight and about fifteen feet to Clowes' windows (*ibid* pp. 88, 195). Naturally, Copley

claimed that the duke's kitchen chimney was producing much smoke, too. He further claimed that the duke's smoke destroyed Clowes' white papers which were hung up (*ibid* p453).

Witnesses for the duke considered that the claim that the chimneys of Northumberland House produce as much smoke as Clowes' chimney was irrelevant. They agreed that the amount of smoke produced by these fireplaces was not as great as Clowes before the use of coke. It was also revealed that these fireplaces were rarely used when the family was not in London:

Q. Before the family came to town were any fires kept in the chimnies that are called the kitchen and pantry chimnies?

A. Perhaps once a month (*ibid* p78)

Copley not only raised doubt over the chimneys of Northumberland House but also over chimneys of its neighbourhood. As Ruff gave evidence about ordinary chimneys, Thomas Williams gave similar evidence about ordinary chimneys around St Martin's Lane:

Q. When you stand up on Northumberland house do you not see the chimneys rising before you all the way north?

A. To a great distance—

Q. I ask whether the chimneys do not not [sic] pour down their smoke directly upon Northumberland House?

A. Smoke comes in that direction but not of a thick nature—

Q. So you mean Sir that the smoke in that part of London is peculiarly light?

A. The smoke that comes from a common chimney does not equal that of a furnace (*ibid* p91)

However, the description of smoke from the direction of the Scotland Yard was slightly different. Williams stated that when the atmosphere was thick, he saw a body of smoke coming from domestic chimneys (*ibid* pp. 93-4). It is not certain what caused the difference between the Scotland Yard and St Martin's Lane. One possibility is the industrial smoke from Lambeth in the opposite shore of the Thames.

Industrial smoke sources around Northumberland House were also pointed out by Copley. They were a blacksmith and a farrier in Scotland Yard and a plumber, John Holroyd, on Nos. 5 and 6 Whitehall Place. In addition, a 'coke burner' was located near Lime Wharf, the riverside of Scotland Yard. Copley also pointed out that there were a few bakers in St Martin's Lane (*ibid* p59). However, the claim by Copley sounds absurd because these shops were not immediate neighbours of Northumberland House. It is especially absurd to include bakers as polluting trade and the document submitted by the duke's side after the trial claimed that the plumber did not melt his lead:

The Farriers & Blacksmith's produce very little smoke. The Plumber does not melt his own lead and the Bakers shops emit no immense quantities of smoke (AC/BPR p20-1).

However, though it is unlikely that blacksmiths caused nuisance to Northumberland House in this case, smith's forge could be a nuisance to the immediate neighbourhood if it was large scale, as abovementioned.

When arguing about noise, Copley took the same strategy as smoke, balancing Clowes' noise by the noise from Northumberland House and its neighbourhood. Copley pointed out that Northumberland House produced not only smoke but also noise. He claimed that routs and balls held at Northumberland House disturbed neighbours at night:

Does my Client complain of the Noise he hears about two or three o'clock regularly once a week infinitely greater and more calculated to disturb a sober family than any thing carried on on this establishment?—Does he complain that he is obliged every night to take a circuit for the purpose of finding his way to his own House because the pavement itself is actually turned into a highway for the Visitors of the Duke (AC/TR pp. 437-8).

The claim possibly had some validity because Northumberland House attracted lots of carriages especially in the special occasions. The

legal document has a short sentence that Parker, probably the foreman at Clowes' firm, threatened to bring action 'for the noise of the Rack chains in the Duke's Stables (AC/BPR p24)'. However, the duke's lawyer claimed that Clowes, in fact, lived in a town house in Parliament Street in addition to a country house and his sleep should not have been disturbed.

Whether the noise caused by the duke's routs or not, Charing Cross was a busy and noisy junction. Copley also claimed that this part of the Strand immediately adjoining Charring Cross, was usually noisy with carriages. To describe the busyness of the traffic, he told an anecdote about an Irish man who visited London. The anecdote was considered to be clever and quoted by *The Times* and *the Morning Chronicle*:

An Irishman came to London, and parted with his Cockney cousin at the corner of Northumberland House, intending to go up St. Martin's-lane; his cousin went into the city, and returned a few hours after to go to his dinner, and found his Irish relation where he had parted with him. "How is it you are here?" cries he, "Oh, by —," cries the Irishman, "I have not been able to cross the road for coaches since you left me." (*The Times* 14/6/1824)

Plate 6-3 shows the busy traffic of the Charring Cross. Although the number of carriages does not look a lot in our twenty-first-century eyes, the paving and carriages produced big noise, as many witnesses told that the steam engine noise sounded like carriage noise.

London was generally associated with smoke and noise. Every Londoner had to accept such nuisances. They were not only victims but also produced more or less nuisances. Copley argues that it was 'give and take':

It is give and take—there is no such thing as a house without some nuisance of some description—who lives in any part of the Metropolis that is at all crowded that if he throws open his

windows does not find his Table occasionally covered with blacks—
In what part of the Metropolis does not this happen?—The Dukes
chimnies pour forth as much black as any other chimnies in the
Metropolis (AC/TR p420).

Copley, in effect, claimed that everyone was annoyed by some kinds
of nuisances in London, and everyone, at the same time, caused
some kinds of nuisances. Though his claim reveals partial truth, it
does not mean that the erection of a steam engine and the trade of
smith were always tolerated by neighbours. Proprietors of a steam
engine were actually taking a risk of prosecution, and the threat to go
to the courts was usually effective because most of the polluters who
were taken to the courts made an every effort to abate the nuisances.

6-14 Conclusion

At the end of the trial, it was decided that the verdict was for the
plaintiff with damages of £1000, an exceptionally large amount
among nuisance cases. However, both sides agreed to arbitration and
the duke paid Clowes to move from Northumberland Court to
Lambeth. According to the fire insurance policy records of Sun Fire
Office, he moved from Northumberland Court after 25th December
1825 and started his business in Lambeth before 31st October 1826⁹⁵.
The duke paid £15,000 for the removal of the printing shop⁹⁶. It was
the exceptional nuisance case that the duke was rich enough to pay
the expense of removing the polluting trade.

The Duke of Northumberland v. Clowes, and other cases in London
show that not only smoke but also noise was the problem in the
metropolis. In fact, nuisances of smoke and soot were often greatly
abated before trials because of the introduction of smoke consumers
and coke. Unlike Leeds, where smoke and soot was the only problem

⁹⁵ LMA 11936/509/1039648; 11936/510/1051723

⁹⁶ AC, N.XIV.10, miscellaneous papers.

relating to the nuisances caused by steam engines, the real problem in London was noise.

It is rash to conclude that Taylor's Act was not effective for the metropolis, as often stated in scholarly literatures. The court cases concerning smoke and soot certainly increased after the passage of the Act, and it conveyed a clear message that polluting trade, especially the one with a steam engine, should not be conducted in the vicinity of residential areas, or manufacturers would risk being taken into court. It, of course, did not stop the deterioration of air quality in the metropolis because segregation of industry was not enough, but it was the first step taken after the long silence on smoke nuisance by eighteenth-century political elites.

Evidence given by servants shows that they were often vulnerable to the nuisance. Still, these servants were parts of the households of upper or middle class families and their employers might seek a solution to the nuisances. Because the realistic solution for the smoke nuisance was the segregation of residential areas and industrial areas, a prestigious address was relatively safe from these nuisances. In this case, the duke succeeded in removing polluting industry from his neighbourhood, but lower class people had to acquiesce to the nuisance if they could not afford to move out.

The Duke of Northumberland v. Clowes was only one of smoke and noise nuisance cases at the metropolis in the 1820s. If we only focus on the central issue, nuisances caused by a steam engine, the case was not a special one. However, unlike other London smoke nuisance cases whose plaintiffs were usually middle class, the involvement of the duke made it easy to integrate it into radical discourse in the early nineteenth century. Still, it was actually the duke's servants who were mostly affected by the nuisance, and the class politics behind the case was more complex than the radical newspaper's report.

Chapter 7 Waterworks and brickmaking

This chapter is divided into two London case studies: waterworks and brickmaking. These two industries besides breweries were considered to be conventional smoke producing industries in London. Framed by George Cruikshank's two caricatures, *Salus Populi Suprema Lex* (1832) and *London going out of town* (1829), examples of early visual depictions of urban environmental deterioration, this chapter will examine these industries.

The first section of this chapter will briefly explore how other caricatures around 1830 dealt with smoke plumes in order to provide contexts to Cruikshank's smoke depiction. Then, I will move on to a case study on waterworks framed by *Salus Populi Suprema Lex* (Plate 7-1). It depicts a smoke plume from the Southwark Waterworks. As early as the eighteenth century, waterworks were one of the culprits for London smoke nuisance because they introduced steam engines to pump water up. After briefly exploring Lambeth and its industries in the second section, the third section will examine how Lambeth Waterworks adopted a smoke consumer when Michael Angel Taylor pressurized it to do so. The third section will examine the confusion over the effectiveness of smoke abatement technology in London water companies and breweries. This case study will also show that Taylor was not only interested in smoke nuisance, but also actively involved with the parliamentary debates on water company issues in the late 1810s and early 1820s. In fact, the main subject of *Salus Populi Suprema Lex* (1832) was water pollution. The fourth section will explore the controversy over London water companies, especially monopoly and water supply. Then, the fifth section will examine *Salus Populi Suprema Lex* within the wider contexts of controversy over water companies.

The second half of the chapter examines brickmaking at St Pancras in relation to Cruikshank's *London going out of town* (1829) (Plate 7-2). It depicts an expanding London as the march of brick and mortar.

After examining the caricature in details in the sixth section, I will move on to the examination of building development in St Pancras. The seventh section will briefly examine the controversy over the development of the Foundling Estate in St Pancras. The eighth section will examine the brickmaking business in London especially around St Pancras, which utilised the one-off structure to burn bricks called a brick clamp. It was a common practice to excavate brick earth and to burn bricks in the ground where housing development was expected. Brick clamps produced smoke nuisance and two court cases took place in the early nineteenth-century London, which will be the focus of the ninth section.

Unlike previous two chapters, the case studies in this chapter not only focus on smoke nuisance but also position it within the wider contexts of urban environment in the early nineteenth century. It was the time when urban infrastructure was significantly changed in terms of sewage, water supply, gas lighting, and the expansion of London. This chapter examines smoke and soot nuisance within this context.

7-1 Smoke in caricatures

This section will examine how smoke was represented in caricatures around 1830 in order to put two George Cruikshank's caricatures in the contexts of contemporary caricature culture. It first explores how smoke was depicted in progress and mechanization prints at the time, and then, it will introduce George Cruikshank's two caricatures this chapter focuses on.

'The March of Intellect' print was in vogue during the second quarter of the nineteenth century (see Chapter 2). The term, march, shows the rapid change early nineteenth-century contemporaries were facing. 'The March in fact was an aspect of democratization and industrialization, a shifting of social stratification, a sense that everything was on the move—feared, resented or welcomed (George 1967 p177)'. One of the typical images of 'the march of intellect' was the self-educated dustman. 'The March of Intellect' also represented

another aspect of expanding access to education. Plate 7-3 is a work of Robert Seymour, which welcomes the establishment of the London University in 1826. It opened the door to university education for non-Anglicans in England. Thus, the giant robot wearing the crown of London University sweeps up rubbish such as special pleaders, a quack doctor, a clergyman and a rector. They represent the privilege and exploitation of the elite, traditionally educated at the Oxbridge, and fake knowledge as quack's medicine. On the other hand, the robot represents knowledge and new technology. The robot's head was made out of books on history, philosophy and mechanics and its eyes are gas lights. A balloon is coming out of its pipe and its body is a steam engine, issuing steam. In this caricature, a steam engine is part of better future.

Steam engines, especially steam carriages, often represented progress. *A view in Whitechapel Road 1830* is one of two aquatints entitled 'the progress of steam' (Plate 7-4). It depicts steam carriages replacing horses in the streets. Three dogs are all skin and bones, showing that they were deprived of horse carcasses as a meat supply. The names of the coaches, 'The Infernal DEFIANCE' and 'THE DREADFUL VENGEANCE' suggests that steam coaches could be more dangerous than ordinary stage coaches, which was already dangerous enough, due to speed competition among them. Although stage coaches posed a potential danger, massive clouds of smoke discharged from each carriage did not cause much nuisance in *A view in Whitechapel Road 1830*. The only exception is the couple on the left, being annoyed by smoke from the carriage ahead. The man is angry and the woman feels sick. The family on the carriage enjoys themselves with food, not caring about others. The other aquatint, *A View in Regent Park*, depicts genteel society enjoying steam carriages. Here, again, people were not annoyed by smoke. In both images, the sky is clear and smoke plumes are mostly discharged where there is nobody. In fact, steam carriages and locomotives were a curiosity, which attracted audiences at the time. 'The progress of steam' shows its early enthusiasm though it does not ignore potential problems.

Robert Seymour's *Heaven & Earth* (1830) satirised negative aspects of mechanisation (Plate 7-5). The caricature shows that mechanisation caused unemployment among working class people, which resulted in their poverty. The two mills on the right are 'silk wove by steam' and 'gloves made by steam'. Two steam carriages can be seen in the scene, one in front of these two mills and the other in front of 'steam hall'. Unlike *A view in Whitechapel Road 1830*, the connotation of the steam carriages was negative, here. However, interestingly, the caricature only blamed the political elite for the suffering of the poor rather than manufacturers and merchants, who did not appear in the caricature. The structure of the caricature is that the privileged classes sucked the money and the benefit out of the steam mills while the poor people were unemployed due to the introduction of steam power. The people on the cloud include a beadle, two excisemen, a constable, a tax-collector, two barristers, two Court officials who hold wands, and a royal herald who blows his trumpet. Above, a drunken king, two bishops, a general, a judge and Lord Chancellor⁹⁷ are there.

Heaven & Earth was not a direct criticism of industrialisation. In fact, the problems associated with factories in the mid nineteenth century such as working hours, child labours and smoke nuisance are not at all focused on. The absence of manufacturers in the caricature suggests that the discourse against manufacturers were not ready-made at the time. Still, the black smoke clouds emitted from factory chimneys in *Heaven & Earth* is remarkable. Considering that most visual images in the early nineteenth century rarely used negative iconography of smoke, it was one of the first visual images which depicted negative black smoke.

Another negative smoke depiction can be seen in caricatures by George Cruikshank, the leading caricaturist in the first half of the nineteenth century. He was born in 1792 as a second son of Isaac

⁹⁷ Lord Chancellor was Lord Lyndhurst, who defended William Clowes in the case, the Duke of Northumberland v. Clowes.

Cruikshank, a caricaturist, and his wife, Mary. George and his older brother Isaac Robert learned skills of the trade in his father's studio, which was on the top of their house in 117 Dorset Street, Salisbury Square. He assisted his father's work as early as 1805 and after the death of his father in 1811 he rapidly established his reputation as a British leading satirist.

In the 1820s Cruikshank produced works on social and cultural issues. He also provided illustrations for books. Most well-known book illustrations of Cruikshank are probably the ones for Dickens, especially *Oliver Twist* (1837-39). In addition to works commissioned by his publishers, he also published his own works as scrapbooks. Between 1828 and 1832 Cruikshank published volumes of works entitled *Scraps and Sketches*. Most plates of *Scraps and Sketches* consisted of several small illustrations, typically one in the centre and four others in corners. However, there are exceptions. *London going out of town* (1829) was one of these exceptions, a large caricature occupying one place. This caricature on expanding London toward Hampstead covered by black smoke was probably partly motivated by his childhood memory. At that time, his father leased a house in Hampstead in addition to the house at Dorset Street and it was a custom of his mother to take Robert and baby George to the house (Cruikshank and Spencer 1896). The black smoke over the metropolis represents the negative images of London expansion. The second half of this chapter will examine this caricature in connection to London brickmaking business.

Salus Populi Suprema Lex (1832), a caricature criticising the Southwark Waterworks, was also based on a familiar landscape to Cruikshank. Dorset Street, where he grew up, was on the north shore of Thames near Blackfriars Bridge. The street was only half a mile away from Three Cranes Wharf depicted in the caricature. *Salus populi suprema lex esto* is originally Cicero's phrase, meaning 'the welfare of the people shall be supreme law'. The phrase was quoted by John Locke in *Two Treatises of Government* (1689). The

caricature's title used the phrase to describe the sanitary condition of Thames. *Salus* means health as well as safety, and the title claims that 'the health of the people shall be supreme law'.

