The Pianoforte at the Great Exhibition of 1851: Investigating Cultural Value

A thesis submitted for the degree of Doctor of Philosophy

by

Bethan Evie Smith

Goldsmiths, University of London

2017

Declaration

I hereby declare that this thesis has been composed by me and that the work described within is my own except where explicitly stated otherwise. I further declare that this work has not been submitted for any other degree or professional qualification except as specified.

Bethan Evie Smith

Acknowledgements

I am grateful for the support and advice of my supervisor Professor Simon McVeigh of Goldsmiths Music Department, without whom this project would almost certainly have been abandoned, and my upgrade examiners, Dr Tom Perchard and Anthony Pryer, also of Goldsmiths Music Department.

I would like to thank my husband, Dr Kevin Smith, for his ingenious creation of a pre-decimal calculator and general encouragement throughout, my daughter Abby Smith, who acted as my 'modern subject' for the purposes of Chapter 5, my friend Dr Suzanne Clayton, who kindly assisted with the proofreading process, and Véronique Brown and Tim Crapper, who provided English translations of French language primary sources.

I have been very generously assisted by museum curators, conservators, archivists, pianists and university academics throughout this project.* The individuals I would like to thank include: Jonathan Santa Maria Bouquet (Russell Collection, Edinburgh); Gary Branch (Finchcocks Musical Museum, Kent); Emyr Davies (Museum of Wales, St Fagans, Cardiff); Taya Drake (The National Trust at Speke Hall, Liverpool); Pierre Geavert (The Musical Instrument Museum, Brussels, Belgium); Emma Hardy (Geffrye Museum, London); Julia Hoffbrand (The Museum of London); Angela Kenny (The Royal Commission Archives, Imperial College, London); Hayley King (The National Trust at Speke Hall, Liverpool); Dr Alastair Laurence (Finchcocks Musical Museum, Kent); Dr Naomi Luxford (University College, London); Dr Paul Martin (University of Leicester); Helen McConnell (Blaise Castle Museum, Bristol); William Newton (Victoria & Albert Museum, London); Christopher Nobbs (The Royal Academy of Music Museum, London); Dr Jenny Nex (The Royal College of Music Museum, London); Professor David Oswell (Goldsmiths College, London, Sociology Department); Dr Roger Parker (Kings College, London); William Phillips (Buckinghamshire County Museum); Robert Simonson (Surrey History Centre); Janet Snowman (The Royal Academy of Music, London); Karin Walton (Bristol City Museum & Art Gallery); Dr Heather Wiebe (Kings College, London).

*The Institutions listed are where these persons were based at the time they were consulted in connection with my research

I am also grateful to the staff at the following institutions whose assistance enabled me to access resources: Cornwall Record Office, Truro; London Metropolitan Archives, London; Norfolk Record Office, Norwich; Reading University Library; Reading University Special Collections; Senate House Library, London; The Bodleian Libraries, Oxford; The British Library, London; The British Museum, London; The Maughan Library, London; The National Art Library, London; The Royal Academy of Music Library, London.

Particular thanks go to Andy Lamb (Bate Collection, Oxford), Dr Joanna Cooper (Natural History Museum, London) and Max Donnelly (Victoria & Albert Museum, London, Furniture Department) for their willingness to identify images based on photographs of piano taken by myself.

Photographs and images have been reproduced with the kind permission of Bristol Culture; Buckinghamshire County Museum; Finchcocks Musical Museum*; The Ashmolean Museum, University of Oxford; The Bate Collection, University of Oxford; The Fashion Museum, Bath and North East Somerset Council; The Geffrye Museum; The Mary Evans Picture Library; The Museum of London; The Museum of Musical Instruments, Brussels; The Museum of Wales at St Fagans; The National Portrait Gallery; The National Trust; The Royal Collection Trust; The Surrey History Centre; The University of Edinburgh; The University of Reading Special Collections; The Victoria & Albert Museum.

Although Finchcocks Musical Museum closed in December 2015, the images used in my work were taken in July 2014 when the instruments concerned were in the possession of Richard & Katrina Burnett. Most instruments in the collection were sold at auction in March 2016 and accordingly the identity of owners as at the time of submission of my thesis is unknown.

Abstract

My thesis is an object-based study which uses the piano as an investigative tool with which to explore cultural value from the perspective of different audiences in attendance at the Great Exhibition of 1851. In a nutshell, my approach is to use an object to explore how a specific historical event was understood. The piano proves to be a provocative agent; physical complexity (both internal and external), the ability to signify multiple meanings and a varied price tag are all relevant characteristics. The thesis examines the perspective of the Exhibition organisers, juxtaposed with networks of other human and non-human actors, focusing specifically on how the materiality of objects and the Exhibition building contributed to meaning. The thesis also considers how visitors and judges might have evaluated exhibits taking into account what knowledge and 'habitus' would have shaped their understanding. The piano maker's perspective is investigated with a view to establishing why the range of instruments displayed was so diverse and whether or not the items chosen reflected normal everyday output. The consumer's perspective questions how class purchasing power might have impacted how visitors understood the designation 'cheap' which was applied to some products, including the piano. Some of my work tackles issues already identified by Exhibition scholars such as visuality, imperialism, consumerism and the question of working-class inclusion, using alternate theoretical methods. Most of the thesis, however, ventures into new territory, specifically the significance of materiality and the role of sound. My work also questions whether the piano was understood primarily as a sound producer or as a decorative object adopting a constructivist methodology rather than the more usual technological approach. In wider terms, my most significant contribution, both to the fields of New Organology and Material Culture Studies, concerns the application of physical evidence to answer wider cultural questions.

The Pianoforte at the Great Exhibition of 1851: investigating cultural value

Contents:

List of Figures

Chapter 1: Introduction: Overview, Literature Review, Sources and Method

Chapter 2: Commissioners, Committees and Artefacts: exploring the role of the piano as actor

Chapter 3: Visitor experience at the Great Exhibition: the sight and sound of the piano

Chapter 4: Professional taste at the Great Exhibition: evaluating sight and sound according to judicial criteria

Chapter 5: Piano manufacture at the Great Exhibition: investigating diversity

Chapter 6: Monetary value and the Great Exhibition: investigating attitudes to 'cheapness'

Chapter 7: Conclusion

Abbreviations, conventions and currency

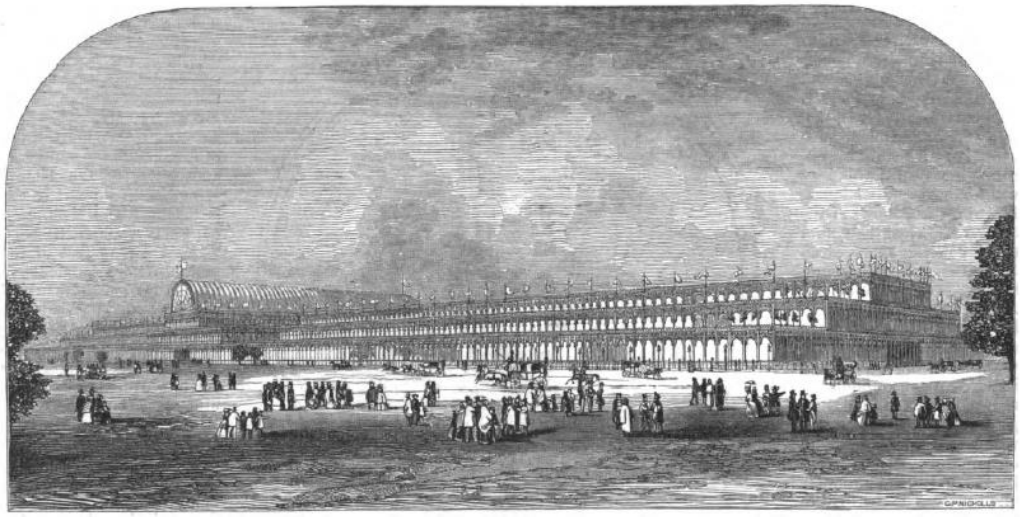
Broadwood: John Broadwood & Sons
Collard: Collard & Collard
Erard: Pierre Orpheus Erard
cm: centimetres
d: pence
&c: et cetera (etc)
f: folio
gn: guinea(s)
g: gram (s)
l: used in some manuscripts in place of £ to denote pounds
mm: millimetres
Ms: Manuscript
s: shilling(s)
‘: foot/feet
“: inch (es)

The only instances in which abbreviations of makers’ names are not used is when they are otherwise referred to in contemporary sources in which case the integrity of the primary source has been preserved.

In instances where sources have been cited verbatim (whether primary or secondary) I have adhered to the unit of measurement used by the author. In instances where data from primary sources is placed in direct comparison with my own findings I have used both imperial and metric units of measurement.

Original spellings have been retained. Text in square brackets, such as ‘[blank]’, has been added by the current author. Any text which is unclear has been transcribed to the best of my ability and included together with a question mark in square brackets. Anything that is completely illegible is denoted using a dotted line .....

Until 1971, English currency was divided into pounds (£), shillings (s) and pence d). There were 12 pence in a shilling and 20 shillings in a pound. The guinea, abbreviated here as gn, was worth £1 1s and was largely used in upper class circles. The majority of mid-century piano makers expressed their prices in guineas although a few used £ s d.



EXTERIOR OF THE BUILDING FOR THE GREAT EXHIBITION (SOUTH SIDE).

Fig 1.1, Paxton's Crystal Palace, *The Art Journal Illustrated Catalogue: the Industry of All Nations 1851 (London: George Virtue, 1851)*, p.xiv

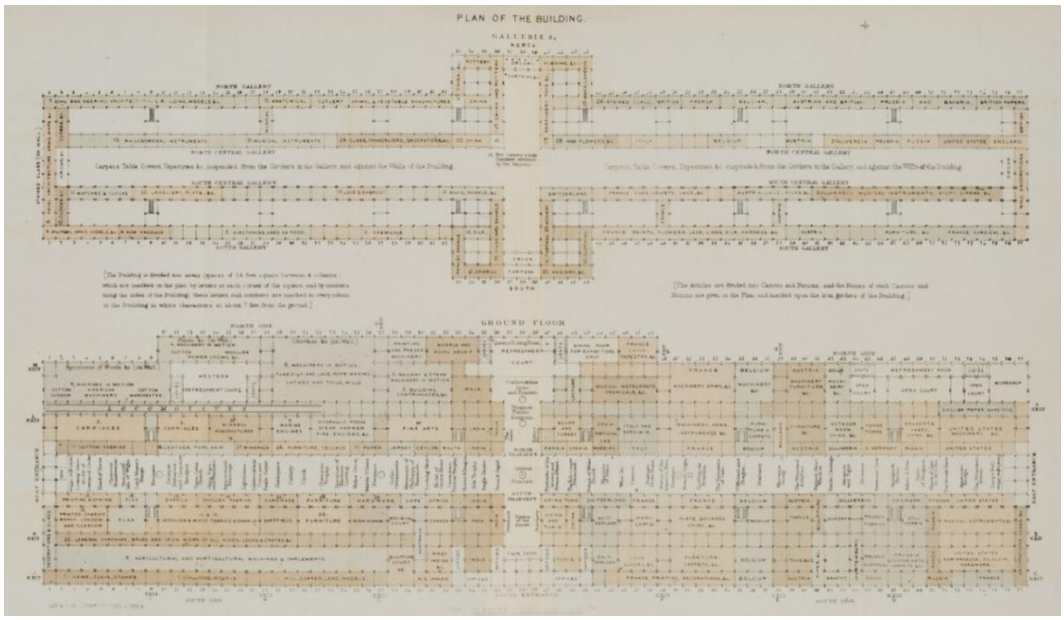


Fig 1.2, Plan showing interior arrangement of the ground floor and upper galleries at the Great Exhibition including details of exhibits positioned in the British Nave, foreign Nave and Transept, The National Archives Collections http://www.nationalarchives.gov.uk/victorians/IndexOfResources4.aspx (accessed 5 February 2016)

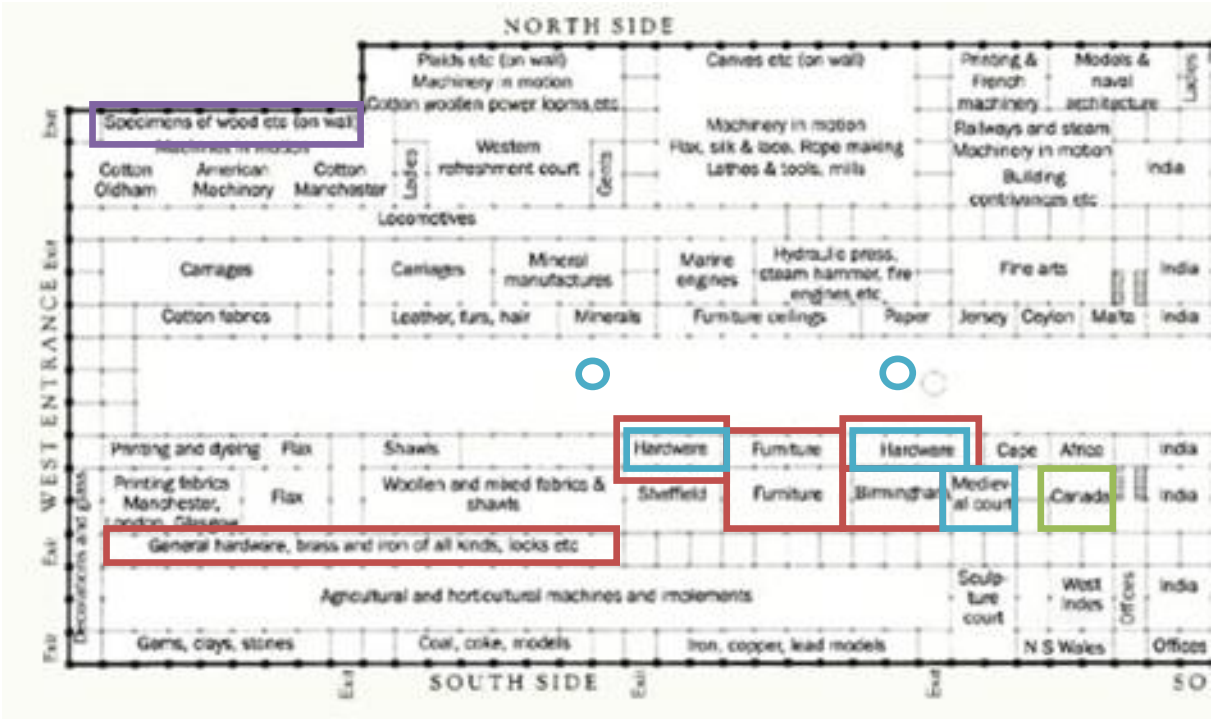


Fig.1.3, Ground Floor Plan of the Crystal Palace: Western Side displaying British Products.

https://upload.wikimedia.org/wikipedia/commons/5/57/Crystal_Palace_-_plan.jpg (accessed 5 February 2016) (Figs 1.4-1.6 below are taken from the same source)

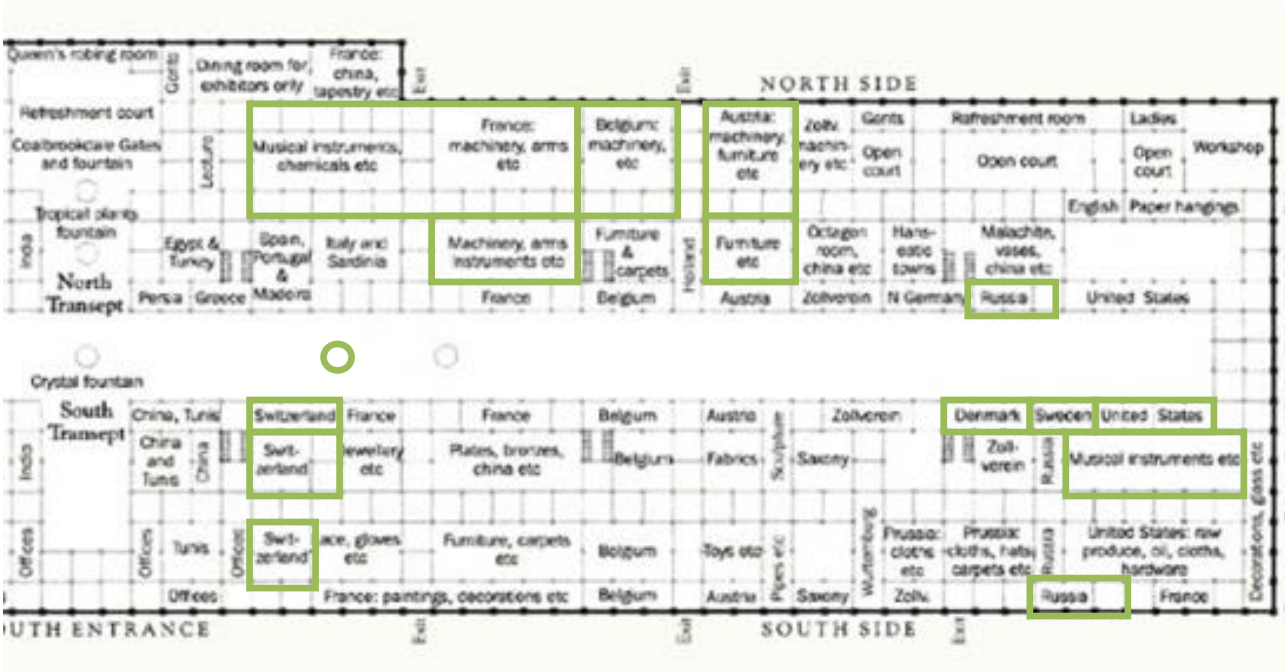


Fig.1.4, Ground Floor Plan of the Crystal Palace: Eastern Side displaying Foreign Products

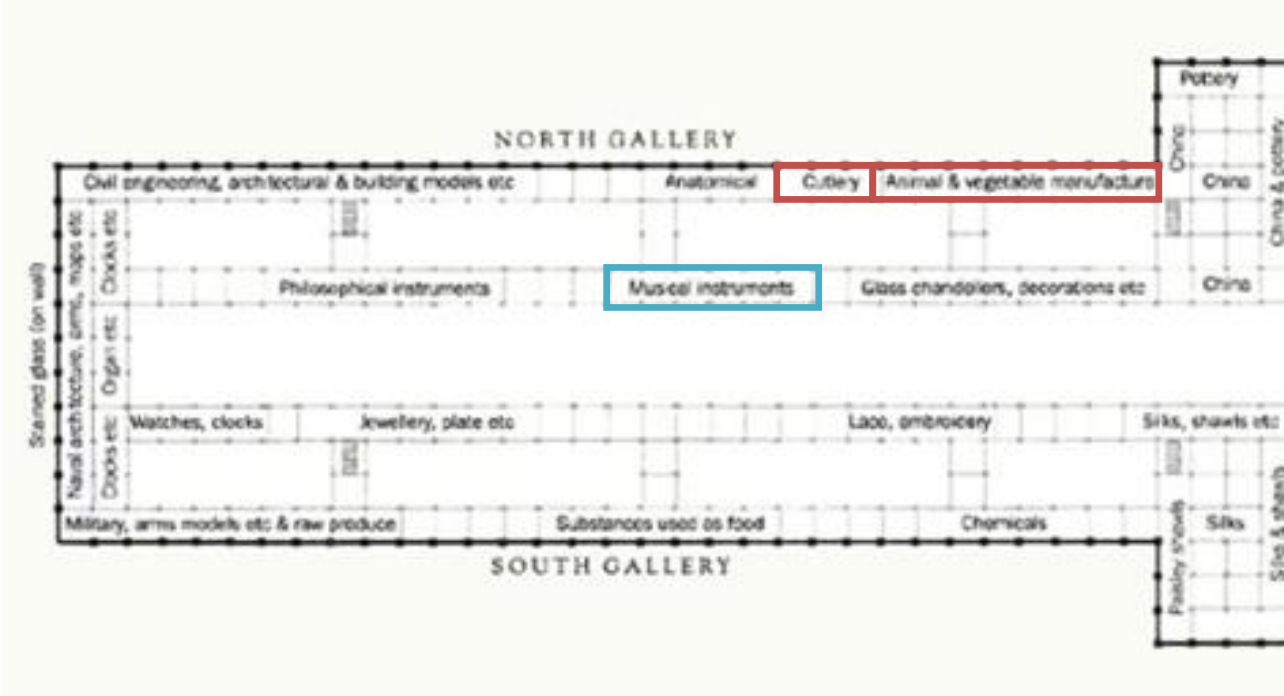


Fig.1.5, Upper Floor Plan of the Crystal Palace: Western Side displaying British Products

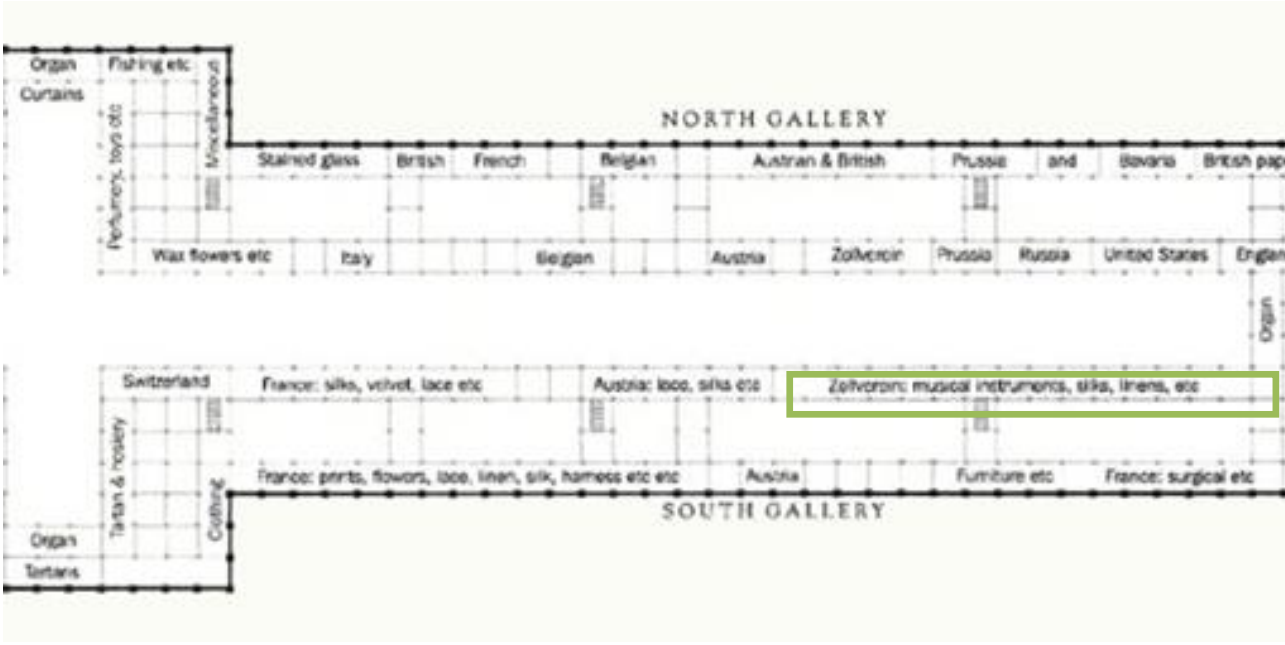


Fig.1.6, Upper Floor Plan of the Crystal Palace: Eastern Side displaying Foreign Products

British piano makers and makers of didactic aids and tuning devices = blue; approximate location of British piano parts and accessory makers = red; location of raw materials used in mid-nineteenth century piano making = purple; the approximate location of foreign piano makers = green.

Introduction: Overview, Literature Review, Sources and Method

1.1: Introduction

My study seeks to use the piano as an investigative tool to establish how value was constructed at the Great Exhibition; in a nutshell, I am using an object to explore a historical event. My work represents a departure from traditional organology in that it seeks to apply established data concerning exterior design and interior construction to consider how pianos would have been evaluated in the Exhibition building. For a number of reasons, the piano yields particularly complex results. It was, at mid-century, understood both as a sound producer, valued for its tone and touch, and as a furniture item, valued for its appearance. It had multiple social meanings signifying respectability, domestic stability and middle-class affluence on the one hand, and illicit relationships, leading to domestic upheaval, on the other. It was an assemblage of many different parts; its existence was reliant on the workmanship of craftsmen within the piano industry but also on that of independent part-makers, wire drawers, iron and brass foundries together with colonial and foreign suppliers of raw materials. It was a product of traditional craftsmanship and mechanised processes, both of which vied for recognition at the Exhibition. It was also a product that advertised the rich colonial and foreign resources newly available to British makers whilst at the same time acknowledging the debt owed by Britain to what contemporaries would have regarded as lesser nations. It was a product that spanned a very wide price bracket and was purchased by consumers equipped with differing levels of knowledge for a range of different reasons. Pianos were sometimes acquired purely because they were socially desirable objects; once purchased they remained silent in the corner of a drawing room. Others became household orchestras, a means by which the music-loving public could re-create what they heard at concerts and operas. They were also purchased by professional musicians and composers, whose primary interest was in touch and tone, where they became instruments of employment both in the concert hall and at home. Notwithstanding claims by piano historians such as Harold Schonberg that the mid-century piano was in essence fully

developed by this time, work by Cyril Ehrlich, Edwin M. Good and others confirms that piano making was very much in a state of flux at mid-century.[1] A glance through the range of pianos on display indicates that makers had different priorities. Whereas some were keen to demonstrate the latest technological advances, others created novelties.

I have chosen the Great Exhibition because it provides an ideal platform upon which to explore how cultural value was constructed. Contemporary sources offer insight into a range of responses, by different audiences, to an environment that was wholly unparalleled. I will be asking questions such as how were exhibits viewed by the organisers? How might taste, both amateur and professional, have shaped how visitors and judges evaluated what they saw and heard? What concerns did makers have when choosing their exhibits and what technological and social considerations might have shaped the way they made their pianos? How might different audiences have viewed exhibits from a consumer perspective? Although purchasing during opening hours was prohibited, how might working, middle and upper-class visitors have appraised objects with their finances in mind? The perspectives analysed are not the only possible ones and I am not claiming to offer an exhaustive range of ways in which the Exhibition might have been understood. Given that the secondary purpose of my work is to examine how the piano was evaluated in terms of sight and sound, however, I have concentrated on audiences for whom this object-type would have been relevant. Analysis of the Exhibition from a religious perspective would no doubt have been interesting, but as pianos were not the focus of this type of publication, I have left this largely unexplored area of Exhibition scholarship to others. I have chosen not to tackle the Exhibition by topic because I believe that by examining specific perspectives it is possible to eliminate some of the evidential problems which characterises published scholarship. As will be discussed later, scholars have found it particularly difficult to establish whether or not the working classes were welcomed to the Exhibition

---

[1] Harold C. Schonberg, *The Great Pianists* (New York, 1963), in Edwin M. Good, *Giraffes, Black Dragons and Other Pianos: a Technological History from Cristofori to the Modern Concert Grand* (Stanford: Stanford University Press, 2001), pp.145-6; Cyril Ehrlich, *The Piano: A History* (London: J. M. Dent & Sons Ltd, 1976), p.10; Good, *Giraffes, Black Dragons and Other Pianos*, p.172, pp.194-6 and p.209.

both as visitors and participants. What becomes clear is that their verdict depends very much on the source consulted and that the opinion of the contemporary writer concerned is determined by political agenda. By grouping audiences together according to how and why they are likely to have evaluated objects, I am hoping to eliminate this problem, at least to some extent. Another reason why I have employed an audience-based perspective is that it allows different connections to be made, insights which are invisible if a topical approach is employed. The latter does not lend itself to answering the question 'how was the Exhibition experienced?' something which I am particularly keen to understand.

The chapters have been arranged to give the reader an optimum understanding of Exhibition experience. Chapter 2 deals with preliminary issues: what objects were present and why, what was the building like in terms of its appearance and environment, how were objects arranged both conceptually and spatially. Chapters 3 and 4 take the reader through the doors of the Exhibition who then experiences the event and its objects through the eyes and ears of the visitor and the judging panel. Accounts of sight and sound are filtered through the lens of knowledge and 'habitus': what considerations did the amateur and the professional take into account when they saw and heard pianos standing silent or when demonstrated? Chapters 5 and 6 then take the reader outside the Exhibition into the wider commercial sphere, examining what makers produced and how pricing related to consumer purchasing power. Looking outside the Exhibition is necessary in order to understand why the range of pianos on display was so diverse and why labelling a product as 'cheap' may not have resonated convincingly with some audiences.

The piano has much to say about the Exhibition in ways that are as yet unexplored. It offers a new view of how we relate human and non-human actors using aspects of actor network theory which is characteristic of the sub-discipline of New Organology which has emerged recently. Whereas existing scholarship simply makes passing reference to the acoustics and environment of the Crystal Palace, my work considers how the materiality of the building might have actively contributed to meanings made. The piano shows that the materiality of the building and the layout of objects had

important consequences for how exhibits were understood. As I will demonstrate, a different building, with a different layout, would have produced alternate narratives, ones where British/Colonial relationships and metropolitan/provincial interdependence would have found another voice.

Whereas it has generally been assumed that visual experience was all-encompassing, in my study the piano provides a means of navigating the soundscape. I will emulate newer precedents such as Tim Barringer's analysis of the role of sight and sound in imperial pageantry, an approach where sound plays a part in sensory experience.[2] My findings question views such as those of Michael Musgrave who is of the opinion that music played little or no part in the life of the building when in Hyde Park.[3] By undertaking a comprehensive study of a single object type, I will avoid some of the generalisations which are characteristic of exhibition commentaries. Although studies by revisionist scholars are valuable for their insight into the diversity of products, the approach used can result in false impressions being formed, an example of which is evidenced by the following remark by John R. Davis:

> Just as much of the sculpture had been displayed in order to show technique and new use of materials, the display of musical instruments had nothing to do with artistic qualities of sound and everything to do with techniques of production, design and use of material. There were pianos here that had two or even four keyboards, that could be raised or lowered in pitch by moving the soundboard or that could transpose to different keys. There were others that were ornately designed such as one by Collard & Collard in mottled oak and gold inlay in the Louis XV style.[4]

Davis' conclusion that appearance was uppermost has presumably been reached because the examples cited happen to support the statement being made. It appears, however, that the pianos used to illustrate the point have been selected on a random basis and in no way reflect the diverse character of the piano section as a whole.

---

[2] Tim Barringer, 'Sonic Spectacles of Empire: the Audio Visual Nexus, Dehli-London, 1911-12', in Elizabeth Edwards, Chris Gosden and Ruth B. Phillips, ed. *Sensible Objects: Colonialism, Museums and Material Culture* (Oxford: Berg, 2006), pp.169-97.
[3] Michael Musgrave, *The Musical Life of the Crystal Palace* (Cambridge: Cambridge University Press, 1995), p.9.
[4] John R. Davis, *The Great Exhibition* (Stroud: Sutton Publishing Limited, 1999), p.148.

Although scholars have established that the Exhibition did serve as a forum for advertising (and accordingly visitors would have looked at pianos with the possibility of acquisition in mind), how different classes of visitors would have understand exhibitors' claims that their goods were 'cheap', has yet to be explored. Using an arithmetical approach, I will look at a range of incomes associated with different occupations, levels of expenditure, separating out necessary and luxury items, in order to determine the likely surplus remaining. Findings here offer an important contribution to existing scholarship concerning whether or not the event was inclusive of the working classes. The piano also illuminates a complex world of knowledge surrounding judicial decisions, characterised by musical preference, personal associations and national loyalties, something which has been passed over in existing scholarship. The Exhibition piano also has much to say about how the instrument was understood both as an eye-catching status symbol and as a medium of sound. Findings indicate that there is no one answer to the question of which was uppermost; how the piano was experienced was a shifting field in which value changed from person to person.

My findings are not simply an unequivocal endorsement of assertions by exhibition scholars that the Great Exhibition had multiple meanings but offer new routes by which the event can be understood. My findings contribute not just to Sound Studies, a sub-discipline of musicology, but also to the New Organology, a field which is as yet in its infancy, as well as to material culture studies, social, economic and consumer history. Instead of focusing exclusively on the grand narrative of the Exhibition, as most scholars do, I have tried to extract what James Buzard describes as 'sub-narratives', which in the case of his work examines the impact of the Commissioners' decision to change from a spatial plan dictated by object-type to one determined by geography.[5] I am not suggesting that my findings concerning the piano are necessarily transferrable to other object-types but my approach, which focuses upon a single product, is conducive to achieving an understanding of the Exhibition from multiple perspectives.

---

[5] James Buzard, 'Conflicting Cartographies: Globalism, Nationalism and the Crystal Palace Floor Plan, in James Buzard *et al*, ed. *Victorian Prism: Refractions of the Crystal Palace* (Charlottesville & London: University of Virginia Press, 2007), pp.40-52, here p.42.

1.2: Literature Review

1.2.1: The piano at the Great Exhibition

Although the place of the piano at the Great Exhibition has already been considered, most writers approach the topic in a narrative style giving only brief details. David Wainright's book *The Piano Makers* describes some of the pianos found in the British section, although no justification is given for his choices. The work erroneously claims that Steinway were present in 1851, which is presumably a mistake, as they did not in fact make an appearance on British soil until 1862.[6] In his history of Broadwood, Wainright outlines the catastrophe suffered by the company when their Council Medal was revoked, yet offers no opinion as to why the decision was made.[7] David Crombie devotes two pages to pianos displayed at the Great Exhibition chiefly in the form of visual evidence. Photographs of Lambert & Co's gilded piano, Pugin's gothic upright piano and a grand piano by the Austrian maker Schneider beautifully encapsulate the appearance of these instruments, although no analytical commentary is offered.[8] The only publication that focuses specifically on musical instruments at the Great Exhibition is Peter & Ann Mactaggart's publication *Musical Instruments in the 1851 Exhibition* which is basically a transcription of relevant entries in *The Official Descriptive and Illustrated Catalogue* coupled with other contemporary sources which refer to pianos.[9] The work, however, offers some insight into the problems inherent in certain types of evidence and is an invaluable starting point for anyone wishing to explore this object-type in more detail. Whether or not so-called 'cheap' Exhibition pianos were financially accessible to visitors is addressed briefly in Cyril Ehrlich's *The*

---

[6] David Wainright, *The Piano Makers* (London: Hutchinson & Co Ltd, 1975), pp.98-104.
[7] David Wainright, *Broadwood by Appointment: A History* (London: Quiller Press Ltd, 1982), pp.167-8.
[8] David Crombie, *The Piano* (London: Balafon Books, 1995), pp.46-7.
[9] Peter and Ann Mactaggart, *Musical Instruments in the 1851 Exhibition: a Transcription of the Entries of Musical Interest from the Official Illustrated Catalogue of the Great Exhibition of the Art and Industry of All Nations, with Additional Material from Contemporary Sources* (Welwyn: Mac & Me, 1986).

Piano: a History. His assessment that Collard's christening of their budget piano as being 'for the people' was a misnomer (as 30 guineas was not an affordable amount), is in-keeping with my own findings. Ehrlich's claim appears, however, to be based on income data for just three occupations with no consideration of likely expenditure.[10] My work will attempt a more thorough investigation utilising newly available evidence unearthed by economic historians since the publication of Ehrlich's work in 1976.

The only exclusively object-based study of the Exhibition to date, namely Nikolaus Pevnser's *High Victorian Design*, focuses on mid-century taste using a selection of aesthetically attractive exhibits as focal points for discussion. No justification is given for the choices made, however, and although Pevsner includes three pianos in his discourse, namely Pirsson's double grand piano, Erard's oblique upright piano and an upright piano by Collard, why these have been selected over other examples is unknown. Pirsson's piano is described simply as an example of a 'novel and tricky gadget'. The other two instruments are discussed in the context of historical style, one demonstrating the Elizabethan, the other the Rococo.[11] Objects are of course mentioned in most Exhibition accounts, as a means of orientating the reader to the layout of the building, and as a spring-board for discussing wider issues. Jeffrey A. Auerbach, for example, describes objects within the four main classificatory divisions, touching on various topics along the way including imperialism, spectacle, education and taste. He also draws the reader's attention to objects with a specific social or nationalistic agenda.[12] Davis, on the other hand, takes his readers on a geographical tour starting in the British section describing the contents of each class in turn, then moving to the foreign section discussing the products of each participating nation.[13]

---

[10] Ehrlich, *The Piano: A History*, p.10 and pp.39-41. Ehrlich repeats the point that a 30 guinea piano was hardly cheap when skilled craftsmen were earning just 30 shillings per week in his lecture *Social Emulation and Industrial Progress: the Victorian Piano* (Belfast: The Queen's University, 1975), p.11.

[11] Nikolaus Pevsner, *High Victorian Design* (London: Architectural Press, 1951), p.45 and pp.71-2.

[12] Jeffrey A. Auerbach, *The Great Exhibition: A Nation on Display* (New Haven & London: Yale University Press, 1999), pp.98-114.

[13] Davis, *The Great Exhibition*, pp.135-58.

The main advantage of this approach employed in the two main revisionist works to date, both of which were published in 1999, is that all object-types are considered in light of overarching principles. The main disadvantage is that it encourages a 'pick-and-mix' type approach where random examples are singled out for analysis and are thus assumed to represent one particular object-type. The main advantage of my method is that a single object-type, in all its diversity, is used as a yardstick against which to evaluate the taste of different user groups. The chief disadvantage of focusing on just one object-type is that some findings are exclusive to that item and therefore inapplicable to a broader range of products. Whatever the drawbacks, the method invites further study using different objects as a focal point, offering an alternative investigative tool to those commonly used. The study also presents a new approach to material culture studies, one where the object, in all its facets, can be used to explore and evaluate an event.

1.2.2: Great Exhibition Scholarship

As I have already explained, the main ways in which my work departs from existing scholarship is that it examines how sound, judging and professional knowledge, materiality, and pricing (relative to visitor purchasing power) may have shaped experience. Additionally, my work contributes to topic areas addressed by Exhibition historians: vision, learning and entertainment, consumption, classification and spatial display, imperialism and the inclusion, or otherwise, of the working classes (both as visitors and exhibitors) are all discussed. On a more minor note, my work questions assumptions made by furniture historians that exhibits were not in character with those products manufactured on a daily basis and that display items were decorated to the extent that their utility was frustrated.[14]

Whether visitors attended the Exhibition to be entertained or educated, and how they navigated the Exhibition in visual terms, is a topic where scholarly opinion differs. Tony Bennett's notion that the Exhibition was essentially a power tool to control the masses lends itself to the idea that

[14] Elizabeth Aslin, *Nineteenth-Century English Furniture* (London: Faber & Faber, 1962), n.p; Simon Jervis, *Victorian Furniture* (London & Sydney: Ward Lock & Co Ltd, 1968), p.13.

people were objectified; that they were as much a part of the display as the exhibits.[15] If surveillance was in fact uppermost, however, this implies that exhibits would have been of secondary importance, something which my study seeks to contradict. The main advocate of spectacle is Thomas Richards, whose work promotes the idea that after 1851 the commodity was rocketed to the forefront of public awareness. The Exhibition fed an existing appetite for visual drama, for consumption, and was therefore more about pleasure than learning.[16] This approach is also largely incongruous with my line of enquiry, as visitors could not have experienced fleeting pleasure through briefly glimpsing an object whilst at the same time examining its construction and comparing it with similar products. Those who perceive visitors to have adopted a didactic approach include Auerbach and Andrea Hibbard. Auerbach agrees with Mayhew's assertion that the Exhibition was essentially a school for those wishing to learn about industry.[17] Hibbard discusses the Exhibition experience in terms of the early-nineteenth-century notion of rational recreation, a concept which by mid-century was essentially a desire to make all pursuits useful. It was also a means by which the middle classes could disassociate themselves from the more superficial attitudes of their upper-class counterparts.[18]

My work leans towards the third interpretation, that learning was both an intended and perceived outcome. Some accounts suggest that detailed inspections were made, others that details of design were noted, others that demonstration was significant. Both Andrew H. Miller and Richards claim that objects were only accessible via the eye, through passive observation, something that my research suggests is incorrect.[19] There is evidence that pianos were played, both to and by visitors, indicating that the ear and the touch were also at work. Rachel Teukolsky's observations that visual

---

[15] Tony Bennett, 'The Exhibitionary Complex', in Vanessa R. Schwartz and Jeannene M. Przyblyski, ed. *The Nineteenth Century Visual Culture Reader* (London & New York: Routledge, 2004), pp.117-30.
[16] Thomas Richards, *The Commodity Culture of Victorian England: Advertising and Spectacle, 1851-1914* (Stanford: Stanford University Press, 1990), pp.17-72.
[17] Auerbach, *The Great Exhibition of 1851*, pp.98-107.
[18] Andrea Hibbard, 'Distracting Impressions and Rational Recreation at the Great Exhibition', in Buzard *et al*, ed. *Victorian Prism*, pp.151-67, here pp.158-62.
[19] Andrew H. Miller, *Novels Behind Glass: Commodity Culture and Victorian Narrative* (Cambridge: Cambridge University Press, 1995), p.57; Richards, *The Commodity Culture of Victorian England*, p.32.

technique was dependent on knowledge, specifically whether the onlooker was amateur or professional, are applicable to the piano. She identifies two types of exhibit where the distinction between expert and amateur was especially prominent, namely the statuary and the Medieval Court.[20] My research shows that there was an obvious difference between how instruments were visually examined, depending on whether or not the visitor was possessed of technical knowledge. What is less clear, however, is how different audiences 'heard' what was played.

The next main bone of contention between scholars is whether or not the Exhibition was inclusive of the working classes either in their capacity as exhibitors or visitors. The distinction between working-class labourers and artisans is difficult to pinpoint with accuracy but clues contained in contemporary sources are explored in detail in Chapter 2. The boundary between working and middle classes is equally difficult to determine but definitions offered by economic historians, detailed in Chapter 6, are of some assistance. The essence of conclusions reached on this subject is that findings depend largely upon what sources are consulted. Evidence in this matter is very difficult to interpret; there are even instances where scholars looking at identical sources have reached different conclusions. Lara Kriegel and Miller, for example, both base their arguments on evidence from *The Art Journal Illustrated Catalogue.* Whereas the former claims that the publication draws attention to artisan labour, the latter asserts that 'objects stand in solitary glory' with no reference to their creators.[21] Having explained that the Exhibition was praised by contemporary writers as a demonstration of class harmony, Peter Gurney then cites excerpts from the radical press which contradict this view. Both *Reynolds Newspaper* and *The Northern Star* were openly critical not only of the Exhibition itself but of other publications which uncritically extolled its merits.[22] Both Auerbach and Miller present an array of

---

[20] Rachel Teukolsky, 'This Sublime Museum: Looking at Art at the Great Exhibition', in Buzard *et al*, ed. *Victorian Prism*, pp. 84-100, here pp.87-9 and p.94.
[21] Lara Kriegel*, Grand Designs: Labour, Empire and the Museum in Victorian Culture* (Duke University Press, 2007), p.95; Miller, *Novels Behind Glass*, pp.76-8.
[22] Peter Gurney, 'An Appropriated Space: The Great Exhibition, the Crystal Palace and the Working Class', in Louise Purbrick, ed. *The Great Exhibition of 1851: New Interdisciplinary Essays* (Manchester & New York: Manchester University Press, 2001), pp.114-45, here pp.116-21.

conflicting evidence, some suggesting that working-class people were accepted, others that such welcome was purely superficial. Although Auerbach offers no definite conclusion, he does highlight the fact that visitor behaviour was class specific; notwithstanding that all ranks of society were present under the same roof, they were separated by their actions.[23] Miller, on the other hand, concludes that working-class involvement was ultimately a facade on the grounds that artisan workers were not permitted to benefit financially from their inventions.[24]

My contribution to this debate is to argue that if labelling an object as 'cheap' or 'economical' was an indication of what was considered affordable for visitors, then (in the case of the piano) working-class people were not in a position of equality with middle and upper classes. Admittedly cheapness was introduced as a judging criterion as a concession to makers who were unhappy that pricing goods was prohibited. The concept may also have been introduced to reinforce British capacity for producing low-cost mass-produced goods in contrast to the European preoccupation with quality. Whatever the reason for its inception, however, the result (I will argue) was that visitors from the lower end of society would have felt excluded due to their inability to acquire the goods displayed.

Another area for debate amongst Exhibition scholars concerns the classificatory system and its practical application. With the exception of Davis, most agree that the latter did not reflect the former and that there was no way in which the exhibits could be investigated in the manner intended. [25] Buzard, for example, goes so far as to describe the relationship between the taxonomy and its physical layout as a 'yawning chasm'.[26] That the classificatory system was the result of compromise reflecting the interests of different parties is also common ground. Steve Edwards, for example, describes the classificatory system as a compromise between organisers and makers; the transition from a three-point to a four-point plan was based on the need to secure support from the manufacturing districts. Auerbach

---

[23] Auerbach, *The Great Exhibition of 1851*, pp.156-8.
[24] Miller, *Novels Behind Glass*, pp.77-8.
[25] Davis, *The Great Exhibition*, pp.106-7.
[26] Buzard, 'Conflicting Cartographies', in Buzard *et al*, ed. *Victorian Prism*, pp.40-52, here p.44.

believes the system represented an amalgamation of interests, namely those of Albert, various scientists and visitors, both as learners and consumers.[27] Some scholars, however, abandon classification and spatial display altogether, concentrating instead on alternative organisational principles. Miller explores the possibility that relationships between products were based on class, gender and nationalistic associations.[28] Eileen Gillooly explores the idea that various rhetorical methods such as analogy, repetition, personification and antithesis may have been used as a tool for comparing and contrasting products.[29] As well as reinforcing the accepted notion that industry could not be comprehensively classified at mid-century, my study ventures into new territory as it postulates how the Exhibition might have been understood had the organisers adhered to their original spatial plan. The possibility is suggested by Buzard; the application presents an alternative picture in which the role of materiality is made apparent.[30]

My study makes one final contribution to Exhibition literature in that it explores how certain pianos were an embodiment of Britain's trading relationship with her colonies and foreign nations. Imperialistic interpretations of the Exhibition emerged in the 1990s and there is currently universal agreement amongst revisionist historians that colonial voices were silent.[31] I will argue that had spatial arrangement been deployed so as to promote process rather than the end-product it is likely the contribution of the colonies would not have been designated as secondary to those of Britain, Europe and America. The subtext highlighted in Kate Flint's essay 'Exhibiting America', namely that western products were understood to be the apotheosis of indigenous raw materials, is visible, but would have been more prominent if exhibited within an alternate materiality.[32] My findings also verify

---

[27] Auerbach, *The Great Exhibition of 1851*, pp.93-4.
[28] Miller, *Novels Behind Glass*, p.10.
[29] Eileen Gillooly, 'Rhetorical Remedies for Taxonomic Troubles: Reading the Great Exhibition', in Buzard, *et al*, ed. *Victorian Prism*, pp.23-39, here pp.25-32.
[30] Buzard, 'Conflicting Cartographies', in Buzard, *et al*, ed. *Victorian Prism*, pp.40-52, here p.45.
[31] Louise Purbrick, 'Introduction', in Purbrick, ed. *The Great Exhibition*, pp.1-25, here pp.17-9; Auerbach, *The Great Exhibition of 1851*, pp.100-1; Davis, *The Great Exhibition*, p.161.
[32] Kate Flint, 'Exhibiting America: The Native American and the Crystal Palace', in Buzard *et al*, ed. *Victorian Prism*, pp.171-85, here p.181.

assertions by Kriegel that Britain was dependent upon other nations in a way that was masked by the Exhibition narrative that prevailed.[33]

1.2.3: Piano History Scholarship

Within this area of scholarship, my work seeks to establish the extent to which piano makers were influenced by social and economic forces, whether they used primarily visual or aural techniques to develop their instruments, and what, if any, was the relationship between the technology of the interior and the physicality of the exterior. The question of affordability has already been mentioned, but in addition to Ehrlich's substantive work on the subject, Arthur Loesser's book *Men, Women and Pianos* contains a short essay discussing piano-ownership in nineteenth-century Austria. Though brief, the approach is similar to mine, as Loesser looks at what makers charged for different piano types and what levels of income citizens had at their disposal.[34] Claims by the same author and others, such as Annalyn Swan, that pianos were accessible to the lower-middle classes in the first half of the nineteenth century are shown to be incorrect.[35] My research indicates that pianos were a luxury item at mid-century, although given the economic trajectory of the decades prior to 1851, and the diverse criteria within which individuals could be categorised as middle class, what would have been deemed 'cheap' at mid-century, in class terms, is a complex question. The relationship between price and decoration in the nineteenth-century upright piano is discussed briefly by Rosamond E. M. Harding, although little or no use is made of the manufacturers' price lists contained in Appendix F.[36]

Works which discuss aesthetic design do so chiefly by way of narrative examples or passing footnote. Albert Dolge's *Pianos and their Makers*, for example, contains a list of extravagant instruments designed

---

[33] Lara Kriegel, 'Narrating the Subcontinent in 1851: India at the Crystal Palace', in Purbrick, ed. *The Great Exhibition of 1851*, pp.146-78, here pp.154-6.
[34] Arthur Loesser, *Men, Women and Pianos: a Social History* (London: Gollancz, 1955), pp.142-4.
[35] *Ibid*, p. 236; Annalyn Swan, 'Enlightenment's Gift to the Age of Romance: How the Piano Came to Be', in James R. Gaines, ed. *The Lives of the Piano* (New York: Holt, Rinehart & Winston, 1981), pp.41-73, here p.41.
[36] Rosamond E. M. Harding, *The Piano-forte: its History Traced to the Great Exhibition of 1851* (Old Woking: Gresham Books, 1978), pp.302-5 and pp.393-402.

specifically for wealthy patrons.[37] Ernest Closson's brief analysis suggests that the question of decoration detracts from the importance of technology.[38] The need for research into the significance of piano design was identified in 2005 by Maximiliaan Rutten but to date, with the exception of Graham S. Gadd's work *The British Art Piano and Piano Design: The Handiness of an African Elephant*, no-one has responded to this lacuna in piano scholarship.[39] Most organological works focus principally, if not exclusively, on technological developments. Discussions may take the form of historical chronology, evolution of a particular piano type or development within a particular country. Good's aforementioned *Giraffes, Black Dragons and Other Pianos* is the main study published in recent years and Harding's acclaimed work *The Piano-forte: its History traced to the Great Exhibition of 1851*, first published in 1932, is also worthy of mention. Some studies focus on specific makers, most notably Alastair Laurence's work on the development of the Broadwood grand piano from 1785-1998.[40] The problem with this approach is that it frequently fails to consider the wider context in which such developments take place giving the impression that technological change takes place in a social and economic vacuum.

The main departure from this method can be found in scholarship which considers how piano makers responded to changing musical fashion. Writers including Harding, William Sumner and Derek Carew discuss how piano makers responded to the public taste for Battle and Storm music in the early nineteenth century by adding various stops and pedals to their instruments enabling the performer to achieve the necessary sound effects.[41] According to Harding this was a phenomenon driven primarily by amateur pianists; she notes that there was opposition to this trend from the

---

[37] Alfred Dolge, *Pianos and their Makers: a Comprehensive History of the Development of the Piano* (New York: Dover Publications Inc, 1972), p.187.
[38] Ernest Closson, *History of the Piano*, ed. Robin Golding, trans. Delano Ames (London: Paul Elek, 1947), pp.113-4.
[39] Maximiliaan Rutten, 'The Art Case Piano', *The Galpin Society Journal, 58* (2005), 168-72, here 171; Graham Gadd, *The British Art Piano and Piano Design: The Handiness of an African Elephant, Volume 1* (Very Yellow Press, 2006).
[40] Alastair Laurence, *The Evolution of the Broadwood Grand Piano 1785-1998* (University of York: Unpublished D.Phil Thesis, 1998).
[41] William Leslie Sumner, *The Pianoforte* (London: MacDonald & Co, 1971), pp.57-62; Harding, *The Piano-forte*, pp.112-50; Derek Carew, *The Mechanical Muse: the Piano, Pianism and Piano Music, 1760-1850* (Aldershot: Ashgate, 2007), pp.105-7.

professional fraternity. Some historians have considered the relationship between the evolution of the grand piano and composers' needs, although no definitive conclusions have been reached. Good is dismissive of claims that Beethoven's compositional style forced piano makers to increase the range of their instruments, although he accepts that Dussek may have influenced Broadwood and Moscheles may have influenced Erard.[42] Ehrlich, on the other hand, presents evidence from Beethoven's piano sonatas to suggest that he was in fact limited by the notational range on offer. Clearly a wider compass was needed, though whether or not Beethoven was the catalyst for change is impossible to substantiate.[43] Good is also hesitant to embrace claims that the repetition action was invented in response to the rise of bravura playing and the growing demand for arrangements of orchestral works suitable for home performance.[44] Comparing Good with David S. Grover illustrates the problem of what is essentially a 'chicken-and-egg' argument. Whereas Good states that the increasing popularity of public concerts necessitated bigger venues, which in turn demanded instruments capable of producing a bigger sound, Grover claims that it was the emergence of a more powerful piano which made larger scale concerts more viable.[45] That piano makers, musicians and concert life were interdependent is clear although attempting to establish who influenced whom is ultimately a fruitless exercise.

My study broaches some new questions, such as how makers sought to improve sound, whether they relied principally on visual or auditory methods to improve and record their methods, and what understanding they might have had of acoustical science. It questions Richard Leppert's contention that nineteenth-century piano design was connected solely with middle-class female lifestyle. [46] Although there is evidence that domestic pianos, specifically uprights, were designed to better accommodate the physicality of the performer (this is briefly discussed by Sumner, Good and

---

[42] Good, *Giraffes, Black Dragons and Other Pianos*, pp.92-3.
[43] Ehrlich, *The Piano: A History*, p.24.
[44] Good, *Giraffes, Black Dragons and Other Pianos*, pp.169-71.
[45] Ibid, p.118; David S. Grover, *The Piano: its Story from Zither to Grand* (London: Hale, 1976), pp.127-8.
[46] Richard Leppert, *The Sight of Sound: Music, Representation and the History of the Body* (Berkeley & Los Angeles: University of California Press, 1993), p.134.

Grover in connection with William Southwell's 'sloping piano' invented in 1811) opinion differs regarding whether this was more to do with facilitating musical performance or making the best of a courtship opportunity.[47] Whilst I agree that the need for performer visibility partially shaped the development of the upright piano I will show that economy and taste were also factors in the equation. The significance of the piano exterior is also considered in relation to how the interior mechanism was adapted. Most scholars who comment on piano casing do so only in connection with sound production in grand piano design. Some, such as Louis Kentner, go so far as to dismiss upright piano casing as having 'no artistic justification whatsoever', a statement which needs re-evaluation.[48] The closest precedent for my work is Richard Leppert's 'Material Culture and Decentred Selfhood', an essay which explores, in part, how the exterior design of an Erard grand piano commissioned by the Foley family in 1840 reflected family status.[49]

Although a nod has been made towards exploring the relationship between sight and sound in existing scholarship, in most cases unusual physical characteristics are made secondary to the main technological discourse. Closson, Harding, Loesser and others all mention the existence of pianos serving also as tables, bookcases and other types of furniture but, aside from well-acknowledged conclusions that such designs were intended to save space or offer the consumer a bargain by incorporating more than one function, little is made of this duality.[50] Whereas some piano historians acknowledge that the mid-century piano served a dual function, others assume that the piano in a domestic setting was simply regarded as furniture. In his aforementioned work, David Crombie makes the following claim:

> Many homes acquired a piano for show, with little intention that anyone in the family would actually learn to play it. For that reason, some

---

[47] Sumner, *The Pianoforte*, pp. 66-7; Grover, *The Piano: its Story from Zither to Grand*, pp.132-8; Good, *Giraffes, Black Dragons and Other Pianos,* p.144.
[48] Louis Kentner, *Piano* (London: MacDonald & Janes, 1976), p.18.
[49] Richard Leppert, 'Material Culture and Decentred Selfhood (Socio-Visual Typologies of Musical Excess)', in Stan Hawkins, ed. *Critical Musicology Reflections: Essays in Honour of Derek B. Scott* (Farnham: Ashgate, 2012), pp.101-25, here pp.101-5.
[50] Closson, *History of the Piano*, p.120; Harding, *The Piano-Forte*, p.228, p.236, p.239 and p.264; Sidney Harrison, *Grand Piano* (London: Faber & Faber, 1976), p.173; Oscar Bie, *A History of the Pianoforte and Pianoforte Players*, trans. E. E Kellert and E. W Naylor (New York: Da Capo Press, 1966), p. 313; Jeremy Siepmann, *The Piano* (London: Carlton Books Ltd, 1996), pp.18-9.

> manufacturers tended to produce instruments that looked far better than they sounded. Tone and playability took second place to appearance.[51]

My study seeks to displace this perception in favour of a shifting pattern of values whereby the piano was understood as both sound producer and aesthetic object in varying measures by different audiences.

1.3: Identifying problems with sources

1.3.1: Introduction

Moving from secondary to contemporary sources, my work relies upon publications produced expressly for the Great Exhibition together with a variety of other sources addressing matters which have no direct connection with the Exhibition but which shed light on audience knowledge and 'habitus'. Items in the former category include publications such as *The Official Descriptive and Illustrated Catalogue* (referred to hereafter as *ODIC*), *The First Report of the Commissioners*, *The Report of the Juries*, and Exhibition prospectuses. These sources provide valuable insight into what was displayed, rules and regulations governing exhibitor conduct, which medals were awarded to whom and why, and how exhibits compared with makers' ordinary stock-in-trade in terms of design and price. It also includes eye-witness accounts written by journalists and members of the public who documented their experiences, and diaries recording the impressions of Exhibition judges. Items in the latter category, with no immediate connection to the Exhibition, include a diverse range of sources such as letters between makers and their customers, price lists, makers' records documenting details of particular pianos, household advice manuals, piano teaching primers, discourse on the science of sound production, letters documenting experiences of urban noise, novels, iconography and material evidence from surviving pianos.

The advantage of Exhibition publications is the level of detail they contain; the disadvantage is that they are not self-critical and there is no sense in which the reader can determine whether or not the decisions made

[51] Crombie, *Piano*, p.45.

were successful. Eye-witness accounts are valuable in that they offer unique insight into the Exhibition experience and are generally candid in the manner of their reportage; their weakness is that it is sometimes difficult to establish what personal agenda may have governed the writer's comments. General sources which shed light on matters such as customer priorities, piano construction, pricing, piano teaching, and the sight and sound of the piano within the home are all valuable because they help illuminate what level of knowledge and what sort of preferences visitors may have had before they entered the Exhibition. The difficulty with letters, however, is that the conversation is generally one-sided; there is no way of knowing precisely why the letter was written or what response was elicited. The problem with publications purporting to advise members of the public on household matters is that is it difficult to establish how widely they were read or whether the advice was actually followed. Evidence found in fictional sources is transparent, free from the censorship which undoubtedly characterised some diaries of this period, yet there is no way of establishing the extent to which events are rooted in the author's experience or his or her imagination.

1.3.2: Exhibition literature and eye-witness accounts

The *ODIC* is an important source of data for my study and forms the basis of the table set out in Appendix A. It is valuable as it clarifies the status of exhibitors and their province or country of origin; that most were present in the capacity of manufacturer or inventor suggests that merchants and retailers were discouraged from attending. In some instances, *ODIC* entries also specify details of the invention presented, the historical design utilised or the materials used to make piano casing. The source is, however, problematic for a number of reasons.

Firstly, because exhibitors did not employ a uniform approach in terms of how they described their instruments, the amount of information about each piano differs greatly. Deacock, for example, described their contribution simply as 'a pianoforte'. Robert Allison's catalogue entry, however, was considerably more detailed:

> A walnut-wood registered cottage pianoforte – the keys of the finger board being alternated in colour, to show all the scales, major and minor, according to a single rule for each mood, founded on the place of the semi-tonic interval, which renders the seven notes to be touched for an octave of each of the other eleven scales, as evident as the scale of C.

Secondly, it is difficult to ascertain what piano types were displayed because such wide-ranging terminology was used. In addition to the three main terms used to describe upright pianos, namely 'cabinet', 'cottage' and 'piccolo', instruments were also referred to as 'microchordan', 'boudoir', 'semi-cottage' and 'semi-cabinet'. The situation is further confused by the fact that different sources do not use the same term for the same instrument. Whereas the piano historian E. F. Rimbault, writing nine years after the Exhibition, referred to an entry by the Irish piano maker McCulloch as a 'cottage', William Sterndale Bennett described the same instrument as a 'piccolo' in his Exhibition diary.[52] Whereas the *ODIC* described entries by the Danish maker Hornung as 'a cabinet and a horizontal', *Newton's London Journal* referred to the same instruments as 'a grand and a square'.[53]

Thirdly, it is only possible to selectively establish what pianos looked like because only a few are shown in engravings. There is no direct evidence to determine why some were given this honour, although David Wainright does make an unreferenced claim that Erard supplied their own picture of their Elizabethan oblique upright.[54] If this assertion is correct then whether or not a picture was published in the *ODIC* was down to the makers' initiative. Fourthly, it is impossible to ascertain precisely how many pianos each maker brought. Pianos are often referred to in the plural without any further details being given and sometimes eye-witness accounts contradict the *ODIC*. Whereas *Newton's London Journal* states that the Russian maker Lichtental brought two pianos, the *ODIC* entry describes just one instrument. Looking at the list of prizes set out in Appendix A, the difficulty of accurately assessing the number of pianos shown is further evidenced by differences

---

[52] E. F. Rimbault, *The Pianoforte: its Origin, Progress and Construction* (London: Robert Cocks & Co, 1860), p.218; William Sterndale Bennett, *Exhibition Diary, 1851,* Royal Commission Archives, RC/I/25 (unpaginated)
[53] W. Newton, *The London Journal of Arts, Sciences and Manufactures and Repertory of Patent Inventions, Volume 39* (London: W. Newton, 1852), p.45.
[54] Wainright, *Broadwood by Appointment*, p.166.

between numbers stated in the *ODIC* and in the medal table in *The Report of the Musical Jury*. Both Herz and Montal received awards for four pianos when their respective *ODIC* entries listed only three instruments. F. Berden & Co received an honourable mention for three cabinet pianos when the *ODIC* entry specified only one such piano-type.

Looking at sources outside the *ODIC*, such as Sterndale Bennett's diary and various newspaper reports, it becomes apparent that not all the pianos allocated space at the Exhibition had a corresponding entry in the *ODIC*. It is likely there were far more makers and pianos present than officially documented. Establishing a true picture of what was shown both in the British half of the building and on the Foreign side is relevant to establishing the relative popularity of different piano types, which makers had the biggest physical presence and how different nations contributed proportionately to the overall display as discussed in Chapter 2. Rimbault states that 191 pianos were shown by 106 makers, a total which he then subdivides into three categories, namely 56 grand, 19 square and 116 upright.[55] Figures reported in *The Report of the Musical Jury* are more conservative and less detailed, recording that 102 makers exhibited a total of 178 pianos.[56] William Pole's publication *Musical Instruments in the Great Industrial Exhibition* claimed that 173 pianos were shown by 101 makers.[57] According to my research set out in Appendix A, a far greater number of exhibitors (totalling 123 British and foreign makers) were present, collectively exhibiting upwards of 194 items, a total which includes hand-strengthening aids and tuning devices. I have not offered a breakdown of different piano types because I do not believe it is possible to do so, indeed it is a mystery how Rimbault was able to divide his list into three categories. The lack of detail provided by the exhibitors, uncertainty as to the number of instruments presented and a lack of standardised terminology make such assessment impossible.

The Official Catalogue, which was the precursor of the detailed *ODIC*, was the only guide to offer visitors a complete account of exhibits. Given that

---

[55] Rimbault, *The Pianoforte*, p.220.
[56] *Reports by the Juries on the Subjects in the Thirty Classes into which the Exhibition was Divided* (London: William Clowes & Sons, 1852), p.328.
[57] William Pole, *Musical Instruments in the Great Industrial Exhibition* (London, 1851), p.23.

it was very widely read, selling 300,000 copies over a five-month period, Exhibition-goers were given the opportunity to select from an exhaustive list.[58] So far as other guides were concerned, whether or not pianos were included was dictated by each author's preferences. Robert Hunt's *A Companion to the Official Catalogue*, which sold 84,000 copies together with over 5,000 copies translated into French, recommended a visit to the philosophical instrument department.[59] Others, for example, 'A Lady's Glance at the Great Exhibition', a guide published in six parts in *The Illustrated London News*, advised their readers to focus exclusively on jewellery, textiles and clothing.[60] Many of the guides available included a plan of the building, which was an important tool to help those seeking particular object-types. The version found in *The Official Catalogue*, which is copiously annotated and even includes a list of exhibits displayed in public walkways, can be found at the very beginning of my work (Fig 1.2).

Most eye-witness accounts have been drawn from Geoffrey N. Cantor's recently published *The Great Exhibition; a Documentary History*, which offers a rich repository of sources written by a wide range of audiences, both British and Foreign, in a variety of styles. Cantor admits that the resource could be made many times larger, such is the quantity of untapped information still lying undiscovered in archives around the world. Choices of what to include and exclude have been made with a view to providing the reader with as wide a range of authors and styles as possible.[61] Cantor's work is especially valuable because in most instances he provides biographical details of the authors concerned and, in the case of official publications, offers some clues as to their readership. Whether or not an account happens to mention pianos, music or sound is really a matter of luck, for such was the scale of the Exhibition that very few visitors had either the time or the inclination to visit all departments. Some visitor accounts offer lists of objects seen (pianos may or may not feature), some give general

---

[58] Geoffrey Cantor, *The Great Exhibition: a Documentary History in Four Volumes*, *Volume III* (London: Pickering & Chatto, 2013), p.1
[59] *Ibid*, *Volume III*, p.2
[60] *Ibid*, p.2
[61] *Ibid*, *Volume 1*, p.xvi.

impressions of the environment, some are preoccupied with fellow visitors, some focus on specific objects of interest.

Newspapers are an important source of eye-witness accounts but it is important to recognise that each had its own political affiliation; the way in which the Exhibition was reported reflected the underlying values of the publication in question. Protectionist newspapers and radical newspapers were both suspicious of the Exhibition, though for different reasons. The former tended towards silence, choosing simply not to comment on developments within the Crystal Palace, whereas the latter was generally critical, focusing on what went wrong rather than what was beneficial. My main sources cover a range of political perspectives: *The Morning Post* had Tory leanings, both *The Morning Chronicle* and *The Daily News* were liberal publications, and *The Times* was aimed primarily at the industrial classes.[62] The reason newspaper accounts are so valuable is that reporters were charged with the task of investigating as many different types of exhibit as possible. Representatives from *The Morning Chronicle*, for example, who were in attendance on a daily basis throughout the Exhibition, ventured an opinion concerning each and every object-type in detail. With the significant exception of *Newton's London Journal*, edited by the engineer Dr William Pole, it is reasonable to assume that none of the journalists who wrote accounts of Exhibition pianos were possessed of any particular technical or musical knowledge.[63]

1.3.3: Some problems with general source-types

One of the evidential difficulties outlined in Mactaggart's publication *Musical Instruments in the 1851 Exhibition* is the lack of surviving Exhibition pianos. As the particulars of most Exhibition pianos are scant, however, I believe it is reasonable to assume that they would have shared at least some features common to surviving instruments of the period. The scope for

[62] Auerbach, *The Great Exhibition of 1851*, pp.67-9.
[63] Newton's London Journal, Volume 39, was reprinted in William Pole's aforementioned publication *Musical Instruments in the Great Industrial Exhibition of 1851*. The latter is virtually identical to the former save that *Musical Instruments in the Great Industrial Exhibition* contains a brief history of the development of the piano together with an account of its construction, pp.1-16.

criticism here is obvious and is accepted. Nevertheless, given that piano makers were known to have trained individuals who then set up on their own and that makers are known to have copied one another, I believe the assumption in reasonable. Accordingly I have examined, and derived physical evidence from, a variety of pianos in both public and private collections throughout Britain, Europe and America dating from approximately 1830-1860.

A further difficulty lies in establishing whether or not visitors read and followed the sources which I will argue formed the basis of taste and domestic musical life. Were publications advising people how to learn to play the piano, how to decorate and furnish their homes, how much to spend, actually observed? Although it is very difficult to determine whether guidelines were followed in practice, it is possible to gauge the popularity of such publications based on whether or not they were re-published. In most instances, household advice manuals and piano teaching primers were published a second or even a third time, either in Britain or in America, suggesting a positive reader response in the first instance. John Claudius Loudon's *An Encyclopaedia of Cottage Farm & Villa Furniture*, first published in 1839, was republished with an additional supplement in 1842 and again after his death in 1867, edited by his widow. Walsh's *A Manual of Domestic Economy*, first published in 1857, made another appearance in England in 1874 and Webster & Parkes, *An Encyclopaedia of Domestic Economy*, first published in 1844, reappeared in America both in the following year and in 1855. Eleanor Margaret Geary's guide to learning the piano entitled *Musical Education* was published twice for a British audience in 1841 and 1851 while a translation of Carl Czerny's publication *Letters to a Young Lady*, originally published in England in 1839, was made available to American audiences in 1851.

My main archival sources are the Broadwood collection, which is the only surviving archive pertaining to a British piano maker, and the Erard collection, which is the only extant European resource for the mid nineteenth century. The former reside principally at the Surrey History Centre, although some additional data can be found amongst the Alfred J. Hipkins papers at The British Library. The latter are held at The Musée de la Musique in Paris,

although a valuable selection of letters dating from the year of the Exhibition can be found online at www.sebastienerard.org in digitised form. It must be emphasised, however, that findings from these sources are not necessarily representative of piano making in general. As will become evident, Broadwood were an elitist company, seeking to serve a wealthy client base and the professional market. Letters from provincial archives have been located using the *Access to Archives* search engine. This is a productive exercise only in instances where documents have been catalogued in sufficient detail to record references to pianos. I am certain that there are further pickings to be had, but these will become accessible only when collections are catalogued in more detail or when researchers have had opportunity to physically trawl archives for such resources.

I have used Charles Booth's cartographical study of late-nineteenth-century London because it offers a unique insight into the class status of occupants at addresses specified in my quantitative study which will be explained below. Booth's research was prompted by a desire to rectify what the author deemed was an inaccurate picture gleaned from other contemporary sources, including the press, who exhibited a tendency to sensationalise the growing problem of urban poverty. Booth was unhappy with the accuracy of census studies and with a population study conducted by Henry Hyndman in 1885. His findings were collated over a seventeen-year period, from 1886-1903, based on data gathered by School Board inspectors, the police and his own experiences in working-class homes.[64] The obvious criticism here is that findings based on a map published in 1899 may not necessarily reflect living conditions almost 50 years earlier. It is true that increasing industrialisation during the late nineteenth century would have led to considerable population growth, but the areas of London with which I am chiefly concerned were known to have been predominantly middle and upper class at the time of the Exhibition, something which appears to have still been the case in Booth's time.

In order to gain greater insight into piano ownership at mid-century I have carried out quantitative research using newspaper auction

[64] Charles Booth Online Archive, http://booth.lse.ac.uk/static/a/2.html#x (accessed 7 January 2016)

advertisements dating from January – December 1851, a small selection of which are set out in Appendix B. All examples have been taken from advertisements which stipulate that the goods for sale have been taken from one particular residence; advertisements containing a medley of items taken from a variety of sources have been disregarded for obvious reasons. Data has been extracted primarily from *The Daily News*, *The Morning Chronicle* and *The Morning Post* together with a few advertisements from *The Era* and *The Standard*. The majority of properties from which items are sold are in the London area although there are a few instances where chattels from provincial addresses are listed; one example in *The Daily News* reads 'Cannon Hill, Braywick, a short distance from the Maidenhead Railway Station – the valuable contents of the mansion and the outdoor effects – the property of Mrs Law deceased'. Advertisements vary considerably in terms of the amount of detail they contain and the format in which they are presented. Some give the precise address of the property (usually because the sale is due to take place on the premises) whereas others simply state the residential area in which the property is located; whereas an advertisement in *The Morning Post* informs readers that goods are to be sold from '11A Weymouth Street, Portland Place', an advertisement in the same paper states simply that items are for sale 'from a gentleman's residence'.[65] Some explain the circumstances in which chattels are being disposed of whereas others do not; one example in *The Daily News* states that personal effects are being sold 'by order of the proprietor giving up housekeeping' whereas an advertisement in *The Morning Post* states that the lease of the 'family mansion' is also available for purchase leaving the reader to draw their own conclusions.[66] The most informative advertisements give details of the make, piano-type, notational compass and casing material; an advertisement in *The Daily News* describes a '6 ¾ octave cottage piano by Mott'. In contrast, a similar entry in *The Morning Chronicle* informs readers only that a 'piano' is for sale.[67]

[65] *The Morning Post*, 15 March 1851; *The Morning Post*, 18 March 1851.
[66] *The Daily News*, 29 April 1851; *The Morning Post*, 28 May 1851.
[67] *The Daily News*, 6 February 1851; *The Morning Chronicle*, 3 February 1851.

I chose to consult auction advertisements over probate records because the former offer insight into circumstances where disposals are made in the event of bankruptcy and relocation as well as death. I consulted newspaper advertisements in preference to surviving auction house records because the number of advertisements for 1851 was far greater in the former source type. The resulting data offers clues as to who owned a piano, where they lived, their gender, the circumstances in which pianos were disposed of, which type of piano was most popular and what other possessions piano owners had in their homes. This quantitative data is used in Chapter 3 to identify the popularity of different piano-types and what notational compass householders would have been familiar with; this in turn helps determine what knowledge visitors might have had before they visited the Exhibition. It is also used in Chapter 6 to determine relationships between piano-type, income and class; this in turn feeds into my findings concerning how visitors would have interpreted the term 'cheap', applied to certain products.

A final word must be said about my study of household accounts designed to establish patterns of middle class income and expenditure. The accounts I have used were chosen purely on the basis that they were written around mid-century and that they document both income and outgoings. As these sources are very extensive it has not been possible to include transcriptions of each source in its entirety; accordingly, I have included a sample of each covering the period of one month in Appendix C to give some idea of how each author has set out details of their income and expenditure. A complete picture of expenditure as documented on an annual basis can be found represented by pie-charts in Appendix H. Five out of the six examples make reference to the name and address of the household concerned which, in the case of accounts from 1841 onwards, makes the census an additional resource. In four out of the six examples it has been possible to establish the age and gender of all family members, their address and occupations. The examples used were found by a simple yet laborious process of trawling archives until I had found documents meeting this criterion. As will become clear in Chapter 6 there appears to have been no such thing as a 'typical' middle class income/expenditure profile. If this sample is representative of a wider picture then middle class attitudes to household finances were diverse

and highly individual. This data is particularly valuable given that economic studies of middle class lifestyle are few and far between owing to the lack of available evidence. The sources I have identified will therefore be of use to economic historians in pursuit of answers to different questions.

1.4: Theoretical approaches

The main sociological approach I have used to explore how objects were understood by different audiences is Pierre Bourdieu's concept of value consisting of 'capital', 'field' and 'habitus'. This approach is particularly valuable in instances where diary accounts and letters survive as these source types generally offer insight into the internal motivation of the author. Although there are different types of capital, in the context of my study the first element is cultural capital, namely knowledge. Bourdieu defined the concept of 'field' in the following way:

> a network, or configuration, of objective relations between positions objectively defined, in their existence and in the determinations they impose upon occupants, agents or institutions, by their present and potential situations (situs) in the structure of the distribution of species of power (or capital) where possession commands access to the specific profits that are at stake in the field, as well as by their objective relations to other positions. Each field presupposes, and generates by its very functioning, the belief in the stakes it offers.[68]

Put simply, within the scope of my study, the concept denotes the Exhibition environment and the network of relationships and values formed within it. The final component 'habitus' is defined as 'the mental or cognitive structures through which people deal with the social world', 'internalised, embodied social structures' acquired primarily in formative years and which change over time through different associations and experiences.[69] With reference to my work, it is the force which determined whether a particular visitor 'liked'

---

[68] Pierre Bourdieu & Wacquant, L. J. D, *An Invitation to Reflexive Sociology* (Cambridge: Polity Press, 1992), p.97.
[69] Pierre Bourdieu, *Distinction: A Social Critique of the Judgement of Taste* (Cambridge: Harvard University Press, 1984), p.18 and p.468.

a piano's tone or whether a particular judge 'preferred' one maker over another and so on.

I have drawn on aspects of Latour's actor network theory to highlight the ways in which pianos themselves contributed to their meaning at least as much as human actors. Clearly an object cannot act intentionally in the same way as a human being can, but any 'thing' that modifies 'a state of affairs by making a difference' or which makes 'a difference in the course of some other agent's action' can be said to possess social agency.[70] Objects are more than just a means of facilitating the causal results of human action: rather they 'authorise, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid and so on'.[71] This approach is particularly valuable in placing a specific object in juxtaposition with other human and non-human agencies.

I am using social constructivism as a tool to counter the main body of piano history literature, which assumes that technological change existed on its own terms, and to show instead that the development of the piano was closely linked with class economics and identity. My main precedent is Trevor J. Pinch and Wiebe E. Bijker's study of the evolution of the bicycle in the late nineteenth century.[72] Their approach to technological change is multidirectional rather than linear; through this method it is possible to examine the relationship between an object, the social groups who use it and the problems experienced by those groups rather than just which objects survived and which died a death. Venturing briefly into anthropological territory, Arjun Appadurai's discourse on demand, knowledge and consumption offers an additional lens through which to consider how objects were understood by different audiences. When Cyril Ehrlich refers to the mid-nineteenth-century piano as 'luxury goods', his use of the term denotes the amount of workmanship necessary to create the product.[73] There are,

---

[70] Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005), p.71.
[71] *Ibid*, p.72.
[72] Trevor J. Pinch & Wiebe E. Bijker, 'The Social Construction of Facts and Artifacts: or how the Sociology of Science and the Sociology of Technology Might Benefit Each Other', in Bijker, *et al,* ed. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge & London: The MIT Press, 2012), pp.11-44, here pp.21-40.
[73] Ehrlich, *The Piano: A History*, p.9.

however, other definitions of 'luxury', one of which is offered by Appadurai. His definition states that such items are characterised by some or all of the following factors: they are restricted to elite persons, are difficult to acquire, signify complex social messages, require specialised knowledge for consumption and are linked to the body of the consumer.[74] The obvious problem with this definition is that it is not rooted in any particular time period; the other difficulty, which will be discussed later, is that the term may not necessarily apply to all piano-types.

1.5: Method/Methodology

1.5.1: Sound Studies

Sound historians such as Jonathan Sterne, Malcolm Nicolson and Stefan Krebs explore how knowledge was derived using new techniques and technologies of listening.[75] Both Nicolson and Sterne consider the role of listening in nineteenth-century medical diagnostics, and Sterne also considers this topic in relation to late-nineteenth-century telegraphy. I use this approach to investigate whether piano makers used primarily visual or aural methods to evaluate their products. Krebs discusses the development of auditory methods by which early-twentieth-century automobile function was assessed and how descriptive vocabulary evolved accordingly. I adopt the same method to explore how piano sound was experienced and subsequently described at the Exhibition. David Hendy, Mike Goldsmith and John Picker all explore the Victorian urban soundscape, focusing specifically on the difference between desirable and undesirable sound in the middle

[74] Arjun Appadurai, 'Introduction: Commodities and the Politics of Value', in Arjun Appadurai, ed. *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 1986), pp.3-63, here p.38.
[75] Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Duke University Press, 2003), pp.87-177; Malcolm Nicolson, 'Having the Doctor's Ear in Nineteenth Century Edinburgh', in Mark M. Smith, ed. *Hearing History: A Reader* (Athens & London: University of Georgia Press, 2004), pp.151-68; Stefan Krebs, 'Sobbing, Whining, Rumbling: Listening to Automobiles as Social Practice', in Trevor Pinch & Karin Bijsterveld, ed. *The Oxford Handbook of Sound Studies* (Oxford: Oxford University Press, 2012), pp.79-101.

class quest for silence.[76] This approach is useful because it illuminates the backdrop against which makers sought to make piano-playing a more easily achievable skill or one that could be rendered inaudible to the neighbours. Studies by Bruce R. Smith and Emily Thompson, both of whom consider how sound would have behaved in particular physical environments, provide a basis on which to consider the materials and acoustic space of the Exhibition building. Smith examines how sound might have behaved in the buildings and streets of early modern London, whilst Thompson investigates how building construction, materials and acoustical science impacted concert venues in early-twentieth-century America.[77]

1.5.2: New Organology

Whereas organological studies have traditionally focused on the mechanics of specific instruments or the activities of particular makers, musicologists have increasingly begun to approach organological studies in new ways. Kevin Dawe's work on the history of the guitar, for example, acknowledges that instruments have a much wider sphere of influence than is assumed by traditional studies.[78] The idea that musical instruments have social agency is a relatively new concept used in work by musicologists such as Eliot Bates and Maria Sonevytsky.[79] In his article discussing the social life of the saz, Bates departs from a traditional organological approach, instead exploring the various networks which interconnect the physical object with

---

[76] David Hendy, *Noise: A Human History of Sound & Listening* (London: Profile Books Ltd, 2013), pp.242-53; Mike Goldsmith, *Discord: The Story of Noise* (Oxford: Oxford University Press, 2012), pp.111-34; John Picker, 'The Soundproof Study', in Jonathan Sterne, ed. *The Sound Studies Reader* (London & New York: Routledge, 2012), pp.141-51.
[77] Bruce R. Smith, *The Acoustic World of Early Modern England: Attending to the O Factor* (Chicago & London: University of Chicago Press, 1999); Emily Thompson, *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America 1900-1930* (Cambridge & London: The MIT Press, 2002).
[78] Kevin Dawe, *The New Guitarscape in Critical Theory, Cultural Practice and Musical Performance* (Farnham: Ashgate, 2010).
[79] Eliot Bates, 'The Social Lives of Musical Instruments', *Ethnomusicology, 56* (2012), 363-95; Maria Sonevytsky, 'The Accordion and Ethnic Whiteness: Toward a New Critical Organology', *Journal of the Ethnomusicology Programme, University of Sheffield, 50* (2008), 101-18

the performer, maker and listener.[80] Emily I. Dolan employs a New Organology approach in her work *The Orchestral Revolution: Haydn and the Technologies of Timbre.* Instead of simply considering the physical construction of the glass harmonica, she considers how its material properties were responsible for its initial success and subsequent failure to stand the test of time. The harmonica's ability to convincingly simulate the character of the human voice, the ideal by which instrumental timbre was evaluated at the time of its invention, was the main reason for its popularity. Its limited range, its inability to facilitate execution of rapid notes and the injurious effect of its vibrations on performers were ultimately responsible for its demise.[81] Applied in the context of the Great Exhibition, my study considers the role of building in creating particular environmental, acoustic and visual conditions. It also considers the material response of pianos and how this would have been different had all instruments been exposed to an identical internal climate. This approach is assisted by principles governing preventive conservation borrowed from museology, chiefly concerning how different materials respond to changing relative humidity and light levels. My main sources here are Shayne Rivers & Nick Umney's publication *Conservation of Furniture* and PSA 198: 2012 Specification for Managing Environmental Conditions for Cultural Collections published by The British Standards Institution.[82]

1.5.3: New Musicology

Contemporary artwork has been used as a resource by musicologists in two main ways. It has been used to corroborate physical evidence of instrument construction obtained from other sources, for example, Helen

---

[80] Bates, 'The Social Lives of Musical Instruments', 374-388; the saz is a necked bowl lute, carved, sounded with the bare fingers or sounded by plectrum and is often called the 'national' instrument of Turkey.

[81] Emily I. Dolan, *The Orchestral Revolution: Haydn and the Technologies of Timbre* (Cambridge: Cambridge University Press, 2013), pp.59-65. Other works using a New Organology approach include 'Toward a New Organology: Instruments of Music and Science', *Osiris, 28* (2013), 278-98, written jointly with the sociologist John Tresch.