The caricature was accompanied with ten-stanza satire criticising the Southwark Waterworks. Cruikshank's biographer, Robert Patten writes that the satire was probably composed by John Wright. Wright was a Tory publisher and an editor of the *Parliamentary Debates* for William Cobbett and Thomas Curson Hansard. Wright launched a campaign on the water quality in the metropolis in 1827, and in fact, the satirical poem accompanied with the *Salus Populi Suprema Lex* well reflects Wright's argument as will be examined later in this chapter. However, Wright's campaign ended when the movement attracted attention of the Home Department and three appointed commissioners published 'Report of the Commissioners' on the water supply in the metropolis in 1828. It was actually the Cholera outbreak in 1832 which directly caused the publication of *Salus Populi Suprema Lex*. A publisher, S. Knight, commissioned *Salus Populi Suprema Lex* and the other caricature criticising the Board of Health to Cruikshank (Plate 7-6).

These two caricatures, *London going out of town* and *Salus Populi Suprema Lex* reflected the contemporary London environment and they are early examples of caricatures on environmental deterioration in urban areas. Negative depiction of smoke was rare even among contemporary caricatures which usually rather optimistically depicted progress and mechanisation though with some doubt and fear.

7-2 Lambeth industrialised

The central theme of *Salus Populi Suprema Lex* is the quality of water distributed by London waterworks and their monopolies. In the caricature, the Southwark Waterworks is the central focus. The building of the waterworks is drawn to the right with the engine chimney and a plume of black smoke emitted from it. Though coal smoke was not the central theme of the caricature, waterworks were

among the industries which were blamed for smoke nuisances in London.

Instead of the Southwark Waterworks whose administrative records are mostly unavailable during the period, this case study will focus on Lambeth Waterworks. In fact, one of Michael Angelo Taylor's motivations to start the smoke abatement campaign was the damage to his garden by industries in Lambeth including Lambeth Waterworks. In the speech he made to the Select Committee (1820) he said that 'the volumes of smoke which issue from the furnaces on every side of the river Thames opposite my own house, actually blacken every flower I have in my own garden at Whitehall (PP (HC) 1820 (244) p10)'. Before exploring smoke nuisance from Lambeth Waterworks, this section will briefly examines industries in Lambeth.

Eighteenth-century Lambeth was mostly green apart from some potteries and glassworks especially around Vauxhall, and in the early nineteenth century it had gradually attracted manufacturers. Between 1779 and 1789, William Curtis, a botanist, operated the London Botanic garden near the site of later Waterloo Bridge in Lambeth. However, he soon closed the garden partly due to London smoke:

I had long observed with ... regret, that I had an enemy to contend with in Lambeth Marsh, which neither time, nor ingenuity, nor industry, could vanquish; and that was the smoke of London; which except when the wind blew from the South, constantly enveloped my plants, and shedding its baneful influence over them destroyed many; and, in a greater or less degree, proved injurious to most of them, especially the Alpine ones (quoted in Curtis (1941) p84)⁹⁸.

Although there were some industries in the neighbourhood of Curtis's garden, such as a glass bottle maker, a vinegar distillery and a

⁹⁸ However, considering the money he spent and the trees, shrubs, and hedges which had grown, he wanted to continue his garden despite the inconveniences if his landlord had not raised the rent.

dyehouse (Roberts and Godfrey 1951), Curtis blamed 'the smoke of London' for the difficulty he felt. Despite the existence of some industries, Lambeth was relatively rural in the 1780s. However, in the early nineteenth century, the Lambeth waterfront was much more industrialized:

The southern bank of the Thames, from Deptford to Lambeth, including Southwark ... has one distinguishing feature from any other, as it abounds with numerous and various manufactories; iron-founderies, glass-houses, soap-boilers, dye-houses, boat-builders, shot and hat manufactories, &c., and many other similar establishments. From the great number of fires employed in these houses, and the offensive effluvia arising from some of the works, this district is rendered extremely unpleasant for human residence (Anon 1820 pp. 35-6).

This description shows the shore of the Thames around Lambeth had been industrialised in 1820. In fact, William Clowes, the printer referred to in Chapter 6, moved to Lambeth in the mid-1820s after he agreed with the duke to move from the neighbourhood of Northumberland House. The fact that Clowes chose Lambeth as a site of his new premises shows that Lambeth was industrialised enough and Clowes did not need to fear potential prosecutions there.

Early nineteenth century views of Lambeth shows several industrial buildings. Plate 7-7 is a part of panorama centralised Lambeth. The original panorama shows St. Pauls on the far left, and on the far right, Westminster Bridge and Westminster Abbey. The main features of this part of the panorama are Waterloo Bridge and two shot towers, round and square. They were the landmarks of Lambeth and can be seen in some other drawings of Lambeth. Plate 7-8 is another example of such views. The square tower was built in c. 1789 in the east of later Waterloo Bridge site and the round tower was built in 1826 in the west of the Waterloo Bridge (Roberts and Godfrey 1951). Shots were made by dropping melted lead in these towers. For small shots, lead was dropped from the half-way level and for large shots it

was dropped from higher level (*ibid* p47). Because lead was melted in the tower, they should have produced smoke to some extent, but most views depicting the shot towers do not have plumes of smoke from these towers.

Another feature of these two views is the high chimney of Lambeth Waterworks. It is shown on the right in Plate 7-7 and in the right edge of Plate 7-8. Right next to the Waterworks was the iron works of John Fowler. In Horwood's map, it is described as 'Iron Foundry' and in two views the signboard says that 'FOWLER'S IRON WORKS'. However, these two views do not show any clear sign of smoke plume from the work. Next to the iron works, the signboard says 'PEACHE' and it was a premise of Clement Peache, boat builder (*ibid* p48). Clark's panorama shows timbers and a few boats in his yard. There is a brewery almost immediately next to the waterworks, and Clark's panorama shows a possible chimney and the smoke of the brewery (plate 7-7 doesn't include the part). Still, the smoke from the waterworks was one of a few prominent smoke plumes in Clark's panorama, and only prominent smoke plume in *View along Waterloo Bridge*.

Despite the industries depicted in these two views, both are celebratory images of Lambeth. *View along Waterloo Bridge* is a view taken on St George's day. St. George's flag is raised on the top of the round shot tower and a flag combining English Red Ensign with Saint Patrick's Cross is over the square shot tower.

7-3 Lambeth Waterworks and a new smoke consumer

In the eighteenth century, waterworks were one of the main smoke sources in London because of the early use of steam engines. *London and Westminster Improved* by John Gwynn (1766), which was a proposal of London improvement, mentioned Chelsea Waterworks for its nuisance. 'The Chelsea water-engine is also very inconveniently situated, as the smoke from it must unavoidably be poured into the palace whenever the wind blows from the quarter (p11)'.

Similarly, the preface to the reprint of *Fumifugium* (1661), which was published in 1772, mentions York Buildings Waterworks and London Bridge Waterworks:

since [Evelyn's] time we have a great increase of Glass-houses, Foundries, and Sugar-bakers to add to the black catalogue; at the head of which must be placed the Fire-engines of the Waterworks at *London Bridge* and *York Buildings*, which (whilst they are working) leave the astonished spectator at a loss to determine whether they do not tend to poison and destroy more of the inhabitants by their Smoke and Stench than they supply with their Water (pp. v-iv).

York Buildings Waterworks was the first London waterworks to erect a steam engine. In 1712 it installed an atmospheric engine invented by Thomas Savery but it was soon abandoned due to its high consumption of coal. In 1726, Newcomen engine was installed but it was again abandoned in five years due to the same reason. Then, in 1741 and 1742, two Newcomen engines were erected as replacements for a water mill at the Chelsea Waterworks and this success was followed by other waterworks. In 1752 the York Buildings Waterworks installed a steam engine and this time it was not to be abandoned. New River Waterworks erected it at the New River Head, Clerkenwell, in 1766 (Graham-Leigh 2000 p17).

Lambeth Waterworks was relatively a new water company, which was established in 1785 (Roberts and Godfrey 1951 pp. 51-54). As other companies, it used steam engines and produced considerable amount of smoke plume. What was different from other waterworks was the location of the company. The water company located almost opposite shore of Michael Angelo Taylor's house and He specified Lambeth waterworks as a source of nuisance in his speech at the House of Commons on 18th April 1821:

He [Taylor] also instanced the case of the Lambeth Water-works, where for some time the steam-engine was such a nuisance that

although on the other side of the river, neither he nor his neighbour, lord Liverpool, could walk in their gardens in consequence of being overclouded with smoke. How noxious then must that smoke be to those in the immediate neighbourhood of the engine? But he and lord Liverpool had determined to prefer an indictment. Upon intimation, however, of their complaint to the gentlemen connected with the waterworks, measures were promptly taken to cure the evil, which had been done effectually by the introduction of a smoke consumer into the engine (Hansard 1822 Vol. V, 440).

The gardens of Taylor and Lord Liverpool were located on the north east shore of the Thames, projecting toward the Thames (See Plate 6-2). Lord Liverpool's house, Fife House, had a large garden. There is a short reference to Fife House garden in a letter from Lady Caroline Stuart-Wortley to her mother, Lady Erne, on 26th June 1820. Lady Erne was a sister of Lady Liverpool and Caroline often visited Fife House:

I went down to Fife House, I had a little talk with him from the balcony into the garden where he was walking whilst he waited to hear what pass'd in the H. of Commons when the Q^s. answer was read ... (Sheffield Archives, Wh M/693/689)

The reference suggests that the garden was an important part of political and social life of Lord Liverpool. It can be naturally assumed that Taylor's garden played an important role in his political and social life, too.

In order to abate the smoke nuisance, Taylor threatened the waterworks with indictments. The exchange between Taylor and Lambeth Waterworks was recorded in the entry of Lambeth Waterworks Agenda book on 7th June 1820:

M^r Cockerell having seen M^r M. A. Taylor who is actively employed in considering the subject now before Parliament to enforce the consumption of smoke by all steam engines and other furnaces.

Informs Mr Cockerell that the several Engines between Westminster Bridge and Blackfriars will be forth with proceeded against by indictments And if the Law as it stands be not sufficient for sustaining that remedy, a declaratory Law⁹⁹ will be provided (LMA ACC 2558/LA/1/45).

Taylor warned the Lambeth Waterworks of his intention not only to amend a law but also to prosecute 'several Engines between Westminster and Blackfriars'. Taylor pointed out other big sources of smoke in his speech to the Parliament on 2nd May. He mentioned small furnaces which were erected in Bridge Street, Blackfriars. In addition, two breweries caused annoyance to genteel society. One of them was the brewery of Elliot & Co. in Pimlico. Taylor stated that due to the brewery, 'gentlemen who had attended the courts at St. James's must have often found it difficult almost to recognize their friends through the dense atmosphere (Hansard 1820 Vol. I, 51-52)'. The other was the Cannon brewery in the vicinity of Hyde Park, which was causing a similar nuisance. Both breweries were mentioned by witnesses for the smoke nuisance case, the Duke of Northumberland v. Clowes, as explored in the previous chapter, and were well-known for its size and smoke nuisance.

Obviously, the Lambeth Waterworks were one of those polluting businesses and they responded to the warning quickly. The Committee of Management and Directors of Lambeth Waterworks resolved that they would form a special committee. They would observe 'the best Furnaces established on the new principle, such as Barclay, Perkins & Co and report their opinions (LMA ACC 2558/LA/1/4 p148)'. It seems that no serious doubt was raised concerning the practicability of smoke consumption because it was also recorded that 'The special meeting will therefore consider the

⁹⁹ The nature of this declaratory law was already explained in Taylor's parliamentary speech on 2nd May. He intended to 'propose a declaratory law, making the present construction a nuisance, and, of course, subject to the same legal prosecutions as other nuisances (Hansard 1820 Vol. I, 52)'.

immediate adoption of a similar remedy for consuming smoke at their Engine, which has been put in practice with complete success at the steam boilers of Mess^{rs} Barclay Perkins & Co¹⁰⁰ (LMA ACC 2558/LA/1/45)‘.

On 21st June it was reported to the Committee of Management and Directors of the Lambeth Waterworks that the appointed committee inspected Parkes’ plan at Barclay, Perkins & Co, and Gregson’s plan at Austin’s calico factory¹⁰¹ at Mitcham. The committee’s intention to inspect one more invention by Brunton at Liptrap’s distillery was reported, too. These names of inventors, Parkes, Gregson and Brunton can be found in the witnesses who presented their smoke consumers to the Select Committee in 1819 and 1820. The Lambeth Waterworks must have referred to the reports of the Select Committee before the inspection.

After examining smoke consumers operated around London, the Lambeth Waterworks chose to devise a new apparatus rather than ordering an existing one. The entry in the minute book of the Committee of Management and Directors on 17th January 1821 recorded that one of the member of the committee, Kenshaw, devised a new plan:

At the Motion of the Chairman the cordial thanks of this meeting were presented to M^r Kenshaw for his having devised a method for burning smoke more effectually than it has yet been done by any other person, and for his application thereof to the Company’s Engines, which was unanimously agreed to (LMA ACC 2558/LA/1/4 p174).

¹⁰⁰ Barclay, Perkins & Co. was a brewery where Josiah Parkes’s plan was first demonstrated publicly on 23rd May 1820 (See Chapter 4).

¹⁰¹ Austin was taken into the court in 1820 and again in April 1821 by a wealthy widow concerning smoke nuisance (MC 09/04/1821). It can be naturally assumed that Austin installed the smoke consumer as a consequence of the trial.

It is not certain what considerations made the Committee devise a new plan. It could be related to deficiencies in the inspected plans, it could be the cost or it could be mainly from the initiative of Kenshaw. Anyway, the parliamentary speech by Taylor shows that the apparatus installed by the Waterworks satisfied Taylor.

7-4 Controversy over smoke abatement technology in London

The Lambeth Waterworks was not the only waterworks which adopted smoke consumers. The New River Waterworks adopted Parkes' plan in early stage but found it not useful. This section will examine the confusion over the effectiveness of smoke abatement technology in London waterworks and breweries including the New River Waterworks and Elliot & Co.

The New River Waterworks started its operation in the early seventeenth century and provided water to a large area of central London. It sent water from the New River Head at Clerkenwell to houses in the City, Westminster and outlying districts to the north and east (Graham-Leigh 2000 p11). Although Taylor did not mention the New River Waterworks in his parliamentary speech, Josiah Parkes' pamphlet shows that the smoke consumer adopted by the water company had fuel-saving effect.

Parkes' pamphlet, *Observations on the Economical Production of Steam, and the Consumption of Smoke* (1822) had a table showing fuel saving effect with figures obtained by experiments conducted at three manufactories including Parkes' and the New River Waterworks (Table 7-1)¹⁰². The figures provided in the table show that fuel efficiency was improved after the adaptation of his plan. The improvement in fuel efficiency was proved by the figures, 'lbs. of Water evaporated by 1lb. of Coal'. The figures at the New River Waterworks were taken five times, two times before the installation

¹⁰² The first part of the pamphlet as well as the table had already published in 1822 in *the Quarterly Journal of Science, Literature, and the Arts* (1822) Vol. XIII.

and three times afterwards. About 7 lbs. of water evaporated by 1 lb. of coal before the installation, while afterwards, about 8 lbs. evaporated. In order to show that the figures were objective, he wrote that 'the duration of each experiment was such as to ensure a fair average result of the performance of the boiler, as the usual day's work in time was the period occupied by the trial (Parkes 1822 pp. 5-6)'. These figures meant to provide scientific and objective evidence of his plan's effectiveness.

In the pamphlet, Parkes copied dozens of letters from his customers, mostly manufacturers, reporting the effectiveness of his plan. These letters were testimonies to prove its effectiveness and also worked as advertisements. As contradictory remarks on the effectiveness of Parkes' plan were made to Parliament on the public experiment at the brewery, Barclay, Perkins and co. (see Chapter 4), some letters sent to Parkes reflecting the confusion over the reputation of Parkes' plan. Adam and George Murray in Halifax, reported the false rumour that they gave up the use of Parkes' plan, spread. Thomas Houldsworth also wrote that 'a report has prevailed in the neighbourhood of Halifax, that I and several others in this town had relinquished Mr. Parkes' system of burning smoke (*ibid* p24)'.

Fredrick Perkins from Barclay, Perkins and co. attributed 'reports, prejudicial to [Parkes'] interest and the merits of [Parkes'] invention' to some of his servants (*ibid* p18). Perkins wrote that these servants should have acted like that 'either by malicious motives, or disappointed in his mercenary expectations (*ibid*)'. Although we cannot judge only from Perkins's writing that their servants spread the rumour, the blame placed on servants was not totally without foundation because some servants could not adapt themselves to the change. John Lum of Bolton wrote that he discharged his engineman. Lum wrote that the engineman 'was much prejudiced against [Parkes'] plan, because it required some practice to get into [Parkes'] way of firing (*ibid* p25)'. Locke, Blackett and Burnett of Newcastle

wrote about the visits they received from manufacturers and enginemen in their vicinity:

Your admirable plan of making up a fire in the morning to last the whole day is so perfectly novel, and so contrary to the common practice in this country of adding coals every five minutes, that some of the operative enginemen, and their masters also, have been obliged to renew their visit before they could believe the evidence of their sense (*ibid* p30).

In addition to the confusion accompanying the completely new idea of feeding fire with coal, Parkes' idea reduced the workload of enginemen. It could have resulted in the discharge of enginemen. The source of rumours, however, could have also been manufacturers who did not want to adopt smoke consumers.

Unlike some manufacturers in Halifax, who were surprised at false rumours, the New River Waterworks found that Parkes' plan was not effective. It is interesting considering that the figures obtained at the water company were supposed to be scientific and objective. The evidence by Mylne, an engineer to the company, is included in the legal document, *Rex v. Gott & others in Leeds*. Mylne claims that Parkes' plan was inefficient:

they set up Parkers' [*sic*] patent, hoping to consume the smoke more effectually, but rejected it for complete inefficiency—Then tried Johnson's, and found that also inefficient, and are now setting an Engine on the old plan of Boulton & Watt, which Witness thinks the best, with regard to consuming Smoke¹⁰³

From Parkes' point of view, Mylne appears to have been a troublesome figure. Josiah's younger brother, Frederick, wrote to his father that '[Josiah] seems to be entirely occupied with Mylne who is certainly a most expert knave' on 20th November 1821 (UCL, PARKES/2).

¹⁰³ WYAL, WYL160/116 Engineering Evidence for Defts.

The trouble between Parkes and Mylne can be observed in Parkes' pamphlet, too. Though Parkes printed part of letters from two companies whose figures were employed in his table, he did not print any letters from the New River Waterworks. It suggests that though Parkes was satisfied with at least the figures obtained from the experiment, the water company was not satisfied with the result.

The newly invented smoke consumer of Lambeth Waterworks caused a similar reaction in a brewery, Elliot & Co, one of the breweries Taylor named in his speech. The smoke consumer was installed to the copper boiler under the superintendence of the waterworks' engine worker and executed by a bricklayer of the waterworks. However, it was not satisfactory for them as other plans they adopted:

Elliott & Coy. Brewers Pimlico—After the passing M^r Taylors Act M^r E determined to burn his smoke—he tried Johnsons Patent[,] the boiler could not carry the Engine (24 Horses)[.] Shakespeare Engineer to the Lambeth Waterworks suggested a plan of his which contracted the passage for the smoke under the boiler so much that the Copper was repeatedly being destroyed and the plan was given up.

Parkes Plan was tried to one of the Coppers & was ineffectual—all were removed and having laid out a great deal of money in experiments[,] the Old plan was followed except that on Court days Coke is used instead of Coals¹⁰⁴.

The failure of Lambeth Waterworks' plan at Elliot & Co. was reported to the Committee of Lambeth Waterworks in December 1821. It was reported by an engineer of the waterworks that the smoke consumer 'in less than six months has burnt a hole in the Boiler and otherwise Damaged its bottom (LMA ACC 2558/LA/1/45)'. The engineer worried that similar damage could happen to the water company's boiler and asked to the Committee to discontinue burning smoke until the new

¹⁰⁴ WYAL, WYL160/116 Minutes of further Evidence.

engine would be set to work¹⁰⁵. A big cross on the entry suggests that this request by the engineer was not accepted.

Waterworks were one of the main sources of smoke in London. They made an effort to reduce the amount of smoke by adopting smoke consumers, but they also suffered from the confusion over the effectiveness of smoke consumers. The variety of smoke consumers caused confusion among manufacturers and other steam engine owners. Even Parkes' plan, which was considered to be one of the best smoke consumers, obtained contradictory opinions and even false rumours.

7-5 Waterworks and Taylor

Smoke nuisance was not the only problem associated with early nineteenth century waterworks. They were also blamed for dilapidation of pavements and the poor quality of the water supply. However, the biggest problem with London waterworks was generally considered to be monopoly, particularly the low quality of water was often ascribed to this. This section examines these problems with Michael Angelo Taylor's involvement to these issues.

The monopoly of water companies was the result of severe competition, followed by the sudden increase in the number of London water companies in the early nineteenth century. There were four London water companies which had already been established in the eighteenth century; London Bridge Waterworks, the New River Waterworks, the York Buildings Company and the Chelsea Waterworks. In order to supply rapidly expanding suburban areas new water companies were founded, and some of them started to supply the houses in the densely populated central area, too. One of the first new companies was Lambeth Waterworks, followed by the South London Waterworks in Kennington, the West Middlesex

¹⁰⁵ Because one of two engines of the waterworks was broken in June of that year, the waterworks had only one engine to employ then. (LMA ACC 2558/LA/1/30/1; ACC 2558/LA/1/45)

Waterworks Company in west London and the East London Waterworks Company. As a result, water companies suffered from severe competition and a price war in the early 1810s (Graham-Leigh 2000). For water companies, it was inevitable to take a path to regional monopolies by making agreements on exclusive water supply areas though the decision was often criticised by Londoners.

Interestingly, Michael Angelo Taylor was also involved in the parliamentary debates on these water company issues. Taylor's first involvement in the problems with waterworks was when he introduced the necessity to improve the pavement of the metropolis to the Parliament in 1815 (Hansard 1815 Vol. XXX, 840). The report from the select committee upon the subject stated that 'the Pavements of the Streets and public Places, in many parts of The Metropolis, are dangerous to passengers, and therefore require speedy and extensive improvement' and specified the main cause of such state as the disturbance of the pavements by water and gas companies and the commissioners of sewers (PP (HC) 1816 (159) p3). The bill of 1816 included the provision that:

from and after Seven years from the passing of this Act, all and every pipes for the conveyance of water, or of inflammable air or gas, which shall be laid down by or on account of any Water or Gas Light Company, or other persons, shall consist and be made of iron alone and of no other material (PP 1816 (433) p10).

Traditionally, wooden pipes were used for the purpose of water supply. Wooden pipes were generally made out of elm trunks, bored by long augers. The joint of wooden pipes rotted relatively quickly and it caused leakage (Graham-Leigh 2000 p15). Pavements were constantly disturbed in the course of searching and remedying the leakage sources. Iron pipes lasted longer than wooden pipes and the replacement would reduce the frequency of repair. In addition, the introduction of a steam engine made it necessary to use iron pipes for strength.

This clause alarmed especially London Bridge Waterworks, which was not doing well in the competition and could not afford the expenditure to replace pipes. The managers of London Bridge Waterworks petitioned the House of Lords against the clause on the replacement of wooden pipes with iron pipes. They succeeded in deleting the part mentioning the overall replacement of wooden pipes and the act only forced waterworks to use iron pipe for new mains (*ibid* p58).

Despite the antagonism over the paving act, Taylor became one of the supporters of West Middlesex Waterworks and Grand Junction Company in 1818. It was soon after that the series of agreements was concluded among waterworks on the boundaries of exclusive supply areas. Because the establishment of new waterworks including West Middlesex Waterworks and Grand Junction Company caused a price war and diminished the revenues of waterworks, the agreements were the natural path to take. However, the withdrawal of certain waterworks from outside of agreed boundaries caused customers confusion and in the worst cases some customers did not have a water supply for a considerable period. In addition, after the period of price war, water companies intended to increase their charges. The wealthy parish of St Marylebone immediately reacted to the proposal of a price hike. The matter was discussed in the House of Lords on 3rd and 8th April. The central issue was the monopoly and the lack of competition. Earl Grosvenor claimed that 'Some of his tenants who had been served by the Chelsea company were now compelled to take the Grand Junction water¹⁰⁶, which was of a bad quality, discoloured, and very disagreeable to the taste (Hansard 1818 Vol. XXXVII, 1184)'.

This time, Taylor supported waterworks' interest. When the Vestry of St Marylebone brought in a new bill for the establishment of their own parochial waterworks in 1819, Taylor, on behalf of two water

¹⁰⁶ The intakes of both waterworks were not far away each other on the Thames, but the Grand Junction Company was to be criticised later for the location of its intake near a sewer and the Chelsea Hospital by John Wright.

companies, the West Middlesex Waterworks and the Grand Junction Company, introduced a bill to limit the rise of water charge for 'ordinary service'. Taylor considered competition did no good and the new agreement on local monopoly should be maintained. In 1818, he stated in his speech that:

He was induced to look into this subject, in consequence of having last session brought in the metropolis paving act; and he then saw the necessity of putting an end to the imposition of the water companies (Hansard 1818 Vol. XXXVIII, 32).

Taylor gave the example of a fire that broke out about six in the morning of 1st March on No. 460, Strand, corner of Hewit's Court. '[S]everal lives were lost, in consequence of the boiler of the York-buildings water company being out of repair, which prevented the water from being turned on (*ibid*)'. *The Times* reported the tragedy of two people who threw themselves out of windows and a mother who was swallowed up by flames immediately after she dropped her baby, who was saved.

A great number of firemen reside in Hungerford-street, and they were very promptly on the premises; but no water could be got for *three quarters of an hour*, and the flames were communicating with the greatest rapidity to the houses of Mr. Ashman, pawnbroker, Mr. Buckingham, brush-maker, and Mr. Rowley, carver, gilder, and picture-frame-maker. The firemen were running from plug to plug, and no water could be got, while the thieves were busily employed in plundering the premises, The engines were not supplied with water until seven o'clock. The flames continued their ravages chiefly at the houses in Hewit's-court, at the back of the above six houses ... which were before nine o'clock entirely gutted (*The Times* 02/03/1818).

Unavailability of water obviously caused great concern among Londoners and *The Times* printed one of 'a mass of letters' it received on the subject. This letter from 'A Londoner' claimed that the delay of

water supply was due to the emptiness of the main pipe, which was ascribed to the monopoly.

Taylor's explanation to Parliament was slightly different. He ascribed the delay to a broken boiler at York buildings Waterworks. Because Taylor gave a speech about six weeks after the incident, he probably had more accurate information. Later, a fireman who gave a testimony in *Report of the Commissioners on supply of water in the metropolis (1828)* stated that it was often due to the mismanagement of the turncock and sometimes due to the repair of mains which caused the deficiency of water for fire extinctions. The fireman stated that in the north shore of the Thames, the problem had already been solved in 1828 because firemen had the keys in the engines then. However, in southern shore of the Thames, water companies did not have reservoirs 'and if a fire happens when the steam [engine] is down we are obliged to wait till the steam is up (PP (HC) 1828 (267) p60)'. The situation in 1828 shows that the unavailability of water was not necessarily due to the monopoly as the Londoner believed.

Despite the general belief that the monopolies caused the unavailability of water for fire extinction, Taylor considered that competition should be avoided because it would damage water companies' finances:

The consequence [of competition] was, that the companies became so distressed in their finances, that they were almost under the necessity of stopping their works. Had they been absolutely compelled to stop them, this great metropolis would have been deprived of water, which was so necessary for the preservation of health, for culinary purposes, and to prevent the ravages of fire (Hansard 1818 Vol. XXXVIII 31-32).

Two bills prepared by the Vestry of St Marylebone and two water companies in 1819 did not pass into acts. However, criticism against monopoly prevailed and the Anti-Water Monopoly Association,

founded in October 1819, was active until early 1820. Finally, a select committee was appointed by the Parliament to investigate the issue of waterworks monopoly in 1821. Even though it was chaired by one of foremost opponents of waterworks, William Freemantle, the committee's findings generally agreed with the water companies' claims (Graham-Leigh 2000 p76).

7-6 *Salus Populi Suprema Lex*

In March 1827, a criticism over the water supply in the metropolis was again launched by John Wright, this time. Wright was a publisher as well as an editor of the *Parliamentary Debates*. He published a small pamphlet entitled *The Dolphin* (1827). The title was borrowed from the term used for the wooden intake of water companies, seen on the surface of the Thames. The focus of Wright's campaign was the quality of water though he also ascribed the low quality of water to monopolies. Wright especially blamed the Grand Junction Company for its water quality. He argued that despite its first promise to provide water from the rivers Colne and Brent, the company now supply water from the Thames taken from 'the dolphin' near the mouth of the great Ranelagh Common Sewer and the Chelsea Hospital.

The Dolphin (Plate 7-9) is the appendix to the pamphlet and conveys a similar message to *Salus Populi Suprema Lex*. The chimney of the Grand Junction Company produces a plume of black smoke, as the Southwark Waterworks in *Salus Populi Suprema Lex*. In *The Dolphin*, a sewer flowed into the Thames where an intake of the Grand Junction Company is located. In addition, the presence of the Chelsea Hospital emphasises the possible contamination of the water.

In the following month, a public meeting on 'Supply of Water to the Western Portion of the Metropolis' was held at Willis's Great Room, St. James's, the venue of famous Almack's Ball. Sir Francis Burdett, a radical M.P., who had already communicated with Wright, chaired the meeting. The meeting attracted upper-class inhabitants, including one

marquess and five earls. The resolution included the description of the filth mixed into the water supply:

That the water taken up from the river Thames at Chelsea, for the use of the inhabitants of the western portion of the Metropolis, being charged with the contents of the great common sewers, the drainings from dung-hills and lay-stalls, the refuse of hospitals, slaughter-houses, colour, lead, and soap-works, drug-mills, and manufactories, and with all sorts of decomposed animal and vegetable substances, rendering the said water offensive and destructive to health, ... (PP (HC) 1828 (267) p125).

Subsequently, the investigation of water quality was commissioned to Peter Roget, a physician, William Thomas Brande, a chemist and Thomas Telford, a civil engineer. Petitions made by the inhabitants of Southwark and Lambeth expanded the scope of investigation to the whole metropolis. 155-page report printed in April 1828 included the testimonies from water companies' engineers, testimonies from inhabitants, observations on water samples made by chemists and proposals of remedies.

Although the enthusiasm to remedy the water pollution was ended after the publication of the report, when Cholera arrived at London in February 1832, Cruikshank was commissioned to draw a caricature and it was *Salus Populi Suprema Lex* (1832). The epidemic had already spread in the Continent in 1831 and it first entered Britain in the autumn of 1831. Londoners had feared the arrival of the epidemic ever since. In fact, *Salus Populi Suprema Lex* was published within two months after the arrival of the epidemic at London.

Though the caricature's message, the water polluted by sewage posed a cholera threat, was quite right in modern understanding, the route of infection was not at all confirmed in the early nineteenth century. In fact, the report on cholera epidemic in the eastern parts of Europe (1831) actually discussed whether cholera was contagious or not (PP (HC) 1831 (49)). Therefore, from an early nineteenth-

century perspective, the connection between the cholera and the quality of water was not necessarily clear. Rather, it was the reuse of the campaign on water quality in 1827 and 1828.

Indeed, the caricature and the satirical poem well reflected *Report of the Commissioners* on the supply of water in the metropolis (1828), especially the testimonies concerning the Southwark Waterworks. The reason why the Southwark Waterworks not the Grand Junction Company was chosen for *Salus Populi Suprema Lex* was probably because first London cases of the cholera epidemic found at Southwark as well as the East London.

The central figure of *Salus Populi Suprema Lex* is John Edwards, the proprietor of the Southwark Waterworks. As Edwards described the location of the waterworks as 'nearly opposite Three Crane Wharf on the one side, and Horse Shoe Alley on the other side' to the commissioners, Cruikshank indicated Horse Shoe Alley on the right hand side and '3 Cranes Wharf' on the left hand side. Under the engraving, ten stanzas address to Southwark residences by Edwards as their king is printed. It entitled as 'ROYAL ADDRESS' of

Water-King of Southwark, Sovereign of the Scented Streams, —
Autocrat of All the Slushes, —Raining Prince of the Golden
Showers, Protector of the Confederation of the (U)Rhine, —
Appropriator of the Diet of Worms, Palatine of the Lower Issues, —
.... and Representative in the Imperial Parliament for Wells, to His
Subjects of the Borough (LMA p5427772).

Because the water companies' monopoly was considered to be the central problem of the issues over water, Edwards was drawn as a tyrannical king.

The Southwark Waterworks started to supply water in 1822 having taken over the service from the London Bridge Water Company and the Southwark Borough Waterworks Company. The Southwark Borough Waterworks Company was a small waterworks which had supplied water to the area between London Bridge and Southwark

Bridge since 1770. New investment in steam engines and iron pipes, which were replacing wood pipes, were enabled by the newly established Southwark Waterworks.

However, residents felt that the water quality deteriorated. They found many insects in the supplied water though similar phenomenon was observed in water supply from most other London water companies according to *Report of the commissioners*. William James, a publican, told the commissioners about the creatures in the supplied water. 'There are many kinds, such as worms, and different kind of animalculæ (PP (HC) 1828 (267) p56)'. Almost all witnesses said that a shrimp like creature, 'very lively, and about the size of a shrimp' was usually found in it (*ibid* p57). They used the water for cooking and making tea but it was muddy. Despite these testimonies, Edwards, the proprietor, said that he hardly had any complaints about the quality of water (*ibid* p35).