[82] PSA 198: 2012 Specification for Managing Environmental Conditions for Cultural Collections (British Standards Institution, 2012); Shayne Rivers & Nick Umney, *Conservation of Furniture* (London & New York: Routledge, 2013).

Rice Hollis' work *The Piano: a Pictorial Account of its Ancestry and Development*.[83] It has also been used as a means of exploring wider issues such as the biography of female artists, nineteenth-century female identity and the public-versus-private-sphere debate. In some analyses, for example Liana Piehler's discussion of Maud Hall Neale's painting *Two Women in an Aesthetic Interior,* which investigates the use of space to depict different aspects of femininity, the piano is largely incidental.[84] In other discussions, for example Richard Leppert's commentary on William Holman Hunt's *The Awakening Conscience*, the piano is an active agent in the narrative.[85] It is the sound of 'Oft in the Stilly Night' which has just been played that precipitates the response of the female character; the apparent cheapness of the piano and other furniture contributes to the vulgarity of the scene. I will depart from both these precedents, however, as my use of iconography lies solely in its capacity to yield physical evidence. Within the Exhibition domain I am interested in images that show what pianos looked like and where they were situated. Artworks showing the piano in domestic life are useful where they offers clues as to the variety of external designs available and whether or not performers were easily visible to their audiences.

The piano in literature features frequently in the work of New Musicologists when discussing class and gender. How music contributed to the formation of masculine and feminine identities and economic status is a common theme. Binary opposites such Angel/Siren and Public/Private feature prominently; the piano as signifier of both domestic harmony and marital breakdown is also considered. Both Jodi Lustig and Mary Burgan chart how novels reflect changes in attitudes throughout the nineteenth century towards the piano as an instrument of courtship, as a signifier of affluence and as a means of female employment; consideration of piano repertoire is integral in the context of female performance.[86] Phylllis Weliver

---

[83] Helen Rice Hollis, *The Piano: a Pictorial Account of its Ancestry and Development* (London: David & Charles, 1975).
[84] Liana Piehler, *Spatial Dynamics and Female Development in Victorian Art and Novels: Creating a Woman's Space* (New York: Peter Lang Publishing Inc, 2003), p.25.
[85] Leppert, *The Sight of Sound*, p.194.
[86] Jodi Lustig, 'The Piano's Progress: the Piano in Play in the Victorian Novel', in Sophie Fuller & Nicky Losseff, ed. *The Idea of Music in Victorian Fiction* (Aldershot: Ashgate, 2004), pp.83-100; Mary Burgan, 'Heroines at the Piano: Women and Music in Nineteenth Century Fiction', *Victorian Studies, 30* (Indiana University Press, 1986), 51-76.

discusses the role of the piano as a means of female employment. She examines factual sources to ascertain the level of employment achieved by professional pianists and teachers, and fictional accounts to establish the opportunities and obstacles facing women wishing to earn their living giving music lessons.[87] Ruth A. Solie investigates the relationship between representations of women at the keyboard and the reality of documented experience; the piano emerges as both oppressor and confidante.[88] Again, my approach differs from this methodology in that it focuses largely on physical evidence. I am concerned with what types of pianos were purchased, by whom and where they were subsequently positioned within the home.

1.5.4: Social/Economic History

As Jan de Vries explains, two main approaches are used by historians to gain insight into household economy. The first, used chiefly by economic historians, examines earnings, supply and demand, and fluctuations in the cost of living; the second, used chiefly by social historians, investigates household possessions.[89] Although my study relies upon the work of the former for wage/salary data, establishing the boundaries between classes according to earnings and anthropometric data, I have borrowed chiefly from the work of social historians. My study is similar to those of Patricia Branca, who uses household accounts to shed light on middle-class housekeeping, Lorna Weathergill, whose study provides a factual framework for discussing early-modern consumer behaviour, and Whitney Walton, who uses household inventories and probate records to investigate the likely consumer preferences of French bourgeoisie visiting the Great Exhibition.[90] It is work

---

[87] Phyllis Weliver, *Women Musicians in Victorian Fiction, 1860-1900: Representations of Music, Science and Gender in the Leisured Home* (Aldershot: Ashgate, 2000), pp.33-45.
[88] Ruth A. Solie, *Music in Other Words: Victorian Conversations* (Berkeley & London: University of California Press, 2004), pp.85-117.
[89] Jan de Vries, 'Between Purchasing Power and the World of Goods: Understanding the Household Economy in Early Modern Europe', in John Brewer & Roy Porter, ed. *Consumption and the World of Goods* (London & New York: Routledge, 1993), pp. 85-123, here pp.89-107.
[90] Patricia Branca, *Silent Sisterhood: Middle Class Women in the Victorian Home* (London: Croom Helm, 1975), pp.26-8, pp.38-59; Lorna Weathergill, 'The Meaning of Consumer

by Walton which has primarily inspired my quantitative study; whereas her investigation identifies French consumer preferences, mine focuses on those of householders in mid-century London.

My study also relies upon the work of consumer historians for definitions of luxury goods and theories of consumption. According to Maxine Berg, during the seventeenth and eighteenth centuries, luxury was about the 'cultural display of power' and 'demonstration of taste', which increasingly characterised the domestic sphere. [91] A more detailed definition is offered in her essay 'From Imitation to Invention' where Berg states that luxury goods were characterised by 'variety and novelty, gave pleasure in their 'fitness', displayed creative imitation and brought taste/distinction to consumers'.[92] She also identifies the emergence of what she calls 'semi-luxury' goods during the eighteenth century, namely products that were desirable, relatively difficult to acquire, yet not exclusively accessible to the wealthy.[93] Berg's approach offers an alternative to that of Appadurai when considering if and why the piano constituted 'luxury goods' at mid-century. By the mid nineteenth century, as Frank Trentmann explains, there was no accepted theory of consumption and ideas still centred round Adam Smith's remark that 'consumption is the sole end and purpose of all production'. The shift whereby value was dictated by the consumer, by how desirable a particular item was deemed to be, was yet to emerge in the 1870s meaning that in 1851, value was conceived in monetary terms.[94] Visitors to the Exhibition, in their capacity as consumers, would have evaluated goods in terms of the amount of the labour and raw materials needed to make a particular item relative to price. My work will explore the possibility that

---

Behaviour in Late-Seventeenth and Early- Eighteenth-Century England', in Brewer & Porter, ed. *Consumption and the World of Goods*, pp.206-25; Whitney Walton, *France at the Crystal Palace: Bourgeois Taste and Artisan Manufacture in the Nineteenth Century* (Berkeley: University of California Press, 1992), p.3, pp.13-4 and pp.71-3.

[91] Maxine Berg, *Luxury and Pleasure in Eighteenth Century Britain* (Oxford: Oxford University Press, 2005), pp.38-9.

[92] Berg, 'From Imitation to Invention: Creating Commodities in Eighteenth-Century Britain', *Economic History Review, 55* (2002), 1-30, here 14

[93] Berg, 'New Commodities, Luxuries and their Consumers in Eighteenth-Century Britain', in Maxine Berg & Helen Clifford, ed. *Consumers and Luxury: Consumer Culture in Europe 1650-1850* (Manchester: Manchester University Press, 1999), pp.63-85, here p. 69. The concept of semi-luxury goods is also discussed in Trentmann, pp.88-100.

[94] Frank Trentmann, *Empire of Things: How We Became a World of Consumers, from the Fifteenth Century to the Twenty-First* (London: Allen Lane, 2016), p.151.

pianos at the lower end of the budgetary scale were in fact ‘semi luxuries’, such was the diversity of the mid-century market; it also questions how the notion of luxury translated into choices made between the musical quality of an instrument and its outward appearance.

1.6: Summary

Chapter 2 considers the Exhibition from the perspective of the organisers and the exhibits, specifically the piano. It asks the question ‘what might the Exhibition have looked like had a different building and a different conceptual and spatial display been used with different makers taking part?’ Considering what might have been gives voice to the materiality of the actual exhibits and building in which they were housed, demonstrating that a wider network of human and non-human relationships were at work. Chapter 3 examines how pianos would have been understood by visitors, namely those equipped with amateur levels of knowledge concerning music and fashion. I consider visual and aural techniques for evaluating sight and sound, taking into consideration the logistical problems that visitors faced. Chapter 4 is the counterpart of the previous chapter, where I explore the issues facing professional artists and musicians charged with the task of evaluating exhibits according to the medal system conceived by the organisers. I examine what level of aural and tactile technique the musical jury (Class XA) might have had, what artistic principles would have been employed by the fine art jurors (Class XXX) and to what extent personal preferences and associations might have impacted their findings. Chapter 5 employs a social constructivist approach to examine what influences may have shaped the diversity of pianos on display. That piano makers were dependent upon certain technologies to make their instruments is accepted, but what is absent from piano history is an evaluation of how makers catered specifically for the needs of the domestic market. The chapter also considers what visual and aural techniques makers may have used in producing their instruments and how the problem of urban noise may have prompted silent inventions designed to aid the piano student. Chapter 6, which examines the visitor in their capacity as consumers, employs a numerical approach to

determining what financial resources different audiences might have had with which to make luxury purchases. I look at wages relating to different occupation groups and what percentage of income was needed for essential expenses in order to calculate the likely excess left over. I also examine household accounts to ascertain what percentage of household expenditure was devoted to different kinds of expenses, specifically furniture and recreation. My findings will thus shed light on what different audiences would have made of the term ‘cheap’ when applied to Exhibition products.

Chapter 2: Commissioners, Committees and Artefacts; exploring the role of the piano as actor

2.1: Introduction

My main goal in this chapter is to examine the ways in which object actors, as well as human actors, contributed to the Great Exhibition. Using the piano as an investigative tool, I will investigate how objects shaped the way in which the Exhibition was understood. The method by which the role of objects is made manifest is to consider the Exhibition both as it was and as it might have been; it is fortunate that sufficient trails exist to illuminate what the road not taken might have looked like. By focusing on how the piano was conceptualised within the classification system, and how it was placed within the building, compared with what methods might have been used, an alternative material reality emerges, one in which the value of the piano as object changes. An investigation of wider issues such as how objects were selected and how the building was designed further contributes to a provocative proposal that human agency was not the only force at work. The initial section of this chapter will summarise what part human actors played in securing public and government support, both in Britain and abroad, in obtaining financial sponsorship and in facilitating the construction of a suitable venue, based primarily on the scholarship of Auerbach, Davis and Hermione Hobhouse. This will then serve as a launch pad from which to consider the role of materiality, the extent to which the presence and positioning of objects created narratives, and how these narratives might have been comprehended differently had alternative choices been made.

2.2: The Human Actors

Anyone reading C. H. Gibbs Smith's brief account of the Exhibition published in 1951 would be forgiven for thinking that Prince Albert, Henry Cole and Joseph Paxton were solely responsible for the success of the Exhibition and that the politician Colonel Sibthorp was the only voice of dissent. According to Smith, Albert and Cole were the only two people

involved in deciding where to place the Exhibition building and it was Albert alone who facilitated the creation of a Royal Commission.[95] Such an approach is typical of earlier Exhibition scholarship and it has been the task of more recent scholars to reassess the role of Albert and the Commissioners, to examine the role of previously unnamed actor groups and to re-consider issues such as whose decision it was to make the Exhibition an international event. It is only in the more recent work of Auerbach and Davis, both published in 1999, and Hobhouse, published in 2002, that attention has turned to the role of the press, who made the Exhibition a matter for public debate, and the financiers, who made the realisation of Paxton's controversial design a reality. Through their research, the personnel who negotiated with British localities and foreign governments become visible, as do local and foreign committees who encouraged the public to support the exhibition by way of voluntary subscription.

New research shows that Albert was in fact very reluctant to endorse the project during its initial stages. Notwithstanding repeated attempts on the part of Henry Cole to gain his support, there is no evidence that Albert had any official involvement until September 1849, several years after the idea was first conceived by the Society of Arts.[96] Davis believes that his reputation as founding father of the Exhibition is most likely the result of the fact that individuals such as Henry Cole took every opportunity to use Albert's name as an advertising tool. On one occasion, at a banquet in Dublin in 1849, Cole actually announced in his speech that it was Albert alone who was responsible for the project.[97] It is also possible that his reputation grew as it did because those who were actually responsible felt that Albert's status made it impossible to correct the perception which had grown up in the public mind.[98] Albert's role was further enhanced by the press who attributed the success of the Exhibition to him following the Opening Ceremony.[99] Notwithstanding the bias of various sources, however, according to Hobhouse, Albert can legitimately be credited with using his contacts to gain

---

[95] C. H Gibbs Smith, *The Great Exhibition of 1851* (London: Her Majesty's Stationery Office, 1950), pp.7-11.
[96] Davis, *The Great Exhibition*, p.14 and p.42.
[97] *Ibid*, p.39.
[98] *Ibid*, p.14.
[99] *Ibid*, p.135.

the support of foreign governments and exhibitors.[100] A similar myth has grown up surrounding the role of the Royal Commissioners, who have traditionally been credited with making the Exhibition a reality. According to Auerbach, most took no active part, serving more as figure-heads, a body of men who represented both ends of the political spectrum and in whom most levels of society were represented.[101]

In addition to Albert, Cole and Paxton, there were in fact many other human actors whose actions made the Exhibition possible. Some credit must go to Francis Whisham, president of the Society of Arts, who was the first to conceive the idea of a national exhibition held on an annual basis.[102] John Scott Russell, Francis Fuller, Charles Wentworth Dilke and Robert Stephenson, all of whom played a part in organising the Exhibition, were members of the very earliest committee formed by the Society of Arts during the 1840s.[103] It was this group who struggled, yet succeeded, to acquaint the public with the benefits of exhibitions witnessing visitor numbers increasing from 20,000 to 70,000 within just one year.[104] Paxton's plan for the building would never have been realised without the financial support of the industrialist Samuel Morton Peto. Had he not been prepared to donate £20,000, and act as guarantor for a further £50,000, it is likely the project, at least on such a large scale, would have died a death.[105] Morton Peto's patronage of the arts did not stop there, for in 1852 he was responsible for the founding of the New Philharmonic Society. As well as advising Albert that a public consultation on plans for the Exhibition was essential, it is possible that in death, a few days before the parliamentary vote was due to take place, Sir Robert Peel silenced the voices of opponents to the project. In the circumstances, most deemed it inappropriate to veto a project which Peel had favoured so highly.[106] Once plans for the Exhibition were properly underway, those acting as ambassadors to the British provinces and foreign

---

[100] Hermione Hobhouse, *The Crystal Palace and the Great Exhibition: a History of the Royal Commission for the Exhibition of 1851* (London & New York: Continuum, 2002), p.43.
[101] Auerbach, *The Great Exhibition of 1851*, pp.29-33.
[102] *Ibid*, p.14.
[103] *Ibid*, p.15.
[104] *Ibid*, pp.18-9.
[105] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.28; Auerbach, *The Great Exhibition of 1851*, p.50.
[106] Davis, *The Great Exhibition*, p.78.

states played an invaluable role explaining the goals and benefits of the Exhibition to different audiences. John Scott Russell was responsible for drumming up support abroad, a role that was particularly important given that a foreign presence was essential to the character of the event.[107] Lyon Playfair and Lieutenant Colonel J. A. Lloyd journeyed to the north and south of the country respectively to speak to provincial manufacturers and their communities. Reactions were mixed; whereas up-and-coming industrial towns were generally in favour of the idea, areas where the economy relied upon tourism, agriculture and mining were more reluctant to get involved.[108]

Despite the efforts of recent scholarship, the question of who suggested the internationalisation of the Exhibition remains unclear, although the assumption that Albert was responsible has been displaced with other possibilities. That it was conceived some time after Henry Cole and the architect Matthew Digby Wyatt went to the Eleventh National Exposition in Paris in June 1849 is certain. Cole's diary states that it was his idea to internationalise the event.[109] Auerbach agrees that this was the case, but that Cole was encouraged in his plans by Wyatt and the manufacturer Herbert Minton.[110] Davis believes the idea was conceived jointly by Cole and Francis Fuller but that the concept would have presented itself via other channels had they not come up with it when they did.[111] It appears therefore that multiple human actors were involved, notwithstanding that it was Albert who officially sanctioned the decision on 29 June 1850.[112]

2.3: The objects

Whether or not objects made it through the doors of the Exhibition was determined not just by the Commissioners and their committees but by wider networks of human and non-human agency. The political situation abroad impacted the ease with which the Exhibition could be publicised overseas. Whereas advertisements placed in Vienna quickly made their way through

[107] *Ibid*, pp.111-2.
[108] Auerbach, *The Great Exhibition of 1851*, pp.72-3 and pp.75-86.
[109] Davis, *The Great Exhibition*, p.25.
[110] Auerbach, *The Great Exhibition of 1851*, p.22.
[111] Davis, *The Great Exhibition*, p.25.
[112] Auerbach, *The Great Exhibition of 1851*, p.23.

south-eastern Europe, administration in the German states was cumbersome as each had to be dealt with separately.[113] Some objects simply could not be delivered to the Exhibition on time or at all. Norway and Sweden, for example, could not send products because the Baltic was closed from December to April.[114] In the US, the government took no responsibility for co-ordinating communication with Exhibition organisers and offered very little assistance to exhibitors transporting their goods.[115] In Britain, local reactions varied greatly according to political leanings. As Auerbach explains, in protectionist areas enthusiasm was generally lacking, whereas in liberal, commercial regions the idea of an Exhibition was well received.[116] Towns that were politically united with a booming economy, such as Manchester, Leeds and Bradford, embraced the idea of the Exhibition; those with little manufacturing activity, such as Liverpool and Bath, were more reluctant.[117]

In Britain human actors in the form of local committees were responsible for deciding what products should be displayed. In Europe and America, foreign Committees were appointed to serve a similar role and in the colonies it was the task of The East India Company to contact local governments throughout India. British local committees were made up of manufacturers, engineers, retailers, bankers, architects and members of trade associations; the London borough of Westminster even had a 'Ladies' Committee'.[118] Their task was key, for not only were they responsible for encouraging makers to come forward with their goods, and persuading local people to support the exhibition both financially and by way of attendance, they also decided what goods to accept and reject.

Little has been written about the make-up of foreign committees, so apart from concluding that their function was basically the same as that of their British counterparts, their exact identity remains a mystery.[119] Material differences between British and European products, however, offer some

---

[113] Hobhouse, *The Crystal Palace and the Great Exhibition*, pp.44-5.
[114] *Ibid*, p.44
[115] Davis, *The Great Exhibition*, p.109.
[116] Auerbach, *The Great Exhibition of 1851*, p.55
[117] *Ibid*, pp.78-81.
[118] Hobhouse, *The Crystal Palace and the Great Exhibition*, pp.41-2.
[119] *Ibid*, p.43.

clue as to who did the choosing and why. According to Davis, foreign goods were chosen mainly by state government, not by those working in, or directly associated with, industry. In the French, Austrian and Russian sections, goods represented choices demonstrating luxury and wealth, choices which Davis suggests were designed to promote state authority. In the German section, marketable goods were most prominent, suggesting a commercial agenda, something that had always been the mainstay of their regional exhibitions. That none of the foreign sections demonstrated any commitment to education he perceives as a factor which separated them from their British counterparts.[120]

It is difficult to establish the exact basis on which objects were chosen. Apart from the list of items prohibited because they were unsafe or perishable, the only criterion stated in *The First Report of the Royal Commissioners* was that each local committee 'should, as far as possible, maintain the proportions of the Four Sections allotted to it',[121] and also that 'in every case ... only those Articles which do honour to our industrial skill as a nation should be admitted'.[122] The fact that committees were directed to ask third parties for advice as to the merit of objects suggests that they may not have possessed the requisite technical knowledge to properly assess the goods before them. Once an initial selection of objects had been made, 'one or two well qualified persons' would be sent out 'for the purpose of giving them (the local committees) information on any point on which they may be enabled to afford it'.[123] Although almost complete autonomy was given to local committees, the Commissioners did reserve powers of selection and rejection for themselves in case demands for space were exceeded. Such reservation proved essential; many objects were vetoed because initial demands for floor space exceeded what was available by approximately 210,000 square feet.[124]

---

[120] Davis, *The Great Exhibition*, pp.108-9.
[121] *First Report of the Commissioners for the Exhibition of 1851* (London: W. Clowes & Sons, 1852), p.13; a prior reference to 'Four Sections' on the same page of the Report suggests that the term means the four main classificatory divisions governing the Exhibition.
[122] *Ibid*, p.13.
[123] *Ibid,* p.11.
[124] *Ibid*, pp.12-3.

It seems reasonable to speculate that not all applications for display space were successful. Given that exhibition space was at a premium, however, it is puzzling that certain makers were permitted to display such a large number of examples. The two leading British makers of the time, Broadwood and Collard each brought four and six pianos respectively. The French maker Erard, displayed a total of 14 pianos across the British and French areas, something that was criticised by the author of *The Crystal Palace and its Contents*:

> We cannot perceive the utility of thus exhibiting duplicates of the same article, while in the warehouses of any of our principal manufacturers dozens of instruments could be found very superior in appearance; but we are glad our great English makers have taken a higher view of the matter, being content to be adequately represented without converting the Exhibition Building into a vast warehouse for their every day productions.[125]

Certain well known names in European piano making were conspicuous by their absence, although this may well have been by choice rather than through an inability to secure display space. Had the Parisian maker Pleyel made an appearance, the French section would have presented in even more dominant terms.[126] Had Bösendorfer, Graf and Stein come to the Exhibition, the number of Austrian pianos would have been significantly larger.[127] Three of the biggest names of the future, namely the German piano makers Bechstein and Blüthner and the American maker Steinway, were as yet in their infancy or unborn at mid-century.[128] Although no notable absences were apparent in the British section, what is obvious is that, apart from J. Harrison, piano makers who catered for the lower end of the market were missing from the line-up. Mactaggart cites several 'budget' piano

---

[125] *The Crystal Palace and its Contents: An Illustrated Cyclopaedia of the Great Exhibition 1851* (London, W. M. Clark, 1852), p.202.
[126] *Ehrlich, The Piano: A History*, p.210. Pleyel were operative from 1807, or possibly earlier, to 1960.
[127] *Ibid*, pp.214-5. Bosendorfer opened for business around 1828 and Stein were operative from 1812; Graf closed their doors in 1851 so possibly they weren't in a position to exhibit; also the date on which Stein ceased trading is unknown so it is also possibly they did not enter because the business had closed.
[128] *Ibid*, p.211 and p.219; Bechstein, Blüthner and Steinway all opened for business in 1853 or possibly earlier. Ernest Closson, History of the Piano, ed. Robin Golding, trans. Delano Ames (London: Paul Elek, 1947), p.102; In 1853 Steinway anglicised their name; they were originally a firm of organ builders operating in Brunswick who made their first piano in 1835 and who immigrated to America to escape political turmoil during the 1840s.

makers who used *The Illustrated Catalogue Advertiser* to promote their products, for example Roberts & Cocks & Co, who advertised their twenty-two-guinea instruments there.[129] Questions of pricing and the monetary value of exhibits are considered in detail in Chapter 6.

The question 'which objects were present and why?' invites a further question 'how did makers select which instruments to place before committees?' Did they take along elaborate custom-made pianos or examples of their everyday stock-in-trade? Broadwood, for example, had invented a 'school-room piano', patented in 1842, designed to help those learning the piano to become familiar with the notes more easily, but it was not amongst the instruments displayed at the Exhibition.[130] Did they decide not to put it before the selection committee in the first place or was their school-room piano rejected as it did not appear to be of the same quality as their four grand instruments? How makers might have selected their products and why the resulting display was so diverse will be discussed in Chapter 5.

What is apparent is that the number of submissions from London makers was approximately proportional to the number of piano makers working in the metropolis at mid-century. Based on data in Appendix A, the following map shows the relative distribution of London and provincial makers (Fig 2.1). If Ehrlich is correct in his estimate that approximately 200 piano manufacturers were operative in London at this time, approximately one in five makers were present at the Exhibition.[131] Provincial piano making was far less prominent and only 13 makers secured display space; given that the trade was much smaller than in the capital, however, it appears that representation was proportionately the same. For example, *Slater's Directory* (1852-3) lists William Akermann as one of just four musical instrument makers in the Somerset area during this period.[132] The same

---

[129] *The Illustrated Catalogue Advertiser*, in Peter & Ann Mactaggart, ed. *Musical Instruments in the 1851 Exhibition* (Welwyn: Mac & Me, 1986), p.23.
[130] Wainright, *Broadwood by Appointment*, p.148.
[131] George Dodds, unspecified source in Ehrlich, *The Piano: a History*, p.34.
[132] *Slater's Directory of Berkshire, Cornwall, Devon, Dorset, Gloucestershire, Hampshire, Somerset, Wiltshire and Wales 1852-53*; section for Somersetshire lists Edwin Pitman, piano tuner, p.28; H. Simms, music and pianoforte seller, p.43; Frederick Williams, piano teacher, p.44; William H.H. Akermann, organ builder, p.54; John Edwards, piano tuner, p.54; William Watson, pianoforte maker, p.70; John Charles Howell, organ builder, p.70; William Chappell

publication lists A. Dimoline as one of five piano makers working in the Bristol area in the early 1850s.[133]

Fig 2.1: Twenty-First-Century map showing geographical distribution of piano makers, makers of didactic devices and tuning aids

Ball, piano seller, p.94 and James Ling, piano manufacturer, tuner & organ builder, www.historicaldirectories.org (accessed 10 January 2012)

[133] *Slater's Directory* (1852-1853); section for the Gloucestershire area lists George Barrett, pianoforte warerooms, p.9; James England, pianoforte tuner, p.17; Taylor & Son, pianoforte makers, p.36; George Turner, piano teacher, p.37; Ann Wills, piano teacher, p.40; Abraham Dimoline, piano maker, p.71; John Gough, piano maker, p.71; Francis Hodges, piano maker, p.71; Samuel Taylor, p.71; three other piano tuners are listed on p.73. www.historicaldirectories.org (accessed 11 January 2012)

Provincial makers were known to be inferior to their London counterparts at mid-century; trade advertisements in the provinces were at pains to reassure their customers that their wares originated in London. For example, the *Pianoforte and Harp Mart* of Gloucester referred to their 'great variety of instruments from the most eminent London Makers', whilst the *Pianoforte Depot* of Cirencester described their goods as 'well selected stock of pianofortes from the most eminent London makers'.[134] This verdict is further endorsed by *The Pictorial Handbook of London*, dated 1854, which announced that 'it is doubtful whether a pianoforte maker would succeed out of the metropolis, but an instrument with the name of a celebrated London maker stamped upon it passes currency everywhere'.[135] This suggests, however, that had the provincial presence at the Exhibition been greater it is likely that the overall quality of the piano section would have suffered.

The material composition of the British piano department and each foreign section where pianos were displayed reflected the work of many human and non-human actors. It reflected the politics which made presence or absence possible, the priorities and knowledge of those doing the choosing, the choices made by makers as to which products to offer for consideration (whether to bring instruments notable for their quality, economy or novelty) and the size and proficiency of the piano industry in London and the provinces at mid-century. Who was present and absent, which objects were presented for consideration, which objects were ultimately selected and rejected all made a difference to the resulting value of the material display as interpreted by Exhibition audiences.

2.4: The Building

Precisely which human actors were responsible for the design of the building is unclear. The only thing upon which scholars agree is that Samuel Morton Peto's liking for Paxton's design was the reason it was eventually

---

[134] *Ibid*, Advertisement Section, p.18 and p.25.
[135] J. Weale, ed. *The Pictorial Handbook of London Comprising its Antiquities, Architecture, Arts, Manufactures, Trade, Social, Literary and Scientific Institutions, Exhibitions and Galleries of Art* (London: 1854), p.232.

chosen.[136] George F. Chadwick, biographer of Joseph Paxton, believes that the building was the product of collaboration between Paxton, Fox & Henderson, the building contractors, and Chance, the glass supplier.[137] Hobhouse, on the other hand, believes this fails to take account of contributions by William Cubitt, Matthew Digby Wyatt and Owen Jones.[138] Exactly who designed the various modifications to the original plan, such as the inclusion of the transept and the semi-cylindrical roof covering the Nave, is also contested. Candidates include Paxton, Sir Charles Barry, the engineer I. K. Brunel, the building contractor Henderson and the Building Committee. Davis believes Paxton and Davis came up with the ideas simultaneously.[139] Hobhouse is of the opinion that the transept design originated from Barry or possibly even from his close friend, the engineer Sir John Wolfe.[140]

The following section will consider the significance of the materiality of the building in terms of acoustics and environmental conditions by comparing, where possible, Paxton's creation (Fig 1.1) with the design favoured by the Building Committee, designed by I. K. Brunel. Despite the fact that a competition was held inviting designs for the building, none of the entries submitted by engineers and architects both in Britain and abroad found favour with the Commissioners; only Brunel and Paxton were ever really in contention.[141] I will also consider how changes to Paxton's initial design impacted the interior in ways that could not have been anticipated, given that most, if not all, modifications were made on the basis of expediency. There is little evidence that Paxton's design was selected because it facilitated visitor navigation and there is no evidence that the acoustic environment of the building was ever considered. The question of how sight and sound were experienced within Paxton's creation, and the

---

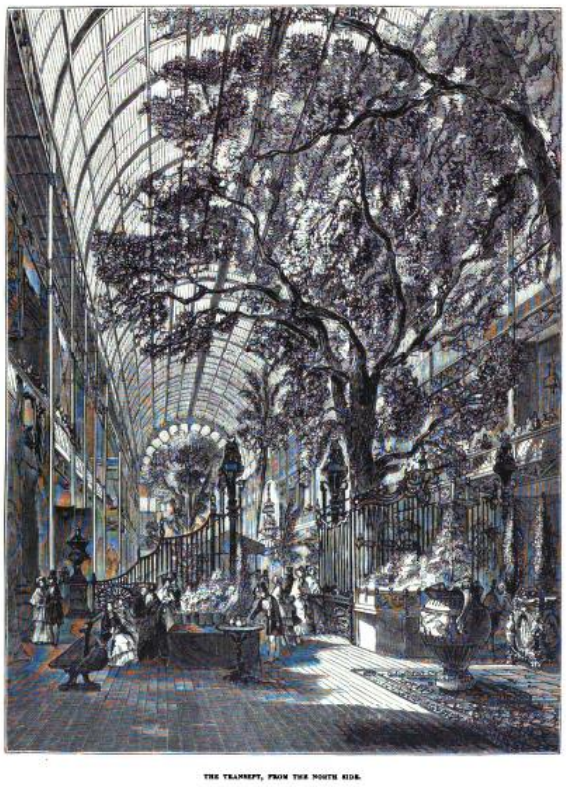
[136] Davis, *The Great Exhibition*, p.83; Auerbach, *The Great Exhibition of 1851*, pp.50-1.
[137] George F. Chadwick, *The Works of Sir Joseph Paxton* (London: The Architectural Press, 1961), Hobhouse, *The Crystal Palace and the Great Exhibition*, p.31.
[138] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.31.
[139] Davis, *The Great Exhibition*, p.84.
[140] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.29.
[141] There is some difference of opinion regarding exactly how many designs the Commissioners received; Davis claims there were 233 entries in *The Great Exhibition*, p.74; Yvonne Ffrench claims 245 submissions were made in *The Great Exhibition: 1851* (London: The Harvill Press, 1951), p.74.

likely problems experienced by visitors, will be explored in greater detail in Chapter 3.

The most immediate difference between the two designs was that whereas Brunel's building was to be made of brick, Paxton's was made of glass. Whereas brick was a commonly used building material, glass was an expensive commodity at mid-century. Not only was it rarely used in building construction but, as Davis explains, glass excise had only been abolished six years previously; the materiality of the building therefore smacked of luxury.[142] The design for the Crystal Palace was therefore instantly appealing; when Paxton took the bold decision to publish plans in the *Illustrated London News*, public curiosity was immediately aroused.[143] Brunel's building was inherently unappealing because its brick structure meant permanence. It was also very large, four times the length of Westminster Abbey, with a huge dome also made of brick.[144] Kensington residents, in particular, did not want a permanent building taking up their recreational space, nor did they want an Exhibition that would potentially attract undesirables to what was a fashionable part of London. Politicians such as Sibthorpe and Brougham expressed particular concerns about the future of the trees in the park.[145] Paxton's building, on the other hand, was temporary. It could be put up and taken down quickly, it was relatively cheap now that glass was no longer a taxable product and the construction was such that sections could be added and taken away as needed. It was perfect therefore in a situation where it was difficult to plan ahead.[146] Also, the building design could be modified to accommodate the Hyde Park trees, thus silencing those whose main argument against the Exhibition rested on such concerns (Fig 2.2).

---

[142] Davis, *The Great Exhibition*, pp.86-7.
[143] *Ibid*, pp.83-6.
[144] Auerbach, *The Great Exhibition of 1851*, p.42.
[145] *Ibid*, p.43.
[146] Davis, *The Great Exhibition*, p.82



THE TRANSEPT, FROM THE NORTH SIDE.

Fig 2.2: The interior of Paxton's Crystal Palace showing how the Hyde Park Elm trees were accommodated, *The Art Journal Illustrated Catalogue*, p.xviii

2.5 The Acoustic environment

Bruce R. Smith's analysis of how building materials used in sixteenth-century London streets and in the Globe Theatre impacted sound is a useful mechanism for considering building acoustics.[147] Smith in turn relies upon M. David Egan's *Architectural Acoustics*, which details the degree to which a variety of materials are either reflective or absorbent of sound at different frequencies. Of the materials present in the Exhibition environment, the most reflective and least sound-absorbent materials included brick and concrete and glass, which measure between 0.02-0.17 at the highest frequency cited. The least reflective and most sound-absorbent materials include wood, carpet and people which measure between 0.25-0.86.[148] An understanding of how sound is modified by the materials surrounding it is important, because it helps explain the reason for the differing accounts of the soundscape recorded by eye-witnesses discussed in Chapter 3. Whereas

[147] Smith, *The Acoustic World of Early Modern England*, pp.58-60 and pp.208-10.
[148] M. David Egan, *Architectural Acoustics* (New York: McGraw Hill Inc, 1988), pp.52-3.

some visitors were disorientated by the soundscape, others found it magical; whereas some complained that it was impossible to hear anything clearly, others found it possible to document the precise repertoire they heard.

Brunel's brick construction utilised a material with a low absorption co-efficient of between 0.02 (low-frequency sound) and 0.07 (high-frequency sound) and would thus have been largely reflective of sound. The same was true of Paxton's building made entirely of glass supported by iron girders, materials with similarly low absorption co-efficients of between 0.18 (low frequency sound) and 0.02 (high frequency sound) and 0.10 (mid-range frequency sound) and 0.02 (high frequency sound) respectively.[149] Whatever internal arrangement was intended in Brunel's building will never be established, but in Paxton's building the acoustic environment was modified considerably by the amount of sound absorbent materials present.

Fig 2.3: The British Department viewed towards the Transept, lithograph coloured by hand, by J. McNeven, 1851 (to view please go to https://collections.vam.ac.uk/item/O85076/the-british-department-viewed-towards-print-mcneven-j/)

Photographs bear witness to the presence of textiles occupying vertical display space and copious carpets and flags suspended from ceilings and

[149] *Ibid*, p.52. The absorption coefficient stated for brick assumes that unglazed brick was used; as no data is given for either cast or wrought iron, I have used data cited for steel.

balconies (Fig 2.3). That exhibitors were permitted to set out their wares using vertical as well as horizontal space increased the surface area through which sound was absorbed. Visitor clothing, particularly on colder days, was also highly absorbent of sound. Whilst it is impossible to be precise, as the quantity of the materials present are unknown, absorption co-efficients would have ranged from approximately 0.03-0.15 (light weight drapery) to 0.57-0.86 (visitor clothing).[150]

Had Paxton's building remained a one-storey affair as originally planned, it is likely a more universal acoustic would have prevailed. The decision to include galleries, however, an additional feature designed by William Cubitt, born of the necessity for more space, meant that acoustics upstairs and downstairs were very different.[151] Whereas some pianos were situated in reflective areas, others were positioned in pockets that were absorbent; the approximate locations of instruments can be found on the plans of the building at the beginning of my work (Figs 1.3-1.6). The sounds emanating from the two upright pianos jointly submitted by J. G. Crace and Lambert & Co, located in The Medieval Court, would have been absorbed by carpets, tapestries and hangings. This is evidenced by Crace's *ODIC* entry which, together with the two pianos, describes items such as 'tapestry damask in silk and wool, silk brocatelles, woollen stuffs for hanging, chintzes, Axminster, Brussels and velvet pile carpets'.[152] These types of materials might have had absorption co-efficients anywhere in the region of 0.37-0.96 depending upon what material was underneath.[153] The sound environment would have been similar in the Austrian court, where furniture by the Viennese maker Carl Leistler & Son was displayed. According to *The North Wales Chronicle*, the display consisted of four rooms, a dining room, library,

---

[150] *Ibid*, pp.52-3.
[151] Hobhouse states that the inclusion of galleries would increase the overall space available for twenty five percent, p.29 and p.32.
[152] *The Official Descriptive and Illustrated Catalogue in Three Volumes*, *Volume II* (London: W. Clowes & Sons), p.761
[153] Egan, *Architectural Acoustics*, p.52; the most sound absorbent carpet type, listed No. 26, is described as a 'carpet, heavy, on 5/8 inch perforated mineral fibreboard with airspace behind; the least sound absorbent carpet type listed No. 33, is described as a 'carpet, heavy, on concrete'.

drawing room and bedroom each hung with drapery.[154] Unfortunately no composite image of the collection survives, but as the piano would most likely have been positioned in the drawing room, according to *ODIC* description, it would have been juxtaposed with two easy chairs, a set of arm chairs and eight other chairs. The absorption coefficient for such materials would have been high and would probably have created an acoustic similar to visitors' homes.

The sound environment surrounding the vast majority of pianos, however, would have been very different. British pianos, located in the North Western gallery, would have had glass on all sides, supported by iron girders, offering a very low degree of sound absorption. Not only that, but unlike some of the downstairs departments, these areas were open-plan so the sound could travel long distances within the building, unimpeded by partition walls which separated downstairs foreign departments. The Zollverein pianos were situated in a similar environment in galleries on the eastern side of the building. Pianos located in departments that were relatively empty, such as that of the United States, also suffered from an endlessly reverberating acoustic. A report by *The Preston Guardian* complained that it was impossible to assess the tone of Pirsson's double grand piano because 'in such an area as that of the Crystal Palace any musical sound degenerated by a process so delicate must inevitably be shorn of any resonance and beauty which it may possess'.[155]

2.6: Temperature, Humidity and Lighting

It is likely that environmental conditions in Paxton's building were very different to the one that might have been. If Hobhouse is correct in her assertion that Brunel's design bears a close resemblance to the building constructed for the 1862 Exhibition, I think it reasonable to begin by comparing temperature data within the two structures on identical days of the

[154] *The North Wales Chronicle*, 14 June 1851; the paper recorded that the four rooms, consisting of a dining room, library, drawing room and bedroom; *The ODIC* description mentions a fifth room, an ante-room.
[155] *The Preston Guardian*, 10 May 1851.

year.[156] The following table lists temperature differences recorded in official reports on the first and last dates of each month for each Exhibition (Fig 2.4). It is probable, however, that data for 1851 was inaccurate as many newspaper reports claimed the galleries were much hotter than officially stated in *The First Report of the Commissioners*.

Fig 2.4: Table showing temperature comparison data for Exhibitions in 1851 and 1862 (in degrees farenheit)

Exhibition Building 1851			Exhibition Building 1862		
Date	Temperature Range	Temperature Difference	Date	Temperature Range	Temperature Difference
*19 May	70-50	20	1 May	70-54	16
31 May	70-57	13	31 May	65-59	6
2 June	79-55	24	2 June	75-58	17
30 June	86-65	21	30 June	69-57	12
1 July	76-64	12	1 July	70-57	13
31 July	78-58	20	31 July	78-60	18
1 August	89-65	24	1 August	78-62	16
30 August	64-52	12	30 August	69-56	13
1 Sept	80-51	29	1 Sept	68-56	12
30 Sept	69-51	18	30 Sept	71-61	10
1 October	65-51	14	1 October	67-54	13
11 October	74-54	20	24 October	58-46	12

*this was the first date on which temperature data was recorded in 1851

Sources; *First Report of the Commissioners for the Exhibition of 1851*, pp.67-8; *The Report of the Commissioners for the Exhibition of 1862* (London: George E. Eyre & William Spottiswoode, 1863), pp.59-60.

[156] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.21.

On 30 June, *The Daily News* reported that temperatures in the galleries reached 90 degrees when the main avenue recorded only 80 degrees.[157] On 20 September, *Freeman's Journal and Daily Commercial Advertiser* told its readers that afternoon gallery temperatures reached 97 degrees.[158] If correct, the data for 1851 above should be regarded as conservative, that is, on the low side. The first point to note is that temperatures in 1851 rose far higher than in 1862. According to official figures, on 30 June 1851 temperatures reached 86 degrees, and on 1 August visitors endured an 89 degree heat. On equivalent dates eleven years later, temperatures rose to a more comfortable 69 degrees and 78 degrees respectively. High temperatures are unlikely to have caused damage to goods but it did impact visitor comfort; nearly all contemporary reports talk about the difficulties experienced by people rather than objects.

Fluctuations in temperature are significant, however, in that they impacted relative humidity (RH) in the building, that is, 'the amount of moisture in the air relative to the amount of moisture the air could hold at a given temperature'.[159] Put simply, as RH levels fall, either because the temperature of the air increases or because the amount of moisture decreases, moisture-sensitive materials such as wood release water, thereby shrinking. As RH levels rise, either because the air becomes cooler or the amount of moisture present increases, wooden components absorb moisture, thereby expanding. Based on temperature data, it is likely that RH fluctuated rapidly within the Exhibition building and pianos would have suffered, especially those that were constructed primarily of wood, causing problems with tuning and movement of wooden components. Not only that, but given that they also contained iron and brass fittings, materials which display no such physical response to changing RH, over time structural integrity may have been compromised as wood and metal responded differently to environmental conditions. Referring back to the table above, the second point of significance is that temperature fluctuations in 1851 were far greater than in 1862. On both 2 June and 1 August a difference of at least 24

---

[157] *The Daily News*, 30 June 1851.
[158] *Freeman's Journal and Daily Commercial Advertiser*, 20 September 1851.
[159] Rivers & Umney, *Conservation of Furniture*, p.253.

degrees was observed and on 1 September a difference of at least 29 degrees. Assuming that moisture in the atmosphere remained roughly constant throughout the day, as temperatures rose (chiefly as a result of visitor activity and heat from sunlight) RH levels fell; as temperatures dropped later in the day, however, RH levels would have steadily increased.

Although humidity levels were never recorded, eye-witness accounts in 1851 reported that the roof leaked and moving parts in machinery failed to function properly; this is evidence that RH levels could be very high. According to *Reynold's Newspaper*, in cold weather operatives of cotton, silk and woollen machinery pronounced their exhibits incapable of functioning.[160] On 12 July, *The Standard* advised readers that heavy rain had permeated the roof causing damage to goods.[161] A few days before the Exhibition was due to close, *The Lancaster Gazette and General Advertiser* reported that visitors were using umbrellas inside the building so great was the leakage from the roof.[162] It is probable that either Paxton or the Building Committee realised early on that moisture levels would be a problem as they installed hollow columns through which rainwater and condensation could drain away and guttering designed to filter condensation away from the building.[163]

That the mid-century piano was in frequent need of tuning is acknowledged by several sources. In her household advice manual, Mrs Beeton warned housekeepers of the dangers of placing pianos in a damp environment.[164] The professional pianist and teacher Carl Czerny and the piano tuner Meissner recommended keeping pianos in a dry environment of average temperature.[165] In his treatise on piano construction first published in 1916, Samuel Wolfenden referred to concert pianos 'in the olden days' as needing tuning during the interval; his implication is that appropriate improvements to remedy the situation first appeared in the mid nineteenth

---

[160] *Reynolds Newspaper*, 5 October 1851.
[161] *The Standard*, 12 July 1851.
[162] *The Lancaster Gazette and General Advertiser for Lancashire, Westmorland, Yorkshire & c*, 18 October 1851, p.3.
[163] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.34.
[164] Madelaine Abey-Koch, 'A History of Housekeeping', *The National Trust Manual of Housekeeping* (London: Butterworth Heinmann, 2006), pp.21-33, here p.24.
[165] Karl Czerny, *Complete Theoretical and Practical Pianoforte School, Vol III,* p.126, in Harding, *The Pianoforte*, p.294; Meissner, *Meissner's Modern Practical System for Tuning the Pianoforte for the use of Amateur Pianists, Tuners etc* (London, D'Almaine & Co, 1841), p.32.

century.[166] Strings supported by a wooden bridge, rather than an iron frame, would have been particularly susceptible to the environment. If temperatures dropped whilst humidity remained relatively high, the swelling of the wood forced the strings sharp; if temperatures rose whilst moisture levels remained relatively low, contraction would slacken the strings rendering them flat.[167] There is considerable circumstantial evidence that conditions in 1851 were damaging to certain types of object. Because pianos were spread throughout the building, instead of being placed together, however, not all instruments suffered in the same way because they were positioned in different environmental pockets. Had Brunel's building been adopted, a more constant temperature would have prevailed, meaning lesser RH fluctuations, creating an altogether more stable environment for moisture sensitive objects.

Light was an important part of visual experience for many visitors and was one of the main characteristics responsible for the appeal of Paxton's building.[168] Although it was described by some in poetic terms, it was in fact the enemy of some exhibits. Brunel's design had no novelty factor - it would never have inspired wonderings about how the light changed throughout the building - but it would have better protected light-sensitive materials. In 1851, some objects were shielded in downstairs compartments, but those displayed in the upstairs galleries would have suffered from light exposure. Hobhouse's claim that an awning was placed so that it only covered half the roof begs the question which half of the building was left exposed.[169] Even the partial covering that was used would presumably have been removed on days when roofing panels were taken out to facilitate air-flow.[170] Following complaints about heat, in July sections of glass at either ends of the building were removed and the following month sections of the roof were removed to

---

[166] Samuel Wolfenden, *A Treatise on the Art of Pianoforte Construction* (Surrey, Gresham Press, 1975), p.189.
[167] For a detailed explanation of temperature and relative humidity, see R. Bruce Hoadley, *Understanding Wood: a Craftsman's Guide to Wood Technology* (Newtown, CT: The Taunton Press, 2000), pp.111-4; Rivers and Umney, *Conservation of Furniture*, pp.253-6. For application of environmental conditions to the piano tuning, see Good, *Giraffes, Black Dragons and Other Pianos*, p.147.
[168] Davis, *The Great Exhibition*, pp.89-90.
[169] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.35.
[170] *The Morning Post*, 6 August 1851.

facilitate air flow through the galleries.[171] There are no eye-witness reports of pianos having suffered light damage, but fading was observed by a journalist for *The Bury and Norwich Post and Suffolk Herald* who, following a visit in early June, reported that damage resulting from light exposure was evident, especially on what he describes as 'beautiful and delicate manufactures'.[172] It is therefore plausible that upright instruments which incorporated a fabric fall into their design either above or below the keyboard, or on the back, might have experienced similar problems.

Some pianos, such as the aforementioned Crace/Lambert entries evaded light damage due to their location. When describing the difficulties of properly observing Pugin's stained glass in The Medieval Court, a journalist for *The Morning Chronicle* referred to a 'want of a sufficiently strong and unimpeded light', suggesting the area was dimly lit.[173] Situated in the upper galleries, British and Zollverein pianos were most at risk, although the awning may have offered some periodic protection. Although the light level in the Exhibition building is unknown, based on the fact that levels within the Kenwood Orangery have been recorded as measuring around 6000 lux, an educated guess concerning likely damage is possible.[174] Fading in high-sensitivity materials such as silk is known to occur at 5000 lux within two months, so any pianos with delicate material upholstery would have suffered noticeable change. If light levels were maintained throughout, high-sensitivity fabrics could have suffered complete fading by the end of the Exhibition.[175] Material falls, usually made of silk, were extremely common on all types of mid-century upright, and Exhibition instruments by George Aggio, Collard and Brinsmead all had material falls above the keyboard (Fig 2.5).

---

[171] *The Nottinghamshire Guardian*, 3 July 1851, p.3; *The Morning Post*, 6 August 1851, p.6.
[172] *The Belfast News*, 4 June 1851; *The Huddersfield Chronicle and West Yorkshire Advertiser*, 5 July 1851, p.7; *The Bury and Norwich Post and Suffolk Herald*, 4 June 1851.
[173] *The Morning Chronicle*, 7 June 1851.
[174] Personal communication with Dr Naomi Luxford, 4 September 2013, made during 'Change or Damage?', AHRC/EPSRC Science & Heritage Programme, Post Doctoral Fellowship at UCL Centre for Sustainable Heritage, 2010-2013.
[175] PSA 198: 2012 Specification for Managing Environmental Conditions for Cultural Collections, pp.36-7.

Fig 2.5: Cabinet piano by Collard, *The Art Journal Illustrated Catalogue*, p.52.

Examples which used fabric on the back of the instrument to highlight decorative fretwork included Brinsmead's cottage upright and Frederick Hund & Son's lyre piano.

It would seem, therefore, that concerns expressed by opponents of the Exhibition had a valid point when they queried whether Paxton's building would be able to properly protect the products displayed. According to the diary of Lily Hicks, a servant in the Paxton household, Colonel Sibthorpe and his supporters claimed that in wet conditions the exhibits would be ruined by damp and on sunny days the heat might be sufficient to set light to products.[176] The protectionist newspaper *John Bull* also raised concerns about the integrity of the building.[177] What none of these opponents realised, however, was that spatial positioning was such that damage would be selective. Because the organisers decided to change how to group exhibits, a topic which will be discussed later, products suffered environmental conditions to different degrees. Had the Commissioners' original plan to arrange exhibits by object-type been adhered to, like-products would have been exposed to the same temperature, RH and light levels.

2.7: The evolution of the classification system

[176] Frances Mary Hendry, *The Crystal Palace: The Diary of Lily Hicks, London 1850-1851* (London: Scholastic, 2001), p.122
[177] *John Bull*, 27 July 1850, in Davis, *The Great Exhibition*, p.90.

Few Exhibition scholars discuss how the classification system came into being and those who do address the issue do not dwell on it in any detail. For my purposes, however, the question of how the classification system evolved is important, as each stage of development would have had a different impact on the way material objects were understood. Suffice it to say that the four-section-plan that was eventually adopted, illustrated in Fig 2.6 below, was the product of much wrangling and compromise. As will be discussed later in this chapter, conceptual organisation and spatial arrangement were essentially separate, notwithstanding that it was the organisers' original intention that the one should reflect the other. Although the British half of the building did approximately adhere to the classification system, this was never intended as a nationalistic statement, an attempt at creating a cultural 'other', rather it was the result of decisions based on expediency.

Exhibition literature is somewhat divided in their accounts of how the classification system evolved. Although everyone is in agreement that the basic principles were discussed at Buckingham Palace on 30 June 1850, exactly what stages the organisers went through before arriving at the four-point-plan, sub-divided into 30 categories, is unclear. Davis claims that the four-section-plan was on the table from the outset and that the only decision to be made was whether the displays should be incorporated into one event or whether they should be separate.[178] For him, the role of the Society of Arts throughout the 1840s was very much evident in the final plan and this is presumably the foundation of Davis' belief that classification was hierarchical, a system where art and design were the pinnacle of the manufacturing process.[179] Rachel Teukolsky is also of this opinion; she states that the classification system was a gradation whereby the visually non-descript sat at the bottom and the beautiful took pride of place at the top.[180] Auerbach also believes that the four-section-plan was the starting point for discussions, although he alone identifies that the order of the four classes was different from what was eventually adopted. 'Machinery and Mechanical

[178] Davis, *The Great Exhibition*, p.26.
[179] *Ibid*, p.27
[180] Teukolsky, 'This Sublime Museum', in Buzard, *et al*, ed. *Victorian Prism*, pp.84-100, here p.86.

Fig 2.6: Four-point classificatory system employed at the Great Exhibition (*The First Report of the Royal Commissioners* Appendix II, s. 123), pp.22-24

Raw Materials (Classes I-IV)

I Mining and Quarrying, Metallurgy, Minerals

II Chemical & Pharmaceutical process & products

III Substances used as Food

IV Vegetable & Animal Substances

Machinery (Classes V-X)

V Machines for direct use

VI Manufacturing Machines & Tools

VII Mechanical, Engineering, Architectural & Building Contrivance

VIII Naval Architecture, Military Engineering Ordnance & Armour

IX Agricultural & Horticultural Machines & Implements

X Philosophical Instruments and Miscellaneous contrivances

Xa Musical Instruments

Xb Horological Instruments

Xc Surgical Instruments

Manufactures (Classes XI – XXIX)

XI Cotton

XII Woollen & Worsted

XIII Silk & Velvet

XIV Flax & Hemp

XV Mixed Fabrics, including shawls

XVI Leather, Skins, Fur and Hair

XVII Paper, Printing, Bookbinding

XVIII Woven, Spun, Felted and Laid Fabrics

XIX Tapestry, Lace & Embroidery

XX Articles of Clothing for immediate, personal or domestic use

XXI Cutlery, Edge & Hand Tools, and Surgical Instruments

XXII General Hardware

XXIII Works in Precious Metals, Jewellery and articles of luxury

XXIV Glass

XXV Ceramic Manufacture, China, Porcelain and Earthenware

XXVI Decorative Furniture, Paper Hangings and Papier Mache

XXVII Manufactures in Minerals used for building or decorations

XXVIII Manufactures from Animal or Vegetable Substances

XXIX Miscellaneous Manufactures and Small Wares

Fine Art (Class XXX)

Fine Arts, Sculpture, Models, Mosaics and Enamels

Inventions' were originally listed first instead of second, something which Auerbach interprets as evidence that the Exhibition was, even from the very earliest stages, all about showcasing new ideas. 'Decorative Manufactures' were placed second instead of third; the fact that the word 'decorative' was eventually deleted suggests that if design school reforms proceeded as planned, manufactures would inherently reflect quality design. Raw materials were positioned third on the list rather than first.[181] That the order was altered so radically suggests that ideas about what the Exhibition should reflect evolved over time.[182] This in turn confirms Auerbach's belief that the classification system was really a marriage of different interests. It reflected Albert's interest in taxonomy, the interests of science, the manufacturing process and consumer's need to understand the division of products.[183]

The notion that Exhibition taxonomy began life as a tripartite system of Albert's making is what Auerbach describes to as 'part of the lore of the Exhibition'.[184] According to Lyon Playfair's autobiography, however, (extracts of which are published in T. Wemyss Reid's biography) an initial three-part taxonomy consisting of raw materials, manufactures and art did exist during the early stages of planning.[185] The change came about in response to concerns raised by manufacturers who felt that Albert's three-section-plan did not present their products to their best advantage. Playfair states that the subsections into which the four main categories were divided each represented a distinct industry.[186] Steve Edwards, who relies upon this source in his essay 'The Accumulation of Knowledge', arrives at the same conclusion, asserting that the classification system was changed in response to consultation with British manufacturers.[187] Although Playfair, above all others, should be credited for the scheme adopted, the role of the manufacturers cannot be underestimated; it was their contribution that

---

[181] Auerbach, *The Great Exhibition of 1851*, p.23.
[182] *Ibid*, p.24.
[183] *Ibid*, p.93.
[184] *Ibid*, p.92.
[185] T. Wemyss Reid, *Memoirs and Correspondence of Lyon Playfair, First Lord Playfair of St Andrews* (London: Cassell, 1899), p.115; This biography was written at the invitation of his third wife, based on correspondence in her possession and an incomplete autobiography which Playfair compiled in his lifetime – the extract relied upon here is autobiographical.
[186] *Ibid*, p.116.
[187] Steve Edwards, 'The Accumulation of Knowledge, or, William Whewell's Eye', in Purbrick, ed. *The Great Exhibition of 1851*, pp.26-52, here pp.35- 6.

finalised the conceptual system by which visitors had to navigate the products on display.

Had Albert's tripartite scheme been retained, a classification devoid of mechanical presence, the piano would have presented either as furniture, an object appraised purely for its casing design, or as an imposter, an indicator that the system was incomplete because objects with sound-producing capabilities had been passed over. A taxonomy more suited to the piano's dual character existed for a short time in a little-known interim stage orchestrated by Playfair, cited only by Ffrench; unfortunately the evidence on which her assertions are based are unreferenced. Here goods were divided into eight categories: metallurgy, chemical manufactures, vitreous-ceramic manufactures, textiles, organic manufactures, engineering & machinery, architecture, fine arts & music, and agriculture and horticulture. Her narrative suggests that this intermediate stage was at least in part the result of correspondence between Albert and Sir Robert Peel, although no details are given.[188] Had this system been adopted, the piano would have had a clear place in a category that accommodated its dual identity. As it was, the piano, together with many other object types, resisted Playfair's system, refusing to fit neatly within any one taxonomical box.

How class boundaries were determined and how objects were categorised if they appeared to qualify for more than one class is unclear. The *Introduction* to the *ODIC* refers to 'eminent men of science and manufacturers' who were invited to assist with the process of establishing a criterion for each class, but no clue is given as to the factors taken into consideration.[189] Anyone reading William Whewell's post-Exhibition lecture 'On the General Bearing of the Great Exhibition' would conclude that the classification system was an unparalleled success. His first line of argument was to highlight the benefits of the taxonomy employed at the Great Exhibition compared with methods used at Paris exhibitions dating from 1806 to 1844, a line of argument which was obviously political. He argued that the degree of gradation employed at the Great Exhibition was particularly

[188] Ffrench, *The Great Exhibition: 1851*, p.58. The footnote following the eight-section-plan merely states that evidence is drawn from '1851 Commissioners' Records'.
[189] Robert Ellis, *Introduction to the Official Descriptive and Illustrated Catalogue*, (London: 1851), p.22.

important, a point illustrated by means of contrast to the system used by the French based upon the utility of objects.[190] Whewell's second line of argument centres on the potential long-term benefits of a widely accepted classification system for the commercial world; if a universal language of industry could be achieved, this would promote both co-operation and increased efficiency.[191]

The reality, however, was that nearly all quarters of society observed that category boundaries were blurred. Lord Normanby, the British Ambassador in Paris, queried whether fur coats were animal products or manufactured articles.[192] In his post-Exhibition lecture entitled 'Civil Engineering and Machinery Generally', Henry Hensman acknowledged that differentiating between a 'Machine' and a 'Manufacture' was sometimes difficult and that the rule which permitted an exhibitor to place all his articles, how disparate in character, in the same space, made the arrangement of objects confusing. He describes a specific end-result to illustrate the problem:

> One justly celebrated firm, having a grant of space for iron work, sent as part of it a cannon and a sugar mill, several tons weight, and found themselves in the same class as candlesticks and teapots. Many pumps were very properly sent as manufactures, and many others as machines. Most of the mining apparatus was shown in the section of Raw Materials, in connection with the minerals worked by it; but in some cases, where a general application, as in the pumping and lifting apparatus for mines, especially when put in motion, it was placed in Machinery proper.[193]

In her diary, Lily Hicks recorded comments made by her brother Jake, an employee of the cabinet maker Messrs Smee & Co. Although officially classed as manufactures, company entries should, in his opinion, have been classified as Fine Art. The products in question are described in an earlier diary entry as being:

---

[190] William Whewell, 'On the General Bearing of the Great Exhibition', in *Lectures on the Results of the Great Exhibition Delivered Before the Society of Arts, Manufactures & Commerce* (London: David Bogue, 1852), p.17.
[191] *Ibid*, p.19.
[192] Hobhouse, *The Crystal Palace and the Great Exhibition*, p.40.
[193] Henry Hensman, 'Civil Engineering and Machinery Generally', in *Lectures on the Results of the Great Exhibition Delivered before the Society of Arts, Manufactures & Commerce*, p.305.

> ... the fanciest ever, Jake says, a bed of carved mahogany and a cabinet with pictures of vases of flowers made of rosewood and ebony and boxwood and 100 more kinds of wood as I can't remember the names of, all different colours like as if they was painted ... and curved glass doors at the ends.[194]

Henry Mayhew wrote at some length in his *London Labour and the London Poor*, expressing dissatisfaction that was most likely rooted in his desire to see working men properly accredited for their work. His criticism was not so much that objects did not fit neatly within a category, but that the fourfold division did not allow for distinction between process and product, nor did it differentiate between what constituted an addition to a product and the actual product itself. He was also critical of the fact that the system did not cater for industrial processes which had no special or distinct products of their own, but which enhanced the quality of others.[195]

2.8: Why the piano resisted classification

The piano resisted being placed in a single taxonomical box because its material character was such that it potentially qualified for three of the four categories: machinery, manufactures and fine art. It was categorised as a machine (Class XA) by virtue of the fact that it was a sound producer yet it sat alongside object types whose purpose it was to convert raw materials into a consumer product. In conceptual terms, however, the piano was a manufactured item because it was a consumable, the end product of raw materials being converted by multiple processes. To complicate matters further, some exhibits were officially categorised as furniture (Class XVI) as well as a musical instruments; some were made to resemble furniture items, such as tables, so that they could fulfil a dual purpose. In terms of exterior design, the piano could also have been considered a fine art item given that the Class XXX jury were instructed to appraise exhibits which demonstrated either improvements in the process of production or improvements in the

---

[194] Hendry, *The Crystal Palace: The Diary of Lily Hicks,* p. 60 and p.107.
[195] Henry Mayhew, *London Labour and the London Poor: A Cyclopaedia of the Condition and Earnings of those that will work, those that cannot work and those that will not work*, Volume IV (London: 1861-1862), p.5.

application of art to manufactures.[196] If piano makers, or their third party suppliers, used new methods or new materials to decorate the finished casing, this element of workmanship could potentially qualify as Fine Art.

The first type of piano to defy conceptual boundaries comprised those registered as both musical instruments and furniture, namely the aforementioned submission by J. C. Crace and Lambert & Co (located in the Medieval Court) and a papier-maché piano jointly submitted by the Birmingham hardware makers Jennens & Betteridge and the Bristol piano maker A. Dimoline (located on the periphery of the Western Nave) (Fig 1.3). These represented instances in which makers took advantage of the organisers' stipulation that goods by the same producer, however different, could be exhibited in a single exhibition space. In the case of Jennens & Betteridge, their papier-maché piano was juxtaposed with other products made of the same material (Fig 2.7).

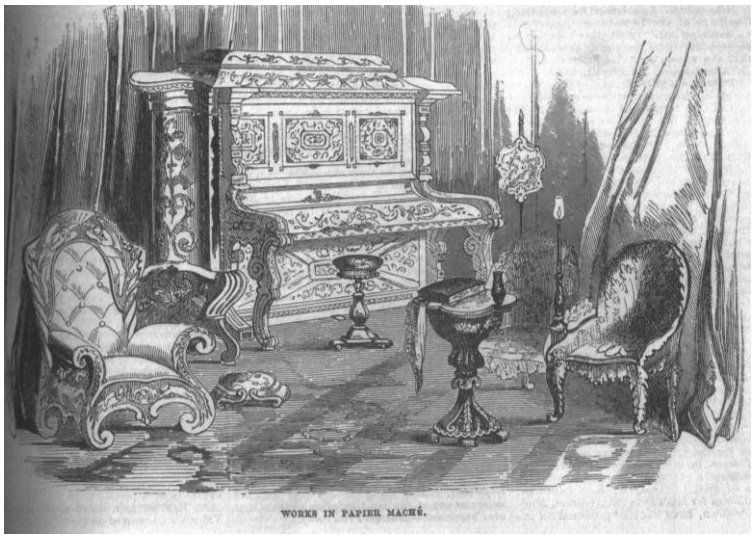


Fig 2.7: Jennens & Betteridge papier-maché piano with other items of furniture, *The Expositor, Vol II*, 1851, p.133. Reproduced by permission of University of Reading Special Collections.

Items included a cot, a music stool and Canterbury, a loo table, a lady's work table, a tête-à-tête chaise longue, a set of toilet furniture, a prie-dieu chair, plus smaller domestic items such as inkstands, reading stands, work boxes

[196] *First Report of the Commissioners for the Exhibition of 1851*, p.18.

and baskets.[197] This particular instrument would have been understood primarily in terms of the material from which it was made. Had it been made to sound, however, such perception would have been displaced. The two pianos jointly entered by Crace/Lambert would have been understood in terms of their design. Positioned next to items such as a sideboard, a cabinet bookcase, a bench, various tables and lecterns, it was their gothic exterior that would have spoken loudest.[198]

A second type of piano to resist classification was the dual-purpose instrument, a design that may have been inspired by what Arthur Loesser describes as 'harlequin' furniture which was fashionable in the late eighteenth century.[199] Dual-purpose instruments were not new to the market so had the classification system been conceived with the piano industry in mind, this difficulty would have been anticipated. The first piano of this kind was William Southwell's upright grand piano made in 1795 which incorporated a bookshelf into the area above the keyboard.[200] Rosamond E. M. Harding lists various such creations all dating from the early part of the nineteenth century such as a piano-secrétaire, a piano incorporating a chest of drawers designed for bedroom use and a work-box piano.[201] All the following examples were exhibited in Class XA with the exception of Mummery's 'piano bedstead' which was categorised as furniture (Class XXVI). The British piano section offered two examples of hybrid work. A 'tavola piano', made by Richard Hunt, (Fig 2.8) was described in the *ODIC* as 'a dining or drawing room table (which) stands upon a centre block or pedestal and contains a pianoforte (opening with spring-bolts)'.

---

[197] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume II*, p.743; the list cited above is not exhaustive and also includes an easy chair, a soft-table, writing desks, albums, portfolios, wine and tea trays.
[198] *The Official Descriptive and Illustrated Catalogue in Three Volumes,* Volume II, p.761; most of the items listed were made of carved oak wood; the display also included a carved prie-dieu and an oak screen.
[199] Loesser, *Men, Women and Pianos*, p.245.
[200] Good, *Giraffes, Black Dragons and Other Pianos*, p.127.
[201] Harding, *The Piano-forte*, pp.264-5. Sumner also discusses this trend in early-nineteenth-century piano making in *The Pianoforte*, p.66.

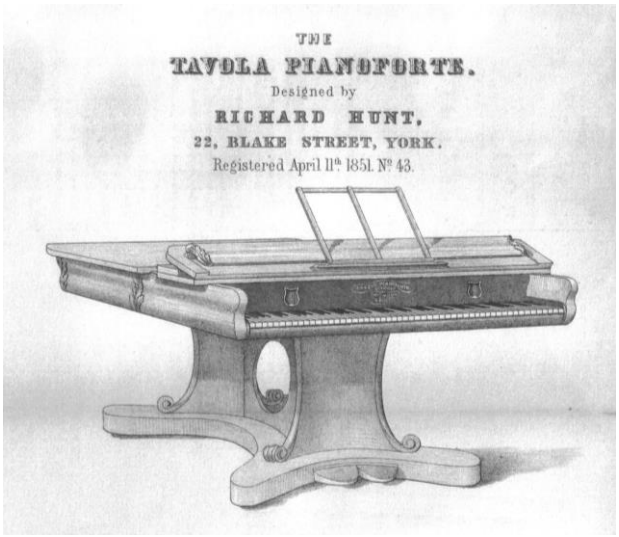


Fig 2.8: Richard Hunt Tavola Piano, Company Exhibition Prospectus. Reproduced by permission of University of Reading, Special Collections

A square piano by W. Stodart & Son was described by the author of *The Crystal Palace and its Contents* as 'having almost the appearance of a sofa table when shut'.[202] Mummery's 'piano bedstead' may constitute a further example although it cannot be said with certainty that the item was capable of sound production. French attempts at dual-purpose instruments were represented in the work of H. Pape who exhibited a table piano described by *Newton's London Journal* as 'having the size and appearance of an ordinary drawing room table; one end being lifted up, the keys slide out in a sort of drawer and the table is converted at once into a pianoforte' (Fig 2.9). They also exhibited a console upright described as having 'the appearance of a chiffonier.[203] The Zollverein section boasted just one dual example, namely T. Heitemeyer's patent table piano, described in the *ODIC* as being 'of peculiar construction'.

[202] *The Crystal Palace and its Contents*, p.201.
[203] Newton, *The London Journal of Arts, Sciences and Manufactures*, *Volume 39*, p.41; a chiffonier is a term used to describe either a tall elegant chest of drawers or a wide low open-fronted cabinet.

Fig 2.9: Pape Tavola piano, *The Art Journal Illustrated Catalogue*, p.315

2.9: Mid-century classification: a broader perspective

As the nineteenth century progressed, taxonomy became increasingly characteristic of the Victorian age as all areas of knowledge expanded. At some point in time between the late eighteenth century and the early nineteenth, taxonomy moved from a system based on what was visible to one based on the hermeneutic. Whereas philosopher Michel Foucault identifies this shift taking place at the end of the eighteenth century, science historian John V. Pickstone claims that the process was gradual; analytical forms can be found emerging in various branches of science from c. 1780-1840.[204] Put simply, cataloguing systems were increasingly designed to facilitate identification, taking account of relationships between subjects, rather than relying purely on what could be observed.[205] As Auerbach explains, Exhibition classification was nothing like the alphabetical system used by the *Encyclopaedia Britannica* or the philosophical order used by Diderot and D'Alembert when compiling the *Encyclopédie* in the second half

[204] Michel Foucault, *The Order of Things*, *An Archaeology of the Human Sciences* (Oxford: Routledge, 2002), p.236; John V Pickstone, 'Museological Science? The Place of the Analytical/Comparative in Nineteenth-Century Science, Technology and Medicine', *The Journal of the History of Science, 32* (1994), 111-38, here 116.
[205] Foucault, *The Order of Things*, p.136, p.152 and p.236; Pickstone, "Museological Science?, 111-38, here 114.

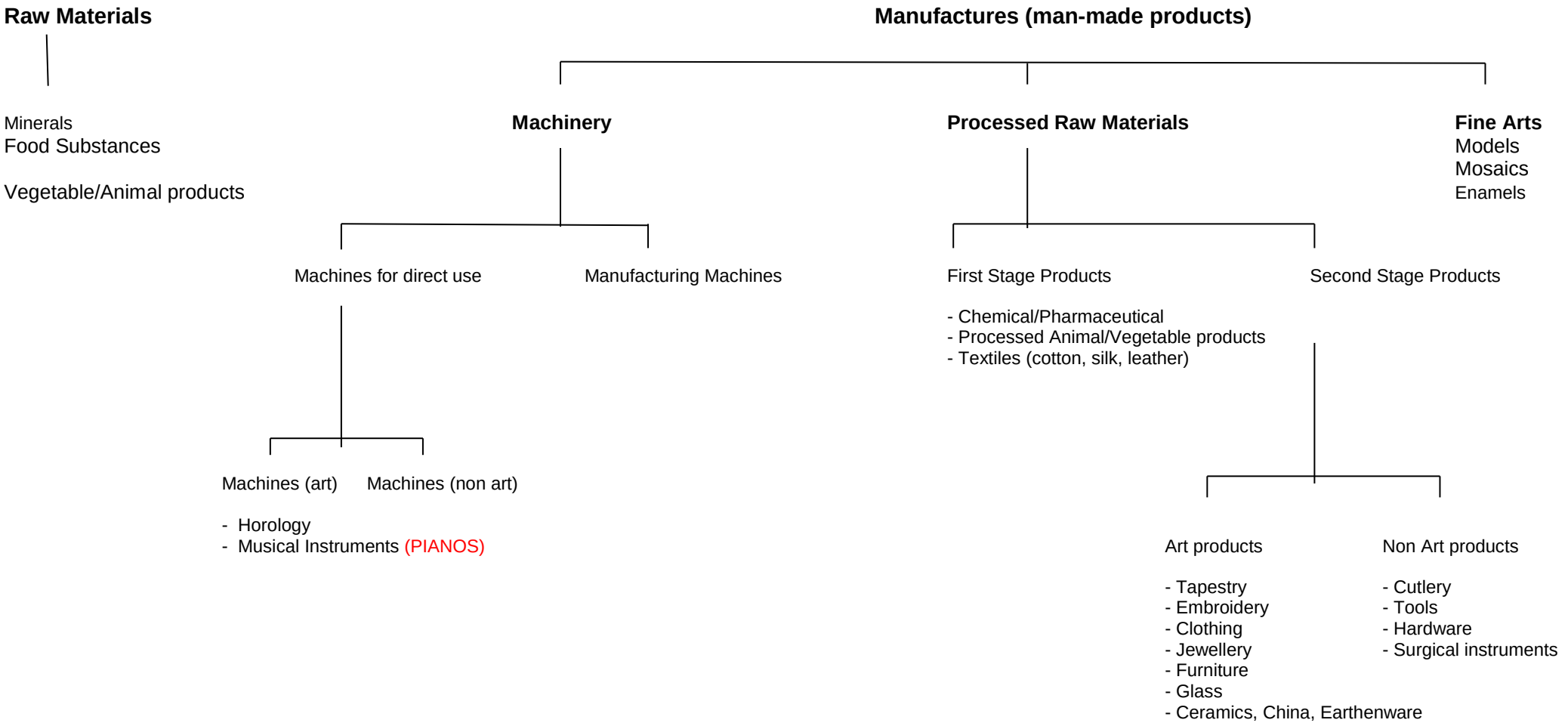
of the eighteenth century.[206] Nor was Exhibition classification based upon scientific principles; notwithstanding that Playfair was a chemist and an advocate for the professionalization of science, on this occasion, it is far more likely his ideas were born of expediency than anything more intellectual. It is no coincidence that the classification system more easily accommodated products made by makers consulted by Playfair as the scheme was evolving.

In scientific terms, one of the main problems with Exhibition classification was that it linked simple and complex items on the same level. Raw materials, for example, were placed on the same level as compound elements, namely machinery and manufactures. The system also failed to distinguish between purpose and method of construction; machinery and manufactures were categorised as two of the four main classes of objects notwithstanding that machinery is itself a form of manufacture. If the piano were to be accommodated in all its diversity, a very different taxonomy would have been necessary, a hypothetical example of which is shown in Fig 2.10 below. I have made a preliminary distinction between products in their natural state and those which have been manipulated in some way in recognition of human involvement. Machinery has been subdivided to overcome the fact that whereas some inventions were intended to convert raw materials into manufactured goods, others were fashioned with a specific function in mind. Processed raw materials have been subdivided in recognition of the different degrees to which sources can be modified to suit different purposes. Given the complex character of the object which inspires this alternate classification, my overriding goal is to suggest a taxonomy in which the difference between functional objects and those which combine function with an aesthetic character can easily be discerned.

The Exhibition system only really worked as it was meant to for products that were organic, where a single maker started with a raw material, used machinery to turn it into something consumable and then decorated it. It was designed to demonstrate basic processes producing finished goods

[206] Auerbach, *The Great Exhibition of 1851*, p.94.

Fig 2.10: Alternative classificatory system



easily recognised by the consumer. Smaller industries, such as piano making, which relied upon a complex network of suppliers, were not uppermost in the minds of the organisers as they struggled to get the British manufacturing community on board with their project. Davis' idea that the organisers intended to create a 'universal' display where potentially anything could find a home, where the definition of 'industry' was as wide as possible, appears to be correct.[207] Unsurprisingly, however, so broad an agenda meant that any form of classification system would have struggled to accommodate all submissions. That the system was flawed is almost inevitable given that it was the first attempt ever made at categorising industrial products; the materiality of industry was more complex than the organisers realised.

2.10: How were the objects arranged?

Some departures from the conceptual arrangement of exhibits caused by the materiality of objects have been observed in existing scholarship. Factors such as size, weight, the need for access to a power supply, the need for a bright light source in the case of stained glass, have all been cited as examples. Adding to this list, makers who chose to display all their goods together, such as the aforementioned Jennens & Betteridge, had the potential to create areas with multiple object-types. As evidenced by this example, the Commissioners' decision to prioritise makers' convenience over product categorisation resulted in a materiality that contradicted their own classification.[208] A similarly incongruous display may have confronted visitors to the British piano section in the form of products by the inventor H. Mapple. His piano compensation mechanism was allotted a place in Class XA, yet the *ODIC* states that his exhibits also included 'a machine for saving life on railways' to a 'mariner's compass needle'. Were all these items also displayed within the piano section? Makers who prioritised design over product-type, such as the aforementioned J.G. Crace, had the capacity to produce displays which married objects from several different conceptual

[207] Davis, *The Great Exhibition*, p.103.
[208] *First Report of the Commissioners for the Exhibition of 1851,* p.7.

categories. Had the classification system been properly observed, products entered by J. C. Crace listed earlier should have been spread across furniture, textiles and musical instrument departments.

The other main in-road impacting the relationship between the classificatory categories and spatial display was the practice of positioning objects in the Nave, Transept and other walkways through the building. Ffrench claims this was done merely to compensate those who did not receive their requested space allocation within their national compartment.[209] Davis believes that objects in the aisle served as a marker for what lay either side, although no specific examples are given.[210] A more likely explanation is that positioning in public areas was a method of showcasing the very finest aesthetic products entered in the competition. Referring back to the ground floor plans shown at Figs 1.3 and 1.4 at the beginning of my work, I have marked the location of these pianos based on evidence found in journalist accounts cross-referenced with the floor plan in *The National Archives*, which describes some of the exhibits shown in the Nave and Transept (Fig 1.2).[211] None of the pianos are shown there, but according to a report in *The Morning Chronicle* three makers had specimen instruments placed in the British and Foreign Naves by 19 July.[212] There is no evidence documenting exactly where Erard's grand piano was positioned, but being the creation of a French company, I have made the assumption that it would have been roughly adjacent to the French Section. According to *The Era*, Broadwood's ebony grand piano was located close to the Acis & Galatea fountain (Fig 2.11) and a letter from Collard to The Royal Commissioners dated 7 August indicates that their grand piano was located under the Coalbrookdale Dome.[213] As both the fountain and the dome are shown on *The National Archives* plan, it

---

[209] Ffrench, *The Great Exhibition: 1851*, p.129.
[210] Davis, *The Great Exhibition*, p.138
[211] Floor Plan of the Crystal Palace, The National Archives. http://www.nationalarchives.gov.uk/victorians/IndexOfResources4.aspx (accessed 5 February 2016). Unfortunately the writing describing the exhibits shown in the aisles is only legible if considerably enlarged; when printed at a size appropriate for this thesis the descriptions become impossible to read; the larger scale plan of the building is taken from. https://upload.wikimedia.org/wikipedia/commons/5/57/Crystal_Palace_-_plan.jpg (accessed 5 February 2016).
[212] *The Morning Chronicle*, 19 July 1851.
[213] *The Era*, 25 May 1851; Letter from Collard to the Royal Commissioners, 7 August 1851, Royal Commission Archives, RC/A/1851/405. Evidence that Broadwood's ebony grand was situated in the Nave appears in *The Morning Chronicle*, 24 May 1851.

is therefore possible to specify the location of the Broadwood and Collard grand pianos. The materiality of these three grand pianos spoke of expensive foreign materials, historical design and the finest tone achievable at mid-century, which supports the hypothesis that only the best were displayed in public areas.

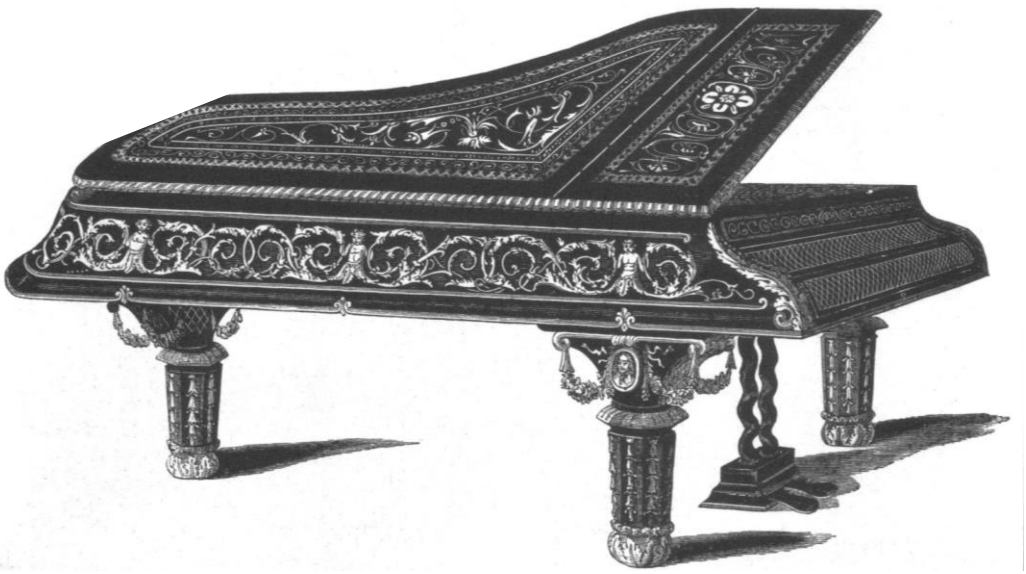


Fig 2.11: Broadwood ebony grand pianoforte, *The Art Journal Illustrated Catalogue*, p.284.

Such interpretation is further endorsed by the fact that space in public areas was coveted by makers as evidenced in Collard's aforementioned letter to the Commissioners. Whereas both their competitors Broadwood and Erard had been given a place in the British and Foreign Nave respectively, Collard were there purely because of the good will of the Coalbrookdale Company.[214] Precisely why Coalbrookdale, a company known primarily for their decorative ironwork, were so generous is unknown, but given the nature of their trade, it is possible that they may have supplied Collard with bracings for their pianos:

> At an early period we had occasion to protest against the acts of partiality evinced, in favour of a foreign competitor by the Executive Committee, or, its subordinate officers, in direct violation of the prescribed regulations –

[214] An engraving of Collard's grand piano situated under the Coalbrookdale Dome being played by a female pianist is shown in Chapter 2, Fig.2.8.

> regulations which we, ourselves, had most rigidly observed; our remonstrances remained either unheeded, or, received no other than a mere formal official acknowledgement and we owe to the courtesy and friendly feeling of the Coalbrookdale Company, rather than to official justice, a position in the Exhibition for the display of our manufactures equal to that officially conceded to our more favoured competitors, although denied to us.[215]

The placement of goods in the aisles, a practice perceived by John Cassell, author of *The Illustrated Exhibitor*, as a 'very happy idea', was from an exhibitors' perspective a material manifestation of bias whereby some makers were given unfair advantage.[216]

2.11: Alternative spatial positioning and alternate narratives

With the exception of Buzard who briefly entertains the question of how the Exhibition might have looked had the organisers adhered to the original spatial plan, how non-human actors might have worked to form alternate narratives is as yet unexplored.[217] In the following section I will offer three hypothetical layouts to illustrate how alternate spatial relationships between objects would have resulted in different narratives being constructed. I will consider firstly how a different juxtaposition of raw materials used in piano making, relative to the finished article, might have created a narrative which highlighted the interdependence of Britain, the colonies and foreign suppliers. I will also consider how an arrangement whereby visitors were able to observe the piano as process might have demonstrated both an interdependence between London and the provinces, and conveyed a message whereby the role of the artisan part-maker was integral to the end-product. A third possibility addresses Buzard's provocative suggestion that an arrangement based on object-type rather than geography would have created a very different Exhibition narrative.

---

[215] Letter from Collard to the Royal Commissioners, 7 August 1851, Royal Commission Archives, AC/A/1851/405.
[216] John Cassell, *The Illustrated Exhibitor* (London: John Cassell, 1851), p.28.
[217] Buzard, 'Conflicting Cartographies', in Buzard *et al*, ed. *Victorian Prism*, pp.40-52, here p.45.