The contaminated water was also supplied to hospitals:

For the use of your *Hospitals* look at my liquor!
Oh, pray do not fancy it makes the sick sicker,
Though in *brewing* arises a scum that is thicker
Than if meat had been boiled in the copper;
And though in the *bath*, when prescribed for your good,
If diseased in your bowels, your nerves, or your blood,
You find yourself stuck in a mass of my mud,
For your health it is all very proper (LMA p5427772).

In fact, *Report of the commissioners* shows some testimonies by witnesses from hospitals whose water supplied from the Southwark Waterworks. A steward of St. Thomas's Hospital, William Nash, stated that they used the water for cooking and brewing. The abovementioned part of satire address was obviously composed using Nash's testimony:

The bath I use is sometimes liquid mud; last Monday, after I had bathed, the bathman said that when the water was let out there

was the eighth of an inch of mud at the bottom of the bath; and in brewing, a scum arises which may be skimmed off as if meat had been boiled in the copper: the brewhouse consumes 100,000 gallons per annum (PP (HC) 1828 (267) p58).

Unlike St. Thomas's Hospital, a steward of St. Guy's Hospital did not have any complaints concerning the water quality since they placed a double hair-cloth over the main. By filtering water, they maintained the water quality (*ibid* p59).

The reference to excretions in the caricature title for Edwards was due to the almost sewage like nature of the Thames. Although the Thames had naturally received the contents of all sewers from London, the sudden deterioration of water quality was caused by a change in the sewage system. Two changes, the introduction of the water closet and the transformation of sewers from rainwater drainage into sewage drainage were the key. Before the use of the water closet, human waste was stored in cesspools, which was regularly collected by nightsoilmen, and eventually sold to farmers. The water closet introduced 'flushing' in the disposal process. Joseph Bramah (1748-1814), a Yorkshire carpenter, patented his newly improved mechanism of water closet in 1778 and it contributed to the popularization of the water closet. The introduction of the water closet changed the destination of excretions. Because flushing water greatly increased the amount of human waste, cesspools ceased to be the best place to contain them. Farmers did not want to buy human waste anymore. In addition, it became possible to connect house drains to public sewers which drained into the Thames in 1815. Before the change, sewers were supposed to be used only for rainwater drainage but they started to drain house and human waste afterwards (Halliday 2007 pp. 201-203). Edwards's address in the caricature satirised the circulation of sewage, from individual house into the Thames and back to houses:

The dolts of the City conceive it a virtue,
To transfer from their dwellings all things that are dirty,

To the great Common Sewers—a hundred and thirty, —
And plump in my Wet the muck souses;
And should they be touched with the Sunderland gripes,
The balmy effects of their stomachs and tripes
Are infallibly destined to roll through the pipes
By which I replenish your houses (LMA p5427772)

Thus, the quality of the Thames water deteriorated rapidly. Cruikshank shows black traces of sewers drained into the Thames. One of the gentlemen watching the Thames from the Southwark shore observes the Walbrook sewer in the opposite shore and exclaims that 'What torrents of filth come from that Walbrook Sewer!!' His friend replies that 'Sewer! Why there are 130 such!' James Mills, who was appointed to inquire the state of water, reported to the commissioners in 1828 that there were 99 sewers on the north shore and 46 sewers on the south shore. To the abovementioned gentlemen's remarks, another indifferently added that 'Oh! never mind any nastiness goes down here in the Borough'. However, it was a different matter for Southwark people and they cries 'Give us clean water!', 'Give us pure water!' and 'We shall all have the Cholera'.

To these people, Edwards raises a goblet overflowing with dirty water. He is enthroned on the top of the water intake, crowned with a chamber pot. The location of the intake was changed into the middle of the Thames when the new company was established in 1822. Edwards' intention was to obtain purer water than from the former intakes near the shore. However, it was not considered to be enough to maintain the water quality, considering that Cruikshank drew the intake sucking black water from sewers. Edwards holds a trident and each prong piercing dead animals, some of them were possibly thrown away into the Thames further deteriorating the water quality.

The address indicates another pollution source, gas works: 'refuse of gas-works, that poisons the fishes'. In order to supply gas for gas lights, some gas companies had been established in the early

nineteenth century. They produced effluvia and one of these companies, City of London Gas Light and Coke Company underwent a trial over the nuisance in 1815. Gas lights were one of new technologies which were introduced to the metropolis with the intention to improve its urban environment. Although it certainly improved some aspects of its environment, it also brought some by-products, which deteriorated urban environment in new ways. In fact, against the claim made by water companies that they had reservoirs to settle mud, Wright argued that because of the chemical pollutants, especially from gas works, reservoirs could not perfectly purify the water. Wright argued that only solution was to obtain water from other source than the Thames.

The caricature also shows other problems such as the unreliability of water supply for extinguishing fires. The address by Edwards says that:

And some lucky night there may come a great fire,
Which, in cases of pest, is a grand purifier:
You need have no fear it too soon should expire,
Without water sufficient to match it (*ibid*).

Finally, the sky in *Salus Populi Suprema Lex* is not clear. The chimney of the Southwark Waterworks on the right hand side produces a plume of black thick smoke. In Southwark Waterworks, a 36 horse power engine worked twelve hours per day for six days in each week. In case of fire, the engine works at night, too. The waterworks also had an 18 horse power engine, which was the spare of the larger engine (PP (HC) 1828 (267) p35). The plume of smoke was one of the iconographies of waterworks as the abovementioned depictions of the Lambeth Waterworks.

To conclude, problems associated with waterworks clearly show the notion that the urban environment was deteriorating. Smoke nuisance was one of these urban problems. However, in terms of smoke nuisance caused by water companies' steam engines, these

companies at least tried to abate the nuisance as a result of Taylor's parliamentary campaign. Interestingly, it seems that water companies as well as breweries had not been taken to the court on smoke nuisance in the 1820s. It is also interesting that unlike nuisance cases examined in the previous chapter, noise never became an issue in terms of these industries as far as available sources tell. They are probably because these conventional polluting industries were already located in the periphery of the town, often in the industrial areas.

7-7 London going out of town

The second half of this chapter will examine London brickmaking business framed by Cruikshank's *London going out of town* (1829). It seems that Cruikshank adopted the caricature title from Tobias Smollett's novel, *The Expedition of Humphry Clinker* (1771)¹⁰⁷. In the novel, a Welsh gentleman, Matthew Bramble, takes his sister, nephew and niece to journey. They first depart from Matt's estate in Wales, go to Bath, London and Scotland. When they arrived at London, Matt wrote to his friend, Dr. Lewis about the changes in London:

London is literally new to me; new in its streets, houses, and even in its situation; as the Irishman said, "London is now gone out of town." What I left open fields, producing hay and corn, I now find covered with streets, and squares, and palaces, and churches. I am credibly informed, that in the space of seven years, eleven thousand new houses have been built in one quarter of Westminster, exclusive of what is daily added to other parts of this unwieldy [*sic*] metropolis. Pimlico and Knightsbridge are now almost joined to Chelsea and Kensington; and if this infatuation

¹⁰⁷ The novel was especially popular in the early nineteenth century, and Cruikshank himself provided illustrations for the novel in 1831. 'Smollett doubtless rose to the height of his literary fame during the first three decades of the nineteenth century, when his works—especially *Humphry Clinker*—were admired, praised, and, in some instances, imitated by such diverse writers as Scott, Keats, and Dickens (Smollett 1990 p. xxiii)'.

continues for half a century, I suppose the whole county of Middlesex will be covered with brick (Smollett 1990 p86).

This Irishman quoted is James Bramston, who published *The Art of Politicks* in 1729 (Smollett 1990 p367):

Pease, Cabbages, and Turnips once grew, where
Now Stands new *Bond-street*, and a newer Square;
Such Piles of Buildings now rise up and down;
London itself seems going out of *Town* (Bramston 1729 p10).

These two descriptions show that the expansion of London was a repeated theme. In 1829, Cruikshank adopted the phrase to depict his contemporary building boom in northern London, which started in the end of the eighteenth century.

Matthew Bramble's description of London was generally negative. Although he admitted that London was better paved and lighted, he wrote that 'the capital is become an overgrown monster; which, like a dropsical head, will in time leave the body and extremities without nourishment and support (Smollett 1990 p86)'. Unlike the phrase 'London is now gone out of town', the simile was common one. For example, Defoe actually objected to the image of a dropsy which drew away nourishment from the country and presented an idea that because of London, the country could flourish (Landa 1975). Smollett used the simile in a common way and he generally described London as corrupted capital, which was constantly advancing toward the countryside. In the same letter, Matthew Bramble complained that labour force in the countryside was attracted to London:

The plough-boys, cow-herds, and lower hinds, are debauched and seduced by the appearance and discourse of those coxcombs in livery, when they make their summer excursions. ... Great numbers of these, being disappointed in their expectation, become thieves and sharpers; and London being an immense wilderness, in which there is neither watch nor ward of any signification, nor

any order or police, affords them lurking-places as well as prey (Smollett 1990 p87).

Cruikshank's depiction of London expansion in *London going out of town* agrees with Matthew Bramble's description on the expansion of corrupted London. In the caricature, the army of developers, or the army of personified tools is advancing toward the countryside. The contrast between dark London and healthy countryside is obvious.

In the foreground, one of these tools is putting up a sign. 'This GROUND To be Lett on a Building Lease/ Enquire of Mr Goth Brickmaker/ Bricklayer Arms/ Brick lane/ Brixton'. It was not unusual to run both brickmaking and bricklaying business. Therefore, the working tools were not only bricklayers but also brickmakers. Four of the workers in the foreground have mortar faces with grotesque features. The name of the brickmaker, Mr Goth, suggests that they are barbarians with inhuman faces. A few pipe-workers behind mortar-faced-workers resemble medieval armours and one of them raises an axe. The bundle of timber behind them looks like a bunch of swords. This group of workers also looks like arms, thrusting their fists into the air before they start a battle.

London going out of Town reflects the contemporary atmosphere of mechanisation. The personified tools drawn in the caricature reflect technological advancement, especially automated movement. Of course, these personified tools are not directly relating to a steam engine like the robot in *The march of intellect* (Plate 7-3). The personified tools are far simpler. The idea was borrowed from a figure in Charles Williams' *Implements animated* (1811), which was not about mechanization but about traditional trades and work (Plate 7-10)¹⁰⁸. Especially, the carpenter in *Implement animated* was almost completely copied by Cruikshank. On the right hand side of the foreground of *London going out of town*, there is a worker with a

¹⁰⁸ The basic idea of tool robots was already engraved by Cruikshank in c. 1827 borrowed by *Implement animated*.

mallet-head, who lays a tree on the ground and points a saw at it. This worker resembles the carpenter in *Implement animated*, which also has a mallet-head and a body of a straw tool-bag. However, although the carpenter's axe arm and his saw which is kept inside of the bag only shows his masculinity during his courtship, tools in *London going out of Town* are used to express their aggression. Even trowels held by two mortar-faced workers in the foreground are drawn as weapons.

In fact, it seems that these workers are soldiers commanded by 'St Paul's cathedral' probably representing the knight looming up behind the smoke (Plate 7-2-b). There are two buttons attached to the dome which is the body of the knight, and on the top, there is a face. In order to draw the cathedral as a knight, the shape of the cathedral seems to have been simplified. Two tiers of the tower on top of the dome become shorter and simpler one-tier structure. Similarly, windows and columns below the dome are not shown in the caricature. The monument to the Great Fire of London seems to be drawn as a candle on the side of St Paul's knight. Compared to Plate 5-4, the monument is changed its form and the monument here is probably not a simple iconography to indicate London. For example, in *Salus Populi Suprema Lex*, Cruikshank depicts the monument only as a symbol of London and its platform is square as it is. However, in *London going out of town*, the platform is round, and the top of the monument is changed into a form of fire. In addition, the devil bird settling on one of the pipe-solders in the foreground shows that the army is evil.

Of course, St Paul's Cathedral has been a symbol of London and it was probably something which could not be debased as an evil knight. However, considering that Cruikshank is described as a man who made 'too much fun of too many things' by his biographers (Wynn-Jones 1978; Patten 1992), it was probably one of Cruikshank's satires which went too far.

In the forefront of the marching suburbs there are smoking tile kilns and brick kilns as well as a factory with two high chimneys apparently using steam engines. The brick kiln firing bricks looks like a cannon firing shots. A haystack says that 'Confound these hot bricks. They'll fire all my Hay ricks'. Following two oxen and a herd of sheep and geese, a mother haystack leads a head of several baby haystacks and says that 'Hey day! Come along my little cocks. We must go farther afield for we are losing ground here'. At the same time, this haystack represents a farmer fleeing from expanding urban area with his livestock. On the left-hand-side in the background, four trees near a post, 'Hampstead' discuss the situation:

Our fences. I fear will be found to be no defence against these Barbarians, who threaten to enclose & destroy us in all "manor" of ways. Detachments are on the Road already.

On the right hand side, fields personalized as trees and haystacks are fleeing from the squad of working tools. A tree without leaves falling over says the 'Oh! I'm Morterly wounded!!!' It is obviously a pun of Mortar and mortally. The excavation of ground in the foreground is in order to obtain brick earth, and the hole is filled with rubbish behind. The ditch also represents a trench to reinforce the image of war.

During the Georgian period, smoke was the iconography of a battlefield because firing inevitably produced smoke. Newspaper articles of sea fights, which showed the power of the empire, often included the word, smoke. *London going out of Town* shows two flags of the Union Jack on the top of church towers behind the brick clamp and tile kilns. They also represent medieval towers in the battlefield. It is possible to read the caricature as industrial, automatic and faceless British Empire invading the good old English countryside, but it is more likely that the entire structure mainly shows Cruikshank's playfulness rather than coherent political and social satire.

Although this caricature drew the housing development in London suburbs as battlefield, there are some direct satirical depictions in the

caricature. Behind the kilns there are new streets with cracks in the new buildings, ill built. Buildings in the town discharge lots of smoke from every chimney and plumes of smoke were flowing toward Hampstead, invading countryside from the air before the building development on the ground. Birds fly away from the smoke cloud. Leafless trees which are defeated by tool brickmakers/ bricklayers were leafless because of the smoke. It was the indirect influence of marching London before the advancement of actual building development.

The second half of this chapter will examine one of the conventional smoke producing industries, brickmaking, focusing on St Pancras. Before focusing on brickmaking business, I will briefly examine the controversy over the development around St Pancras.

7-8 Foundling Hospital in St Pancras

Eighteenth-century St Pancras was the northern edge of London, mostly rural. In fact, King's Cross was beyond the range of John Rocque's London map (1746) (Plate 7-11). The entry in St Pancras vestry minutes in April 1782 still shows the rural nature of the area. It records caution from some inhabitants submitted to the vicar of the Parish, Mr Meuce. It expressed their concerns over worms which would cause plague as well as damage to their cattle. It made instruction to cut twigs of hedges which those bugs were fixed to and burn them ¹⁰⁹. This entry shows that the parish was generally rural in the 1780s.

The Foundling Hospital, a home of orphans, chartered in 1739 and it had been the key building on the boundary of the town until housing development started in the late eighteenth century. Rocque's map shows it was in the midst of fields in the mid eighteenth century. The expansion of the town around St Pancras started when the hospital planned to develop its own fields around the hospital due to its financial difficulties. Wealthy residents living on the south of the

¹⁰⁹ CLSA, St Pancras Vestry minutes 1780-1805 P/PN1/M/1/2 p7

hospital lodged protests against the planned development. An anonymously published pamphlet (1787) claimed that the opposition was for the health of children. For example, it claimed that:

There are buildings already on the East, and on the North, as well as on the South; and though the former is at present at some distance, a very few years would soon bring them to a nearer alliance; and the addition of a very few links to the chain, would inclose the Foundling Hospital in smoke, and unwholesome air (Anon 1787 p33).

The smoke here was not industrial nuisance but domestic. Despite its claim that the opposition was mounted for the children's cause, it is far more reasonable to consider it as an excuse to hide the less noble aim of wealthy residents, which was to preserve a better living environment for themselves. A second pamphlet was published in the following year by John Holliday of Lincoln's Inn¹¹⁰. It provided several reasons why the development should be stopped. The reasons included were that because the former landowner of the Foundling Estate, Earl of Salisbury, sold the land for the hospital, not for building, because development would not do any good in terms of finance of hospital, and because it would not do any good for children's health (Holliday 1788). However, as the pamphlet written by 'member of the general committee' of the Foundling Hospital, *A vindication of the governors of the foundling hospital* (1788), rightly claimed, the unwritten real motive behind the opposition seems to have been that people in Ormond Street and Queen's Square wanted wholesome air and the view of Highgate and Hampstead from their streets.

The protest could not stop the development. Open fields around St Pancras were to be gradually built-up in the late eighteenth and early

¹¹⁰ It is likely that the the anonymously published pamphlet in 1787 was also written by Holliday.

nineteenth centuries. The rural landscape was rapidly changed into streets by builders and brickmakers.

7-9 London brickmaking

Before buildings were constructed around St Pancras, the soil of the ground was often used to make bricks. The ground adjoining to northern boundary of Foundling Estate had been a brickmaking field as early as 1623. In 1739 there was already a tile kiln and a family of brickmaker, the Harrisons, owned the land in the eighteenth century (Roberts and Godgrey 1952 pp. 70-1). Plate 7-12 shows Harrison's brickyard with the back front of the Foundling Hospital.

Around London, bricks were usually burnt using 'clamps', not kilns. A clamp was the one-off structure to burn bricks, made by neatly piled not-yet-burnt bricks. Another characteristic of brick clamps was that raw bricks were burnt not baked as in brick kilns. It became possible by mixing fuel, or 'soil', into the brick earth. 'Soil' was the special name for sifted ashes:

The fuel used in clamp burning is domestic ashes, or, as they are technically called, *breeze*. The ashes are collected in large heaps, and sifted; the siftings, which are called *soil*, being mixed with the brick-earth, and thoroughly incorporated with it in the processes of soiling and "tempering," whilst the cinders, or "breeze," are used as fuel. A small quantity of coal and wood is also made use of in lighting the clamp (Dobson 1850 p4).

The amount of fuel used for burning 100,000 bricks was about 35 chaldrons of sifted ashes, which was mixed with brick clay, and 'about 12 chaldrons of the cinders or breeze to light the clamp (*ibid* p35)¹¹¹. In order to supply the fuel for the brickmaking business of Harrison, they accumulated ashes at the Battle Bridge Field, around today's

¹¹¹ Because one London chaldron is 36 bushels, 100,000 bricks needed 1260 bushels of ashes and 432 bushels of cinders (Hutton 1815).

King's Cross. Plate 7-13 shows a huge dust heap, with some carts carrying dust to add more to the heap.

These carts heading to the dust heap are led by dustmen. In caricatures, a dustman usually drawn as a person who carries a bell and wears an enormous hat, which hangs half way down his back. In Plate 7-13, four dustmen wearing dustman's hats lead their carts and another dustman looks upon the dust heap with his wife and a dog. A contemporary article on dustmen provides description on their life. The main part of dustman's work was to collect ashes from houses. When his cart was filled he went to discard ashes on a dust heap:

When 'the dustman' has done work, his chief amusement is to walk about the cinder heaps, smoking tobacco in a short pipe. On Sundays, he sometimes strolls, like other folks, into the 'country,' and enjoys, as well as any one else, 'a walk in the fields;' but *his* country is Battle bridge or Islington; and the fields in which *he* wanders, boast neither green herbage or wild flowers, but are well known in the vicinity of the metropolis as '*brick fields*:' there he can meet brick-makers, and scavengers, and cinder wenches; and find amusement in discussing the value of 'breeze,' the gains and losses of different contractors, and the difference in quality of the 'stuff' from various parishes (*The Casket* 1827 Vol. I No. 37 p293).

As this article shows, prices of ashes fluctuated according to the demand for ashes by brickmakers, in other words, the prices fluctuated according to demand for buildings. For example, in 1817, it was noted that 'the scavengers used to pay the parishes about 25,000*l.* per annum for the ashes, chiefly for brick-making, and now 10,000*l.* per annum is paid for taking them away' because the town was overbuilt (Feltham 1818 p315). Similarly, though the parish of Mary-le-bone received £7000 per annum during the building boom between 1827 and 1829, the parish of St. George's paid £400 for the removal in 1832 (*The Literary Gazette* 1832 p425).

In addition to 'soil' which was mixed with brick earth, ashes were used for fuel by sandwiching them between raw bricks. Dobson provides description of a common clamp:

The sides and top of the clamp are cased with burnt brick. The fuel used in burning the laid bricks consists of cinders (breeze, as before described), which are distributed in layers between the courses of bricks, the strata of breeze being thickest at the bottom. To light the clamp, *live holes* or flues, 7 in. wide and 9 in. high, are left in the centre of the upright, and at every 7th or neck. These live holes extend through the whole thickness of the clamp, and are filled with faggots, which, being lighted from the outside, soon ignite the adjacent breeze. As soon as the clamp is fairly lighted, the mouths of the live holes are stopped, and the clamp burns until the whole of the breeze is consumed, which takes from three to six weeks (Dobson 1850 pp. 26-31).

Plates 7-14 is a close look at the clamp. This example given by Dobson is confusingly similar to some kinds of brick-kilns, whose shape was like a box. Brick kilns had permanent openings and could have roofs, which protected fuel and fire-man from the weather. Flights of steps, an access to the top of the kiln, could be attached to brick-kilns, too (*ibid* pp. 77-79).

Clamping was not considered to be the best method of burning bricks by engineers. In 1825, the Institution of Civil Engineers received a letter from J. Gibb on the subject of brickmaking, stating that clamps consumed more fuel than kilns (ICE, O.C/16). Mr Anderson, who wrote to the Institution of Civil Engineers on a similar subject, also stated that brick kilns were preferable method to burn bricks because bricks were properly burned in kilns. However, kilns were more expensive for brickmaking around London 'except where a Public Company might wish to get rid of their surplus material, such as probably the Thames Tunnel Company with whom room might be an object (ICE, O.C/17)'. According to Dobson, the cost of erecting brick kiln in Nottingham in the mid nineteenth century was from £30 to

£50. In order to burn 25,000 bricks at once, more than that number of bricks was required to erect the kiln (Dobson 1850 vol. 1, p79). When making bricks around development grounds, a costly permanent structure was not necessary.

Around London, brick fields were dispersed in the developing ground because 'the bricks being made upon the spot where they are afterwards used (Anon 1820 p34)'. For example, there were twelve estates which had brick fields in St Pancras in 1804 and most of them seem to be a temporary arrangement to make bricks before development though one of them was Harrison's brickfield, which had been long established (Thompson 1804).

One of the examples of brickmaking before housing development was Brewer's company estate located in the north of the King's Cross. Tompson's map (1801) indicates a tile kiln and brick field there in 1801. Therefore, it was a brickfield when the Company obtained the Act of Parliament for the development of the estate in 1811. In 1824, the Brewers' Company posted an advertisement calling for a tenant or a developer to develop the estate. The details of the intended contract are partly known from a two-page document printed by the Brewers' Company, entitled 'Particulars relating to the Ground at PANCRAS, ... intended to be let for the purposes of Brick-making and Buildings (Guildhall Library Ms 18420)'. It indicated how deep developers would be allowed to dig to obtain the brick earth and it shows the intention of the Brewers' Company that the brick earth excavation should not affect the construction of buildings later.

The Foundling Hospital similarly utilised brick earth before the development of its estate. The brickmaking at the Foundling Hospital estate was committed to James Burton, who was not only the main developer of the Foundling Estate but was also largely responsible for the development of northern London during the period (Arnold 2005 p32). The contract between the Foundling Hospital and Burton shows that Burton was to pay the rent, six pounds per acre before brickmaking started. Afterwards, the rent would be charged depends

on the numbers of bricks made and amounts of soil taken out. The rate was two shillings and six pence per thousand bricks, and ten shillings per cartload of loam, gravel and sand used for any other purpose than brickmaking. The contract instructed Burton to make at least six million bricks in 1793 and eight million bricks afterwards. It means that the hospital expected 1,000 pound rent every year after 1794, only from brickmaking.

The contract shows that the brick earth was rather a valuable source than easily accessible material which could be wasted. The agreement referred to the end of the contract, which was when the brick earth would be completely dug out. When 'by Reason of the present or any other War foreign or civil[,] the Consumption and Demand of Bricks in the Neighbourhood of London shall be manifestly reduced', the number of bricks required to be made would be reduced to six million (LMA A/FH/A16/30/18/1). The contract did not stipulate the possibility of stopping brickmaking when there was still brick earth left.

The bricks made at the Foundling Hospital estate were used for the development there. In August 1793, Burton complained to the hospital that the foreman of Mr Norris obtained the supply of bricks from elsewhere. The letter suggests that Burton used bricks for his building contract and he also expected other developers of the estate to use his bricks. According to Burton, his bricks were not inferior to the bricks obtained by the said foreman. He requested the correction of the situation.

Thus, the brickmaking industry flourished around St Pancras while housing development was going on. However, brickmaking was to move further north when the development was completed. William Smith, who lived in Derby Street, Grays Inn Lane, which was one street south from King's Cross, appealed against the assessment of his premises to the vestry in 1826. The assessment was £70, but he claimed that 'the business of Brickmaking upon which he had a great

deal depended is now entirely at a stand'¹¹². Although Horwood's map shows some small pieces of empty fields in 1819, F.A. Bartlett's *A survey of parliamentary borough of St Marylebone* (1834) shows that the area was almost completely built-up except for some short streets. The formerly rural St Pancras was transformed into a part of London in a few decades.

7-10 Brickmaking and nurseries

The smoke from brickburning was unpleasant. In 1766, *The Public Advertiser* printed a letter from a reader on the smoke problem. It was addressed to 'the Hon. Members of the County of Middlesex', and the main claim of the letter was that many children are deprived of the nourishment. The letter argues that cows are 'in great Danger of being deprived of, by that wicked and diabolical Custom of making Bricks upon the Grassing Ground (8/7/1766)'. The writer proposed to remove brickmaking from '[the] proper Limits of the Cities of London and Westminster (*ibid*)'. It seems that the proper limits for the writer were five miles from London. The proposal soon attracted two supporting letters from other readers (11/7/1766; 28/7/1766).

Due to its suburban nature, two court cases on brickmakers' smoke nuisance in the early nineteenth century both concerned the damage to plants. As brickmaking was a suburban industry, so nurseries were also located in London suburbs. Plants for London gardens were supplied from nurseries, especially because deteriorated state of London air made a regular supply of fresh plants necessary. Books on gardening sometimes referred to London smoke when instructing care of plants. For example, *The gardeners dictionary* (1764) by Philip Miller wrote that '[the common Spruce Fir] will grow likewise in almost any Soil or Situation in *England*, provided it be not within the Reach of the Smoke of great Cities, which is very injurious to all

¹¹² CLSA, St Pancras Vestry minutes, P/PN1/M/1/7 p426

these Sorts of Trees'¹¹³. When *Fumifugium* was republished in 1772, its editor wrote that:

Our Author [Evelyn] also complains that the Gardens about *London* would no longer bear Fruits, It would now puzzle the most skilful Gardener to keep Fruit-trees alive in these places: The complaint at this time would be, not that the trees were without Fruit, but that they would not bear even Leaves (Evelyn 1772 piv).

Even without smoke, London was not the best place to grow plants due to its limited sunshine and the poor soil of the gardens. In addition, people living in houses without spacious garden satisfied themselves with potted plants, which were supplied from suburban nurseries (Longstaffe-Gowan 2001).

In 1818 a legal conflict arose between a brickmaker and a nurseryman in Highgate. Highgate, a village to the north of London, attracted wealthy residents. The plaintiff, Croome had rented two acres of nursery grounds from the defendant since 1815. The defendant, Lonsdale, was a brickmaker of considerable scale. It seems that large-scale brickmakers tended to let part of their estate to farmers and nurserymen. The St Pancras survey in 1804 shows that estates which included brick field lot in it, sometimes included lots for agricultural purpose or gardens (Thompson 1804). It seems that brickmakers and gardeners were commonly conducted their businesses in each other's neighbourhood.

Plate 7-15 is a watercolour of brick field in Hackney. Next to the brick field, there is a cultivated ground. This brick field is very likely to be William Rhodes', a very successive brickmaker. William ran the brickmaking business with his brother, Thomas, and Thomas Rhodes also had his estate in the parish of St Pancras, where he had additional brick fields. Thomas Rhodes's estate in St Pancras was large-scale including a house, offices, cow-sheds and other fields very

¹¹³ In the entry of Abies.

likely to have been used for cultivation purpose (Thompson 1804). Similarly, Balmes Farm, the estate where Rhodes brothers conducted their brickmaking business in Hackney, also included lots for cultivation purpose. In fact, before the estate was developed into a town from the 1820s, it was mainly used for agricultural purpose as well as brickmaking (HA D/F/TYS/59/1-3). The agricultural fields in Plate 7-15 are very likely to have been cultivated by sub-tenants of Rhodes brothers.

The legal conflict in 1818 was not the first conflict between Croome and Lonsdale, but in 1816 a similar complaint had already been made to Lonsdale by Croome. At that time, a compensation of £ 50 plus voluntarily added £10 was paid to the plaintiff as a result of arbitration. Obviously, the nuisance did not cease and Croome again took Lonsdale to court in 1818 and claimed that the smoke and heat of brick-kilns scorched and perished a great quantity of laurels, *laurustinus*, fruit trees (MC 19/02/1818).

Despite Croome's claim, Lonsdale's side tried to prove that brickmaking did not affect the nursery this time. Lonsdale's side prepared a nurseryman as a witness to support its claim:

the brick-kilns did not and could not cause the injury to the Plaintiff's nursery; that they had recently had opportunities of examining the Plaintiff's nursery; that the plants were in general in as good state as in their own and other nurseries; and that the evil complained of arose from the badness of the soil and dampness of the situation, and the blight, heat, and a subsequent unseasonable frost in the last summer (*ibid*).

The claims from each side were contradictory. However, it is certain that these two typical suburban industry, brickmaking and nurseries were sometimes not compatible as neighbours. In fact, a similar case was submitted to the Court of Chancery in 1825. Rodge, a plaintiff,

had horticultural ground¹¹⁴, where he grew fruit trees and also created pleasure-grounds. However, the defendant, New, started to make bricks near Rodge's horticultural ground. Although the consequence of the claim is not clear, Lord Chancellor's speech reveals the perception of contemporary view of smoke from brickmaking:

There could be no doubt in the world that the burning of bricks created a noxious and unwholesome air, & was injurious to the fruit as well as detrimental to the health; but if any one would take a walk on the Hammersmith-road, and observe the building and brick-making going forward close to Messrs. Kennedy and Lee's nursery grounds, he would find that the trees grew, and the fruit ripened, notwithstanding the noxious smoke (MC 5/5/1825).

The watercolour depicting Balmes Farm shows only light grey plumes of smoke. They are not as large as a smoke plume from steam engine chimneys. It is understandable that Lord Chancellor did not consider that brick-burning smoke was injurious to plants from general observations. Indeed, it could be argued that brick-burning could facilitate ventilation of metropolis:

"There are many who object to such a manufacture being suffered in the neighbourhood of the metropolis, considering it offensive and unwholesome. On the other hand, it is contended that fire is a great purifier of the atmosphere; and that in close and hot weather, a number of brick-kilns near London is of real use to the health of the inhabitants," by promoting a change of air (Middleton 1798 p26).

However, the argument that smoke from brick-burning was wholesome appears not to be the mainstream view. In fact, in some satires on working class women's aspiration for suburban life, their liking for the smell of brick field was ridiculed. For example, one

¹¹⁴ It was not specified in the newspaper where the horticultural ground was.

satirical poem on a widow of a foreman to a sugar-baker who moved to the London suburb writes that 'Beyond these was a brick-kiln, small/ But always smoking; she must needs/ Confess she liked the smell, and all/ Agreed 'twas good for invalids (*The London Magazine* 1821 Vol. III p79)'. Similarly, *The Lady's Magazine* printed a story on Mrs. Dumplin, a wife of grocer, who 'is one of those ladies whose virtues are not quite so prominent as their follies; she has picked up somewhere high notions of life, and considers a whisky and a country house as raising her above the common rank of mortals (1789 Vol. XX p355)'. The villa which her husband rented was adjoining a brick field, but 'the perfume of which, however unpleasant it may be to some noses, *Mrs. Dumplin* assured me was very "wholesome." (*ibid* p356)'

Compared to the other smoke nuisance cases in the 1820s mainly caused by steam engines, smoke nuisance cases concerning brick clamps were rare. It is partly understandable considering that smoke consumers were not applicable to brick clamps, and therefore, brick clamps were out of scope of Taylor's act. It is also likely that because brick making was suburban industry, brickmakers rarely conduct their business in the neighbourhood of rich and respectable residences, who possibly resorted to legal solution. In the earliest example of legal conflict over smoke from brick clamps around London, the main plaintiff was the Duke of Grafton. The case took place in 1736 at the Courts of Chancery. The defendant, Hilliard, made bricks at the field called the Hay Fields, 'within a very few yards of the back of the houses in New Bond Street and Grosvenor Street (Bennett and Smith 1851 p18)'. As the location suggests, other plaintiffs of the case include aristocrats such as the Earl of Graham. However, the defendant could continue burning bricks in the end because the inconvenience caused by brickmaking was not confirmed. It was said that the period of brick-burning was limited and 'if brick-kilns were general nuisances it seemed strange that so many of them should be permitted to stand in the several quarters of this town (Ambler 1828 p160)'

Although lawsuits concerning brick-burning smoke were rare around London, such smoke was definitely one of the nuisances associated with London. A contemporary travel book provides the following description on the approach toward London:

London comes in apace; and all those disgusting ideas with which its great avenues abound. Brick kilns, steaming with offensive smoke,—sewers and ditches sweating with filth, —heaps of collected soil, and stinks of every denomination, —clouds of dust rising and vanishing from agitated wheels, pursuing each other in rapid motion, or taking stationary possession of the road with their loads, filling the atmosphere with pestilential infection (Anon 1822 p357).