All three scenarios require a return visit to the plans at the beginning of my work (Figs 1.3–1.6) where raw materials, parts and accessories, British pianos and foreign pianos are colour-coded to indicate their location. It is necessary to concentrate primarily on the British side of the building purely because the location of woods and piano parts used by foreign makers relative to the finished product are unknown. The problem quickly becomes apparent following a perusal of the ground floor and gallery plans for the Western side. Whereas British pianos were located upstairs, raw materials were to be found downstairs against the Northern wall and the parts and accessories were scattered through multiple ground floor areas on the south side. In the Exhibition that was, it would have been extremely difficult, if not impossible, for the average visitor to make a connection between a piano, the woods from which it was made and component parts.

The second of these hypothetical possibilities is particularly significant because it feeds into existing scholarship concerning the status of the working classes in their capacity as exhibitors. As has already been mentioned in the Introduction, the question of whether the contribution of the working classes was acknowledged is largely dependent upon which sources are examined. Peter Gurney illustrates the problem by contrasting Henry Mayhew's *Mr and Mrs Sandboys*, a novel which espoused the idea that working-class labour was valued, with Edward Reynolds' assertions that the Exhibition had effectively been commandeered by the upper classes.[218] Auerbach cites two poems, both inspired by the Exhibition, one by Martin Tupper which glorifies the role of the artisan, the other by John Critchley Prince which describes the downtrodden labourer.[219] Further evidence of divided opinion is cited by Miller who remarks on the fact that whereas *The Illustrated London News* depicted workers as central to the manufacturing process, *The Art Journal Illustrated Catalogue* depicted objects in their finalised form with no reference to the workers responsible for their creation. For him, legislation preventing workers from deriving financial benefit from their inventions provides conclusive evidence that working-class participants

[218] Gurney, 'An Appropriated Space', in Purbrick, ed. *The Great Exhibition*, pp.114-45, here pp.115-21.
[219] Auerbach, *The Great Exhibition of 1851*, pp.131-2.

were acknowledged in name only.[220] Evidential difficulties are further exacerbated by the fact that most sources use the terms 'labourer', 'working classes' and 'artisans' interchangeably so it is difficult to ascertain precisely which audience is being referred to at any one time. Blanchard Jerrold, cited by Miller, for example thought that the Great Exhibition recognised the contribution of the 'working classes'. A quotation from *Punch*, however, included in Jerrold's argument because it presented an opposing view, referred to the audience concerned as 'artisans'.[221] Other writers such as the French political economist Jerome Adolphe Blanqui, cited by Kriegel, simply talked about recognition of 'human industry' without any class labelling.[222]

2.11.1: The piano as embodiment of colonial and foreign resources: an imperialist-based display

The main source of evidence for an imperial-based and labour-based layout is an inventory of parts relating to one of Broadwood's amboyna grand pianos which itemises both the raw materials used and the number and type of parts purchased from third parties (Appendix D).[223] The various woods listed in Broadwood's inventory, used to form the piano action and casing, constitute a shopping list encompassing practically the entire globe. According to Blackie's *The Cabinet Maker's Assistant*, published in 1853, although many of the more common woods used by Broadwood, such as beech, pine and birch, could have been obtained from most countries in Europe and North America, some of the more unusual woods were available only from specific locations. Amboyna, for example, the principle wood used for the casing, was found only in The Spice Islands, part of the East Indies.[224] Whereas earlier in the century Britain had been dependent largely on her colonies to supply raw materials, the repeal of the Navigation Acts in 1849

---

[220] Miller, *Novels Behind Glass*, pp.77-8.
[221] *Ibid*, pp.76-77.
[222] Kriegel, *Grand Designs*, p.86.
[223] Broadwood Amboyna Grand Pianoforte Inventory of Parts, No 17842, undated, Surrey History Centre, 2185/JB/84/2.
[224] *The Victorian Cabinet Maker's Assistant* (London: Blackie & Sons, 1853, republished by New York: Dover Publications Inc, 1970), pp.1-48.

meant that import duties on timber were abolished; consequently materials were more freely available.[225] Woods such as beefwood, listed as being used as part of the action, was imported from colonial dependencies, whilst mahogany and zebrawood were obtained as a result of commercial treatises with Spain and South American countries including Brazil. Broadwood's amboyna grand was a material embodiment of free trade, a movement which most Commissioners were tacitly in favour of, but which was downplayed somewhat to retain the support of protectionist members.

It is possible that a spatial layout demonstrating the relationship between the piano as an end-product and as an application of raw materials exhibited by colonial and foreign suppliers could have changed the way British Imperialism was perceived. As it was, the exotic woods that many piano makers used were displayed chiefly as the property of various administrative bodies, so no connection was made between the raw material and its application. To take mahogany as an example, this product was exhibited by St Domingo where ownership was claimed by Sir Robert Schomburgk, H. M. Consul of The Dominican Republic.[226] In Class IV (Vegetable and Animal Substances used in Manufactures) mahogany was one of an extensive list of materials imported by Richard & John Harrison of Hull. Described as 'Specimens of English and Foreign Woods', examples of mahogany were shown to originate from British colonies such as the Bahamas and Jamaica, from independent countries such as Cuba, St Domingo, Honduras, Panama and parts of Africa and South Australasia.[227] Mahogany appears again in Class XXIX (Miscellaneous Manufactures and Small Wares), this time identified as the property of J. C. Archer of The Liverpool Local Committee. Describing himself as an 'arranger and collector', this exhibitor claimed credit for a wide variety of materials sourced from across the globe, collectively referred to as 'Hard and Fancy Woods

---

[225] Adam Bowett, *Woods in British Furniture Making, 1400-1900: an Illustrated Historical Dictionary* (Wetherby: Oblong Creative, 2012), pp.xvii-p.xix.
[226] *The Official Descriptive and Illustrated Catalogue in Three volumes*, *Volume II,* p.1429, p.1140 and p.1314.
[227] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume I*, pp.195-6 and p.206.

imported in 1850'.[228] At no point, however, was value deemed to lie either with the indigenous population of the country of origin or in the hands of makers with the capacity to convert it into a consumable product: rather its value was claimed by whoever administered its land of origin or whoever facilitated the importation process.

One of the main problems identified by the majority of Exhibition scholars was that at no point could the reality of exchange with the colonies and foreign suppliers be clearly discerned. Auerbach maintains that manufacturers were encouraged to view the colonies as a lucrative resource and visitors were taught to understand them as a possession.[229] Davis highlights a similar narrative whereby the voice of imperialism was the only audible one and the public were taught to view the world of the Exhibition in those terms.[230] In an essay concerning how America's indigenous resources were displayed, Kate Flint agrees that the public were encouraged to view British consumer products as the apotheosis of resources obtained from less developed cultures.[231] Could a process-based display have changed this perception? Products such as Broadwood's amboyna grand, if displayed as process, might have suggested a more reciprocal relationship between Britain and the colonies based on the fact that, as Lara Kriegel explains, at mid-century there was concern that Britain could not produce her own raw materials.[232] A glance at the lists of wood used for piano casing in Appendix A corroborates this claim, as (apart from a few instances when oak was used) barely any British makers used material indigenous to Britain. The majority of casing was made of either rosewood, obtainable principally from Brazil, or walnut, available in varying quality from Italy, France and America.[233]

---

[228] *The Official Descriptive and Illustrated Catalogue in Three volumes, Volume II,* p.803 and pp.812-3.
[229] Auerbach, *The Great Exhibition of 1851*, p.101.
[230] Davis, *The Great Exhibition*, pp.104-5 and p.161.
[231] Flint, 'Exhibiting America', in Buzard, *et al*, ed. *Victorian Prism*, pp.171-85, here p.181.
[232] Kriegel, 'Narrating the Subcontinent in 1851', in Purbrick, ed. *The Great Exhibition of 1851*, pp.146-78, here p.154.
[233] *The Victorian Cabinet Maker's Assistant,* pp.23-4.

2.11.2: The piano as process: a labour-based display

Had makers made more use of the facility to display process, it is likely that commercial relationships between London makers and provincial part-makers and accessory-makers would have been more obvious. That such arrangement was permitted is stated in *The First Report of the Commissioners*:

> Where it is desired to exhibit processes of manufacture, a sufficient number of articles, however dissimilar, will be admitted for the purpose of illustrating the process; but they must not exceed what may be actually required.[234]

Some exhibitors did set up displays designed to promote understanding of processes and product application. Hibbert Platt & Sons, for example, treated visitors to a demonstration of how a waistcoat was made, from the raw material through to the final article.[235] The mineralogist James Tennant displayed a variety of minerals labelled as being 'for educational, scientific and ornamental purposes', and other entrants in Class I produced working models which demonstrated mining processes.[236] Had piano makers followed suit, the materiality of component parts would have become more significant and the contribution of third parties to the assemblage of a complex product more prominent. Had the practice of displaying process been more widespread, industry would have become a source of spectacle and instruction on a much bigger scale. Just as visitors to Cadby's piano workshop in 1864 were keen to see the factory in full swing, so process could have become a more prominent attraction at the Exhibition.[237]

Broadwood's inventory for their amboyna piano offers clear evidence of the amount of work that was carried out by independent craftsmen. The basic casing was made in August 1850 by Oxley and subsequent work was carried out in October and November by Young. The case was then widened in February 1851 by Oxley, after which final decorative work was carried out in March by Darby. Veneering work on the piano legs was carried out in April

---

[234] *First Report of the Commissioners for the Exhibition of 1851*, pp.7-8.
[235] Ffrench, *The Great Exhibition:1851*, p.64.
[236] Davis, *The Great Exhibition*, pp.142-3.
[237] Dr G. L. M Strauss, *et al*, *England's Workshops* (London: Groombridge & Sons, 1864), pp.311-2.

1850 by Wilson; the task of turning was done by Garbull in May. Further decorative additions such the lyre-shaped support for the piano pedals were supplied by Selby. Similar evidence of a contracted workforce is evident with regard to the piano action. Under-dampers and under-damper lifters were made by Stevenson; springs were then added by Hubert and the device in its entirety was fitted by Haldane. Additional parts such as hammers and strings (to name but a few) were supplied by Hubert. It is significant, however, that whereas the design, inlaying, carving and gilding of Broadwood's amboyna piano was acknowledged in the *ODIC* as the intellectual property of E. M. Barry, G. Watson, J. Thomas and G. J. Morant respectively, no such commendation was awarded to part-makers.[238] In the case of Dimoline's semi-cottage piano, accreditation was given to Mr Lane of Birmingham who designed and executed the mother-of-pearl painting on glass adorning the front of the instrument (Fig 2.12). This suggests that in the Exhibition that was, decorative concepts and techniques were worthy of separate commendation whereas craftsmanship was not.

Fig 2.12; Upright piano with mother-of-pearl painting on glass, A. Dimoline Exhibition company prospectus; the reference to glass painting by Mr Lane appears in *The Morning Chronicle*, 26 July 1851. Reproduced by permission of University of Reading, Special Collections.

[238] *The Official Descriptive and Illustrated Catalogue in Three Volumes*, *Volume I*, p.468.

Had a spatial link been made between the piano as an end-product and the many component products on display, a relationship of mutual dependence might have emerged. All the makers listed in Appendix E made products essential to the piano industry, the majority of whom were based in Birmingham. Within the Exhibition building, however, their contributions were displayed in locations where spatial association with the finished piano was rendered impossible. As indicated in the building plans (Figs 1.3-1.6) whereas British pianos were located in the North-Western gallery, the majority of accessories listed below were to be found in the British hardware section, located on the south side of the British Nave.

Had products been displayed in one space demonstrating a continuous temporal line, not only would the relationship between makers have been visualised, but apparently humble goods such as musical wire would have spoken differently. As will be discussed in greater detail in Chapter 5, the quality of piano wire was in fact crucial to the tone of a finished instrument and poor tensile strength produced a weak sound and a brittle finish to the strings. Sound, therefore, was not wholly the responsibility of the piano maker, rather it was at least in part dependent upon the efficiency of their suppliers. Improvements made in the production of musical wiring during the 1850s by makers such as the Birmingham firm Webster & Horsfall, a forerunner of which was present at the Exhibition, were crucial to the industry as a whole.[239] In the Exhibition that might have been, demonstration of process would have helped illuminate the role of third parties, thus bringing working-class and artisan contributions to the fore.

2.11.3 The piano displayed according to object-type: how the Exhibition was originally intended

Unlike the two scenarios previously discussed, this third alternative presents a picture of the Exhibition that is not wholly fictional in the sense that arranging goods by object type was intended by the Commissioners during the early stages of planning. In this reality, certain aspects of the

[239] Sumner, *The Pianoforte*, p.74; Ehrlich, *The Piano: a History*, p.29.

materiality of the objects concerned takes on greater significance and certain impediments which hindered visitor experience of sight and sound would most likely have been removed. Although scholars agree that the organisers' decision to change how products were displayed was based on expediency rather than principle, as Buzard points out, no specific reason was ever recorded in the Commissioners' minutes.[240] The original plan had been to arrange exhibits according to product-type to facilitate comparison, but what actually happened was that whereas British products adhered to this scheme, foreign goods were arranged according to geography. The decision to change from a product-based arrangement to a geographical one was made neither lightly nor quickly, but over the course of ten months from March to December 1850.[241]

Most Exhibition authorities concur that the classification system and the spatial arrangement of products were incompatible. Eileen Gillooly believes the taxonomy employed was ineffective in aiding visitors understand what they saw, a view she appears to base on Henry Mayhew's disparaging comments on the same subject.[242] According to Auerbach, the display promoted spectacle rather than rational understanding of the industrial process; it certainly failed to reflect the conceptual categories into which products were divided.[243] Buzard goes as far as to describe the difference between the conceptual and spatial systems as a 'yawning chasm'.[244] The narrative of the Exhibition that might have been, something which is considered briefly by Buzard, is an approach I want to develop further in a final bid to explore the role of non-human agents. How different would the materiality of the Exhibition have been had objects been arranged according to product-type and what new narratives might have emerged?

Positioning pianos within the same physical space would have meant that certain nationalities and manufacturers would have been visibly

---

[240] Davis, *The Great Exhibition*, p.105; Buzard, 'Conflicting Cartographies', in Buzard *et al*, ed. *Victorian Prism*, pp.40-52, here p.49.
[241] *Ibid*, pp.46-8.
[242] Gillooly, 'Rhetorical Remedies for Taxonomic Troubles', in Buzard, ed. *et al*, *Victorian Prism*, pp.23-39, here pp.24-5.
[243] Auerbach, *The Great Exhibition of 1851*, pp.94-5.
[244] Buzard, 'Conflicting Cartographies', in Buzard *et al*, ed. *Victorian Prism*, pp.40-52, here p.44.

dominant. The difficulties of establishing exactly how many makers and instruments were present has already been explained in the Introduction, but (based on the estimates given) Britain was by far the biggest contributor, exhibiting upwards of 86 items in Class XA, collectively the property of 54 manufacturers. France came in second, exhibiting upwards of 43 pianos by 20 makers; Zollverein took third place with 19 exhibitors showing upwards of 27 pianos. Had pianos been grouped according to maker, however, France would have dominated and British piano making would have appeared less prolific. Whereas Broadwood and Collard entered four and six pianos respectively, Erard presented a total of 14 instruments.[245]

Such hypothetical juxtaposition whereby a staggering 194 pianos, tuning devices and didactic aids, or more, were positioned in the same part of the building would have necessitated a system of co-ordinated demonstration. Newspaper reports indicate that competing pianists were considered a nuisance by visitors; *The Aberdeen Journal* commented on an occasion when The Royal Party hurried past the British piano section to avoid duelling exhibitors.[246] Under the prevailing layout, although the piano was officially categorised as a sound producer, little formal opportunity was given for visitors to experience pianos in action. A layout determined by object-type, however, would have meant that some kind of formal schedule would have been essential. In such alternate materiality, concerns that entertainment should not take the place of learning, something which is discussed in Chapter 3, would probably have been laid to one side.

Another likely consequence of an alternate layout is that comparison between products of different nations would have been much more achievable and the variety of pianos on display would have been more apparent. Exterior design, internal construction and resulting sound could all have been evaluated more easily. With specific regard to the environment, a

[245] There is some uncertainty as the exact number of pianos presented by both Collard and Erard, a difficulty which has been outlined in general terms in the Introduction. Whereas *The Official Descriptive and Illustrated Catalogue* states that Collard entered five instruments on p. 430, according to Peter & Ann Mactaggart, *The Catalogue Supplement* states that a total of six were exhibited; the discrepancy appears to rest upon whether they entered one or two microchordan pianos. Whereas *The Official Descriptive and Illustrated Catalogue* records Erard's contribution to the English section as totalling eight instruments, according to Peter & Ann Mactaggart, the company prospectus details only seven.

[246] *The Aberdeen Journal*, 9 July 1851.

layout dictated by object-type would have made all pianos subject to the same temperature, RH and lighting conditions. If the humidity of the environment was as unstable as temperature data suggests, Zollverein and American manufacturers Bessalie and Pirsson, who purported to have created a mechanism to make tuning easier, would have been put to the test.[247] Any maker claiming that their instrument could stay in tune notwithstanding increased temperatures and humidity would have been caught out had their invention proved inadequate. Such innovations were especially prevalent amongst American manufacturers, such as Meyer, Nunns & Clark and Pirsson.[248] Conrad Meyer of Philadelphia, for example, exhibited pianos described in the *ODIC* as 'constructed with iron-plate frames, particularly adapted to damp and warm climates'. Although J. Chickering did not claim any special advantage for his instruments if exposed to extreme climates, his grand piano would have withstood an adverse environment on account of its metal string plate, bars, wrest block and bridge, all cast as a single piece. Assuming all pianos were played with equal regularity in the prevailing environment, it is likely American pianos would have been presented in more robust terms than their British and European counterparts.

In this reality, material construction which made a piano durable would have become more significant, no instrument would have been privileged by its location and the strength of national presence could have been determined more easily in relative terms. The necessity for some kind of demonstration schedule would have given visitors more opportunity to hear pianos in action thus displacing any tendency to view instruments primarily in visual terms on account of their silence.

---

[247] *The Official Descriptive and Illustrated Catalogue in Three Volumes*, *Volume III*, p.1052 (Bessalie); pp.1438-9 (Pirsson).

[248] *Ibid*, p.1437 (Meyer); pp.1459-60 (Nunns & Clark); pp.1438-9 (Pirsson); p.1436 (J. Chickering). Chickering's catalogue entry is sparse; for a more detailed record of piano entries, see Newton, *The London Journal of Arts Sciences and Manufactures*, p.46.

2.12: Conclusion

Scholars are correct in their assertions that the Exhibition was the work of many hands. Contributors ranged from conservative aristocrats to liberal industrialists, from the provincial British public to foreign monarchies. Albert has been largely displaced from his traditional pedestal in favour of a more wide-ranging network of human actors in the form of Exhibition officials and committees. On the one hand, human actors decided what objects to submit, what objects to display and how they should be classified and arranged. On the other, non-human actors gave voice to national presence, to whether sight or sound was uppermost, to whether the classification system was comprehensible and (perhaps mostly significantly) whether or not particular narratives were detectable. Whereas human actor studies examine the wider political and economic forces at work, analysis of non-human actor activity looks at ways in which the building and its contents shaped the way in which meaning was made. By contrasting the Exhibition that was with what might have been, it becomes apparent how the colonies, and the British provinces, on the one hand, and British labour, on the other, might have had a more substantive presence. The materiality of objects exposed the weaknesses of the classification system. That so many objects did not fit neatly within the taxonomy suggests that the materiality of industry at mid-century was far more complex that the organisers anticipated. By comparing the Exhibition that was with the plan originally conceived by the Commissioners, it becomes apparent that materiality, as manipulated by organisers and exhibitors, unfairly privileged some objects over others. Whereas some enjoyed positioning that was visually, aurally and environmentally favourable, others were hidden in the depths of ground floor departments or exposed to extreme temperature fluctuations and lighting levels in the galleries. A layout determined by object-type, however, would have meant all pianos were subject to the same environmental conditions, were equally accessible to visitors and were positioned so that visual and aural comparison was possible.

Chapter 3: Visitor experience at the Great Exhibition: the sight and sound of the piano

> The Queen and party stopped for a few moments beside Erard's Grand piano, the exhibitor of which was in attendance, and listened to a short prelude, played to show the wonderful power and brilliancy of the instrument. *The Daily News*, July 19, 1851.

> We have to thank Messrs Broadwood for adding to the British display of parquetrie ornament by the choice example they have given on their pianoforte case.... We have seldom seen a better example of Italian ornamental forms.... *The Morning Chronicle*, September 26, 1851.

3.1: Introduction

For many visitors, entering the Exhibition building for the first time was an overwhelming, even frightening experience; it was an environment the like of which no-one had witnessed before. This chapter seeks to explore what visitors saw and heard, with particular reference to pianos, and what knowledge and preferences they might have had enabling them to evaluate exhibits. This line of enquiry draws upon the many ways in which Exhibition scholars believe that visitors navigated their surroundings visually. Whereas most have wedded themselves principally, if not exclusively, to one approach, I have questioned how objects would have been understood using a variety of techniques, definitions of which are set out below. To date, most Exhibition analyses assume that visuality was either dominant or autonomous; one such example is Kylie Message and Ewan Johnston's essay 'The World within the City'.[249] In contrast, the role of sound remains largely unchartered territory and accordingly it has been assumed that the soundscape did not play any substantive part in how the Exhibition was

[249] Kylie Message and Ewan Johnston, 'The World within the City: The Great Exhibition, Race, Class and Social Reform in Britain', in *The Empire and the World at The Great Exhibition of 1851*, ed. Jeffery A, Auerbach and Peter H. Hoffenberg (Farnham: Ashgate, 2008), pp.27-46.

understood. Although some mention has been made of the soundscape at the Opening and Closing ceremonies, scholarly remarks are usually limited to the identity of the performers and the repertoire played, coupled with a description of the prevailing acoustics.[250] In his publication *The Musical Life of the Crystal Palace*, Michael Musgrave is of the opinion that music and sound played little part in the life of the Exhibition building prior to its relocation to Sydenham in 1854.[251] So far as piano scholarship is concerned, this chapter contributes to the question of whether the piano was understood principally as a sound producer or as an aesthetic object and how such values changed according to the 'field' of enquiry and the capital and 'habitus' of the audience concerned.

When Exhibition scholarship broaches the question of vision, a complex range of terminology prevails: to cite just a couple of examples, whereas Richards describes 'new ways of seeing', a system in which the commodity became central, Teukolsky refers to 'competing kinds of aesthetic visions' when discussing how the visual landscape was navigated by amateurs compared with professional artists.[252] As I am considering multiple methods I will use the term 'ways of looking', a collective term encompassing the three main methods used, namely surveillance, spectacle and rational recreation. Surveillance, a technique discussed by Tony Bennett in his essay 'The Exhibitionary Complex', was primarily a means of control, a system by which a display of power served to regulate behaviour. By giving people a place amongst the biggest and best products of the day, their co-operation was assured.[253] Spectacle is discussed in detail by Thomas Richards in relation to how advertising during the second half of the nineteenth century was impacted by the Great Exhibition. It was a distraction which Victorian audiences craved in ever increasing degrees of complexity.[254] Spectacle was vision in pursuit of pleasure that would gravitate towards pretty, well-made, eye-catching exteriors. The desire for the spectacular also shaped the

---

[250] Davis, *The Great Exhibition*, pp.126-8.
[251] Musgrave, *The Musical Life of the Crystal Palace*, p.9.
[252] Richards, *The Commodity Culture of Victorian England*, p.18; Teukosky, 'This Sublime Museum', in Buzard *et al*, ed. *Victorian Prism*, pp.84-100, here p.85.
[253] Bennett, 'The Exhibitionary Complex', in Schwartz and Przyblyski, ed. *The Nineteenth Century Visual Culture Reader,* pp.117-30, here pp.121-3.
[254] Richards, *The Commodity Culture of Victorian England*, pp.54-7.

inclination to look at the layout as a whole rather than at individual items. Like surveillance, it was also a mode of behaviour that would have distracted visitors from examining specific products. The third and final possibility, namely rational recreation, was a notion which originated earlier in the century designed to encourage class harmony and the productive use of leisure time. By mid-century it had become a means by which the middle classes could dissociate themselves from their betters whose shallow indifference to the Exhibition prompted much criticism in the press. Eye-witness accounts confirm that many classes of visitor did employ an investigative approach. *The Leeds Mercury* spoke of 'the sober business-like class who want really to see the Exhibition' and *The Morning Chronicle* witnessed mechanics and artisans 'cross questioning the attendants, and, in short, evidently bent upon gaining instruction as well as amusement.'[255] Addressing a readership described as 'the Industrious classes', the writer of *The Family Economist* assumed that visitors would want to see products utilised in their occupations.[256]

Techniques specific to sound include 'audile technique', 'monitory listening' and 'diagnostic listening'. The first is a term coined by Jonathan Sterne and denotes a deliberate technical skill designed to promote the 'coding and rationalisation of what was heard'. Sterne defines the technique as a prelude to an investigation of medical, telegraphic and sound-reproduction technologies.[257] My interest relates to how visitors attempted to verbalise what they heard and whether they were able to link the novelty claimed for the instrument in question to the sound produced. 'Monitory listening' and 'diagnostic listening' are terms used by Trevor Pinch and Karin Bijsterveld both of which denote different levels of listening skill.[258] The former describes the ability to determine 'whether something is wrong' and the latter to assess 'what is wrong'. Both are useful tools for considering

[255] *The Leeds Mercury*, 17 May 1851; *The Morning Chronicle*, 27 May 1851.
[256] Cantor, *The Great Exhibition, Volume III*, pp.199-200; 'The Great Exhibition', *The Family Economist* (London: 1851) in Cantor, *The Great Exhibition*, *Volume III*, pp.201-4, here p.202.
[257] Sterne, *The Audible Past*, pp.23-5; for a more extensive application of the term see pp.92-5.
[258] Pinch and Bijsterveld, 'New Keys to the World of Sound', in Pinch and Bijsterveld ed. *The Oxford Handbook of Sound Studies*, pp.3-35, here p.14.

whether visitors knew how to assess tone, whether a piano was correctly tuned and whether an instrument was defective in some way.

The chapter will be divided into two main parts discussing sight and sound respectively prefaced by a brief introductory section exploring what factors may have limited visitor experience, for example building size, choice of what to look at and opportunities for looking and listening. Problems specific to sight and sound experience are discussed separately within the relevant sections. My discussion of how the piano might have been experienced visually investigates whether visitor methods of looking were conducive to achieving an in-depth understanding of exhibits and whether the spatial layout discussed in Chapter 2 would have made any difference to whether sight or sound were uppermost. It also examines how the use of Exhibition guides might have influenced visitor behaviour and how prior knowledge of style and materials might have shaped visitor opinion. The second part of the chapter, which explores what role sound may have played in visitor experience, investigates whether or not visitors had the requisite knowledge to evaluate piano tone or to determine how sound was linked to underlying construction. It also looks at what experience visitors might have had of solo piano music, what music was played at the Exhibition and how pianos might have been demonstrated either by exhibitors or members of the public. When considering the question of sight and sound, the perspective examined here is that of the 'average visitor', in other words, the amateur; the perspective of the professional will be considered in Chapter 4. Admittedly some visitors sit on the border between the categories, such as the engineer Dr William Pole, editor of *Newton's London Journal*, which was a technical publication. My findings are based principally on reports by journalists for metropolitan and regional newspapers together with diary accounts.

3.2: Exploring the physical limitations of the Exhibition building

Although visitors were free to wander where they wished, scholars have identified that in reality they were limited in certain ways. Visitors were sometimes restricted in terms of the amount of time they could spend looking

at a particular exhibit.[259] They were also hampered by their own inability to acclimatise to the environment quickly enough to make something of the visit. Information overload coupled with exhaustion were a problem for many.[260] The size of the building was an issue for those wishing to learn rather than simply enjoy the spectacle. Having spent a day in the one million square feet that was the Crystal Palace, a writer for *The Glasgow Herald* concluded that, in practical terms, if traversed in its entirety, the visitor would have travelled 'nearly three miles' around the galleries together with 'six miles travelled on the ground floor'.[261] Someone wishing to compare British pianos, situated in the North West gallery, with those in the American Department, located at the mostly easterly point on the ground floor, for example, would have faced a very long walk (Figs 1.4 and 1.5).

Whether or not all exhibits were equally accessible in practice is debatable. That newspapers advised their readers not to attempt viewing anything in ground-floor compartments during initial visits meant that none of the foreign pianos would have been inspected at an early stage.[262] Such advice was offered to readers of *The Glasgow Herald* on the first day the Exhibition was open to season-ticket holders. Some weeks later, when visitors were presumably more familiar with their surroundings, journalists for both *The Daily News* and *The Lancaster Gazette* reported that the galleries were poorly attended because most visitors would only venture up there once they had seen everything on the ground floor.[263] If their verdict was accurate, both the British piano section and that of the Zollverein would have suffered from a lack of attention. There would certainly have been instances when visitors with a particular goal in mind would have been frustrated. One account of the Russian department, for example, where two grand pianos by Lichtental were displayed, likens the scene to 'the crush room of the opera'.[264] Because they were placed in direct competition with the jewellery on display in that area, it is unlikely either piano would have been physically

---

[259] Richards, *The Commodity Culture of Victorian England*, p.35.
[260] Auerbach, *The Great Exhibition of 1851*, p.95.
[261] *The Glasgow Herald*, 2 May 1851.
[262] *Ibid.*
[263] *The Daily News*, 30 May 1851: *The Lancaster Gazette and General Advertiser for Lancashire, Westmorland and Yorkshire*, 21 June 1851, p.3
[264] *The Morning Chronicle*, 9 June 1851.

accessible. The only visitors likely to have achieved an exhaustive investigation were those with the time and inclination to emulate Her Majesty the Queen, who limited herself to just one or two compartments per visit.

The soundscape of the Exhibition also presented limitations. Some accounts describe an acoustic where individual sounds were rendered indistinct; a journalist for *Trewman's Exeter Flying Post and Plymouth and Cornish Advertiser* observed that 'the tones of minor musical instruments die on the ear at the shortest distance'.[265] Those in attendance at both the Opening and Closing Ceremonies reported that words and music were so inaudible that participating in 'God save the Queen' was difficult.[266] The conveyance of sound over long distances was so poor that it was possible for Mr Willis to tune his organ, located at the farthest westerly point in the building, whilst a full band and chorus performed 'The Hallelujah Chorus' in the Transept during the Opening Ceremony.[267] The few accounts which describe noisy interference of one exhibit with another most likely represent the experience of a visitor located within a localised pocket of sound. That there was no formal organisation of sound was problematic; a journalist for *The Daily News* found himself so bombarded with sounds from different musical instruments that he felt compelled to suggest a timetable whereby instruments could only play one at a time.[268]

Notwithstanding that visuality was uppermost, there is some evidence that visitors used sound to navigate the building. A journalist for *The Belfast News* described being able to link musical sound with a particular geographical location:

> What music is that
> That strikes my charmed senses?
> Is it in the earth or in the air?
> But you follow it to its source; you find (whether it be a piano of Erard or the organ of Ducrochet) that is no 'uncertain sound' that charms you. It comes from the side compartments of France.[269]

---

[265] *Trewman's Exeter Flying Post and Plymouth and Cornish Advertiser*, 12 June 1851.
[266] *The Standard*, 2 May 1851.
[267] *The Morning Chronicle*, 1 May 1851.
[268] *The Daily News*, 15 July 1851.
[269] *The Belfast News*, 19 May 1851.

Accounts also indicate that certain sounds had the capacity to create particular associations. Upon hearing the sound of working machinery, one journalist described himself as being amid 'the pervading sound and aural atmosphere of the cotton cities'.[270] By extrapolation, it seems reasonable to surmise that upon hearing the sound of a piano, some visitors would be transported to either the drawing room or the concert hall, depending upon the acoustic at work. Visitors were also able to identify what Barry Truax denotes as 'keynotes' against the backdrop of ambient noise.[271] The sound of workmen's hammers at the beginning of the Exhibition signified incomplete display areas, whilst an identical sound during the closing days signified dismemberment of exhibits. The sound of bells and gongs at the end of each day told visitors it was time to go home.

One of the greatest impediments to the soundscape of the Exhibition was that musical performance was not officially sanctioned by the organisers. If Hibbard is correct in her assertion that the organisers thought music would prejudice the acquisition of knowledge, distracting visitors from the task of learning, such performances would have been frowned upon.[272] Evidence from both metropolitan and provincial newspapers, however, indicates that music would have been a welcome addition to proceedings. A journalist for *The Times* complained that there was just too much to see and that a little music for the ear would have been a pleasant relief. As though mindful of the overarching rationale that considered music a pleasurable rather than a didactic pursuit, the writer hastens to add that 'adjuncts to public amusement provided should not be of too engrossing a character'.[273] Notwithstanding such difficulties, however, piano makers understood that demonstration was an important part of visitor experience and they advertised performances accordingly. Towns & Packer, for example, advised visitors when and where demonstrations would take place. Their advertisement mentioned that a 'professional gentleman' would be available to explain the advantages of

---

[270] *The Morning Chronicle*, 12 May 1851.
[271] Barry Truax, *Acoustic Communication* (New Jersey: Norwood, 1984), pp.21-2, in Smith, *The Acoustic World of Early Modern England*, p.44.
[272] Hibbard, 'Distracting Impressions and Rational Recreation at the Great Exhibition', in Buzard *et al*, ed. *Victorian Prism*, pp.151-67, here p.160.
[273] *The Times*, 7 May 1851, p.7; a similar remark also appeared in *The Derby Mercury* on 21 May 1851.

their pianos.[274] George Peachey did likewise, telling readers of *The Morning Chronicle* when they could observe their pianos in action.[275]

3.3 Considering aesthetic knowledge

Based on the ways in which visitors to the British piano department were described in newspaper reports, it seems likely that instruments were judged from a variety of perspectives. *The Morning Chronicle* described visitors to this part of the building as 'music lovers', an audience for whom new inventions and the resulting sound and touch were all matters of interest.[276] Newspapers clearly believed that members of the public would be interested in learning more about the history of the piano; this was explained in many publications, most notably *The Times*, so that visitors could examine exhibits with those developments in mind.[277] Female visitors to the British piano department were referred to as 'the fairer portion, who appreciate and acknowledge its important agency and influence in the domestic circle', a comment which suggests that comparison between Exhibition pianos and those found in visitors' homes was a likely approach.[278] This is reflective of other contemporary reports which suggest that in general the desire to compare and the desire to possess were the chief motivating factors driving visitor behaviour. As the American journalist Horace Greeley observed, 'on every side sharp eyes are watching, busy brains are treasuring, practical fingers are testing and comparing'.[279] As Hibbard explains, the tendency towards rational recreation, that is the desire to find something useful in all things, was tinged with the drive to acquire. Citing extracts from the diary of Her Majesty the Queen, she draws attention to the fact that (alongside references to goods and venues within the building) the desire to buy is also evident.[280] A writer for *The Essex Standard and General*

[274] *The Times*, 2 September 1851, p.11; 17 September 1851, p.11.
[275] *The Morning Chronicle*, 4 October 1851.
[276] *The Morning Chronicle*, 24 May 1851.
[277] *The Times*, 7 May 1851, p.7.
[278] *The Morning Chronicle*, 24 May 1851.
[279] Horace Greeley, unspecified source, in Richards, *The Commodity Culture of Victorian England*, pp.38-9.
[280] Hibbard, 'Distracting Impressions and Rational Recreation at the Great Exhibition', in Buzard *et al*, ed. *Victorian Prism,* pp.151-67, here pp.155-6.

Advertiser for the Eastern Counties interpreted visitor activity as a quest for knowledge motivated by consumption:

> Go into the hardware department, or into the carriage or railway sections, or mount to the galleries, and visit the clocks, or the pianos, or the pottery, and it is still the same. You will find people there pondering over particular articles of which they are probably in want, and enlarging their ideas by the experience of the Exhibition.[281]

If value was determined according to whether or not visitors 'wanted' a particular item, which in turn would have been dictated by what they already owned, preferences may have been shaped by what piano types were popular in at mid-century. Establishing precisely what piano types were popular has proved difficult, however, given that data differs depending upon the source examined. Data from my quantitative study suggests that for London audiences, upright forms, specifically cabinet and cottage pianos, were by far the most popular type of instrument (Fig 3.1).[282]

Fig 3.1: Table showing relative popularity of different piano types in London homes

Piano Type	Percentage owned in London homes
Grand	22
Semi-Grand	2
Square	2
Upright Grand	1
Cabinet	40
Cottage	38
Piccolo	8
Boudoir	1

References to pianos in novels of the period present a rather more mixed picture; in instances where the piano type is mentioned, it could be a cottage, cabinet, square or grand piano which is owned by literary characters. Thackeray's *Vanity Fair*, for example, contains reference to both

[281] *The Essex Standard and General Advertiser for the Eastern Counties*, 30 May 1851.
[282] As I explained in the Introduction, there was no standardised terminology applicable to piano-types at mid-century; the terms used here are taken from the auction particulars and have been determined by the opinion of the individual auction house concerned; Because some of the households investigated had two or even three pianos in their possession the percentage totals indicate how many people chose a particular piano-type; accordingly the total percentage adds up to more than 100%.

a square piano and a grand; the former type is bought as a gift for Amelia Sedley by Captain Dobbin.[283] In *Men's Wives*, whereas Mrs Walker owns a grand piano which 'occupied four fifths' of her drawing room, Miss Morgiana plays a 'little red silk cottage piano'.[284] Brontë novels favour the cabinet piano; Jane Eyre's employer Mr Rochester has a cabinet piano in his library, a room which is also used as a schoolroom for his daughter; *The Tenant of Wildfell Hall* also refers to an 'elderly cabinet piano'.[285]

A trawl through Broadwood's Porter Books for May-June 1851 suggests that popularity of piano-type varied according to regional area (Fig 3.2). In London, the biggest sellers were grand and semi-grand pianos, but in Britain as a whole, square and semi-cottage instruments were most popular. The export market was dominated by the square piano, a piano-type which was no longer fashionable in mid-century London; foreign destinations included Australia, New Zealand and India.

Fig 3.2: Table showing the distribution of Broadwood's consumer markets in Britain and abroad for different piano types (May-June 1851)

	London		Britain & Ireland		Export market	
Piano type	No of pianos (23)	% of total	No of pianos (105)	% of total	No of pianos (11)	% of total
Grand	9	39	19	18	1	9
Short/Semi Grand	6	26	13	12	1	9
Square	3	13	29	28	6	55
Cottage	1	4	4	4	0	0
Semi-Cottage	4	18	40	38	3	27

When Ehrlich states that the square piano was still desirable at mid-century, he is presumably relying on data relating either to the country as a whole or the colonies.[286] Square pianos made up just 13% of Broadwood sales in London for the time period in question and my quantitative study indicates

[283] W. M. Thackeray, *Vanity Fair: A Novel without a Hero* (London: Bradbury & Evans, 1853), p.133, p.358 and p.503.
[284] Thackeray, *Men's Wives* (New York: D. Appleton & Co, 1852), p.44 and p.108.
[285] Currer Bell [Charlotte Brontë], *Jane Eyre: An Autobiography* (New York: Harper Bros Publishers, 1850), p.107; Acton Bell [Anne Brontë], *The Tenant of Wildfell Hall, in Three Volumes, Volume 1* (London: T. C. Newby, 1848), p.115.
[286] Ehrlich, *The Piano: A History*, p.9.

that only two homes in the metropolis had this piano-type. It is likely the data sets differ for two main reasons: firstly, Broadwood did not offer such a broad choice of piano-type as the wider industry; secondly, as will be discussed in Chapters 5 and 6, Broadwood actively targeted wealthier clients, hence their high turnover in grand and semi-grand pianos.

When deciding what to acquire, visitors would have been guided by the many publications which offered advice to the public concerning how to decorate their homes. For the early Victorians, it was customary to furnish a home just once in a lifetime but by the second half of the nineteenth century, women were being encouraged to view decoration as part of their remit as household managers. The ability to make tasteful choices was becoming increasingly important.[287] To the uninitiated, the range of styles available to the consumer at mid-century was baffling, as authorities contained different lists and descriptions. Nathaniel Whittock's *Decorative Painter's and Glazier's Guide* published in 1827, for example, identified six styles of interior decoration: Grecian, Roman, Gothic, Chinese, Egyptian and Arabesque. H. W. and A. Arrowsmith's *House Decorator's and Painter's Guide*, published in 1840, listed nine styles: Greek, Roman, Arabesque, Pompeian, Gothic, Cinque Centre, François Premier, Elizabethan and modern French. Owen Jones' *Grammar of Ornament*, published in 1856, testified to the existence of 19 different historical and contemporary styles.[288] The situation was complicated by the fact that there was no universally accepted terminology. A case in point is illustrated by a journalist for *Lloyds Weekly Newspaper* who described the piano jointly submitted by Jennens & Betteridge and Dimoline as 'Elizabethan', when in fact the *ODIC* entry, written by the makers, described the instrument as 'in the Italian style'.[289]

In the following section evidence will be drawn from publications dating from decades either side of the Exhibition, namely John Claudius Loudon's *Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture* and *The Suburban Gardener*, Thomas Webster's *Encyclopaedia of*

---

[287] Joanna Banham, Sally MacDonald & Julia Porter, *Victorian Interior Design* (London: Cassell, 1991), pp.11-2.
[288] *Ibid*, pp.47-9.
[289] *Lloyd's Weekly Newspaper*, 4 May 1851; *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume II* (London: W. Clowes & Son, 1851), p.748

Domestic Economy and J.H. Walsh's *Manual of Domestic Economy*. Design historians agree that although by mid-century the middle classes had the means to acquire beautiful things they lacked knowledge of what was tasteful.[290] Accordingly they were easily influenced by the aesthetic standards of the upper classes and by writers claiming professional status. Although Loudon himself was a horticulturalist, his publication was written with assistance from upwards of 70 contributors, the majority of whom were architects and engineers. The book was written with a view to improving the taste of the general public, and, judging by the range of dwellings covered, it appears the author was trying to reach all levels of society.[291] Webster's *Encyclopaedia* addresses the upper end of the social scale and is written from a standpoint that science, rather than practical experience, is the best vantage point from which to advise others. A qualified architect and geologist, Webster focuses primarily on matters such as heating and ventilation; furniture is not something he deems worth troubling about in any detail, because the subject is well known.[292] Little is known about the author J.H. Walsh other than that he was a fellow of the Royal Society of Physicians and eight years prior to the publication of his manual he was employed as a surgeon at the Worcester Eye Infirmary.[293] In the preface to his work, Walsh makes clear to his readership that advice is offered partly on the basis of personal experience but also in consultation with others. Comments on medical matters need no explanation, but Walsh asserts that his qualifications for commenting on furnishings derive from first-hand experience of many and varied domestic situations.[294]

Although Loudon's *Encyclopaedia* was written with all social classes in mind, it is the third section of his book, which deals with designs pertaining to larger properties known as 'villas', that is relevant for our purposes. Neither

---

[290] Tobin Andrews Sparling, *The Great Exhibition: a Question of Taste* (New Haven: Yale Centre for British Art, 1982), p.4.
[291] John Claudius Loudon, *Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture* (London: Longman, Orme, Brown Green and Longmans, 1839), p.vi and pp.xix-xx.
[292] Thomas Webster, *An Encyclopaedia of Domestic Economy* (London: Longman, Brown, Green & Longmans, 1844), p.v-vii.
[293] *The Transactions of the Provincial Medical and Surgical Association, Worcester, 16* (1849), p.436 and p.479
[294] J. H. Walsh, *A Manual of Domestic Economy suited to families spending from £100 to £1000 a year, Second Edition* (London: G. Routledge & Co, 1857), pp.v-vii.

the first section, which deals with cottages suitable for labourers, mechanics, gardeners, bailiffs, upper servants and small farmers, nor the second, which covers ‘farmhouses, country inns and parochial schools’, speak of design in any substantive way. The third section identifies four main styles, namely Grecian, Elizabethan, Gothic and Louis XIV, which he then discusses in relation to exterior, interior and furniture design. The size of the ‘villas’ in question suggest that his advice concerning style is addressed to the middle classes or higher. Pianos were recommended as suitable drawing-room furniture for larger residences; the examples given include a relatively plain Wornum upright, which nods towards the Louis XIV style (Fig 3.3), and a Gothic upright shown in an illustration of a drawing room furnished entirely in that style (Fig 3.4).[295]

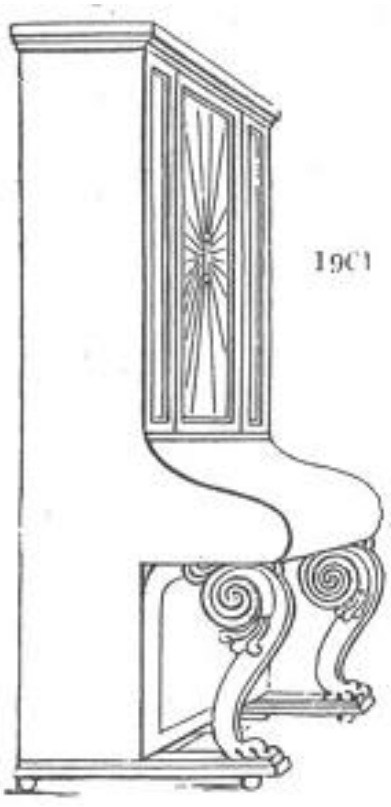


Fig 3.3: Upright piano, J. C Loudon, *An Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture* (1839), p.1069.

[295] Loudon, *Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture*, pp.1039-96.

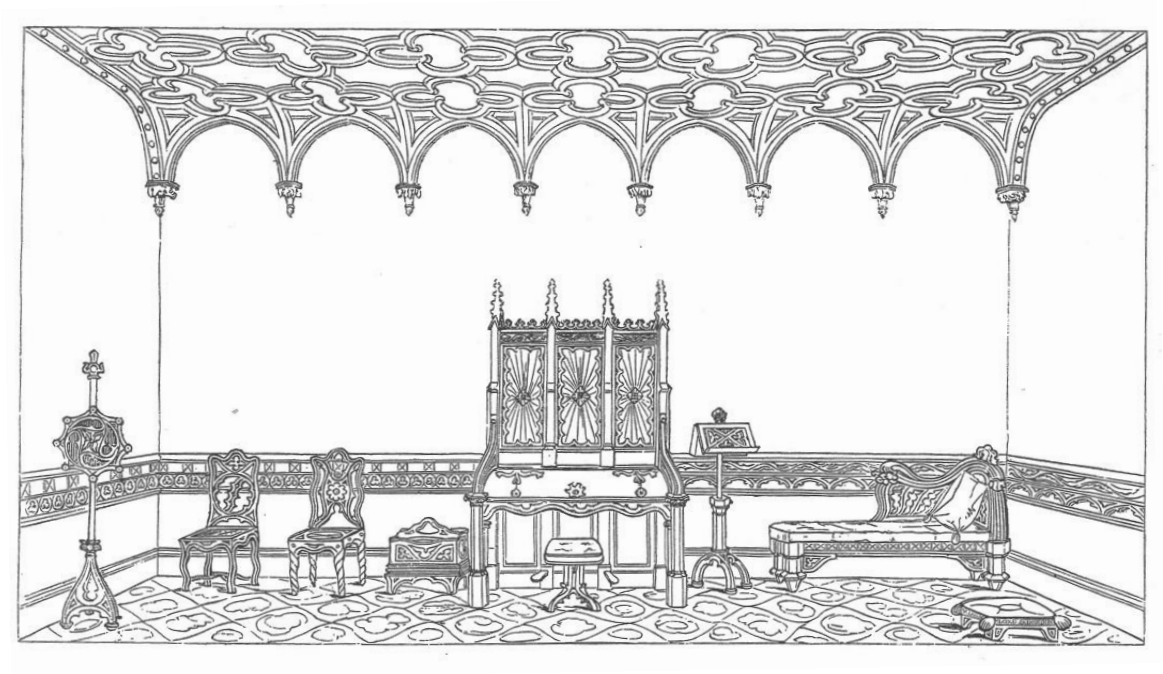


Fig 3.4: Gothic-style upright piano in a drawing room of like style in Loudon*, An Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture*, p.1096.

Literary sources agree that the drawing room was the most usual place for a piano. The only examples which suggest otherwise are the aforementioned example of Mr Rochester's cabinet piano, which is located in a former library, and a piano featured in Thackeray's *The Newcomes*, which is located in a 'little room near the conservatory'.[296] Loudon's *The Suburban Gardener* recommended furniture made of particular woods for specific rooms; mahogany, for example, was recommended for the dining room. The positioning of furniture fashioned in a historical style was also location specific; both Gothic and Elizabethan styles were recommended for use in libraries. According to Loudon, interior decoration should reflect that of the exterior; individual items of furniture should also be in keeping with the overall style adopted.[297]

Webster's *Encyclopaedia* contains only general advice concerning colour and style. Both mahogany and fancy woods were acceptable in the drawing room and the style of Louis XIV found favour on the basis that it was

[296] Bell [Brontë], *Jane Eyre*, p.107; Thackeray, *The Newcomes: Memoirs of a Most Respectable Family* (London: Bradbury & Evans, 1864), p.545.
[297] John Claudius Loudon, *The Suburban Gardener and Villa Companion* (London: Longman, Orme, Brown, Green and Longmans, 1838), pp.91-105.

cheap to make yet looked deceptively expensive. Contrary to Loudon, Webster advised his readership that the Classical style had fallen from favour, that the Elizabethan, or 'Old English', was objectionable as it was too often crudely executed, and that the Gothic was unsuitable for domestic furniture.[298] J. H. Walsh's manual published six years after the Exhibition suggests that public taste remained relatively static during the middle decades of the nineteenth century. Householders were advised to apply the same style to all furniture in a particular room; an incongruent appearance was inadvisable. Certain woods were still being recommended for specific rooms; walnut was now the material of choice for the drawing room, although satinwood was considered highly ornamental, especially when new. All four aforementioned styles were still in fashion by the late 1850s and all were equally expensive.[299]

Visitors who accepted the ruling that certain woods were specific to particular rooms would have wished to acquire exhibits which complimented what they already owned. Data from my quantitative study confirms that most mid-century London householders had either mahogany or rosewood suites displayed in their drawing rooms; although both were in vogue at mid-century, mahogany was slowly becoming unfashionable. Although walnut furniture was increasingly sought after, only six out of eighty nine householders could boast suites made from this material. Furnishings made from more exotic materials were present in mid-century London homes but examples are rare; just one household possessed an amboyna wood suite and just one a suite decorated with tulip and kingwood. Looking at Appendix A, extracts from which are summarised below in Fig 3.5, it is evident that British piano makers used mainly walnut and rosewood, whereas foreign exhibitors used rosewood almost exclusively. In keeping with the organisers' goal of acquainting the public with resources not previously available, makers also used woods that would have struck visitors as novel and expensive.

[298] Webster, *An Encyclopaedia of Domestic Economy*, p.vii; pp.219-50.
[299] Walsh, *A Manual of Domestic Economy*, pp.212-4.

Fig 3.5: Table showing types of wood used by British and foreign piano makers for piano casing.

Wood	British Makers	Foreign Makers
Walnut	14	2
Ebony	2	0
Amboyna	2	1
Rosewood	11	26
Zebrawood	1	1
Oak	4	0
Pine	1	0
Satinwood	1	0
Mahogany	0	3
Tulipwood	0	2
Nutwood	0	2
Purplewood	0	1
Poplar	0	1
Maple	0	3

Evidence from correspondence between Broadwood and their customers indicates that casing colour, and therefore wood type, was an important consideration. In a letter to A.J. Hipkins dated 19 February 1887, a Mr Negan explained that after due consideration he and his wife had decided not to proceed with their order for a new piano because 'it will not match our furniture and as Black Walnut is so much dearer we have decided not to have it'.[300] Similar priorities are evident amongst Broadwood's more illustrious customers, including William Morris for whom choice of wood and tint were important considerations:

> I have spoken to Mr A. Torrides about this piano and he will have one of the same make of stained oak; I shall be glad to help as to the tint which I think ought to be much the same as Messrs Flowers'.[301]

The importance of historical style is rather more difficult to evaluate although the following newspaper reports confirm that it was a matter on

[300] BL Add.41636, f.34, Letter from Mr Negan to A. J Hipkins, 19 February 1887.
[301] BL Add.41637, ff.8-9, Letter from William Morris to A. J. Hipkins, 17 March 1883.

which visitor tastes differed considerably. Referring back to Appendix A, extracts from which are summarised in Fig 3.6 below, it is apparent that all main styles, with the notable exception of Grecian, could be found at the Exhibition. Based purely on *ODIC* descriptions given by exhibitors, historical style was far more prevalent amongst British goods.

Fig 3.6: Table showing historical styles used by British and Foreign piano makers

Style	British Makers	Foreign Makers
Louis XIV	2	1
Italian/Florentine	3	0
Elizabethan	2	0
Gothic/Middle Ages	2	1

Visitor appreciation, however, would have been largely dependent upon which authority they adhered to, if any. Those who agreed with Loudon would have found exhibits such as the two Gothic style pianos by Crace/Lambert pleasing. If Webster's advice was favoured, pianos such as Collard's grand, in the style of Louis XV (Fig 3.9) would have been judged favourably. Pianos in the Elizabethan style, such as those entered by Erard (Fig 3.7) and Jenkins & Son, would have found favour provided that workmanship looked authentic. The two gothic-style pianos by J. C. Crace/Lambert & Co located in the Medieval Court prompted considerable difference of opinion. A writer for *The Morning Chronicle* commented on their appearance in disparaging terms, an opinion which was later echoed by *The Daily News*:

> The design of the pianoforte cases is by no means commendable, showing neither vigour nor appropriate character; and one of them, being covered entirely with gilding, is vulgar to the last degree, and produces precisely the effect of a piece of gilt gingerbread. How this should have obtained admission into Mr Pugin's court is a marvel to us. Let no-one be deceived into thinking it of Medieval Style. In moderation, and in designed contrast with uncoloured surfaces, partial gilding is a most chaste and beautiful

> enrichment; but entire gilding answers to that tawdry vulgarity of dress which is displayed where there is wealth without refinement.[302]

A writer for *The Morning Post*, however, offered a contrary opinion stating that 'the upright cottage by Messrs Lambert & Co, standing in the Medieval Court, is remarkable for its ornate qualities.'[303]

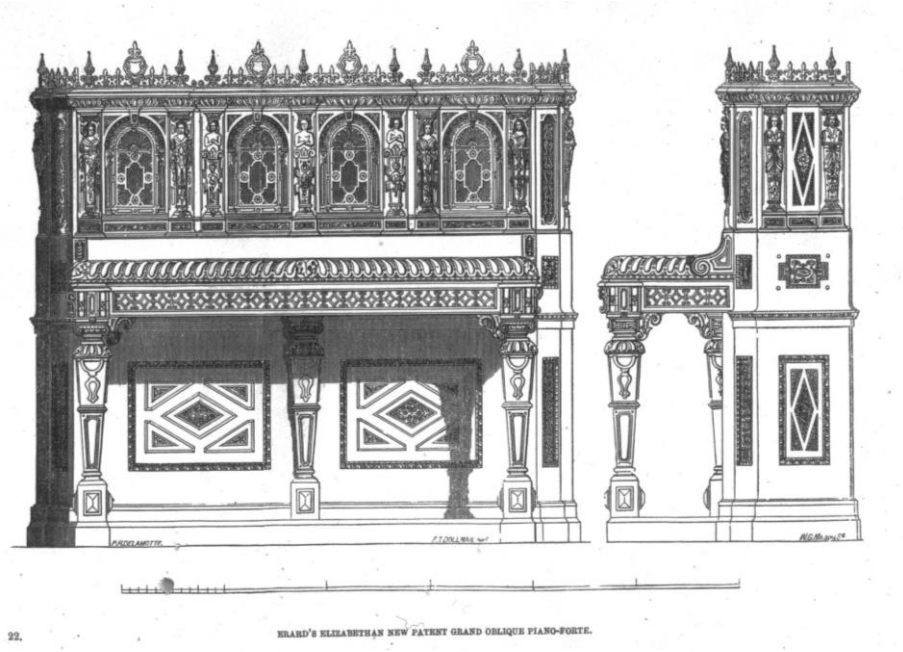


Fig 3.7: Erard oblique grand piano, *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume I*, Plate 22 (London: W. Clowes & Son, 1851)

3.4: Assessing ways of looking

A discussion of surveillance as a way of looking leads to an understanding which has very little to do with objects and everything to do with the behaviour of visitors and the law enforcement precautions taken. Had surveillance been the dominant method used, visitors would never have overcome the initial distraction of 'seeing and being seen', a phenomenon which eye-witness accounts suggest was relatively fleeting. For some, the presence of Her Majesty Queen Victoria and the Royal Party was an insurmountable obstacle to focusing on the products at hand. A writer for

[302] *The Morning Chronicle*, 6 August 1851; *The Daily News*, 25 August 1851.
[303] *The Morning Post*, 2 October 1851, p.3.

The Morning Chronicle, however, managed to observe Her Majesty's presence in the Nave whilst at the same time recording details of the piano she was inspecting, the identity of the performer, the repertoire played and the explanation of technical improvements given by the exhibitor. That the account was written in mid-July, by which time the author was probably a seasoned visitor, well accustomed to the sights and sounds of the Exhibition, is telling.[304]

Spectacle was a mode of looking which enjoyed a longer life span than mere 'people-watching', as over time what newspapers described as the 'lions of the Exhibition' achieved prominence. Although this approach could be object-centred, equally visitors were drawn to ways of looking which embraced the Exhibition as a whole rather than its constituent parts. British and Zollverein pianos, for example were at a disadvantage as their location in the galleries presented visitors with multiple choices in terms of where to direct their attention. They could employ a bird's eye view, looking down on objects on any part of the ground floor; equally, they could gain a sense of overall space both horizontally and vertically. There is no evidence to suggest that even the most elaborately decorated pianos featured on the list of 'must see' attractions, although it is possible the Crace/Lambert pianos received more than their fair share of attention because the Medieval Court was very popular. Journalists clearly thought some pianos were worth looking at more than others. *The Morning Chronicle* announced that visitors would find Collard's grand piano 'mounted in British mottled oak, with gold ornament in the style of Louis XV' (Fig 3.9) and Ennever & Steedman's marqueterie semi-cottage (Figs 4.10-4.15) both charming and tasteful. [305] Even fairly humble specimens such as Metzler's cottage instrument 'with ornamental shell front' were commented on for their appearance if they attracted a lot of attention.[306]

A way of looking, which seems to have characterised the more seasoned visitor, was looking in pursuit of knowledge. Gillooly believes that for visitors who found the classification system incomprehensible, various

[304] *The Morning Chronicle*, 19 July 1851.
[305] *Lloyd's Weekly Newspaper*, 11 May 1851.
[306] *The Morning Chronicle*, 24 May 1851.

comparative techniques would have taken its place as a means of navigating exhibits. Visitors might have questioned whether particular exhibits were reflective of national character, whether the relative value of like-objects was the same for all participants and how exhibits reflected the capabilities of their country of origin.[307] Notwithstanding the number of eye-witness accounts complaining that comparison of products was impossible, there are quite a few documented instances in which aspects of piano design are compared. Based on this object-type at least, it appears that Gillooly is correct in her assertions that the arrangement invited competitive comparison.[308] *The Morning Chronicle* offered readers a generalised verdict on French, German and Belgian pianos, concluding that design was their best feature, although this may simply have been a statement in-keeping with the accepted view that European products were stylistically superior to those of British makers.[309] A similar comparison was made by *Lloyd's Weekly Newspaper* of the respective aesthetic merits of the Broadwood grand located in the Nave and one of Erard's grand pianos situated in the French section; here the writer focused exclusively on the visual, referring to the instruments as 'musical furniture'.[310] A journalist for *The Times* wrote in detail as to the relative merits of the tuning devices found on Erard pianos compared with those of Pirsson's double grand instrument; the latter, he concluded was inferior on account of the mechanism being too complex and expensive.[311]

Some comparative reports appear to be politically motivated and although the press professed impartiality, there were instances when journalists voiced preference for British products. The following extract from *The Morning Post* is an example of what Gillooly's terms 'antithesis', namely the practice of establishing British manufacture as the norm and then contrasting contributions by other nations.[312] Whereas the British piano is

---

[307] Gillooly, 'Rhetorical Remedies for Taxonomic Troubles', in Buzard *et al*, ed. *Victorian Prism*, pp.23-39, here pp.25-6.
[308] *Ibid*, p.28.
[309] *The Morning Chronicle*, 24 May 1851; Gillooly, 'Rhetoric Remedies for Taxonomic Troubles', in Buzard *et al*, ed. *Victorian Prism*, pp.23-39, here p.32.
[310] *Lloyd's Weekly Newspaper*, 11 May 1851.
[311] *The Times*, 7 May 1851.
[312] Gillooly, 'Rhetoric Remedies for Taxonomic Troubles', in Buzard *et al*, ed. *Victorian Prism*, pp.23-39, here p.32.

extolled due to its suitability for classical repertoire, a musical style that was favoured by many British musicians, French instruments are associated with continental virtuosity:

> After comparing the instruments of Messrs Erard with those of Broadwood, Collard and Kirkman, we are of the opinion, that whilst the former excel all others in power and brilliancy, to the latter belong, in various degrees, superior sweetness, delicate fullness of tone and durability. The former we should prefer for music of the modern 'school', the latter for that of a more classic period. We are aware that upon an Erard grand, Liszt, Thalberg, Leopold de Meyer, et hoc genus omne, produce their most tremendous 'effects' but it is to our thinking, upon a Broadwood or Collard that the refined musicianly execution of a WSB, Pauer, Halle or Lindsay Sloper, is heard to the greater advantage.[313]

Whether or not the average visitor would have been permitted to inspect the physical structure of pianos is unclear. Allowing visitors access to internal workings would no doubt have caused anxiety if audiences were known to consist of provincial and foreign piano makers. Although patent protection was available, as will be discussed briefly in Chapter 5, in some instances this was not enough to allay concerns that inventions would be stolen. Although it is unlikely that the writer for *Newton's London Journal* behaved as a typical visitor, the publication proves that pianos were inspected visually for more than just their outer casing. Focusing specifically on technological advances, this specialist journal records levels of detail that far outstrip descriptions contained in the *ODIC*. An inspection of what is described as 'a small upright' by Erard illustrates the point well. Clearly writing with knowledge of English piano construction in mind, the writer states that this French piano differs from indigenous models in that there are three, rather than two, strings per note, the strings are placed obliquely, and there is a metal bracing in front of the soundboard. The writer also notes that the 'soft pedal' effect is achieved by placing a piece of fabric between the hammer and strings rather than by the English method of moving the action so that hammers strike one string instead of two.[314] The writer has enjoyed a level of accessibility over and above 'just looking'; at minimum he has

[313] *The Morning Post*, 30 September 1851, p.6.
[314] Newton, *The London Journal of Arts Sciences and Manufactures, Volume 39*, pp.31-2.

needed to lift the lid and possibly also remove the front panel to make his observations.

There were instances in which visitors were encouraged to inspect pianos for their visual qualities such as the woodworking techniques. When visiting the Belgian department, a writer for *The Morning Chronicle* commented at length on the merits of the system of ornamentation employed on one of the pianos exhibited by Zastzrebski of Brussels:

> Up to the present time the system of ornamentation adopted has been used only upon small boxes and cases because the varnish which the clever workmen of the spa employ cracks and the paint will not stand different temperatures; but the rich painting of these pianos will never lose it brilliancy nor freshness by reason of a new varnish, the invention of the exhibitor – it will not crack in any climate.[315]

Similar comments on the quality of woodworking were made by *The Times* with regard to one of Erard's extra grand pianos; here the visitor was directed to admire the 'inlaid wood, not exceeding a small fraction of an inch in width' used instead of the usual veneering.[316] No matter how beautiful a piano casing, however, if the instrument produced an unsatisfactory sound, the overall merit would be called into question. Seuffert's beautiful upright piano exhibited in the Austrian dining room was described by *The Morning Chronicle* as being 'exceedingly rich and elaborately ornamented'. When the piano was played, however, the writer concluded that 'its tone does not, however, equal its exterior pretensions'.[317]

Precisely how easy or difficult visitors would have found it to locate a specific object is unclear. Climbing to the galleries on the western side to view the British piano department or wading through the depths of the various foreign departments would have been off-putting for some, especially those limited by time or money to just one visit. What is certain, however, is that the grand pianos by Erard, Broadwood and Collard, discussed in Chapter 2, would have enjoyed far more attention than any others. Most visitors would have been drawn to the Nave and Transept, at least initially, because they were visually less complicated than other parts of the building.

---

[315] *The Morning Chronicle*, 24 May 1851.
[316] *The Times*, 7 May 1851.
[317] *The Morning Chronicle*, 26 July 1851.

As previously mentioned, it is impossible to establish which of Erard's grand instruments was placed in the Nave; it was either an extra grand 'in a tulipwood case, inlaid with silver bands, tortoiseshell and brass elaborately engraved, supported by six cariotides' (Fig 3.8) or one in 'rosewood with ormolu ornaments'.[318]

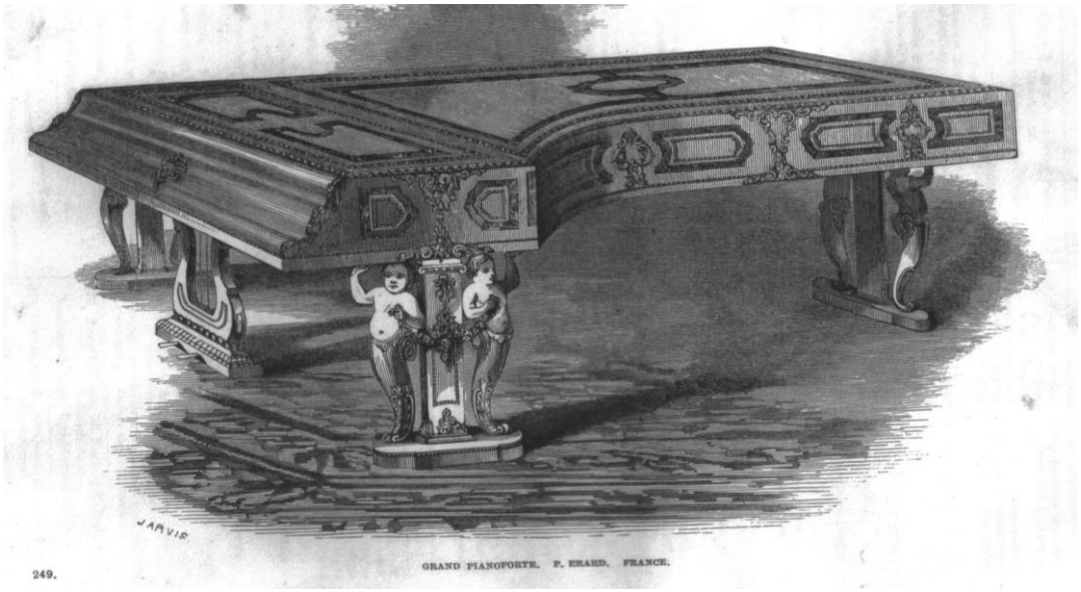


Fig 3.8: Erard Grand Pianoforte, *The Official Descriptive and Illustrated Catalogue in Three Volumes, Vol III*, Plate 249

It was Broadwood's ebony grand (Fig. 2.11) that occupied a place 'near the centre of the English Nave', a piano that was described by *The Art Journal Illustrated Catalogue* as having 'inlaid and ornamental work upon its surface ... of the best kind' with 'ornaments in gold relief'.[319] Because Collard brought just one grand piano, it can be said with certainty that visitors to this area of the Nave would have found a creation in 'British mottled oak with gold decorations in the style of Louis Quinze' (Fig 3.9).[320]

[318] Erard Exhibition Prospectus, French Department (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09.
[319] *The Art Journal Illustrated Catalogue*, p.284.
[320] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume 1*, p.430.

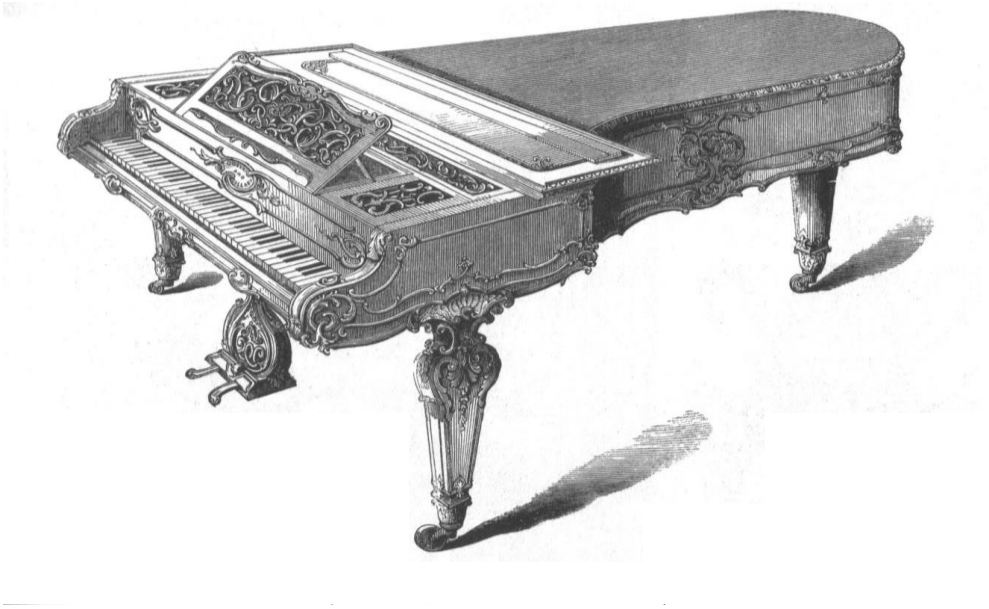


Fig 3.9: Collard grand piano, *The Art Journal Illustrated Catalogue*, p.51.

Put simply, these three pianos were an embodiment of the very finest cabinet work fashioned from the rarest of materials on the outside, with the latest technological advancements on the inside, resulting in the best possible tone when played. Of Broadwood's grand instrument *The Era* remarked 'what may be the tone of this instrument we have had no means of judging, but a more magnificent specimen of carving, inlaying and gilding it would be difficult to find'.[321] Whether appearance or tone would have been considered uppermost would have been largely dependent on circumstance.

Many of the visitors brave enough to move away from public walkways would have used a guide to assist them. Both the *ODIC*, and its earlier more compact version, *The Official Catalogue*, were thought unsatisfactory by many. *The Morning Post* thought the publication unhelpful for both the 'ignorant' and 'educated' alike.[322] Even *The Morning Chronicle,* arguably the most detailed and enthusiastic exponent of the Exhibition, was critical because the publication failed to facilitate comparison.[323] The main problem with other Exhibition guides was that each reflected the author's own value judgements. 'Must-see' items identified by newspapers did not necessarily facilitate an understanding of a particular type of object: for example, several

[321] *The Era*, 25 May 1851.
[322] *The Morning Post*, 9 May 1851, p.6
[323] *The Morning Chronicle*, 14 June 1851.

regional newspapers recommended that their readers view the double grand piano by Pirsson in the American Department (Fig 3.10).[324] Although this piano was unique, inspection would not have led to a general understanding of the piano industry at mid-century and according to Her Majesty the Queen the sight of the piano demonstrated by four performers 'had ludicrous effect'.[325]

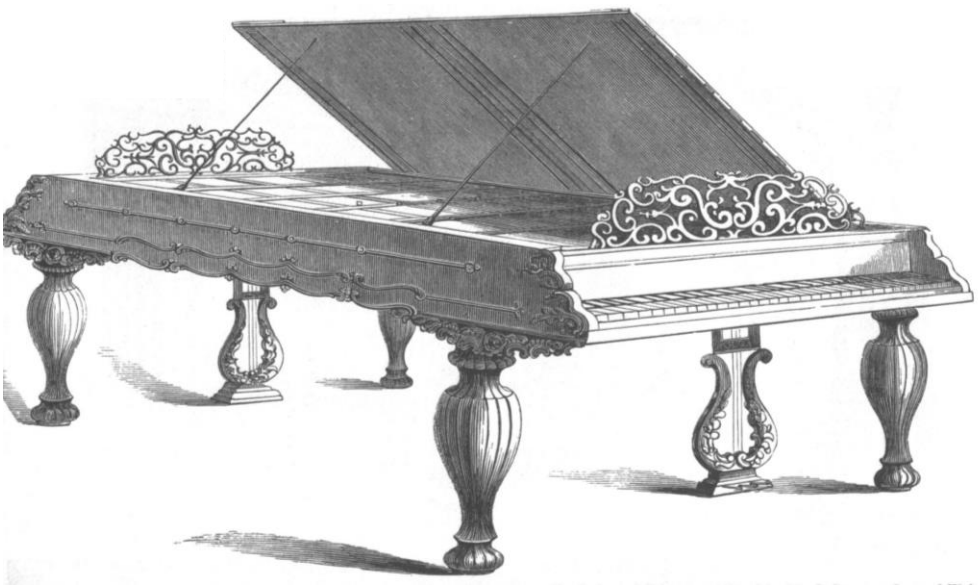


Fig 3.10: Pirsson Double Grand piano, *The Art Journal Illustrated Catalogue*, p.245.

As Geoffrey Cantor explains, Robert Hunt's *Synopsis of the Contents of the Great Exhibition of 1851* was hardly a dispassionate navigational aid; rather it reflected the author's personal interests. Appointed as one of the Metropolitan Commissioners for mineralogical exhibits in July 1850, Hunt was clearly fascinated by the Mining and Metallurgy category, devoting 11 pages of his guide to the topic.[326] British pianos were allotted just one paragraph, in which they were described briefly as 'of great beauty as pieces

[324] *The Huddersfield Chronicle and West Yorkshire Advertiser*, 3 May 1851, p.8; *The Leeds Mercury*, 3 May, 1851.
[325] www.queenvictoriajournals.org/search/results.do?QueryType=articles. Journal entry, 19 May 1851, Volume 31, p.251 (accessed 20 February 2016)
[326] Cantor, *The Great Exhibition of 1851*, *Volume III*, pp.33-4.

of cabinet work'.[327] George Cameron's guide, *A Visit to the Great Exhibition by One of the Exhibitors*, aimed at an artisan audience, focused chiefly on the skills and processes on display. In his capacity as professional cabinet maker, his brief reference to British pianos stated that they were 'of every shape and size, some of them in very handsome cases'.[328] My final example is representative of a number of guides that focused upon exhibits of interest to the author to the exclusion of other product types. The anonymous publication 'A Lady's Glance at the Great Exhibition', published in instalments in *The Illustrated London News*, invited the visitor to focus solely on fabrics, clothing and jewellery. As Cantor points out, anyone following this guide would have taken a very different route through the building to those armed with a more general publication.[329]

Pianos could have been witnessed visually as spectacle or as objects of scrutiny. Methods employed would have been determined by individual 'habitus', coupled with both technical and consumer knowledge. Those wishing to learn would have had a very different experience to those who just wanted to enjoy the view or scrutinise other visitors. Those wishing to learn more about how pianos were constructed would have 'looked' differently to those looking for an instrument for their drawing room. Visitor experience would have varied according to date, time of day and location in the building; finances would have dictated how many visits could be made. Sometimes pianos could be witnessed in action; other times they stood silent. For most visitors, value would most likely have been constructed following encounters, whether silent or otherwise, with those pianos positioned on the main public walkways.

3.5: The soundscape of the Exhibition: some specific problems

---

[327] Robert Hunt, *Companion to the Official Catalogue, Synopsis of the Contents of the Great Exhibition of 1851* (London: 1851), in Cantor, *The Great Exhibition of 1851*, *Volume III*, pp.35-88, here p.62.
[328] Cantor, *The Great Exhibition of 1851*, *Volume III*, pp.89-90; George Cameron, *A Visit to the Great Exhibition by one of the Exhibitors* (London: 1851), in Cantor, *The Great Exhibition*, *Volume III*, pp.91-135, here p.111.
[329] Cantor, *The Great Exhibition of 1851*, *Volume III*, pp.137-8; Z.M.W, 'A Lady's Glance at the Great Exhibition', in *The Illustrated London News* (London: 1851) in Cantor, *The Great Exhibition of 1851*, *Volume III*, pp.139-197.

Before considering what pre-existing attitudes visitors may have had towards piano sound or what knowledge they were able to derive through listening, it is first necessary to consider some difficulties specific to sound experience. Irrespective of the skill of the listener, at mid-century, it was only possible to document sound experience in a subjective way. This is possibly why *Newton's London Journal* chose to comment on Exhibition pianos purely in terms of their construction, not according to the impressions made by their sound.[330] A further complicating factor is the difficulty of separating knowledge derived from the visual and aural. Many of the eye-witness reports are worded such that what, at first glance, purports to be a sound-based judgment is in fact merely a conclusion based on knowledge obtained by visual means. Discussing sound experience was also problematic because there was no universally accepted distinction between what constituted noise, sound and music. To complicate matters further, definitions conceived within the domestic sphere cannot necessarily be applied directly to Exhibition experience given that it constituted a wholly different field of cultural value. The final issue governing the many variables impacting sound experience was whether or not an instrument was played by a professional pianist, an exhibitor or a member of the public. That makers understood the value of sound is unquestionable; that pianos attracted more attention when played than when standing silent is also certain. What is unclear, however, is the extent to which visitors who played derived their knowledge through touch, as well as sound, and to what extent visitors believed that the identity of the performer could impact tone.

The range of adjectives used by journalists to describe piano sound clearly illustrates that a sonic index was a work-in-progress, something which is explored by Stefan Krebs in the context of automobiles in the early twentieth century.[331] Just as motorists attempted to attach adjectival labels to the changing sounds of their car engines, so visitors listening to piano sound at the Exhibition attempted to codify what they heard. The range of vocabulary used by different publications is striking. *The Aberdeen Journal*

---

[330] Newton, *The London Journal of Arts, Sciences and Manufactures, Volume 39*, p.28.
[331] Krebs, 'Sobbing, Whining, Rumbling', in Pinch and Bijsterveld, ed. *The Oxford Handbook of Sound Studies*, pp.79-101, here, pp.84-5.

described the sound emanating from Erard pianos as 'clear, bell-notes'.[332] When writing about the tonal qualities of pianos in the Zollverein section, *The Morning Chronicle* used a variety of terms to capture the sound quality experienced. The tone of a rosewood grand piano by A. Adam Gerhard was deemed 'weak, but mellow'; a piano by M. Klein of Dusseldorf was commended as an instrument with a 'very powerful tone'; the tone of a grand piano exhibited by Messrs Zeitter & Winkelman of Brunswick was denoted as 'brilliant'. One of the pianos entered by M. Schiedmayer & Sons was described as having 'a very powerful bass but the treble appears to be rather weak in proportion'.[333] A similar attempt at aural comparison was made by the same newspaper when discussing the tonal qualities of French pianos. This time the adjectives used included 'metallic', 'clear' and 'not full'.[334] Whether any of these terms would mean the same when used by a different writer is doubtful.

There are several examples where evaluation of sound was probably pre-determined by knowledge derived from physical inspection. When a journalist for *The Morning Chronicle* wrote that pianos by the French maker M. Herding had a 'metallic tone', it is impossible to say whether his verdict was based on the fact that the instruments had iron frames (which would have been apparent either by looking or reading the *ODIC* description) or by associating the sound produced with an established concept.[335] The verdict of a writer for *The Morning Post* is similarly ambiguous when he remarked that pianos by British makers were generally 'woody' compared with their more 'metallic' French counterparts.[336] He may have been simply reiterating a term coined by the British piano-making community whereby national distinction could be easily made; equally the remark could be based on the fact that mid-century British pianos generally contained fewer metal components than those by European makers.

Establishing the basis on which distinction between meaningful sound and meaningless noise was made in the Exhibition building is also

---

[332] *The Aberdeen Journal*, 23 July 1851.
[333] *The Morning Chronicle*, 26 July 1851.
[334] *The Morning Chronicle*, 10 June 1851.
[335] *The Morning Chronicle*, 10 June 1851.
[336] *The Morning Post*, 30 September 1851, p.6.

problematic. Accounts documenting the categorisation of sound in the domestic sphere suggest that no single definition is possible. As Hillel Schwartz explains, noise is not merely a matter of decibels or whether or not a particular tone is pleasing, rather it is a question of 'social temperament, class background and cultural desire, all historically conditioned'.[337] The following extract from *Maud: the Illustrated Diary of a Victorian Woman*, dated February 1888, clearly illustrates that what is a noisy nuisance to one person can be beautiful, edifying music to another. The diarist Maud Tomlinson, the twenty-nine year old, unmarried daughter of a retired mathematics teacher, describes the differing reactions of the family servant and her father to her own piano playing. She then documents the experiences of her friends Lilian and Mollie:

> I had varying reactions to my mornings grappling with the keys. Annie, cleaning the hearth, declared herself much moved by my rendition of a nocturne by Chopin. The Great G came in, while I was hard at work on my arpeggios, to say he had just started a course of reading Plato and found he was vastly distracted by my music. Very difficult, attempting to be studious when each attempt brings only reproach. Abandoned my arpeggios in favour of a lullaby by Schumann, which I hoped would soothe the Great G's mood. Heard from Lilian later that Mr Barnes made a similar protest at Collingbourne, indeed went so far as to say that the rondo she was practising in the drawing room was no better than the caterwauling the kitchen cats made. Dear Mr Boucher, mildest of men, sat in an armchair and tapped his pipe and his foot in tune to his daughter's music all morning, Mollie reported. The Bouchers are not, of course, an intellectual family, in any sense.[338]

A lack of established sonic vocabulary is thus evident in the domestic sphere, although here it is more a marker of the boundary between noise and music than a description of the tonal quality of the instrument concerned. Likening piano sound to caterwauling cats has echoes of William Makepeace Thackeray's literary descriptions of piano sound as 'infernal jingling'.[339] Given that the role of sound within the home and the Exhibition were

---

[337] Hillel Schwartz, 'On Noise', in Smith, ed. *Hearing History: A Reader*, pp.51-3, here p.52
[338] Flora Fraser, *Maud: The Illustrated Diary of a Victorian Woman* (San Francisco: Chronicle Books, 1987), p.21.
[339] Thackeray, *Men's Wives*, pp.112-3.

altogether different, however, it is likely that knowledge and 'habitus' worked together to form different conceptions of sound and noise specific to that particular space.

Within the confines of the Exhibition building, it is unsurprising that the traditional definition of noise coined by G.W.C. Kaye, namely 'a sound out of place', proves an inadequate investigative tool.[340] A step towards a working hypothesis is possible, however, using Annegret Fauser's ideas conceived in relation to the soundscape of the 1889 Paris Exhibition, based upon the theories of Pierre Schaeffer. Here categorisation of sound is determined according to the cognition of the individual listener as 'noise music', 'subjective noise sound' and 'objective noise sound'.[341] In practical terms this would seem to translate such that 'noise music' applies in instances where recognisable repertoire is being played, 'subjective noise sound' in situations where sounds are objectively noise yet meaningful to the listener and 'objective noise sound' when the witness does not understand the context in which sounds are being produced. For example, a visitor witnessing the demonstration of a repetition action would have interpreted the same note played rapidly over and over again as 'subjective noise sound'; someone ignorant of purpose, however, would have designated the same as 'objective noise sound'.

The final variable in the make-up of sound experience lies in the identity of the performer; who played what, where and when would have greatly impacted the quality of sound heard by visitors. Some exhibitors employed professional musicians to demonstrate their pianos, whereas others used an attendant to carry out this task. There is evidence, which will be discussed later, that members of the public and journalists alike were also able to test instruments. Exactly why professional musicians were invited to demonstrate instruments is uncertain, although plausible answers are possible. It could be that makers knew visitors would gravitate towards the sound of recognisable repertoire played well; a familiar sound within an

---

[340] The phrase was coined by the British physicist G.W.C Kaye and is quoted in Karin Bijsterveld, *Mechnical Sound: Technology, Culture and Public Problems of Noise in the Twentieth Century* (Cambridge, Mass & London: MIT Press, 2008), p.240 and in Hendy, *Noise*, p.viii.