7-11 Conclusion

This chapter dealt with two distinct sources of smoke in London, brickmaking and waterworks. These industries appear in Cruikshank's caricatures of a rapidly deteriorating London environment. Although it was well known that domestic fires were part of the sources of London smoke, Londoners knew the culprits for local and particular smoke nuisance. Waterworks, brickmaking and breweries were symbols of London smoke nuisance. This chapter revealed that while waterworks were the central focus of smoke abatement efforts in London, brickmaking business did not receive such attention. Obviously, it was because smoke consumers were not applicable to brick kilns and clamps. Still, brickmaking business sometimes affected its neighbours, especially nurserymen and gardeners.

Unlike brickmaking, Taylor succeeded in forcing water companies and some large breweries to install smoke consumers. However, some of them experienced confusion over the effectiveness of smoke consumers, and eventually abandoned them. It was very similar to Gott's experience in Leeds, as shown in Chapter 5. In order to defend against rumours and bad reputations, Parkes tried to establish the effectiveness of his smoke consumer based on scientific figures.

However, these figures do not seem to have been persuasive for manufacturers who installed his plan and experienced difficulties. Raw experience was obviously more persuasive than scientific figures, in this case. However, both the claim that Parkes' smoke consumer was completely ineffective and the claim that it was effective, were partial truth. The fact was, it was successfully adopted in some factories, but in some other factories, manufacturers seem to have experienced difficulties. Unfortunately, such a complicated view never prevailed in the 1820s. People usually believed either that Parkes' smoke consumer was completely effective or completely ineffective.

Chapter 8 Conclusion

This thesis has dealt with urban smoke and its nuisance in early nineteenth century English towns, especially focusing on Leeds and London. Chapter 2, the Literature Review, showed that although there has been some work on Victorian air pollution history such as Ashby and Anderson (1981), Mosley (2001) and Thorsheim (2006), Georgian smoke nuisance per se has attracted little attention. This thesis argues that Taylor's Act (1821) has not been properly evaluated in terms of its social impact. The lack of recognition it is argued may be mainly due to the lack of archival materials, especially the limited amount of available local administrative records with which to explore this issue. As set out in Chapter 3, however, materials such as trial records, newspapers and visual images provide an insight into early nineteenth-century smoke nuisance and its abatement campaign.

Chapter 4 explored how iconographies, medical knowledge and technologies concerning smoke were developed during the Georgian period. Eighteenth-century literature generally lacked concern about smoke nuisance. Although noise and smoke were associated with negative aspects of London life during the second half of the eighteenth century, smoke was also associated with industrial sublime, which often emphasised economic prosperity and national power. In terms of medical views of smoke, there were two narratives. Medical experts often supported the view that smoke was wholesome because it was a disinfectant against animal and vegetable vapours. However, some people believed that coal smoke was unwholesome because asthmatics suffered from smoky air. In the early nineteenth century, it was impossible to prove the unwholesomeness of coal smoke, and therefore, smoke problems were nuisance issues. The development of smoke abatement technology represented something of a breakthrough in terms of coal smoke being seen as a problem. In particular, the smoke consuming

apparatus invented by Josiah Parkes became the driving force to pass Taylor's Bill into an act.

Chapter 5 examined the Leeds smoke abatement campaign. After the passage of Taylor's Act, local newspapers in Leeds, especially *The Leeds Mercury*, promoted the idea of smoke abatement and smoke abatement technology. However, there were several available types of smoke consuming apparatus in the market and some of them were not necessarily effective. This caused the confusion among Leeds manufacturers, who were not unwilling to adopt such apparatus at first. Still, newspapers and Leeds inhabitants maintained the claim that smoke abatement technology was effective and threatened manufacturers with indictments. Though most manufacturers adopted the technology in order to avoid indictments, Benjamin Gott was determined to show the absurdity of such enforcement. Gott once tried Prichard's smoke consumer and it frequently caused stoppages in his factory. This experience formed Gott's scepticism against the smoke abatement technology. In addition, Gott claimed that it was the development of the fields between his factory and the town which caused the sudden increase of smoke nuisance in the neighbourhood of his factory. Another lawsuit against a manufacturer who had already adopted a smoke consumer also revealed that smoke abatement technology did not necessarily guarantee smoke abatement, in contrast to the claim by local smoke abatement committee.

Chapter 6 examined the court case, the Duke of Northumberland v. Clowes, which took place at Charing Cross, London. Although London inhabitants did not start a local campaign against smoke nuisance, several lawsuits took place in London after the passage of Taylor's Act. This was a time when a steam press was introduced to the printing business, and four court cases took place concerning printer's nuisances in London in the 1820s. This case study examined one of these cases, and in this context, the court case came about due to the change in printing business. However, because the plaintiff was

an aristocrat, the defendant's barrister and later a radical newspaper described the case as the one between powerful and absurd aristocrat and a diligent middle-class printer. Actually, the nuisances including smoke and noise was mainly felt by the duke's servants and employees, which shows the different aspects of class issue within the case. Of course, the difference in social status between the duke and the printer caused some difficulties in negotiation over the nuisance and its remedies. For example, Clowes tried almost every possible remedy except for the removal of his steam press in order to avoid the trial, but Clowes had to negotiate with the duke's agents who were not generally vested with authorities.

Chapter 7 dealt with two case studies in London, waterworks and brickmaking framed by George Cruikshank's two caricatures depicting the London environment. The first half of the chapter examined the environmental and hygiene problems early nineteenth-century water companies were associated with. Because London waterworks introduced steam engines as early as the eighteenth century, they were considered to be one of the conventional smoke sources in London, besides brickmaking businesses and breweries. Taylor himself pressurised Lambeth Waterworks into introducing the smoke consuming technology. Other large-scale smoke-producing businesses such as the New River Waterworks and Elliot, a large-scale brewer, also introduced such technology at the time, but they experienced confusion over the effectiveness of such technology as in the case of Leeds manufacturers. This case study also examined other environmental problems associated with waterworks including the deterioration of water quality. The second half of the chapter examined the brickmaking business and its smoke nuisance. Cruikshank's caricature, *London going out of town* (1829) depicts black smoke as a negative iconography of London, which was expanding toward its suburbs. At the forefront of the London expansion was the brickmaking business, which was often operated in the spots where housing developments would later take place. Although brick clamps produced annoying smoke, this did not trigger

many court cases except for two lawsuits in which damages to a nursery field and a horticultural ground were claimed.

8-1 Three objectives

At the beginning of this thesis, I set out three objectives. The first objective was to explore early nineteenth-century smoke abatement campaign. The second objective was to explore historical geographies of smoke nuisance. The final objective was to explore how discourses of smoke functioned during the smoke abatement campaign. This section examines these objectives based on the case studies this thesis presented.

8-1-1 Georgian smoke nuisance

This thesis has provided insight into the early nineteenth-century smoke abatement campaign. Literature on air pollution history has generally argued that Taylor's Act was not influential. Although this evaluation seems to be partly true because it is doubtful that Taylor's Act substantially reduced urban smoke, this thesis has revealed that the smoke abatement campaign was widespread in Yorkshire towns; dozens of smoke nuisance trials were triggered by the Act, and many manufacturers adopted the smoke abatement technology. In fact, Victorian smoke abatement movement has been evaluated in a similar way; it gradually changed public opinion though it could not abate the air pollution. Therefore, the early nineteenth-century smoke abatement campaign should be given the proper recognition within Georgian urban history and air pollution history.

In addition to early nineteenth-century smoke abatement campaign, this thesis also considered Georgian smoke perceptions. Due to the lack of works which give a general context in terms of Georgian air quality, Georgian urban history literature can sometimes be a little misleading; quotes from travellers' journals sometimes give the impression that Georgian towns were generally smoky and Georgian urban inhabitants were concerned about the air quality. However, most Georgian towns were covered by black coal smoke only from

the end of the eighteenth century and even in smoky towns such as London, inhabitants generally did not enthusiastically seek the solution for smoke nuisance in the eighteenth century.

This thesis has revealed that dozens of lawsuits took place in the 1820s. The nature of litigation was different between Leeds and London. In Leeds, the threat to litigation was effective in forcing smoke abatement technology for manufacturers. Interestingly, some manufacturers were willing to adopt smoke consumers at first. However, manufacturers' favourable opinions on smoke abatement technology in the early stages could not be maintained through the enforcement process. The antipathy toward the smoke abatement technology appeared as a by-product of the campaign. The blame should be placed on the unregulated market which could not exclude ineffective apparatuses. In addition, the smoke abatement committee did not seriously consider the cost of selecting the most appropriate apparatus and installing it. In London, smoke nuisance cases took place sporadically. However, most cases were not pure smoke nuisance cases. These cases involved mixed nuisances, especially noise because plaintiffs' houses were generally adjoined to defendants' houses. In this sense, smoke abatement technology was not the most important issue in London because it was nothing to do with noise. Smoke nuisance cases in London were rather efforts to maintain the environment of residential and commercial areas than efforts to abate smoke nuisance in general. The goal of London court cases was the exclusion of polluting industries from residential and commercial areas.

These two case studies show that it was impossible to achieve smoke abatement only through litigation. Although Mosley (2001) and legal historians such as McLaren (1983) argue that more litigation could have more effectively abated the air pollution mostly in the context of Victorian air pollution, smoke nuisance cases in the 1820s show that it was not necessarily very effective without the sophistication of the technology and policy. Although the London case study shows that

litigation could facilitate the segregation between residential area and industrial area, this response did not necessarily solve the problem. The Leeds case study shows that at least the regulation on smoke abatement apparatuses was necessary to protect manufacturers from ineffective plans.

8-1-2 Historical geography of smoke

This thesis introduced geographical perspectives in air pollution history. Three different geographical perspectives can be adopted to interpret early nineteenth-century smoke and its nuisance.

1. The macro-geography of law and technology development
2. Urban geography of smoke nuisance.
3. Iconography of smoke.

These perspectives will now be discussed in turn.

8-1-2-1 The macro-geography of law and technology development

The idea of smoke consumption was not a taken-for-granted concept before Taylor's Act. Both the smoke consuming technology and smoke abatement legislation were originally a local product. Local technology and legislation developed into widely available concepts via Taylor's Act.

In terms of legislation, Manchester seems to be the first local authority to have the smoke abatement clause in its Improvement Act (1792). Clauses in an improvement act were often copied from other towns' act in order to secure the passage of the bill at the Parliament. The smoke abatement clause in Manchester Improvement Act was copied by other towns and the clause was gradually simplified. Although it does not seem that serious efforts were made to abate smoke nuisance in other towns than Manchester, these local acts were discussed in Parliament. It can be assumed that Taylor learned the idea of smoke consumption through the parliamentary debate. Similarly, Parkes developed his apparatus in order to solve a personal problem in his family's factory. Before Taylor noticed the

effectiveness of Parkes' apparatus, Parkes sold the invention locally and Taylor's parliamentary campaign created the national market for the invention.

Although Taylor's Act helped to diffuse smoke consuming technology throughout the country, the acceptance of the technology and the idea on smoke abatement varied from town to town. As examined in chapter 5, Leeds and other Yorkshire towns experienced smoke abatement campaign, but such campaigns were not seen in London. The difference was mainly caused by newspapers. In Leeds, the editor of *The Leeds Mercury* was one of the leading figures to start the smoke abatement campaign. However, in London, newspapers did not play such a role. In addition, the size of London was too large, and therefore, local authorities were ramified in terms of jurisdiction. The situation was different from Leeds, where the number of local political elites was limited.

8-1-2-2 Urban geography of smoke nuisance

More smoke does not necessarily mean more smoke nuisance conflicts. If the segregation between the industrial area and residential area was established, it was not likely that smoke nuisance conflicts necessarily surfaced. In this sense, the urban geography of smoke producing trades is central to an understanding of urban smoke nuisances.

This thesis has argued that smoke producing industries tended to locate in particular areas or suburbs partly due to the accessibility of water, raw materials, fuels and transportation. For example, industries tended to locate in the riverside in Georgian Leeds. In London, one of the conventional smoke producing industries, brickmaking, was a suburban industry. In this sense, smoke producing trades were not dispersed throughout towns though the segregation was not strictly established.

If the industrial area was roughly segregated in Georgian towns, why did smoke nuisance conflicts take place? Two smoke nuisance case

studies in this thesis seem to indicate that smoke nuisance conflicts can be interpreted as the struggle to mark the blurred boundary between the industrial area and residential area. For example, the Leeds case study shows that the rapid development of residential area and factories blurred the boundary between two different land uses and it triggered the conflict. The trial between the Duke of Northumberland and Clowes shows that the introduction of steam presses to the printing industry was the direct cause of the conflict. Although the printing industry was not traditionally a polluting industry, the steam press suddenly changed it into one. While prosperous commercial areas were suitable sites for conventional printing trades, they were not suitable for the operation of steam presses. Once the boundary blurred, there was a need to reset the boundary. However, blurred boundaries did not always cause smoke nuisance conflicts. For example, poor residents who could not move from industrial areas could not start an indictment. Although segregation was the most effective solution for the smoke nuisance problem in the early nineteenth century, it was only rich people who could remove the polluting trade from their neighbourhood or flee from the nuisance.

In addition, this thesis has argued that urban improvement in the early nineteenth century was partly needed in order to adjust the by-product of other improvements. The early nineteenth century was the time when British towns experienced rapid change. Improvements such as lighting, paving, water supply and sewage, changed the urban landscape. However, towns needed adjustment for new infrastructure because improvements often accompanied side effects.

8-1-2-3 Iconography of smoke

The ways that smoke was depicted in visual images reveals smoke perceptions. It has been argued that most views of Leeds drawn in the early nineteenth century chose viewpoints which could include industrial buildings in the foreground. Plumes of smoke emitted from industrial buildings were features of Leeds views. Generally, views of

Leeds depicted white smoke beautifully floating in the sky. However, the depiction of smoke in these images does not necessarily reflect the real landscape of industrial Leeds. Some artists adjusted the amount of smoke in order to show the clear picture of the town. In addition, radically reduced amounts of smoke and the choice of viewpoint which do not include smoke in its foreground could show the disapproval of rapid industrialisation by an artist.

Unlike urban panoramic views which tended to be drawn to show local pride, caricaturists depicted different perception of smoke. George Cruikshank's satires, *London going out of Town* (1829) and *Salus Populi Suprema Lex* (1832) are examples of the early depiction of completely negative iconography of urban smoke. It is not impossible to see the negative impacts of industrialisation in Turner's *Leeds* but the smoke depicted is whitish and it enhances the aesthetic effect of the watercolour. Unlike *Leeds*, smoke depicted in *London going out of Town* is black and it only shows the negative aspects of suburban expansion. The appearance of negative iconography in visual image came later than in prose. While London smoke was associated with negative aspects of urban life in prose in the second half of the eighteenth century, negative iconography of smoke appeared in visual images about 1830.

8-1-3 Discourses

This thesis has not only introduced a geographical perspective but also discourse analysis in analysing air pollution history. It has argued that it was through Taylor's parliamentary campaign that the coherent story line of smoke abatement was formed. The narrative was that smoke consuming apparatus was effective in abating smoke nuisance as well as improving fuel-efficiency, and therefore, it was a win-win solution. In reality, manufacturers needed to pay the installation costs which could be massive when an apparatus was ineffective. However, local newspapers provided their readers with reports on successful experiments in a London brewery and success stories on smoke abatement in other towns, and suppressed the

doubt over the story line. It is likely that most residents of Leeds who were not directly related to factories only obtained information concerning smoke abatement from newspapers and did not entertain doubt about the story line. In this sense, smoke abatement discourse regulated what could be done and what could not be done. Of course, the emergence of the discourse enabled smoke abatement to occur, which was extremely difficult before its emergence. However, the story line maintained by local newspapers was completely contradictory to Benjamin Gott's local experience, which showed the ineffectiveness of smoke consuming devices. Owners of manufacturing plants who had tried smoke abatement technology encountered problems, which were not fully discussed in newspapers. Local manufactories in Leeds were the sites which presented very different experience from newspaper reports.