[341] Annegret Fauser, *Musical Encounters at the 1889 Paris World's Fair* (Rochester: University of Rochester Press, 2005), p.7.

unfamiliar soundscape would be reassuringly attractive. There are numerous eye-witness accounts of pianos played by professional musicians quickly attracting an audience and an engraving of an Erard grand piano in action, published in *The Crystal Palace and its Contents*, offers visual testimony that musical sound was a powerful magnet for visitors (Fig 3.11). *The Belfast News* remarked on the fact that, if played, Erard and Broadwood pianos could be seen with 'hundreds of attentive and enthusiastic auditors clustered around'.[342] Even Her Majesty the Queen was observed staying until closing time listening to a 'brilliant performance' on Erard's grand pianoforte in the Nave.[343]

Fig 3.11: Erard's Pianoforte and Harps, *The Crystal Palace and its Contents* (London: W. M Clark, 1852), p.200.

[342] *The Belfast News*, 27 August 1851.
[343] *The Daily News*, 9 June 1851.

It is also possible that makers would choose the repertoire performed, knowing that certain pieces of music would flatter the sound of their instruments more than others; for example, a slow lyrical composition would mask an unsatisfactory repetition action. If Rimbault's assertion, that the tonal quality of a piano was determined by the skill of the pianist, was widely accepted then the services of a professional could substantially improve public perception of an instrument.[344]

3.6: Considering musical knowledge

Exactly what constituted a good piano tone was probably a mystery to most. In line with advice given in an anonymous consumer guide entitled *The Guard*, published in 1854, and addressed to 'The Musical Public', most purchasers made their choice based on the identity of the maker. According to this unknown author, entering the establishment of Erard, Broadwood, Collard, Wornum or Stodart was a fail-safe method of acquiring a good instrument.[345] Although Brinsmead offered contradictory advice in their publication, *The History of the Pianoforte,* advising readers to buy from 'those who are rapidly rising to fame', this was probably just a marketing ploy to promote their own instruments.[346] An alternative solution to this dearth of knowledge was to rely upon the judgment of a 'professional gentleman', as recommended by The *Magazine of Domestic Economy*, who told its readership they did not have the necessary skills to select a piano themselves.[347] Although Appadurai's definition of luxury states that goods of this nature necessitated 'specialised knowledge as a prerequisite for their "appropriate" consumption, that is, regulation by fashion', it seems it was perfectly possible for someone to buy a piano without understanding how to evaluate its tone.[348] Whereas guides were available telling householders

---

[344] Rimbault, *The Pianoforte,* p.192; this claim is substantiated by a quotation from the great virtuoso pianist Sigismund Thalberg who was a member of the Class XA jury.
[345] *The Guard* (London: 1854), p.7.
[346] Edgar Brinsmead, *The History of the Pianoforte* (London: Cassell, Petter & Galpin, 1870), p.68.
[347] *The Magazine of Domestic Economy* (London: W. S. Orr & Co, 1841), p.242
[348] Appadurai, 'Introduction: Commodities and the Politics of Value', in Appadurai, ed. *The Social Life of Things*, pp.3-63, here p.38.

what to look for in terms of wood, colour and style, there was little to advise consumers as to the musical qualities of an instrument in terms that they could understand.

Although customer orders are rare, I have found three examples which shed light on consumer knowledge and priorities. The first, consisting of extracts from two letters written to Broadwood in 1820 by a Mr William Rashleigh, places total reliance upon the maker to select an appropriate instrument. Little is known about the parties concerned, save that the writer was heir to the Sheriff of Cornwall, who was his uncle. No known musical associations are evident, but it seems reasonable to assume the family were affluent. The only apparent concerns Mr Rashleigh has relate to cost, size, compass and design:

> Menabilly, 20 October, 1820
>
> Sir, I will thank you to inform me of the dimensions of the following pianofortes in your list printed in January last & whether you have the instruments ready-made in case of your receiving an order for one being sent to myself of Brentford & whether any abatement is made from your printed prices for prompt payment.
>
> I am, yours & c, W A Whinstanley

Square piano	No 2 with grand piano touch	£33	12
Do	No 3 with circular ends	£35	14
Do	No 6 with circular ends	£42	-
Do with 6 octaves	No 9 (deletion)	£38	17
Do	No 12 with circular ends	£47	5

> Menabilly, 28 October, 1820
>
> I will thank you to send a pianoforte marked No 3 on your list with circular ends to the Reverend Mr Whinstanley at Barton Cottage, Brentford, directed for Mrs Whinstanley with compliments – as it is meant for a present I must rely on your judgment to select such an instrument as will be approved of by the lady who is a good judge of music.[349]

[349] Letters from William Whinstanley to Broadwood, October 1820, Cornwall Record Office, R/S/1282 and DDR(S) 1/284. Information concerning the identity of the parties concerned was provided by Claire Wardle, Archivist at the Cornwall Record Office, in e-mail correspondence dated 3 March 2015.

The second example, written by Kate Palmer to Edward Postle in 1849, confirms that some purchasers did adopt a 'try before you buy' approach. The anonymous author of the aforementioned *The Guard* was emphatic that young ladies should test their prospective piano using a series of chords and scales to ascertain whether a satisfactory legato and staccato sound could be achieved.[350] Whether the favourable verdict reached by the young lady referred to in the letter, Emily Sandford, meant that a well-made instrument had been found is unknown, as is the manner in which it was tested. That she would have received the best education available to a lady at mid-century, however, is likely given that she was the granddaughter of a baronet:

> Dear Sir
>
> I am much obliged by your letter of this morning. You will like to hear that Mr Palmer & I took Emily today to choose a piano. We have got it for her at trade price – a semi-cabinet, quite new – the real price 45 guineas – 25 per cent will be taken off. She tried a great many instruments – the one Emily has chosen is a very excellent one – a fine, rich tone....[351]

It is difficult to determine whether a 'hands-on' approach would have been widely adopted. Based on examples from literature it would seem that a more common situation would be for a friend or family member to make the selection on behalf of the lady in question. In Thackeray's *Vanity Fair*, Amelia Sedley's pianoforte is selected for her from Broadwood by her parents for the sum of 25 guineas.[352] In *The Heir of Redclyffe*, Charlotte Mary Yonge's character Amy has her pianoforte chosen for her by her future husband Sir Guy Morville during their engagement.[353]

My final example is an extract from a letter to Broadwood from Louise Dulcken, concert pianist and piano teacher to the Royal Family, dated 1838. Her status suggests that a superior level of knowledge is at work and the wording of the letter suggests that Mrs Dulcken can distinguish between the

---

[350] *The Guard*, p.15.
[351] Letter from Kate Palmer to Edward Postle, 8 May 1849, Norfolk Record Office, FX 181/1. Information regarding the life of Emily Sandford and the status of her family was provided by Frank Meeres, Archivist at Norfolk Record Office, in e-mail correspondence dated 2 March and 3 March 2015.
[352] Thackeray, *Vanity Fair*, p.137.
[353] Charlotte Mary Yonge, *The Heir of Redclyffe* (London: John W. Parker & Son, 1854), p.322.

sound and touch of different instruments and is unwilling to rely on anyone else's opinion but her own:

> I wish to know if you have a pianoforte like the one Mrs Spottiswood bought – it must be very beautiful as it is for a pupil of mine who is an excellent player – if you have one ready which will suit pray let me know by return of post to Wigmore Street or No. 1 Park Street, Windsor where I am at present. I would then call and look at it on Saturday when I am coming into town for a few hours. I would also very much like to know if and where I can get one of your pianos in Dublin as during my stay I wish to make use occasionally of one of your instruments as well as Erard. (The young lady's name is Miss Hibbert). The piano in Dublin must have a light touch and much body of tone like the newest I saw at your house.[354]

It seems likely, therefore, that Exhibition visitors who were normally reliant upon consumer publications would either have accepted that all pianos were meritorious, being presented by reputable makers, or deferred to musical acquaintances. Those who understood the importance of testing a piano prior to purchase would probably, given the opportunity, have played Exhibition instruments for themselves.

Although Broadwood's Porter Book for the year 1851 contains numerous requests for assistance, this did not necessarily mean that customers knew what was wrong with their piano. Some entries state that the services of a tuner were required; others merely reported that something was amiss. An entry dated 23 April, which reads 'bringing semi GPF (grand pianoforte) No. 1336 from Mr Alexander 5 Clarendon Place, Hyde Park to look over and tune', is an example of the former. There is an example of the latter type of service required on the same page which reads 'bringing GPF (grand pianoforte) No. 14725 and cottage PF (pianoforte) No 000 both from Mr Edward Herring, Wandsworth Cottage, the GPF to examine for repairs and wait'.[355] It is not even possible to say definitely whether piano owners knew when their piano needed tuning, as periodicals such as *The Magazine of Domestic Economy* instructed families to utilise the services of a tuner

[354] Letter from Louise Dulcken to Broadwood, 10 October 1838, Surrey History Centre, 2185/JB/87/6.
[355] Broadwood Porter Book, 1851, Surrey History Centre, 2185/JB/42/46.

routinely four times a year.[356] In his *A Description and History of the Pianoforte*, Alfred J. Hipkins implies that the expertise of tuners was universally employed. The source has a retrospective feel, but given that it was published in 1896 the temporal context of statements are uncertain. When Hipkins states that 'the difficulty of tuning renders the employment of a specialist in that art necessary', he could be describing a situation at any point in a fifty-year period.[357] Florence Caddy's remark that householders ought to learn to tune their own pianos in order to save money, addressed to readers of *Household Organisation*, is more likely reflective of the true situation in the average middle-class household given that it is the author's mission to encourage thrift.[358] Inventions designed to facilitate tuning by sight provide further evidence that few possessed sufficient technique to tune by sound; one such example was patented in England by the French maker, Pape, in connection with his piano console.[359]

Tuning manuals, such as *Meissner's Modern Practical System of Tuning*, published in 1841, can be taken as evidence of consumer competence only if a widespread readership can be established. Addressed to amateur pianists living in rural locations, the advice in this guide might have been used by those who had no alternative.[360] Advice in a similar vein, addressed to amateurs, was offered in both the aforementioned piano histories by Brinsmead and Rimbault. The former makes the point that a full explanation of tuning would be impossible and that the advice given is meant to equip the reader to tune a few notes or replace a string.[361] The latter author's advice, addressed to 'students', necessitates a good understanding of intervals, knowledge that might well have been beyond the average piano-owner, and hints that in practice tuning would have been beyond the skill of either the artist or the amateur.[362] It is difficult to know what practical use a householder might have made of the troubleshooting section of Rimbault's

---

[356] *The Magazine of Domestic Economy* (London: 1840), p.241.
[357] Alfred J. Hipkins, *A Description and History of the Pianoforte and of the Older Keyboard Stringed Instruments* (London & New York: Novello Ewer & Co, 1896), p.3.
[358] Florence Caddy, *Household Organsation* (London: Chapman & Hall, 1877), p.xi and p.196.
[359] Harding, *The Piano-forte*, pp.296-298 and pp.369-70.
[360] Meissner, *Meissner's Modern Practical System of Tuning the Pianoforte*, pp.3-5.
[361] Brinsmead, *The History of the Pianoforte*, pp.68-9.
[362] Rimbault, *The Pianoforte,* pp.372-8.

book entitled ‘how to regulate defects in the regulation of the mechanism’. Here, the piano-owner is told what to do in the event of various problems such as keys sticking or rattling, the hoppers making an unpleasant sound and noises emanating from the hammers or dampers. Rimbault makes clear that the directions are not intended to replace the services of a regulator, rather they are meant to aid ‘those who from circumstance or situation are unable to secure the services of the experienced in these matters’.[363]

It seems likely therefore that amateurs would have had little knowledge relevant to the proper consumption of pianos as musical instruments. They did not know how to tell good from bad on the basis of the sound and touch produced, nor did they know how to rectify problems with their instruments, thus requiring the ongoing services of a piano maker for maintenance purposes. It does seem, however, that most amateurs did have a basic awareness of when their piano needed servicing; in other words, they could undertake what Pinch and Bijsterveld call ‘monitory’ listening’.[364] It seems plausible, therefore, that any problems with tuning or basic piano function found in Exhibition examples would not have gone unnoticed. ‘Diagnostic listening’, however, would have been beyond the capabilities of most visitors.[365]

3.7: Assessing ways of listening

Although listening techniques were developing by mid-century, research by scholars such as Jonathan Sterne and Malcolm Nicolson suggests they were emerging only in very specific contexts. Developments in medical diagnosis, telegraphy and acoustical engineering all required a degree of listening ability that was both localised and in its infancy.[366] This raises the question of whether the average mid-century concert goer ‘listened’ to what was being performed or whether attendance was simply an opportunity for social interaction. Certainly, within the domestic sphere,

---

[363] *Ibid*, pp.380-6.
[364] Pinch and Bijsterveld, ‘New Keys to the World of Sound’, in Pinch and Bijsterveld, ed. *The Oxford Handbook of Sound Studies*, pp.3-35, here p.14.
[365] *Ibid*.
[366] Sterne, *The Audible Past*, pp.99-136 and pp.137-77; Nicolson, ‘Having the Doctor’s Ear in Nineteenth- Century Edinburgh’, in Smith, ed. *Hearing History: A Reader*, pp.151-68.

music was still more of a backdrop to conversation than an occasion for active listening, something which was lamented by Florence Caddy in *Household Organisation.* If, she reasoned, audiences could listen sufficiently well in a concert setting to identify a mistake, why could they not then exercise the same level of focus at a domestic performance?[367]

Whether or not audiences were capable of listening during public performances is a topic which has been addressed by musicologists, although to date findings centre mostly around eighteenth-century concert life. James H. Johnson's *Listening in Paris: a Cultural History*, published in 1995, is a classic text on this subject.[368] William Weber believes the assumption that audiences did not listen is rooted in the fact that talking and moving around during performances was considered acceptable in the mid eighteenth century. There is evidence that, for some, concert going did have a learning objective; what he calls the 'learned listener' was capable of reflecting on what he or she heard.[369] In her discussion of listening practices at the opera, Jennifer Hall-Witt concludes that, by the mid-Victorian period, audience behaviour had changed in a way that was more conducive to listening rather than socialising. Changes in lighting and the positioning of the audience relative to the stage also helped create an atmosphere where the performance was central to the occasion. Diary evidence dating from the early to mid nineteenth century, although it relates exclusively to the perspectives of upper-class attendees, also suggests a more active type of listening taking place, although there is still evidence of appreciation being rooted in the event rather than the music.[370]

If visitors applied knowledge gained in the private and public spheres to the field of the Exhibition, it seems likely they could have investigated instruments using various comparative methods. One type of listening is what Fauser denotes 'sound music', that is the performance of compositions with which visitors were familiar. This type of listening would prompt visitors

---

[367] Caddy, *Household Organsation*, pp.133-4.
[368] James H. Johnson, *Listening in Paris: a Cultural History* (Berkeley & Los Angeles: University of California Press, 1995)
[369] William Weber, *The Great Transformation of Musical Taste: Concert Programming from Haydn to Brahms (*Cambridge & New York: Cambridge University Press, 2008), pp.17-8.
[370] Jennifer Hall-Witt, *Fashionable Act: Opera and Elite Culture in London 1780-1850* (Durham: University of New Hampshire Press, 2007), pp.252-64.

to compare how a composition they knew sounded on an Exhibition piano compared with the one in their home or the instrument in the concert rooms they attended. Although the solo piano recital was not yet fully integrated into English concert life, many visitors would no doubt have experienced the solo piano as part of a mixed recital programme featuring other instruments.[371] Unfortunately Exhibition piano repertoire is very poorly documented compared to that of the organs; even though the latter were observed performing a wide range of keyboard music, it seems unsafe to assume that piano makers would have chosen the same compositions to demonstrate their instruments. There are multiple reports in *The Morning Chronicle* from May to September listing the repertoire performed on organs in the building; the majority of programmes encompass styles ranging from operatic arias to J.S. Bach to popular songs.[372] What is clear is that professional performance was regularly used as a means of demonstrating a product notwithstanding that the organisers believed music would distract visitors from the task of investigating and learning.

So far as piano performances were concerned, a report by *The Morning Chronicle* observed Lindsay Sloper performing works by his former teacher Chopin on Collard's grand piano.[373] The 1850s witnessed a change in musical taste such that works by classical composers were increasingly preferred over operatic and virtuosic styles. Works by Chopin are known to have featured on concert programmes during the 1840s and accordingly audiences would have been familiar with the style; Louise Dulcken, for example, played selected works of Chopin at her 1844 soirees.[374] Much later in the Exhibition, the same newspaper reported a performance by an 11 year old girl, Miss Annie de Lara, accompanying herself whilst singing arias from

---

[371] Janet Ritterman & William Weber, 'Origins of the Piano Recital in England 1830-1870', in Therese Ellsworth & Susan Wollenberg, ed. *The Piano in Nineteenth-Century British Culture: Instruments, Performers and Repertoire* (Farnham: Ashgate, 2007), pp.171-91, here pp.171-2 and pp.178-9.

[372] For programme listings, see *The Morning Chronicle* for 23 May, 7 June, 12 June, 19 July, 28 July, 8 September, 29 September 1851.

[373] *The Morning Chronicle*, 19 July 1851; the identity of Lindsay Sloper is briefly discussed in James Huneker, *Chopin: The Man and his Music* (Project Gutenberg, 2004), Section IV, n.p.

[374] Ritterman & Weber, 'Origins of the Piano Recital in England 1830-1870',in Ellsworth & Wollenberg, ed. *The Piano in Nineteenth-Century British Culture*, pp.171-91, here p.180.

Don Giovanni.[375] This sort of repertoire was representative of musical taste that was slowly disappearing, although it was still part of concert repertoire in the run up to the Exhibition. Although medley programmes with contemporary operatic arias, and piano variations based on operatic themes, were slowly going out of fashion, they were still a feature of some of Franz Liszt's concerts at mid century.[376] A third and final example of an account documenting piano repertoire by John Todd, an individual who Cantor identifies as an artisan visitor from Edinburgh, describes hearing 'some dull slow quadrilles and other tunes', followed by the Scottish folk tune 'Tulloch-Gorum'.[377] By the 1850s, ballads had disappeared from classical music concerts, so the performance of this type of repertoire is either a throw-back to earlier decades or reference to a more popular drawing-room culture.[378] That songs and dances were played by visitors, rather than professional musicians, is perhaps indicative of attempts on the part of the public to introduce a familiar element into an otherwise alien environment. Taken as a whole it seems that the repertoire heard at the Exhibition was inclusive of the popular and the classical; it reflected the melting pot of musical taste that was characteristic of the mid-century concert scene.

Based on the premise that visitors would have compared Exhibition pianos with their own domestic instruments, it is possible to plausibly speculate how instruments might have been played. Visitors listening to the sound resulting from this kind of experimentation would have experienced either Fauser's 'subjective noise sound' (if they understood the reason for the demonstration) or 'objective noise sound' (if they experienced the sound dissociated from its source). Starting with differences in notational range, data shown in Appendices F and G highlights the varying compass of Exhibition instruments (based on descriptions in the *ODIC*) pianos found in mid-nineteenth-century homes (based on my quantitative study) and surviving examples in museum collections. The first two sources give only

[375] *The Morning Chronicle*, 13 October 1851.
[376] Ritterman & Weber, 'Origins of the Piano Recital in England, 1830-1870', in Ellsworth & Wollenberg, ed. *The Piano in Nineteenth-Century British Culture*, pp.171-91, here p.177 and pp.179-80.
[377] Cantor, *The Great Exhibition*, *Volume III*, pp.279-80; John Todd, 'Visit to London & the Exhibition' extracts, in Cantor, *The Great Exhibition*, *Volume III*, pp.281-95, here p.292.
[378] Weber, *The Great Transformation of Musical Taste*, p.35.

approximate measurements, for example, an *ODIC* description might state that a piano had seven octaves whereas by examining surviving examples it is possible to be precise not only as to the exact range but whether the range was extended in the upper or lower registers. Clearly few mid-century piano owners would have been familiar with a keyboard larger than 6 ½ octaves, although those with 6 ¾ and 7 octaves were in circulation. It is probable therefore that pianos demonstrating a 7 or 7 ½ octave compass would have attracted attention and the 'new' notes would have been made to sound. Here 'subjective noise sound' listening would have led visitors to appreciate advancements in string tension making new notes possible; 'objective noise sound' listening would have simply exposed visitors to random tones at the top and bottom of the register.

Looking at particular models, it is evident that owners of square pianos were unlikely to have been accustomed to anything more than 6 octaves; a range of 6 ¾ octaves would have been intriguing. Owners of grand and upright pianos, specifically cabinet and cottage models, would typically have been familiar with a 6 ½ octave range. The former might therefore have been drawn to 7 octave entries by British makers Broadwood and Kirkman and foreign makers Erard, Hoxa and Schneider; the latter to foreign entries by Erard and Scheel. The table in Appendix G indicates that notes were being added at both the top and bottom of the average piano compass. When played, very high frequency notes such as A'''' (3520hz) with a short wavelength would have been easily blocked by large objects; conversely, very low frequency notes, such as AAA (28hz) with a longer wavelength would have been more easily audible, having the ability to pass around intervening objects.[379] Whether or not other visitors would have heard pianos being tested was at least partly dependent, therefore, on where they were situated in relation to other objects and which notes were made to sound.

The nature of some inventions make the likely sound produced predictable. A piano claiming to have an improved repetition action would

[379] P.H. Parkin and H. R. Humphreys, *Acoustics, Noise and Buildings* (London: Faber & Faber, 1969), p.26 and pp.46-7 and pp.309-13; Egan, *Architectural Acoustics*, p.5 and pp.52-3.

have been played so that one note would have been made to sound again and again. Upright pianos may have received particular attention given that rebounding hammers had been a problem in this type of design in previous decades. Entries by British makers Collard, Holdernesse, Kirkman and Oetzmann & Plumb all claimed to have created a more efficient version; foreign makers Guriche and Pape made similar assertions. Anyone listening to a transposing piano would probably have heard the same scale, finger exercise or excerpt being played consecutively at different pitches. As all but one of these devices were located in the British piano section (the one exception being that of the Austrian maker Seuffert), this type of demonstration would have been experienced only by visitors to the North West gallery.[380] Pianos made to produce a distinctive kind of sound, unlike that of an ordinary domestic instrument, would also have been notable. Examples include Hueni & Hubert's harpsichord piano, Adolphe Frey's piano equipped with metallic hammers (both shown in the Swiss compartment) and Hopkinson's piano on which 'a kind of tremolo may be produced by slightly agitating the key when down'.[381]

Both Richards and Teukolsky argue that the autonomy of vision was partly dependent on the fact that touch was prohibited, a ruling which does not appear to have been observed in practice. Whereas Richards' argument relates to the desirability of goods in a predominantly consumer environment, Teukolsky's aim is to highlight the role of the dispassionate, professional gaze, an approach which was encouraged in all visitors. Notwithstanding differences in agenda, however, both agree that permitting physical contact would, as suggested by Roland Barthes, have demystified objects.[382] There is evidence, however, to suggest that reporters, in particular, actively expected to be given the opportunity to assess sound and touch. A writer for *The Morning Chronicle* remarked 'when we first noticed the English

---

[380] Transposing pianos varied greatly in terms of the number of different keys that were made possible; according to the company prospectus, Woolley's instrument boasted a facility which allowed the pianist to play a piece in any key; according to Newton's London Journal, p.34, J. Harwar produced a piano upon which performers were restricted to just three semitones up or down from the keynote.
[381] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume 1*, p.467
[382] Richards, *The Commodity Culture of Victorian England*, p.32; Teukolsky, 'This Sublime Museum', in Buzard *et al*, ed. *Victorian Prism*, pp.84-100, here p.88.

pianofortes, there were several instruments which we had not then had an opportunity of testing, but which appear to deserve some mention'.[383] One report describing Collard's grand piano implies that the writer must have been allowed first-hand experience of the instrument:

> The tone, so far as we have been enabled to test it, combines great richness and mellowness; the touch is delicate and elastic answering at all points of depression, with promptitude to the slightest movement of the finger, in fact, it is difficult to conceive that the requirements of even the modern school of pianoforte playing can call for any greater amount of manufacturing excellence.[384]

Similar comments are also made in the same article concerning Kirkman's miniature grand piano, which the writer thought remarkable because of its 'power and promptness of the mechanism, the elasticity of touch, and the close damping with the movement of the pedals'.

That the public also played pianos is evidenced in several ways. The first comes from the aforementioned John Todd who reported seeing and hearing a member of the public playing a piano.[385] The second comes from an article in *The Caledonian Mercury* which reported that a member of the public had 'died of excitement' having been allowed to play one of Broadwood's grand pianos.[386] An engraving of The Coalbrookdale Dome, published in *The Crystal Palace and its Contents*, offers a third and final source of evidence that visitors were permitted to play pianos, although here there is the possibility that the lady in question could be professional (Fig 3.12). There were a few who achieved such status at mid-century and accordingly it is impossible to say whether the performer shown was there at the request of Collard or was merely an inquisitive member of the public. That touching exhibits was prohibited by the Exhibition authorities is telling; such prohibition was mentioned in *The First Report of the Royal Commissioners* on two occasions.[387] It may simply have been to ensure that products survived the duration of the Exhibition unsullied; it may also have

---

[383] *The Morning Chronicle*, 26 July 1851.
[384] *The Morning Chronicle*, 24 May 1851.
[385] Cantor, *The Great Exhibition*, *Volume III*, pp.279-80; John Todd, 'Visit to London & The Exhibition' extracts, in Cantor, *The Great Exhibition*, *Volume III,* pp.281-95, here p.292.
[386] *The Caledonian Mercury*, 1 September 1851.
[387] *First Report of the Commissioners for the Exhibition of 1851,* p.25 and p.30.

been to ensure that visitors did not investigate products in a way which identified flaws. In most instances where knowledge was obtained as a result of touch, the degree of knowledge derived appears in excess of what would have been achieved through sound alone.

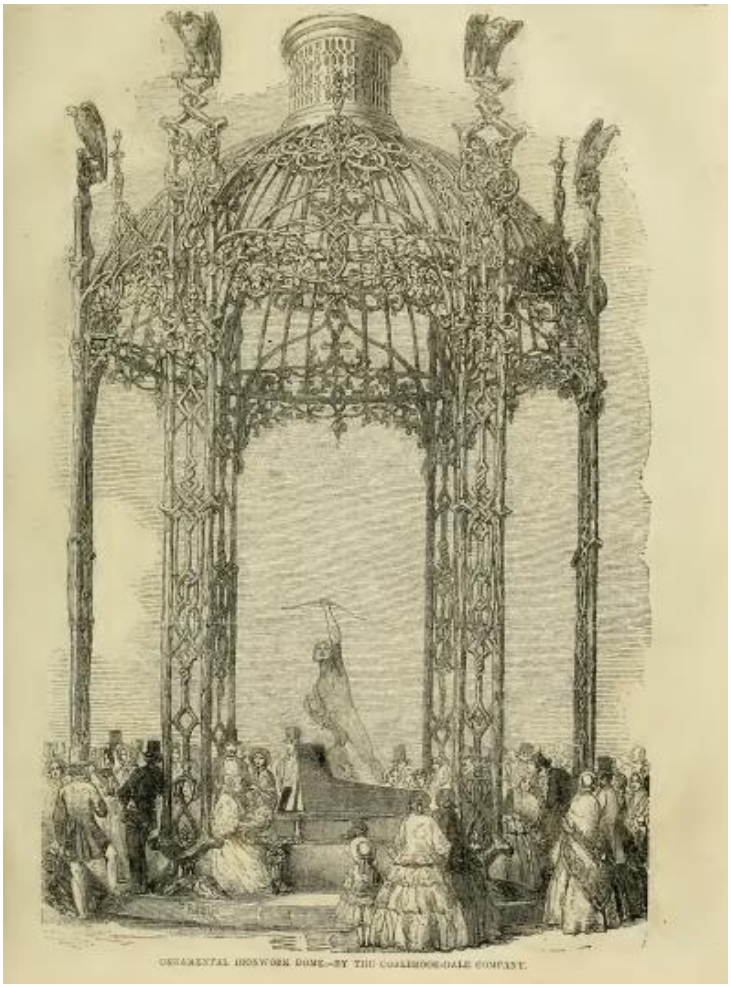


Fig 3.12: Female pianist playing Collard's grand piano situated under the ornamental Ironwork Dome by the Coalbrookdale Company, *The Crystal Palace and its Contents*, p.89.

In terms of sound experience, it is fair to conclude that visitors were at a disadvantage. Public performances on pianos and other instruments were sporadic and given that the organisers were concerned that music might distract visitors from the pursuit of learning, it is unlikely they were officially sanctioned. Sound is known to have travelled poorly across wide spaces and listening techniques were poorly developed. Notwithstanding that the

vocabulary through which findings were expressed was subjective, however, navigation using sound was possible and visitors could learn through listening and touch what they could not by simply looking. Had music been viewed as an aid to learning rather than a distraction, pianos would most likely have been evaluated as sound producers to a fuller extent than was actually possible. As I explored in Chapter 2, an object-based layout rather than a geographical one would have made formal organisation of demonstration a necessity.

3.8: Conclusion

Within the 'field' of the Exhibition, it is likely that objects were valued more for their visual appearance than for any sound-producing capabilities. The exhibition building was a visually engaging space where the eye was continuously drawn in different directions and the mind was torn between different ways of looking. After the initial desire to 'see and be seen', visitors would have either enjoyed the more ornate pianos as part of the spectacular landscape or would have settled down to visually comparing them with what they understood of their own domestic instruments. In the case of the piano, the spatial layout adopted by the organisers favoured sight over sound, as the most easily accessible instruments were richly and skilfully decorated. Whereas there was much for the eye to feast upon, that these pianos were often found standing silent meant there was nothing for the ear to engage with. It must, however, be emphasised that aesthetic appearance was most likely dominant because of the spatial arrangement endorsed by the organisers coupled with constraints placed upon exhibitors. Their decision to refrain from arranging a schedule whereby exhibitors could demonstrate their pianos in turn meant that whether or not visitors were able to hear them played was largely a matter of chance. Whereas sight was ever present, sound was intermittent.

Whereas visitors would have been reasonably well versed in matters of design and would have known how to evaluate the materials used in piano casing, the question of what constituted a good piano tone was a mystery for most, as was the relationship between construction and resulting sound. On

the one hand therefore, it is very unlikely that the average visitor could have evaluated the quality of piano sound in any meaningful way. On the other, there is clear evidence that visitors were drawn to the sound of familiar repertoire indicating that sound was used as a navigational tool. It is perfectly plausible that visitors could have tested instruments in a comparative way to ascertain how the compass differed from their own pianos, how the speed of the action differed, or to test inventions claiming to produce a new kind of sound. If pianos were investigated as I have proposed, a 'hands-on' approach would have helped visitors to understand the significance of technological advancements made, providing them with an additional sensory mechanism through which to compare products.

That less conventional exhibits, for example the violino-piano presented by the American maker, J. Wood, prompted great difference of opinion suggests that the underlying knowledge and preferences of visitors was diverse. At one extreme, a journalist for *The Lancaster Gazette* remarked that the instrument 'discourses sweet music' and the author of *The Crystal Palace and its Contents* described it as 'a very ingenious and curious instrument'.[388] At the other extreme, reporters for *The Manchester Times* and *The Examiner*, together with the Exhibition commentator John Tallis, respectively concluded that its sound was 'peculiar', akin to 'a saw mill in a high state of excitement' and 'ludicrous'.[389] An account by John Lemoinne, a journalist for the Paris daily newspaper *Journal des Débats, Politiques et Littéraires*, offers an entirely different perspective, one that is based not on musical sound but on economy. Upon finding Wood's violino-piano in the American Department, he remarked 'tis original and economical to boot – it saves one man's time; it is one artist the less in the republic, and Plato was opposed to having any'.[390] Here the divergence between amateur and professional taste is clear, which leads into a discussion of the latter in

---

[388] *The Lancaster Gazette and General Advertiser for Lancashire, Westmorland and Yorkshire,* 21 June 1851; *The Crystal Palace and its Contents*, p.202.
[389] *The Manchester Times*, 9 August 1851; *The Examiner*, 14 June 1851; John Tallis, John *Tallis's History and Description of the Crystal Palace and the Exhibition of the World's Industry in 1851 in Two Volumes* (London: J. Tallis, 1852), p.119.
[390] John Lemoinne, 'Letters of M. John Lemionne', in *The Great Exhibition and London in 1851* reviewed by Dr Lardner (1852), in Cantor, *The Great Exhibition*, *Volume IV,* pp.3-14, here p.13.

Chapter 4. Whereas most visitors believed Wood's instrument was ridiculous, the Class XA musical jury awarded it both an honourable mention and a monetary prize to compensate the maker for expenses incurred.[391]

Despite the fact that vision was uppermost, findings indicate that it might not have enjoyed the exclusive autonomy commonly supposed by Exhibition scholars; certainly the way in which pianos were experienced suggests the emergence of in-roads whereby objects could be understood, at least in part, by other senses. The view of the organisers that sound, in the form of music, was a distracting pleasure-seeking activity did not mean that sound, in other forms, could not have served as a rational medium. Despite the fact that the Exhibition boasted spectacular attractions, listening did enhance visitor experience. Notwithstanding that sonic vocabulary was in its infancy, the act of hearing was not necessarily purely subjective as it did facilitate a better understanding of instruments. Although sound could promote an emotional response, it could also potentially appeal to the intellect. Knowledge derived through sound therefore calls into question some of the traditional distinctions outlined by Sterne in *The Audible Past*.[392]

[391] *Report by the Juries*, p.335.
[392] Sterne, *The Audible Past*, p.15

Chapter 4: Professional Taste at the Great Exhibition: evaluating sight and sound according to judicial criteria

4.1 Introduction

Just as amateur taste has been used as a tool to explore how visitors might have understood sight and sound in Chapter 3, so this chapter investigates how professional taste might have impacted how the judges evaluated whether or not products were deserving of prizes. This is a topic which has largely escaped the attention of Exhibition scholars; the only remarks made to date are essentially descriptive, briefly outlining how the judging system worked and how many prizes were awarded. Davis, for example, explains how the organisers' initial plans to keep juries small had to be abandoned because of complaints from foreign commissioners that this would result in foreign nations being unrepresented on judging panels.[393] So far as visual aesthetics were concerned, professional taste, and the way in which the public responded to it, was something with which the Exhibition organisers were very much preoccupied during the early stages of planning. Standards of design in Britain in the decades preceding the Exhibition were considered poor in comparison with those of European makers. One of the main goals of Henry Cole and others at the Society of Arts was to improve education; artists were to receive technical training based more closely on scientific principles. They sought to improve methods whereby art was applied to manufactured products and in so doing generate a public taste for better quality items.[394] These ideals were what prompted the small-scale national exhibitions organised by the Society of Arts during the 1840s. By the time the Exhibition was declared open, broadly speaking, amateur audiences were concerned with materials, style and cost, whereas professionals were preoccupied with matters of construction, design and ornamentation. That there was an important difference between professional and amateur taste is accepted by Exhibition scholars, as discussed by Rachel Teukolsky in her essay 'This Sublime Museum'. She explores how

[393] Davis, *The Great Exhibition*, p.111.
[394] Auerbach, *The Great Exhibition of 1851*, pp.10-4.

different audiences experienced statuary and the Medieval Court by contrasting amateur understanding, which adopted a chiefly moral stance, to that of professional art critics who were dispassionate, evaluating exhibits in terms of style and artistic traditions.[395]

Whereas art experts had a clear idea of how standards in design should develop, exactly what constituted 'good' musical taste in professional circles was far less clearly defined. Quoting official endorsement from someone of celebrity status appears to have been the main method by which piano makers sought to convince the public that their products were 'good'. Examples are numerous, but to cite just one example, in his 'Remarks on the Royal Albert Pianoforte', written to extol the virtues of a transposing device, William Hutchins Callcott reported that over 200 professional musicians considered the invention 'an invaluable addition to the pianoforte'.[396] Makers also drew attention to past accolades, citing instances in which prizes had been conferred on their instruments at previous Exhibitions. Domeny of Paris, for example, announced in their prospectus that they had previously been awarded a gold medal and four silver medals at various national Exhibitions dating from 1827 to 1849.[397]

Following a brief overview outlining the composition and relationship between the juries, the award system and the criteria upon which the judges were instructed to assess exhibits, this chapter will be divided into two main parts, the first examining how pianos might have been evaluated for their design by the fine art jurors (Class XXX) and the second exploring how the musical jury (Class XA) might have evaluated tone and touch. Having first identified the ideals of Redgrave and Pugin concerning issues such as craftsmanship versus machine-made components, historical style and ornamentation relative to purpose, I will consider how these values might have been applied to exhibition pianos. The second section examines what previous experiences a predominantly British musical jury might have had of European pianos, how pianos were evaluated in terms of tone and touch,

---

[395] Teukolsky, 'This Sublime Museum', in Buzard, *et al*, ed. *Victorian Prism*, pp.84-100, here pp.89-98.
[396] William Hutchins Callcott, 'Remarks on the Royal Albert Pianoforte', Robert Addison Exhibition Prospectus, (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09, pp.18-20.
[397] Domeny Exhibition Prospectus, University of Reading Special Collections, n.p.

whether jurors were likely to have been impacted by personal relationships with exhibitors and what conclusions are possible based upon which inventions were awarded which grade of medal. Evidence which highlights discrepancies between contemporary verdicts concerning piano touch-weight and organological data is also considered; it is here that the role of knowledge and that of personal preference in determining value seem to collide more than any other. The famous medal controversy, whereby both Broadwood and Collard were stripped of their Council Medal, is also re-evaluated in light of earlier patent disputes and possible breach of Exhibition rules.

4.2: Explaining the Judicial System

Due to the classificatory problems outlined in Chapter 2, Exhibition pianos could potentially have been judged under criteria applicable to musical instruments (Class XA), furniture (Class XXVI) and Fine Art (Class XXX), details of which appear in Fig 4.1 below. The criteria applicable to Class XXVI would have been relevant only to those pianos entered jointly by Jennens & Betteridge/Dimoline and J.C.Crace/Lambert & Co, and Mummery's 'piano bedstead' creation. Because 'beauty of design' was one of the criteria applicable to musical instruments the musical jury would have deferred to the Class XXX jury under provisions in *The First Report of the Commissioners* which allowed juries to seek assistance from others if appropriate knowledge was lacking.[398] One of the organisers' main priorities was to convince exhibitors that the prize system was not intended to be hierarchical; rather the awards were meant to commend different kinds of achievement.[399] There were two main awards: the Prize Medal, which could be awarded to makers whose goods demonstrated some kind of excellence, and the Council Medal, which could be conferred only upon products that were exceptional.

---

[398] *First Report of the Commissioners for the Exhibition of 1851*, pp.18-20 and p.105.
[399] *Ibid*, p.xli and p.106.

Fig 4.1: Table summarising judging criteria applicable to pianos

Judging criteria for Class XA (Musical Instruments)	Novelty of invention, novel application of old inventions, improvement of mechanical action, tone, perfection of workmanship, beauty of design combined with general excellence, increased facility of action, cheapness combined with durability
Judging criteria for Class XXVI (Furniture) (these criteria was applicable to Group E in general, denoted 'Miscellaneous Products')	Novelty of material in application, excellence of design, material, workmanship and cheapness
Judging criteria for Class XXX (Fine Art)	Originality and excellence of design and importance of the work combined with great merit of execution; merit of execution combined with application to useful purposes
The judges were **not** expected to make enquiries to ensure that design and inventions were the property of the exhibitors claiming ownership; it was not their task to root out plagiarism.	

Source: *The First Report of the Commissioners*, p.22 and p.107.

Two other types of award were also possible, namely the Honourable Mention, something which Jurors could bestow on exhibits that were good, but insufficient to qualify for a medal prize, and monetary awards, which could be given in circumstances where the exhibitor had incurred substantial costs producing the item in question. The organisers appear to have had difficulty defining the respective standards necessary for the two medals. The matter is mentioned in *The First Report of the Commissioners* in no less than four different places and a summary of the guidelines given appears in Fig 4.2 below.[400]

[400] *Ibid*, pp.xl-xli and pp.18-22.

Fig 4.2: Table summarising official requirements and identity of awarding body for each type of judicial award

Type of Award	Awarding Body	Official requirements (specific to products classified as machinery)
Council Medal	The Council of Chairmen on the recommendation of the Individual jury concerned and the Group jury	- To be awarded in exceptional cases - The invention in question must have been patented no more than 15 years prior to the Exhibition - The product concerned must represent some important novelty of invention or application - It must be anticipated that the invention in question will exercise an influence upon the wider industry of which it is part - A large financial outlay is not sufficient grounds for this category of award
Prize Medal	The Individual Jury responsible for the class in which the product is entered (rubber-stamped by the Group Jury and the Council of Chairmen)	To be awarded for any product deemed to possess excellence of whatever nature
Honourable Mention	The Individual Jury responsible for the class in which the product is entered	To be awarded where contributions are meritorious but are deemed insufficient to entitle the maker to receive a Prize Medal
Monetary Award	Unknown	To be given in rare instances where the maker in question has incurred considerable expense in producing the exhibit without the probability of being remunerated for the outlay. Unlike all other prizes, it could be given in conjunction with a medal.

Source: *The First Report of the Commissioners*, pp.18-22 and pp.105-6.

The other main priority was to ensure fairness by reducing the possibility of national loyalties prejudicing judging decisions. *The First Report of the Commissioners* expressly stated that judges had been selected for their impartiality and that medals would be awarded without reference to nationality.[401] Each individual jury was made up of equal numbers of British and foreign jurors, on the basis that British and foreign manufacturers had contributed approximately half of all products respectively. Some juries, such as the musical jury, were made up of a main jury and an associate jury; exactly why such a distinction was made is unclear as there is nothing in *The First Report of the Commissioners* to suggest that the powers of the associate jury were any different to their main counterparts. In the case of the Honourable Mention, this type of commendation could be given by the individual jury concerned without reference to any other judicial body. In the case of medal awards, however, in order to compensate for the fact that not every jury could accommodate an expert from every nation present, once preliminary judging decisions had been made, they would then be referred to a Group Jury and then to the Council of Chairmen. As illustrated in Fig 4.3 below, the thirty juries and four sub-juries were divided up into six groups, the idea being that decisions could be sanctioned by others with suitable expertise.[402] Decisions concerning pianos therefore would have been made initially by the Class XA jury but then referred, at first instance, to the Group Jury made up of juries from Classes V-IX together with the other sub-juries of Class X. After that, decisions would be referred to the Council of Chairmen whose main task it was to ensure that Exhibition rules and regulations were adhered to and that the decision making process was consistent. *The First Report of the Commissioners* is difficult to interpret on this point, but the inference is that whereas prize-medal decisions were merely rubber-stamped by the Group Jury and The Council of Chairmen, the Council Medal could only be conferred by the Council of Chairmen on the recommendation of individual and group juries.

---

[401] *Ibid*, p.18-20 and p.106.
[402] *Ibid*, pp.xxxviii-xxxix and pp.18-20.

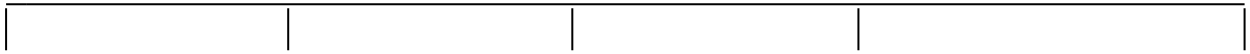
Fig 4.3: Diagram showing Judicial Hierarchy

The Council of Chairmen

(This level of the judicial hierarchy was comprised of chairmen from each of the 30 juries and 4 sub-juries)

5 Group Juries

(Each of these juries was comprised of all jury members responsible for classes within the same group. This system was applicable to all groups except Group F which was autonomous. It was thought that a Group Jury would have the collective expertise to properly ratify each others' judging decisions)



Group A	Group B	Group C	Group D	Group E	Group F
Raw Materials	Machinery	Textiles	Metallic/Vitreous/Ceramics	Miscellaneous	Fine Art
Classes I-IV	Classes V-X	Classes XI-XX	Classes XXI-XXV	Classes XXVI-XIX	Class XXX
4 Juries	6 Juries	10 Juries	5 Juries	4 Juries	1 Jury
	4 Sub/Associate Juries				
	(including Jury and Associate jury for Class XA)				

*Red text denotes the position of the musical jury (Class XA) within the overall hierarchy; Blue text denotes the groups who were members of the Group Jury responsible for decisions concerning musical instruments

Although the process was intended to be fair and impartial, as will be discussed later in the chapter, in reality this was an impossible goal. That manufacturers were dissatisfied with the award system is evident in contemporary reports, not least the two piano makers Broadwood and Collard who suffered the humiliation of having their Council Medal reduced to that of a Prize Medal by the Council of Chairmen. An investigation of knowledge and 'habitus' surrounding judging decisions, coupled with the regulations specific to the field of competition, will explain why such decisions were made and why professional verdicts mattered so much to exhibitors.

4.3: The Class XXX Jury: exploring aesthetic value

4.3.1 Introduction

Although the members of the Class XXVI (Furniture) and Class XXX (Fine Art) juries are listed in *The First Report of the Royal Commissioners*, little is known about them save for some details concerning their occupations, status, place of residence and country of origin.[403] The two names which do

[403] According to *Reports by the Juries*, p.683, the Class XXX jury was made up of 15 members including G. Von Viebahn, Chairman, Zollverein, Privy Councilllor in the Department of Commerce at Berlin; Lord Colbourne, Deputy Chairman, 19 Hill Street, Berkeley Square; Antonio Panizzi, Reporter (Tuscany), British Museum, Keeper of the Printed Books at the British Museum; C. R Cockerell, R. A. Bank of England, Architect; J. Gibson, R. A. 7 Tilney Street, Park Lane, Sculptor; Lord Holland (Tuscany), Minister at the Court of Turin; Count Leon de Laborde, France, Member of Institute; General George Manley, 19 Rutland Gate, formerly Adjutant-General in Rome; C.T. Newton, British Museum, Assistant in the Antiquarian Department of the British Museum; A. W Pugin, St Augustine, West Cliff, Ramsgate, Architect; Lambert A. J. Quetelet, Belgium, Secretary of the Academy of Fine Arts and President of the Circle-Artistique, Brussels; Richard Redgrave, R. A. 18 Hyde Park Gate, South Kensington Gore, Artist; Y.D.C Seurmondt, Holland, late Master of the Mint at Utrecht; Dr C. Waagen, Zollverein, Director of the Museum of Fine Arts at Berlin; W. Wyon, R. A. Her Majesty's Mint, Medalist. According to the same source, p.544, the Class XXVI jury was made up of 12 principal members including Professor Roesner, Chairman and Reporter, Austria, President of the Imperial Academy of Fine Arts; Lord Ashburton, Deputy Chairman, 82 Piccadilly; John Lewis Aubert, 20 Lower Road, Islington, Paper Stainer; Charles de Beyne, Russia, Architect; Francois Coppens, Belgium, Architect; J. G. Crace, Joint Reporter, 14 Wigmore Street, Cavendish Square, House Decorator; Charles Crosso, Sardinia, Manufacturer; John Jackson, 49 Rathbone Place, Manufacturer of Composition and Papier Maché ornaments; W. Meyer, North Germany; N. Rondot, France, Late of Embassy to China and Member of Central Jury; Edward Snell, 27 Albemarle Street, Upholsterer and Cabinet Maker; John Webb, 8 Old Bond Street, Upholsterer and Cabinet Maker. There were also four associate members namely Lieut-Colonel Demanet, 99 Warwick Street, Pimlico; L. Gruner, 12 Fitzroy Square, Architect (Juror in class XXIII); Chev Lencisa, Commissioner to the Exhibition for H. M the King of Sardinia; M. Wolowski, France,

stand out are those of the artist Richard Redgrave and the architect A. W. N. Pugin; accordingly I have based my arguments concerning how I think pianos would have been judged aesthetically on their artistic ideals. Although Redgrave's diary survives in a format edited by his daughter, unfortunately the entry for 1851 is what she describes as 'peculiarly short'.[404]

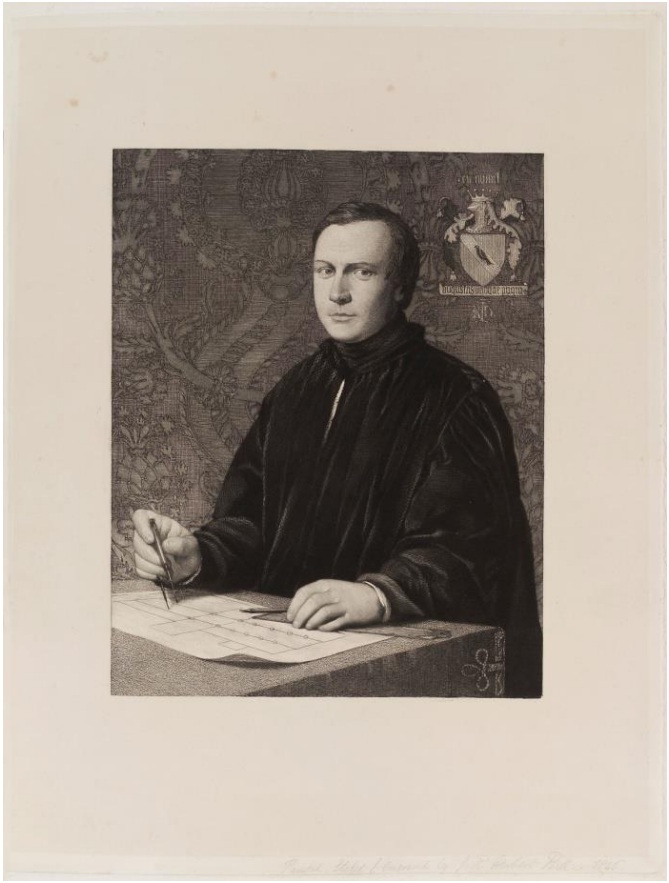


Fig 4.4: A. N. W. Pugin by James Henry Lynch, after John Rogers Herbert, 1853 (NPG 20474). Reproduced by permission of The National Portrait Gallery

The importance of construction and ornamentation are outlined in Redgrave's *Supplementary Report*, published as part of the *Report by the Juries*, together with some remarks on the merits of historical style. Although the majority of Pugin's work focuses on style and construction in an architectural context, some of the same issues are discussed in relation to furniture in his essay *The True Principles of Pointed or Christian Architecture*. Details of

---

Professor to Museum of Arts & Sciences, Member of the Central Jury and the Legislative Assembly of France (Juror of Class XIX).

[404] Frances Margaret Redgrave, ed. *Richard Redgrave: A Memoir* (London: 1891), pp.75-6.

both works will be discussed later in relation to specific designs evidenced in iconographical sources and extant instruments.

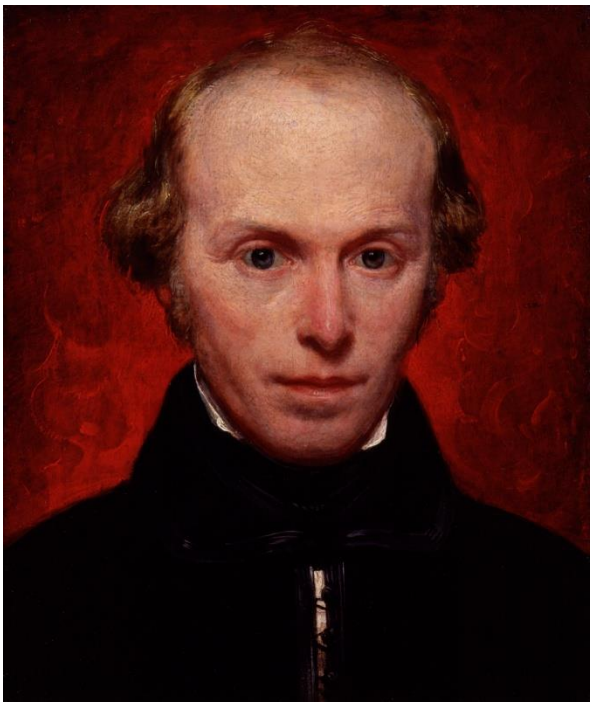


Fig 4.5: Richard Redgrave, self portrait, undated (NPG 2464). Reproduced by permission of the National Portrait Gallery.

Although the basic tenets of professional value are discernible from these sources, there are very few instances in which comments are directed specifically at pianos and accordingly my conclusions are based on inference rather than direct evidence. Because relatively little visual data survives testifying to the appearance of Exhibition pianos, I have taken the step of assuming that they would have had at least some features in common with surviving examples. The scope for error here is obvious, but given that most makers brought typical stock-in-trade items, a matter that will be discussed in detail in Chapters 5 and 6, it seems likely that Exhibition pianos would have represented a cross section of the industry, not just expensive, custom-made products. The allocation of awards offers some crude indication of whether particular designs were considered acceptable and will also be considered in due course. The problem with trying to evaluate the aesthetic quality of an object based on whether or not it received an award is that according to the

medal table no instrument was singled out based purely on its appearance; prizes were nearly always given based on more than one criterion.[405]

4.3.2 Craftsmanship, style and ornamentation

Auerbach explains how Exhibition values reflected the dichotomy that characterised contemporary views. On the one hand, traditionalists, such as John Ruskin, emphasised the importance of products as representations of labour; the value of a product was determined by the skill and workmanship that went into it. On the other, industrialists such as James Nasymth stressed that value was chiefly monetary; a product was deemed 'good' if it could be mass produced at a low cost.[406] Notwithstanding such diversity of views, however, Exhibition scholars are in agreement that what constituted industrial value was defined in the broadest possible terms by the organisers; individually-made handcrafted goods and cheap mass-produced products were to be evaluated using the same criteria.[407] Confirmation to such effect was set out in *The First Report of the Commissioners* which stated that:

> Excellence in production is not only to be looked for in high-priced goods, in which much cost of labour and skill has been employed, but they encourage the exhibition of low-priced fabrics, when combining quality with lowness of price, or with novelty of production. They can readily conceive that Juries will be justified in giving the same class Medal to the cheapest Calico print, made for the Brazilian or other South American market, as they would to the finest piece of *Mousseline de Soie* or *Mousseline de Laine*, if each possessed excellence of its own kind.[408]

Pugin represented the conservative side of this debate. His dislike of modern, short-cut methods whereby ornaments could be made quickly and without reference to the creativity of the artist made him predisposed to dislike many of the industrial products before him. In *Contrasts*, he derided the practice of attaching 'pressed putty ornaments' to products, partly because it required no skill and partly because the result was 'heavy,

---

[405] *Reports by the Juries*, pp.333-5.
[406] Auerbach, *The Great Exhibition of 1851,* pp.117-8
[407] *Ibid,* pp.96-7 and p.104
[408] *First Report of the Commissioners for the Exhibition of 1851*, p.18.

disjoined and ugly'.[409] Richard Redgrave was more receptive to the potential benefits of a marriage between art and industry, but he too was uncomfortable with the idea that products would no longer be shaped by the variety inevitably resulting from human endeavour.[410]

It is likely piano making would have found favour with the conservative camp as it was still chiefly a craft at mid-century. George Dodd's *Days at the Factories,* a publication which describes the inside of Broadwood's Horseferry Road site, indicates that although workshops were organised according to a division of labour, the machinery used was still very much dependent upon the skill of the operator. Fretwork, for example, was made using an extremely fine, thin saw.[411] A report into the workings of Cadby's piano factory entitled *England's Workshops* refers to oak and walnut veneers being cut with a powerful knife.[412] If, however, piano makers were utilising the imitative techniques that emerged in the decades before the Exhibition, given their ideals, it is likely the Class XXX jurors would have disliked the end product. Based on findings by Clive D. Edwards, mouldings made from wood substitutes, patterns burnt into wood using an iron mould and raised surfaces using steam were all being used as an alternative to hand-crafted workmanship at this time. Carving machines were also in use as early as the latter part of the eighteenth century; experimentation was especially prevalent during that 1840s.[413] If Exhibition pianos were primarily decorated using hand-labour, they would have been judged favourably; if, however, decorations were made using mechanised processes, thus producing a hybrid item, it is probable they would have failed to impress.

As has already been discussed in Chapter 3, piano makers used most of the main historical styles prevalent at mid-century to decorate their instruments, namely Gothic, Elizabethan, Italian and Louis XIV. Depending upon which household guides were favoured by visitors, most of these styles

---

[409] A. W. N. Pugin, *Contrasts, or, a Parallel between the Noble Edifices of the Fourteenth and Fifteenth Centuries and Similar Buildings of the Present Day showing the Present Decay of Taste* (London: A. W. N. Pugin, 1836), p.35.
[410] Richard Redgrave, 'Supplementary Report on Design', in *Reports by the Juries*, p.710.
[411] Dodd, *Days at the Factories*, p.405.
[412] Strauss, *et al*, *England's Workshops*, p.308.
[413] Clive D. Edwards, *Victorian Furniture: Technology & Design* (Manchester & New York: Manchester University Press, 1993), pp.57-61 and pp.64-72.

would have been popular with the public. Pugin's philosophy, however, that the application of historical style should respect both original context and materials, probably made him critical of a market in which ideas were readily transplanted. In *The True Principles of Pointed or Christian Architecture*, he criticised the appropriation of designs originally intended for execution in stone by those working with wood; the differences in construction made such application unsuitable. He was similarly disparaging of the way in which the Gothic style was used to decorate homes as the expensive appearance was, in his opinion, contrary to the original spirit of the style.[414] Richard Redgrave disliked products fashioned after Louis XIV and XV, something which the public craved and which many Exhibitors chose to emulate. Although this style was extremely fashionable, Redgrave was dismissive on the basis that it was conceived wholly as an expression of extravagance. By his estimate, around three-quarters of all Exhibition products demonstrated these styles, a situation which Redgrave ascribed to an inability on the part of the public to properly appreciate style coupled with a love of an eye-catching exterior.[415] That Erard achieved the coveted Council Medal for submissions that included an upright piano in the Elizabethan style, (Fig 3.7) and Collard received a Prize Medal for a group of five instruments that included a grand piano in the style of Louis XV, (Fig 3.9) suggests that the opinion of the Class XXX jury was of less importance in cases where the technical attributes of instruments were sufficiently advanced.

As regards the question of ornamentation, the manner and degree to which goods were decorated relative to their purpose was very much uppermost in the mind of design experts at mid-century. The amateur was chiefly concerned with how costly a product looked; the more highly decorated it was, the more expensive it was deemed to be.[416] Professional taste, however, was concerned with whether or not an item was fit for purpose and whether or not the level of ornamentation complimented the basic structure. One of the main criticisms Redgrave made in his 'Supplementary Report' directly addressed the issue of ornamentation. In his

[414] A. W. N. Pugin, *The True Principles of Pointed or Christian Architecture* (London: John Weale, 1841), p.34 and p.40.
[415] Redgrave, 'Supplementary Report on Design', p.708.
[416] Edwards, *Victorian Furniture*, p.57.

view, it had to be subordinate to the main structure of a product and it could not be allowed to prejudice utility. Aware that over-decoration was actively sought after in the public mind, Redgrave called for better professional training and increased education for society in general with a view to improving taste.[417] Pugin's views were similar. In *Contrasts*, he spoke about the importance of an object being fit for purpose in an architectural context. In *True Principles*, one of the grounds on which he deemed the use of the Gothic style unsuitable for the home was because it interfered with utility; specifically, it made furniture uncomfortable.[418] It was widely acknowledged in Exhibition commentaries, quoting professional critics, that many products were decorated to the point that their basic function was compromised.

So far as piano ornamentation was concerned, Redgrave was critical of casing decorated to the point that the instrument was actually difficult to play, singling out a piano exhibited by the Belgian maker Deffaux to illustrate the point. Although Redgrave does not disclose the name of the maker, a reference to a piano with bulrushes described in Ralph Nicolson Wornum's prize essay 'The Exhibition as a lesson in taste', makes identification possible. Here the piano is mentioned as part of Wornum's appraisal of the Belgian furniture and is cited as a contrast to furniture items where the Louis XV style has been well applied.[419] Although Wornum does not say so directly, the inference is that Deffaux's artistry is poor. In Redgrave's 'Supplementary Report', the same instrument is described as 'surrounded by bristling bulrushes which must always be catching in the dresses of those who approach it, and with hardly a right line in any part of it'.[420] Another such example, where utility is potentially prejudiced by over-decoration, is evidenced by an extant piano believed to be the Brinsmead cottage upright shown at the Great Exhibition (Fig 4.6).[421] Here, the maker has fashioned

---

[417] Redgrave, 'Supplementary Report on Design', pp.708-11.
[418] Pugin, *Contrasts*, p.1; Pugin, *The True Principles of Pointed or Christian Architecture*, p.40.
[419] Ralph Nicholson Wornum, 'The Exhibition as a Lesson in Taste', in *The Art Journal Illustrated Catalogue*, p.xii ***.
[420] Redgrave, 'Supplementary Report on Design', p.720.
[421] This instrument which is owned by the Museum of London is believed by the Museum to be the exact same piano as was shown at the Great Exhibition.

the pedals into the shape of treble clefs, but instead of placing the wrought iron formations vertically, they are placed horizontally (Fig 4.7).

Fig 4.6: Brinsmead upright piano, *The Official Descriptive and Illustrated Catalogue in Three Volumes*, *Vol I*, p.465.

I have tried to play the instrument and, in my opinion, it is very difficult for the pianist to keep his or her feet in the proper position; although the design is novel and eye-catching, it is impractical for performance.

Fig 4.7: Pedals formed in the shape of a treble clef placed horizontally, Brinsmead upright piano, Museum of London (photograph taken by B. E. Smith). Reproduced with the permission of The Museum of London.

An image of Palmer's upright piano in *The Art Journal* suggests a similar approach whereby the maker has used a leaf shape, a feature in keeping with the Italian style, to form the pedals (Fig 4.8). In the absence of the actual instrument, it is impossible to say for certain, but it seems likely that a performer would have experienced similar difficulties.

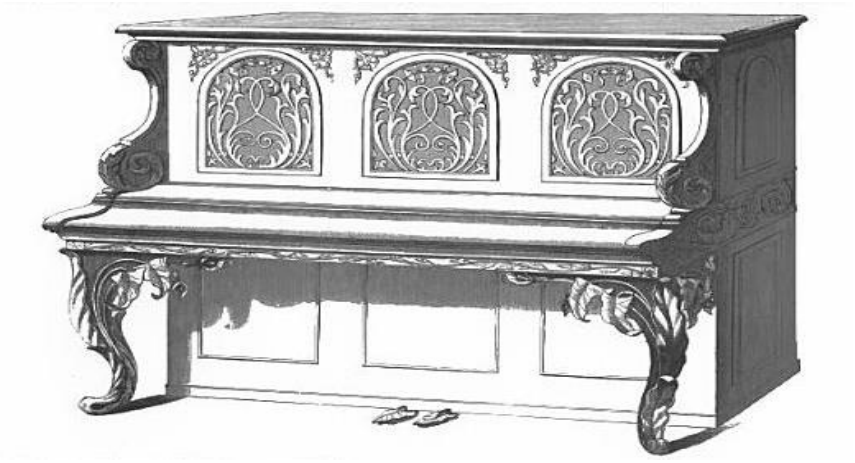


Fig 4.8: Upright piano exhibited by H. Palmer of Bath, *The Art Journal, Volume IV*, (London, 1852), p.154.

Redgrave was also critical of makers who copiously decorated their piano casing. In his view the primary function of a piano was to produce music and a plain outward appearance was desirable so that 'one organ may have rest while the other is occupied'.[422] Makers who chose not to use a historical style approached decoration in two main ways. They either addressed the piano's sonic character, decorating the casing with images of musical instruments, or they used a design intended to promote their own nationality. Redgrave was openly disapproving of those who used what he described as 'a whole concert of musical instruments'; in his opinion quality wood decorated with 'carved or gilt mouldings' was perfectly adequate. By inference therefore exhibits such as Oetzmann & Plumb's cottage upright would have been deemed distasteful (Fig 4.9). An engraving of this piano

[422] Redgrave, 'Supplementary Report on Design', p.723.

printed in the *ODIC* details a viola da gamba, a vihuela and a natural trumpet on the left hand panel. These are complimented on the right by a viola da gamba, a lute, a natural trumpet, a tambourine and some sort of necked string instrument.[423]

Fig 4.9: Oetzmann & Plumb upright piano, *The Official Descriptive and Illustrated Catalogue in Three Volumes, Vol I,* p.470.

Quite what Redgrave would have made of designs promoting a nationalistic narrative is hard to determine as his report is silent on the matter. Both Dimoline and the Canadian manufacturer J. W. Herbert used carvings denoting national emblems. The former placed a carved rose, thistle and shamrock on the central panel of their cottage upright.[424] The latter used carvings which he referred to as 'emblematic of Canada' though precise details are unknown. If the Exhibition entry by Ennever & Steedman and a surviving upright in the collections of Bristol Culture are one-and-the-same item, this object presents an interesting example of decoration

[423] Identifications of these instruments have been provided by Andy Lamb, Curator of The Bate Collection, Oxford. Some of the images are so imprecise, however, as to make definitive identification impossible; identifications were made on the basis of photographs, not physical inspection.
[424] Dimoline Exhibition Prospectus, (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09.

designed to denote British supremacy. The *ODIC* description reads 'elegant walnut marquetrie semi-cottage pianoforte, new design, with double action with pearl and tortoiseshell keys' which closely matches the aforementioned piano, photographs of which are discussed below. Fig 4.10 shows an image of Britannia with a lion and a British flag surrounded by oak leaves and acorns on the piano key cover. Fig 4.11 depicts an ensemble of musical instruments in close proximity to Britannia include a side drum, a natural trumpet, a hand horn and some kind of flag denoting music-making in a military context.[425] The right and left panels, shown in Fig 4.12, most likely depict St George and the Dragon, and the lake shown in the central panel at Fig 4.13 may also relate to this legendary tale. The central panel also depicts fête galante or champêtre imagery; the lady on the swing is perhaps adapted from the famous Fragonard painting, although a dog has been put in the foreground, making the scene mildly more respectable. The man trying to catch a butterfly in the background is presumably also an amorous allusion. Collectively the images combine a nationalist theme with more light-hearted iconography.[426] The side panels and lower brackets feature birds of exotic origin, as shown in Figs 4.14 and 4.15. Their positioning around the periphery of a larger group of obviously British images perhaps hints at the marginal identity of the colonies within the Empire. On the bracket connecting the main body of the piano to the leg, a kingfisher is apparent; on both side panels, a parakeet perches on top of what might be a eucalyptus plant.[427] Both species were indigenous to India and Australia at mid-century suggesting a narrative denoting a colonial presence as a backdrop to British domination. Whether Redgrave would have admired the sentiment at work or whether the degree of over-decoration would have offended him is

[425] These identifications have also been provided by Andy Lamb, Curator of The Bate Collection, Oxford.
[426] Identifications of these images have been provided by Max Donnelly, Curator of Furniture, Clothing and Textiles at the Victoria & Albert Museum, London. The identifications were made on the basis of photographs, not physical inspection.
[427] Identifications of birds and countries of origin have been provided by Dr Joanne Cooper of The Natural History Museum, London; again data is provided on the understanding that because images are highly stylised it is difficult to be precise. As well as acknowledging a possible colonial connection, Dr Cooper has also suggested the possibility that these birds were an appeal to British taste for exotica. It may have been an appeal to those wealthy enough to subscribe to John Gould's 'The Birds of Australia' published in 1848. The identifications were made on the basis of photographs, not physical inspection.

unknown. That none of the Exhibitors who decorated their instruments in this way received an award, however, may be indicative that such narrative was deemed inappropriate.

Figs 4.10-4.15: Images of Ennever & Steedman upright piano, Bristol City Museum and Art Gallery, displayed at Blaise Castle Museum, Bristol (photographs taken by B. E. Smith). Reproduced by permission of Bristol Culture.

Fig 4.10: Keyboard cover showing an image of Britannia with a lion and British flag surrounded by oak leaves and acorns

Fig 4.11: Military musical instruments including a side drum, a natural trumpet, a hand horn and some kind of military flag

Fig 4.12: Left and right hand panels showing images of St George and the Dragon located immediately above the keyboard.

Fig 4.13: Central panel depicting scenes from the story of St George and the Dragon, located immediately above the keyboard.

Fig 4.14: Image of kingfisher, located on the lower bracket connecting main body of piano with right hand leg

Fig 4.15: Image of parakeet (possibly with eucalyptus leaves and nuts), located on the left hand side panel

4.3.3 Ornamentation and Fitness for Purpose: evidence from contemporary pianos

Notwithstanding that, in general, British exhibition products were decorated excessively there is some material evidence that makers were concerned with fitness for purpose. Some surviving pianos demonstrate features which do appear to have been designed with the user in mind. Looking first at the shape of the mid-century piano pedal, it seems plausible that the straight shape applied to instruments intended for domestic use was fashioned with female footwear in mind. The main authority on this subject is John Lord Peck's *Dress and Care of the Feet,* a publication written to encourage women to abandon footwear made using straight lasts. His comments are difficult to date as he refers to fashions in decades prior to 1872 as 'formerly', but I am assuming that his descriptions relate to fashions around mid-century or earlier. According to Peck, straight lasts were always used to shape ladies' slippers, footwear made exclusively for indoor use, making them the likely female attire used when undertaking piano practice. Male footwear, on the other hand, was made exclusively using left and right-shaped lasts.[428] Straight pedals are nearly always found on surviving cabinet, cottage and piccolo instruments, the only exception being the Euphonicon piano which was designed with left and right pedals (Fig 4.16).[429] Grand pianos of this period almost always have left and right pedals, reflecting the contemporary trend in male footwear (Fig 4.17).[430]

---

[428] John Lord Peck, *Dress and Care of the Feet* (London: William Tegg, 1872), pp.31-2.
[429] Surviving examples of Beale's Euphonicon piano are located at Strangers Hall, Norfolk, the Victoria & Albert Museum, Buckinghamshire County Museum Trust, The Russell Collection and Finchcocks Musical Museum. If further research were to reveal that it was used for both concert and domestic purposes, this would explain the anomaly.
[430] I found only two grand pianos from this period with straight pedals namely a Broadwood grand dated 1850 owned by the National Trust at Powys Castle and a Stodart grand dated 1828 (with compensation frame) owned by The Royal Academy of Music. This anomaly is probably due to the fact that some grand pianos were designed for the domestic market; my quantitative study reveals that 22% of London homes included in the sample (comprised of 89 households) possessed pianos of this type in 1851.

Fig 4.16: Ennever & Steedman upright piano; example of straight pedals (photograph taken by B. E. Smith)

Fig 4.17: Broadwood grand piano, 1845, Finchcocks Musical Museum, example of right and left pedals (photograph taken by B. E. Smith). Reproduced by permission of Finchcocks Musical Museum.

Material evidence further indicates that some makers made domestic pianos specifically to accommodate the ever increasing dimensions of female skirts. Dress historians Cunnington & Cunnington document the transition from horsehair petticoats designed to expand skirt size during the 1840s to the even larger cage and hoop crinolines of the 1850s and 60s.[431] An example of a crinoline dating from the end of this period is shown in Fig 4.18 below.

[431] C. Willett Cunnington & Phillis Cunnington, *Handbook of English Costume in the Nineteenth Century* (London: Faber & Faber, 1959), pp.423-50.

Fig 4.18: 1860s cage crinoline, Fashion Museum Studies Facilities. Reproduced by permission of The Fashion Museum, Bath and North East Somerset Council, United Kingdom.

This trend is further reflected in the dimensions of the material examples shown in Fig 4.19 below. If the sample is representative of dress size in general it is fair to conclude that skirts almost doubled in size over the course of thirty years. The relationship between piano making and fashion is briefly mentioned by Arthur Loesser, who asks how makers of the five-octave Viennese piano sought to accommodate the hoop skirts that were in fashion in the late eighteenth century.[432] Whereas Loesser, in his own words, 'remain(ed) mystified', examples shown in Figs 4.20-4.22 below confirm that mid-nineteenth-century makers did modify their instruments to take account of female attire.

[432] Loesser, *Men, Women and Pianos*, p.226.

Fig 4.19: Table showing dimensions of female dresses, skirts and crinolines, 1830-1870

Garment type	Date	Circumference * (cm)	Diameter (cm) **	Radius (cm)
Dress (I.09.1400)	1830	245	78	39
Dress (2005.49)	1836-40	400	128	64
Dress (I.09.1296)	1840-1849	300	96	48
Dress (I.09.1016)	1840-1845	320	102	51
Skirt (I.09.1299A)	1850	350	112	56
Dress (I.09.1043)	1851	400	128	64
Dress (I.09.1045)	1851-1855	400	128	64
Dress (I.09.1061)	1850-1859	300	96	48
Dress (I.09.1065)	1860	400	128	64
Crinoline cage (I.27.3000)	1860-1869	310	99	49.5

Source: Collections at Bath Fashion Museum.

*Dress circumferences are rounded up to the nearest 10 cm; owning to the style and cut of some dresses, accurate and consistent data was difficult to obtain, hence measurements should be treated as approximate.

* *Diameter calculations are rounded up to the nearest whole number

That furniture makers attempted to accommodate this trend towards vast skirts is endorsed by historians Judith Flanders and Michael Patterson. Although material examples are not cited, Flanders states that easy chairs

were made gender specific; those intended for female use were made with lower arms so that skirts could be accommodated.[433] Likewise Paterson highlights the fact that by the 1850s female skirts were so large that ladies could no longer sit comfortably in older style furniture and accordingly new designs were conceived with current fashions in mind.[434]

Fig 4.20: Broadwood Cabinet Piano, 1832, Russell Collection, University of Edinburgh. Reproduced by permission of The University of Edinburgh. Photograph obtained from http://www.mimo-international.com/MIMO (accessed 2 March 2016)

[433] Judith Flanders, *The Victorian House: Domestic Life from Childbirth to Deathbed* (London: Harper Perennial, 2003), p.134.
[434] Michael Paterson, *Life in Victorian Britain: A Social History of Queen Victoria's Reign* (London: Constable & Robinson Ltd, 2008), p.216.

Fig 4.21: Eavestaff Cabinet Piano, 1845, The Museum of Instrument Instruments, Brussels. Reproduced by permission of The Museum of Musical Instruments, Brussels.
Photograph obtained from http://www.mimo-international.com/MIMO (accessed 2 March 2016)

Fig 4.22: Dreaper & Son Cabinet Piano, 1860, National Trust Collections, Speke Hall, Liverpool. Reproduced by permission of The National Trust/Robert Thrift.
Photograph obtained from http://www.nationaltrustcollections.org.uk/results?SearchTerms=Dreaper+piano (accessed 2 March 2016)

Based on measurements taken from the surviving examples illustrated above (Figs 4.20-4.22), I believe that piano makers did modify the design of cottage and cabinet pianos to make them more easily accessible to female users. The dimensions shown below illustrate that the area immediately in front of the pedals increased in size during this period both as regards width and depth. By comparing the data in Fig 4.23 with the diameter and radius measurements previously listed in Fig 4.19, it is possible to see a direct correlation between the expanding diameters and skirts and dimensions of the seating area.

Fig 4.23: Table showing dimensions of cabinet pianos with increased seating area, 1832-1860.

Piano details	Length (cm)	Length of seating area (cm)	Depth of seating area (cm)
Broadwood Cabinet Piano, 1832*	115	95.5	34
Eavestaff Cabinet Piano, 1845**	121.5	97.3	37
Dreaper & Son Cabinet Piano, 1860***	132	118	77

*Measurements of the base were provided by Jonathan Santa Maria Bouquet, MIMO Conservator, University of Edinburgh.

** Measurements of the base were provided by Pierre Geveart, Conservator, The Museum of Musical Instruments, Brussels.

*** Measurements of the base were provided by Hayley King, Conservation Assistant, The National Trust.

According to the ideals of Redgrave and Pugin, within the ‘field’ of the Exhibition, exhibits representing stock-in-trade items would have been valued more highly from a design perspective than decorative offerings made specifically for the Exhibition. Exhibitors who designed their instruments to reflect historical style, using new decorative techniques, who addressed the occasion for which the artefact was made, would probably have fared less

well than those who adopted plainer casing that was sympathetic to the needs of the user. This created a dilemma for exhibitors. Should they appeal to professional taste which would result in official endorsement or cater for amateur taste which valued over-decoration, denoting expense?

4.4 The Class XA Jury: evaluating sound

With the exception of the physician Dr J. Robert Black and the scientist Dr Schafhautl, the Class XA jury and associate jury consisted entirely of musicians.[435] The British musical contingent consisted of Sir Henry Bishop, William Sterndale Bennett, Cipriani Potter, Sir George Smart and Henry Wylde. Their foreign musical counterparts included Hector Berlioz, Sigismund Thalberg and Chevalier Neukomm. The associate jury consisting of Rev W. Cazalet, James Stewart and William Telford all had musical credentials.[436]

Fig 4.24: Sir Henry R. Bishop by Samuel William Reynolds, after Thomas Foster, mezzotint, 1822 (NPG D31795). Reproduced by permission of The National Portrait Gallery

[435] According to *Reports by the Juries*, p.324, the Musical Jury included two non-musical members, namely the American physician Dr Black and the German scientist Dr Schafhautl who was a Professor of Geology, Mining and Metallurgy. According to Walter Stewart Broadwood's letter to J. W. Davidson dated 10 October 1851 which features in the second section of this chapter, Schafhautl was well known for 'his acoustical researches'. If this is correct, all save Schafhautl and Black had some musical knowledge, either of a practical or technical nature.

[436] *Reports by the Juries*, p.324.

With the exception of the French composer Berlioz, all jurors were able to play the piano to some degree, although standards varied greatly.[437] Whereas Smart and Wylde were primarily organists, Sterndale Bennett was a concert pianist as well as a composer, and Thalberg was acknowledged as being one of the great 'lions' of the keyboard by mid-century. In Chapter 3, I considered how the average visitor's knowledge of matters such as tone, tuning, maintenance defects and piano repertoire might have shaped their understanding of Exhibition pianos. Here, I am interested in establishing what knowledge the judges might have had to help them assess tone and touch and to what extent this overlapped with 'habitus' - specifically how preferences rooted in personal associations and national loyalties shaped value. The extent to which the 'field' of the Exhibition reflected the wider commercial sphere is also relevant, as the rivalries that became apparent during the medal controversy were broadly reflective of the relationships between British and French piano makers at mid-century. Fortunately, primary sources are plentiful, which makes an investigation of individual knowledge and 'habitus' possible. The Exhibition diary of William Sterndale Bennett is especially valuable, as are surviving letters from musicians to and from Broadwood. First-hand impressions of touch recorded by other musicians around the time of the Exhibition compared with empirical findings in organological studies are also helpful in defining the overlap between knowledge and personal preference.

Because they were permitted entry to the building in advance of public opening hours, the judges did not have to contend with the same visual and aural distractions as characterised visitor experience. Most importantly, they were at liberty to play any instrument in whatever manner they saw fit, for as long as they wished. Diary evidence suggests that Berlioz was primarily responsible for evaluating wind and brass instruments, a task that he did not

[437] Evidence in Berlioz's autobiography suggests that his relationship with the piano was, at times, antagonistic. 'It is unnecessary to mention the great orchestral effects which are lost on the piano ... By destroying the instrumental effects the piano at once reduces all composers to the same level, and places the clever, profound ingenious instrumentalist on the same platform which an ignorant dunce, who know nothing of that branch of his art. The piano is a guillotine, and severs the head of noble or of churl with the same impartial indifference'. Berlioz, *Autobiography of Louis Hector Berlioz from 1803 to 1865 comprising his travels in Italy, Germany, Russia and England, Volume 1,* trans Rachel (Scott Russell) Holmes and Eleanor Holmes (London: Macmillan & Co, 1884), pp.116-7.

relish. In a letter to his sister he described the tuning and tonal qualities of instruments he was tasked to assess in derogatory terms, complaining 'my head is bursting from hearing hundreds of these foul machines, each more out of tune than the last, with three or four exceptions'.[438] He was also dismissive of the repertoire chosen by exhibitors to demonstrate their instruments. Having recognised the merits of the Ducroquet organ, Berlioz then complained to D'Ortigue about how it was demonstrated:

> I have already made a report in M Ducroquet's favour; so he has reason to be pleased with me. I can't say as much for the young man who plays on his organ, curse him! He regales us every day with two or three dozen polkas, not to speak of cavatinas out of opera-bouffes; no doubt he thinks the English are imbeciles![439]

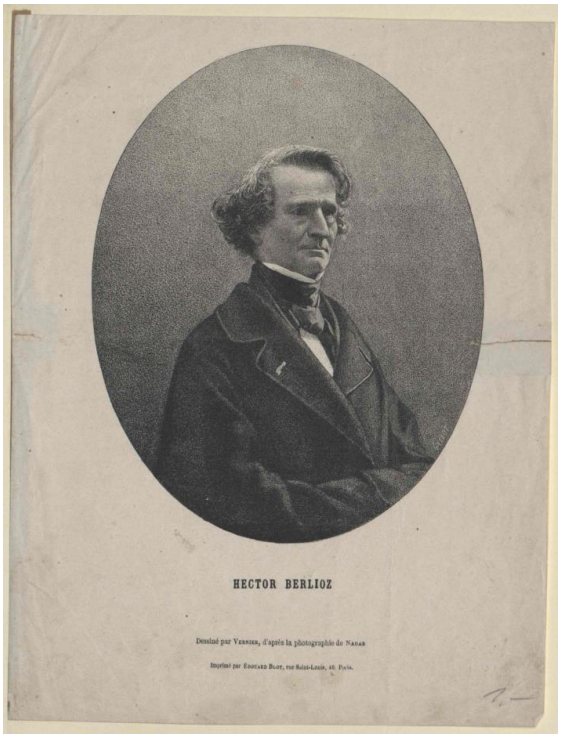


Fig 4.25: Hector Berlioz, undated. http://www.europeana.eu/portal/en/record/92062/BibliographicResource_1000126030437.html?q=Hector+Berlioz%2C+%C3%96sterreichische+Nationalbibliothek+-+Austrian+National+Library (accessed 20 May 2016)

That Sterndale Bennett was primarily responsible for testing pianos is evidenced by his Exhibition diary, although the fact that not all pianos are mentioned suggests that possibly some of the other jury members were also

[438] Letter from Berlioz to Adele Suat, 20 June 1851, in Hugh MacDonald, ed. *Selected Letters of Berlioz*, trans. Roger Nicols (London: Faber & Faber, 1995), p.278.
[439] Letter from Berlioz to D'Ortigue, 21 June 1851, in A. W. Ganz, *Berlioz in London* (London: Quality Press Ltd, 1950), p.98.

involved in making assessments. Thalberg's contribution to the *Report of the Musical Jury*, which makes detailed mention of one of Erard's grand pianos, indicates that he must at least have played that particular instrument.[440]

4.5: The role of musical knowledge: investigating tone

That expert knowledge was deemed valuable by jurors and exhibitors alike is beyond question. When told of the Council's decision to strip Broadwood of their Council Medal, it was on the grounds of knowledge that Walter Stewart Broadwood lodged an appeal. He could not accept that a panel of non-musicians, in the shape of The Council of Chairmen, were at liberty to overturn a decision made by musical experts. Writing in protest to his friend J. W. Davison, musical editor of *The Times*, he complained 'it appears that the authority of a Jury is inversely to its special knowledge!!!!'[441] In their letter appealing against the decision to revoke Broadwood's medal, the musical jury also based their argument on knowledge; theirs was surely superior to that of the Chairmen, so their decision must be definitive:

> The Jurors who transmit this Memorial beg most respectfully to be allowed to point out to His Royal Highness and the Royal Commissioners that in this case a decision which was arrived at after due deliberation by the Jury Class 10 specially qualified and selected in consequence of technical knowledge of the objects to be submitted to its judgment and which received subsequent confirmation from the Group of Associated Juries has been set aside by a Body of Gentlemen who distinguished as they are for their general attainments may have no special and technical knowledge of Pianofortes or Pianoforte making nor have they in their capacity of Chairmen (except the Chairman of Class 10a whose opinion and statements ought to have had due weight) even inspected or been called upon to become acquainted with the instruments upon which the Award which they rejected was made.[442]

---

[440] *Reports by the Juries*, pp.327-8.
[441] BL Add.70920, f.146-7, Letter from Walter Stewart Broadwood to J. W. Davidson, 10 October 1851.
[442] Letter from the Musical Jury to the Royal Commissioners, undated, Royal Commission Archives, RC/A/1851/400.

It is possible that prior experience of European pianos may have resulted in negative preconceptions and British judges might have entered the arena of the Exhibition expecting to be disappointed. When William Sterndale Bennett visited Leipzig in 1837 he struggled unsuccessfully with what he described as a 'bad clavier, not strong enough'.[443] His experience on this piano, which David Mawson believes was a Viennese instrument, was most likely the reason why two years later, in readiness for his second appearance, Broadwood sent one of their pianos with which he was more familiar.[444] Sir George Smart recorded first-hand experiences of European pianos whilst on tour in 1825, all of which he deemed unsatisfactory.

Fig 4.26: George Smart by William Bradley, oil on canvas, 1829 (NPG 1326); The National Portrait Gallery.

To cite but two examples, during a performance of the opera *Jacon in Wein* in Vienna, he reported that the piano used by the conductor was 'queer-toned' and he was similarly disappointed by the sound of the square piano used to accompany a female vocalist during a performance of *Hausfrieden* by Iffland.[445] Assessment of hand-strengthening and positioning devices

[443] J. R. Sterndale Bennett, *The Life of William Sterndale Bennett* (Cambridge: Cambridge University Press, 1907), pp.56-7.
[444] David Graeme Mawson, *The Piano Music of Sterndale Bennett in the Context of Nineteenth-Century Pianism: a Practice Based Interpretive Study with Critical Commentary* (University of Leeds: Unpublished PhD Thesis, June 2007), p.48.
[445] H. Bertram Cox & C.L.E Cox, *Leaves from the Journal of Sir George Smart* (London: Longmans, Green & Co, 1907), p.79, p.98 and p.214.

shown at the Great Exhibition may have been adversely effected by prior experience of 'Logier's chiroplast'.[446] Both Sir Henry Bishop and Cipriani Potter witnessed the application of this device intended to guide the fingers of the pianist before The Philharmonic Society in 1817; negative impressions formed on this occasion may have influenced subsequent opinions of similar inventions.[447] Sir Henry Bishop seems to have been the only juror to have recorded favourable impressions of European pianos. During his visit to France in 1822 he was pleasantly surprised by the quality of a cabinet piano hired from Pleyel finding the instrument pleasing in both tone and touch.

In terms of how piano tone was assessed there is little evidence to suggest that professional musicians were any more familiar with the interior workings of their pianos than the average householder. Sterndale Bennett's diary, which is the richest source of evidence, suggests that he was able to do no more than exercise 'monitory listening', the results of which he denoted using a kind of hierarchical language.[448] Unlike the sonic language used by journalists which was seemingly arbitrary, Bennett's index was more akin to a binary system wherein the worst tones were denoted as either 'inferior' or 'bad' and better timbre as 'nice quality', 'good' or 'excellent'. Some terms such as 'thick', used with reference to Broadwood's walnut grand piano, and 'queer' used to describe the sound of Harwar's transposing piano, are harder to assess. It is apparent that Bennett systematically tested different parts of the register, as some pianos are praised for having a good upper register but a bad lower one and vice versa. There is little to suggest that he was able to comment on how specific inventions impacted the resulting sound, with the possible exception of Cadby's grand piano where his notes indicate a link between what he deems an 'inferior tone' and a suspended adjustable soundboard.

---

[446] Richard Andrews' hand strengthening and positioning apparatus and Robert James Edwards' silent keyboard are the two main examples of this product type and are discussed further in Chapter 5.
[447] Northcott, *The Life of Sir Henry R. Bishop*, p.15.
[448] Sterndale Bennett, *Exhibition Diary*, Royal Commission Archives, London, RC/1/25; all references in this paragraph are drawn from this source which is entirely unpaginated.

Fig 4.27: William Sterndale Bennett by Daniel John Pound, after a photograph by John Jabez Edwin Mayall, 1861 (NPG D1054); The National Portrait Gallery

It is apparent, however, that tone was not an overriding consideration. In the case of Jenkins' collapsible travelling piano, despite a poor judicial verdict pronouncing its tone to be 'inferior', novelty of invention won the day and the piano was awarded a prize medal.[449] Broadwood's walnut grand piano, deemed by Sterndale Bennett to have a 'thick' tone, was awarded a Council Medal, which was then reduced to a Prize Medal. Similarly, notwithstanding that the tone of the upper register of Collard's grand piano was judged 'inferior', the company received an identical award. As both Broadwood and Collard entered several pianos, in both instances, it is probable that poorer sound quality in one entry was disregarded because multiple instruments were submitted. Conversely, it was possible for a maker to produce an instrument yielding a good tone yet miss out on a medal award. Both the British maker Towns & Packer and the French manufacturer Kleinjasper presented pianos judged by Bennett to have 'good tone', yet both only achieved an honourable mention.

[449] *Reports by the Juries:* all recipients of the Council Medal, the Prize Medal and Honourable Mention in Class XA, both British and Foreign, are listed on pp.333-5.

4.6: Considering knowledge and preference: investigating touch

The assessment of touch was essential if an instrument was to be considered under the judging criteria 'improvement of mechanical action' and 'increased facility of action'.[450] This aspect of piano construction was particularly important, as makers had devoted much time and energy to improving how keys responded to the player's fingers during the decades prior to the Exhibition. Although Sterndale Bennett's diary makes little mention of touch, it is possible to deduce that as with tone it was not necessarily the deciding factor in whether or not an award was given. One of Erard's oblique pianos was deemed to have an 'imperfect touch', yet, together with numerous other entries, it received the highest commendation. Conversely, despite the fact that the touch on Cadby's zebrawood semi-cabinet was described as 'pretty good', the company failed to achieve recognition.[451] It is unfortunate that so little is known about how the pianos were tested by the judging panel, given that different makes are known to respond better to particular types of playing. In his comparative study of Broadwood, Pleyel and Erard actions, Christopher Nobbs explains that executing a softer dynamic, for example, is more difficult on Broadwood pianos than on those by Pleyel. The complexity of the Erard action, though highly responsive, can make the control of dynamics and tone hard to manage.[452] This being the case, if pianos were tested using repertoire, rather than scales and exercises, choice of composition may have been a key factor in the impression formed.

The question of whether musicians preferred a particular make of piano because they could discern differences in the touch mechanism or because they had a pre-existing preference is an important one. As will become evident it is difficult to establish whether opinions, favourable or otherwise, were based on knowledge or personal inclination.

---

[450] *First Report of the Commissioners for the Exhibition of 1851*, p.107.
[451] Sterndale Bennett, *Exhibition Diary*, Royal Commission Archives, RC/1/25; n.p.
[452] Christopher Nobbs, 'A Comparison of the Piano Actions of Broadwood, Pleyel and Erard' in Alec Cobbe, ed. *Chopin's Swansong: The Paris and London Pianos of his Last Performances now in the Cobbe Collection* (The Chopin Society & The Cobbe Collection Trust, 2010), pp.38-44.

4.6.1: The subjective evidence: contemporary musicians' assessment of touch-weight

Evidence gleaned from teaching primers, diaries and Exhibition reports suggest that preferences were based upon whether a particular piano was sympathetic to individual playing style. Writing earlier in the century, Johann Nepomuk Hummel expressed his preference for German pianos over English ones based on lightness of touch facilitating ease of execution. No specific make is mentioned, but clearly the Viennese mechanism is favoured.[453] Thalberg was known to favour Erard pianos; he was a staunch supporter of their repetition action, a mechanism essential for bravura playing.[454] His preferences are made especially obvious in his section of the Class XA report which focuses exclusively on the merits of one of Erard's grand pianos to the exclusion of all else.[455] In his early career Moscheles explained his liking for Clementi pianos, in contrast with his colleague J. B. Cramer who preferred Broadwood. The reason for such preferences is rooted in performing style, each instrument suiting each pianist respectively:

> 'The strong metal plates' observes Moscheles, 'used by Broadwood in building his instruments, give a heaviness to the touch, but a fullness and vocal resonance to the tone, which are well adapted to Cramer's legato, and those fingers softly gliding from key to key; I, however, use Clementi's more supple mechanism for my repeating notes, skips and full chords'.[456]

According to Chopin, a further basis for preference lay in the perceived ability of a piano to respond to mood. When explaining his penchant for Pleyel pianos he wrote:

> The communication of my inward thoughts and feelings is more direct and personal. I feel my fingers in more immediate communication with the hammers which translate faithfully the sensations I desire, the effect I wish to obtain.[457]

---

[453] J. N. Hummel, *A Complete Theoretical and Practical Course of Instruction in the Art of Playing the Pianoforte*, in Sumner, *The Pianoforte*, p.49.
[454] Wainright, *Broadwood by Appointment*, p.128.
[455] *Reports by the Juries,* pp.327-8.
[456] Charlotte Moscheles, *Life of Moscheles, Volume I* (London: Hurst & Blackett, 1873), p.65.
[457] Unspecified source in Christopher Nobbs, 'A Comparison of the Piano Actions of Broadwood, Pleyel and Erard', p.39.

Looking specifically at the views of the judging panel, an apparent dichotomy emerges. Berlioz and Thalberg, who favoured the new bravura style of playing, sat on one side, whereas Sterndale Bennett, together with his former teacher Cipriani Potter, who favoured a more conservative style of playing applicable to the music of Bach and Mozart, sat on the other. Although both the following sources were written several years after the Exhibition, I am assuming they are dated closely enough to reflect judicial views. Berlioz's remarks on the qualities of the piano in his *Treatise upon Modern Instrumentation and Orchestration* imply that it was at its best when used to perform compositions by virtuosos such as Liszt. In his opinion the only way its full capacity could be realised was if other such composers and performers continued to push boundaries.[458] Sterndale Bennett, who actively disliked bravura playing, questioned the merit of the ever-more powerful pianos that were emerging at mid-century. In his ninth lecture entitled 'Music of the Present Time', made before the Sheffield Literary and Philosophical Society in 1859, he suggested that such instruments had done composition a disservice, as they encouraged a style designed to promote mechanical skill rather than musicianship. In his mind, the best music had been composed many decades earlier on pianos of far more limited capabilities. In his tenth lecture entitled 'Fashions in Music', he questioned whether audiences derived any more enjoyment from the newer mid-century pianos than they did from the earlier ones used by Clementi, Cramer and Dussek when sensitivity was the key to maximising tone.[459]

4.6.2: The empirical evidence: organological measurement of touch-weight

The question of how the musical jury might have evaluated touch is difficult to investigate because data obtained through empirical studies appears to at least partly contradict the subjective impressions of contemporary musicians. Assuming organological data is correct, two

[458] Hector Berlioz, *Treatise Upon Modern Instrumentation and Orchestration* (London: J. Alfred Novello, 1856), p.72.
[459] Nicholas Temperley, ed. *William Sterndale Bennett 1816-1875: Lectures on Musical Life* (Woodbridge: The Boydell Press, 2006), pp.131-2 and p.144.

possibilities present themselves. One explanation is that makers were inconsistent in their measurement of parts so that one piano by the same maker differed from the next. The other is that musicians and composers thought they could identify a physical discrepancy between different makes when in fact they were experiencing a purely cognitive difference born of personal preference.

Some diary reports agree with what piano historians judge to be the basic differences between English, French and Viennese pianos made in the first part of the nineteenth century. Immediately prior to the delivery of Broadwood's famous gift piano to Beethoven in 1817, the Austrian piano maker Streicher, whose premises in Vienna were used to store the instrument, remarked that although they found the tone beautiful, neither he nor Moscheles could successfully negotiate the action. Cipriani Potter, who was responsible for arranging the delivery, was able to play the piano without difficulty on account of his familiarity with the English action.[460] A similar situation occurred in 1873 when Hans von Bülow attempted to play a mid-nineteenth century Broadwood piano belonging to Sterndale Bennett. According to J. R. Sterndale Bennett, the reasons for von Bülow's reaction, which was to immediately desist, were due to the heaviness and depth of the touch and the narrowness of the accidentals, all of which were unfamiliar to him.[461]

There are instances, however, where contemporary opinion appears to contradict empirical evidence. In 1822, Moscheles explained that the reason he preferred Clementi pianos was that their action was much lighter than those of Broadwood.[462] A glance at Fig 4.28 below, however, which details relevant findings from Kenneth Mobbs' extensive study, illustrates the problem with that statement. [463] Had he been comparing a Clementi made in 1821 with a Broadwood made in 1823 this statement would make sense; had

---

[460] Alexander Wheelock Thayer, *The Life of Beethoven, Volume II*, p.595, in Philip Henry Peter, *The Life and Works of Cipriani Potter (1792-1871)* (North Western University: unpublished partial submission for D.Phil), p.60.
[461] Sterndale Bennett, *The Life of William Sterndale Bennett*, p.442.
[462] Moscheles, *Life of Moscheles, Volume 1*, p.65.
[463] Kenneth Mobbs, 'A Performer's Comparative Study of Touch-weight, Key-dip, Keyboard Design and Repetition in Early Grand Pianos, 1770-1850', *The Galpin Society Journal*, *54* (2001), 16-44

the Clementi piano in question been made a year later, however, Moscheles must surely have been mistaken. Although Moscheles did not favour Erard pianos during his early career, in 1830 he described a turning point when he suddenly found the touch to be greatly improved.[464] Based on physical evidence, however, this revelation is puzzling given that Clementi, whom he always favoured, made actions that were considerably lighter during this period.

Fig 4.28: Table showing comparative touch-weights in pianos dating 1821-1840.

Pitch at which measurement of touch-weight taken	Touch-weight (g)	Make of Piano	Year
C1 (dampers on) C1 (dampers off) F3 (dampers on) FF (dampers on)	53 52 39 61	Clementi	1821
C1 (dampers on) C1 (dampers off) F3 (dampers on) FF (dampers on)	62 59 48 107	Clementi	1822
C1 (dampers on) C1 (dampers off) F3 (dampers on) FF (dampers on)	57 (no data) 39 64	Broadwood	1823
C1 (dampers on) C1 (dampers off) F3 (dampers on) FF (dampers on)	68 (no data) 50 75	Erard (French factory)	1840

Source: extracts from Mobbs, 'A Performer's Comparative Study of Touch-weight, Key-dip, Keyboard Design and Repetition in Early Grand Pianos, 1770-1850'; this

[464] Moscheles, *Life of Moscheles, Volume 1*, p.245; in previous diary entries in 1821, 1825 and 1828 Moscheles expressed reservations about the heaviness of touch he experienced on Erard pianos, p.59, p.106 and p.113.

reference applies to Figs 4.29 and 4.30. In each instance I have presented evidence pertaining to pianos dating most closely to 1851.

*It seems likely this measurement is a misprint as it is disproportionately higher than all other measurements

This evidence strongly suggests that when musicians and composers claimed to prefer a particular make of piano, what they meant was that they 'liked' one specific instrument. Their statement was not intended as a generalisation applicable to all pianos of a particular house.

A comparison of organological evidence with other sources produces some surprising results. If the data in Fig 4.29 below is typical of mid-century pianos of the makes specified, this means that Brinsmead's claim that mid-century English actions were heavier than those of Erard is incorrect.[465] No matter where you go in the register, Broadwood touch-weights are either identical or lighter.

Fig 4.29: Table showing comparative touch-weights in mid-century Viennese, English and French pianos

Pitch at which measurement of touch-weight taken	Data for Henschker piano, 1840* (g)	Data for Broadwood piano, 1844 (g)	Data for Erard piano, 1841 (French factory) (g)
C1 (Dampers on)	69	68	73
C1 (Dampers off)	62	64	64
F3 (Dampers on)	52	57	61
FF (Dampers on)	89	82	93

*Henschker has been included as an example of Viennese piano making closest to mid-century; it is relevant to note that whilst both Broadwood and Erard were exhibitors in 1851, Henschker was not.

An assertion by the author of *The Crystal Palace and its Contents* that the touch on foreign pianos was heavier than English ones also appears to be

[465] Brinsmead, *A History of the Pianoforte*, p.65.

partly incorrect in light of this data.[466] If the Erard pianos made by their French factory cited here were typical, then French actions were generally heavier than English ones; Viennese pianos, however, were lighter to play with the dampers off and were also lighter in the upper part of the register.

The differences in dimensions outlined in Fig 4.30 below suggest that the judging panel may have found pianos more or less difficult to play according to their hand size.

Fig 4.30: Table showing comparison of key-dip, octave compass, dimensions of gaps between and length of accidental and natural keys

Measurement	Data for Henschker piano, 1840 (mm)	Data for Broadwood piano, 1844 (mm)	Data for Erard piano, 1841 (French factory) (mm)
Depth of key-dip of C1	8	9	9.3
Length of octave span	15.9	16.6	16.6
Length of gap between top and bottom of adjacent accidentals	1.76 (top) 1.51 (bottom)	1.68 (top) 1.58 (bottom)	1.78 (top) 1.48 (bottom)
Average width of accidentals (top)	7.5	10.5	9.5
Length of accidental (top)	9.8	9.2	9.15
Length of accidental (base)	10	9.6	9.75
Length of natural	14.55	14.1	14.4
Length of natural head	4.55	4.5	4.65

[466] *The Crystal Palace and its Contents*, p.202.

English and French pianos of this period both had a wider octave compass than Viennese keyboards. Finger thickness was also relevant and, according to Mobbs, spaces between the tops of accidental notes of anything less than 1.7cms (17mm) would have made heavily chorded or arpeggiated compositions difficult to play. Accidentals of less than 8mm in width would have been difficult to hit with any accuracy, so precision may have been hard to achieve on Viennese pianos.[467] Given that the difference in width between accidentals in Broadwood and Henschker pianos was 2.5 mm, it is surprising that von Bülow, who would have been familiar with Viennese instruments, objected to Sterndale Bennett's piano partly on the grounds that the accidentals were too narrow. Either that particular instrument departed from the general trend observable in Broadwood keyboards or von Bülow found it hard to play for reasons that he did not specify.

Equipped with their 1821 repetition mechanism, Erard pianos were the instruments on which the fastest trills and tremolando effects could be achieved. Based on the small sample of data set out in Fig 4.31, the repetition action on Erard pianos was significantly faster than on those of English and Viennese makers. Whether or not this was realised by the judges would have been dependent on how pianos were tested, but given the growing prevalence of compositions containing this type of effect, it is unlikely this would have been passed over.

Fig 4.31: Table showing comparison of repetition speed

Speed of Repetition (average notes per second)	Data for Henschker piano, 1840	Data for Broadwood piano, 1844	Data for Erard piano, 1841
Dampers on	6.8	7.4	8
Dampers off	6.4	7	7.6

[467] Mobbs, 'A Performer's Comparative Study of Touch-weight, Key-dip, Keyboard Design and Repetition in Early Grand Pianos, 1770-1850', 16-44, here 33-4

In his Jury Report, Thalberg discussed the importance of the piano action at length, explaining the differences between English and Viennese mechanisms and the significance of Erard's invention which utilised the best of both. When commenting on one of Erard's grands, he praised the quality of the action, extolling the mechanism that made possible accurate communication between finger and strings.[468]

Although assessments made by contemporary musicians seem questionable when compared with organological evidence derived from surviving pianos, there are some instances in which they do corroborate one another. As Erard's action responded significantly faster than other contemporary pianos, it becomes apparent that Thalberg's glowing report was the product of expert assessment, not personal bias. It is likely that in general terms English, French and Viennese pianos of this period would have seemed very different in the hands of an experienced player accustomed to his favourite make. A verdict that one instrument was 'better' than another may in fact have meant that it was more familiar, not that it was actually superior.

4.7: 'Habitus': the role of personal associations

Although it is clear that several musical jurors were known personally to exhibitors, whether or not this gave rise to impartial decisions is hard to ascertain. Berlioz was aware at the outset that it would be challenging to fairly judge entries by friends, yet he declared his intention to refrain from favouritism. He clearly feared potential conflict between Parisian and Berlin instrument makers, describing himself as being 'between the devil and the deep sea', yet 'determined to remain a *Minos* worthy of these more or less harmonious trials and not to do injustice'.[469] He saw his presence on the jury as necessary to ensure his fellow countrymen were treated with what he described as 'conspicuous fairness'; he doubted French exhibitors would

[468] *Reports by the Juries*, pp.327-8.
[469] Letter from Berlioz to Camille Pal, 15 April 1851, in Ganz, *Berlioz in London*, p.83.

have done as well had he been absent.[470] Some relationships between makers and musicians seem to have been purely cordial. Berlioz, for example, wrote letters of introduction to both Morris Barnett, reporter for *The Morning Post*, and Charles Lewis Gruineisen, on behalf of his friend the Belgian instrument maker Adolphe Sax, asking them to welcome him to London.[471] It is reasonable to suppose a close relationship between Sir Henry Bishop and the exhibitor Robert Addison as in 1855 he appointed him executor of his Will.[472]

Some judges, however, had been financially dependent upon particular makers, a situation which may have left one party obligated to the other. Sterndale Bennett, who had been sponsored by Broadwood during his early career, was able to travel to Germany for his first concert performances only because the company paid his expenses.[473] Two years later, in 1841, Bennett wrote to Broadwood asking for a loan to see him through a period of financial hardship; assuming the answer to his request was affirmative, the company loaned him the sum of £20.[474] Sir George Smart was also financially indebted to the company, having borrowed the sum of between £200 and £300 from them in 1802 in order to secure a lease.[475] Broadwood were well known for their generosity to musicians, so the fact that such a relationship existed between them and members of the judging panel is coincidental. In 1858, for example, they donated the sum of £30 to Arthur Sullivan to meet his student expenses whilst studying in Germany.[476] Such relationships may, however, have impacted 'habitus' in ways that were probably unintentional yet unavoidable.

Walter Stewart Broadwood certainly believed that personal prejudice was a determining factor in the values which underpinned judicial decisions.

---

[470] Letter from Berlioz to Camille Pal, 26 July 1851, in Ganz, *Berlioz in London*, p.118; the same letter is also published in Hugh MacDonald, ed. *Selected Letters of Berlioz*, p.280.
[471] Letter from Berlioz to Morris Barnett, 25 April 1851, in Ganz, *Berlioz in London*, p.85; Letter from Berlioz to Charles Lewis Gruineisen, 25 April 1851, in Jacques Barzun, *New Letters of Berlioz 1830-1868* (New York: Columbia University Press, 1954), p.95.
[472] Northcott, *The Life of Sir Henry R. Bishop*, pp.119-20.
[473] Sterndale Bennett, *The Life of William Sterndale Bennett*, p.40.
[474] Letter from William Sterndale Bennett to Henry Fowler Broadwood, 8 July 1841, Surrey History Centre, 2185/JB/87/8.
[475] H. Bertram Cox and C. L. E Cox, *Leaves from the Journal of Sir George Smart*, p.9.
[476] Letter from Sir George Smart to Henry Fowler Broadwood, 26 June 1858, Surrey History Centre, 2185/JB/87/11.

Whether such bias was real or perceived will never be fully determined, but it is significant that exhibitors believed that jurors were subject to such forces. One remark, which raises more questions than it answers, suggests that Broadwood's plight was a foregone conclusion. The details are vague, but Walter's belief that underhand dealings were at work, both on the part of the juror Henry Wylde and the Council, is apparent:

> The Chairman threw out our name and confirmed that of Erard – thus confirming Col Lloyd's prophecy who when Wyld was protesting against Broadwood at an entry stage of the proceedings, said 'if you want to exclude Broadwood's appeal to the Council of Chairmen: they will be glad enough to lop off one medal.' (fact. C. Potter)[477]

According to Walter, not only did Erard actively seek to deprive Broadwood of a medal, but their supporters refused to acknowledge the merit of either Broadwood or Collard:

> We are told that the Chairman's decision was mainly attributable to the activity of Messrs Erard's country men who being anxious for the glory of France, would hear of no divided honours – we have canvassed no one such proceedings having been deprecated by Mr Erard himself, when he called at our house shortly before the struggle – nevertheless it was his friends who successfully strove to deprive us of a distinction which diminished, only by dividing, that given to Erard – many of our friends among the Chairmen were absent – the French, to a man, was present & active.... You observe, that, as it was not supposed to be a question of superiority, but of general merit only, our friends all voted for Erard as well as for us - the Erardite for Erard only - they now interpret as an admission of the superiority of Erard even by opponents – and as a complete majority.[478]

Given that Pierre Erard referred to his fellow competitors as his 'enemies' and the controversy surrounding the awarding of medals as a 'fight', it seems likely that for him the Exhibition was not just an industrial competition but a commercial battleground where the ends justified the means.[479]

---

[477] BL Add.70920, f.146-7, Letter from Walter Stewart Broadwood to J. W. Davison, 10 October 1851. In most secondary sources Henry Wylde is spelt with an 'e' but in this particular primary source it is spelt 'Wyld'.
[478] *Ibid.*
[479] Letter from Pierre Erard to Maison Erard dated 31 July 1851. www.sebastienerard.org (accessed 26 February 2016). Translations provided by Veronique Brown.

4.8: The Council Medal Controversy: competition within the Exhibition and beyond

Despite the fact that the 'field' was closely defined by specific rules and regulations, it was in many ways a snapshot of increasing competition between piano makers during the first half of the nineteenth century. Relationships between British makers were chiefly cordial. When a fire consumed Broadwood's Horseferry Road site in 1856, piano makers and craftsmen went to their aid just as they themselves had assisted Collard when a similar disaster struck their premises five years earlier.[480] The French maker Erard, however, was perceived as a threat, especially by Broadwood; Alastair Laurence believes one of the reasons the company purchased the premises of Stumpff's harp factory in April 1812 was to prevent Erard from gaining a foothold in London.[481] The main distinction between the two makers was that whereas Erard was aggressively commercial, Broadwood were conciliatory, slow to defend their intellectual property rights. At approximately the same time that Breitkopf & Häertel were busy copying the Broadwood grand piano sent over to Germany for use by Sterndale Bennett, Erard were petitioning the Privy Council in England to have their 1821 patent, which protected their precious repetition action, renewed.[482] Not only were Erard protective of their inventions but they were also keen to corner the same global markets. In letters dated July 1851, Pierre Erard expressed his concern that Collard were able to charge such high prices for their pianos in South America:

> Collards, whose instruments are very fashionable in Rio, have got really high prices. I know this from a good source and Friou confirmed that to me. So they sell their pianos at 4000 francs to sellers in Rio. Friou wants to come and find Collards because his pianos have got the best reputation in Rio.[483]

---

[480] Wainright, *Broadwood by Appointment*, pp.172-4; Alastair Laurence, *Five London Piano Makers* (London: Keyword Press, 2010), p.59.
[481] Laurence, *The Evolution of the Broadwood Grand Piano, 1785-1998,* p.76.
[482] Wainright, *Broadwood by Appointment*, pp.135-7.
[483] Letter from Pierre Erard to M. Duyityros, Maison Erard, dated 15 July 1851; concerns along the same lines are also expressed in letters to and from the same parties dated 16 and 23 July. www.sebastienerard.org (accessed 27 February 2016). Translations provided by Veronique Brown.

There are two main ways in which the wider 'field' of mid-century piano making was reflected in the politics of the Exhibition. One bone of contention was who had invented what and when. The other main area of dispute concerned the point at which an existing creation evolved into something new. Just as later in the century A. G. Wornum criticised Broadwood for what he considered to be an inaccurate account of his father's contribution to the development of the upright piano, so exhibitors argued about stages in piano development using *The Times* as their forum.[484] It began when Broadwood pointed out perceived errors in an account of the development of the piano published on 10 May, specifically concerning the application of metal bars. This then prompted responses from Stodart and Erard, both of whom were eager to verify their respective contributions to piano development. Both Stodart and Erard claimed to have been the first to use iron bars to brace their piano frames. In his letter dated 8 May (published 10 May) Matthew Stodart claimed, on behalf of his father, that the use of metal bracing in pianos had first been introduced by their company in 1820.[485] Erard then responded that their method of bracing (first used in 1821) was entirely different from that of Stodart. Rather than using a system where only one end of the bar was fixed to the frame, Erard used a system of metal arches, supported by metal posts, along the entire length of the piano which were fixed at both ends. Stodart's invention, they claimed, was in fact based upon a method introduced by Thom & Allen in 1819.[486] It is not known whether this debate ever came to the attention of the jury, but arguments of this kind renders the Commissioners' direction that juries were not to concern themselves with the question of originality entirely understandable.[487]

Notwithstanding that establishing originality was beyond judicial remit, it is possible that allegations of plagiarism made by Erard against Broadwood in 1839 may have been the reason why Broadwood's Council Medal was revoked. That their award was rubber-stamped by the Group Jury, and their letter of appeal was signed by all jurors, suggests that their award could only

---

[484] Letter from A. G. Wornum to Henry Fowler Broadwood, 19 August 1868, Surrey History Centre, 2185/JB/6/4/63.
[485] *The Times*, 10 May 1851, p.8.
[486] *The Times*, 14 May 1851, p.5.
[487] *First Report of the Commissioners for the Exhibition of 1851*, p.22.

have been revoked on a technicality. There is no evidence that Broadwood failed to comply with Exhibition rules and as one of their instruments used a patent registered in 1847, they were eligible for a Council medal. It is impossible to say for certain, but Broadwood's reference to 'mis-statements' in their letter of appeal may be hinting at Erard's threat of legal action against them 12 years earlier:

> The Council of Chairmen however (as it has been generally reported) rejected the Award thus doubly confirmed and in seeking for the grounds of this rejection the Jurors of Class Xa who transmit these papers are compelled to state it as their opinion that undue weight must have been attributed to mis-statements made at the Meeting of the Group in the presence of many of the Chairmen affecting Messrs Broadwoods claim as Improvers of the Pianoforte. The mis-statements were upon remonstrance withdrawn but it is a lamentable fact that the injurious effect of such statements positively put forth can seldom be completely effaced by a retraction.[488]

In 1839, Erard had claimed that Broadwood had used brass studs and an upward-bearing string arrangement, an invention that was patented in their name in 1821. Correspondence illustrates the difficulties inherent in establishing whether Erard's arrangement was in fact truly new when they claimed patent protection and whether Broadwood's system was sufficiently different to constitute a new invention. Unfortunately the outcome of these allegations is unknown but as the company thought it necessary to obtain an official opinion from the scientist Andrew Ure, it seems unlikely the matter was settled easily. James Shudi Broadwood's approach to making his case, set out in a letter to his son dated 28 August, was to check company records and question personnel for evidence that the same methods of stringing had in fact been used by Broadwood in square pianos prior to the date of Erard's claim. He was only too aware, however, that any such method was likely to be so different to that of Erard as to be unconvincing proof of prior ownership.[489] Turning to the particulars of Erard's patent, Ure concluded in his report dated 7 September 1839, that the diagrams accompanying Erard's

[488] Letter from Class XA Musical Jury to The Royal Commissioners, undated, Royal Commission Archives RC/A/1851/400.
[489] Letter from James Shudi Broadwood to Henry Fowler Broadwood, 28 August 1839, Surrey History Centre, 2185/JB/6/4/12.

1821 patent were too poorly drawn to ascertain exactly how the strings or studs were to be kept in position on the bridge. In his opinion no monopoly could be claimed as details were too imprecise.[490] Although Broadwood's 1847 patent (upon which their claim to a Council Medal would have rested) did not claim any improvements concerning the manner of securing strings, if the Council of Chairmen believed that the overall success of the company's pianos was the result of plagiarism, they could not have allowed their award to stand.[491]

Walter Stewart Broadwood's aforementioned letter to J. W. Davison offers valuable insight into how, from an exhibitor's perspective, judicial value was constructed.[492] Musical knowledge was clearly paramount and Walter was angry that a non-musical jury, namely the Council of Chairmen, was able to ignore the opinion of professionals. His comment that there is 'but one specifically qualified to give an opinion on each article' is presumably a reference to Sir Henry Bishop who represented the Class XA jury on the Council. What he failed to understand, however, was that the Chairmen's authority was based not upon superior specialist knowledge but on their right to identify and punish a breach of regulations. Lord Canning's report published in *The First Report of the Commissioners* made it clear that their sphere of authority related to advising judging panels on rules and attempting to ensure consistency in the way decisions were made.[493]

Why Collard's Council Medal was revoked is also shrouded in mystery. The company appealed against the decision on two occasions, once in person and once via the Class XA Jury. In a letter to the Commissioners dated 18 August, they protested that the British piano industry had been unfairly commended relative to organ making:

---

[490] Report by Andrew Ure, 7 September 1839, Surrey History Centre, 2185/JB/6/4/49.
[491] In their aforementioned letter of appeal, Broadwood listed details of their 1847 patent which included: a newly revised scale of strings with proportionate striking distances; a peculiar method of fixing the sounding board; a metal transverse suspension bar; the construction of the tension bars are furnished with side flanges; the fixing of these bars in the string plate by means of wedges thus ensuring equal tension; diagonal tension bars. Letter from Class XA Musical Jury to The Royal Commissioners, undated, Royal Commission Archives RC/A/1851/400.
[492] BL Add.70920, f.146-7, Letter from Walter Stewart Broadwood to J. W. Davidson, 10 October 1851.
[493] *First Report of the Commissioners for the Exhibition of 1851*, p.101.

> we have since learned that no less than three great medals have been awarded among the few organs exhibited while for Pianofortes, one of the staples of our commerce & of which there are nearly 200 constituted by upwards of 100 exhibitors, the award has been limited to one great medal; an anomaly which we conceive is perfectly inconceivable with the comparative commercial importance of the instruments.[494]

They appealed again in November 1851, although their appeal was not endorsed by all members of the Class XA jury: Berlioz, Thalberg and Henry Wylde were all conspicuous by their absence.[495] Had Collard's medal been sanctioned by the Group Jury, I believe it would have been vetoed by the Council of Chairmen on regulatory grounds, namely that two of the most important inventions claimed by the company during the requisite fifteen-year period were in fact the property of James Stewart, who was an associate juror. Stewart had been employed by Collard since the mid-1820s during which time he devised patents for improvements to the horizontal piano action dated 11 November 1841 and improvements to actions of square and upright pianos dated 29 April 1843.[496] *The First Report of the Commissioners* stated that any exhibitor who chose to accept the office of juror could no longer be considered eligible for prizes; as Stewart was an employee of Broadwood at this time, these inventions had to be disregarded.[497] If these patents are taken away from the list that Collard included in their *ODIC* entry, this leaves just two eligible inventions patented on 1 January 1838 and 15 October 1847, both of which pertained to the square piano. As previously discussed, the square piano was no longer fashionable London at mid-century and accordingly inventions relating to this

---

[494] Letter from Collard to the Royal Commissioners, 18 August 1851, Royal Commission Archives, RC/A/1851/428.
[495] Letter from the Class X Jury, on behalf of Collard to the Royal Commissioners, 6 November 1851, Royal Commission Archives, RC/A/1851/678.
[496] Martha Novak Clinkscale, *Makers of the Piano Volume II 1820-1860* (Oxford: Oxford University Press, 1993), p.357. Clinkscale refers to a letter from George H Chickering (son of Jonas Chickering) stating that his father had met James Stewart while he was at Collard in 1851; she further states that he remained with the company for a period of thirty five years. Alastair Laurence states that James Stewart was employed by Collard from the mid-1820s having previously worked for Jonas Chickering since 1812 in *Five London Piano Makers,* p.58. Details of these patents can be found in *Patents for Inventions* (London: The Office of the Commissioners of Patents for Inventions, 1871): Patent No. 9150 dated 11 November 1841 was registered to James Stewart, p.137; Patent No. 9716 dated 29 April 1843 was jointly registered to James Stewart and Thomas Lambert, p.142.
[497] *First Report of the Commissioners for the Exhibition of 1851*, p.20.

piano type would have failed to meet the requirement that a Council Medal invention had to be of wider significance to the industry. It would seem therefore that knowledge of the political constraints imposed by the Exhibition organisers was at least as important as knowledge of pianos and their workings.

4.9: Conclusion

The dissatisfaction apparent amongst piano makers was echoed by exhibitors in other departments and when the medal list was published on 16 October, complaints poured forth. In their report from the previous day, *The Morning Chronicle* expressed confidence that the juries had coped admirably with a very difficult task.[498] Following a fortnight of complaints by exhibitors, however, by 28 October the paper was openly critical, claiming that the Commissioners had adopted a system which had, intentionally or not, produced an unfair result.[499] In a letter to *The Morning Chronicle* dated 27 October, Charles Pritchard, asked with some incredulity how the Council of Chairmen could possibly be permitted to revoke a decision made by eminent men such as Sir John Herschel.[500] Numerous complaints rolled in pertaining to circumstances in which exhibitors had been awarded only a prize medal when, so far as they were concerned, they had met the published criteria for a Council Medal. Comparison was a key feature of this type of grievance; exhibitors looked at their rivals, compared products and failed to see how their products had been passed over. One such example was the china and glass manufacturer W. T. Copeland who declined to accept his prize medal based on the fact that Minton had been awarded a Council Medal.[501] There were also allegations of unfair practices. One of the grounds on which P. Claussen appealed against his award was that an unnamed exhibitor, who presented a mode of treating textiles very similar to his own, was transferred from Class XVIII to Class IV expressly for the purpose of awarding him a

[498] *The Morning Chronicle*, 15 October 1851.
[499] *The Morning Chronicle*, 28 October 1851.
[500] *The Morning Chronicle*, 27 October 1851.
[501] *The Morning Chronicle*, 20 October 1851.

Council Medal.[502] Allegations of bias in the horological jury were actually upheld in a report dated 24 October, in which the Commissioners admitted some 'serious irregularities' in favour of a personal acquaintance'.[503] Having first listed the many judging decisions he deemed untenable, a reporter for *The Bury and Norwich Post and Suffolk Herald* concluded that the awards were '3000 bits of metal and no more – the things soonest to be forgotten'.[504] In the weeks following the Exhibition, the validity of professional taste was in doubt. The value of expert knowledge was in question and the ability of judges to exercise impartiality was a source of conjecture. It was also uncertain how awards, or the lack thereof, would impact success in the wider commercial field.

Although the reasons behind judicial decisions are difficult to ascertain due to lack of detail and consistency, looking at the list of prizes awarded set out in Appendix A, some general observations are possible. It seems that pianos were treated primarily as sound producers given that no award was conferred purely on the basis of the design or materials used. There are two instances in which the prize list draws attention to the wood from which the casing was crafted, namely Schiedmayer who was awarded a prize medal for a square piano 'in mahogany', and Westermann & Co who received an honourable mention for a grand piano 'in rosewood'. This wording may indicate a particularly thoughtful manipulation of the material in question, but without further details no definitive conclusion is possible. Joint entries indicate that casing and piano action were assessed separately: whereas Jennens & Betteridge received a prize medal for their 'inlaid japan pianoforte case', no recognition was awarded to Dimoline who made the internal workings of the instrument; whereas Lambert & Co were awarded a prize medal for one of their cottage pianos, J.C. Crace, who made the outer casing, were passed over. There are numerous instances in which makers presented multiple instruments but received commendation for only some of their entries. The British maker Robert Wornum exhibited a semi-grand and a piccolo but was awarded a prize medal only for the latter instrument; a

[502] *The Daily News*, 20 October 1851.
[503] *The Morning Chronicle*, 24 October, 1851.
[504] *The Bury and Norwich Post and Suffolk Herald*, 22 October 1851.

similar situation prevailed with the American maker Pirrson whose square piano received an honourable mention whilst his double grand piano was passed over (Fig 3.10). Only three of the four pianos entered by the French maker Roller & Blanchet were allocated a prize medal. Prizes were given not only for instruments with enhanced tone and touch but for those demonstrating some novelty or addressing social need: W. Jenkins & Son's prize medal for their 'expanding piano suitable for yachts' is an example of the former; Robert Addison's transposing piano, a device designed to make home performance easier, which also received a prize medal, is an example of the latter. No awards were given for products entered for 'cheapness'; notwithstanding that Sterndale Bennett commended J. & J. Hopkinson for the economy of their boudoir piano priced at 28 guineas, his prize medal was given in acknowledgement of his grand piano with 'new patent action'.[505]

[505] Sterndale Bennett, *Exhibition Diary*, Royal Commission Archives, London, RC/1/25.

Chapter 5: Piano manufacture at the Great Exhibition; investigating diversity

> First appear whole battalions of pianos – pianos of every size, on every principle, of every price; plain pianos, and pianos glittering like vast pieces of jewellery; pianos of extraordinary, and some of them of uncouth, shapes; eccentric pianos about the keys, eccentric pianos about the legs, eccentric pianos in their insides, eccentric pianos in their outsides – every possible shape, in fact, into which the spirit that assumes the form of the stretched strings of a pianoforte could be induced to enter. (*The Morning Chronicle*, 14 May 1851)

5.1: Introduction

Having briefly tackled the question of what objects were exhibited and why in Chapter 2, this section examines what forces and techniques shaped mid-century piano making in order to explain why the British department contained such a diversity of instruments. As has already been explained, not all makers were able or willing to attend and probably not all products submitted for consideration were allocated Exhibition space. Nations and regions where protectionism was uppermost would have been reluctant to participate in the Exhibition because of the values it represented. Opposed to free trade, protectionists favoured conditions in which local industry and employment were kept safe from the threat of foreign competition. Although foreign and colonial exhibitors did not have to pay duty on their goods upon arrival at the Exhibition this waiver was temporary as import tariff was payable either upon re-exportation or sale after the Exhibition closed.[506] Scholars agree that makers were concerned their ideas would be stolen by competitors and for this reason emergency design copyright and patent legislation was introduced.[507] Notwithstanding such protective measures, however, it is likely some boycotted the Exhibition fearing plagiarism. Those who did attend took steps to ensure that their products could not be

---

[506] *First Report of the Commissioners for the Exhibition of 1851*, p.16.
[507] Miller, *Novels Behind Glass*, pp.77-8; Ffrench, *The Great Exhibition: 1851*, pp.137-8; Davis, *The Great Exhibition*, p.41.

inspected too closely. According to an unreferenced source by the French piano maker Henry Herz, many pianos were locked periodically, making it impossible for anyone to examine the internal workings.[508]

As evidenced by the above extract from *The Morning Chronicle*, the British piano department presented an array of different piano types. There is an assumption amongst furniture historians that most makers brought elaborate custom-made goods designed especially for the Exhibition, something which my work suggests was not always the case.[509] The most convincing evidence in mainstream Exhibition scholarship is that of Auerbach, who highlights what he calls 'absurdities', namely items that were unique with no practical application, and goods designed with Exhibition narrative in mind, specifically those with a nationalistic theme.[510] In reality, the situation was far more diverse: some makers presented expensive luxuries, others intriguing novelties; some brought items that could be found in their company prospectus; others occupied a middle ground, exhibiting mixed offerings representing both novelty and normality across a range of budgets.

An example of the first approach was represented by Broadwood, whose offerings presented a radical departure from their usual output. According to their price list dated March 1851, extracts from which are shown below (Fig 5.1), pianos were usually available either in mahogany or rosewood, yet their Exhibition instruments were made of highly decorated amboyna, ebony and walnut.[511] Although the company made pianos designed specifically for the colonial market capable of withstanding extreme weather conditions, these pianos were conspicuous by their absence. Broadwood's decision not to display their 'schoolroom' piano, an instrument designed specifically to help those learning to play, patented in 1842, is open to several possible interpretations.[512]

---

[508] Unreferenced source by Henry Herz, in Alastair Laurence, *More London Piano Makers* (London: Keyword Press, 2015), p.61.
[509] Aslin, *Nineteenth-Century English Furniture*, p.32; Jervis, *Victorian Furniture*¸p.13; Edward Joy, *Furniture* (London: The Connoisseur, 1972), p.165.
[510] Auerbach, *The Great Exhibition of 1851*, pp.110-2.
[511] Broadwood Price List No. 39, March 1851, Surrey History Centre, 2185/JB/7611.
[512] Wainright, *Broadwood by* Appointment, p.148.

Fig 5.1: Table showing extracts from Broadwood Price List No. 39, March 1851, Surrey History Centre 2185/JB/76/1

Piano Type	Description	Decorative features
Upright Piano	Single action, C-G	Cylinder or French front, mahogany or rosewood
	Double action, C-G	Cylinder front, Full size with carved trusses or Boudoir with carved trusses
Square piano	Single action, C-G	Round corners, fret & long hinge, mahogany.
	Double action, C-G	French corners, full frets, mahogany or rosewood.
	Grand Action, C-G	Full frets, rosewood
Grand piano	Short bichord, tension bars, drilled bridge, C-G	Mahogany or rosewood
	Long bichord, tension bars, drilled bridge, C-G	Mahogany or rosewood
Boudoir grand	Trichord, C-G	Mahogany or rosewood
Full size grand piano	Trichord with short or long harmonic bar, C-G	Mahogany or rosewood, with ogee mouldings and carved legs, Mahogany or rosewood
7 octave grand piano (made to order)	Trichord with long harmonic bar, 8’6’’ in length.	Carved mouldings and legs, mahogany or rosewood

Pianos for India	Short Grand piano	Bichord, C-G	Mahogany
	Full Grand piano	Trichord, C-G	Mahogany
	Square piano	Double action, bichord, C-G	Mahogany with carved legs

They may have thought didactic instruments would be unlikely to receive official commendation (based on the conclusion to Chapter 4, any such assumption was incorrect as novelties were sometimes commended); they

may have thought that only their biggest and best instruments could effectively compete with their rivals; the company may have selected products based on the target market they wished to attract. Erard's 1851 tariff, shown below (Fig 5.2) tells a similar story; their elaborately decorated Exhibition instruments were in no way representative of their usual stock. Under normal circumstances, customers were able to choose from three types of grand, two semi-grand, three uprights plus large and small square pianos.[513]

Fig 5.2: Table showing extracts from Erard's tariff for 1851

Piano Type	Description
Grand piano (grand model H)	7 octaves, brass fittings and agraffe, 2m 55 cm in length
(grand model No 4)	7 octaves, 2m 48 cm in length
(grand model No 3)	7 octaves, 6 bars, 2m 40 cm in length
(petit model No 2)	7 octaves, 2m 12 cm in length
(petit model No 1)	From 6 ½ - 6 ¾ octaves, 5 bars, 2m 5cm in length
Upright piano (model No 11)	Vertical stringing, 3 strings, 6 ¾ - 7 octaves
(ordinary model, No 9)	Oblique stringing, 6 ½ octaves
(grand model No 12)	Oblique stringing, 6 ¾ octaves
Square piano (grand model)	3 strings, 6 ¾ octaves
(petit model)	2 strings, 6 ½ octaves

Source: Rene Beaupain, *La Maison Erard: Manufacture de Pianos 1780-1959* (Paris: L'Harmattan, 2005), p.36.

Entrants such as Cadby and J. & J. Hopkinson exhibited pianos that were reflective of their general output. The latter chose a horizontal grand and a rosewood boudoir piano, representing their most expensive and cheapest options respectively. Exhibitors such as W. Jenkins & Sons and J. Kirkman

[513] René Beaupain, *La Maison Erard: Manufacture de Pianos, 1780-1959* (Paris: L'Harmattan, 2005), p.36.

& Son opted to appeal both to the visitor's sense of familiarity and their desire for novelty. For example, Jenkins' expanding and collapsing piano 'suitable for yachts, saloons and ladies' cabins' fulfilled the latter criteria, whereas their walnut cabinet piano in the Elizabethan style appeared on the company's list of 'usual' merchandise.[514]

Why makers made such different choices is unknown, although circumstantial evidence makes educated guesswork possible. Erard brought multiple examples probably because they had become accustomed to doing so at Exhibitions held in France during the early part of the nineteenth century. The company had been competing on a national level since 1819 and, according to the history of the company published in readiness for the 1855 Exposition in Paris, they had been awarded gold medals on almost every occasion.[515] In the case of Brinsmead, whose business did not extend to anything other than upright pianos until 1862, deciding what to bring was dictated by practicality.[516] Referring back to Appendix A, it is evident that although both Broadwood and Erard made square pianos, neither company brought an example of this type. This decision may well have been due to an awareness that, as discussed in Chapter 3, square pianos were no longer fashionable in London and that the main market was overseas. That Erard tailored their instruments for the audience at hand is evidenced by the fact that they displayed a piano Pompadour, a form of upright grand, at the Paris Exposition of 1855. No such example was entered in 1851, probably because the company knew that, although still fashionable in France, this type of piano was no longer made by mainstream British makers.[517]

Because the technological diversity of pianos at mid-century is such a well explored topic, this chapter has very little to say on the subject except to confirm that the range of pianos on display broadly reflected the diversity of the industry at this time. Rosamond E. M. Harding's *The Piano-forte* contains detailed discourse concerning the technological development of all piano types in Britain, Europe and America during the first half of the nineteenth

---

[514] Exhibition prospectuses for Cadby, J. & J. Hopkinson, J. Kirkman and W. Jenkins & Sons, University of Reading Special Collections, Great Exhibition Oversize 09.
[515] Exposition Universelle de 1855, Notice sur les travaux de mm Erard, facteurs de pianos et harpes (Paris: 1855), pp.10-28.
[516] Laurence, *Five London Piano Makers*, p.19.
[517] Exposition Universelle de 1855, p.34.

century culminating at the Great Exhibition. Her work also includes an extensive list of European and American patents for this period.[518] A glance through Exhibition entries and corresponding patents indicates that makers were primarily experimenting with sound. How to make pianos louder, how to enhance tonal quality, how to better sustain sound and how to make instruments immune to the effects of environmental change were all questions that makers sought to answer. There are a few British inventions which did not make it through the doors of the Exhibition, namely pedals and stops designed to produce certain types of sound, pianos of unconventional shape, keyboards where touch was adjustable, enharmonic pianos and self-acting pianos.[519] The situation regarding European and American exhibits was similar. A representative sample of inventions were present, although again modified keyboards, pianos of unconventional shape and pianos with adjustable touch were absent from the Exhibition displays.[520]

Although this chapter has little to contribute from a technological angle, it does shed light on the wider social and scientific contexts in which developments took place. The first section examines ways in which sound requirements impacted aesthetic appearance, and vice versa, identifying some interesting causal relationships which impacted the material character of pianos. The second identifies the requirements of amateur consumers who needed a piano for use in the domestic sphere and explores some of the technological challenges faced by makers in meeting those needs. The third focuses on how makers responded to the challenge of creating a better piano

[518] Harding, *The Piano-forte,* pp.318-75.

[519] An extensive list of various pedals and stops appears in Harding pp.340-5; patents for pianos of unconventional shape include P. F. Fischer's patent for a circular or hexagonal piano dated 13 May 1835 No. 6835, *Patents for Inventions*, p.118 and H. Rape's patent dated 2 July 1839 No. 8137 for the construction of oval pianos, *Patents for Inventions*, p.130; patents whereby touch can be varied through adjusting the weight of the keys are listed in Harding pp.368-9, the earliest example in England appeared in 1787 and the patent dated closest to the Exhibition is Henry Pape's patent dated 1839 which uses a moveable paddle which serves to harden or lighten the touch; the earliest example of an enharmonic piano was registered by David Loeschman dated 26 July 1809 No. 3250, *Patents for Inventions*, p.57; a patent for 'improvements' to a self-acting pianos was registered by T.H. Rolfe on 11 August 1829 No. 5831, *Patents for Inventions*, p.110.

[520] French and Belgian patents for pianos of unusual shape are listed in Harding, pp.351-2; European and American patents to allow adjustment of touch are listed, pp.368-9; Patents by Belgian and Bavarian makers for pianos with multiple keyboards are detailed on p.336; patents for alternative arrangement of one or more keyboard registered in Europe and America appear on pp.335-6.

sound, examining the comparative techniques used, the level of acoustical knowledge available at mid-century, and the ways in which makers responded to the tastes of both amateur and professional customers. The fourth and final section considers how makers addressed the problem of noise; their response was to provide amateur pianists with devices to facilitate silent practice and modified keyboards designed to make learning easier. In keeping with one of the principal themes of this thesis, the chapter focuses mainly on material examples that illustrate the duality of the piano as both sound producer and decorative furniture.

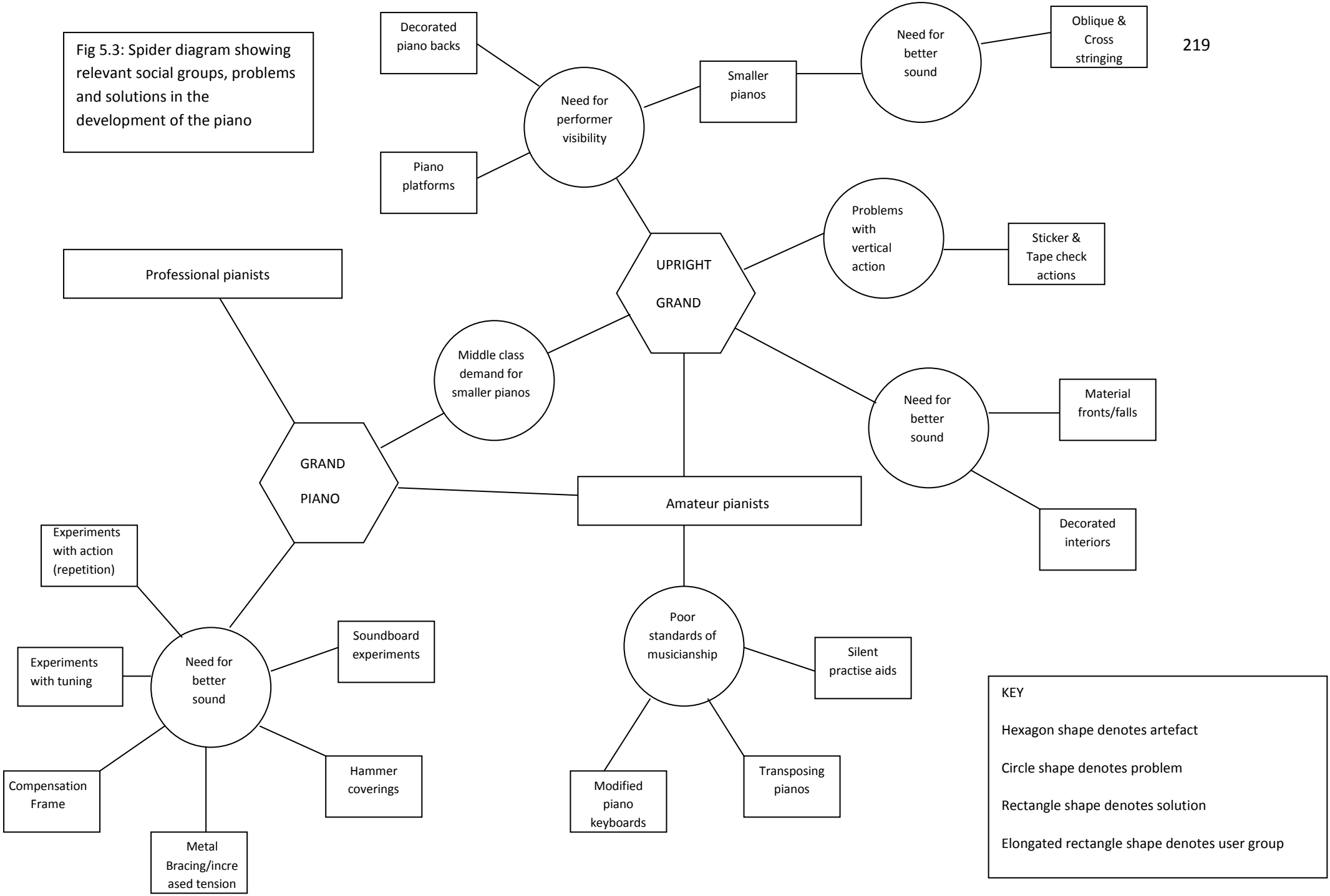
The main method used throughout this chapter is social constructivism, a tool that helps identify the ways in which makers responded to the needs of amateur and professional user groups. Drawing on a model devised by Trevor J. Pinch and Wiebe E. Bijker to explore the evolution of the early-twentieth-century bicycle, I have designed a spider diagram (Fig 5.3 below) to illustrate some of the causal relationships which gave rise to the variety of piano designs shown at the Exhibition.[521] This multidirectional approach explains the rise and fall of innovations which ultimately fell by the wayside as well as those that survived the test of time. The main disadvantage is that the model fails to impart a sense of temporality; it is impossible to tell how long the various changes took to evolve. Modifications to grand piano design, though a relatively small part of the overall diagram, took over 150 years to effect, beginning with Cristofori's first grand piano documented in 1700 and continuing into the second half of the nineteenth century.[522] In contrast, modifications to the upright piano progressed relatively quickly; the journey from upright grand to the most compact console piano took just 40 years to effect. The model is useful, however, in that it clearly illustrates how the two piano types, which broadly speaking can

---

[521] Pinch & Bijker, 'The Social Construction of Facts and Artifacts', in Bijker *et al*, ed. *The Social Construction of Technological Systems*, pp.11-44, here pp.29-31.

[522] There is some disagreement between organologists regarding when, and by whom, the first piano was invented. In *Giraffes, Black Dragons and Other Pianos,* pp.29-35 Good claims that the first grand piano was made in Italy by Cristofori in 1700; older scholars such as Dolge and Closson, however, claim that the first piano was invented simultaneously in Italy by Cristofori in 1707, in France by Marius in 1716 and in Germany by Schroter in 1717. See Dolge, *Pianos and their Makers*, pp.41-2; Closson, *History of the Piano*, p.72

Fig 5.3: Spider diagram showing relevant social groups, problems and solutions in the development of the piano



be associated with two user groups, followed quite different evolutionary paths.

Makers concentrated on improving the grand piano in terms of its sound, leaving its basic structure unchanged. Experiments focused on three main areas: different forms of metal bracing designed both to stabilise tuning and to facilitate greater string tension; the piano action, paying particular attention to the problem of rapid and reliable repetition; the shape, thickness and placement of the soundboard. The evolutionary path of the upright piano, however, was rather more complicated, as not only its sound but also its physical form, were subject to experimentation. Once the grand piano had been turned on its end at ninety degrees and placed on a stand by William Southwell in 1795, a series of experiments followed, fuelled by the need for a more compact instrument suitable for the smaller home and budget.

Although piano historians are unanimous that the birth of the upright was born of monetary and spatial limitations, what is less well explored is why the piano became gradually smaller. One possibility is that changes were precipitated by musical considerations, to ensure that the female performer was audible; singing into the fabric fall of a tall upright piano positioned against the wall would have defeated any such goal. The need for visibility, however, could equally have been precipitated by a desire to flatter the female form, a notion which finds credence in the fact that the piano is acknowledged by New Musicologists to have been a site of middle-class courtship. This may constitute a further ground on which Appadurai's definition of luxury goods is applicable to the mid-century piano, namely one where there is a high degree of linkage with the human body. An alternative explanation, however, is that pianos became smaller in a bid to cut costs, thus making domestic-music-making more accessible. It is of course possible that social and economic causes were not mutually exclusive in how they impacted instrument materiality.

5.2: Exploring sight and sound as forces for technological change: the chicken and the egg

The following section, which relies heavily upon physical evidence from extant instruments, is problematic in that makers' intentions are not necessarily apparent from their construction. In some instances, a comparison of the finished instrument with the patent reveals that conclusions based purely on visual observations are incorrect. A notable example is the use of alternative materials for piano keys, something which at first glance appears to be an aesthetic novelty, but which was in fact an innovation intended to improve performance. *Newton's London Journal* commented on the practice employed by Ennever & Steedman and Lambert & Co of using tortoiseshell and mother-of-pearl keys in place of the customary ebony and ivory; in both instances they thought the concept misguided.[523] A glance at a patent for an almost identical creation registered in June 1832 by Frederick William Isaac, however, indicates a musical purpose:

> These improvements consist in new modes of covering those parts which are usually either veneered with ivory or made of ebony, with pearl, tortoise-shell etc, so as not only to add greatly to their splendid and elegant appearance, but also from the superior hardness, glossiness, or high polish of their surfaces to facilitate the rapidity of the fingering in the performance of quick and brilliant passages in musical compositions.[524]

It is important therefore to consider, where possible, physical evidence in conjunction with other sources such as Exhibition literature and iconography in order to explore the apparently symbiotic relationship between sound and aesthetics.

The use of material in the front panel of upright pianos is a prime example of a feature which makers considered necessary to aid sound production but which became the subject of consumer choice. Although a plain piece of cheap fabric would have fulfilled functional requirements, customers clearly wanted something attractive. Evidence from mid-nineteenth-century artwork suggests that three basic designs were available. *The Drawing Room of 18 South Audley Street*, (Fig 5.4), dated 1843, by the amateur artist Charlotte Bosanquet, is a depiction of an actual physical

---

[523] Newton, *The London Journal of Arts, Sciences and Manufactures, Volume 39*, p.30 and p.35.
[524] *Patents for Inventions*, p.113.

location and is therefore likely to reflect contemporary detail. Here the artist has included an upright piano where the material fall is fashioned into vertical pleats.

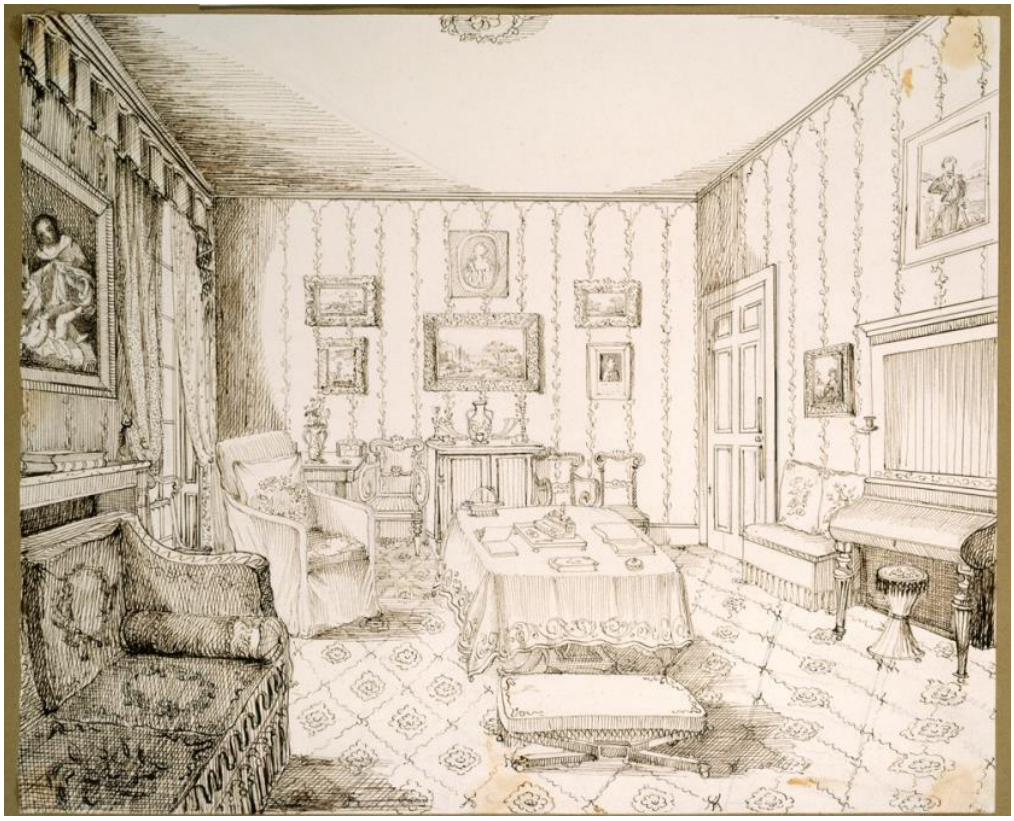
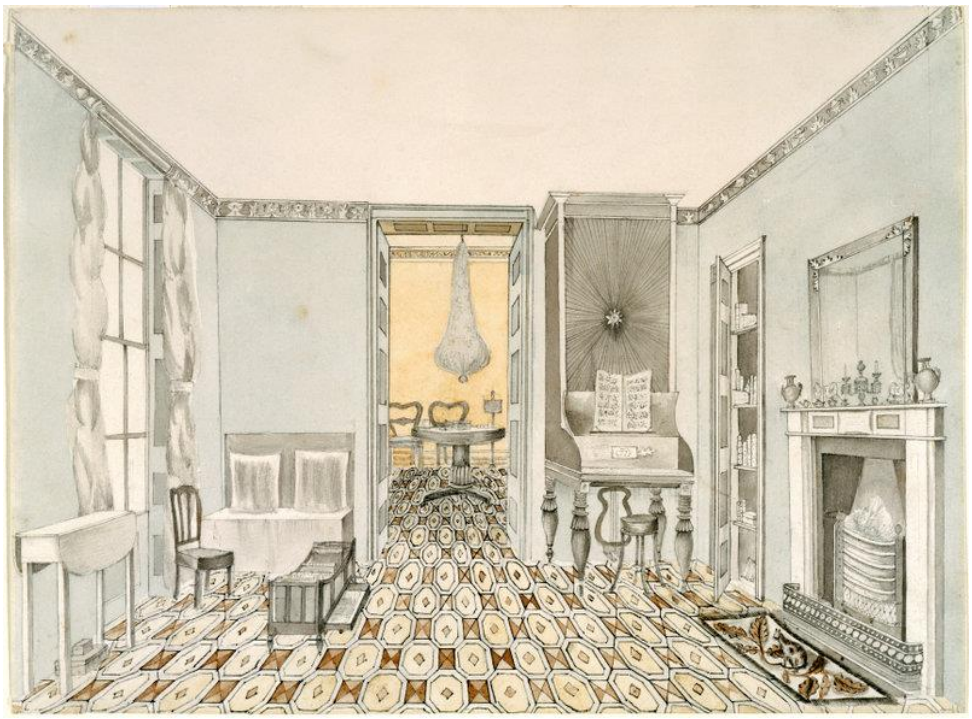


Fig 5.4: Drawing Room of 18 South Audley Street, London, 1843, Charlotte Elizabeth Ives Bosanquet (WA 1968.459.2.17). Reproduced by permission of The Ashmolean Museum, University of Oxford.

Two works by unknown mid-century artists, both dating from the 1830s, (Figs 5.5 and 5.6) are in a similar vein. The former depicts a 'swags-and-tails' type arrangement at the top of the fall; the latter shows what appears to be an upright grand piano where the fall is fashioned into a radial design. Although the watercolour depicting three ladies and a child may also have a narrative agenda, I have no reason to think that this prejudices physical detail.

Fig 5.5: Group Portrait, watercolour on paper, by an unknown artist c.1830 (38/2005). Reproduced by permission of The Geffrye Museum, London.



5.6: View of a Drawing Room, pencil, ink and watercolour on paper, by an unknown artist, c.1835-40 (44/2006). Reproduced by permission of The Geffrye Museum, London.

Descriptions found in Exhibition prospectuses suggest that seven different frontal designs were available, namely Ogee, French, Cylinder, Square, Radiated, Albert and Victoria. The Ogee design, which appears in seven different prospectuses, seems to have been the most popular; the other types were offered by just two or three makers. Lambert & Co were the only manufacturers offering customers an 'Albert' fall, although this may have been due to the fact that the design was newly invented, as stipulated in their prospectus.[525] Unfortunately the terminology used is rather unclear. The terms 'fall', 'front' and 'curtains' seem to be used interchangeably and it cannot be said with certainty whether the terms used simply denote a particular shape, whether they describe a material insertion, or some kind of carving or shaping.

That the appearance of the material fall was important to the stylistic congruency of a room is evident from Loudon's *The Suburban Gardener*, discussed in Chapter 3, where readers were advised that the silk panelling of their upright piano should match the curtains in their drawing room.[526] What is unclear, however, is whether householders were supposed to buy a piano with a fall that matched their existing soft furnishings or vice versa. One entry in Broadwood's porter book dated 19 May 1851, for an amateur client named Mrs Pearl, indicates that customers did on occasion request that the material fall be replaced. The details read 'Bringing cabinet PF No.7289 from Mrs Pearl, 9 Hugh Street, Eccleston Square; re-silk same colour, rub up polish and wait.'[527] Such requests were rare, however; this is the only example evident for the period May to December of that year. In later decades, the material fall was to become something that householders were encouraged to change in the interests of good taste. In *The Drawing Room:*

---

[525] Exhibition Prospectuses for J. Brinsmead, J. & J. Hopkinson, Cadby, Lambert & Co and J. Kirkman (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09. Choices varied considerably from one company to the next; the following examples illustrate the difficulties inherent in the terminology used. Both Brinsmead and Hopkinson offered either an Ogee or a revolving Ogee front on their upright models and Cadby offered either an Ogee or Victoria fall which could be either plain or ornamented or a Square fall which was available exclusively on their piccolo pianos. Customers of Lambert & Co could purchase an upright piano with an Albert Fall, those of Kirkman could obtain either a Cylinder or a French front on any upright model and those of Towns & Packer could obtain an upright with a 'rich silk radiated front'.

[526] Loudon, *The Suburban Gardener and Villa Companion*, p.102.

[527] Broadwood Porter Book, entry for 19 May 1851, Surrey History Centre, 2185/JB/42/46, n.p.

its Decorations and Furniture, Lucy Orrinsmith told her readers that 'the silk introduced into the front is usually of an evil tint' and that rather than put up with it, householders should replace it with a rich piece of velvet or delicate embroidery.[528]

The way in which material falls were shaped by the surrounding carvings and fretwork was also determined by consumer demand; evidence from artwork, extant examples and Exhibition prospectuses suggests that a great many variations were possible.[529] J. Roberts' depiction of a piccolo piano located in Queen Victoria's apartments at Osbourne House (Fig 5.7) depicts elaborate mahogany fretwork both above and below the keyboard, thrown into sharp relief by the underlying red silk.

Fig 5.7: Osbourne House: The Duchess of Kent's Rooms by J. Roberts, 1854 (RCIN 919869). Reproduced by permission of The Royal Collection Trust/ Her Majesty the Queen Elizabeth II 2016.

[528] Lucy Orrinsmith, *The Drawing Room; its Decorations and Furniture* (London: MacMillan & Co, 1877), p.108.

[529] Exhibition prospectuses for J. Brinsmead and Cadby (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09. Choice of decoration evident in Exhibition prospectuses is highly varied but to cite just a few examples, Brinsmead advertised their upright models as being available with 'carved wreathes or pillars' or 'double flowers and trusses'; Cadby pianos could be purchased with 'handsome spiral columns, projecting wings and elegant carved door' or 'ornamented fret doors'.

Similarly elaborate examples by Brinsmead survive in collections at The Museum of London and at Finchcocks Musical Museum (Fig 5.8 and 5.9). The extent to which fretwork was used in the overall design was variable, as evidenced in Broadwood's porter books for April to June 1851. In some instances customers requested 'full fretwork'; piano wholesalers Messrs Hime & Addison of Manchester and Mr Edgar of Liverpool requested this for an additional fee of 30 shillings and 12 shillings respectively.[530] This probably denoted a design with fretwork at the base as well as directly above the keyboard, or possibly an instrument with fretwork on the back. A further order by Mr Edgar on 19 May for a semi-cottage piano requested a 'centre fret' for which an extra 12 shillings was payable.[531] An order from a Lieutenant Colonel Campbell on 17 June stipulated that his semi-cottage piano should have a silk back, available for the additional sum of 31s 6d.[532] In some instances silk and fretwork were dispensed with altogether by customers who preferred an altogether plainer instrument. One solitary order appears in Broadwood's porter books for the period in question made by a Mr Buckler who required 'no frets' on a semi-cottage; that the instrument was purchased for shipment to New Zealand may be indicative of a lifestyle less influenced by the dictates of fashion.

Fig 5.8: Front panel, Brinsmead upright piano, c.1851, Museum of London. (photograph taken by B. E. Smith). Reproduced by permission of The Museum of London.

[530] Broadwood Porter Book, entries for 23 April and 15 May 1851, n.p.
[531] *Ibid*, entry for 19 May, 1851, n.p.
[532] *Ibid*, entry for 17 June, 1851, n.p.

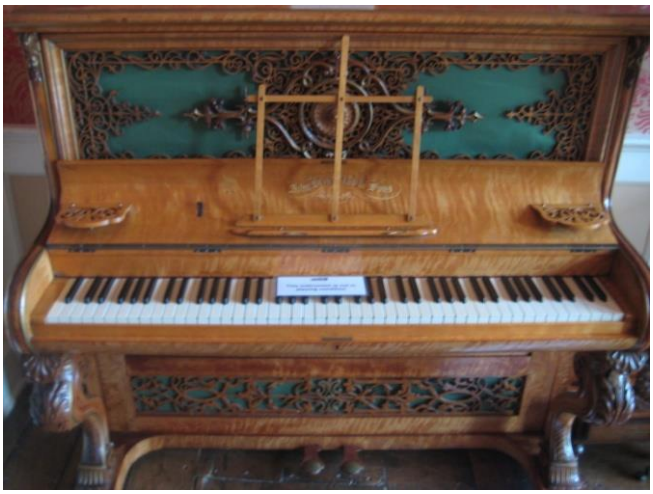


Fig 5.9: Front panel, Brinsmead upright piano, 1855, Finchcocks Musical Museum (photograph taken by B. E. Smith). Reproduced by permission of Finchcocks Musical Museum.

As Broadwood's porter books classified customers according to status, it is possible to say whether orders were placed by private individuals, wholesalers or professionals. The sample size analysed includes a total of 119 orders placed during the period April to June, 1851. Of the 12 professional clients listed, just one requested a decorative feature, namely that spiral legs should be included on their walnut boudoir grand. Of the 47 private individuals named, six stipulated that their order should include some form of additional decoration such as ogee moulding, lyre pedal and ornamentation. Of the 60 wholesale orders, six requested decorative additions to instruments including additional fretwork and carvings.[533] Based on this sample, relatively few customers appear to have been concerned with adding to the appearance of their piano. That specifications pertaining to aesthetic appearance were almost exclusively the province of amateur piano owners, purchased either directly from the maker or via a wholesale supplier, is telling. It seems reasonable to infer accordingly that professional clients were predominantly concerned with sound rather than appearance.

[533] Broadwood Porter Book, entries for April-June 1851, n.p

Another example of aesthetic design born of sound considerations was the use of interior veneering and marquetry work in upright pianos. There are several extant mid-century examples where the maker has decorated the inside of the lid inviting the assumption that it would have been opened during performance, a feature that is largely absent from later pianos. That the lid was meant to be kept open during performance is further apparent either from the presence of a hook and stand or markings where such hardware fittings once were. No such decorative detail is recorded concerning any Exhibition piano, but given that the surviving Ennever & Steedman upright cottage discussed in Chapter 4 has this feature, it seems reasonable to assume that interior lid design was commonplace (Fig 5.10). When advising readers on how to care for their instruments, Rimbault instructed piano owners to refrain from placing objects on the top, believing it would 'injure the tone' and produce an 'unpleasant jarring during performance'.[534] Clearly sound was uppermost on his agenda, but those who followed his advice would have had the added advantage of being able to show off a decorative interior.

Fig 5.10: Interior of Ennever & Steedman cottage upright piano, (photograph taken by B. E. Smith). Reproduced by permission of Bristol Culture

[534] Rimbault, *The Pianoforte*, p.369.

It was sometimes the case that a novel aesthetic design made a piano unplayable. Daniel Hewitt's cabinet piano with curved keyboard, an example of which survives in The Museum of Wales, is one such creation (Fig 5.11). The keys are not of uniform length, meaning that the player has to move differently according to which part of the register is being used. There is a difference of 2.5 cm between middle C and CC and also between middle C and C''; there is a difference of 5cm between middle C and the very lowest and highest notes. Having tried the instrument, I can vouch for the fact that the curvature of the keys makes playing a piece with scalic passages, octave couplers or skips very difficult as the distance between the keys does not fall under the hand as anticipated. That the area immediately in front of the keys is very wide means that resting the wrist on wood is unavoidable, something which would have made reverting to a normal keyboard uncomfortable. That this particular instrument was played in this way is evident from the markings on the wooden area in front of the keys.

Fig 5.11: Cabinet upright piano with curved keyboard by Daniel Hewitt, mid nineteenth century, St Fagan's Museum of National History (National Museum of Wales) (photograph taken by B. E. Smith). Reproduced by permission of The Museum of Wales.

Judges and visitors who tested J. Kirkman's Exhibition miniature grand piano might have experienced performance difficulties due to the fact that the instrument was so small. Although the piano was a technological triumph as it solved the problem of creating a small instrument whilst maintaining an acceptable tone, it was arguably impossible to play. Measurements taken by *Newton's London Journal*, listed in Fig 5.12, suggest that a normal octave hand-span would cover nearly twice the distance on this miniature piano and that players would have approximately 50% less room for manoeuvre along the length of the keys.[535] That Exhibition commentators remarked on this little instrument in such glowing terms, however, suggests that Kirkmans were judged purely on technological achievement; problems concerning practical usage were secondary.

Fig 5.12: Table showing comparative dimensions of a conventional mid-century piano with Kirkman's miniature model grand.

	Dimensions of ordinary bichord grand piano		Dimensions of Messrs Kirkman's model	
	Feet	Inches	Feet	Inches
Outside Length	7	0	4	1
Outside Width	4	3	2	10
Height from ground to the top of the instrument	3	2	1	8 ½
Length of keyboard	3	7 ½	2	2 ½
Length of each octave	0	6 ½	0	3 15/16
Depth of the keys from front to back	0	5 3/8	0	3 ½

Some makers used decorative techniques to disguise technological innovation, specifically in instances where metal bracing was visible. By mid-century it was widely accepted that iron was a necessary part of the piano

[535] Newton, *The London Journal of Arts, Sciences and Manufactures, Volume 39*, p.35.

frame, both to support the necessary tension of the strings and to help maintain tuning. Several French exhibitors such as Van Overbergh, Franche and M. Herding drew specific attention to metal bracings in their prospectuses, a feature they claimed promoted durability.[536] English makers, however, were more reticent, as it was believed that putting iron in the piano frame negatively impacted tonal quality. Exactly when acceptance of metal became widespread amongst makers is unclear. Grover interprets Broadwood's production of a grand equipped with a full iron frame in 1847 as evidence that by mid-century attitudes were changing.[537] Contrary evidence presents itself, however, in Rimbault, who states that metal was still considered injurious to tone.[538] This negative attitude towards metal bracing was based not only on the opinion of contemporary musicians, but also on that of the engineer Dr William Pole whom Henry Fowler Broadwood consulted regarding the construction of an iron frame in the late 1840s.[539] A rather different reason for English reluctance is suggested by Arthur Loesser who claims that this reticence towards metal may have been rooted in an association with its use in crafting weapons of war. He attributes the subsequent change, whereby metal was regarded more favourably, to a newly emerging association with money and progress.[540] Testimony to some residual reticence on the part of English makers is evidenced in extant instruments. A square piano, dated 1844, property of The Bate Collection, Oxford (Fig 5.13), an amboyna grand piano, dated 1845, property of Finchcocks Musical Museum and a grand piano, dated 1845, property of The Royal Academy of Music Museum, all contain decorated metal sections.

---

[536] Exhibition prospectuses for Van Overbergh, Franche and M. Herding (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09
[537] Grover, *The Piano: its Story from Zither to Grand*, p.110.
[538] Rimbault, *The Pianoforte*, pp.162-8.
[539] Wainright*, Broadwood by Appointment*, p.149.
[540] Loesser, *Men, Women and Pianos*, p.202.

Fig 5.13: Decorated metal in Broadwood square piano, 1844, The Bate Collection, Oxford (photograph taken by B. E. Smith). Reproduced by permission of The Bate Collection, Faculty of Music, University of Oxford.

Further confirmation that decorated metal was popular at mid-century is provided by W. Jenkins' prospectus, which gave consumers the option to have the 'metallic string plate decorated in tortoiseshell and gold' on all forms of upright and semi-grand pianos. Purchasers of semi-grands could also have the wrest plank and metallic tubes decorated in identical fashion.[541]

The relationship between sight and sound, particularly in the upright piano, is complex; materiality was dictated both by technological developments and consumer desire for an attractive product. Some pianos were crafted such that their musical function was concealed when closed. One such example is Astor & Horwood's square piano, dated 1820, in The Bate Collection, Oxford. When not in use, the presence of drawers either side of the keyboard, coupled with the inconspicuous positioning of the pedal at the very back of the instrument, are sufficient to make the casual observer

[541] W. Jenkins Exhibition Prospectus (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09

believe they are looking at some kind of desk. In some instances, decorative elements were positioned such that they are only evident when the piano was in use, suggesting that the aesthetic and musical function went hand in hand.

Fig 5.14: Detachable candlestick on velvet cushion inside key cover of Hewitt cabinet upright piano, St Fagan's Museum of National History (National Museum of Wales) (photograph taken by B. E. Smith). Reproduced by permission of The Museum of Wales.

In the aforementioned cabinet piano by Hewitt, detachable candlesticks are placed on velvet cushions inside the keyboard cover (Fig 5.14). This feature, which has no practical function, is clearly for show, but it is an expression of extravagance that eludes the viewer unless the lid is raised ready for use. The most likely reason for such variable priorities is rooted in mid-century makers' understanding of the widely differing degrees of knowledge and taste governing how consumers exercised their power of choice.

5.3: The decreasing size of the upright piano: technological change stimulated by social demand

Irrespective of whether their primary focus is technological or social, piano historians are in agreement that the evolution of the upright from the grand piano was driven by increasing demand from consumers who did not have sufficient space in their homes to accommodate a larger instrument.

Although many writers are critical of the upright action, which was, certainly in the early stages of development, considered inefficient, prevailing popularity both in England and France is commonly attributed to size and price. Scholars such as Ernest Closson, Arthur Loesser, William Leslie Sumner and others are all in agreement in this matter.[542] Fortunately, the evolutionary path of the upright piano is well documented, which makes the relationship between social need and technological response easy to trace. As the piano was turned at 90 degrees, makers faced the dual challenge of how to make the action operative in the absence of gravity and where best to position the hammers and tuning pins. The sticker action, followed by the tape-check action, emerged in response to the first problem, and the hammers were moved to the front of the instrument whilst the tuning pins were moved to the top of the casing, in response to the latter. As the piano grew smaller, makers negotiated the problem of how to fit the strings in the casing whilst still maintaining a decent tone. Retaining vertical strings whilst making them thicker, using springs at the bottom of the bass notes, oblique stringing and finally cross-stringing were born as a result. The first upright grand was devised by the English maker William Southwell in 1795, followed by the cabinet piano, a design where the casing rested on the floor rather than on a stand, also invented by Southwell in 1807. Attempts at further reducing piano size were manifest in an instrument which Southwell named the 'piano sloping backwards' in 1811, in Frederick William Collard's upright square piano and perhaps most famously in the successive 'cottage' and 'piccolo' inventions of Robert Wornum.[543] The search for the ultimate small piano continued, pursued predominantly by French makers, culminating in the form of Roller & Blanchet's one-metre-high instrument with a semicircular hole in the base for the performer's feet, and Henri Pape's series of console pianos which used cross-stringing instead of the more usual vertical or oblique style used by English makers.[544]

---

[542] Closson, *History of the Piano*, p.89; Loesser, *Men, Women and Pianos*, p.248; Sumner, *The Pianoforte*, p.66; Kentner, *Piano*, p.18; John Paul Williams, *The Piano* (London: Aurum Press Ltd, 2002), p.29; Siepmann, *The Piano*, p.15.

[543] Harding, *The Piano-Forte*, pp. 221-32. Wornum also registered other patents relating to cottage and piccolo style upright pianos in 1811 when he produced a smaller instrument with diagonal stringing and also in 1828 when he patented improvements to the piccolo action.

[544] Harding, *The Piano-forte*, pp.236-9.