The view of smoke as a symbol of prosperity, which would be the part of Victorian anti-smoke abatement discourse, appeared in *The Leeds Mercury* as an expression of local pride after the smoke abatement campaign. In Georgian contexts, anti-smoke abatement discourse was created after the smoke abatement discourse emerged. The order seems to be the reverse of the argument presented in literature on Victorian air pollution history.

8-2 Further implications

The geographical focus of this thesis was Leeds and London. The fact that each reacted differently to Taylor's Act suggest that it is likely that other towns also reacted differently to the Act quite differently. A case study of Manchester would help to give a broader picture of Georgian smoke abatement campaign. This thesis sometimes refers to Manchester's Improvement Act (1792) as an early example of smoke abatement clause. In fact, Mosley (2001) writes that the Court Leet of the Manor of Manchester was active in smoke nuisances at the turn of the nineteenth century and Bowler and Brimblecombe (2000) deal with police commissioners' involvement in smoke abatement at the time. However, unfortunately, these works do not reveal how

Manchester inhabitants formed the idea of smoke abatement at first and a Manchester case study would help to fill the gap. In addition, other types of industrial towns, such as Birmingham and Sheffield, which were metalworking towns and Newcastle, a coalfield town, could have different stories to tell.

As briefly mentioned in Chapter 4, British people's preference for domestic fires shows the inefficient use of fuel compared with northern countries on the Continent. It is likely that other European countries on the continent have different air pollution histories and the comparison should reveal the different cultural views of smoke.

The time focus of this thesis was the Georgian period, especially 1800-1830. After the interest in smoke abatement spread in the 1820s, the interest was resurrected in the 1840s. Although the general framework of the smoke abatement campaign does not seem to have changed very much, a direct connection with the former campaign seems to be rare. For example, the most popular inventors of smoke abatement apparatus in the 1820s including Parkes had lost their markets in the 1840s. Work on Victorian air pollution history generally gives a picture of the Victorian smoke abatement movement as the repetition of emerging new campaign and its failure. An examination of the relationship between the older campaign and the newer one might be fruitful.

Finally, in terms of environmental history, the application of discourse analysis to the process of environmental policy formation might also prove to be fruitful. In other words, the methodologies used in geography of knowledge field can be applied outside of the scientific communities such as policy making and the formation of public opinions.

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Tables and Plates

No image due to copyright issue.

Table 4-1 Distribution of coal consumption, 1700-1830 (Flinn 1984 p252)

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Plate 4-1 Francois Vivares after Thomas Smith (1758) *South West Prospect of Coalbrookdale* (Smith 1979 p15)

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Plate 4-2 Philip James De Louthembourg (1801) *Coalbrookdale by Night*
(Smith 1979 p46)

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Plate 4-3 Wenceslaus Hollar (1643-4) *Winter* in the series 'The Four Seasons'
© Trustees of the British Museum.

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Plate 4-4 Early plan of 'consuming smoak' (1754) (*The Gentleman's magazine*, Vol.24, April, pp. 172-3)

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Plate 4-5 Gregson's Patent Smoke consuming Furnace (PP (HC) 1819 (574)
Plate I)

No image due to copyright issue.

Plate 4-6 Brunton's Patent Smoke Burning Apparatus (PP (HC) 1819 (574)
Plate VIII)

No image due to copyright issue.

Plate 4-7 Consumption of Smoke (1825) (*Glasgow Looking Glass*, Vol.1,
No.VIII) University of Glasgow.

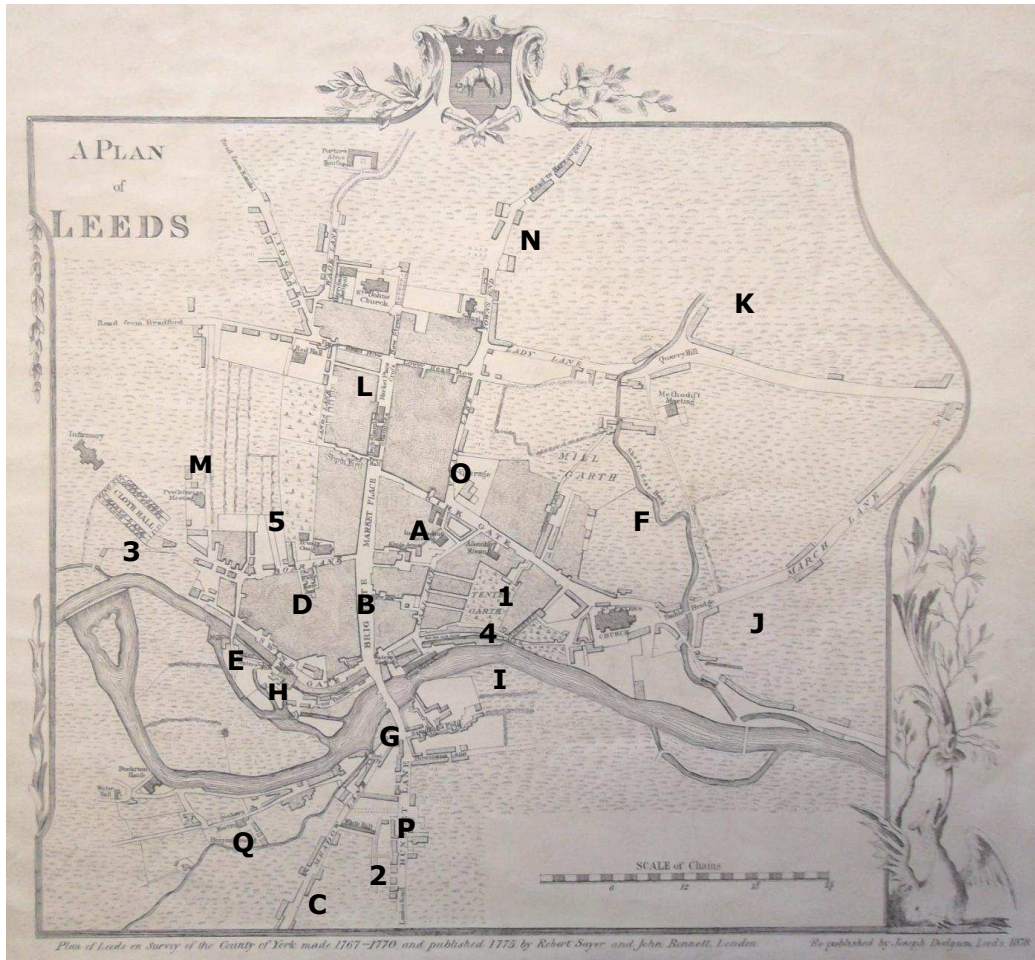


Plate 5-1 T. Jefferys (1770) *A plan of Leeds*, The Thoresby Society, the Leeds Historical Society.

A Kirkgate, B Briggate, C Meadow Lane, D Boar Lane, E Mill Hill, F The stream of Sheepscar, G Leeds Bridge, H Swinegate, I The Calls, J Marsh Lane, K Mabgate, L Headrows, M later Park Row, N North Street, O Vicar Lane, P Hunslet Lane, Q Water Lane

1 First White Cloth Hall (erected in 1710-11), 2 Second White Cloth Hall (1755-56), 3 Coloured Cloth Hall (1756-58), 4 Third White Cloth Hall (1775-76), 5 Irregulars' Cloth Hall (1792-93)



Plate 5-2 Francis Place (1715) *The Prospect of Leeds from the Knostrop Road*, The Thoresby Society, the Leeds Historical Society.

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Plate 5-3 William Lodge (c1680) *The Prospects of the two most remarkable towns in the North of England For the Clothing Trade viz Leeds... and Wakefield* (Thoresby 1715)

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Plate 5-4 William Lodge (1677) *View of the Monument and surrounding square* © Trustees of the British Museum

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Plate 5-5 Robert Riddell (c1795) *Leeds from Beeston Hill* (Hill 2008)



Plate 5-6 J. M. W. Turner (1816) *Leeds from Beeston Hill*, Yale Centre for British Art.

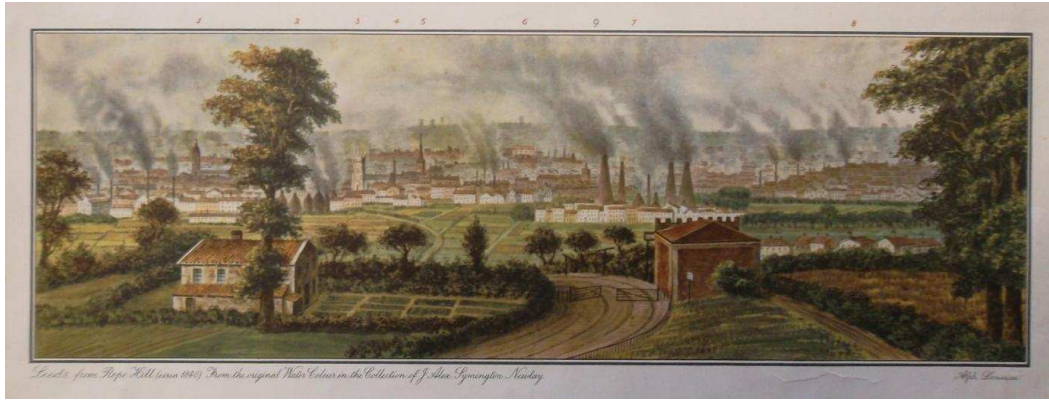


Plate 5-7 Alphonse Dousseau (1828-31) *Leeds*, drawn from the hill called *Rope-Hill* to the south of Leeds, The Thoresby Society, the Leeds Historical Society.



Plate 5-8 Robert Buttery (1833) *Leeds from Beeston Hill*, The Thoresby Society, the Leeds Historical Society.



Plate 5-9 Charles Cope (c1826) *View of Leeds from the East*, The Thoresby Society, the Leeds Historical Society.



Plate 5-10 Detail from (1792) *A plan of Leeds*, The Thoresby Society, the Leeds Historical Society.



Plate 5-11 Detail from Netlam & Francis Giles (1815) *Leeds*, The Thoresby Society, the Leeds Historical Society.

A: The Manor House, B: Nussey's Dyehouse, C: Marshall's Mill

Date	Inventers	Inventers' address	Inquiry or installation in Leeds
25 Jan 1812	Proctor and Marsdens	Leeds	
11, 18 & 25 Aug 1821	John Parkes and Sons	Warwick	Inquiry: Hirst & Bramley/ Fenton & Murray
18 & 25 Aug 1821	Martin Cawood and son/ Prichard's patent	Leeds	Installation: Benjn. Gott & Sons/ Wm. Carr & Sons/ T. & J. Bischoff & Co./ John Rothery & Co./ Edw. Huson & Co./ Wm. Sugden of Keighley
15, 22 & 29 Sep 1821	J. Gregson	Liverpool	
13 Oct 1821	H. Browne	Derby	
6 April 1822	John Stanley's invention/ makers are J. & T. Sherratt	Salford	
24 Aug 1822	J. Wakefield	Manchester	
28 Sep & 5 Oct 1822	Josiah Parkes	Manchester	Installation: Fenton & Murray/ Hirst & Bramley/ Benyon & Co./ Titley, Tatham & Walker/ Lord & Robinson/ Wilks
5, 12 & 19 Oct 1822	Johnson's patent	Manchester	Installation: Moses Atkinson of New Bank
2 & 9 Nov 1822	Johnson's patent	Manchester	Installation: Moses Atkinson/ John & Benjamin Hogg/ Harris & Wilkinson/ James Holdforth
9 Nov 1822	R. Longley	Leeds	Installation: Metcalf / Benson & Simpson/ J. & S. Shann/ Walton
16 Nov 1822	George Strattan's patent	Holborn	

21 & 28 Dec 1822	William Brunton's patent	Birmingham	Installation: R. Holdsworth & Co.
8 Feb 1823	Josiah Parkes	Manchester	Installation: J. & T. Bischoff & Co./ Armisteads/ A. Rhodes & Co./ Inquiry: Samuel Green, bricklayer

Table 5-1 Smoke Consumption ads appeared on *The Leeds Mercury*, 1811-1823

	Steam Engines (Real power calculated by pressures when the engine was working)	Coal consumption (per year)
Mill A	40 h.p. (57.5 h.p.)	1385.6 Tons
Mill B	31 h.p. (36.6 h.p.) & 56 h.p. (59.3 h.p.)	2315 Tons
Mill C	70 h.p. (69.7 h.p.) & 8 h.p.	2240 Tons
Total	205 h.p. (222 h.p.)	5940.6 Tons

Table 5-2 Coal consumption in Marshall's mill in 1823 (based on UL MS 200/39)

Plate 5-12 A printed sheet for smoke cases, October 1823. (WYAW
QS1/162/9)

No image due to copyright issue.

	M.T. Sadler (Tory)	J. Marshall (Whig)	T.B. Macaulay (Whig)
Vote from meeting supporters (28 individuals in total)	14	12	11
Actual vote	1587	2011 (elected)	1983 (elected)

Table 5-3 The political orientation of smoke abatement meeting supporters (Each constituent had two votes.) (based on the Poll Book of 1832 election)



Plate 5-13 Anon (c1822) The map prepared for Gott's trial based on Giles, Netlam and Francis in 1815, The Thoresby Society, the Leeds Historical Society.

1 Gott's mill, 2 Bingley's House, 3 Infirmary, 4 Sheepshanks mill, 5 Paper Mill (it is called Foster's or sometimes Walker's), 6 Glover's mill, 7 Bischoff's mill, 8 St Paul's Church, 9 John Ellis's mill

A Park Square, B Park Row, C South Parade, D East Parade, E Park Place, F Kirkstall Road (New Road), G Spring Garden, H Lisbon Street

Plate 5-14 Anon (c1824) Plan of Mr Gott's Mill and the adjacent Places referred to in the Evidence (UL, MS 193/193)

No image due to copyright issue.

	December 1823										
Date	3	6	8	11	13	16	19	22	24	27	30
Sheepshanks	x	x	x	x	x	x	x	x	x		x
Glovers	x	x	x	x	x	x	x	x	x	x	x
Foster (paper mill)	x	x	x	x	x	x	x	x	x	x	x
George (Dryhouse)	x	x		x		x		x	x		x
Calverts	x	x	x	x	x	x	x	x	x	x	x

	January 1824								February 1824				
Date	2	7	10	13	17	20	24	28	3	7	11	14	19
Sheepshanks		x	x		x			x	x	x			x
Glovers	x	x	x	x	x	x	x	x	x	x	x	x	x
Foster (paper mill)	x	x	x	x	x	x	x	x	-	-	-	-	-
George (Dryhouse)		x	x	x	x			x	x	x	x	x	x
Calverts	x	x	x	x	x	x	x	x	x	x	x	x	x

Table 5-4 Smoke records of mills around Gott's (x was a day when chimneys smoked badly) (based on WYAL WYL 160/116)

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Plate 5-15 Thomas Burras (c1840) *A View of Leeds from the north west* (Hill 2008)

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Plate 5-16 Thomas Burras (1844) *A View of Leeds from the west* (Hill 2008)

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Plate 6-1 Benjamin Davies (1823) *A New Map of London, Westminster, Southwark, and their suburbs*, published by Boys, Thomas, © Trustees of the British Museum.

A Charles Square B Goodman's Fields C Bolt Court, Fleet Street



Plate 6-2 Richard Horwood's map (1813) (Horwood 1985)

A The Admiralty; B The Horse Guards; C St James's Park; D the Scotland Yard; E the Privy Gardens; F Charring Cross; G the Strand; H Buckingham Street; I Adelphi; K Villiers Street

1 Northumberland House; 2 Lambeth Waterworks; 3 York Buildings Waterworks; 5 Brewery; 6 Fife House; 7 Taylor's house; 8 Fowler's Iron Foundry

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Plate 6-3 George Scharf (1825) *Drawing* © Trustees of the British Museum

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Plate 6-4 Anon (1813) *Ackermann's Library, for Works of Art* © Trustees of the British Museum

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Plate 6-5 Anon (c1824) *Plan of the proposed improvement at Charing Cross, St. Martin's Lane and entrance to the Strand*, London Metropolitan Archives.