That patents relating to small instruments registered decades before the Exhibition expressed a social purpose suggests that exhibitors who chose to address the problem were tackling a long standing issue. The patent for Southwell's aforementioned 'piano sloping backwards' mentions 'the front of the instrument being so much away from the face'.[545] Simon Thompson's patent of 1830 for an 'instrument ... constructed much below the usual height' stated that 'the objection made by vocal performers when accompanying their own voices on an upright pianoforte 'that the silk front or face absorbs the voice' is completely obviated'.[546]

Although none of the *ODIC* descriptions admit that smaller pianos were made in response to social requirements, they were interpreted as such by commentators. That Richard Hunt's 'Tavola' piano could be placed in the centre of a room was considered one of its merits by *The Expositor;* a similar verdict was reached by the same writer in relation to Henri Pape's console piano.[547] Without reference to any particular exhibit, a journalist for *The Morning Chronicle* told readers that the cottage piano was 'unquestionably one of the most important improvements effected in the manufacture of pianos', one of the reasons being that it was capable of 'being placed between the audience and the performer'.[548] English makers who chose to exhibit pianos of cottage dimensions or less were extremely numerous, as indicated in Appendix A. They included, to name but a few, J. Brinsmead, C. Cadby, Collard and Ennever & Steedman; both jointly submitted pianos by Jennens & Betteridge/Dimoline and J. C. Crace/Lambert & Co were also of this type. Foreign examples, which were not quite so prevalent, included pianos by Cropet, Claude Montal and Henri Pape of France, Cuijpers of The Netherlands and John Herbert of Canada. It is significant however, that *ODIC* descriptions, commentaries and most advertisements pertaining to piccolo pianos extol its virtues in terms of affordability. As will be discussed in Chapter 6, although their dimensions clearly facilitated visibility, the way in which they were marketed and consumed appears to have rested upon an economic premise.

---

[545] *Patents for Inventions*, p.65
[546] *Patents for Inventions*, p.112
[547] *The Expositor*, 1851, University of Reading Special Collections, p.229 and p.41.
[548] *The Morning Chronicle*, 10 June 1851.

Whereas some exhibitors addressed the question of visibility by reducing size, others responded by modifying construction to impact outward appearance or effecting purely cosmetic changes. The best account of early-nineteenth-century experiments is to be found in Harding's *The Piano-forte*. One example cited is Broadwood's cottage upright piano, designed with a section of reduced height in the centre, an example of which is extant at The Musical Instrument Museum in Brussels (Fig 5.15).[549] Its dimensions will be considered in comparison with other upright forms later in this chapter.

Fig 5.15: Broadwood upright piano, 1835, Musical Instrument Museum, Brussels. Reproduced by permission of The Museum of Musical Instruments, Brussels. Photograph obtained from http://www.mimo-international.com/MIMO (accessed 2 March 2016)

Eulriot's patented lyre-shaped piano, in which a space was made between the arms of the lyre and a moveable reflective glass placed behind the instrument so that the performer could be seen by the audience, appears to be addressing the same purpose. Perhaps surprisingly, the patent focuses

[549] Harding, *The Piano-forte*, p.268; presumably the patent is no longer extant as the author speculates that 'the dip in the middle is probably to enable the performer to be seen and to permit his voice to carry into the room'.

mainly on the ingenuity of the repetition action which uses rollers to facilitate movement; if it was the maker's intention to promote visibility this has been omitted from the description.[550] Harding's final example, the only one of which finds a comparable example amongst Exhibition pianos, was Thomas Woolley's 1846 patent for a piano mounted on a platform; its design is similar to the Lyre piano exhibited by Frederick Hund & Son. Although full details are elusive, the brief description states that 'the stand enables the singer to be seen'.[551]

At the Exhibition, the approach taken by both Brinsmead and Akerman, which was a purely cosmetic measure, was to decorate the back of the piano. It could then be placed in the centre of a room without offending the audience with the usual plain functional fabrics (Fig 5.16).

Fig 5.16: Beale & Co, Euphonicon Piano, dated c.1850, Buckinghamshire County Museum (photograph taken by B.E. Smith). Although this type of piano was not present at the Exhibition, the principle of decorating the back of the instrument was similar to other forms of upright. Reproduced by permission of Buckinghamshire County Museum Trust.

[550] *Ibid*, p.236; for description of patent with diagram, see pp.252-5.
[551] *Ibid*, p.339

The former maker chose to apply this technique to a cottage upright, the latter to a European-style lyre instrument. In the absence of documentary evidence, it is difficult to say how important this feature would have been to the average householder at mid-century, but domestic guides written some 30 years later indicate that decorated backs were considered essential. Writing in 1881, addressing a readership towards the top end of society, Mrs Haweis criticised the upright form, calling for decorations to render the overall effect more pleasing to the eye. The back of the piano should be treated such that:

> Some tracery or arches of Gothic form might replace the patch of green cotton at back; these, when the pianoforte stood well out in the room, could be filled by handsome oriental jars without contact with the instrument.[552]

Addressing a more solidly middle-class audience in 1888, Mrs Panton advised at some length how the 'lamentable appearance of piano backs' could be remedied. The red flannel or baize back which she thought so ugly can be replaced by:

> a crewel worked piece of art coloured serge, the useful and cheap Japanese leather paper, or else by a square of cretonne similar to that used for the curtains; but I prefer either the serge or paper to this. If the serge be worked with bulrushes and iris and grasses, or with long sprays of honeysuckle, the effect is charming.... If a more careless arrangement be desired, a large square of drapery can be arranged gracefully over the back, securing it with small tintacks on the inside of the lid, or a large Japanese screen can be placed before it....[553]

The approach taken by the exhibitor Hund & Sons was to alter the construction of the piano so as to elevate the performer on a platform. Although the maker's particulars in the *ODIC* state only that the platform served as a 'sound conductor', it is plausible that performer visibility was also a motivating factor. The invention posed some unusual technical difficulties and in the absence of a surviving patent it is difficult to know exactly how these were addressed. If the strings simply continued vertically into the platform, the arrangement would have posed no other difficulty than that

---

[552] Mary Eliza Joy Haweis, *The Art of Decoration* (London: Chatto & Windus, 1881), p.320.
[553] Jane Ellen Panton, *From Kitchen to Garret: Hints for Young Householders* (London: Ward & Downey, 1888), pp.86-7.

faced by makers of small instruments. Had the strings been somehow coiled within the space, however, it is difficult to see how an appropriate level of tension could have been achieved or how broken strings could be replaced. It seems that commentators, namely *Newton's London Journal* and *The Morning Chronicle*, thought improved sound and performer visibility were the intended goals. The platform was intended as a sound conductor, which would be at least partly immune to the absorbency of household carpeting; it was also designed to elevate the performer because it could be positioned in the middle of a room and because the entire instrument stood just 3 ½ feet from the ground.[554] That the aforementioned Mrs Haweis advocated the use of platform pianos as a means of ensuring visibility and audibility in preference to what she describes as 'the present unpopular cottage grand' suggests they were being made at least until the 1880s.

However much visually pleasing designs were commended by Exhibition commentators and sought after by householders, however, there was universal acknowledgement that design preferences could not be pursued at the expense of structural integrity. Mrs Haweis criticised makers for their ideas pertaining to form and style, but their authority in technological terms was ultimately respected.[555] Although Mrs Panton's goal appears to have been to disguise the grand piano, to the extent that it was practically invisible, she conceded that any visitor wishing to play must be able to lift the lid.[556] Such sentiment was echoed in various Exhibition commentaries; readers were left in no doubt that a pretty, novel instrument was not worthy of attention unless it was also capable of adequate sound production.

The question of whether the cottage piano facilitated visibility, or whether it was merely a stepping stone onto the diminutive piccolo, is, I believe, best answered using anthropometric data. Although certain mid-century artworks suggest that performers were visible over the top of small upright pianos, this type of evidence is problematic because there is no way of knowing either the height of the woman portrayed or whether the dimensions shown represent reality. One such case is evident in an

---

[554] Newton, *The London Journal of Arts, Sciences and Manufactures, Volume 39*, p.34; *The Morning Chronicle*, 26 July 1851.
[555] Haweis, *The Art of Decoration*, p.320.
[556] Panton, *From Kitchen to Garret*, p.88.

engraving by H. Bruyeres where a young woman is seated at an instrument which is presumably a pianino-style instrument in the manner of Pleyel (Fig 5.17).

Fig 5.17: Lady at Piano, 1847, Mary Evans Picture Library No 10112304 Source: Engraving by H Bruyeres in 'La Phrenologie'

I propose that a more reliable method would be to establish what constituted 'average' female height at mid-century and then to ascertain how measurements when standing translate into a seated position using a modern subject of similar size. By comparing a range of seated heights to the dimensions of extant cottage and piccolo pianos, it is then possible to postulate what size of upright would have best flattered the female performer.

The following data set out in Fig 5.18, taken from Exhibition prospectuses and price lists, indicates that not only did the descriptive terminology used by makers vary, but the dimensions of particular models were not universally agreed. If the dimensions stated in exhibition prospectuses are representative of the piano industry in general, the smallest

piano available at mid-century was 3’ 8’’ (112cm) and the largest instrument qualifying for the description ‘cottage’ stood at 4’ 8 ½’’ (143.5 cm).

Fig 5.18: Table showing height of upright pianos as advertised in Exhibition prospectuses and price lists.

Exhibition Prospectus/price list	Piano type/description	Height*
J. Brinsmead	Piccolo/semi-cottage pianos	3’ 10 ½’’ (118 cm)
	Cottage pianos	4’ 8 ½’’ (143.5 cm)
	Semi-cabinet pianos	5’ 5 ½’’ (166.5 cm)
	Cabinet pianos	6’ 6’’ (198 cm)
Woolley	No 1 Vocale	3’ 10’’ (117 cm)
	No 2 Utileton	4’ 5’’ (134.5 cm)
	No 3 Grand Upright	5’ (152.5 cm)
George Luff & Sons	Piccolo piano	3’ 8’’ (112 cm)
	Boudoir piano	4’ (122 cm)
	Albert cottage	4’ 3’’ (129.5 cm)
	Cottage cabinet	4’ 9’’ (145 cm)
	Victoria cabinet	5’ 7’’ (170 cm)
	Grand cabinet	6’ 4’’ (193 cm)
Broadwood	Cottage piano (single action)	3’ 11’’ (119.5 cm)
	Cottage piano (double action)	4’ 1’’ (124.5 cm)
	Cottage piano (full size)	4’ 6’’ (137 cm)
	Boudoir piano	3’ 10’’ (117 cm)

*Prospectus measurements are in feet and inches; metric equivalents have been added to the nearest half cm

A glance at data obtained from extant examples set out in Fig 5.19 below reflects a similar situation: the smallest available piano, purchasable from

Priestly, stood at 36 ½" (93.5cm); the maximum height of a 'cottage', manufactured by Brinsmead, totalled 57" (145.5cm).

Fig 5.19: Table showing height of surviving upright pianos, c.1829-1860

Piano maker	Piano type and date	Height	Collection and location details
A. Dimoline of Bristol	Cottage upright, c.1850	136 cm (53 ½'')	Bristol Culture: Bristol City Museum and Art Gallery
Broadwood	Piccolo upright, c.1850	112 cm (44'')	Bristol Culture: The Red Lodge
J. Brinsmead	Cottage upright, 1851	145.5 cm (57'')	Museum of London
Collard	Cottage upright, c.1850	128 cm (50 ½'')	Museum of London
R. Wornum	Piccolo upright, 1829	109 cms (43'')	Museum of London
Priestly	Piccolo upright, pre 1860	93.5 cm (36 ½'')	Victoria & Albert Museum, London
Broadwood*	Cottage upright with dipped centre, c.1835 (photograph shown at Fig 4.13)	109.5 cm at lowest point (43'') with a total height of 129.5 cm (51'')	The Musical Instrument Museum, Brussels

*measurements for this piano were provided by Pierre Geveart, Conservator at The Musical Instrument Museum, Brussels

Interpretation of anthropometric data is admittedly problematic and consequently there is some difference of opinion amongst scholars. Whereas Joachim-Voth & Leunig concludes that disease reduced adult height, a study by Heintel & Baten reveals opposite findings. Whereas R. V. Jackson claims that maximum adult female height was not attained until after the age of 21 years, Nicholas & Oxley conclude that women were fully grown

at 18 years old. Based on measurements cited in such studies a young woman of marriageable age in 1851 would have measured around 61.35" (Fig 5.20).

Fig 5.20: Table showing female height relative to age in the mid-nineteenth century.

Female height (inches)	Date of birth	Age in 1851	Reference
61.82 61.35 61.63	1816 1828 1835	35 23 16	Johnson & Nicholas
61.68 62.58	1818 1819	33 32	R. V. Jackson
60.00	1819/1820 (subjects were aged 17-18 years at date of study)	31-32	Parliamentary Session Papers

Sources: Paul Johnson and Stephen Nicholas, 'Male and Female Living Standards in England and Wales, 1812-1857: Evidence from Criminal Height Records', *The Economic History Review, 48* (1995), 470-81, here 477; R. V. Jackson, 'The Heights of Rural Born English Female Convicts transported to New South Wales', *The Economic History Review, 49* (1996), 584-90, here 586; Parliamentary Session Papers, 31 January-17 July 1837: Returns by Inspectors of Factories, p.13.

Admittedly, most of the data is generated from the social underclass, namely convicts, prisoners and factory workers. If it can be accepted that growth was stunted by arduous labour, coupled with poor diet, it seems reasonable to assume that middle-class women would have grown slightly taller than their working-class counterparts. That being the case, I have taken the following measurements set out in Fig 5.21 using a subject who at the date of writing, when standing, measured 5' 2 ½'' (159cm), just in excess of the recorded working class average. It seems therefore that the 'cottage' piano was not just a stepping stone in the search for a piano small enough to facilitate performer visibility; rather it was, in some instances, of such size

that the average middle-class woman could have been seen and heard over the top.

Fig 5.21: Table showing various 'seated' heights for a 5' 2 ½" (159cm) female.

Height when standing	159 cm (5' 2 ½'')*
Height when seated on a chair measuring 45 cm from the seat to the ground (17.5'')	130 cm (4' 3 ½'')
Height when seated on a chair measuring 49 cm from the seat to the ground (19'')	133 cm (4' 4 ½'')
Height when seated on a chair measuring 53 cm from the seat to the ground (20 ½")**	136 cm (4' 5 ½'')

*all measurements in inches are recorded to the nearest half inch

** this is the maximum height at which the subject could be seated whilst still being able to reach the pedals

The development of the piccolo piano therefore may have been precipitated by the need for greater visibility, it may have been designed to cater for younger users, or, as will be discussed in Chapter 6, its creation may have been more to do with the economics of smaller casing.

The final question for this section is whether or not the need for performer visibility was rooted in the role of the piano in courtship. That the piano was the site of middle-class liaisons, both of a legitimate and of an illicit nature, is widely acknowledged and is explored by scholars such as Richard Leppert, Jodi Lustig and Mary Burgan.[557] The sources that underpin these studies, however, are chiefly literary or iconographical, and little or no physical evidence has been derived from surviving instruments. Whether or not materiality was in any way determined by the need to show-case the female form seems unlikely based on present evidence, although more

[557] Leppert, *The Sight of Sound*; Lustig, 'The Piano's Progress', in Fuller & Losseff, ed. *The Idea of Music in Victorian Fiction*, pp. 83-100; Burgan, 'Heroines at the Piano', *Victorian Studies, 30,* (1986), 51-76

detailed studies of upright pianos made around mid-century may yield a different answer. Any such causal pathway would be difficult to identify, however, as designs which flattered the performer also enhanced sound and suited the smaller pocket. Pianos intended to improve visibility might have survived because they also served as sound enhancers and small pianos enjoyed continued popularity largely because they were affordable, opening up the opportunity for piano-ownership ultimately to the lower end of society. In short, characteristics that facilitated courtship in the early and mid-nineteenth century were materially inseparable from those that aided sound production and alleviated budgetary constraints.

5.4: Developing piano sound: the impact of science, makers' techniques and musical taste

This section considers the ways in which piano makers worked to improve tonal quality. Just as acoustical engineers conducted experiments with lay test subjects in the late twentieth century to establish what customers wanted their cars to sound like, a concept they denoted 'target sound', so piano makers consulted with consumers, both amateur and professional, to establish what they considered a 'good tone'. Despite being some 150 years apart, the problems facing makers were similar: the lack of an established sonic index with which to communicate opinion; the subjectivity of response, namely how two people could experience the same sound, yet one find it pleasing and the other not; the problem of relating sound evaluation to underlying design.[558] If a customer 'liked' the sound of a particular instrument, piano makers then faced the question of how that sound quality had been achieved. If a particular instrument was deemed lacking in tone, the question of how to remedy the situation was answerable only if constituent ingredients were identifiable. That experimentation was in progress concerning all elements listed below, which are now known to contribute to tone, is unquestionable. Whether the fruits of such

[558] Eefje Cleophas and Karin Bijsterveld, 'Selling Sound: Testing, Designing and Marketing Sound in the European Car Industry', in Pinch and Bijsterveld, ed. *The Oxford Handbook of Sound Studies*, pp.102-24, here pp.109-17.

experimentation, which are evident both in patents and extant examples, were the product of chance, an understanding of acoustical principles or a response to musical tastes, is the main focus of this section.

Mid-century publications, for example *Newton's London Journal*, written by Dr William Pole, claim that relatively little was known about tone at mid-century. In the introduction preceding his assessment of Exhibition pianos, Pole is critical of makers in terms of their understanding of mechanical principles and acoustics:

> The theory of the production of tone, at least as regards its quality, is at present wrapt in mystery; few persons seem to have any definite idea what are the essential conditions under which 'a good tone' in general, or still less, any particular quality of tone, can be ensured. A series of tentative experiments leads to certain methods of construction which are considered good; all possible care is then taken to avoid defects in the manufacture; but the result is, after all, frequently due to some fortuitous combination of circumstances, which cannot be foreseen.[559]

What makes his assertions viable is that mid-century treatises on sound published in England make no mention of the importance of partial tones as component parts of a note. The relationships between pitch and string length, weight and tension were clearly understood; the role of partials, however, was either ignored or dismissed as irrelevant. In his publication *Sound and its Phenomena*, Ebenezer Cobham Brewer concurred with Newton that individuality of tone was a phenomenon that defied explanation.[560] William Mullinger Higgins acknowledged the existence of partials, describing them as 'harmonic sounds' detectable by the practised ear, but offered no explanation for their presence, describing them as merely 'curious'.[561] Gottfried Weber accepted that partials made up part of the sound when a note was struck, a phenomenon he referred to as 'accessory sounds', but considered their presence largely damaging to the fundamental tone. He dismissed them as 'almost so inaudible, that they can produce no effect at all, and consequently do no injury'. This view was by no means

---

[559] Newton, *The London Journal of Arts, Sciences and Manufactures, Volume 39*, p.26
[560] Ebenezer Cobham Brewer, *Sound and its Phenomena* (London: Longman, Brown, Green and Longmans, 1854), pp.71-2.
[561] William Mullinger Higgins, *The Philosophy of Sound and History of Music* (London: William S. Orr & Co, 1838), pp.76-7.

universal, however, as the writer mentions that his work contradicts findings by Professor Maass and unnamed others who claim that what they call 'participating tones' are essential to the quality of the overall sound.[562] It is, however, unlikely that a definitive explanation of fundamentals and partials was available to an English readership until Hermann Helmholtz's *On Sensations of Tone* was translated in 1885.[563] That mid-century piano makers did not understand such principles, however, does not mean that they did not realise that the undesirable partials could be diminished, or even extinguished, from the overall mix by calculating a specific strike point.

That tonal quality was difficult to analyse is perhaps unsurprising given the lengthy list of variables that are now known to contribute to timbre. The following list is mainly a repetition of the factors outlined by Robert S. Winter's article 'Striking it Rich', to which some additions have been made based on work by Good Laurence and Dolge:[564]

- The size, mass and type of covering on the hammer; a hard material will generate many upper partials creating a harsh, bright tone whereas a soft material will generate less, creating what Good describes as a 'thick fuzzy' tone.
- The speed of the hammer blow and the escapement; a lingering hammer on the string will impede the tone.
- The place on the string where the hammer strikes; an optimum striking point will maximise harmonious partials whilst diminishing dissonant ones.
- The length, thickness, and type of piano wire; strings must be made of pure steel, be of the same mass and shape throughout and free of twisting.

---

[562] Gottfried Weber, *The Theory of Musical Composition* (London: Robert Cocks & Co, 1851), pp.7-9.
[563] Hermann Von Helmholtz, *On the Sensations of Tone*, trans. Alexander J. Ellis (New York: Cosimo, 2007).
[564] Robert S. Winter, 'Striking it Rich: the Significance of Striking Points in the Evolution of the Romantic Piano', *Journal of Musicology, 6* (1988), 267-92, here 269-70; Good, *Giraffes, Black Dragons and Other Pianos*, pp.7-22; Laurence, *The Evolution of the Broadwood Grand 1785-1998*, p.47; Dolge, *The Piano Makers*, p.51 and p.106.

- The size and location on the soundboard of the bridge; the positioning of the bridge relative to the bent side of the grand had a significant impact on tone.
- The material, sounding area and thickness of the soundboard; it was believed by some mid-century scientists that the soundboard actually contributed to sound quality rather than just acting as a resonator, a concept known as 'wave theory'.
- The weight, shape and location on the string of the damper that stops the tone.
- The string tension linked to the resistance of the frame; the transition from bichord to trichord, and from wooden to iron frame, was significant to the resulting sound.

With the exception of Laurence, however, none of the writers listed offer any indications as to the relative importance of these elements. His international reputation as a piano conservator renders his assertions that it was the finishing processes which achieved the desired tone, as well as generating the most profit, well worthy of note.[565] On this basis it is likely a hierarchy of importance existed whereby the regulation of the action and adjustment of hammer coverings (a process known as 'voicing') were the most significant factors.

Although Wainright believes that Broadwood pianos were developed in consultation with scientists, such as the engineer Dr William Pole, the majority of evidence points to a more practical, method-based process.[566] Dolge wrote in his piano history that makers operated without the benefit of scientific principles when constructing their soundboards, relying instead upon empirical evidence generated by experimentation.[567] When comparing strike-point ratios in instruments made at the end of the eighteenth century, Laurence concludes that sound was ultimately determined by the workmanship of staff responsible for finishing each piano rather than on any mathematical principles.[568] His claim concurs with that of Winter who dismisses Helmholtz's assertion that John Broadwood was the first to

[565] Laurence, *The Evolution of the Broadwood Grand*, p.74
[566] Wainright, *Broadwood by Appointment*, pp.148-9.
[567] Dolge, *The Piano Makers*, p.106.
[568] Laurence, *The Evolution of the Broadwood Grand*, p.34.

standardise string tension and strike point as early as 1788.[569] That makers operated largely outside the confines of science at this time, however, did not mean that experimentation was random; had trial and error been their only method it seems unlikely that designs could have been repeated. It is possible that continuous experiments were in fact a response to changing musical taste, something that Winter believes explains the great variety of strike-point ratios evident in late-eighteenth and early-nineteenth-century pianos. The strike points evident in a Graf piano dated 1820, which range from ratios of 7 to 12, are attributed to the need for a wide ranging tonal palette necessary for compositions such as Schubert's Impromptu in E flat major; the climbing register necessitates an increasingly brilliant tone.[570] Chopin's penchant for Pleyel pianos is explained through comparison of strike points in a surviving example dated 1838 compared with a piano by Erard dated 1853; the tonal palette of the former is sympathetic to compositions such as Chopin's F minor fantasy.[571] Ultimately, evidence derived from material examples is ambiguous; the wealth of documentary evidence at the Broadwood archive, however, if representative of the mid-century piano industry in general, offers an invaluable corroborative resource.

The prevalence of documentation containing dimensions is testimony to the fact that piano makers were not only recording their workings but consciously trying to devise a formula for the ideal instrument. A comparison chart dated 1856 documenting strike points for pianos by Broadwood and Streicher is testimony that makers understood the importance of strike-point ratios; they also recognised the need for data recording, possibly with a view to investigating how 'target sound' differed according to English and Viennese tastes.[572] That the practice of comparing strike points continued well into the latter half of the nineteenth century, as evidenced in a letter to A. J. Hipkins reporting ratios in Steinway pianos, clarifies the continuing importance of visual technique as a means of ultimately reproducing 'target

---

[569] Winter, 'Striking it Rich', *Journal of Musicology, 6* (1988), 267-92, here 272-3
[570] *Ibid*, 282
[571] *Ibid*, 286-7
[572] Table showing strike points for pianos by Broadwood and Streicher, Surrey History Centre, 2185/JB/6/4/21B; the table is written on paper watermarked with the date 1856 and the archive have dated the document accordingly.

sound'.[573] Letters from Francis Allan, a correspondent believed to have been a Broadwood employee, dating from 1859 to 1860, all contain measurements of different component parts.[574] Correspondence dating from the 1860s between Andrew Oborne, a former company employee who emigrated to the US, and Henry Fowler Broadwood indicates that Broadwood were able to compare their grand pianos to those of the American maker J. Chickering using both model instruments and diagrams. From data contained in a letter from Oborne dated 30 October 1866, Broadwood were able to compare their wrest planks, string length, tension and casing size, adjusted to improve string placement, with those of their competitor.[575]

Notwithstanding the importance of visual comparison, the 'audile' technique of employees is unquestionable. Francis Allan's aforementioned letters of 1859 contain evidence of sonic language used to classify the tone of iron grand pianos, a comparison of the tonal range of different instruments made using the same method, and a comparison of resulting sound with constructional changes:

> The last two iron grands finished on Saturday and tuned up today are very fine instruments I think fully equal to the last two, the same ring and distinct articulation of each note which is peculiar to that class of instruments; (192)17 I think at present is the sweetest and (192)18 the most powerful. The new belly that you had had put in 255 has done wonders for it. It is now the most powerful instrument in the house and would fill I believe the Crystal Palace such is now the volume of tone that it possesses.[576]

Letters by the same author also present evidence of an ability not only to assign particular tonal quality to certain instruments but to identify whether

---

[573] BL Add.41637, ff.89-90, Letter to A. J. Hipkins from A. J. Ellis, 15 August 1884.

[574] Although the identity of Francis Allan cannot be determined with absolute certainty, according to Mr Robert Simonson, archivist for the Broadwood Archive at Surrey History Centre, his names appears on a list of gratuities, 1855-1857, Surrey History Centre, 2185/JB/15/9, in which he receives the sum £15 on 7 July 1855, the sum of £20 designated for 'F Allen to go to Germany' on 2 August 1856, and £10 for F Allen on 14 July 1857. That his name appears on correspondence sent from both Bridle Lane and 33 Great Pulteney Street further suggests his status as a senior employee. Letters to Broadwood from Francis Allan dated 27 September 1859, Surrey History Centre, 2185/JB/6/4/23, letters dated 1860, 2185/JB/6/4/24A, 24B and 25 all contain measurements relating to the alteration of wrest planks.

[575] Letter from Andrew Oborne to Henry Fowler Broadwood, 30 October 1866, Surrey History Centre, 2185/JB/6/4/44.

[576] Letter from Francis Allan to Broadwood, 27 September 1859, Surrey History Centre, 2185/JB/6/4/23.

that sound was the same as that which consumers were known to appreciate:

> I enclose an abstract of the three last Grands that I have tested and also that of the .... No 14 in that you may compare them with it. The latter has turned out a very fine instrument in all respects clear and at the same time powerful in tone. The 19994 .... 13 is finished but not regulated. Many people will prefer it for its sweetness and clear ring though not quite so powerful.[577]

Broadwood were dependent not only upon their employees to evaluate sound within the workshop but they were also vulnerable to public opinion. A letter from A. G. Robertson, a piano retailer in Edinburgh, dated 1836, reported that Broadwood grands were proving insufficiently powerful to cater for contemporary taste. Whether Robertson is referring to the professional or amateur market is unknown, but news that customers were turning their attention to pianos by their main rivals, Erard, would no doubt have been a cause for concern.[578] Broadwood's response to this letter has not survived, but it is likely to have been similar to that written four years later to M. Moses, a wholesaler in Dublin. Although the identity of the 'competitor' is unspecified it is likely that Erard pianos are the make stated here as being preferred by this regional audience. Relying on the self-professed impartiality of Moses, and presuming upon a friendship existing between maker and retailer, Henry Fowler Broadwood asks why his pianos are being overlooked; is it to do with tone or touch?[579] The response from M. Moses is also missing, but a letter of reply some 18 months later indicates that Broadwood were still struggling to establish why their pianos were not selling more readily. In a letter dated 1841, Moses reported that Collard's semi-grand pianos were most popular because they 'never go out of order or break strings'. In order to explain why the equivalent Broadwood model had not achieved the same success, Moses relies upon the opinion of someone whom he describes as 'a professor' whose credentials are unknown.

---

[577] Letter from Francis Allan to Broadwood, 10 November 1844, Surrey History Centre, 2185/JB/6/4/34.

[578] Letter from A. G. Robertson, Music Saloon, 39 Princes Street, Edinburgh, to Broadwood, 26 January 1836, Surrey History Centre, 2185/JB/6/4/37.

[579] Letter from Henry Fowler Broadwood, to M. Moses, 27 March 1840, Surrey History Centre, 2185/JB/6/4/42.

According to this unknown expert, Broadwood semi-grand pianos were allegedly deficient due to a 'weakness in the tenor'.[580]

The importance of the opinion of 'professors' also features in correspondence with the aforementioned Andrew Oborne concerning the new iron grand:

> The instrument will go out to concerts and we shall soon hear from Professors whether they find either touch or tone improved. I have in the same way tried Erard's and other actions – of course without drawing the Professors attention to the circumstances – but I have always hitherto had to fall back upon what we best understood – the old action with the proportions enlarged to suit modern requirements.[581]

The letter suggests that the term 'professor' meant performers given that they were expected to comment on the merits of touch as well as tone. That professional opinion was sought concerning a variety of makes, in circumstances where the purpose of the enquiry was undisclosed, suggests that visual and aural comparison was a matter for secrecy. Given the date of the letter, it is possible that improvements based on such verdicts were needed in readiness for the forthcoming 1867 Paris Exhibition.

Feedback from professional pianists was not just a catalyst for improvement but also a matter of endorsement of a finished product. In some instances, professional verdicts were pleasing, offering official confirmation that the desired 'target sound' had been achieved. One such example appears in a letter from Daniel Rose to his employer recording the reaction of Mrs Lucy Anderson, pianist to Her Majesty, to a Broadwood grand piano purchased for Buckingham Palace. He wrote that having tried the piano, she 'expressed herself delighted both with its tone and appearance'.[582] Professional feedback was not always favourable, however, as was the case of the piano delivered to Clara Schumann during her London visit of 1871. In her initial letter to A. J. Hipkins, dissatisfied with the instrument delivered to her, she asks to try a new selection of pianos in the hope of finding one

---

[580] Letter from M. Moses to Henry Fowler Broadwood, 13 December 1841, Surrey History Centre, 2185/JB/6/4/43B.
[581] Letter from Henry Fowler Broadwood, to Andrew Obourne, 2 January 1867, Surrey History Centre, 2185/JB/6/4/45.
[582] Letter from Daniel Rose to Henry Fowler Broadwood, 6 August 1838, Surrey History Centre, 2185/JB/6/4/59D.

'where the tones go a little deeper'.[583] Five days later, she reports that the action feels heavy, something she initially attributes to personal tiredness, but later to what she deems an unsatisfactory servicing procedure. She also complains that 'the sound is not so brilliant as it was before; it sounds dull, as all my friends told me'. Although Mrs Schumann is apologetic, she alludes to her professional status, finishing her letter 'you will understand how important it is for me to feel quite comfortable on the piano'.[584] She is able to remember the previous tone quality, compare it to that of the same piano once serviced and identify the difference, yet she is unable to say why such changes have occurred.

Probably the most significant evidence defining the relationship of maker and musician is manifest in a letter from Charles Hallé written in the wake of Broadwood's defeat at the Great Exhibition. Anxious to determine why their Council Medal was revoked, Henry Fowler Broadwood asked Hallé to compare his own grand pianos with those of Erard in a concert setting, with a view to establishing precisely how the instruments were different. The following extract from his letter of reply clarifies the respective domains of authority occupied by makers and musicians respectively:

> I played the first two pieces on your piano and the last two on Erards; and the first observation I made is that in the harmony of beauty and richness of tone there is no comparison, yours being far superior. I believe that the public unanimously shared my opinion. At least, everyone I have spoken to said the same thing, some even adding that the tone of the Erard piano, following yours, seemed at first utterly disagreeable. That question, it seems to me, has been totally resolved.
>
> Now as you have asked me to tell you frankly about the good qualities of the Erard, I shall obey you. This is what seemed to me to be the opinion of the public, as well as my own. First, as to the achievement of clarity in the very rapid passages, Erard undoubtedly had the advantage; does this happen because the tone is less rich and sonorous than yours, and is therefore more easily detached? I believe so. I found further that the tone of the Erard is capable of wider variety of shading – but this requires a longer explanation which I will do my best to give. I believe that the sum of the variations from

[583] BL Add.41636, ff.64-5, Letter from Clara Schumann to A. J. Hipkins, 13 March 1871.
[584] BL Add.41636, ff.66-7, Letter from Clara Schumann to A. J. Hipkins, 18 March 1871.

> pp to ff, if they could be measured, would perhaps be as great in your pianos as those of Erard but the character of the variation ('nuances') in Erard's is rather different, and the effect is definite, in this way; in your pianos, the quality of the sound from the pp to the ff remains identically the same, that is to say, that whether you play loud or soft you hear – believe me – that it is always the same instrument, the same sonority. In the Erard pianos, on the other hand, the nature of the sound essentially changes according to the manner of attack; play pp and it is veiled, ff and it becomes loud and even strident; from this a larger variety of effects is certainly derived.
>
> The difference in the quality of sound is sometimes so great between the ff and pp, that it seems to me impossible to believe that it is the same piano, without seeing it. This also makes certain effects much easier, for example, all the effects of Thalberg (I speak from memory) and I must say that although now after a year I have only rarely played on an Erard, even at home, your piano was more tiring in the concert than the other, and as the touch is no harder – on the contrary – and the repetition is <u>at least</u> as good, I cannot myself explain this, other than by the greater effort that one makes to achieve the necessary variation of shading to make an effect on the public. Could this be due to the action? I am not sure; but if you understand what I mean, I should like to have your opinion on this..... I believe – and I am utterly convinced of this – that if you could unite these qualities with those that your pianos already possess, you would produce a Phoenix that nothing could approach.[585]

It is telling that virtually all comments made with any certainty pertain either to sound quality or ease of touch; any attempt at explaining the causal link between the prevailing tone and touch with construction is at best tenuous. Hallé seems confident that the Erard piano is capable of a more wide ranging tonal palette and better clarity of repetition. He is also, rather reluctantly, prepared to admit that the Broadwood piano is very tiring to play. What he is unable to comment upon is why; this is clearly not his area of expertise and he defers back to Broadwood in this matter.

Although evaluation of sound was usually the sole province of the professional musician, there were instances in which musicians ventured into

---

[585] Letter from Charles Hallé to Henry Fowler Broadwood, 30 December 1852, Surrey History Centre, 2185/JB/87/10; the original letter is in French but a translation has been provided by David Wainright which is now kept at the Surrey History Centre.

the area of piano construction. One such example presents in the form of John Francis Barnett's 'graduated pedal', a device designed to permit the pianist to raise the dampers in one part of the register whilst preventing the continued vibration of the strings elsewhere. Writing in 1856, at the age of 19 years, by which time he had already secured a reputation as a concert pianist, Barnett identified the type of compositions in which such difficulties prevailed. In his opinion, the invention would be useful for the performance of works containing lengthy arpeggiated passages sounding simultaneously with sustained bass notes.[586] It seems safe to assume that Broadwood ignored his suggestion given that no invention matching this description emerged until 1874 when Steinway patented the *sostenuto* pedal.[587]

Although piano history scholarship is already accepting of the fact that musical taste did on occasion influence piano makers, and vice versa, my research reveals a largely reciprocal relationship existed between piano makers and musicians. Whether a particular instrument had a desirable 'target sound' was the province of the latter, whereas the task of determining how to modify construction in order to achieve said 'target sound' was dependent on the expertise of the former. That acoustical science played no direct part in piano making at mid-century is evident although makers did understand many of the variable factors impacting tone as a result of experimentation, comparison and record keeping. That makers relied upon both visual and aural methods to assess their products is also apparent.

5.5: The sound of silence: hand-strengthening aids and modified keyboards

[586] Letter from John Barnett to Broadwood, 18 December 1856, Surrey History Centre, 2185/JB/6/4/21A. Although identity is not absolutely certain, Robert Simonson, the Broadwood archivist, believes that the John Barnett mentioned in the Broadwood wholesale customer ledgers for 1857-1862, Surrey History Centre, 2185/JB/29/46/1, p.497, is the same as John F. Barnett, the pianist composer born in 1837. His association with the company was presumably commercial; on 25 June 1861 he is recorded as hiring a grand piano for one night for a concert at St James's Hall and again on 22 May 1862.

[587] Good, *Giraffes, Black Dragons and Other Pianos*, p.24; a *sostenuto* or middle pedal on a grand piano operates such that 'if one plays a chord and, while holding down the keys, puts down the *sostenuto* pedal, that chord will continue to sound, but no other dampers are affected'.

It would have taken an especially observant visitor to spot the presence of this type of product amongst the multitude of pianos in the British section. Just one exhibitor, Robert Allison, submitted a piano with a keyboard designed especially to make learning scales easier, and only three manufacturers (two English and one French) entered devices on which piano students could practise without using a full scale instrument. Given that none of the usual commentators thought these products worthy of attention, and in the absence of surviving patents, descriptions contained in the *ODIC* offer the only evidence as to construction and purpose. Richard Andrews presented 'an apparatus for giving a good position to the hands, arms and fingers of pupils commencing the pianoforte: also for strengthening the fingers in exercises for that instrument'. The French maker Zeiger described his patented invention entitled 'The gymnasium of the pianist' simply as 'an octave pianoforte'. Robert James Edwards exhibited apparatus referred to as:

> An instrument intended to assist instrumental players. It resembles the pianoforte in appearance but when acted upon is perfectly silent. The keys are of porcelain. The degree of action is regulated by turning the screw at the back of the instrument.

The only device with a definite claim to silence is that of Edwards. Andrews' use of the word 'apparatus' suggests something more akin to Henri Herz's Dactylion invented in 1836, which consisted of a system of rings suspended over the keyboard, the idea being that finger strength could be developed by pulling the rings downwards. Whether or not Zeiger's keyboard was capable of sound is unclear but given the limited notational range stated this seems unlikely. Although evidence that such devices were intended to reduce noise is purely circumstantial, sources which document the amount of time spent on piano practice and the type of music played suggest that these products were conceived in response to social requirements. That the piano was considered a producer of noise will become evident, although whether it should rightly be categorised as part of the wider urban noise problem apparent at mid-century is questionable.

Piano-teaching primers published in the decades prior to the Exhibition indicate that piano pedagogy consisted of five finger exercises,

scales and repertoire in varying proportions. Students of a guide written by the concert pianist Eleanor Margaret Geary were instructed to undertake 30 minutes of finger exercises, 30 minutes of scales and one hour of repertoire daily.[588] John Freckleton Burrowes advocated a virtually identical pattern of exercises, scales, arpeggios, shakes and repertoire to be practised daily within an identical timescale. A system whereby six separate practice 'menus' were used on different days of the week was recommended, presumably to offer limited variety.[589] Carl Czerny's *Letters to a Young Lady* recommended that a minimum of three hours (including an hour lesson) per day should be spent at the keyboard. The author's suggestion that a young adolescent should be able to progress from complete beginner to virtuoso within a maximum period of 100 weeks, however, casts doubt on its practical usage. The emphasis here is more on repertoire than on scales and exercises; just half an hour per day is allocated to the latter.[590] Of the three writers, Geary is the only one to advocate the use of hand-strengthening devices, specifically the aforementioned Dactylion. In her opinion such apparatus was useful for fostering independence of the third and fourth finger, not because it facilitated silent practice if used away from the keyboard.[591]

That pianos were actually played for the period recommended seems credible in light of other evidence. Lily Hick's diary records that the daughter of her employers typically practised the piano for three hours daily.[592] That the diary is a candid account of her life is likely, given the forthright nature of the opinions expressed concerning the behaviour of household members; she seems unconcerned by the possibility that the diary might be monitored. In *Musings of a Musician*, the musician Henry Lunn criticised the practice of allowing young ladies to sit at the piano for four to six hours a day, describing it as 'cruel'. Neither his target readership nor his agenda are clear, but the

---

[588] Eleanor Margaret Geary, *Musical Education; with Practical Observations on the Art of Pianoforte Playing* (London: D'Almaine & Co, 1851), pp.41-9.
[589] John Freckleton Burrowes, *A Guide to Practice on the Pianoforte* (London: J. F. Burrowes, 1841), pp.12-4 and pp.26-32.
[590] Carl Czerny, *Letters to a Young Lady on the Art of Playing the Pianoforte*, trans. J. A. Hamilton (London: Robert Cocks & Co, 1839), p.iv and p.29
[591] Geary, *Musical Education*, p.15.
[592] Hendry, *The Crystal Palace: The Diary of Lily Hicks*, pp.111-2.

fact that he recommends the use of self-acting pianos as a solution to the problem, suggests that - in his view - learning to play the piano for the purposes of domestic entertainment required effort disproportionate to the result. His observation that it is easier to turn a machine off than to ask a young lady to desist, possibly hurting her feelings, hints that female efforts at the keys were sometimes unwelcome.[593] That Jane Welsh Carlyle wrote to her husband expressing some degree of relief that their neighbours had thoughtfully kept their piano playing limited to just two hours, from 9 to 11 in the morning, further indicates that long hours at the keyboard were indeed the norm.[594] Literary sources also have a contribution to make on this subject, not so much in terms of time spent at the keyboard, but in the way they highlight the response of household members forced to listen to piano practice. The works of Thackeray offer the most plentiful examples, many of which suggest a degree of sympathy for the young women forced to spend their time in such manner. The following extract from *Men's Wives* exposes a reality in which piano playing was thought both noisy and futile:

> By everything sentimental, when I see two kind, innocent fresh cheeked young women go to the piano and sit down opposite to it upon two chairs piled with more or less music books (according to their convenience) and, so seated, go through a set of double barrelled variations upon this or that by Herz or Kalkbrenner – I say, far from receiving any satisfaction at the noise made by the performance, my too susceptible heart is given up entirely to bleeding for the performers.[595]

The definition of noise as being 'a sound out of place', originally proffered by G.W.C Kaye, seems appropriate in this context.[596] Even the famously sensitive Thomas Carlyle was amenable to having a piano for use in his own home; 'a little music of an evening' was agreeable. What he objected to was his neighbours playing their keyboards either in a manner he found offensive or at a time when it interfered with his creative endeavours. One example of piano playing he described as 'two women literally crashing

---

[593] Henry C. Lunn, *Musings of a Musician: a Series of Popular Sketches illustrative of Musical Matters and Musical People* (London: Robert Cocks & Co, 1854), pp.91-2.
[594] Letter from Jane Welsh Carlyle to Thomas Carlyle, 7 September 1846. The Carlyle Letters Online http://carlyleletters.dukeupress.edu/ (accessed 10 May 2015)
[595] Thackeray, *Men's Wives*, p.112.
[596] The phrase was coined by the British physicist G.W.C. Kaye and is quoted in Bijsterveld, *Mechnical* Sound, p.240 and in Hendy, *Noise*, p.viii.

hoarse thunder ... (for it was louder than an iron-forge)'.[597] Two months prior to the completion of his famous soundproof study, he described the practising of a female neighbour as 'thumping like ten pairs of fanners, and squalling and trilling like a cat-concert twenty strong – it went thro' me like sharp shot and drove all writing far away!'[598] Complaints recorded in letters to family members are rife; when he wrote to his sister immediately after his study was complete, he described it as a 'nice little closet' that was 'silent from all pianos'.[599] That other sources document similar grievances suggests that the problem was generally widespread; it was not just an isolated issue, problematic only for a handful of intellectuals such as Carlyle and Charles Dickens. Charles Babbage's *A Chapter on Street Nuisances* published in 1864, for example, reported a situation where a professional musician was compelled to cover his piano with blankets in order to suppress the sound at the request of a neighbour.[600] A sketch in *Punch* entitled 'The Battle of the Pianos' published in 1855 shows two neighbours striving to drown each other out on their respective instruments (Fig 5.22).

Fig 5.22: 'The Battle of the Pianos', a sketch by John Leech in *Punch*, 1855, Plate No.82.

[597] Letter from Thomas Carlyle to Jane Welsh Carlyle, 17 August 1831. http://carlyleletters.dukeupress.edu/ (accessed 10 May 2015)
[598] Letter from Thomas Carlyle to Jean Carlyle Aitken, 28 September 1843.
[599] Letter from Thomas Carlyle to Jean Carlyle Aitken, 12 November 1843.
[600] Charles Babbage, *A Chapter on Street Nuisances* (London: John Murray, 1864), pp.7-8.

In light of other evidence it seems likely the sketch is reflective of the wider feelings of society, not just some personal peeve of the artist concerned.

Although it was undoubtedly a nuisance, piano playing cannot, however, be categorised as part of the wider problem of urban noise stemming from the activities of street musicians, livestock and various forms of transport. In a parliamentary debate in 1864 concerning the Street Music (Metropolis) Bill, one of the members present, a Mr Hankey, argued that it would be unreasonable to pass legislation prohibiting street music, as this would open the flood gates to other more minor complaints; piano playing is cited as one such example.[601] If John Picker is correct that the crusade for anti-noise legislation was in fact more an exercise in class and racial differentiation, in which the middle classes sought to clarify their identity, it seems even more unlikely that piano playing would have been part the equation, given that it was very much a middle-class domestic activity.[602] Mike Goldsmith's contention that the concept of noise was associated with vulgarity further suggests that piano playing would not have been part of the middle-class campaign for quieter cities.[603]

Notwithstanding the absence of direct evidence, it is likely householders would have welcomed the facility for piano students to conduct their daily finger exercises on silent devices. Those who did not appreciate the wider ramifications might have contemplated purchasing a piano that claimed to reduce the hours necessary to learn scales, perhaps not realising that this would render the student incapable of reverting to a conventional keyboard. That inventions in this vein continued into the second part of the nineteenth century is evidenced by the Digitorium, a five-key silent keyboard patented in 1866 by Myer Marks, an invention that was probably akin to the aforementioned device exhibited by Edwards. Unfortunately the patent does not shed any light on its intended purpose other than that it was meant to 'strengthen the wrists and fingers'.[604] Silence could have been an objective, but equally portability could also have been a driving force; even simply

---

[601] Michael T. Bass, *Street Music in the Metropolis* (London: John Murray, 1864), p.112.
[602] Picker, 'The Soundproof Study', in Sterne, ed. *The Sound Studies Reader*, pp.141-51, here p.144.
[603] Goldsmith, *Discord*, p.108.
[604] *Patents for Inventions*, 1871, p.488.

saving wear and tear to the family piano might have made this type of invention attractive.

5.6: Conclusion

Not only does my study offer further proof that the mid-nineteenth-century piano industry was far from standardised, it also offers a fresh perspective on instruments that piano historians have traditionally dismissed as curiosities. Although the earlier decades of the nineteenth century witnessed the birth of innovations of long-term value such as the repetition action, it would be many years before such inventions were standardised; many makers insisted on adhering to their own tried-and-tested methods well into the second half of the nineteenth century.[605] Good believes that the modern grand piano only emerged when Steinway united these inventions in 1867.[606] Whereas some pianos at the Exhibition demonstrated innovations that would stand the test of time, others reflected a response to social needs that were specific to the time period. Many of the inventions discussed, such as those that facilitated silent practice, or which made learning the piano easier, together with other innovations such as the transposing piano, were designed to make domestic music-making more accessible. I have argued that more compact, decorative instruments were intended not only to improve sound production but also to provide an attractive forum in which the performer was more easily visible to their audiences. Producing these types of piano, however, created fresh technological problems. Some would argue they were merely a distraction from the main task of achieving the best possible tone and touch; conversely, I would argue that these types of instruments allowed the amateur the opportunity to achieve a better standard of competence at a more affordable price, in a way that complimented middle class ideals. The reason such a wide diversity of pianos were displayed at the Exhibition was not because makers wished to indulge in experimentation for its own sake; rather they sought to cater for the different needs of all their

[605] Good, *Giraffes, Black Dragons and Other Pianos,* pp.145-6, p.172 and p.194.
[606] *Ibid*, p.196 and p.209.

potential customers. What the amateur wanted for their parlour was often very different from what the virtuoso pianist needed for the concert hall.

As well as explaining the reason for diversity, this chapter contributes to the age-old debate concerning whether makers impacted the activities of musicians, or vice versa. It also offers some insight into the visual and audile techniques employed in mid-century piano making. It seems that Broadwood at least did receive customer feedback, from retailers who advised them whether or not their instruments were selling well and why, and from musicians and composers who told them whether or not their pianos were 'good'. Whether or not the company acted on this information is uncertain and probably varied depending upon the situation and individuals concerned; in the case of Charles Hallé's verdict on their grand pianos in the aftermath of Exhibition, the company certainly did respond to the advice given. Although no formal system of visual and audile evaluation was in place at mid-century it seems that Broadwood employees did on occasion attempt to compare their instruments with those of other makers and record their impressions of the sound produced. I interpret this as an early indication of a future when pianos would be made according to a standardised formula, when connections between specific technical features of an instrument and the resulting sound would be recognised, producing a formally sanctioned template.

Chapter 6: Monetary value and the Great Exhibition: investigating attitudes to 'cheapness'

> These (Collard's pianos) are submitted as specimens of very superior instruments of their particular class, in which every skill is displayed, and at prices within the reach of a very numerous class of purchasers, who might otherwise be driven to the alternative of buying inferior instruments. (*The Blackburn Standard*, 18 June 1851)

> It has remained for Messrs Collard & Collard to remove the objection to high priced pianos, by the manufacture of instruments which are in no degree inferior to the best in tone and touch, but greatly so in price, and with all the advantages of construction usually adopted.
> (*The Morning Chronicle*, 15 July 1851, quoting from *The Art Journal*)

6.1: Introduction

Although most Exhibition historians touch briefly on the subject of pricing, it is Richards who covers the topic in greatest detail. His findings are that on the one hand the absence of price tags meant that visitors could enjoy experiencing objects without being reminded that they were unaffordable, whereas on the other they were sufficiently practised as consumers to guess monetary value.[607] Most historians conclude that, despite the organisers' best efforts, the Exhibition did become a trade fair. In the last few weeks of opening, reports state that goods were being sold off, and after the official closing date the Exhibition was then re-opened to offer members of the public a chance to buy what they could previously only admire.[608] The Commissioners' initial decision to ban all official pricing was, according to Charles Babbage, a cause for relief amongst British manufacturers, who were concerned about the impact of competition, but prompted an outcry from various international committees. The reason for their eventual concession permitting the judging panels to enquire as to price

[607] Richards, *The Commodity Culture of Victorian England*, p.38.
[608] Auerbach, *The Great Exhibition of 1851*, pp.120-1.

is unclear. Babbage raises various possible arguments but then demolishes them himself. Pricing might have encouraged sales, which would have meant removing goods from display, but if exhibitors had been permitted to take orders for delivery of an identical item directly to the consumer, the problem would have been solved. Whilst the Commissioners were unwilling to vouch for the accuracy of pricing, they were inexplicably willing to endorse possible inaccuracies passed on to the Exhibition judges. For Babbage, pricing was essential to the spirit of competition, a prerequisite for subsequent consumer activity and vital to the verification of claims by exhibitors.[609] The organisers' initial decision to allow pricing of goods was repealed in response to complaints that British products would be undercut by foreign competitors. The resulting decision to ban all pricing was then re-negotiated in response to complaints from makers who deemed the cheapness of their product to be its principle merit.[610] The final state of affairs, whereby the judging panel were permitted to enquire as to the cost price of goods exhibited for 'cheapness', was most likely a compromise whereby the interests of British retailers and British and foreign exhibitors were balanced.

As Auerbach explains, determining a single economic objective is virtually impossible given that the value of objects was understood in fundamentally different ways. Some saw merit in labour (in other words the more evident the level of workmanship, the more valuable the product) whilst others saw it in the monetary value (in other words, cost relative to quality). There was also a middle group inhabited by officials such as Henry Cole, who believed that the spirit of individual labour could be captured on a larger industrial scale.[611] As has already been explained in Chapter 4, a judging criteria which allowed juries to give 'the same class medal to the cheapest calico-print, made for the Brazilian or South American market, as they would to the finest piece of *mousseline de soie* or *mousseline de laine*, if each possessed excellence of its own kind' meant that both objectives could be

[609] Charles Babbage, *The Exposition of 1851, or Views of the Industry, the Science and the Government of England* (London: John Murray, 1851), pp.64-95.
[610] Auerbach, *The Great Exhibition of 1851*, pp.118-9.
[611] *Ibid*, p.118-21.

accommodated.[612] This would have been particularly advantageous to British manufacturers, whose reputation rested principally on the production of machine-made goods for the masses.

Notwithstanding the Commissioners' decision to prevent exhibitors from attaching prices to their products, the price of goods shown at the Great Exhibition was a badly kept secret; most contemporary newspaper reports discuss the matter. Some recorded the actual price of a particular object: *The Belfast News*, for example, gave details of a 'writing desk and table from Wurtemberg' costing 400 guineas. Others commented on whether a particular exhibit was superior to like-products commonly available relative to the price charged; when discussing British-made carts, *Jackson's Oxford Journal* concluded that although exhibition examples were better than what consumers could currently buy, there was no difference in price. Price comparisons were commonly made between British goods and their European and American counterparts; for example, *The Newcastle Courant* observed that shawls made by European makers cost nearly double that charged for an equivalent British product.[613] Some exhibitors sought to circumvent the pricing ban by encouraging visitors to view their goods outside the Exhibition environment; piano makers Mott and Brinsmead both did this, inviting the public to come to their showrooms. It is possible they did this because they thought the soundscape unflattering, but it is more likely they sought to use the status of the Exhibition to their advantage in an environment where sales were not prohibited.[614]

Although 'cheapness' was a criterion upon which a product could be displayed and subsequently judged, it did not apply to all classes. Referring back to Fig 4.3 which explains the judicial hierarchy, none of the four 'raw material' categories in Group A, nor Group D (comprising metallic, vitreous and ceramic manufacture), nor Group F (denoting Fine Arts) were assessed on this basis.[615] Although some exhibitors claimed 'cheapness' as a ground for adjudication, examples are relatively sparse when the *ODIC* is considered

---

[612] *A Guide to the Great Exhibition containing a Description of Every Principal Object of Interest with a Plan* (London: George Routledge & Co, 1851), p.51.
[613] *The Belfast News*, 28 May 1851; *Jackson's Oxford Journal*, 24 May 1851; *The Newcastle Courant*, 27 June 1851.
[614] *The Daily News*, 21 June 1851; *The Daily News*, 20 August 1851.
[615] *First Report of the Commissioners for the Exhibition of 1851*, pp.106-7.

as a whole. A few exhibitors in Class X claimed this quality for their scientific inventions; one entrant in Class V described his carriage as 'combining lightness and cheapness with elegance'; Class IX included a piece of agricultural machinery by W. Cromwell described as 'simple, powerful and cheap'.[616] The majority of so-called 'cheap' British products were to be found in Classes XII to XV, where various types of textile were categorised, and in Class XXII, where hardware items were shown. The only openly publicised attempts at producing a budget piano were made by Collard (namely their 'Pianoforte for the People' which will be discussed in detail later) and the Zollverein company M. Schotts in the form of a zebrawood instrument.[617]

It is impossible to say exactly what the Commissioners meant by the terms 'cheapness' and 'economy', although the fact that it was expressed in slightly different terms in each class suggested that no one meaning was absolute. The judging panel responsible for Class VI (manufacturing machines and tools) was given a wide interpretation, namely 'economy in the first cost', 'economy of production' and 'economy of maintenance'. In some classes, 'cheap' appears to have been a relative term; for example, Class VA (carriages) was subdivided so that a criterion of 'reasonable cheapness' applied to 'carriages of luxury' whereas 'carriages for public service' were to be judged simply for 'cheapness'.[618] The suggestion made by *Chambers' Edinburgh Journal*, with reference to Collard's 'Pianoforte for the People', was that 'cheap' meant 'socially accessible'. As indicated in the following extract, however, the challenge of producing a luxury product so that it was financially accessible to the lower end of society had not yet been achieved by mid-century:

> The lower classes have no good instruments, and have no great artists. The comparatively poor and the really economical do not buy pianos, simply because they are far beyond their means: and in England the cause of

---

[616] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume 1*, p.442 (Class X, No. 411 John Phillips exhibited an 'air barometer of very cheap construction; p.399 (Class X, No. 32 W. H & S Jackson exhibited a 'registered soliclave lever watch for cheapness.'); p.260 (Class V, No. 958 Charles Saunders entered a carriage 'combining lightness and cheapness with elegance) p.373 (Class IX, No. 135 W. Cromwell exhibited as 'two horse colonial thrashing part – a simple, powerful and cheap machine)

[617] *The Morning Chronicle*, 26 July 1851; the company's ODIC entry, however, makes no mention of 'cheapness'.

[618] *First Report of the Commissioners for the Exhibition of 1851*, pp.106-7.

> musical science and kindly feeling is deprived of the aid of a family instrument.[619]

Thalberg also spoke of accessibility in his contribution to the Class XA Jury Report. He begins by listing audiences for whom a domestic piano is now a given: social groups which he denotes as 'educated portions of society', 'fashionable circles', men of commerce seeking 'intellectual enjoyment after work' and 'passengers on long sea voyages'. His claims extend further down the social scale, which probably means that he is speaking of life in Europe rather than in Britain:

> This influence of the piano is not confined to them, but extends to all classes; and while considerable towns have often no orchestras, families possess the best possible substitute, making them familiar with the finest compositions.[620]

It is certainly true that the 'Pianoforte for the People' was cheap compared to most of the other instruments shown in Class XA, priced at just 30 guineas. Collard's product was not in any sense new, as different forms of upright pianos had existed since the late eighteenth century, but it is likely that it was smaller and more compact than similar models available at mid-century. Although imitation was the usual method by which luxury goods were turned into semi-luxury ones, in order to fulfil its function as a musical instrument an irreducible level of technology was mandatory in piano construction. What may appear, at first glance, akin to what Maxine Berg calls a 'process innovation', a version of an existing product made at a reduced price, was, in fact, also a 'product innovation', as the challenge of creating a smaller instrument presented certain technical difficulties as discussed in Chapter 5. It is no coincidence that the examples of products where imitation was possible, cited by Berg, such as Turkish carpets and creamware, are articles where function is both simple and secondary to aesthetic appearance.[621] Small modifications could be made by piano makers - for example, the 'specimens of jet and opal glass, suggested as

---

[619] *Chambers' Edinburgh Journal*, November 1850, quoted in Robert Hunt, *Hunt's Handbook to the Official Catalogues: a Explanatory Guide to the Natural Productions and Manufactures of the Great Exhibition of the Industry of all Nations, 1851 in Two Volumes, Volume 1* (London: W. Clowes & Sons, 1851), p.420.
[620] *Reports by the Juries*, p.328.
[621] Maxine Berg, 'From Imitation to Invention: Creating Commodities in Eighteenth-Century Britain', *The Economic History Review, 55* (2002), 1-30, here 4, 21-5

adapted for pianoforte keys', exhibited by William Riddle, as a low-priced alternative to the customary ebony and ivory - but the basic internal workings had to remain intact.[622] *Newton's London Journal* criticised J. Harrison's 'utilitarian boudoir' piano on the grounds that a desire for economy had compromised the action, thus impairing sound quality. Their appraisal neatly summarises the three options available to makers wishing to cater for a budget market.[623] The dimensions of the casing could be reduced, the level of exterior decoration could be modified or the action could be compromised; in the case of Harrison's piano, there was only one string to each note. By all accounts Collard's 'Pianoforte for the People' was a visually plain affair yet produced an acceptable tone.

My intended contribution to existing Exhibition scholarship here is to establish how the term 'cheap' might have been construed as a comment on class purchasing power. In particular, I am interested in establishing how working-class visitors would have responded to the term; if such items were clearly beyond their means, could this be further evidence that they were only superficially included? That the organisers did not want the Exhibition to become a commercial event is accepted and there is no question that the term would have been deliberately intended either as an invitation to buy aimed at the wealthy or a snub directed at the lower classes. Notwithstanding any official agenda, however, the Exhibition was undeniably a consumerist event, which means that re-visiting questions of taste raised in Chapter 3 will crystallise a different concept of value if viewed through the lens of economic circumstance. Visitors clearly had different priorities based on their knowledge of fashion and music, but how did this translate into their desire as consumers to acquire, based on their income and outgoings?

In terms of piano history, I am seeking to expand on Cyril Ehrlich's assertions that even the lowest priced piano was a luxury item at mid-century. At this juncture, a brief reminder about definitions is necessary; as I explained in the Introduction, it is possible to understand the term 'luxury' in a number of different ways. Ehrlich's use of the term in a mid-nineteenth-century context suggests that luxury meant goods produced by

---

[622] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume 1*, p.659.
[623] Newton, *The London Journal and Arts, Sciences and Manufactures, Volume 39*, p.33.

craftsmanship rather than by machines, which in turn dictated that luxury products were expensive.[624] When Berg uses the term to describe eighteenth-century products, her definitions are more about what luxury goods represent. Luxury meant taste and civilised living; it was also associated with global expansion, goods which represented newly available markets.[625] Although the specifics of Appadurai's definition are dissimilar to that of Berg, his overarching idea that luxury is about signification rings true; the value of luxury goods was defined not in the sense that they were the binary opposite of 'necessities', but in the social messages conveyed.[626] That the piano was a complex social signifier and an embodiment of newly available resources from the colonies is accepted in other areas of my study. In this chapter, however, my principal approach is similar to that of Ehrlich, which is to establish occupational and/or investment income, deduct the cost of necessities, thus calculating the surplus available for luxury purchases. Taking account of budgetary considerations, I am concerned with establishing what choices different classes of consumers made, which in turn feeds into the overarching question of sight versus sound. If financial resources were limited, where did consumers compromise? Would they rather have owned a decorative instrument or one with a large compass and a responsive action?

My study will begin with some further analysis of why exhibitors chose such different types of piano for display, this time considering the question from an economic perspective. The main body of the chapter will consider how working-class and middle-class visitors might have understood the term 'cheap' relative to their income and spending patterns. Using evidence from my quantitative study, the final section will explore piano ownership relative to what other items were in the possession of the households being sold; by cross-referencing findings with household advice manuals it is possible to postulate what income band owned what kind of instrument. Comparing address data for each residence from which items were sold with Charles

---

[624] Ehrlich, *The Piano: A History*, p.9.
[625] Berg, *Luxury and Pleasure in Eighteenth-Century-Britain*, p.39; Berg, 'New Commodities, Luxuries and their Consumers in Eighteenth-Century Britain', in Berg & Clifford, ed. *Consumers and Luxury: Consumer Culture in Europe 1650-1850*, pp. 63-85, here p. 66-8.
[626] Appadurai, 'Introduction: Commodities and the Politics of Value', in Appadurai, ed. *The Social Life of Things*, pp.3-63, here p.38.

Booth's late-nineteenth-century taxonomy of London streets makes it possible to approximately assess what class of person owned what type of instrument. Broadwood's sales ledgers are a useful tool for establishing what types of piano were purchased at what price and what aesthetic and technical additions were requested.

6.2: Exhibitors, consumers and price

As has already been discussed, how piano makers decided which items to submit for consideration, and how local committees interpreted their instructions concerning selection, is unknown. That the instruments present reflected a great variety of styles and prices is accepted; the lack of 'cheap' examples was presumably down to the way in which the local committees interpreted their brief that only the best would do. As I have explained in Chapter 2, none of the manufacturers who marketed their instruments in the advertisement section of the *ODIC* were allocated space, suggesting that most were rejected because their creations did not represent the best the industry could offer. One such example was Robert Cocks & Co, who offered 'very superior pianofortes – piccolos' for a mere 22 guineas.[627] Makers whose cheaper instruments were admitted were allocated space probably because they were accompanied by more costly, aesthetically pleasing examples. This was possibly how Collard's 'Pianoforte for the People' was selected for display, and also how Hopkinson's 'boudoir piano', which Sterndale Bennett commended as being very reasonably priced at 28 guineas, got through the door.[628] The only other low-priced piano shown at the Exhibition, by J. Harrison, was admitted probably because the maker claimed to have created an improved action. [629] Costing just 18 guineas, cheapness was undoubtedly a distinguishing feature of Harrison's instrument.

---

[627] *The Illustrated Catalogue Advertiser*, in Mactaggart, ed. *Musical Instruments in the 1851 Exhibition*, p.23.
[628] Sterndale Bennett, *Exhibition Diary*, Royal Commission Archives, RC/I/25, n.p.
[629] *The Official Descriptive and Illustrated Catalogue in Three Volumes, Volume 1*, p.467 (J. & J. Hopkinson, No. 500); Volume 1, p.464 (J. Harrison, No. 464A).

As discussed in Chapter 5, whereas some makers sought to demonstrate diversity, or displayed pianos designed to meet a social need, others, such as Broadwood and Erard, brought only high-budget instruments. According to the engineer Dr William Pole, the most expensive pianos included Collard's grand piano costing 500 guineas, a grand piano by Erard costing 1000 guineas and one of Broadwood's four grand instruments costing 'probably a higher price still'.[630] That Broadwood's exhibition pianos represent (at least in part) a decision to abandon the budget market in favour of wealthy clientele is evidenced in the following correspondence. A letter written by a piano dealer in Dublin, M. Moses, dated ten years prior to the Exhibition, confirms that the company failed to price their instruments competitively:

> Your more liberal discount has enabled me to place your instruments on an equality with Messrs Collards who from the first have trusted me with similar liberality: formerly I always set 5 per cent more on your pianos than on any others; which alone was sufficient to retard their sale; every advantage you have bestowed on me I have faithfully transferred to the instruments in order to place them on a par with those of other makers of the same style appearing in the warerooms with them. [631]

That the company struggled to place their lower budget instruments on an equal footing with other makers is further demonstrated in a letter from James Shudi Broadwood to his son Thomas written one year earlier in 1840:

> I have seen at Wright's warehouse some excellently finished short Cabinets or Cottages – in rosewood cases made by Bates in Cornhill – for which he pays 30 guineas – our price wholesale is I believe 40 guineas – Wright says he pays Bates for the same instrument in Mahogany case 27 guineas – ours are I think 34 guineas – the difference therefore in price in our rosewood instruments compared with Bates is therefore 10 guineas – perhaps – our cases may have been more elaborately finished – but no-one looking at the outside would think our worth more than 3 or 4 guineas than Bates – our tones are better – but not to command such a price – if Bates sells these instruments at 30 guineas & has as much manufacturing trades-mans profit of 25-30 per cent – these Rosewood cottages must cost him about £22 cash

[630] Newton, *The London Journal of Arts, Sciences and Manufactures, Volume 39*, p.25.
[631] Letter from M. Moses of Westmorland Street, Dublin to Broadwood, 13 December 1841, Surrey History Centre, 2185/JB/6/4/43B.

> – now as we can buy wood in Chicago as he – we should be able to make as cheap – or if you please to add one pound more for extra finishing – we certainly should be able to make our Rosewood cottages as £23 – or say £24 - & putting as a profit of 35% - per the wholesale prices – we should be enabled to sell them at 32 guineas, £33 - £42 wholesale.[632]

Having considered how prices could be lowered, however, later in the same letter Mr Broadwood senior decides that competing with the lower end of the market is fruitless. The company should 'endeavour to keep up our reputation with the monied Gentry – by superiority of tone & handsome exteriors - & by bringing out every now & then something new'. If attitudes amongst manufacturers were similar to that of Broadwood, it seems likely that exhibits were chosen according to what would appeal to each company's target market.

A glance at Broadwood's porter book for May-June 1851 suggests that although the company may have actively targeted an elite clientele, the vast majority of their orders were in fact for smaller instruments.[633] That the company did not seize the opportunity to advertise their cheaper pianos, which were clearly selling well, suggests firstly that they saw the Exhibition as a platform for technical competition, and secondly that they wished only to expand their upper-class client base. Of the 119 orders denoted in Fig 6.1 below, just 20 were for grand pianos. The top price paid was 200 gns for a seven-octave instrument made of Pollard Oak; aside from orders relating to second-hand and ex-hire pianos, the lowest amount paid was 110 gns. 14 orders were placed for boudoir grand, semi-grand and short grand pianos. 35 orders are recorded for customers wishing to acquire a square piano. By far the largest clientele, totalling nearly half the orders, were comprised of those wanting to purchase either a cottage or a semi-cottage instrument. Six orders were placed for cottage pianos, priced at between 85gns and 70gns; 44 orders are recorded for semi-cottage instruments priced at between 65gns

---

[632] Letter from James Shudi Broadwood to Thomas Broadwood, 20 August 1840, Surrey History Centre, 2185/JB/6/3/11.

[633] Broadwood Porter Books, 1851, Surrey History Centre, 2185/JB/42/46. Although most prices are expressed in guineas, some are recorded in pounds, shillings and pence denoted using letters of the alphabet using a code based on the word 'Cumberland'. In a personal communication dated 27 May 2014, the Broadwood archivist Robert Simonson explained that C=1, U=2, M=3 etc so, for example, CBD would mean 140 pounds

and 48gns (notwithstanding that reductions were given to a select few wholesale and professional customers).

Fig 6.1: Table showing price and model of pianos purchased from Broadwood, May-June 1851.

Piano type	Grand	Semi/Short/ Boudoir Grand	Square	Cottage	Semi-Cottage
Total number sold	20	14	35	6	44
Price range (new pianos)	110-200 gns	90-110 gns	45-72 gns	70-85 gns	48-65 gns
Price range (second hand)	£21 (one example)	£35-£55	£10-£50	N/A	N/A

Exhibition prospectuses are a valuable tool with which to investigate piano makers' attitudes towards the Exhibition as a marketing opportunity and towards consumers in general. As previously discussed, the placing of prices on display models was expressly forbidden; the circulation of advertisements detailing what each maker had to offer at their showroom, however, was perfectly acceptable. Many exhibitors took advantage of the Exhibition as an opportunity to advertise their wares and fortunately many examples of these prospectuses are extant. Judging by surviving examples, the level of information laid out for the public to read seems highly variable. Some makers, such as Erard, simply listed the instruments selected for the Exhibition, describing details of the materials and patent inventions used. No effort is made to acquaint the consumer with the range of pianos offered by the company; the publication is useful only as a guide to better appreciating the examples on display. Others, such as Richard Hunt, used prospectuses as an extension to their descriptive entries in the *ODIC.* In this case, details of his tavola 'table' piano are given, but the reader is left with the impression that this is the only instrument available for purchase as no other models are specified. At first glance, W. Jenkins' prospectus appears to follow suit, as the front page is devoted entirely to their miniature piano designed for 'gentlemen's yachts, the saloons of steam vessel, ladies' cabins and other

situations having insufficient room for pianofortes'; further inspection, however, reveals a detailed price list on the back. Most English makers circulated prospectuses designed to tempt the visitor to their showrooms to view a wider range of instruments in an environment where sales were permissible. Some makers even offered further variations on their main wares. With reference to a complete list of their pianos, Brinsmead's prospectus announced that 'the above can be ornamented to any given price or manufactured of any description of wood'. Similarly, Kirkman offered 'pianofortes in walnut tree, from 10 to 20 gns extra on the price of rosewood; ditto in maple and gold, satin wood, ebony, or amboyna and gold from 10 to 100 gns.'[634]

When considered as a whole, Exhibition pianos reflected the range of normal stock items available from London makers.[635] Prices listed in Fig 6.2 below are drawn from Exhibition prospectuses with the exception of Broadwood, where information has been obtained from a company price list dated 1851 as the prospectus is no longer extant.[636] Within the confines of manufacturers' workshops and showrooms, grand pianos, made from expensive wood with the latest technical innovations, rubbed shoulders with small, plain uprights which boasted no special advancements. Not all makers catered for expensive tastes, however; only 6 out of the 13 makers listed offered grand or semi-grand pianos for sale. Notwithstanding that Broadwood clearly did sell large numbers of semi-cottage pianos, as evidenced in Fig 6.1, according to their price list they did not officially offer a low-budget option. Peachey was the only maker committed solely to the lower end of the market, offering only piccolo pianos priced at 45-50 gns. The majority of makers catered for the middle-income market, providing a wide range of upright forms.

---

[634] Prospectuses of Erard, Richard Hunt, W. Jenkins & Sons, J. Brinsmead and J. Kirkman (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09

[635] Data is based on information taken from Exhibitions prospectuses for J. Kirkman & Son, Thomas Woolley, Towns & Packer, J. Brinsmead, W. Jenkins & Sons, Ennever & Steedman, Cadby, J. & J. Hopkinson, George Luff & Son, W. Stodart & Son, Lambert & Co and G. Peachey (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09.

[636] Broadwood Price List No. 39, 1844-1860, Surrey History Centre, 2185/JB/7611.

Fig 6.2: Table showing prices of different piano-types available in the mid-nineteenth century (in guineas except where indicated)

Piano maker	Grand	Semi Grand/Fonda Grand	Oblique	Piccolo/Semi Cottage/microchordan/boudoir	Cottage/Semi Cabinet	Cabinet/Grand upright/Grand cottage	Grand cabinet/upright grand	Square
Joseph Kirkman & Son	90 - 165	80 - 120	75 - 120	36 - 75	55 - 85			
Woolley				35 - 50	40 - 50	50 - 60		
Towns & Packer		60 - 95		25 - 40	28 - 45			
J Brinsmead		75 - 85		33 - 46	42 - 60	52 - 70		
*W Jenkins & Sons		£78 15s - £92 8s		£31 10s - £32 11s	£36 15s - £37 16s	£47 5s - £50 8s		
*Ennever & Steedman				£21 - £33	£30 - 45	£45 - £75		
Cadby	100 - 150	70 - 100		27 - 80	45 - 90			
J & J Hopkinson	110 - 125			25 - 50	30 - 60	35 - 80		
George Luff & Son	68 - 75			35 - 50	40 - 50	50 - 62	68 - 75	
W Stodart & Son	80 - 160			36 - 50	55 - 65			55 - 70
Lambert & Co				30 - 53	43 - 60	55 - 90		
G Peachey				45 - 50				
J Broadwood & Son	90 - 180	90			48 - 95			45 - 90

*Prices for W. Jenkins & Sons and Ennever & Steedman are shown in £ s d.

Differences in price were determined by size of casing, the type of wood used, the level and type of decoration requested, whether or not the exterior was to reflect a particular historical style, and what notational range and type of action was required. In nearly all cases, the lowest price would have reflected the minimum requirement for serviceability; more expensive options would have met the need for aesthetic beauty and a desire for the latest technology, whether or not this was understood in real terms. If this sample is representative of makers in London generally, then the very cheapest instrument, available from Ennever & Steedman, cost just £21 whereas the most expensive, available from Broadwood, cost 180gns.

6.3: ‘Cheapness’ and the working-class visitor

At this juncture it is appropriate to say something about terminology, given that neither contemporary writers nor modern scholars necessarily have the same criteria in mind when using class labels. Contemporary journalists seem to have drawn an initial dividing line between the upper and lower end of society according to whether or not a visitor could afford to attend the Exhibition prior to the introduction of the shilling charge. After that, class membership was determined principally by dress, as well as behaviour and preferences within the building. The following extract from *The Morning Chronicle* reporting on the first day when the lower classes were allowed access to The Crystal Palace illustrates the point:

> The first glance revealed the change from the last day of last week. The glitter, the elegance, the refinement, the luxe were gone. The bright and eternally changing and shifting dresses of trains of ladies ... were gone. The crowd, at first sight, looked dingy and sombre.... Looking abroad you saw that the old stereotyped class of frequenters had vanished from the Nave, that the loungers had given place to the walkers, that the great Central Avenue was rather a thoroughfare than a promenade.... The middle classes and those between the middle class and the working class trades folk, and the great nondescript order of people who are seen on all public occasions in England, who are difficult to place socially, but who never miss a Derby, who throng the back benches of the Court of law ... such formed the mass of the undistinguished Crystal Palace public of yesterday. No doubt there were many working class people also....[637]

When audiences began to dwindle at the height of summer, writers turned to seasonal class behaviour patterns for guidance, suggesting that attendance was now no longer possible due to harvest, the cessation of cheap excursion trains or because the London Season was drawing to a close.[638]

In modern scholarship, it seems that boundaries between the three main categories of Victorian society, together with the various sub-divisions which made up the ‘middle classes’, are equally difficult to pin down; they are moveable depending upon the basis on which they are defined. Such fluidity

---

[637] *The Morning Chronicle*, 27 May 1851.
[638] *The Examiner*, 9 August 1851; *The Standard*, 14 August 1851.

invariably means that, no matter what guidelines are used, there is always potential for uncertainty when determining where the recipient of a particular income, in a particular occupation falls, or where an individual belongs according to their moral and political outlook. Broadly speaking, there are two main methods by which class can be defined, as outlined by H.R. French. Identity is defined in polemical terms, focusing either on 'exterior' features, namely salary, occupation, taxation and accumulated wealth; or on 'interior' features, namely attitudes towards work, leisure and fashion.[639] Put another way, as discussed by Simon Gunn, class differences can be expressed in political and cultural as well as economic terms.[640]

Investigating working-class purchasing power in relation to a luxury item may seem at first glance to be a pointless exercise, as the conclusion is surely obvious. A brief consideration of working-class income is useful, however, in the sense that it highlights just how far short of achieving domestic luxury the average working-class visitor would have fallen. It also contributes further to the debate regarding whether the Exhibition was inclusive of working-class people as visitors. Commending an object for 'cheapness', if it was clearly far beyond the means of the majority in attendance, would suggest aspirations exclusively towards the elite. Scholars agree that the Exhibition experience was not as easily accessible to the working classes as to their middle-class and upper-class counterparts. Despite efforts by Paxton and others to waive entry fees, thus making the Exhibition freely available to all, the working classes were effectively excluded for the first three weeks because admission was restricted to season-ticket holders.[641] Because the working classes could afford no more than the reduced entry fee of one shilling which was introduced from 26 May onwards, the initial weeks clearly reinforced class distinctions. Although working-class attendance was eventually aided by the efforts of local committees, travel clubs and cheap fares offered by railway companies, securing accommodation in London was extremely difficult. Notwithstanding

---

[639] H. R. French, 'The Search for the 'Middle Sort' of People in England 1600-1800', *The Historical Journal, 43* (2000) 277-93, here 282

[640] Simon Gunn, 'Class Identity and the Urban: the Middle Class in England c.1790-1950', *Urban History, 31* (2004) 29-47

[641] Gurney, 'An Appropriated Space', in Purbrick, ed. *The Great Exhibition of 1851*, pp.114-45, here p.119.

recommendations by Alexander Redgrave that schemes be set up to assist working-class travellers, none of his ideas crystallised into reality.[642] Although plans for a Central Working Classes Committee (a body which Albert intended should assist the Commissioners cater for the needs of working-class visitors) did briefly come to fruition, because it was disbanded after just a few weeks, the lower end of society lacked an official spokesperson amongst the Exhibition organisers.[643]

Within piano history studies, the question of affordability at mid-century is tackled by Cyril Ehrlich. Comparing the cost of what he refers to as a 'satisfactory' grand piano to the wages of a teacher and a clerk, Ehrlich concludes that annual income would have been roughly equivalent, totalling between 50 and a 100 gns.[644] Unsurprisingly Ehrlich concludes that even the most basic upright piano was a luxury item in 1851, findings which are endorsed by Derek B. Scott who confirms the luxury status of pianos based on middle-class income data identified by Geoffrey Best.[645] Ehrlich's work is very much a starting point, however, one which I propose to develop in two main ways. In this section I want to consider what level of expenditure was obligatory for householders in order to calculate what sort of surplus income might have been available; differences in purchasing power depending on class, family structure and gender will become evident.

My starting point is to analyse the cost of a budget piano in relation to wages received by male employees in a range of occupations that could be considered either working class or lower-middle class. Wage data can be found in Column 1 of Fig 6.3 below; these figures are approximate for a number of reasons. It is unclear to what extent they reflect regional and seasonal variations in pay. It is evident from the work of Arthur L. Bowley that wages were higher in some parts of Britain and increased during the

---

[642] Auerbach, *The Great Exhibition of 1851*, pp.137-44.
[643] *Ibid*, p.130 and p.134.
[644] Ehrlich, *The Piano: A History*, p.10; Ehrlich, *Social Emulation & Industrial Progress*, pp.10-1.
[645] Geoffrey Best, *Mid Victorian Britain 1851-1871* (London: Weidenfeld & Nicolson, 1979), pp.101-11, in Derek B. Scott, *The Singing Bourgeois: Songs of the Victorian Drawing Room and Parlour* (Milton Keynes: Open University Press, 1989), p.47

summer months.[646] Equally, it is relevant to note that data relating to occupations subject to seasonal unemployment, such as agriculture, are also approximate, as it is unclear whether annual calculations assume a full working year or reduced hours. That temporary unemployment was a reality facing many working-class employees is broached by B. R. Mitchell, although the matter is quickly dismissed as making only nominal impact on overall figures.[647] Whether the following figures are optimistic or pessimistic is unknown, but they nevertheless provide a useful guide.

Research into the likely earnings of female family members and children is also significant when evaluating working class purchasing capacity. Whereas it is reasonable to suppose that most middle class families adhered to the 'male breadwinner' model (the spouse remaining at home, daughters being educated at home by a governess, sons at private school), in most working-class families, both parents, together with their older children, contributed to the domestic purse. Exactly where the line between these conflicting domestic ideologies should be drawn in terms of occupation, however, is anyone's guess. That working-class female employees earned less for performing the same tasks as their male counterparts is well documented and is discussed both in the work of George Henry Wood and in more recent scholarship by Nicola Verdon.[648] Columns 2 and 3 of Fig 6.3 contain estimated total incomes based on research by Peter H. Lindert and Jeffrey G. Williamson, which reveals that in working-class families female earnings totalled between 22% and 47% of their spouse's income, whilst child labour yielded between 13 % and 41% of that of the male head of the

---

[646] Arthur L. Bowley 'The Statistics of Wages in the United Kingdom during the Last Hundred Years: Wages in the Building Trade, Part VIII', *The Journal of the Royal Statistical Society, 64* (1901) 102-12; Bowley, 'The Statistics of Wages in the United Kingdom during the Last Hundred Years: Agricultural Wages', *The Journal of the Royal Statistical Society, 61* (1898) 702-22

[647] B. R Mitchell, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), p.340.

[648] George Henry Wood, 'The Statistics of Wages in the United Kingdom during the Last Hundred Years: The Cotton Industry, Part VX', *The Journal of the Royal Statistical Society, 73* (1910) 128-63; Nicola Verdon, 'A Diminishing Force? Reassessing the Employment of Female Day Labourers in England Agriculture c 1790-1850', in Penelope Lane *et al*, ed. *Women, Work and Wages in English Society, 1600-1850* (Woodbridge: The Boydell Press, 2004), pp.190-211, here pp.203-11.

household.[649] Some of the occupations listed below, such as porters, policemen and school teachers, seem unlikely candidates for family employment, and accordingly no composite total is given. That is not to say, however, that wives and children could not have been employed in a different area of work independent to that of the head of the household. Notwithstanding the uncertainty surrounding the contribution of female family members and minors, it is safe to say that the estimates given in Columns 2 and 3 are extremely optimistic, representing the maximum total possible.

The final step toward calculating a possible surplus working class income can be achieved using data from Sara Horrell's study 'Home Demand and British Industrialisation'. Taking figures applicable to the mid nineteenth century, it is possible to determine how much income was allocated to essential items; in turn, calculation of surplus is possible. Again, figures are approximate as they do not account for the fact that accommodation was provided in some occupations or that some families would have received payments in kind. Notwithstanding such variables, however, Horrell concludes that two-thirds of household income was spent on food and a total six-sevenths of annual income was needed to cover all necessities, leaving precious little for services or other items, such as clothing, furniture and household goods. Horrell concludes that mid-century expenditure on non-essential items totalled a mere 5-10% and that income devoted to items such as furniture and bedding totalled less than 1% of working-class family income.[650] The estimates in Column 5 reveal possible figures for surplus income available to working-class families, although as Horrell's study does not specify exactly which occupations made up the 283 household budgets used, her percentage allocations may not apply to all occupations listed below.

---

[649] Peter H. Lindert & Jeffrey G. Williamson, 'English workers' Living Standards during the Industrial Revolution: a New Look', *The Economic History Review, 36* (1983) 1-25, here 18; percentage earnings vary by region and date and also according to weekly and hourly pay; the figures stated are specific to weekly rates applicable in England and Wales during 1833.
[650] Sara Horrell, 'Home Demand and British Industrialisation', *The Journal of Economic History, 56* (1996) 561-604, here 572-80.

Fig 6.3: Table showing annual working-class male, female and child income relative to estimated surplus income after payment of necessities (£ per annum).

Occupation	Column 1 Annual male income	Column 2 Annual female income (47% of spouse income)	Column 3 Annual child income (41% of parent income)	Column 4 Total income	Column 5 Surplus income (total income less 6/7th)
Low wage agriculture	23.40	10.99	9.59	43.98	6.29
Mining	70.61	33.18	28.95	132.74	18.97
Factory	48.88	22.97	20.04	91.89	13.13
Trades	61.75	29.02	25.31	116.08	16.59
Farm Labourers	29.04	13.64	11.90	54.48	7.80
Non-Farm Common Labour	44.83	21.07	18.38	84.28	12.04
Messengers & Porters	88.88	-	-	88.88	12.70
Other government low wages (watchmen, guards, porters, messengers, post office letter carriers, janitors)	66.45	-	-	66.45	9.50
Police & Guards	53.62	-	-	53.62	7.66
Colliers	55.44	26.05	22.73	104.22	14.89
Shipbuilding trades	64.12	30.13	26.28	120.53	17.22
Engineering trades	84.05	39.50	34.46	158.01	22.58
Building trades (bricklayers, masons, carpenters, plasterers)	66.35	31.18	27.20	124.73	17.82
Cotton spinners	58.64	27.56	24.04	110.24	15.75
Printing trades (compositors)	74.72	35.11	30.63	140.46	20.07
Schoolmasters	81.11	-	-	81.11	11.59

Sources: Horrell & Humphries, 'Old Questions, New Data and Alternative Perspectives', *The Journal of Economic History, 52* (1992) 849-80, here 855 (data covers the period 1845-50 and is shown in Column 1 of the top section of the table;

Lindert & Williamson 'English Workers' Living Standards', *The Economic History Review, 36* (1983) 1-25, here 4 (data is for 1851 and is shown in Column 1 of the bottom section of the table). Data in Columns 2-5 are calculations based on findings in Lindert & Williamson's aforementioned 'English workers' living standards' and Horrell's 'Home Demand and British Industrialisation'.

Returning to Collard's humble microchordan, if the title 'pianoforte for the people' was intended as an invitation to all classes to buy, it was inappropriate. Looking first at families reliant on a combined income of multiple earners, the average surplus totals £15.26 per annum, meaning that, if no other purchases were made, Collard's budget piano could have been purchased with two years' worth of savings. Given that items such as clothing and household utensils could only have been purchased from money left over after essentials such as food and rent, however, it is extremely unlikely that saving the entire amount would have been feasible. Looking at households dependent upon a single male earner, the average surplus was much lower, totalling a mere £10.36 per annum. Here Collard's piano cost over four times the lowest surplus earnings and over twice the highest, meaning that it would have taken an average single-earner working-class household nearly three years to save the necessary amount. These findings very much support scholarship by Gurney and Miller, both of whom argue that the Great Exhibition was in some respects exclusive of the lower end of society. Certainly they were able to visit the exhibition, and it was their labour that breathed life into many of the products on display, but in consumer terms they were asked to gaze upon items they would probably never have the means to purchase.

6.4: 'Cheapness' and the middle-class visitor

If the working classes left the Exhibition thinking that a supposedly 'cheap' piano was extremely expensive, was the situation any different for middle-class visitors? Again, it is appropriate at this juncture to establish possible criteria by which the term 'middle class' can be understood. Exterior factors are numerous. According to Geoffrey Best, one criterion for being

middle class was exceeding the exemption threshold for income tax which between 1842 and 1852 was £150; home ownership and the employment of a servant might also have been determining factors.[651] G. Kitson Clark, cited in John Burnett's *A History of the Cost of Living*, suggests that a salary as low as £60 per annum could make the recipient eligible; Burnett observes that on this criterion even Bob Cratchet in Charles Dickens' *A Christmas Carol*, who earned 15 shillings per week would have been considered middle class. It is obvious that class characterisation becomes difficult when approaching the lower end of the income scale. Although Burnett confidently labels aristocrats as receiving over £10,000 per annum, and gentry as receiving over £1,000, he offers no such definition to separate the middle and working classes.[652] In his study of business activity in nineteenth-century Glasgow, Stana Nenadic's approach to the question focuses more on who was excluded than who was included; occupations listed as 'non middle class' are 'manual workers (save those who were also employers), aristocrats, landed gentry and farmers'. He also characterises middle-class membership as being synonymous with property over a certain value and reliance upon domestic help. 'In Glasgow the average house value in middle class circles was £26 with 5 rooms and 0.5 servants'.[653] Interior factors are harder to pin down, but historians who use economic determinants to state their case acknowledge that they were at work. Geoffrey Best, for example, acknowledges that many citizens who did not pass the income tax test would have thought of themselves as middle class.[654] If, as Simon Gunn suggests, attitudes shaping class identity changed during the course of the nineteenth century, pin-pointing the values governing middle-class life at the time of the Exhibition is even more difficult.[655]

Whereas working-class expenditure has been quite extensively researched, middle-class spending patterns are still shrouded in mystery.

---

[651] Best, *Mid Victorian Britain*, pp.101-2.
[652] John Burnett, *A History of the Cost of Living* (Harmondsworth: Penguin, 1969), pp.233-4 and p.224.
[653] Stena Nenadic, 'Businessmen, the Urban Middle Classes and the 'Dominance' of Manufacturers in Nineteenth-Century Britain', *The Economic History Review, 44* (1991) 66-85, here 67-72
[654] Best, *Mid Victorian Britain*, p.101.
[655] Gunn, 'Class Identity and the Urban', *Urban History 31* (2004) 29-47, here 34-5

The historian interested in the lower end of society is furnished quite generously with data from contemporary surveys undertaken by government bodies, charitable organisations and other social commentators. Those wishing to investigate the middle classes, however, must resort either to budgetary advice found in domestic manuals or track down household accounts. The disadvantage of the former is that it is never clear whether the advice given is based on expenditure by actual individuals or whether it is merely the opinion of the author which is being offered. Equally problematic is the question of whether such publications were actually adhered to by householders; that historians such as Judith Flanders believe that they were, although not necessarily by the class audience intended, is encouraging.[656] That some percentage expenditure allocations correlate with findings based on other contemporary data offers further assurance that household manuals were used for guidance by mid-century householders. Research by Sara Horrell, for example, indicates that a household in receipt of an income of £205 would have spent £162 on basics.[657] This is broadly similar to Walsh's assertions (whose publication has already been discussed in Chapter 3) that an annual budget of £250 warranted expenditure on food of around 60%; recommendations for expenditure will be discussed in detail in the next section.

Using household accounts poses challenges of a different kind. This type of data is often fragmentary, offering a financial picture for only part of a calendar year. Records usually only document expenditure, making it impossible for the researcher to determine whether the year is finished with a debit or credit balance. Unlike data that is the product of an official survey, types of expenditure are recorded in different ways so that it is often unclear what is included in any one category. Notwithstanding these difficulties, however, I propose to use both methods in my work to establish what level of income would have been available in middle-class households for luxury purchases and recreational spending. Precedents for my work include John Burnett's use of the Carlyle family accounts to illuminate likely spending

[656] Judith Flanders, *The Victorian House: Domestic Life from Childbirth to Deathbed* (London: Harper Collins, 2003), p.140.
[657] Horrell, 'Home Demand and British Industrialisation', *The Journal of Economic History, 56* (1996) 561-604, here 591

patterns of a middle-class childless couple, Patricia Branca's analysis of domestic records and Amanda Vickery's investigation of gender roles using what she calls 'his and hers accounts'.[658] The approach used by H. M. Boot, who estimates middle-class expenditure using recommended household budgets commonly attributed to Maria Rundell, first published in 1823, provides the other main precedent for my work.[659]

6.5: Middle-class income and expenditure: a look at budgetary recommendations

Because the Rundell accounts were written rather too early to offer reliable estimates for expenditure at mid-century, I am basing my investigation on budgetary advice written by J. H. Walsh published in 1857. Advice regarding the purchase of furnishings and day-to-day expenditure are divided into four categories each designed to accommodate different income. At the top end, Walsh's manual caters for those in receipt of an annual budget of £1,000; at the bottom end those earning just £100 are included with intermediate budgets of £250 and £500 representing middle earners. Although recommendations for purchasing furniture are made for each income bracket, it is unclear where the writer intends that funding should come from, given that no allowance is made for furniture in a later section dealing with day-to-day expenditure. Based on the following comment, it seems likely the writer anticipates that such purchases will be made at the beginning of married life. Perhaps a prospective householder was meant to have saved the required amount before embarking on matrimony or perhaps a dowry would have been relied upon to meet these costs?

> A table of prices is offered to the reader ... so that any young housekeeper who is about to enter upon this important era of his or her life, may, as soon as the income is known, at once calculate what will suffice to supply him with corresponding articles of furniture ... [660]

---

[658] Burnett, *A History of the Cost of Living*, pp.235-6; Branca, *Silent Sisterhood*, pp. 26-8; Amanda Vickery, 'His and Hers: Gender, Consumption and Household Accounting in the Eighteenth Century', *Past and Present, Supplement 1* (2006) 12-38

[659] H. M. Boot, 'Real incomes of the British Middle Class 1760-1850: the Experience of Clerks at the East India Company', *Economic History Review, 52* (1999) 638-68

[660] Walsh, *A Manual of Domestic Economy*, pp.v-vi, p.192 and p.212.

If this assumption is correct, however, this does rather beg the question where money for replacements and repairs was to be found. Whilst changing fashions in furniture are acknowledged, no clue is offered regarding how these should be paid for.

Fig 6.4: J.H. Walsh's Table of Expenditure designed for four different annual budgets from *A Manual of Domestic Economy, 1857*, p.606 (expressed in £ s d); recommended expenditure expressed at percentages do not appear in the original.

Type of expense	Budget of £1,000	Budget of £500	Budget of £250	Budget of £100
Butchers	75 0 0	40 0 0	30 0 0	18 0 0
Fish/Poultry	30 0 0	10 0 0	7 0 0	-
Bread	20 0 0	16 0 0	14 0 0	10 0 0
Milk, Cheese, Butter	20 0 0	18 0 0	16 0 0	8 0 0
Grocery	30 0 0	20 0 0	18 0 0	8 0 0
Italian Goods	8 0 0	5 0 0	3 0 0	-
Greengrocery	20 0 0	12 0 0	10 0 0	6 0 0
Beer	20 0 0	12 0 0	10 0 0	5 0 0
Wine & Spirits	50 0 0	15 0 0	8 0 0	1 0 0
Coals	25 0 0	15 0 0	12 0 0	5 0 0
Chandlery	12 0 0	7 0 0	7 0 0	2 0 0
Washing	40 0 0	30 0 0	15 0 0	2 0 0
Sub-total	**350 0 0** **(35%)**	**200 0 0** **(40%)**	**150 0 0** **(60%)**	**65 0 0** **(65%)**
Carriages/horses	150 0 0 (15%)	50 0 0 (10%)	-	-
Rent & Taxes	125 0 0 (12.5%)	62 10 0 (12.5%)	31 5 0 (12.5%)	12 10 0 (12.5%)
Clothing	125 0 0 (12.5%)	62 10 0 (12.5%)	31 5 0 (12.5%)	12 10 0 (12.5%)
Wages & Incidental expenses (this includes charitable giving)	125 0 0 (12.5%)	62 10 0 (12.5%)	18 15 0 (7.5%)	5 0 0 (5%)
Illness & Recreation	125 0 0 (12.5%)	62 10 0 (12.5%)	18 15 0 (7.5%)	5 0 0 (5%)
Sub-total	**1000 0 0**	**500 0 0**	**250 0 0**	**100 0 0**

In the breakdown which appears in Fig 6.4 above, although most categories are unequivocal, expenditure allocated for ‘wages and incidental expenses’ and ‘illness and recreation’ could potentially stretch to permit the purchase of an additional luxury item such as a piano. Assuming that a family were prepared to dispense with a year of domestic help and did not need medical services, those earning between £500 and £1,000 per annum might, at best, have as much as £125 - £250 respectively at their disposal. In the absence of more urgent priorities, therefore, acquiring a piano within Walsh’s recommended limits of between 20 -120 gns would have been an option. Those with a more limited combined ‘wages and incidental’ and ‘illness and recreation’ budget of £37 10s 10d might have been able to afford a cheap instrument, subject of course to the same proviso as previously stated. Those with just £10 would have been in a similar situation to some working class employees, where saving and sacrifice for a period of years would have been the only option.

Looking at the list of incomes which appear in Fig 6.5 below, all of which, judging by exterior factors, are solidly middle-class, there were those for whom money probably was no object. Lawyers, senior clerks, entrepreneurs and various private-sector professionals all enjoyed a level of income where advice on how to make your money go further was unnecessary. For those lacking seniority or employed in lower-paid occupations such as clerics and some government occupations, however, it becomes clear that, notwithstanding their non-manual status, luxury purchases would have been difficult. For the majority, Walsh’s guidelines for an annual budget of £250 would have been applicable, meaning that if maximum ‘wages and incidental’ and ‘illness and recreation’ budgets were combined, only 15% of a household income could be available for a costly outlay. A clergyman’s maximum ‘luxury’ allowance would have totalled around £40; a high-wage government employee around £35; the lowest-paid surgeon/doctor just £30. Given that Walsh’s intended audience are families, it seems reasonable to surmise that expenditure on ‘necessary’ items in single-male and female households in receipt of the same income would have been much lower.

Fig 6.5: Table showing a range of middle-class incomes

Date	Occupation	Annual income (£)
1850	Barrister	5,000
1850	Doctor (at a fashionable practice)	1,000-2,000
1850	Business (example given is partnership profits from 'Knights' – a soap manufacturing firm)	15,000-17,000 divided between four partners
1850	Headmaster of a leading school	500-1,000
Mid 1850s and after	Civil Service occupations:	
	Chief Clerks	1,000
	Senior Clerks	650-900
	Assistant Clerks	350-600
	Junior Clerks	125-300
Late 1860s	Doctor	400 (300 net of expenses)
1851	Government High Wage (clerks, post office sorters, warehousemen, tax collectors, tax surveyors, solicitors, clergymen, surgeons, medical officers, architects, engineers)	234.87
	Clergy	267.09
	Solicitors & Barristers	1837.50
	Clerks	235.81
	Surgeons & Doctors	200.92
	Engineers & Surveyors	479.00
1851	All National Government employees	182.36
	Clerks (private sector)	235.81
	Clergy	267.09
	Professionals (private sector)	824.46
1839	Salaries of clerks at the East India Company (increasing according to length of service)	112 (1-5 years) 192 (6-10 years) 272 (11-15 years) 352 (16-20 years) 400 (21-25 years) 400 (26-30 years)

Sources: Burnett, *History of the Cost of Living*, p.229 (data is for 1850); Dudley Baxter, unspecified source, in Best, *Mid Victorian Britain*, pp.107-10 (data is for the mid 1850s and late 1860s); Lindert & Williamson, 'English Workers' Living standards during the industrial revolution', *The Economic History Review, 36* (1983) 1-25, here 3 (data is for 1851); Jeffrey Williamson, 'Earnings Inequality in Nineteenth Century

Britain', *The Journal of Economic History, 40* (1980) 457-75, here 474 (data is for 1851); Boot, 'Real Incomes of the British Middle Class, 1760-1850', *The Economic History Review, 52* (1999) 638-68, here 643 (data is for 1839).

Individuals free from the responsibility of maintaining a wife and children would therefore have had a higher percentage of their income available for leisure and luxury spending. Whatever the mathematics of the situation, how either an individual or a family with surplus income would have exercised spending choices would have been dependent on taste. An individual possessed of adequate financial means, but who lacked the necessary capital and 'habitus', would not have perceived piano ownership either as a signifier of personal respectability or as a necessary tool for the expression of musical taste. The same is true in reverse; those who understood the value of owning a piano would have purchased such an item in preference to other luxuries or even at the expense of some necessities. The following case studies go some way towards demonstrating the priorities and preferences of middle-class individuals and families with regard to recreational spending in general.

6.6: Middle-class income and expenditure: investigating household accounts

Notwithstanding that they may not constitute a truly representative example, the following six case studies, three of which relate to family units, three of which represent unmarried males, provide a window on middle-class spending patterns. Evidence has been collated in spreadsheets and the resulting data is presented in pie-chart form in Appendix H; a small sample of each of the accounts has been transcribed and presented in Appendix C. The object of the exercise here is to ascertain whether families and individuals saved in order to purchase luxury items and how much of their annual income was allocated to either household furniture or recreational expenses. They also offer some insight into changing financial priorities which are particularly apparent in accounts covering a number of years. Having a complete picture of financial life makes it possible to surmise where

compromises could have been made in order to make luxury purchases possible. The accounts are also useful in that they offer a contrast to the somewhat rigid patterns suggested by Walsh and other publications offering advice in a similar vein. Not only do spending patterns change from one year to the next but each individual family or single unit is different. In three out of the six examples, pianos have at one time been on the household shopping list; evidence is manifest either in the form of the services of a tuner or the purchase of piano felt.

The examples have been selected based on two criteria: firstly, they document income and expenditure for a full calendar year; secondly, they represent individuals who can be identified specifically by name and address or where accounts are sufficiently detailed to offer an insight into lifestyle. Expenditure has been categorised in a manner that attempts to isolate what might be deemed 'core' commodities from luxuries. 'Compulsory' covers items such as rent, poor rates, sewer rates and tax; 'household expenses' and 'additional expenses' cover food, drink and other household basics such as candles and fuel; 'clothing and personal apparel' includes items such as jewellery, perfume and haircutting. Recreational expenses cover a wide range of payments such as books, paintings, photographs and visits to cultural venues such as the theatre or the opera. The category of 'gifts/donations/subscriptions' is similarly wide-ranging, including gifts to family members and friends, donations to the poor, and offerings at church services. In the majority of cases, the 'household utensils and furniture' category contains relatively minor costs, indeed it is unusual to find large payments. The category of 'servants/services' includes payments to live-in employees as well as periodic payments for services such as washing, mangling and repairs. What is immediately apparent is that not all expenses identified fit neatly into the suggested expenditure plan recommended by Walsh. Equally, omissions become apparent: no allowance is made for travel in households unable to afford a carriage and horses; nothing is set aside for property repairs and breakages; the concept of saving is conspicuous by its absence.

An element of guesswork has been inevitable in the process of interpreting these accounts given that expenses are not always described in

the same way: some refer to a 'house purse' as representing routine payments for food; others make payments to housekeepers 'on account'; another alternative is to itemise suppliers generically. I have made a distinction between 'household expenses' and 'additional food and drink' to represent spending habits which in turn suggest lifestyle differences. Whereas some accounts document bulk purchases each week or fortnight from a particular merchant, others record random items almost on a daily basis. There is of course a capacity for overlap between categories which is unavoidable. A payment to a servant that also includes money for a particular item clearly spans two categories, but unfortunately there is no means of separating the two. On occasion, the context in which an item is purchased, or the type of purchase relative to the gender of the author, hints that a gift, rather than some other type of purchase, is being made, but no clarification is possible. A further difficulty is that there has to be a category for what I have called 'unidentifiable payments'. These are minimal where accounts are comprehensively and consistently written, but more extensive where entries are ambiguous or illegible. A comparison of the account transcriptions with the percentage data derived from spreadsheet calculations will reveal some discrepancies; the ability of some authors to add up correctly appears suspect in some cases. Some authors, such as Mrs Howard, openly acknowledge a deficiency in their mathematics, admitting that some expenses are missing.

Beginning with the accounts of Mr Frederick Carpenter, which document income and expenditure over four consecutive years from 1856 to 1859, a picture emerges of an unmarried male who occupies the borderland between classes.[661] His residence in Ash Grove, Cambridge Heath, Hackney, is in an area which Charles Booth labels purple in his colour-coded cartographic analysis of central London populations dated 1898-1899. Booth's designation indicates that the area is 'mixed; some comfortable, others poor'.[662] Mr Carpenter's salary of just over £100 a year, coupled with

[661] Household Accounts of Mr Frederick Carpenter dated 1856-1859, London Metropolitan Archives No. 0/96/001.
[662] Charles Booth Online Archive, http://booth.lse.ac.uk/cgi-bin/do.pl?sub=view_booth_and_barth&args=528500,179300,1,large,0 (accessed 2 January 2016)

the absence of domestic help, makes him working class; additional income in the form of dividends from investments and rent, however, serve to triple his income, raising his status to that of middle class. If categorised purely by occupation, his work as a clerk for the Regents Canal Company suggests a possible 'lower middle class' label; his overall income, however, clearly elevates his position. Although he manages to live within his means in 1857, expenditure exceeds income for the other three calendar years. Unlike the authors of the other five case studies, where saving is virtually non-existent, in the three years leading up to his marriage in September 1859, Mr Carpenter chooses to re-invest approximately two-thirds of his income. Although his lifestyle is generally frugal compared with Walsh's recommendations, recreational expenses are disproportionately high, though still within the suggested limit. A significant change in spending patterns is evident in 1859, however, when Mr Carpenter liquidises assets in order to furnish the marital home. A total of just over £250 is spent on furniture and related items, including a piano by Hastelow costing £30, and Mr Carpenter and his bride relocate to a property in Lonsdale Square, an area designated red in Booth's system, denoting 'middle class, well-to-do'. If Mr Carpenter's spending patterns were typical, it seems likely that most luxury purchases were made at the beginning of married life; Walsh's omission to allocate ongoing income to this category indicates that the marital home would only be furnished once.

My second example of a single-male household is provided by accounts of Mr Frederick De Coetlogon dated 1832 and 1835.[663] Supplemented with diary entries that helpfully explain some of the expenses recorded, Mr Coetlogon presents as an extravagant cultured single man in his late 50s living near Hanover Square, who is unable to quite live within his means. This area is designated yellow by Booth, indicating that Mr Coetlogon's place of residence is 'upper-middle and upper class; wealthy'. His income, provided for him in the form of an annuity payable in October of each year, ranges from between £297 and £545. That payments for additional food and drink items exceed regular household bills is indicative of

[663] Personal Accounts of Mr Frederick De Coetlogon dated 1832 and 1835, London Metropolitan Archives No. ACC/0268/009 and ACC/0268/011.

a spontaneous lifestyle borne out by the numerous references in Mr Coetlogon's diary to dinner dates with acquaintances. Exceptionally high combined expenditure on gifts, recreation and a housekeeper's wages (in 1832 these expenses add up to 36% of the total, over 20% more than the recommended amount) indicate a desire for comfort, a need to be a 'man about town' and a love of culture. Cultural capital is obvious, evidenced by payments for concerts, opera and exhibition tickets and purchases of music for female friends. Contrary to Walsh's recommendations, probably as a result of his unmarried status, spending on household utensils and furniture is also unusually high. In 1835, over £40 was spent, mostly at Phillips auction house, indicating that Mr Coetlogon chose to acquire items second-hand rather than new. That his accounts document payment to a piano tuner in 1835, but not in 1832, indicates that he purchased an instrument some time during this period. No such capital payment is documented, but this would most likely have been recorded in accounts for 1833 and 1834 which have not survived.

Some final insights into single-male spending patterns are offered by the accounts of Mr Johnston dated 1858 and 1859.[664] Based on levels of income and expenditure, this example is very much representative of the top end of the financial spectrum; unfortunately this cannot be verified by location as Mr Johnston's residence 'Beaulieu Lodge', Winchmore Hill, Edmonton is outside the geographical scope of Booth's study. Described in the 1841 census as an 'individual' living with his seventy-five-year-old widowed mother and numerous servants, Mr Johnston was maintained entirely by investment income totalling between £778 14s and £912 16s 6d. Despite receiving such a substantial income, however, he manages to spend a staggering £1227 18s 1 ½d in 1858 and a further £1124 18s 11d the following year. For Mr Johnston, recreation and household furnishings are clearly not a priority. Expenditure on household items is non-existent during 1858, a year where a mere 2% is spent on recreation, and only 9% is devoted to such expenses in 1859. Expenditure on servants' wages, however, is substantial, totalling 23% and 20% in the two respective years, including payment for the services of

[664] Household Accounts of Mr Edmund Johnston dated 1858-1859, London Metropolitan Archives No. ACC/1292/181.

someone akin to an estate manager. Repairs to the property were a major consideration in 1858, when 28% of Mr Johnston's income was spent paying bricklayers, carpenters and other craftsmen. Maintaining the household grounds, where small quantities of livestock were kept, also appears to have been of considerable importance.

As great a degree of variation in financial behaviour within family units becomes evident through an examination of a further three sets of accounts. Beginning with the Howard family, the picture that emerges is one of a household headed up by an elderly gentleman in his early 80s and his wife, who are consistently committed to regular, large-scale, purchases of consumables, supported by a large staff.[665] The 1851 census confirms that two servants lived with the family at their Yorkshire property, although they also owned a London property, 76 Beau Grove, Tottenham, an area also outside the scope of Booth's study. The accounts indicate that wages were paid to other employees both on a regular and casual basis. Given that Mr Howard is referred to as a 'landed proprietor' in census records, it is likely the income paid to the couple came from rental payments which averaged approximately £450 per annum over the four year period investigated. It seems probable that what was once a normal level of expenditure for this family has become unsustainable and it is unlikely they are able to indulge in purchases catering for higher wants given that what they view as a subsistence level of living is barely affordable. Despite being on the threshold of Walsh's income bracket for carriage ownership, no such means of transport is apparent. That records do not account for compulsory expenses such as taxation and rates indicates that the family were even further in debt than is recorded.

The Stracey family accounts document the income and expenditure of a married couple with three young children.[666] By 1855 Mr Stracey is known to have been appointed vicar of Buxton, Norfolk, but as no trace of salary payments appear in the accounts it seems reasonable to assume that he was in training during the early 1850s, supported by large payments from his

[665] Mariabella Howard Accounts dated 1843-1846, London Metropolitan Archives No. ACC/1017/1394-96.
[666] Household Accounts of Rev William James Stracey dated 1852-1853, London Metropolitan Archives No. ACC/1360/497.

father and various third parties. Patterns of spending are closely related to lifestyle determined by Mr Stracey's vocation. Much money is devoted to rental payments, especially in 1852, probably because the family lived an itinerant lifestyle, moving between properties in the South of England and Norfolk. Charitable donations made by the family are especially large: Walsh's recommended 12.5% for 'wages and incidental' expenses is exceeded by 5.5% in 1852 and by 13.5% the following year. Here, capital in the form of religious belief, coupled with the practical requirements of Mr Stracey's vocation, appears to override other considerations. Although, on the face of things, money for luxuries, such as furnishings and recreation, was scarce, the accounts document large regular payments to Mrs Stracey for her own use, funds which could have made luxury purchases possible.

Although the exact identity of the Smith family, who furnish the final example in this study, is impossible to determine, the accounts are written in sufficient detail to construct a consumer profile. An earlier fragmentary set of accounts dating from the latter part of 1853, coupled with a full set written in 1864, provide clues as to the changing circumstances experienced by the family over the course of 11 years.[667] In 1864 the family, comprised of two parents and three young children, are resident in the Brighton area; earlier accounts suggest that there may also have been two or three other children who are no longer dependent. The source of the family's income is unknown although the accounts show that for the year in question, expenditure of £680 14s 11 ¼d exceeded a total income of £665 11s 6 ¾d. Compared with the earlier accounts where there is no evidence of illness, by 1864 the family are coping with disability. Most of the payments included in the 'travel' category are for the hire of a bath chair suggesting that a family member was an invalid. 'Additional payments' have also increased considerably due to daily purchases of alcohol, possibly for pain relief. The main focus of expenditure is on regular bulk purchases of consumables; the main secondary expense is the maintenance of a live-in servant coupled with regular payments for various cleaning services. That the family owned two pianos, however, is evidence that at one time priority was given to furnishing the home. A luxury

[667] Smith Accounts dated 1853 and 1864, London Metropolitan Archives No. B/SK/002 and B/SK/003.

purchase which the family would have struggled to buy in 1864 due to lack of surplus funds was something they could afford in earlier years.

Notwithstanding the enormous variation in lifestyle evident in these accounts it is possible to venture some general observations. Pianos are evident in households where either culture, in the case of Mr De Coetlogon, or a desire to move up the social scale, in the case of Mr Carpenter, was a priority. Large-scale purchases of new furniture seem to be unusual once a household was up-and-running; payments in this category are usually small and relate to routine expenses and minor repairs. Recreation seems to be prioritised in single households where the person lives alone (notwithstanding the presence of a servant). If income remains unchanged, increased physical need will always reduce capacity for purchases relating to higher wants, for example in the case of the Smith Family. Moral or religious capital can trump economic considerations as in the case of the Stracey family, whose donations to churches, charities and missionary organisations totalled an astonishing £118 4s in one calendar year. If these sample accounts are in any way representative of the wider middle-class population at mid-century it appears that saving was a largely alien concept and that debt was more prevalent than anticipated. Although no one pattern of spending priorities is discernible from these studies, if further research can locate more examples, a greater quantity of data will hopefully make some general conclusions possible.

6.7: Piano ownership and income

My final line of enquiry also relies upon Walsh's budgetary recommendations but this time in conjunction with my quantitative study. Nearly all of the 89 auction inventories consulted relate to properties in the London area for the year 1851, although there are a few provincial examples included. The circumstances in which contents were auctioned fall into three categories, namely bankruptcy, death or geographical relocation; in approximately 50% of cases the address of the property from which items were disposed has been stated in sufficient detail to locate in Booth's cartographic taxonomy. In Chapter 3 this data was used to analyse the

relative popularity of different piano-types in mid-century London and provincial homes, what types of wooden casing were most commonly purchased, and the notational compass with which visitors would have been familiar based on what they had in their own drawing rooms. In this chapter, I will cross-reference particular household items which, according to Walsh, denote a particular income bracket (detailed in Fig 6.4) with items listed in the auction accounts.[668] It will then, in turn, be possible to ascertain which types of piano were purchased by which income bracket. A summary of my findings, set out in Fig 6.6 below, indicates that although affluent homeowners clearly wished to own a piano, there does not seem to have been any strong desire to possess the very best instrument on the market. This section will also briefly analyse data to see if there was any correlation between piano ownership and material culture denoting scholarship, connoisseurship and artistry.

Fig 6.6: Table illustrating the relationship between specific chattels identified in Walsh's four income bands and piano ownership.

	Grand	Upright grand	Semi-grand	Square	Cabinet	Cottage	Piccolo	Upright
Carriage ownership (£500+)	2	1	1		4	5		2
Wine & Spirit cellars (£500+)	6	1			6	6		
Semi-luxury furniture (£250)	1				6	5		
Budget furniture (£100)	1		1		6	3		

[668] Walsh, *A Manual of Domestic Economy*, p.606.

Based on Walsh' assertions that no-one in receipt of less than £500 per annum should own a carriage, the 13 households listed as owning transportation devices were presumably relatively affluent. Expenditure on this type of luxury was variable, however; whereas two households owned a simple cart, one possessed a post chariot, a Britzaka and a Stanhope, and another two possessed Phaetons together with a light Clarence carriage. Looking at these same households with regard to piano ownership, two owned a grand piano (one of whom owned a semi-grand piano as well), one owned an upright grand (this must have been a relatively old instrument given that they were no longer being manufactured by mid-century), four owned a cabinet and seven owned a cottage piano.

Another possession, which according to Walsh would only have been accessible to the higher income brackets, was alcohol. Although this type of purchase was permissible for all four budgets, those in receipt of £250 and £100 were advised to spend just £8 and £1 per annum respectively. It seems reasonable therefore to conclude that inventories which include wine cellars would have belonged to the top two income brackets, where expenditure of £50 and £15 per annum was recommended. 19 out of the total 89 households studied possessed such an asset and, despite terminology being somewhat vague, it is again obvious that spending varied considerably. One household is referred to as owning 'a few dozen Madeira' and some inventories describe properties as having 'a small cellar'; at the other extreme, auction advertisements refer to '90 dozen' and '100 dozen' bottles of wine. Of these households, six had a grand piano, one owned an upright grand (this is the same household as previously mentioned) and twelve had either a cottage or cabinet piano. The owner of '50 dozen Madeira' clearly prioritised piano ownership as the inventory for his property documents three Broadwood instruments, one grand, one cabinet and one cottage. Perhaps unsurprisingly, none of these households chose to purchase either a piccolo or a square piano. Although relatively few high-income households chose to spend large sums on a grand piano, few resorted to purchasing an instrument designed for a small home and a small pocket.

According to Walsh, the difference between £250 and £100 households, is determined by the presence or absence of specific types of furniture. Whereas households in receipt of £250 were permitted scaled-down 'imitation' versions of what their betters possessed, those reliant on income of just £100 seem to have been more sparsely furnished. Lists of furniture for households in receipt of £250 include 'Birch chairs – stained as rosewood' and 'bedroom chair stained imitation'. Of the twelve salient examples, just one household boasts a grand piano, five a cottage and six a cabinet; only one example makes reference to two instruments, namely a Collard semi-grand and a cottage piano by George Peachey. Similar findings are evident in the lowest budget households which are characterised by iron, rather than wooden bedsteads, and basic mahogany dining-room furniture. The eleven examples of households boasting low-budget furniture contain just one grand piano, one semi-grand, three cottage and six cabinet pianos. The continuing absence of piccolo pianos in the lowest income categories is surprising. The most likely explanation is that they were so badly made that, on the whole, they were not worth having even as a status symbol.

Moving away from Walsh's recommendations and instead simply looking at the presence of luxury items, there is some correlation between material objects denoting leisure and intellectual activities and piano ownership. Of the 43 households listed as owning paintings (examples include old masters as well as works by contemporary artists such as Landseer) roughly one quarter had grand pianos, over half had either a cabinet or cottage piano and just over one tenth had piccolo instruments. Statistics for inventories which mention luxury items such as books, clocks, bronzes and ornaments are broadly similar: grand, cabinet and cottage pianos are owned roughly in equal measure, whilst piccolo and square pianos are absent. As anticipated there is a correlation between fashionably situated properties denoted 'yellow' in Booth's study, expensive furniture and costly pianos. One household, formerly resident at Upper Montague Street, Montague Square, owners of a solid walnut drawing-room suite with tulip wood and kingwood, also owned a grand piano. A household in St John's Wood boasted a grand piano to accompany their amboyna wood drawing-room suite. The owners of a Louis XIV Fauteuil suite, resident in Curzon

Street, Mayfair, however, selected a cabinet and a cottage piano for their purposes; a household based in Upper Brook Street, Grosvenor Square, though able to afford a suite with marqueterie and crimson damask manufactured by Messrs Snell, settled for a cabinet upright.

6.8: Piano ownership and class

As some of the inventories in my quantitative study do not cite full address details of the previous owner of the goods, Fig 6.7 below presents only a partial picture of the relationship between class and piano ownership. Pianos can be found mainly in middle, upper-middle and upper-class homes; a few are found in what Booth described as 'fairly comfortable' and 'poor' households but none of the addresses evidenced in auction advertisements fall within the categories which Booth referred to as 'very poor, casual; chronic want' (colour-coded dark blue) or 'lowest class; vicious semi-criminal' (colour-coded black). Detailed inspection of auction particulars reveal that pianos found in poorer homes are exclusively uprights and tend to be of more limited compass, denoting an instrument dating from earlier in the century. It is the wealthier residences which boast grand pianos, well-known manufacturers' names, fashionable rosewood exteriors and ownership of multiple instruments. To find cottage and piccolo instruments in upper-class homes is surprising; my guess would be that these instruments were acquired for use in the schoolroom or servants' quarters and that the main instrument was sold off separately.

Although there is a strong correlation between high income, luxury goods and pianos, householders did not necessarily consider a grand or semi-grand piano more desirable than the more expensive upright instruments. Consumers at the opposite end of the financial spectrum seem to have avoided the very cheapest piccolo pianos, also choosing a form of upright instrument. Although it is impossible to say for certain as the data presented is not sufficiently detailed, it is likely compromise was made concerning the age of the instrument (an older piano would have had a more limited compass and a less effective action) and the level of decoration on the casing.

Fig 6.7: Table showing the relationship between Booth's cartographic taxonomy, residential addresses identified in auction particulars and piano ownership (39 residences out of the total 89 examples found are represented here)

Colour Code/Definition	Number of homes identified	Grand	Square	Cabinet	Cottage	Piccolo
Light Blue ('Poor; 18-21 shillings per week for a moderate family')	3			2	1	
Pink (Fairly comfortable; good ordinary earnings')	3			2	1	
Pink/Red (mixed lower-middle and middle class area)	1		1			
Purple/Red (Purple 'mixed: some comfortable, others poor')	1					1
Red ('Middle Class; well-to-do')	10 (1 home has 2 pianos)	1		4	5	1
Red/Yellow (mixed middle and upper class area)	7 (1 home has 2 pianos)	1		3	2	2
Yellow ('Upper-middle and Upper classes; wealthy')	14 (1 home has 2 pianos)	5	1	6	3	

As discussed in Chapter 3, it is likely most householders understood fashion but were unable to assess tone and touch; they knew what visual qualities were desirable but not what constituted a 'good' instrument. In economic terms, this seems to translate into a situation where those who could afford the best (namely grand pianos) often chose a cheaper form of upright and those who would have struggled to buy a piano at all made sacrifices in terms of its sight and sound.

6.9: Conclusion

Labelling a product as 'cheap' was not tantamount to an announcement that it was available to all. Assuming visitors to the Exhibition had the capacity to quietly price exhibits notwithstanding the absence of an official label, denoting an item as 'cheap' when it was clearly unaffordable is further evidence that working class people were only nominally included. Notwithstanding the difficulties of how the label 'middle class' should be applied, some would have been able to buy a modest piano quite comfortably, whereas others would have struggled. 'Cheap' was not a term reflecting the Commissioners appreciation of class purchasing power. If anything it served as a tacit invitation to the upper end of society, including the middle classes, to consider monetary value as reflected in the workmanship on display and part with their cash outside the confines of the building. This survey demonstrates that Appadurai's definition of luxury goods as goods available 'either by price or by law, to elites' was not applicable to all piano types.[669] Expensive instruments displayed by Broadwood and Erard most certainly were luxuries but budget creations by makers such as Harrison were affordable further down the social scale. This suggests that Maxine Berg's concept of semi-luxury may be applicable to smaller pianos, items that were expensive enough to necessitate saving but not so costly that only the very rich could afford them.[670]

As well as making the distinction between luxury and semi-luxury within the piano industry, what has also emerged through my research is a much richer picture of mid-century consumer activity. In purely economic terms, it is now possible to say what level of income would have made a piano affordable and what level of income would have necessitated some level of sacrifice. Exactly what governed consumer choices inevitably remains somewhat murky, but some sense of what factors would have governed selection are apparent. What is clear is that an array of choices

---

[669] Appadurai, 'Introduction: Commodities and the Politics of Value', in Appadurai, ed. *The Social Life of Things*, pp.3-63, here p.38.
[670] Berg, 'New Commodities, Luxuries and their Consumers in Eighteenth-Century Britain', in Berg & Clifford, ed. *Consumers and Luxury: Consumer Culture in Europe 1650-1850*, pp.63-85, here p.69.

presented themselves, whereby cost increased either according to the technical serviceability of the instrument, or the degree of decoration, or both. Those possessed with the necessary audile technique to understand tone would have made different choices from those governed by a desire for social respectability. A piano purchased for educational and performance purposes, even in a domestic context, served a very different function to one that stood silent in a drawing room for visitors to admire. Notwithstanding makers' efforts to make pianos more cheaply, the absence of machine-made processes within the industry was such that the piano retained its luxury status. Because it was expensive, the piano signified social respectability, but when, later in the century, it became increasing affordable to the lower classes, the piano's role as signifier gradually disappeared.

Chapter 7: Conclusion

7.1: The Future of the 1851 Building and its exhibits

In conclusion to a study which considers the significance of the materiality of the Exhibition building and its contents, it is fitting to briefly consider whether any exhibits survived and how the building was modified to suit its continuing purpose as a centre of entertainment and learning in a new location. Following the closure of the Exhibition in October 1851, some of the exhibits were donated to form the nucleus of collections for new institutions which the Commissioners planned to set up using the surplus funds.[671] When the Exhibition closed they found themselves in receipt of an unexpectedly large sum totalling £186,000, an amount which far exceeded anyone's expectations, money which Prince Albert believed should be used to found establishments, each one devoted to a particular classificatory category.[672] When these funds were later combined with a government grant of £150,000, land was purchased in South Kensington which today forms the educational complex comprising the Victoria and Albert Museum, the Natural History Museum, the Science Museum, the Imperial College of Science and Technology and the Royal Albert Hall.[673] Most, if not all, pianos entered a commodity state when the Exhibition closed. Although the South Kensington Museum, which later became known as the Victoria & Albert Museum, ultimately boasted a rich collection of musical instruments, the first keyboard instrument was not acquired until 1857.[674]

One of Broadwood's Exhibition grand pianos was presented to The Royal Society of Musicians, on the understanding that it would be sold to raise money for the institution; its retail cost was valued at 1200 gns.[675] M. Jullien purchased one of Erard's grand instruments to use at his annual series of concerts commencing in November 1851.[676] Pianos made by six

---

[671] Davis, *The Great Exhibition*, p.205.
[672] Hobhouse, *The Crystal Palace and the Great Exhibition*, pp.85-6.
[673] Auerbach, *The Great Exhibition of 1851*, pp.199-200.
[674] James Yorke, *Keyboard Instruments at the Victoria & Albert Museum* (London: Victoria & Albert Museum, 1986), pp.9-10.
[675] *The Era*, 15 March 1852.
[676] *The Morning Chronicle*, 15 November 1851.

Belgian exhibitors were sold at Sotherby & John Wilkinson on 16 October.[677] Ennever & Steedman's marquetry semi-cottage piano was taken on tour by the company to York where prospective purchasers were encouraged to inspect the instrument with a view to parting with 300 gns.[678] To my knowledge, seven Exhibition pianos have found their way into museum collections thus surviving to the present day. The aforementioned cottage uprights by J. Brinsmead and Ennever & Steedman reside in British collections in London and Bristol respectively. One of the Medieval Court pianos entered by Crace/Lambert is currently on display at Holdenby Hall, Northampton and a grand piano by the Austrian maker Schneider is the property of the Clavier Colt Collection in Kent. Debain's player piano and Kirkman's miniature grand piano are both the property of the Smithsonian Museum in Washington D.C.

After much debate regarding whether the Exhibition building should remain in situ, be dismantled permanently or relocated, it was purchased for the sum of £70,000 by Francis Fuller, one of the Exhibition's original supporters, and the Brighton Railway Company.[679] On 10 June 1854, a considerably extended version of the original building, comprised of five stories with a vaulted roof, an enlarged transept and two additional wings, was opened to the public in its new location in Sydenham in South London.[680] Although there was some tension between different audiences, the Crystal Palace, in its new location, had something for everyone irrespective of social class.[681] It offered a didactic experience for those wishing to learn, a spectacle for those who came in pursuit of pleasure and a shopping experience for visitors seeking the widest possible choice of

---

[677] *Catalogue of a Valuable Collection of Miscellaneous Goods and works of Art in The Belgian Division of the Great Exhibition* (London, J Davy & Sons, 1851); Pianos advertised for sale included those of F. Berden & Co, Brussels (two cabinet pianos), Felix Jastrzebski of Brussels (two pianos), Louis Sternberg of Brussels (two cabinet pianos), F. T. Vogelsangs, Brussels (one grand and one upright piano), G. F. Aerts of Antwerp (one grand piano) and J. B. Deffaux of Brussels (three pianos).

[678] *The York Herald and General Advertiser*, 13 December 1851, p.1.

[679] Hobhouse, *The Crystal Palace and the Great Exhibition*, pp.79-80.

[680] Michael Musgrave, *The Musical Life of the Crystal Palace* (Cambridge: Cambridge University Press, 1995), p.11.

[681] Peter Gurney, 'A Palace for the People? The Crystal Palace and Consumer Culture in Victorian England', in Buzard *et al*, ed. *Victorian Prism*, pp.138-50, here p.140 and p.145.

products.[682] The author and art critic, Elizabeth Eastlake, described her surroundings in a manner which Peter Gurney believes recognisably reflects 'the world of modern consumer culture, of the urban flaneur and the window shopper'.[683]

Research by Michael Musgrave in *The Musical Life of the Crystal Palace* illuminates the role of the building as a concert venue and exhibition space until its destruction by fire in 1936. The salient point to extract from his extensive research is that numerous modifications were necessary in order to transform The Crystal Palace into a satisfactory concert venue, a process which took approximately 14 years to complete (from the date of relocation in 1854 to the date it was deemed fit for purpose by the press in 1868 as discussed below). In 1856, an area designated 'The New Music Room' was adapted to prevent visitors from wandering in and out during performances; by 1865 it was deemed fully fit for purpose.[684] At around the same time the area that served as the Central Transept at the Great Exhibition was transformed into what became known as 'The Handel Auditorium', an area equipped with a stage and an organ with seating for between 10,000 and 12,000 people.[685] Following reports from performers and audiences alike that sound was at times inaudible, in 1859 officials placed a large oiled canvas awning over the performance area to minimise reverberation. Continuing criticisms from professional journals such as *The Musical World* and *The Musical Times* prompted the authorities to build a permanent roof over the area three years later, effectively forming a soundboard.[686] Improvements continued until in 1868 *The Illustrated London News* announced that previous reservations about the suitability of the Crystal

---

[682] Gurney, 'An Appropriated Space', in Purbrick, ed. *The Great Exhibition of 1851*, pp.114-45, here p.124.
[683] Elizabeth Eastlake, 'The Crystal Palace', *Quarterly Review 96* (March 1855), pp.303-53, in Gurney, 'A Palace for the People?', in Buzard, *et al*, ed. *Victorian Prism*, pp.138-50, here p.141.
[684] Musgrave, *The Musical Life of the Crystal Palace,* pp.70-1.
[685] *Ibid*, pp.35
[686] *The Musical World*, 37/28, 9 July 1859, pp.440-1, in Musgrave, *The Musical Life of the Crystal Palace*, p.40.
The Musical Times, 9/198, August 1859, pp.94-9, in Musgrave, *The Musical Life of the Crystal Palace*, pp.40-1.

Palace as a concert venue had 'been so completely obviated'.[687] The evolution of the building confirms the existence of acoustical problems in 1851, puts into context the difficulties visitors would have faced at the Great Exhibition and renders the fact that visitors did navigate the environment and exhibits using sound all the more remarkable.

7.2: The piano at the International Exhibition of 1862

7.2.1: Introduction

Looking forward eleven years to the next international Exhibition hosted by Britain in 1862 offers an additional lens through which to examine some of the key themes in this thesis. By revisiting 1851 in light of developments eleven years later, it is possible to see how The Great Exhibition paved the way for a new culture of display on an international scale; this approach also offers clues as to what the organisers may later have considered to have been mistakes.

7.2.2: Classification, spatial display and the environment

Although Playfair's four-point-plan was utilised in 1862, there were ten additional taxonomical classes, making a total of 40 categories, many of which were further divided into sub-classes, a summary of which is set out in Appendix I. On this occasion, pianos fitted more comfortably within the classification system; dual-purpose instruments were missing from the line-up and makers did not make joint submissions. Although the mechanism for Jackson & Graham's piano, which was both classified as furniture (Class XXX) and displayed as such, was made by Erard, no official accreditation was given to the company for their contribution.[688] That the piano fitted

---

[687] *The Illustrated London News, 52,* 20 June 1868, p.614, in Musgrave, *The Musical Life of the Crystal Palace*, p.43.

[688] Jackson & Graham's piano is described in *The Daily News*, 29 May 1862; *The International Exhibition of 1862; The Illustrated Catalogue of the Industrial Department in Four Volumes*, *Volume II* (London: 1862), p.23 refers to 'a piano (the interior by Messrs Erard), the case of fine Amboyna wood, richly inlaid in various ornamental devices, musical trophies and flowers in marqueterie work'.

better within the more intricate taxonomy of 1862 confirms my assertions that in 1851 the organisers did not fully understand the complexity of industry.

Moving next to the outworking of taxonomy within the building, the spatial display employed in 1862 witnessed the emergence of new narratives; the piano was exhibited such that there was a physical link between product and process and between Britain and the colonies. To cite one of several examples, Broadwood brought along component parts and diagrams designed to acquaint visitors with the piano-making process, something that the musical jury (Class XVI) thought was worthy of special mention in their report.[689] A pamphlet was also available for purchase from their stand explaining the history of the piano and the basic components of construction, with particular reference to the grand piano.[690] Artisan workmanship within the piano industry was also more prominent in 1862. Class XVI made specific reference to a list of trades including action makers, hammer coverers, hammer-rail makers, silkers, small work manufacturers, string makers, turners, key makers and pin makers.[691] The Musical Jury Report highlighted the fact that the piano industry was made up of many different workmen, some of whom should be independently recognised for their work.[692]

The voice of the colonies was also more audible, embodied in the form of one of Kirkman's grand pianos (Fig 7.1). Indigenous workers from Madras were credited for the beauty of the casing, although admittedly their talents were only acknowledged in the context of Western demand. *The Morning Post*, for example, remarked that the piano demonstrated 'how the skill of the native artist may be made available for European works'.[693] Kirkman's grand was displayed in the Indian department: it was spatially separated from the company's other pianos, and would presumably have been juxtaposed with indigenous goods. There was a sense, therefore, of the instrument

---

[689] *Reports by the Juries on the Subjects in the Thirty-Six Classes into which the Exhibition was* Divided; *Report of the Musical Jury (Class XVI)* (London: 1863), p.5.
[690] *List of Pianofortes and of various samples and models intended to illustrate the principles of their manufacture* (London: W. S. Johnson, 1862).
[691] *Report of the Commissioners for the Exhibition of 1862*, p.114.
[692] *Reports by the Juries*, p.7
[693] *The Morning Post*, 27 May 1862, p.3.

belonging to a cultural ‘other’, notwithstanding that in concept it was a Western product.

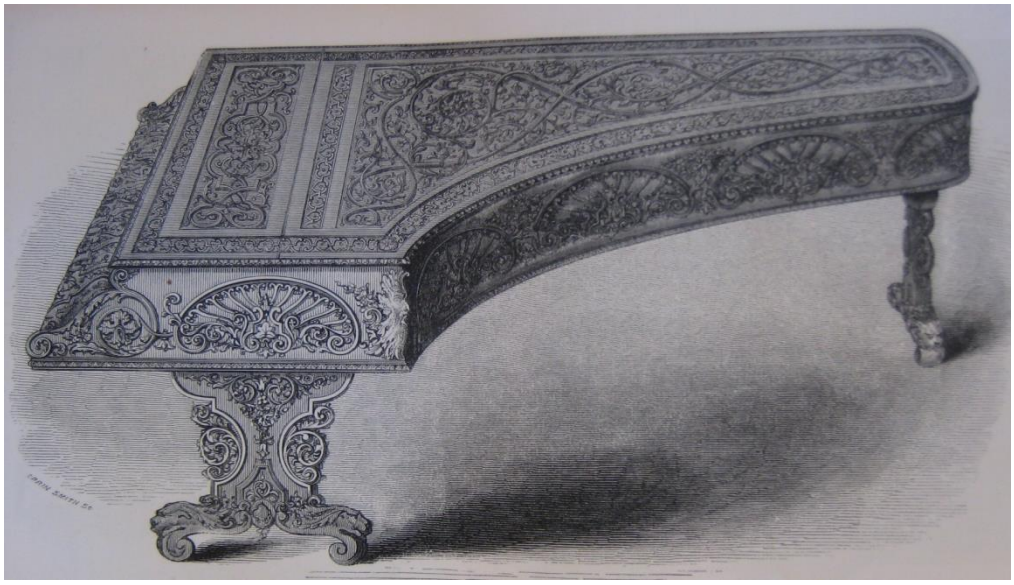


Fig 7.1: J. Kirkman & Son, grand Piano in case carved by indigenous craftsmen in Madras, India, *The Illustrated Catalogue of the Industrial Department*, *Volume III*, p.252.

Such differences between the two Exhibitions confirm my assertions that in 1851 little thought was given to the politics of display. There is no evidence that the organisers understood that spatial arrangement could either mask or enhance a particular material attribute or relationship to other products; rather the display was shaped by practical considerations characterised by preferential treatment for some exhibits.

Sources indicate that the organisers of the 1862 Exhibition understood the importance of establishing suitable environmental conditions for the safety of objects. Such awareness seems to have been precipitated mainly by concern for the vast numbers of fine art items present in the galleries.[694] The galleries were dried using heaters before exhibits were put in place and lighting was adjusted so that exhibits were sheltered from direct sunlight.[695]

[694] *Report of the Commissioners for the Exhibition of 1862,* p.xvii
[695] *Ibid,* p.xxxv.

A direction in the report advising exhibitors that they should 'make the requisite arrangements for keeping the articles free from rust' is both a tacit acknowledgement that the environment was far from perfect and evidence of concern for the physical integrity of objects.[696] A description of the acoustics witnessed during rehearsals for the Opening Ceremony suggests that Fowke's building presented none of the difficulties suffered at the Great Exhibition. A journalist for *The Leeds Mercury*, who described the building's acoustics as 'magnificent', remarked as follows:

> There was no echo, no glassy-ring, while the voices were heard fully and sonorously. As we retreat from the orchestra down the Nave, the sound, of course, diminishes, and half way down the piano passages of the instrumental music are inaudible; but the forte passages can be distinctly heard even in the Western Dome.[697]

These improvements were ultimately due to the fact that the 1862 Exhibition was housed in a robust brick building which *The Commissioners Report* stated was intended for long-term use as a display venue.[698] The environmental conditions in Paxton's building were defective because it was a compromise solution, initially intended for temporary use, accepted without proper consideration of whether or not it was fit for purpose.

7.2.3: The soundscape

One the most significant differences between the two Exhibitions was that in the latter music was a far more prominent part of the soundscape. Those in attendance at The Opening Ceremony would have heard a series of programmes of popular repertoire originating from some of the participating nations. Proceedings opened with Meyerbeer's grand overture, composed especially for the occasion, a choral work by William Sterndale Bennett and a grand march by Auber, followed by the Hallelujah Chorus and the National Anthem. Various operatic pieces arranged for brass band were then performed as a procession of officials made its way around the building, including Quick March from Balfe's opera *Blanca*, Wedding March from *A*

---

[696] *Ibid*, p.16.
[697] *The Leeds Mercury*, 1 May 1862.
[698] *Report of the Commissioners for the Exhibition of 1862*, p.xvii

Midsummer Night's Dream, Quick March from Benedict's opera *Lily of Killarney* and March from *Tannhäuser*.[699] A similar programme continued through the afternoon culminating in a final section to close proceedings which included the Overture to *Fra Diavolo* by Auber, 'March of the Israelites' from Costa's *Elijah* and the Overture to Macfarren's *Robin Hood*.[700] Whereas the awards ceremony in 1851 had been a chiefly silent affair, in 1862 the occasion was regaled by a total of 16 military bands arranged in groups of four at different points in the building playing national airs.[701]

Not only was musical performance more prominent at official ceremonies, but it became an important part of the everyday visiting experience. That there are many more accounts specifying details of the repertoire performed than in 1851 suggests that piano-playing was not only more audible but that it was better advertised; an eclectic programme was designed to suit all tastes. The more classical end of the spectrum was represented by Beethoven's 'Moonlight Sonata', tastes for the virtuosic were catered for by way of compositions by Thalberg and Chopin and a fantasia of national airs for left hand only, and opera lovers would have recognised arrangements from *Rigoletto* for piano.[702] A British musical presence was apparent through popular songs such as Sir Henry Bishop's 'Home Sweet Home', and music from Julius Benedict's *Erin*. International tastes were in evidence as national airs were heard emanating from the Austrian court.[703] Famous and up-and-coming, British and foreign, male and female pianists, were seen and heard playing upon British pianos throughout the Exhibition. Whereas some performers, such as Herr Alfred Jaell, pianist to the King of

---

[699] *Report of the Commissioners for the Exhibition of 1862,* pp.72-4; repertoire was also listed in some newspaper reports of the Opening Ceremony such as *The Leeds Mercury*, 1 May 1862, which contained a detailed account of the musical programme; other repertoire played during this part of the Ceremony included The Prince of Wales March, The Schiller March and Quick March 'The Advanced Guard'.

[700] Other repertoire played during the afternoon at the Cromwell Road entrance included The Colburg March and Lindpaintner's Fest March; works played to conclude the proceedings also included Invocation March from Wagner's 'Cola Rienzi' and The Coronation March from 'Le Prophete' and Rackeltanz by Meyebeer.

[701] *Report of the Commissioners for the Exhibition of 1862,* p.75.

[702] *The Belfast News*, 4 July 1862 ('Moonlight Sonata); *The Daily News*, 5 July 1862 ('music by Thalberg and Chopin); *The Morning Post*, 19 July 1862, p.7 ('Fantasia of national airs for left hand only); *The Daily News*, 1 September 1862 ('variations from 'Rigoletto')

[703] *The Era*, 25 May 1862 ('Home Sweet Home'); *The Belfast News*, 4 July 1862 ('Erin', Julius Benedit); *The Morning Post*, 19 July 1862, p.7 (Austrian airs performed in the Austrian Court)

Hanover, played exclusively on Bösendorfer pianos, most offered their services to more than one maker.[704] Ellen Bliss, Mrs Macfarren, Willen Coenen and Hobson Carroll all performed on Kirkman pianos.[705] John Francis Barnett and Miss Warren both played on pianos by Cadby.[706] Hopkinson's pianos were demonstrated by Mr Boscovitch, Mdlle Niebuhr and Miss Tasker.[707]

The altered character of the soundscape in 1862 suggests two possibilities. The first is that 1851 represented what came to be perceived as a false educational ideology, one based on the belief that music would serve as a distraction rather than a tool of learning. The second is that 1851 was the lowest point of a trajectory whereby exhibitions were perceived less about education and more as a forum for pleasure and entertainment.

7.2.4: The Judicial System, Pricing, Design, National Presence and Selection

The Jury system in 1862 was markedly less complicated than that of eleven years previously. Each class and sub-class had its own jury, each nation could nominate their own juror provided the class in question contained more than 20 exhibitors (or more than 15 exhibitors in the case of sub-class), there was no middle-stage Group Jury, and as previously all decisions were sanctioned by The Council of Chairmen.[708] The awards system was also much simpler than in 1851. One award was given for any object 'possessing decided superiority', and as previously the jurors were allowed to commend those who had done well, but not well enough for a medal, by way of honourable mention.[709] This decision to simplify matters suggests that in 1851 the organisers had little appreciation of the politics

[704] *The Daily News*, 1 September 1862.
[705] *The Standard*, 10 June 1862, p.3 ('Ellen Bliss'); *The Belfast News*, 4 July 1862 ('Hobson Carroll); *The Morning Post*, 7 July 1862, p.3 ('Mrs Macfarren'); *The Morning Post*, 19 July 1862, p.7 ('Willen Coenen').
[706] *The Daily News*, 5 July 1862 ('John Francis Barnett); *The Daily News*, 17 July 1862 ('Miss Warren');
[707] *The Morning Post*, 19 July 1862, p.7 ('Mr Boscovitch'); *The Standard*, 30 July 1862 ('Mdlle Niebuhr'); *The Daily News*, 17 July 1862 ('Miss Tasker)
[708] *Medals & Honourable Mentions Awarded by the International Juries* (London: George E. Eyre & William Spottiswoode, 1862), p.iii.
[709] *Ibid,* p.vii

surrounding professional value, the complexity of commercial fields both within the Exhibition and in wider industries, or the significance awards would have for exhibitors.

Another significant difference between the two exhibitions was that the price of exhibits was a matter of public knowledge in 1862. Not only were 'cheap' instruments more prevalent in the later exhibition, but the cost at which it was possible to make a quality piano was much lower. Makers who could demonstrate economy in their production methods were commended, for example Hulskamp's short-grand piano was praised because such an invention was 'likely to prove profitable'.[710] Based on prices published in *The Illustrated Catalogue* for Bechstein, Hundt & Son and Schiedmayer & Sons, a prize-winning grand piano now cost between £105 and £60, a cottage piano cost £42 and a square piano cost between £33 and £25. If the range of prices set out in Appendix J is compared with that of prices in Fig 6.2, the steadily decreasing cost of acquiring a piano becomes apparent. The significance of these changes are twofold. Firstly the line separating learning from a shopping opportunity, so carefully preserved by the organisers in 1851, was very much blurred 11 years later; this may in turn suggest that 1851 represented the beginning of a trajectory whereby exhibitions became less about education and more about commercial exchange. Secondly, that so many more exhibitors presented products notable for their 'cheapness' emphasises the earlier British desire to compete in luxuries rather than in mass-produced goods. It seems likely therefore that British perception in 1851 was that value meant quality notwithstanding that the organisers were at pains to define merit in much broader terms.

That 1862 saw at least a partial move towards plainer designs suggests a change in aesthetic values, specifically towards a more balanced approach to ornamentation relative to function, a philosophy upon which the earliest plans for The Great Exhibition was based. Although some makers continued using both historical and heavily ornate styles, others displayed a preference for simpler exteriors. On the one hand, Collard pianos demonstrated most major styles of the time including Renaissance, Italian

[710] *The Standard*, 2 June 1862, p.3.

and Louis XVI.[711] Ralph Allison & Sons displayed an upright piano in the style of Charles I (Fig 7.2).[712]

Fig 7.2: Ralph Allison, Elegant Oak piano in the style of Charles I, *The Illustrated Catalogue of the Industrial Department in Four Volumes*, *Volume II,* p.87

Broadwood's new iron grand pianos, however, were markedly less decorative than their 1851 entries.[713] Similarly Bechstein's grand pianos described in *The Illustrated Catalogue* as being 'without ornaments' reflected a more austere approach to piano casing.[714] The question of whether or not The Great Exhibition succeeded in its agenda to improve design and taste has not been definitively answered by Exhibition scholars; looking back at 1851 from the vantage point of 1862, however, a move towards greater simplicity is apparent in localised examples.

That 1862 saw more countries participating and more exhibitors attending with a wider sample of products suggests a growing appreciation of the value of competition as the century progressed. British newcomers included Challen & Son, Chappell & Co and Priestley and on this occasion

[711] *The Illustrated Catalogue of the Industrial Department in Four Volumes*, *Volume II*, pp.98-101.
[712] *Ibid*, p.87.
[713] Laurence, *The Evolution of the Broadwood Grand Piano,* pp.105-6.
[714] *The Illustrated Catalogue of the Industrial Department in Four Volumes*, *Volume IV,* p.82.

there was a quality provincial presence, namely Pohlmann & Son of Halifax, Yorkshire. European newcomers included Austrian makers Streicher & Son and Bösendorfer, French makers Pleyel Wolff & Co, German makers Bechstein and Ibach, and American makers Steinway & Son. Italy and Spain, neither of whom contributed to this class of products at the Great Exhibition, entered pianos in 1862. Most British makers submitted a range of instruments rather than just one or two examples. Hopkinson's pianos, for example covered the entire commercial spectrum, ranging from a full-size walnut grand to an upright described as being of 'moderate price'.[715] Based on descriptions in *The Illustrated Catalogue* it seems that makers focused their attention on improving mainstream designs rather than on novelties. *The Musical Jury Report* highlighted expanded compass and increased tension necessary to facilitate higher pitch as the main achievements in piano making generally since 1851. Commentary concerning specific makers focused mainly on improvements in framing and action.[716]

The Great Exhibition of 1851 paved the way for developments in world-wide exhibition culture. That the event was problematic both in its conception and execution was largely because it was without precedent; it was because the Great Exhibition was so successful, however, that organisers of subsequent world fairs did not have to negotiate the same problems. As dialogue with foreign nations and the British provinces had already been opened, organisers of subsequent Exhibitions benefited from the efforts of their predecessors.

7.3: Conclusion

My main contribution to Exhibition scholarship has been to highlight both the significance of materiality, namely the role of the non-human actor, and the significance of sound within the Exhibition building. The first of these two topics contrasts sharply with the recent work of scholars such as Auerbach and Davis, both of whom have exposed the role of individuals and organisations largely ignored in older commentaries. Investigations tell of the

[715] *Ibid*, p.106.
[716] *Reports by the Juries*, pp.4-7.

difficulties faced by The Society of Arts in persuading British society to accept the value of exhibitions and by Local and Foreign Committees in gaining support from manufacturers. They also explore the role of the press, financiers and the public in making the Exhibition a viable proposition. My work, on the other hand, exposes the role of the non-human actor, thus showcasing the power of the object as an investigative tool, an approach which engages with the materiality of the displays rather than simply taking the reader on a pick-and-mix tour of the Exhibition. In response to Buzard's provocative remark that it would be interesting to contemplate how the Exhibition might have looked had all objects been arranged by concept rather than geography, I have developed the idea by considering the Exhibition as it was, as it might have been had different decisions been made, and how it can be understood from the vantage point of the Exhibition of 1862. Not only does this approach reveal how objects contributed to meaning but also exposes narratives that were hidden from view: had process been made autonomous rather than product, relationships between Britain and the colonies, and between piano makers and producers of parts and accessories, would have been visible.

The materiality of the Exhibition is made manifest first through the voice of the building; this facilitates an appreciation of how both environmental conditions and physical arrangement might have shaped the way in which visitors were able to understand the Exhibition. The second voice of the non-human actor can be heard through the displays; perception of relative national presence, the prominence of particular makers and the relative status of metropolitan and provincial production are all in evidence here. The third voice is that of the individual object which, in the case of the piano, demonstrates how objects were either enhanced or prejudiced depending on their location and their particular physicality.

The role of sound, which has been considered largely irrelevant in previous scholarship, is explored in relation to the visuality of the event. Such was the Victorian appetite for all kinds of visual entertainment that it is perhaps unsurprising that sound was considered unimportant at an event where music played little part within a building designed with no consideration of acoustics. There is, however, evidence that sound was

used as a navigational tool, that it was a medium of entertainment and that it could also serve as a mechanism of learning especially for visitors willing to exercise comparative techniques.

For amateurs, it is likely that pianos were more notable for their visual appearance than for their sound, but for reasons that are entirely specific to the Exhibition environment. The politics of display meant that the pianos most easily accessible to the public, namely those of Broadwood, Erard and Collard, were extremely ornate and in no way typical of the piano-making industry at mid century. The organisers' concerns that musical entertainment would detract from the didactic character of the Exhibition meant that performances were not officially sanctioned, which in turn meant that pianos would have often been found standing silent. Evidence further suggests that whereas amateurs were knowledgeable about fashion they lacked proper understanding of tone and touch. Although audiences would have been familiar with solo piano repertoire, it is unclear to what degree listeners were able to cognitively engage with what they heard.

The same priorities cannot be applied either to the Exhibition judges or makers in attendance, however, as for them sound was very much uppermost on their agenda. According to the judicial criteria for Class XA submissions, tone and touch were of paramount importance and there is no indication that any award was given on the basis of appearance alone. Notwithstanding the disparity with organological evidence from surviving instruments, composers and pianists certainly claimed to detect differences of touch-weight between instruments. Whether this was based on physical assessment or a pre-existing preference or prejudice, however, remains unclear. Whilst makers understood the importance of accommodating consumer demand for attractive casing, efforts were very much focused on improving the piano's repetition action and increasing the strength of the frame, so that compass could be expanded and a better sound achieved. In the case of the upright piano, demand for smaller casing created fresh technological challenges as makers strove to make shorter, thicker strings still capable of acceptable tone. Although some makers chose attractive, eye-catching instruments to display at the Exhibition, there is ample evidence that others brought plainer everyday stock-in-trade items. Based on their

choice of instruments for display, it appears that Broadwood were intent on using the Exhibition as a forum for pursuing their target market, specifically the upper-class elite. Others, however, distributed prospectuses offering a range of instruments spanning all budgets, offering both decorative and plain casing.

Although the question of working-class inclusion (whether as visitors or exhibitors) has been very much debated in recent scholarship, the advantage of my approach is that it bases findings on one specific type of data, namely the price of pianos relative to levels of income and spending habits of different working-class occupations. The problem with arguments about working-class inclusion in other scholarship is that reliance is placed upon diverse sources that are by their very nature difficult to interpret and evaluate. Such arguments refer to the creation and subsequent dissolution of the Central Working Class Committee, the absence of a working-class presence amongst the Royal Commissioners, the measures put in place to help working-class visitors attend the event, the fact that the lower end of society was initially excluded from the event, whether or not the entry fee of a shilling was affordable and the fact that exhibitors were not permitted to derive financial benefit from their inventions. Looking at iconographical evidence the question of working-class inclusion becomes even murkier: it is worth reiterating that Miller and Kriegel, having cited the same evidence from *The Art Journal Illustrated Catalogue*, arrive at quite different conclusions as to whether working-class labour was actively acknowledged or not. Although identifying exactly where class boundaries fall is a continuing difficulty, I believe that by taking an arithmetical approach, I have come closer to a definitive conclusion that working-class visitors were only nominally included.

My contribution to piano history is to demonstrate firstly that social and economic forces shaped mid-nineteenth-century piano making just as much as technological innovation and secondly that makers were driven by market forces at least as much as by their desire to invent something new. My research thus offers a counterpart to the more usual approach employed by piano historians which typically presents invention within a chronological or national context as the only way in which instruments can be understood. It also sits alongside the work of New Musicologists such as Richard Leppert

although here my conclusions are ambiguous. While it is apparent that social demand for a smaller, prettier piano, designed to enhance the visibility of the performer, shaped piano making, there is no direct evidence to connect this with the fact that the piano was the site of middle-class courtship. Increased visibility could have been purely the product of a desire for enhanced music making but it could also quite plausibly have created a physicality that was flattering to a female performer.

Although it is not possible to offer definitive findings concerning whether the piano was understood primarily as furniture or as a musical instrument, my work does highlight the many variables involved: either sight or sound could be uppermost depending upon the spatial context in which evaluation takes place, and the knowledge, preferences and financial resources of the audience concerned. Piano historians who offer an opinion on the issue tend to be guided by their own personal tendency to prioritise either technological or social issues. For the former, piano casing is practically irrelevant; for the latter, the role of the piano as signifier is paramount. My study shows that for amateur consumers, fashion and affordability appear to have been of primary importance, whereas knowledge of tone, touch and construction were very much secondary considerations. Looking at the results of my quantitative study cross-referenced with Walsh, it is telling that many affluent individuals, in receipt of in excess of £500 per annum, chose a cabinet or cottage upright for their homes in preference to a grand piano, suggesting that visual appearance was often a key factor in decision making. It is, however, also worth noting that piccolo pianos, the most economical model available at mid century, were uncommon in contemporary London homes, suggesting that there may have been a point at which musical sound was so poor that householders considered them a waste of money. In contrast it seems that professional consumers were chiefly concerned with the sound of their piano. If deemed satisfactory, instruments were praised for their tone and touch, but on occasion where the customer deemed sound quality somehow defective, this was cause for the offending piano to be returned. Whereas musicians were able to assess whether or not the tone of a particular instrument was ‘good’, however, the

question of how that particular sound quality had been achieved fell squarely within the knowledge and expertise of the piano maker.

In class terms, wage and expenditure data indicates that even Collard's so-called 'Pianoforte for the people' would have been unaffordable for working-class individuals and families. Such a purchase could only have been made following years of saving and sacrifice. It is interesting, however, to observe that a few cabinet and cottage pianos were present in properties which Booth would have labelled as either 'poor' or 'fairly comfortable' suggesting a particular determination on the part of these individuals. Evidence surrounding middle-class income and spending paints a considerably more varied picture: Walsh's higher income brackets could have afforded a piano fairly easily, whereas those in receipt of the lower income of just £100 would have struggled. Household accounts illustrate not just that a multitude of priorities were at work but that expenditure of luxury purchases was very much down to the preferences and inclinations of the individuals. Ehrlich is correct that pianos were luxury items at mid-century, although it is possible to make a distinction between instruments made for a wealthy target market and smaller budget models aimed at less affluent households, a product-type which Berg's definition identifies as 'semi-luxury'. This growing trend amongst makers to concentrate on providing cheaper instruments, evident at mid-century, sets the scene for a downward trend later in the century when pianos became widely accessible lower down the social scale.

Within the broader field of musicology, my work demonstrates how findings from traditional organology can be used to investigate instruments in a wider cultural context. The most obvious example is the way in which I have used research concerning touchweight, key-dip and octave span on English, French and Viennese pianos of similar date to speculate on how the musical jury might have experienced exhibits given their prior knowledge of such instruments and personal preferences. Additionally my work addresses many of the same questions currently being asked by sound historians: how was knowledge derived from what was heard? How was sound codified enabling cause and effect to be linked? What physical factors impacted sound experience within a particular historical venue? In so doing I have been able to offer a comprehensive hypothesis concerning how pianos were

tested and evaluated by exhibitors and visitors taking account of the variable acoustics that prevailed within the building. This approach also yields valuable insight into how visual and audile techniques worked in partnership, as makers strove to improve the tone of their pianos working to establish precisely what material adjustments produced a particular 'target' sound.

In the context of material culture studies, my work demonstrates the value of material evidence in relation to other types of primary source. Whereas such evidence has typically been relegated to either secondary or merely descriptive status, this study demonstrates that it can sometimes offer insight where contemporary accounts are silent. The most obvious example occurs in Chapter 4; evidence derived from pedal shape (in relation to fashions in women's footwear) and an increasing size of the base of the piano (in relation to women's skirt size) combines to present a convincing argument that makers did indeed work to accommodate the needs of their users. Extensive though the Broadwood archive is, there is no documentary evidence to suggest such an agenda; this is an instance, therefore, where physical evidence can compensate for a deficit in documentary evidence. My study also provides a template for other object-based investigations. An approach whereby an event is explored from the outside, taking into consideration wider cultural values, is one option; the opportunity for using an event such as The Great Exhibition as a spring board for exploring a particular industry or workforce in the wider commercial field is another possibility. Admittedly there will always be places where specific objects cannot go; the piano, for example, has very little to contribute to Auerbach's debate concerning whether the Exhibition was chiefly an international or a national event. Some of the topics I have covered, however, can only be broached using a specific object as an investigative tool. The intricacies of the judicial process, the impact of the environment, and the role of sound and touch can only be fully evaluated using the method I have employed. Additionally, it is only through an object-based approach that it is possible to link the event to the wider pattern of shifting values and priorities characteristic of the domestic and commercial worlds inhabited by different audiences.

APPENDIX A

Table of British and Foreign piano makers

Exhibitor/capacity in which object entered	Region	Number and type of pianos	Material/design used	Award given **	*ODIC* reference * (all Class XA unless otherwise specified)
Robert Addison (patentee & proprietor)	London	1 upright (transposing)		Prize medal; 'Royal Albert' transposing piano	No.487, Vol 1, p.467.
George H. Aggio (designer & manufacturer)	Colchester, Essex	1 upright	Plate glass		No.488, Vol 1, p.467
William H. H. Akerman (inventor & manufacturer)	Bridgwater, Somerset	1 upright			No.490, Vol 1, p.467
Robert Allison (manufacturer)	London	1 cottage	Walnut		No. 480, Vol 1, p.465
Ralph Allison (manufacturer)	London	1 cottage	Walnut		No.483, Vol 1, p.466
Richard Andrews (inventor)	Manchester	Apparatus for positioning and strengthening			No.551, Vol 1, p.471
Joseph Anelli (inventor)	Edinburgh	Tuning/regulating device			No.511, Vol 1, p.468
John Brinsmead (manufacturer)	London	1 upright	Walnut		No.474, Vol 1, p.464 (details of materials come from The Crystal Palace and its Contents, p.202)

Broadwood (manufacturer)	London	4 grand	1 ebony 2 amboyna 1 walnut	Prize medal; for successful improvements in piano making	No.518, Vol 1, p.468
C. Cadby (manufacturer)	London	2 grand 1 upright	1 rosewood 1 zebrawood		No.471, Vol 1, p.464
G. Church (inventor)	Bristol	Wrist-supporter for securing a good position in playing the pianoforte			No.514, Vol 1, p.468
Collard (manufacturer)	London	2 grand 1 cabinet 1 square 2 semi-cottage/microchordans	1 British mottled oak (Louis XV) 1 rosewood 1 British oak (Louis XV) 1 walnut (Florentine style) 1 pine 1 rosewood	Prize medal; for successful application of several improvements in piano making	No.168, Vol 1, p.430
J.G Crace/Lambert & Co (Crace describe themselves as manufacturers; Lambert's status is omitted)	London	2 pianos	Gothic style	Prize medal; a cottage piano (award given only to Lambert & Co)	J. G. Crace, No.530, Class XXVI, Vol II, p.761; Lambert & Co, No.100, Class XA (There is no entry for Lambert & Co in the *ODIC* but in the Medal Table for Class XA, the company is listed as No 100 (no page number referenced), Report by the Juries,

					p.334
T. Deacock (status omitted)	London	1 piano			No.473, Vol 1, p.464
Deacon (status unknown)	London	1 cottage			No catalogue number; referred to in Rimbault, p.217.
A Dimoline/Jennens & Bettridge (both describe themselves as manufacturers & designers)	Bristol/ Birmingham	1 upright (joint entry) 1 semi-cottage (entered solely by Dimoline)	Joint entry; papier mache (in Italian style) Dimoline sole entry; rosewood (The Morning Chronicle)	Prize medal; inlaid japan pianoforte case (award given only to Jennens & Betteride by the Class XXVI Jury)	Dimoline No.489, Class XA, Vol 1, p.467; Jennens & Betteridge, No.187, Class XXVI, Vol II, p.748
Robert James Edwards (inventor)	London	Silent keyboard			No.516, Vol 1, p.468
Ennever & Steedman (manufacturer)	London	1 semi-cottage	Walnut		No.479, Vol 1, p.465
Erard, English factory (inventor, designer & manufacturer)	London	3 extra grand 1 small grand 2 grand oblique 1 grand cottage 1 reduced cottage.	1 Walnut 1 rosewood 1 grand oblique walnut (Elizabethan style) 1 grand oblique ebony 1 satinwood 1 Brazil wood (details appear in *The Derby Mercury*, 21 May and *Lloyd's Weekly Newspaper*, 11 May yet are missing from the company prospectus)	Council medal; peculiar mechanical actions applied to pianos and harps	No.496, Vol 1, p.467 (Details re wood come from the Erard company prospectus)

George Greiner (inventor & maker)	London	1 semi-grand		Honourable mention; tuning apparatus Monetary award of £50; new & useful method of bringing into unison the string of each choir of the piano, also for his invention of a new and mechanical contrivance for pianos, combining the advantages of Erard's machine with greater simplicity of construction and durability.	No.468, Vol 1, p.464
J. Harrison (manufacturer & inventor)	London	1 boudoir (model) 1 piano			No.464A, Vol 1, p.464
J.Harwar (manufacturer)	London	1 piano (transposing)			No.493A, Vol 1, p.467
Charles Holdernesse (manufacturer)	London	1 cottage grand	Walnut		No.482, Vol 1, p.466
J. & J. Hopkinson (manufacturer)	London	1 grand 1 boudoir	1 rosewood	Prize medal; horizontal grand piano with new patent action	No.500, Vol 1, p.467
Frederick Hund & Son (inventor & manufacturer)	London	1 cottage		Prize medal; a cottage piano in form of a lyre	No.486, Vol 1, p.466

Richard Hunt (inventor)	London	1 tavola piano			No.477A, Vol 1, p.465
W. Jenkins & Sons (inventor & manufacturer)	London	1 collapsible piano 1 cabinet	1 walnut (Elizabethan style)	Prize medal; expanding piano for yachts etc	No.484, Vol 1, p.466
J. C. Jones (inventor & manufacturer)	London	1 double semi-cottage	Walnut		No.481, Vol 1, p.466
J. Kirkman & Son (manufacturer)	London	1 miniature grand 1 grand 1 semi-grand 1 oblique piccolo	1 rosewood 1 walnut	Prize medal; a semi-grand and an oblique piccolo piano	No.467, Vol 1, p.464
George Luff & Son (manufacturer)	London	1 cottage	Rosewood (WSB's diary)		No.477, Vol 1, p.465
H. Mapple (inventor)	London	Compensation for piano strings			No.126, Vol 1, p.419
W. Matthews (inventor & manufacturer)	Nottingham	1 string frame of upright with tuning mechanism 1 upright			No.550, Vol 1, p.471
McCulloch/McCullagh & Co	Belfast, Ireland	1 piccolo			Rimbault states this maker's catalogue number as 483 (p.217) but this is the number allocated to Ralph Allison in the Official Catalogue.
George Metzler (manufacturer)	London	1 cottage	Pollard oak		No.475, Vol 1, p.465
J. & H. Moore & Co (designer &	London	1 grand cottage			No.476, Vol 1, p.465

manufacturer)					
Morley (no details known)		1 cottage			No catalogue number; reference appears in Sterndale Bennett's diary
I.H.R.Mott (manufacturer)	London	Cottage grand piano (1+) Grand piano (1+)			No.498, Vol 1, p.467
Frederick H. Mummery (manufacturer)	London	1 piano bedstead			No.292, Class XXVI, Vol II, p.757
B. Nickels (no details known)	Lambeth, Surrey	Double pianos (1+)			No catalogue entry; referred to in *The Times*, 7 May 1851.
H. Palmer (no details known)	Bath	1 upright	Walnut (Italian style)		No catalogue entry; referred to in *The Art Journal*, p.154.
Oetzmann & Plumb (inventor & manufacturer)	London	Cottage (1+) Cabinet (1+)			No.683, Vol 1, p.470***
G. Peachey (manufacturer)	London	2 piccolo	1 pollard oak 1 rosewood		No.502, Vol 1, p.467
William Rolfe & Sons (manufacturer)	London	1 cottage 1 piano			No.472, Vol 1, p.464
Smyth & Roberts (manufacturer)	Birmingham	1 cottage			No.491, Vol 1, p.467
William Southwell (manufacturer)	London	1 grand		Prize medal; a grand piano	No.469, Vol 1, p.464
William Stodart & Son (manufacturer)	London	1 grand 1 square	2 rosewood	Prize medal; a square piano	No.470, Vol 1, p.464

Tootal & Brown (status omitted)	London	1 piano			No.706, Vol 1, p.473***
Towns & Packer (manufacturer)	London	1 grand (transposing) 1 microphonic cottage		Honourable mention; a semi-grand transposing piano	No.494, Vol 1, p.467
Wheatstone & Co	London	1 cottage			No.526, Vol 1, p.469. The *ODIC* does not mention a piano but Rimbault claims the company exhibited a cottage piano, p.217
T. Woolley (patentee & manufacturer)	Nottingham	Pianos (1+) 1 grand 1 utiliton piano (transposing)			No.493, Vol 1, p.467
Robert Wornum (inventor & manufacturer)	London	1 piccolo 1 semi-bichord grand	1 walnut	Prize medal; improved piccolo piano	No.499, Vol 1, p.467 (details of materials come from The Crystal Palace and its Contents, p.200)

* There are several versions of the *ODIC*; the one I have used is that which is owned by the Royal Commission Archive published in Three Volumes

** Descriptions of instruments that received awards have been taken from the *Report by the Juries*, pp. 333-35; reference to the prize medal awarded to Jennens & Betteridge by the Class XXVI Jury appears on p.551.