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Plate 6-6 John Bluck after A.C. Pugin and T. Rowlandson (1809) *Pillory, Charing Cross* © Trustees of the British Museum

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Plate 6-7 Thomas Hosmer Shepherd (1826) *View of Northumberland House with a horse-drawn carriage standing in front of the statue of King Charles I*
© Trustees of the British Museum

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Plate 6-8 Anon (1811) *Charing Cross, looking up the Strand* © Trustees of the British Museum

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Plate 6-9 George Scharf (1824) *The Strand from the corner of Villiers Street*
© Trustees of the British Museum

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Plate 6-10 George Scharf (1824) *The Strand from near Villiers Street* ©
Trustees of the British Museum

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Plate 6-11 Charles Barry (c1851) *Northumberland house, plan of the principal floor, The Alnwick Castle*
(The north front is in the bottom of the plan.)

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Plate 6-12 Charles Barry (c1851) *Northumberland house, plan of the one pair floor, The Alnwick Castle*
(The north front is in the bottom of the plan.)

No image due to copyright issue.

Plate 6-13 George Frederick Sargent (c1861) *Interior view of the Grand Gallery in Northumberland House*, London Metropolitan Archives.

No image due to copyright issue.

Plate 6-14 James Gillray (1809) *Theatrical Mendicants, relieved* © Trustees of the British Museum

Name	occupation	employer
Joseph Morris	'resident agent' or 'servant agent'	The duke
Thomas Williams	A clerk of Morris's office	The duke
Michael Heim (a German)	A porter at the stable yard	The duke
Robert Henry Clive	Brother of the duchess and the younger son of Edward Clive, 1st Earl of Powis	
John Walker	A gardener	The duke
James Reeves	An assistant gardener	The duke
James M. Grath	A labourer and A watchman	The duke
Jonathan Parsons	clerk of the works at Northumberland House	
William Parsons	superintendent of the Northumberland House's refurbishment	
William Ruff	a bricklayer	
Joseph Fairlie	an engineer	
Joseph Foster	a bricklayer	
Robert Grieve	a principal Porter	The duke
William Piggott	a night porter	The duke
William Frederick Boyle	a private secretary to the duke	The duke
Hamilton Smith Day	an artist	
Bryan Donkin	an engineer	
William Webb	a worker at the stables (a stable boy)	The duke
Thomas Fletcher	a worker at the stables (a stable boy)	The duke
Joseph Wigg	a surveyor	
William Rogers	a foreman to a bricklayer	Mr Stutely, bricklayer
George Hewitt	a carpenter	Mr. Candy the architect
George Druid	Employed about the furniture of the Northumberland House	Messrs. Morel & Hughes, the upholsterers

Table 6-1 The list of witnesses for the duke, who were present at the trial

Name	occupation	employer
James Earl	A bedmaker at Northumberland House	The duke
Richard Symons	A carpenter at Northumberland House	The duke
James Furlow	Probably a carpenter	Mr Collins
William Grant	Under butler	The duke
Mary Finney	A house maid	The duke
Ann Morris	A still room maid	The duke
Elizabeth Heybourn	A housemaid	The duke
Alice Underwood	Responsible for the chambers over the Stable Yard	The duke
Alice Elizabeth Underwood		Messrs. Morel & Hughes, the upholsterers
James Hannen	A wine merchant residing in Northumberland Street	
Cordelid Stonnill	A servant	James Hannen
Not named	A servant	James Hannen
Peter Alley, Esq.	A resident in Northumberland Street	
Elizabeth Dyer	A servant in Northumberland Street	Mr Hancock

Table 6-2 The list of witnesses for the duke, whose testimonies were presented after the trial

Monday	Tuesday	Wednes- day	Thursday	Friday	Saturday	Sunday
			June	18	19	20
starting time (duration (mins))				7:20 (3)		
21	22	23	24	25	26	27
7:00 (5)				6:45 (9)		7:00 (7) No water/ Worked till 21:00
28	29	30	1 July	2	3	4
7:00 (12) 7:15 (8)	8:30 (2)	7:15 (4)	7:20 (10)	7:00 (3) 21:00 (9)	8:15 (13)	
5	6	7	8	9	10	11
7:15 (8) 9:10 (6)	7:20 (8)		6:50 (11) 7:15 (7)	6:55 (14)	7:10 (3) 9:45 (9)	
12	13	14	15	16	17	18
7:00 (16) 10:09 (8)	16:15 (4)	7:10 (3)			7:05 (9)	
19	20	21				
7:09 (5) 9:45 (12)	7:00 (6)	6:52 (4) 7:20 (13) 7:41 (32) 8:15 (20) 9:03 (7)				

Table 6-3 The account of black smoke from Clowes' chimney, 18th June - 21st July 1824. Time indicates what time black smoke started to issue. (Duration of time (mins.)) (based on AC/BPR pp. 31-32)

No image due to copyright issue.

Plate 7-1 George Cruikshank (1832) *Salus Populi Suprema Lex*, London Metropolitan Archives

No image due to copyright issue.

Plate 7-2-a George Cruikshank (1829) *London going out of Town, or, The March of Bricks & Mortar* © Trustees of the British Museum

No image due to copyright issue.

Plate 7-2-b Details from George Cruikshank (1829) *London going out of Town, or, The March of Bricks & Mortar* © Trustees of the British Museum

No image due to copyright issue.

Plate 7-3 Robert Seymour (1828-1830) *The March of Intellect* © Trustees of the British Museum

No image due to copyright issue.

Plate 7-4 Anon (1830) *A View in White Chapel Road 1830*, London Metropolitan Archives

No image due to copyright issue.

Plate 7-5 Robert Seymour (1830) *Heaven & Earth* © Trustees of the British Museum

No image due to copyright issue.

Plate 7-6 George Cruikshank (1832) *The central board of health* © Trustees of the British Museum

No image due to copyright issue.

Plate 7-7 Clark (c1829) Part of *Panorama of the River Thames from the Adelphi*, London Metropolitan Archives

No image due to copyright issue.

Plate 7-8 Anon (1826) *View along Waterloo Bridge from the Strand end, looking towards Lambeth*, lithograph, London Metropolitan Archives

TABLE.

	No. of Experiment.		Plan.		Weight of Coals burnt.		Weight of Water evaporated.		Time.		lbs. of Water evaporated by 1 lb. of Coal.		Cubic Feet of Water evap. by 112 lbs. of Coal.		Temp. of Water on entering the Boiler.		Wt. of Coals burnt to raise the Water to 212 deg.		Wt. of Coals burnt in evaporating from 212 deg.		Cub. Ft. of Water evap. by 112 lbs. of Coal from 212 deg.			
	No.		lbs.	lbs.	Ho.	Ms	lbs.	Cub. ft.	Deg.	lbs.	lbs.	Cub. ft.	Deg.	lbs.	lbs.	Cub. ft.								
At Messrs. Thomson, Chippindall, and Co. of Primrose.	1	Old	2576	12956	11	30	5.02	9.0	42°	391	2185	10.62												
	2	New	2576	14356	11	25	5.57	10.0	42°	391	2185	11.77												
	3	ditto	1568	9318	9	0	5.94	10.65	42°	238	1330	12.55												
	4	Old	1568	11468	8	0	7.31	13.1	44°	235	1333	15.4	} Boiler 20 ft. by 5 ft. 6 in. Flue thro' the Boiler.											
	5	ditto	1568	11512	8	46	7.34	13.1	44°	235	1333	15.47												
	6	1568	11668	10	0	7.44	13.45	44°	235	1333	15.68												
	7	New	2016	16775	12	25	8.32	14.92	44°	303	1713	17.54												
At Messrs. Horrocks and Co. of Preston.	8	Old	2576	19312	9	19	7.5	13.4	76°	322	2254	15.35	} Boiler 15 ft. 6 in. Fluc thro' the Boiler.											
	9	New	2576	21875	10	0	8.48	15.2	80°	314	2262	17.33												
	10	ditto	2688	22125	8	0	8.23	14.75	74°	341	2347	16.93												
At the New River Head Water-Works, Islington.	11	Old	3200	22500	10	59	7.03	12.63	102°	332	2868	14.06	} Two Boilers 15 feet by 5 feet. No flue thro' the boiler.											
	12	ditto	2312	16125	8	0	6.97	12.5	101°	241	2071	13.95												
	13	New	1917	15375	7	18	8.02	14.37	96°	210	1707	16.14												
	14	ditto	1837	14764	6	54	8.03	14.4	97°	198	1639	16.13												
	15	ditto	2199	18112	8	10	8.23	14.75	97°	237	1962	16.51												
At Messrs. John Parkes & Sons, Warwick.	16	New	3024	26812	14	30	8.86	15.8	56°	426	2598	18.6	} 3 Boilers 12 ft. by 5 ft. No flue.											
	17	ditto	2800	26600	14	30	9.5	17.0	60°	380	2420	19.7												
	18	ditto	3360	26820	14	30	7.98	1.43	56°	473	2887	16.64												

Table 7-1 Josiah Parkes's experiment on saving fuel (Parkes 1822 p12 (1509/4047)) © British Library Board

No image due to copyright issue.

Plate 7-9 *The Dolphin, or Grand Junction nuisance* (1827) (Graham-Leigh 2000 p99)



Plate 7-10 Charles Williams (1811) *Implements Animated pl.1.*, Derbyshire Record Office, D5459/4/31.

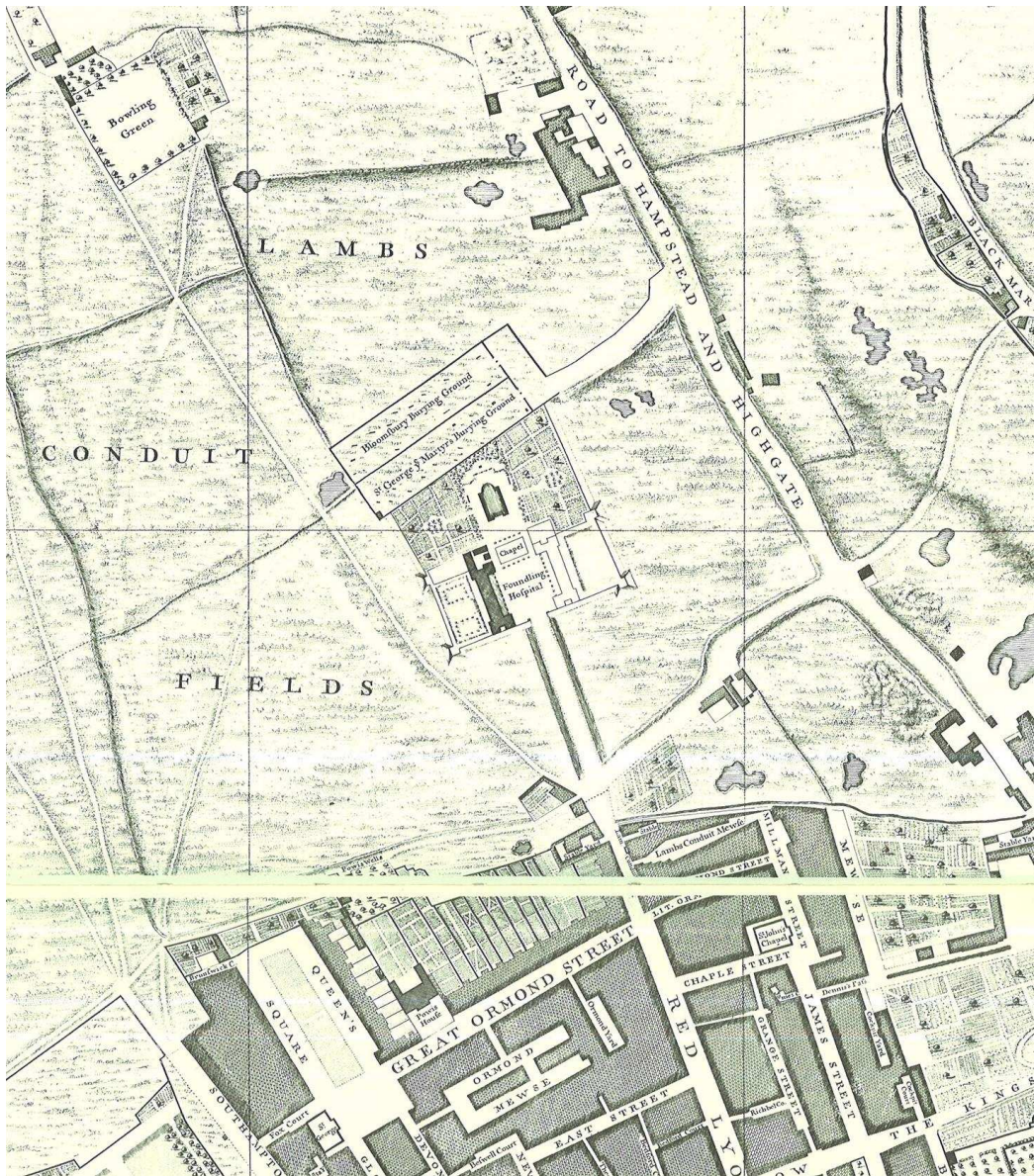


Plate 7-11 John Rocque (1746) *London map* (Rocque 1981)

No image due to copyright issue.

Plate 7-12 Harrison's Brickyard, Looking Towards the Foundling Hospital (1808) (Roberts and Godfrey 1952)

No image due to copyright issue.

Plate 7-13 C. H. Matthews, *The Dust Heap, Battle Bridge* (Roberts and Godfrey 1952)

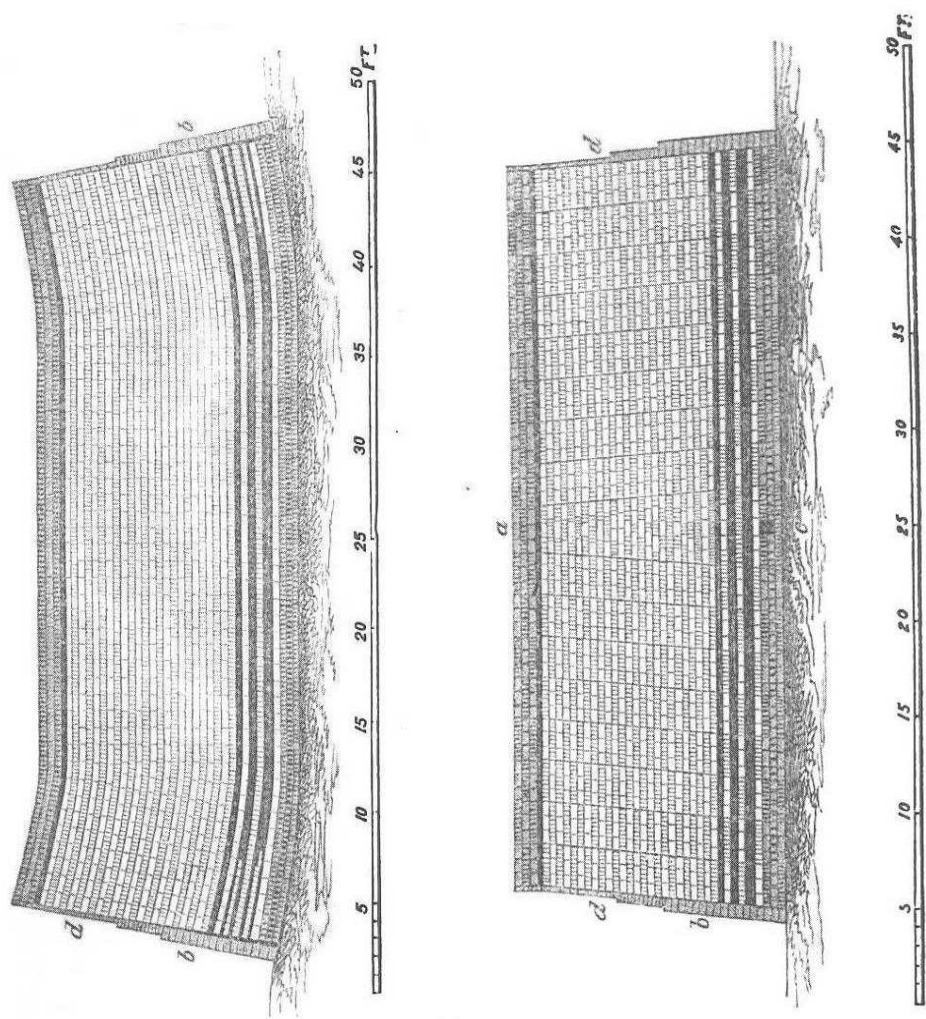


Plate 7-14 The Clamp (Dobson 1850)

The Left: Transverse section (parallel to necks) (Scale 10 ft. to an inch.)

The right: Longitudinal section (parallel to necks) (Scale 10 ft. to an inch.)

- a. The upright.
- b.b. Close bolts
- c. Live hole (Letter c can be seen on the bottom of Plate 3)
- d. Bestowing

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