After p.478 of the *ODIC* Volume 1, page numbering re-starts at p.465-478; pages containing relevant entries are denoted with an ***.

Table of Foreign pianos

Nation	Exhibitor/capacity in which object entered	Region	Piano type	Materials/design used	Award given**	*ODIC* Reference (Class X unless specified otherwise)
France	Aucher (manufacturer)	Paris	2 upright		Honourable mention; two upright pianos	No.404, Vol III, p.1197
	A. Bord (manufacturer)	Paris	1 grand			No.1099, Vol III, p.1230
	Colin (manufacturer)	Paris	Upright pianos (1+)			No.103, Vol III, p.1176
	Cropet (manufacturer)	Toulouse	1 cottage 1 model piano	1 mahogany		No.131, Vol III, p.1177
	A. Debain (manufacturer)	Paris	1 piano mécanique (antiphonal piano)		Prize medal; a mechanical piano	No.1172, Vol III, p.1233
	Detir & Co/Detyr & Co (Piano Workmen Society)	Paris	2 upright		Honourable mention; two upright pianos	No.475, Vol III, p.1200
	L. J. Domeny (manufacturer)	Paris	Upright pianos (1+)			No.477, Vol III, p.1200
	Erard, French factory (manufacturer)	Paris	2 extra grand 1 semi-grand 1 grand square 1 grand oblique 1 oblique	1 tulipwood 2 rosewood	Council Medal; peculiar mechanical actions applied to pianos & harps	No.497, Vol III, p.1201
	Charles Franche (manufacturer)	Paris	2 pianos		Prize medal; new repetition action in	No.1234, Vol III, p.1236

					a piano	
	Herding/Hardeng (manufacturer)	Angers	1 pianos			No.335, Vol III, p.1193
	Henry Herz (manufacturer)	Paris	1 piano-organ 1 grand 1 semi-grand		Honourable mention; four pianos	No.1268, Vol III, p.1237
	J. F. Kleinjasper (Pianoforte maker)	Paris	1 cottage		Honourable mention; a cottage piano	No.1633, Vol III, p.1255
	Sebastian Mercier (manufacturer & pianoforte maker to the late King of the French and to the Queen of England as well as the King of Sweden)	Paris	Cottage/piccolo pianos (1+)		Honourable mention; two cottage pianos	No.633, Vol III, p.1208
	Claude Montal (Musical Instrument Maker)	Paris	3 cottage	1 tulipwood	Prize medal; four cottage pianos	No.1665, Vol III, p.1256
	Jean Henry Pape (manufacturer)	Paris	1 grand 1 square 1 table piano 1 upright (piano console) 1 upright		Prize medal; for certain improvements in pianos	No.943, Vol III, p.1125 (Catalogue entry is ambiguous re number of pianos; information comes from Newton's London Journal, p.39)
	Roller & Blanchet (manufacturer)	Paris	4 pianos		Prize medal; three pianos	No.1687, Vol III, p.1257

	Scholtus (manufacturer)	Paris	2 upright			No.1482, Vol III, p.1247
	Souflete (manufacturer)	Paris	1 grand 2 cottage		Honourable mention; three cottage pianos	No.1699, Vol III, p.1257
	Van Ovenbergh (manufacturer)	Paris	Pianos (1+)			No.724, Vol III, p.1213
	A. Zeiger (inventor)	Lyons	Piano gymnasium; one octave compass			No.747, Vol III, p.1216
Zollverein	Gerhard Adam (manufacturer)	Wesel on Rhine	1 grand 1 oblique	1 rosewood (The Morning Chronicle, 26 July)		Electoral Hesse, No.487, Vol III, p.1079
	Baumgardten & Heins (producers)	Hamburgh	1 horizontal			Hamburgh, No.12, Vol III, p.1137
	H. P. Bessalie (manufacturer)	Breslau	1 grand	Rosewood		Prussia, No.71, Vol III, p.1052
	Breitkopf & Haertel (manufacturer)	Leipzig	1 grand	Rosewood	Prize medal; a grand piano	Saxony, No.25, Vol III, p.1106
	Dieudonne & Blaedel (manufacturer)	Stuttgart	1 grand 1 cottage		Honourable mention; a grand piano with double action	Wurtemberg, No.20, Vol III, p.1115
	F. Doerner (manufacturer)	Stuttgart	1 grand 1 square	1 rosewood	Honourable mention; a square piano	Wurtemberg, No.21, Vol III, p.1115
	C. J. Gebauhr (manufacturer)	Königsberg	2 pianos	2 rosewood	Prize medal; a piano	Saxon Duchies, No.848, Vol III, p.1096

	B. Guricke (inventor & manufacturer)	Zossen, near Berlin	1 grand	Rosewood		Prussia, No.73, Vol III, p.1052
	Theodor Heitemeyer (manufacturer & inventor)	Münster	1 table pianoforte			Electoral Hesse, No.486, Vol III, p.1079
	J. B. Klems (manufacturer)	Dusseldorf	1 grand			Electoral Hesse, No.595, Vol III, p.1083
	Gottlieb Kuehnst (manufacturer)	Darmstadt	1 grand	Mahogany		Grand Duchy of Hesse, No.20, Vol III, p.1127
	Richard Lipp (manufacturer)	Stuttgart	2 square pianos	2 rosewood		Wurtemberg, No.22, Vol III, p.1115
	H. Rumms/Ruhms (producer)	Hamburgh	1 piccolo		Honourable mention; an upright piano	Hamburgh, No.14, Vol III, p.1137
	C. Scheel (manufacturer)	Cassel	1 cabinet			Electoral Hesse, No.668, Vol III, p.1087
	J. L Schiedmayer & Sons (inventors & manufacturer)	Stuttgart	1 grand 1 square 1 cottage	1 rosewood 1 mahogany 1 nutwood	Prize medal; a square piano in mahogany	Wurtemberg, No.23, Vol III, p.1115
	B. Schotts & Sons (manufacturer)	Mentz	1 semi-grand	Zebrawood		Grand Duchy of Hesse, No.25, Vol III, p.1127
	C. H. Schroder (producer)	Hamburgh	1 horizontal		Honourable mention; a grand	Hamburgh, No.13, Vol III, p.1137

					piano	
	Westermann & Co (manufacturer)	Berlin	1 grand	Rosewood	Honourable mention; a grand piano made of rosewood	Prussia, No.80, Vol III, p.1053
	F. Zeitter & T. C. Winkelmann (manufacturers)	Brunswick	1 piano 1 grand			Saxon Duchies, No.709, Vol III, p.1089
Belgium	F. G. Aerts (status omitted)	Antwerp	1 grand	Rosewood		No.186, Vol III, p.1157
	F. Berden & Co (status omitted)	Brussels	1 cabinet	Rosewood	Honourable mention; three cabinet pianos	No.174, Vol III, p.1157
	Jean-Baptiste Deffaux (status omitted)	Brussels	Pianos (1+) Cabinet (1+)	Style of Louis XV		No.188, Vol III, p.1157
	Felix Jastrzebski (status omitted)	Brussels	Uprights (1+)	Rosewood and maple wood	Prize medal; an upright piano	No.176, Vol III, p.1157
	Louis Sternberg (status omitted)	Brussels	1 cabinet	Amboyna		No.180, Vol III, p.1157
	Francois-Jacques Vogelsangy (status omitted)	Brussels	1 grand 1 upright	2 rosewood	Honourable mention; a grand piano	No.181, Vol III, p.1157
Netherlands	J. Cazaux (Inventor & proprietor)	Valkeburg, near Leyden	Mechanical tuning-key for pianoforte ... particularly adapted for an upright Brussels piano			No.89, Vol III, p.1147
	J. F. Cuijpers	The Hague	1 small piano	Purple wood		No.95, Vol III,

	(manufacturer)					p.1148
Switzerland	Adolphe J. G. Frey (manufacturer)	Geneva	2 upright	2 rosewood		No.82, Vol III, p.1272
	Hueni & Hubert (inventors & manufacturers)	Zurich	1 patent harpsichord piano		Honourable mention; a grand piano	No.87, Vol III, p.1272
	Charles Kuetzing (manufacturer)	Berne	1 grand			No.89, Vol III, p.1272
	Sprecher & Baer (manufacturer)	Zurich	1 piano	Nut-wood (style of the Middle Ages)		No.103, Vol III, p.1273
Austria	F. Hoxa (manufacturer)	Vienna	1 grand	Hungarian poplar wood		No.141C, Vol III, p.1015
	Carl Leistler & Son (Flooring manufacturers)	Vienna	1 upright piano	Rosewood		No.633, Vol III, p.1039 (Although the *ODIC* entry makes no mention of a piano amongst the furniture items entered, *The Art Journal Illustrated Catalogue*, p. 177 shows an upright piano; narrative states that it is of rosewood with buhl work.
	J. Pottjie (manufacturer)	Vienna	1 grand	Rosewood		No.141A, Vol III, p.1015
	Joseph Schneider (manufacturer)	Vienna	1 grand	American maple		No.140, Vol III, p.1014

	E. Seuffert (manufacturer)	Vienna	1 piccolo (transposing)	Rosewood		No.141B, Vol III, p.1015
	Johann Vlasky (manufacturer)	Prague	1 piano	Walnut		No.141, Vol III, p.1015
Russia	Lichtental (manufacturer)	St Petersburg	1 imperial piano 1 cottage		Honourable mention; a semi-grand piano	No.172, Vol III, p.1372
Denmark	C. C. Hornung (inventor & manufacturer)	Copenhagen	1 cabinet 1 horizontal	2 rosewood	Honourable mention; a square piano	No.30, Vol III, p.1357
Sweden	P. Rosenwall	Stockholm	1 grand			No.62, Vol III, p.1353
United States	J. Chickering (maker)	Boston, Massachusetts	1 grand 1 square		Prize medal; a square piano. The Jury also think highly of his grand piano	No.458, Vol III, p.1463
	Gilbert & Co (status omitted)	Boston	Pianos (1+)		Honourable mention; a piano with an Aeolian attachment	No.435, Vol III, p.1462
	G. Hews (status omitted)	Boston	Pianos (1+)		Honourable mention; a square piano	No.438, Vol III, p.1462
	Conrad Meyer	Philadelphia	Pianos (1+)		Prize medal; two pianos	No.59, Vol III, p.1437
	Nunns & Clark (designers & manufacturers)	New York	1 square 1 piano with aeolian attachment	1 rosewood	Prize medal; a 7 octave square piano and a new tuning of Aeolian reeds	No.374, Vol III, pp.1459-1460

	James Pirsson (maker)	New York	1 patent double grand 1 patent square		Honourable mention; a patent square piano	No.90, Vol III, pp.1438-1439
	J. S. Wood (status omitted)	Virginia	1 piano-violino		Honourable mention; a piano-violin Monetary award of £50; for expenses incurred in constructing his piano-violin	The ODIC makes no reference to this instrument but it does appear in the Medal Table marked No.533, Report by the Juries, p.335. The actual *ODIC* entry under this number, however, is for J Francis, a New York maker, who exhibited a rowing-boat made of Spanish cedar
Canada	John W. Herbert (status omitted)	Montreal	1 boudoir	Canadian woods; black walnut, bass wood, Canadian maple and Canadian spruce		No.18A, Vol II, p.961
Nova Scotia	Central Committee of Nova Scotia (status omitted)		1 piano	Bird's-eye maple wood		No.2, Vol II, p.970

** Descriptions of instruments that received awards have been taken from the *Report by the Juries*, pp. 333-35.

Appendix B

Sample auction advertisements from London newspapers, 1851

The Morning Post, 20 March 1851, p.1 [13]

Camberwell – modern elegant furniture, a 6 ½ octave cottage piano, a 5 keyed flute, plate, linen, china and glass, a costly microscope (by Smith & Beck) 500 volumes of books, paintings, prints, 20 dozen of wine and effects

Messrs Ellis & Son are directed by the Executors of John Lee Esq. deceased to sell by auction on the premises, No. 2 Grove Villas, Camberwell Grove on Thursday 3 April and following days at 11 o clock.

The modern nearly new household furniture – comprising an elegant drawing-room suite in green and gold damask; rosewood card, loo and occasional tables; large chimney glass, ornamental clocks and china ornaments, capital dining room and library furniture, Brussels and Turkey carpets, a few good paintings (by Carmichael), fine prints, handsome mahogany four-post bedsteads and bedding, winged and single wardrobes, marble wash-hand stands and the usual fittings of the bed chamber and furniture of the domestic offices. The books comprise Rees Cyclopaedia, Penny Cyclopaedia, Knight's pictorial Shakespeare, the works of Scott, Moore, Byron, Arnold etc and numerous scientific works; an air pump, a plate electrical machine and apparatus. The Plate consists of elegant chased waiters, a claret jug, a teapot, forks, spoons & a gold level watch and chain and numerous items.

The Era, 1 June 1851 [26]

Henry Harries & Son have received instructions from the Executors of the late G. Watson Esq. to sell by public auction, on the premises, Nine-Elms House, Nine-Elms, Battersea, on Wednesday, June 11, at 11 for 12 o clock precisely, all the excellent Household furniture, comprising mahogany four-post, tent and other bedsteads, goose feather beds, good blankets, linen, mahogany and other window cornices, chintz curtains, Spanish mahogany wardrobes and wash-stands, Turkey and Brussels carpets, mahogany telescope, dining tables and sideboard, chiffonier, copper, kitchen furniture, capital 6 octave cottage piano in rosewood case, small library of books and a small quantity of wine, consisting of port, sherries etc, superior brass telescope, double-bodied phaeton in good condition, useful brown horse and harness, garden tools &c; also a large quantity

of various stores in the adjoining granary. The private house, with large yard and granary, is to be let on lease.

The Daily News, 5 August 1851 [43]

Stamford Hill – furniture, pianoforte and effects of Lilleshall Cottage

Messrs H. Brown & T. A. Roberts will sell by auction on the premises near the Bird Cage, Stamford Hill tomorrow, August 6 at 12, by order of the Mortgagee, household furniture comprising bedsteads with furniture and bedding, marble-top washstand, chests of drawers, wardrobe and other chamber requisites, mahogany dining, Pembroke and loo tables, sideboard, rosewood chiffonier, chairs and couch, work and chess tables, noble chimney glasses, fine-toned piccolo piano, paintings, choice prints, framed and glazed, china, glass, books, culinary articles and various effects.

The Morning Chronicle, 12 September 1851 [52]

No. 43 Queen Square, Bloomsbury – furniture and effects

Messrs Bullock will sell by auction, on the premises, on Thursday next, at 11 for 12 exactly, all the Household appendages of a spacious residence, including chiefly Brussels carpets and rugs, suites of window curtains, 10 rosewood drawing room chairs and couch, marble-top console, loo and occasional tables, 6 ½ octave fine-toned horizontal grand piano by Broadwoods, rosewood piccolo ditto, 12 broad back dining room chairs, sliding frame tables, pedestal sideboard, sideboard table, nine feet glazed and winged mahogany bookcase; the contents of the various sleeping apartments viz. 25 French bedsteads with bedding and blankets to each, drawers, chimney and toilet glasses, a few pictures and prints, glassware, domestic items &c.

The Daily News, 3 November 1851 [69]

In bankruptcy – modern furniture, piano by Broadwoods, service of plate, linen, china, glass, 1500 volumes of books, wine, paintings &c

Messrs Davis & Vigers are instructed by the Assignees of Mr W. Benning, a bankrupt, to sell by auction, upon the premises, No.7 St John's Wood Park, St John's Wood, on Friday November 7, and following days, at 12 for 1, all the modern furniture of 8 bedrooms, drawing room suite with amboyna wood centre and pier tables, rosewood chairs, couches and tables, 6 ½ grand piano by

Broadwoods, chimney and pier glasses, china and ivory ornaments, tapestry carpet, curtain etc; dining room fittings of superior extending tables, pedestal sideboard, secretaire bookcase, pair of chiffoniers, Turkey carpets &c , service of about 250 ozs of plate, linen, china, glass, a few fine paintings and engravings, violoncello, Encyclopaedia Britannica, 41 volumes, about 1500 volumes of theological, historical and other works; also the necessary appointments of the domestic offices.

APPENDIX C

Extracts from household accounts for one month (January)

Sample from the accounts of Frederick Carpenter for 1859

Debit Cash Account (balance brought forward)		***36***	***10***	***0***
29 January	One quarters rent for House			
	No 5 L P Lane	29	7	6
	½ year dividend on 250 consols	3	13	6
5 February	One quarters' Annuity	15	0	0
Sub-total		***84***	***11***	***0***

Credit Cash Account

31 December	Guarantee Society	1	12	0
1 January	One weeks expenses	0	10	0
8 January	Ditto	0	10	0
11 January	Mr Tidy's a/c	1	4	6
15 January	One weeks expenses	0	10	0
22 January	Ditto	0	10	0
29 January	Ditto	0	10	0
	Prayer book	0	3	0
	Crinoline	0	2	6
	Advertisements	0	10	6

Sample from the accounts for Charles Frederick De Coetlogon for 1835

January	Athenaeum	0	0	4
	William 1 week	0	3	0
Sub-total		***0***	***3***	***4***
	Baker's Bill	0	1	8
	Mr C's servants	0	11	0
	Coach to town	0	6	0
	Postage	0	1	7
	Wood	0	0	6
	Candles	0	0	7
	Butter	0	0	7 ½
	Sugar	0	0	9
6 January	Fish Bill	0	8	6
	Potatoes	0	0	3
	Sundries – Eliza and Mary	1	12	6
	Candles	0	1	2
	Gloves	0	2	0
	Braces	0	1	0
	Coach Hire	0	7	0
7 January	.....	0	4	0
9 January	Cakes, writing paper (6)	0	1	3
	..... and butter	0	2	6
	Bacon and eggs	0	1	3 ½
	.....	0	2	3
	Coach Hire	0	10	0
	P to	0	3	0
10 January	William 1 week	0	3	0
	Sugar	0	0	9
	Butter	0	1	11
	Candles	0	0	7
	Wood	0	0	6

	McClary by cheque	2	16	6
	Tea	0	2	4
	.....	0	1	9
	Rush lights (7), letters (4)	0	0	11
	Athenaeum	0	0	4
	Sundries	0	0	8
11 January	Newspaper	0	0	7
	Milk Bill	0	8	¾
Sub-total		***8***	***11***	***4 ¾***
11 January	Butchers Bill	0	10	6 ½
	Bakers Bill	0	2	2 ¼
	Milk Bill	0	0	8 ¾
	Washing	0	1	4
13 January	Postage	0	0	6
	Coach Hire	0	8	6
	Baker – Christmas box	0	2	6
14 January	Music	0	2	0
15 January	Postage to	0	1	0
16 January	Coach Hire	0	1	6
17 January	Candles	0	0	7
	Butter	0	1	5
	Sugar	0	1	6
	Tea	0	2	4
	William 1 week	0	3	0
	Athenaeum	0	0	4
	Ellen – cash on account	2	12	6
	Heeling boots	0	2	6
	Coffee (6), Eggs (4 ½)	0	0	11
	Postage	0	0	2
	Postage	0	3	0
	Music C.B	0	2	0

	Potatoes	0	1	3
	Catalogue	0	1	0
18 January	Newspaper	0	0	7
Sub-total		***13***	***15***	***3 ¼***
18 January	Butchers Bill	0	1	8
	Bakers Bill	0	2	11
	Milk Bill	0	0	8 ¾
	Shoes	0	8	0
	A folding hat	1	0	0
	P Phillips by cheque	4	6	0
21 January	Postage	0	0	7
	Fish	0	1	0
22 January	Paid Smith by cheque	4	0	6
	Postage Mr C	0	0	7
	Christmas box – postman	0	2	0
23 January	Fish, Lard, Eggs	0	3	6
	Coach Hire	0	2	6
24 January	Candles	0	7	6
	Pomatium	0	2	6
	Paid Widowson by cheque	17	13	0
	Butter	0	2	3
	Sugar	0	2	6
	Tea	0	2	4
	Candles	0	0	7
	Athenaeum	0	0	4
	William 1 week	0	3	0
	Wood	0	0	6
	Sundries	0	0	6
	Postage	0	0	3
25 January	Newspaper	0	0	7
Sub-total		***43***	***11***	***1***

25 January	Butchers Bill	0	7	4 ½
	Bakers Bill	0	3	0
	Milk Bill	0	0	8 ¾
	Groceries	0	6	6
27 January	A tongue	0	5	6
28 January	Englefield by cheque	5	3	6
29 January	Fruit and vegetables	0	4	1
	Postage	0	0	6
	Cheese, butter, eggs	0	5	0
30 January	Poultry	0	10	0
	Postage	0	1	8
	Fish	0	5	10
31 January	Hair for card table	0	2	6
	Paid P Phillips by cheque	4	0	0
	Butter	0	1	5
	Sugar	0	2	3
	Coffee	0	9	0
	Tea	0	2	4
	Athenaeum	0	0	4
	Selling razors	0	0	6
	William 1 week	0	9	0
	Candles	0	1	4
	Wood	0	0	6
	Vinegar	0	1	0
	Postage of Books	0	2	0
Sub-total		***56***	***10***	***11 ¼***

Sample from the accounts of Edmund Johnston for 1859

1 January	Gardeners Account	2	13	0
	Miss G's Account	2	13	0
4 January	Paid Month's account	20	6	4
	Stable account	3	4	0
	Coals given away	0	13	6
6 January	Pew Rent ½ year	3	12	0
	Poor Rate	10	10	8
	Sundries	20	0	0
8 January	Gardeners Account	2	14	0
	'Youthful A.W'	1	0	0
	Months Bills including tea £1 1 4 and Mrs			
	Harries' services £1 4 0	4	3	4
10 January	Sent Mr Harvey to H..... School	1	1	0
	Also for 'Preparation of the Gospel'	0	10	6
13 January	To Watkins – Farrier	7	5	6
14 January	Grant – Sadler	1	13	0
15 January	Gardeners account	2	13	0
	Miss G's account	1	12	11
18 January	Rowley (bricklayer)	0	2	3
	Riley (Painter)	43	12	3
	Forster (carpenter)	32	7	11
	Cuthbert	2	18	8
22 January	Gardeners Account	2	13	0
	New [?] Pig	0	14	0
	.....	1	1	0
	Miss G's account	0	8	4 ½
24 January	Beadle – Upholsterer [?]	12	2	0
25 January	Pateshall & Jones Chandler	6	16	0
	Green (Tailor)	15	8	0
27 January	Donaldson (Hatter)	3	8	0

29 January	Miss G's account	1	2	9
	Gardeners account	2	13	0

Sample from the accounts of Mariabella Howard for 1846

Cash Debit Account

19 (no month stated)	Cash in Hand	59	16	6
2m 28 (28 February)	To L.H	20	0	0
3m 5 (5 March)	Ditto	5	0	0
6 (no month stated)	Ditto	16	0	0
Sub-total		***100***	***16***	***6***

Cash Credit Account

1m (January)	Jacob	0	6	0
	Gridison	0	4	6
	Sweeping grove [or grave]	0	3	0
	Millers Bill	5	16	10
	Bakers	1	13	9
	Garman	0	10	10
	Greengrocer	1	4	3
	Challis	0	7	4
	Butcher	6	11	6
1m 29 (29 January)	Johnson, candles &c	1	7	3
	Jane’s Bill	3	1	2 ½
	Jacob	0	6	0

Sample from the accounts of Rev William Stracey 1852

1 January	Offering at St Pauls	0	2	6
2 January	Payne boots?	0	7	6
	Received for M	0	8	6
	House purses	5	0	0
4 January	Offering at St Pauls	0	2	6
	Mrs C.....	0	2	0
5 January	Envelopes with	0	6	9
6 January	Offering at St Pauls	0	2	6
16 January	Hodgson – bill in London	1	19	0
	Fortnam & Mason	1	18	0
10 January	Mr Leech's Bill	5	16	0
	Crockery	0	3	6
6 January	Mr White – four	0	4	0
10 January	H ... veterinary surgeon	0	6	6
	Stroud – coach [?]	0	9	0
9 January	Gloves	0	7	6
10 January	[entry blank]	0	1	0
11 January	Offering at St Pauls	0	2	6
12 January	.....	1	0	0
	.....	0	5	6
Sub-total		***19***	***4***	***9***
12 January	House purse	15	0	0
	House purse	0	2	6
	..... Bill	0	4	6
16 January	Notepaper	0	4	0
	Mutton bill	0	3	6
18 January	Offering at St Pauls (Mrs C)	0	4	6
20 January	Basket for Emma	0	11	0
	..... Mrs C	0	3	6
21 January	.....	0	10	0

	.....	0	4	0
	House purse	10	0	0
24 January	Ellison – surgeon of Windsor	1	18	0
	.....	0	10	10
25 January	Offering at St Pauls	0	2	6
	Mrs C (2/-)	0	2	10
26 January	Offering at St Pauls	0	2	6
	1/6 .... Mrs C	0	5	6
27 January	Offering at St Pauls	0	2	6
28 January	Offering at St Pauls	0	2	6
30 January	Offering at St Pauls	0	5	0
Sub-total		***50***	***4***	***6***
31 January	Offering at St Pauls	0	1	9
	Wiles – Blacksmith	1	0	0

Sample from Smith Family Accounts 1864

1 January	Porter	0	0	9
	Plant [?]	0	0	6
	Tailor	0	8	0
	Comb	0	0	9
	Paper	0	0	3
	Hood	0	2	0
7 January	Porter	0	1	6
	Bread	0	0	4 ½
	Mrs Hoare	0	2	6
	Plants [?]	0	2	6
	Mending Boots	0	4	6
	.....	0	1	0
	Mrs Lewis – cleaning windows	0	1	2
	Porter	0	0	10 ½
	Thermometer	0	2	0
	Porter	0	0	9
	Cleaning	0	3	6
	Porter	0	0	6
8 January	Coals	1	8	0
	Backgammon Board	0	2	6
	Porter	0	0	6
	Fly	0	2	6
	Wood	0	1	0
	Bread	0	0	2
	Birdseed	0	0	3
	Wine	1	1	0
	.....	0	4	5
	.....	1	1	0
	.....	0	9	3
	.....	2	7	6

	.....	1	13	3
9 January	Tuning piano	0	5	6
	Porter	0	1	0
11 January	Bath Chair	0	1	6
	Tape	0	0	2
	Mrs Hoare	0	2	6
	Porter	0	0	6
	Bread	0	0	1
12 January	Cod Liver Oil	0	2	6
	Grocer (Dec 20 – Jan 4)	3	6	1 ½
	Poulterer (Dec 20 – Jan 4)	1	5	3
	Milkman (Dec 20 – Jan 4)	0	10	10 ½
	Baker (Dec 20 – Jan 4)	0	15	5 ½
	Fishmonger (Dec 20 – Jan 4)	0	8	4
	Buns	0	0	2
	Bath Chair	0	1	6
	Ball	0	0	6
	Porter	0	0	6
	Firewood in Logs	0	2	0
13 January	Porter	0	0	6
	Band	0	1	0
	Paper	0	0	9
	Sundry	0	11	0
14 January	Fly – Mrs Smith	0	1	0
	Fly	0	2	6
	Pay rent (Dec 6 – March 6)	0	10	6
	Cleaning waistcoat	0	2	0
	Porter	0	0	6
	Butcher (Dec 18-Dec 28)	2	6	4
	Greengrocer (Dec 12-Dec 28)	0	19	10
15 January	Firewood	0	2	0

	Porter	0	0	6
	Felt for Piano	0	3	0
	Mending Boots	0	1	8
16 January	Coals	1	9	0
	Cook's Wages	4	8	0
	Porter	0	1	0
18 January	Wine glasses & basin	0	1	10
	Mrs Hoare	0	2	6
	Mrs Lewis – cleaning windows	0	1	2
	Porter	0	0	6
	.....	0	0	2
19 January	Butcher (Dec 28-Jan 10)	4	17	5
	Milk (Dec 20 – Jan 10)	2	19	7
	Greengrocer (Dec 28 – Jan 10)	0	19	0
	Baker (Jan 4-Jan 10)	0	7	3 ½
	Poulterer (Jan 4 – Jan 10)	0	5	3
	Fly to Miss Fisher's	0	4	0
	Porter	0	0	6
20 January	Cleaning & mending two coats	0	8	0
	Porter	0	0	6
	Linseed	0	0	6
21 January	Dr Mackern	1	1	0
	Tea	0	0	11 ½
	Postage stamp	0	0	1
	Porter	0	0	6
	Baby stockings	0	2	10
	Buns	0	0	2
22 January	Grocer (Jan 4 – Jan 17)	2	7	2
	Fishermonger (Dec 28 – Jan 14)	1	1	5
	Firewood	0	1	0
	Porter	0	0	6

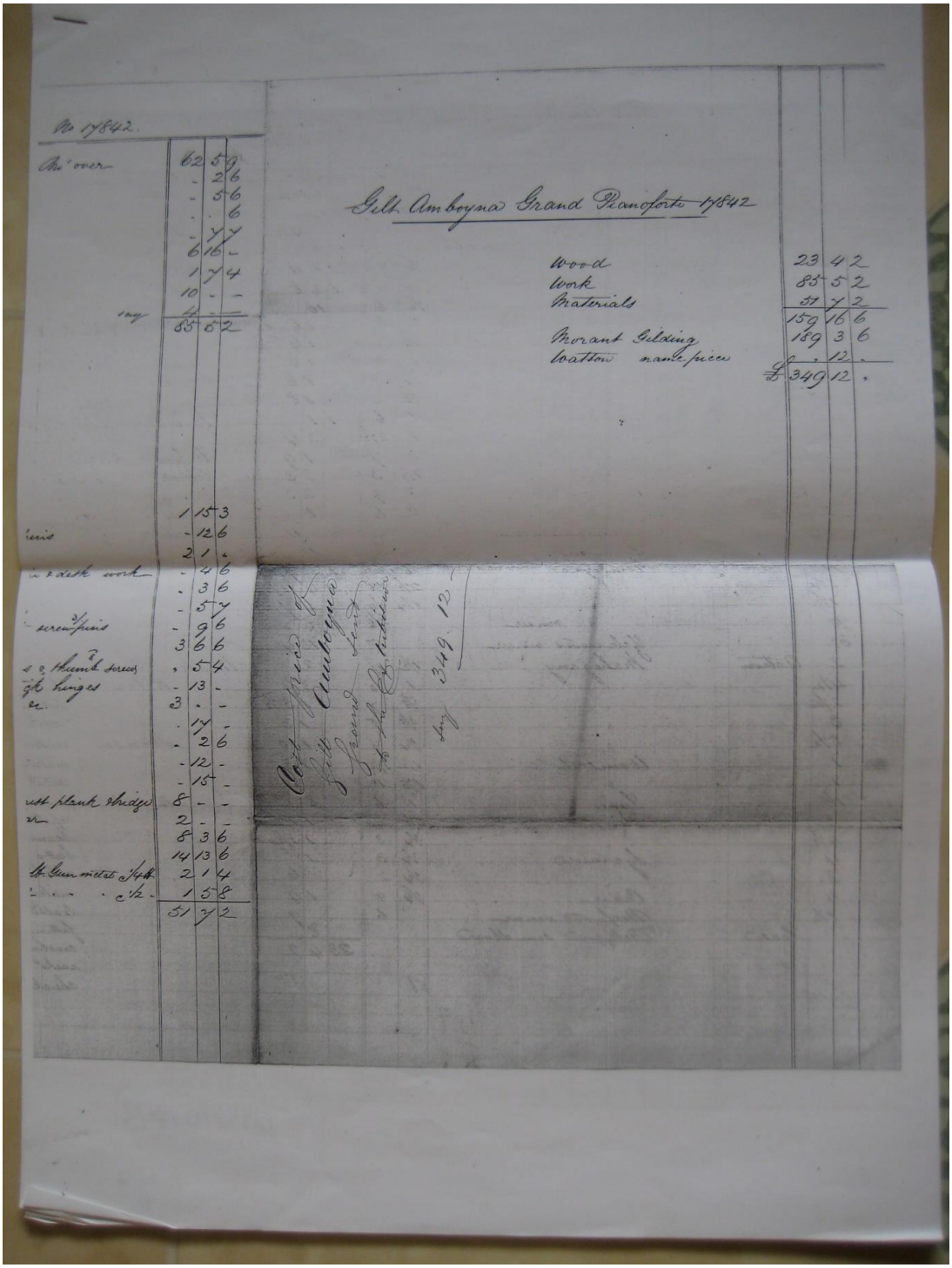
	Postage stamps	0	2	6
	“Sunday at Home”	0	0	6
	Pot Marjorie	0	1	0
	Washing (4 weeks)	3	4	2
	Washing silks & collars (4 weeks)	0	11	10
23 January	Tea	1	4	6
	Porter	0	1	1 ½
25 January	Band	0	1	0
26 January	Ale & Porter for Thursday	0	1	9
27 January	Bath Chair (Morning)	0	1	0
	Bath Chair (Afternoon)	0	1	0
28 January	Bath Chair	0	1	6
	Buttons & cap	0	0	3
29 January	Ale & Porter – 2 days	0	1	2
	Wood	0	2	0
	One bottle port wine	0	3	6
	Bath Chair	0	1	6
	1/2 a yard of [linen]	0	0	7 ½
	Sewing Silk	0	0	1
	Sugar Candy	0	0	½
	Butcher’s Bill (to 16th)	1	16	2 ½
	Baker	0	13	½
	Poulterer (to 22nd)	0	3	0
	Fishmonger (to 21st)	0	4	10
	Milkman (to 23rd)	1	0	½
	Grocer (to 23rd)	1	12	5
	Greengrocer	0	9	10
30 January	Ale	0	0	7
	Bath Chair	0	1	6
	Illustrated London News	0	0	5
	Rum & Brandy for Des	0	8	6

Boiled Ham	0	1	0
Barley sugar for Jenny	0	0	½

APPENDIX D

Inventory of parts for Gilt Amboyna Grand Pianoforte No 17842, Surrey History Centre 2185/JB/84/2

Reproduced with the permission of Surrey History Centre



Wood used in Gilt Amboyna Grand Piano No. 17842.

Feet								
4	Case	Wainscot		2½	2/		8	
5½		"		1½	1/3		6	10½
37		"		1¼	1/	1	17	
1½		Mahogany		3	2/3		3	4½
12		"	in solid	1	8		8	
5		"		5/8	7		2	11
34		"	Top	¾	8	1	2	8
20		"		½	6		10	
3		Beech		2	6		1	6
6		"		¾	3		1	6
6		Pine		1	3		1	6
6		"		¾	3		1	6
10		"		½	2		1	8
42		Lime		1	6	1	1	
16	run	Deal		1	2½		3	4
3		"		3	7		1	9
13		"		1½	3		3	3
3		Birch		3	9		2	3
2		"		2	6		1	
5½		Sycamore veneer			2			11
4		Sycamore		¾	3		1	
11		Amboyna		5/8	1/10½	1	-	7½
3¼		"		2½	7/6	1	4	4½
1½		"		1¼	3/9	-	5	7½
90		" veneer			2/6	11	5	-
32		Zebrawood veneer			5		13	4
2	Action	Mahogany		½	1/		2	
4½		"		1	10		3	9
2½		"		5/8	7		1	5½
3		"		3/8	5		1	3
5½		"		¼	4		1	10
1		Wainscot		½	1/3		1	3
1		"		1/8	10			10
16		Lime		1	6		8	
3		Pine		½	4½		1	1½
4½		"		¾	3		1	1½
4		Sycamore		¾	3		1	
3		"		¼	2			6
4		Cedar		¼	4		1	4
1½		Beefwood veneer			6			9
	Case	Bellywood soundboard					8	
						23	4	2

Work to Gilt

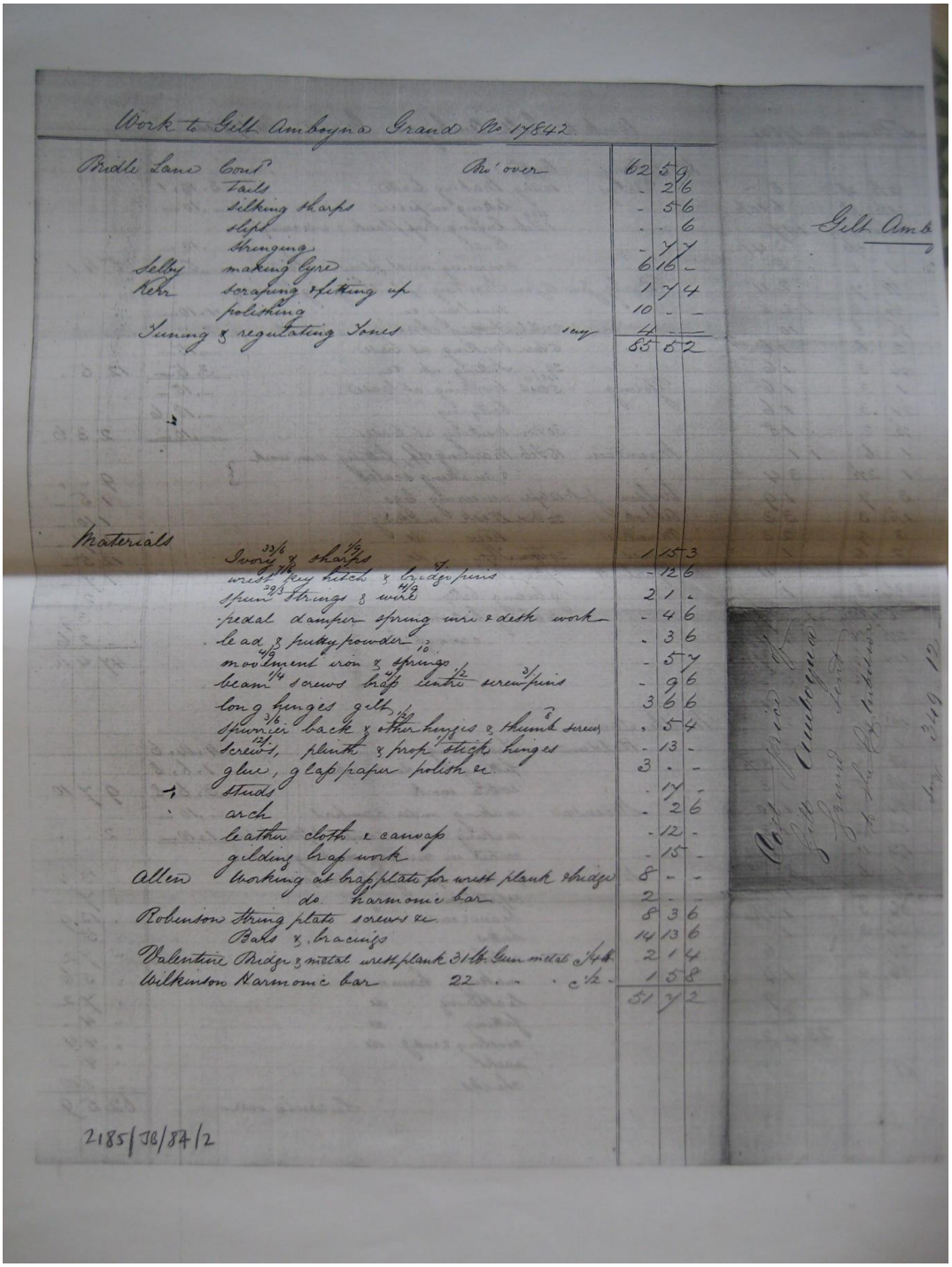
Horseferry	Booked 1850
Oxley	10 Aug.
	1851 1 Feb.
Darby Junr	18 Jan.
	22 Feb.
	8 Mar.
	29 1850
Young	5 Oct.
	30 Nov.
Mountain	15 Feb.
Wilson Jos.	12 Apr.
Abbott	22 Mar.
Moutrie	
Ayres	29 Mar.
Garbutt	17 May
	g lucen
	making
Bridle Lane	
Haldane	
Stevenson	
Hubert	

Prices No 17842

2½	2/		8	
1½	1/3		6	10½
1¼	2/	1	1/	
3	2/3		3	4½
1	8		8	
5/8	7		2	11
3/4	8	1	2	8
½	6		10	
2	6		1	6
3/4	3		1	6
1	3		1	6
3/4	3		1	6
½	2		1	8
1	6	1	1	
1	2½		3	4
3	7		1	9
1½	3		3	3
3	9		2	3
2	6		1	
	2			11
3/4	3		1	
5/8	1/6½	1	-	7½
2½	7/6	1	4	4½
1¼	3/9	-	5	7½
	2/6	11	5	-
	5-		13	4
½	1/		2	
1	10		3	9
5/8	7		1	5½
3/8	5		1	3
1/4	4		1	10
1½	1/3		1	3
1⅛	10			10
1	6		8	
½	4½		1	1½
3/4	3		1	1½
3/4	3		1	
1/4	2			6
1/4	4		1	4
	6			9
			8	
		23	4	2

Work to Gilt Amboyna Grand No 17842

Horseferry	Booked 1850					
Oxley	10 Aug	Making Case	3.19.1			
	1851	letting in pieces	-.10-			
	1 Feb	laying Wrest plank & widening Case	-.10-			
		veneering wrest plank at Lane	-.5-	5	4	1
Darby Jun	18 Jan	Fronting & plinthing, leg blocks moulding &c.	4.10-			
	22 Feb	Fitting cheek ornaments, cleaning &c.	3.15-			
	8 Mar	Working at Case	-.15-			
	29/1850	Fitting up &c.	3.5-	12	5	.
Young	5 Oct	Working at Case	-.15-			
		bellying	-.18.6			
	30 Nov	Working at Case	-.10-	2	3	6
Mountain	15 Feb	Marking off, fitting iron work & making scales		9	-	-
Wilson Jos	12 Apr	veneering legs		1	5	-
Abbott	22 Mar	Desk making		1	10	-
Mourie		Keys do		1	17	-
Ayres	29 Mar	Top do		12	5	-
Garbutt	17 May	Turning legs		1	7	-
		glueing belly		-	2	-
		making bottom		-	3	9
		, canvas frame		-	2	6
				47	4	10
Bridle Lane						
Haldane		Finishing	4.14.6			
		fitting underdampers	1.6.8			
		extra work	3.6.8	9	7	10
Stevenson		making under dampers	-.10-			
		making under damper lifters, buttons centres in mortice making rail &c.	1.10-	2	-	-
Hubert		putting springs to dampers		.	13	4
		repetition		.	7	-
		beam & ends		.	13	9
		butts		.	5	-
		notches		-	7	2
		making hammers		.	5	6
		leathering do		.	7	2
		fitting do		-	4	-
		covering & cutting do		.	4	4
		racks		.	4	-
		checks		-	1	10
		Carried over		62	5	9



Work to Gilt Ambyna Grand No 17842

Bridle Lane	Cont.	Bro' over	62	5	9
	Tails		.	2	6
	Silking sharps		.	5	6
	slips		.	.	6
	Stringing		.	7	7
Selby	making Lyre		6	16	-
Kerr	scraping & fitting up		1	7	4
	polishing		10	-	-
Tuning & regulating Tones		1 cwt	4	-	-
			83	8	2
Materials					
	Ivory 33/6 & sharps 1/2		1	15	3
	wrest 21/- key hitch & bridge pins 7		.	12	6
	spun 23/- Strings & wire 49		2	1	.
	pedal damper spring wire & desk work		.	4	6
	lead 4/6 & pulley powder 10		.	3	6
	movement iron & springs		.	5	7
	beam 14 & screws brass centre 1/2 screw pins 3/-		.	9	6
	long hinges gilt 3/-		3	6	6
	spinnier 3/6 back & other hinges & thumb screws 3		.	5	4
	screws, plinth & prop stays hinges 12/-		.	13	-
	glue, glass paper polish &c		3	.	-
	studs		.	17	-
	arch		.	2	6
	leather cloth & canvas		.	12	-
	gilding brass work		.	15	-
Allen	Working at brass plate for wrest plank & bridge		8	-	-
	do. harmonic bar		2	-	-
Robinson	String plate screws &c		8	3	6
	Bars & bracings		14	13	6
Valentine	Bridge & metal wrest plank 31 lb. Gun metal 3/4		2	1	4
Wilkinson	Harmonic bar 22 . . @ 1/2		1	5	8
			51	7	2

Gilt Amb

2185/JC/87/2

Appendix E

Table showing British makers of piano parts and accessories

Name of Exhibitor/capacity in which object entered	Region	Product Description	Official Catalogue Number and Reference
Cocker & Sons (manufacturer)	Derbyshire	Piano wire	No.234, Class XXII (General Hardware), Vol II, p.618
Cope & Collinson (manufacturer)	Birmingham	Locks, hinges, springs and iron work used in piano making	No.255, Class XXII (General Hardware), Vol II, p.621
Joseph Faulding (inventor & producer)	London	Specimens of ornamental and curvilinear sawing for embellishing pianos	No.502, Class XXII (General Hardware), Vol II, p.651
Kate G. Fonnereau (inventor & designer)	Ipswich, Norwich	Inlaid wood applicable to pianos	No.40, Class XXVI (Furniture), Vol II, p.732
William Gough (manufacturer)	Birmingham	Electro-plated articles including piano candlestick	No.33, Class XXIII (Precious Metals), Vol II, p.677
E. Greaves (manufacturer)	Sheffield	Tuning forks and tuning keys for grand and cabinet pianos	No.503, Class X, Vol 1, pp.467-468
E. Hawksworth & Co (designers & manufacturers)	Sheffield	Piano candlesticks	No.35, Class XXIII (Precious Metals), Vol II, p.678
Henn & Bradley (manufacturer)	Birmingham	Taper hand-rail screws adapted for piano makers	No.316, Class XXII (General Hardware), Vol II, p.629
James Horsfall (manufacturer & proprietor)	Birmingham	Piano wire	No.334, Class XXII (General Hardware), Vol II, p.632
Francis Marrian (manufacturer)	Birmingham	Piano candlesticks	No.31, Class XXIII (Precious metals), Vol II, p.676
A. Mathieson (manufacturer)	Glasgow	Pianoforte-maker's key tools	No.32, Class XXI (cutlery, edge and

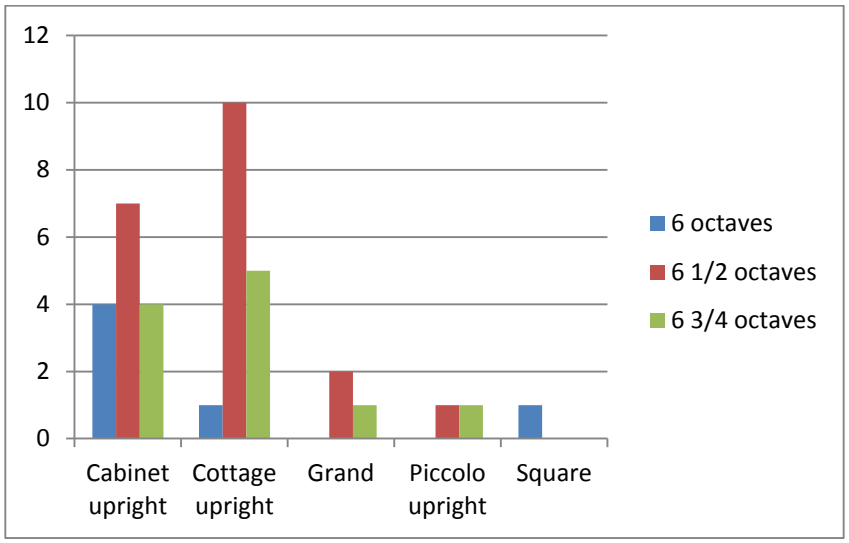
			hand tools), Vol II, p.592
John Meadows (inventor, patentee & manufacturer)	London	New method of veneering by machinery: Grecian & Doric column and capital, adapted to all kinds of upholsterers' work, cabinet and pianoforte.	No.165, Class XXVIII (manufactures from animal and vegetable substances), Vol II, p.787
Paul Moore & Co (manufacturer)	Birmingham	Brass hinges for pianoforte	No.274, Class XXII (General Hardware), Vol II, p.624
William Riddle (inventor)	London	Specimens of jet and opal glass, suggested as adapted for pianoforte keys	No.637, Class XXII (General Hardware), Vol II, p.659
Sandy & Powell (manufacturer)	London	Fret cut truss or leg of rosewood suitable for a pianoforte &c relieved with carving	No.112, Class XXVIII (Manufactures from animal and vegetable substances), Vol II, p.785
Pemberton Simcox & Sons (manufacturer)	Birmingham	Sconces of various designs for pianofortes	No.321, Class XXII (General Hardware), Vol II, p.630
C & A Taylor (designer & manufacturer)	London	Ornamental tablet, being a specimen of fretwork, cut by improved machinery; used in the decoration of pianofortes	No.113, Class XXVIII (manufactures from animal and vegetable substances), Vol II, p.785
William Turnbull (manufacturer)	London	Set of Pianoforte Keys	No.500A, Class X, Vol 1, p.467

APPENDIX F

Graphs showing notational compass of mid-nineteenth-century pianos

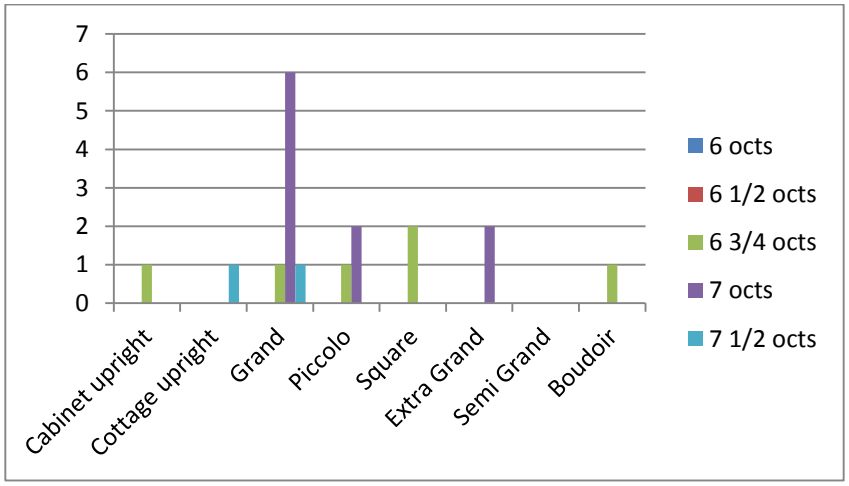
(In some instances it is difficult to compare piano-types because of the lack of standardised terminology used by piano makers at mid-century)

GRAPH 1



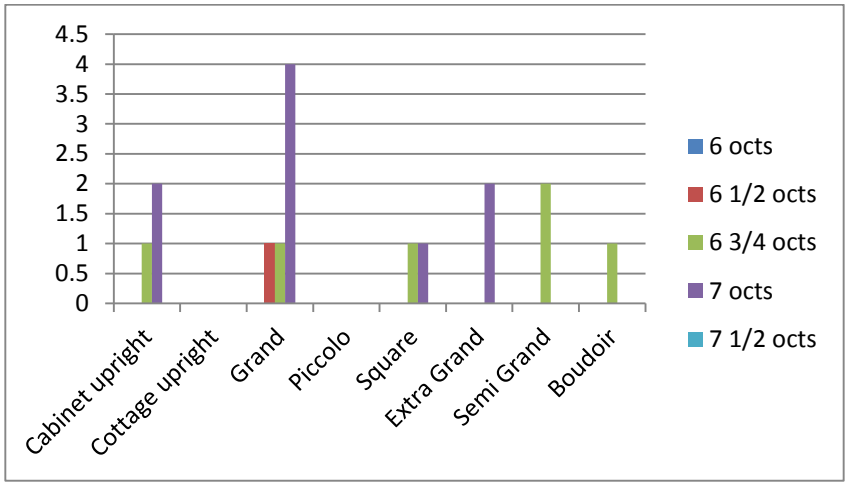
Graph 1 is compiled from my quantitative study data (of the 112 instruments identified in 89 auction advertisements, details of compass is specified with regard to only 37 instruments)

GRAPH 2



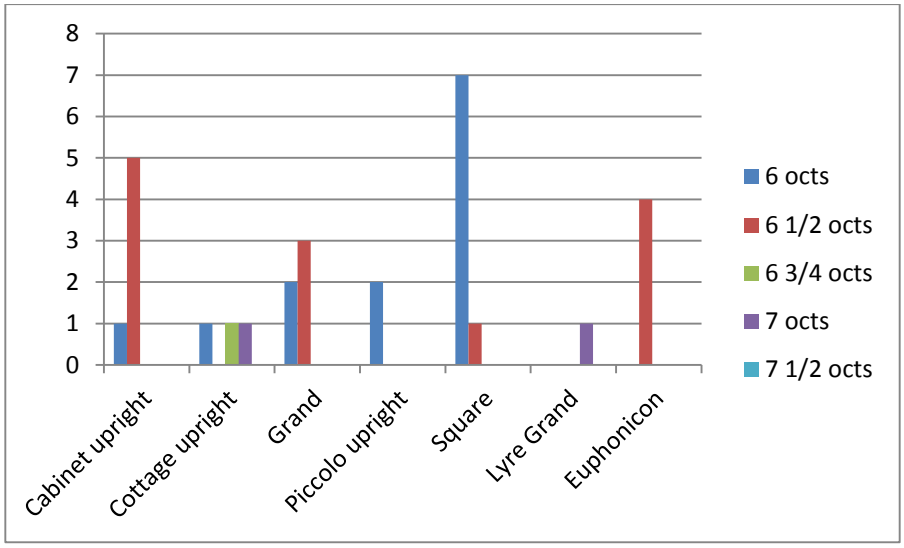
Graph 2 – data represents British Exhibition pianos listed in the *ODIC*. Only 18 instruments have been included because in many cases manufacturers did not specify the range of their exhibited instrument.

GRAPH 3



Graph 3 – data represents pianos shown by foreign exhibitors listed in the *ODIC* (subject to the same limitations as above); 16 pianos are represented, including all those by Erard.

GRAPH 4



Graph 4 – data represents surviving examples of English pianos dating from 1830-1850; 29 instruments are represented.

APPENDIX G

Table showing notational compass of extant pianos by English makers dating from between 1840-1850

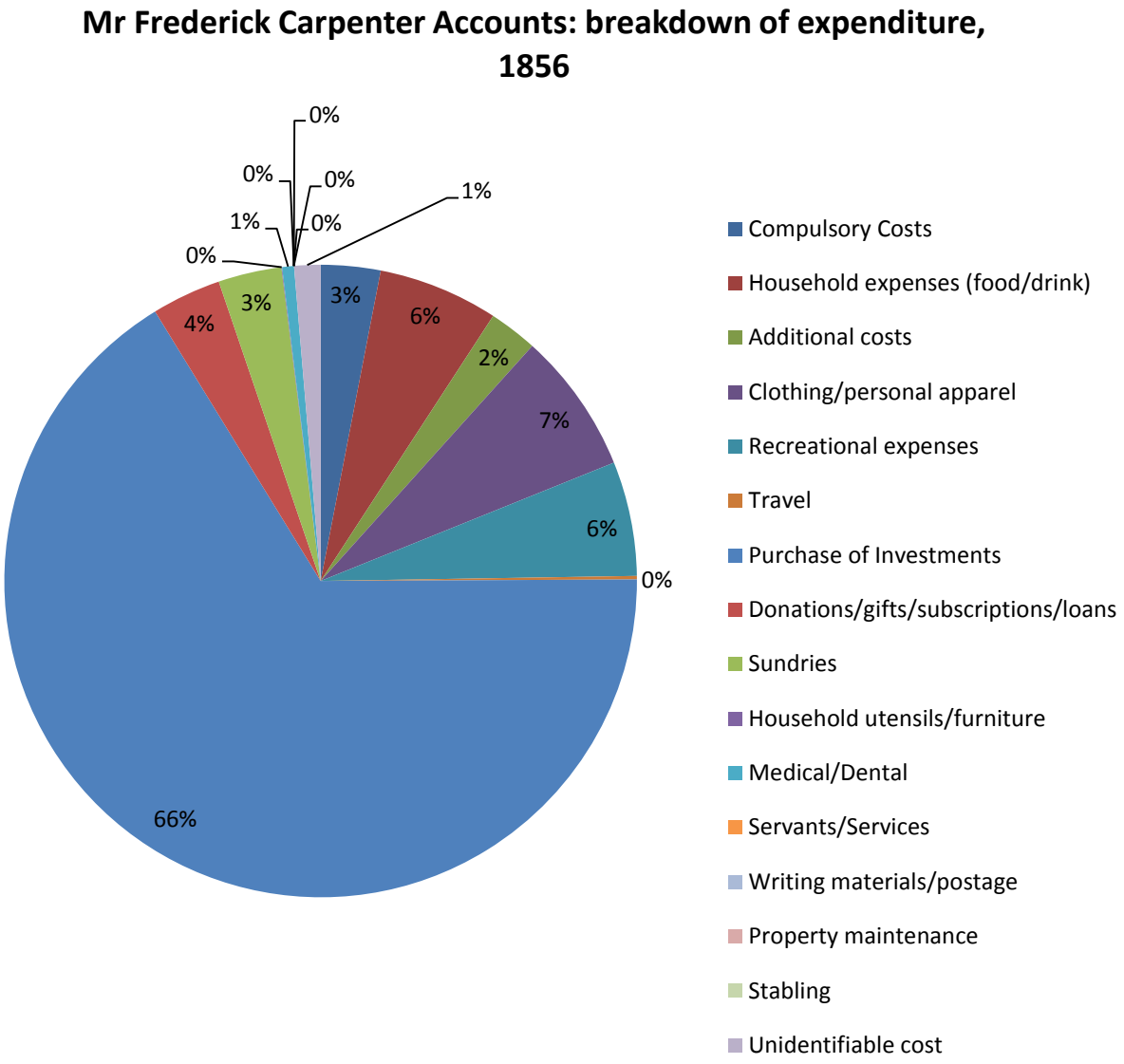
Piano Type	Manufacturer	Date	Compass	Collection
Grand	Broadwood	1844	CC-F”” (6 ½ octs)	Royal Academy of Music Museum
Cottage Upright	Ennever & Steedman	1850	CC-A”” (6 ¾ octs)	Bristol City Museum & Art Gallery (Blaise Castle)
Piccolo Upright	Broadwood	1840	GG-G”” (6 octs)	Bristol City Museum & Art Gallery (The Red Lodge)
Square	Collard	1840	FF-G”” (6 octs)	Royal College of Music Museum
Lyre/Giraffe Grand	William Mardon	1840	CCC-C”” (7 octs)	Museum of London
Euphonicon	Beale & Co	1841	CC-G”” (6 ½ octs)	Victoria & Albert Museum
Cabinet Upright	Collard	1840	CC-F”” (6 ½ octs)	Victoria & Albert Museum
Grand	Broadwood	1846	CC-G”” (6 ½ octs)	Finchcocks Musical Museum
Cottage Upright	Ennever & Co	1850	AAA-A”” (7 octs)	Finchcocks Musical Museum
Euphonicon	Beale & Co	1842	CC-G”” (6 ½ octs)	Finchcocks Musical Museum
Square	Broadwood	1845	CC-A””(6 ¾ octs)	Russell Collection, University of Edinburgh
Euphonicon	Beale & Co	1845	CC-G”” (6 ½ octs)	Russell Collection
Piccolo Upright	Wornum	1841	FF-F”” (6 octs)	Russell Collection
Square	Broadwood	1840	FF-F”” (6 octs)	Bates Collection, University of Oxford

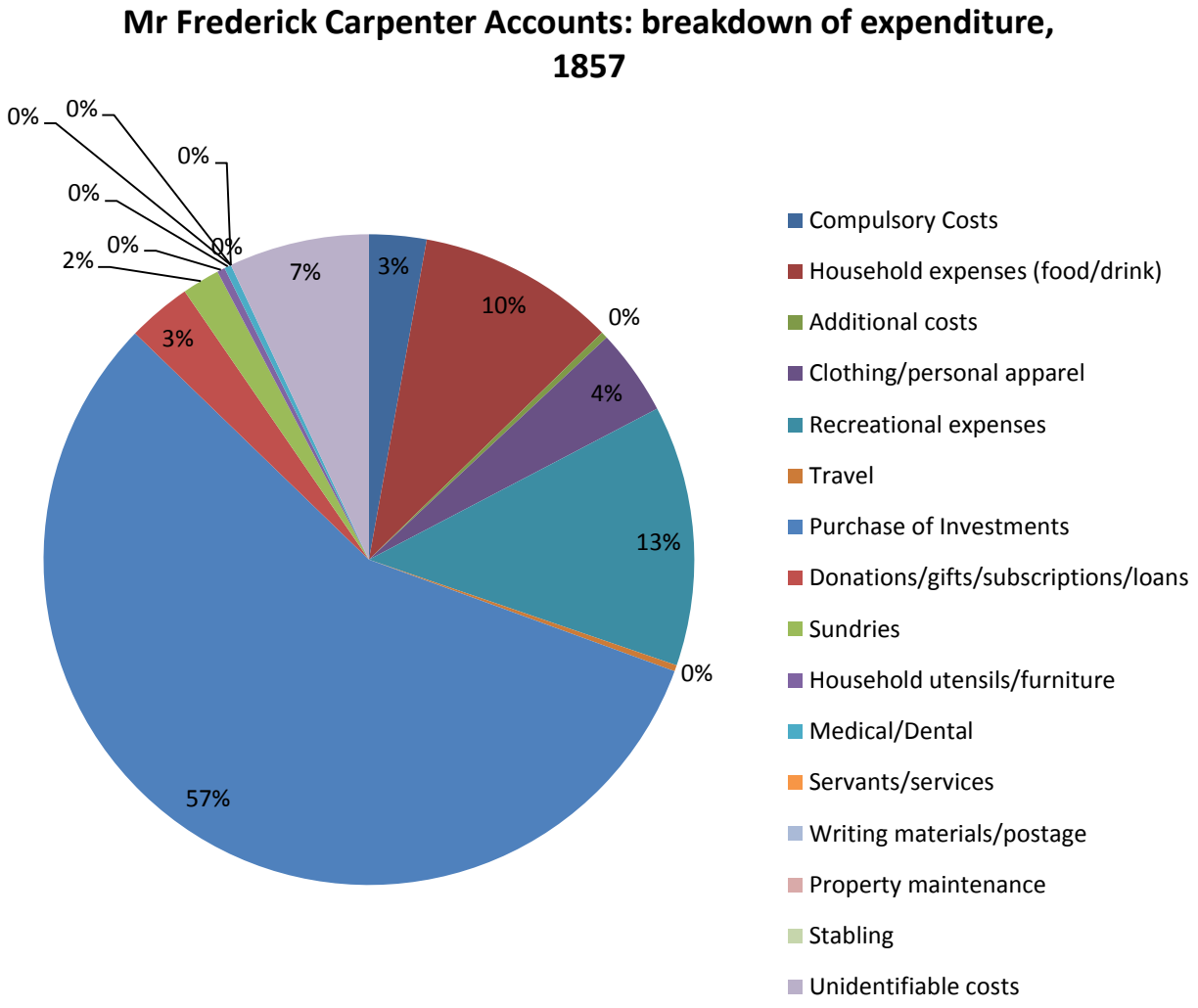
Table showing notational compass of Exhibition Pianos (where known)

Piano Type	Manufacturer	Compass	Source
Grand (Amboyna)	Broadwood	G-G (7 octaves)	*ODIC*
Grand (Amboyna)	"	"	"
Grand (Amboyna)	"	"	"
Grand (Walnut)	"	"	"
Extra grand	Erard (French section)	A-A (7 octaves)	*ODIC*
Extra grand	"	"	"
Semi grand	"	C-A (6 ¾ octaves)	*ODIC*
Grand square	"	"	"
Oblique upright	"	"	"
Grand	Erard (English section)	A-A (7 octaves)	*Newton's London Journal*
Grand	"	"	"
Upright	"	"	"
Grand	Kirkman	A-A (7 octaves)	*Newton's London Journal*
Upright	"	C-A (6 ¾ octaves)	"
Grand	Stodart	C-A (6 ¾ octaves)	*Newton's London Journal*
Piccolo upright	Wornum	C-A (6 ¾ octaves)	*Newton's London Journal*
Grand	Mott	F-C (7 ½ octaves)	*Newton's London Journal*

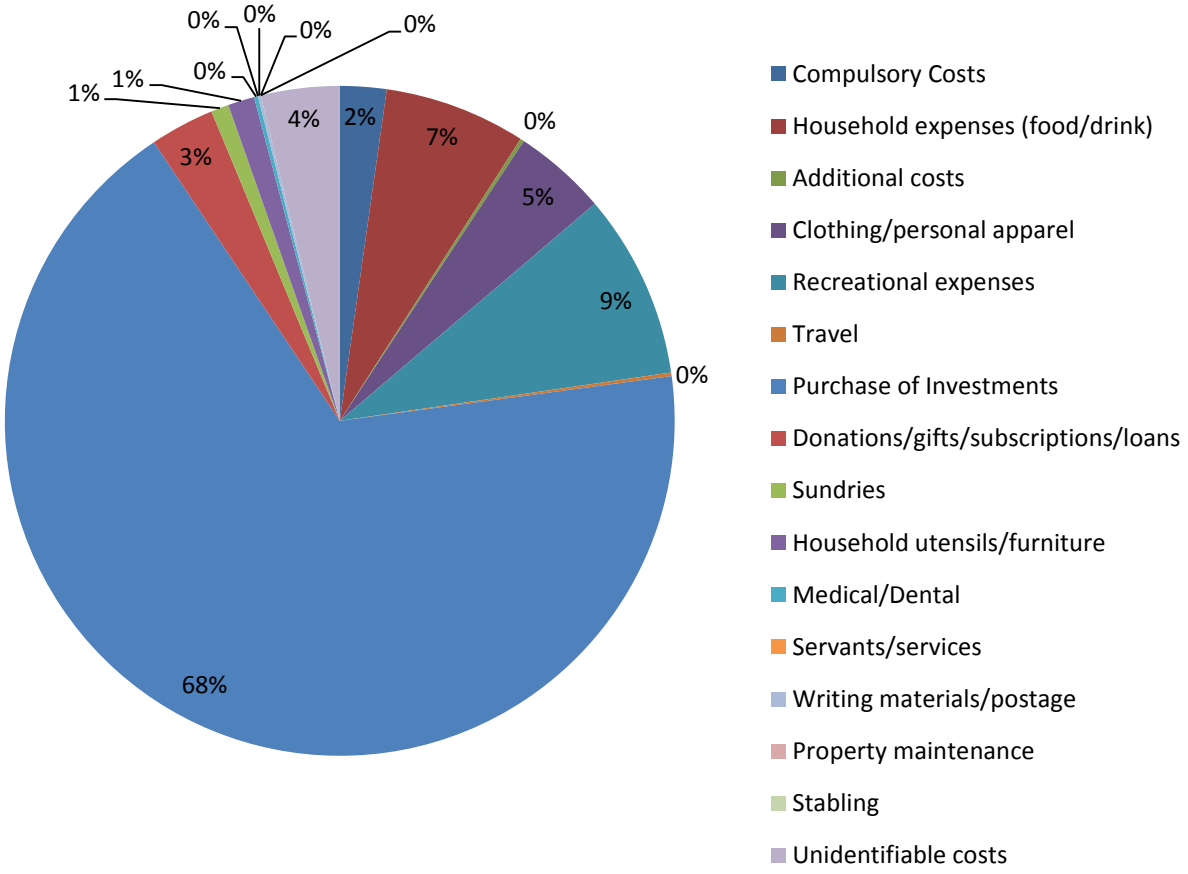
APPENDIX H

Data representing percentage expenditure for complete calendar years for six separate households as documented in household accounts

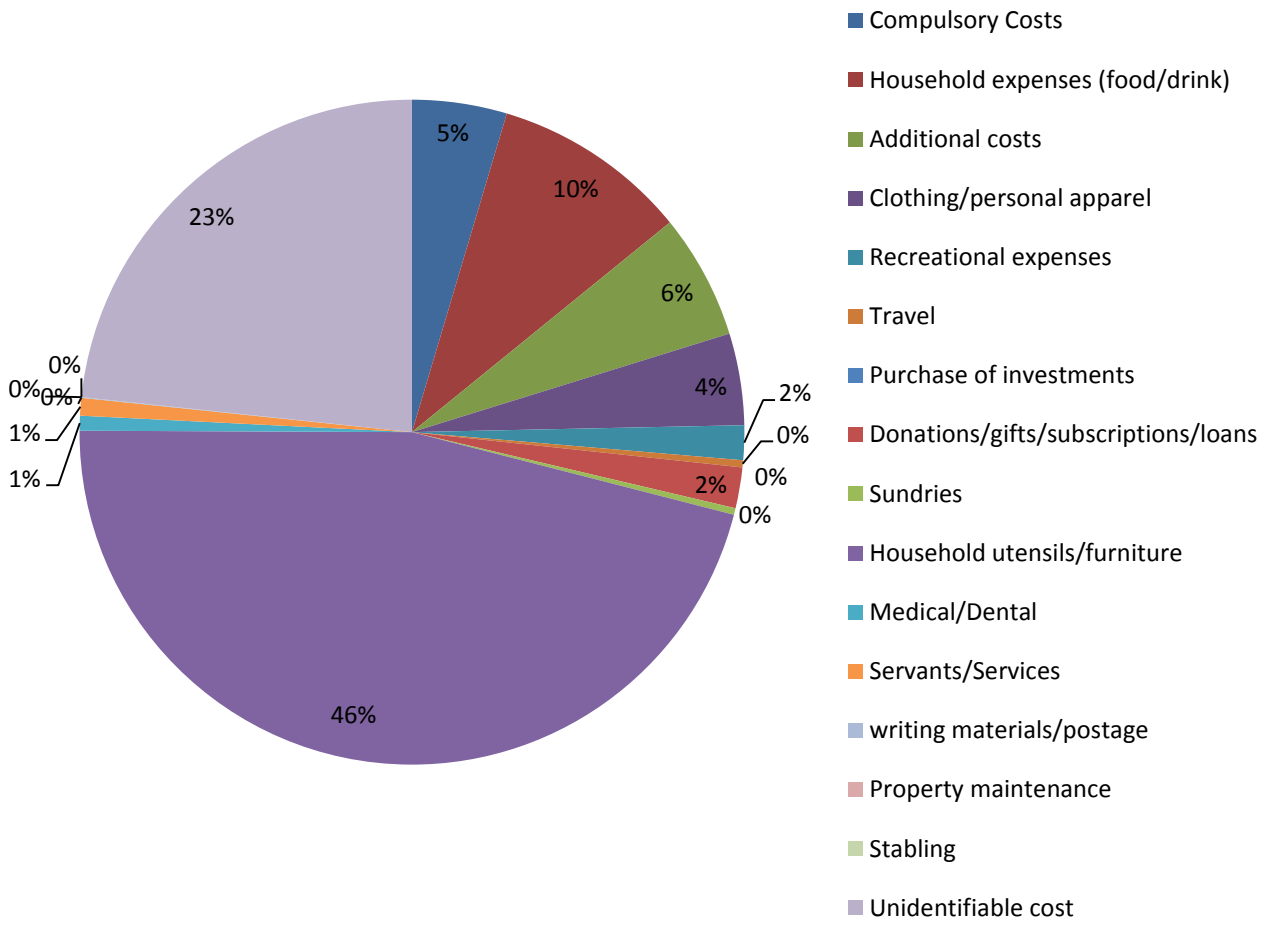



Mr Frederick Carpenter Accounts: breakdown of expenditure, 1857
0%
0%
0%
0%
0%
2%
7%
3%
10%
0%
4%
13%
0%
57%
3%
Compulsory Costs
Household expenses (food/drink)
Additional costs
Clothing/personal apparel
Recreational expenses
Travel
Purchase of Investments
Donations/gifts/subscriptions/loans
Sundries
Household utensils/furniture
Medical/Dental
Servants/services
Writing materials/postage
Property maintenance
Stabling
Unidentifiable costs

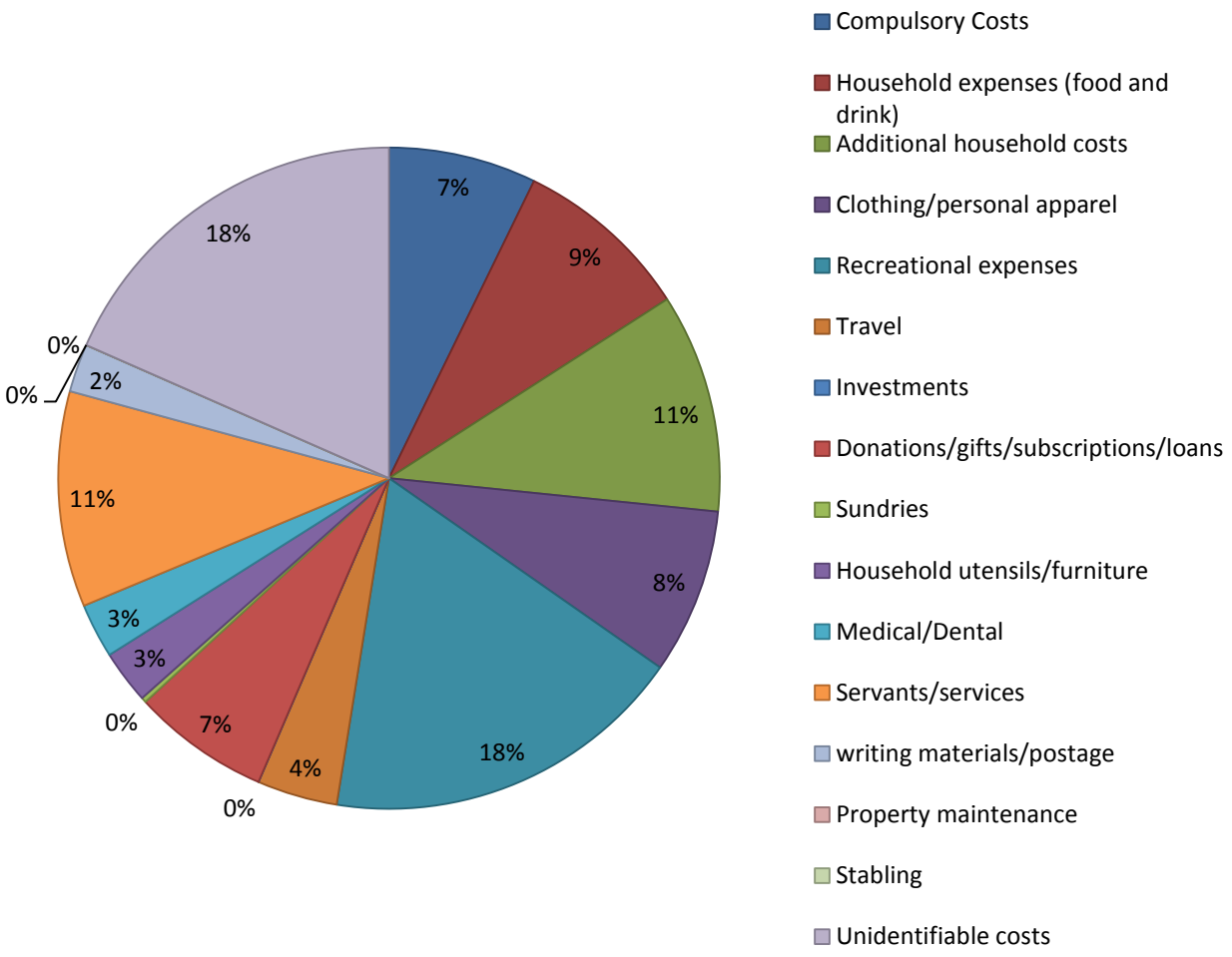
Mr Frederick Carpenter Accounts: breakdown of expenditure, 1858



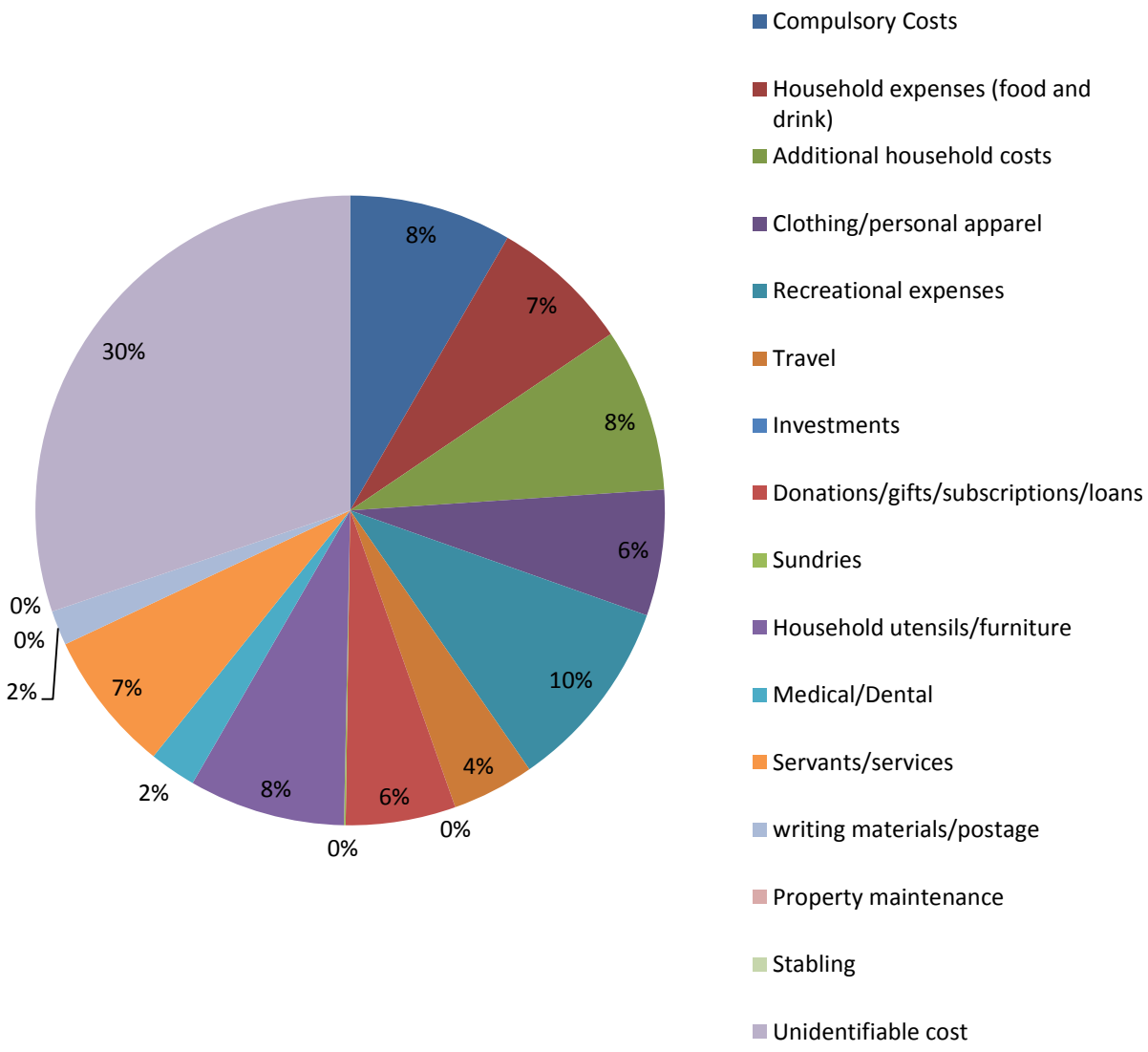
Mr F. Carpenter Accounts: breakdown of expenditure, 1859



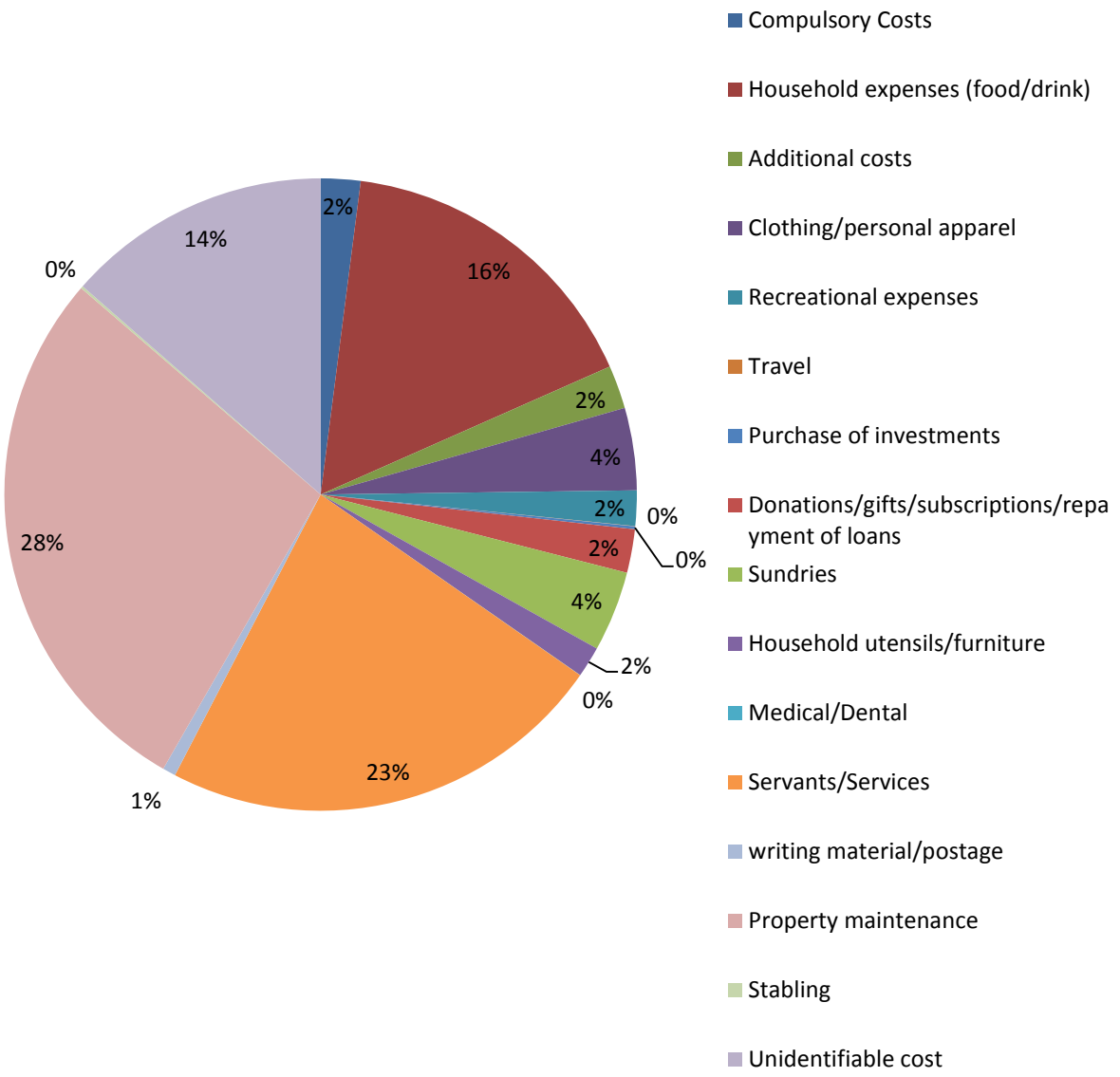
De Coetlogon Accounts: breakdown of expenditure, 1832



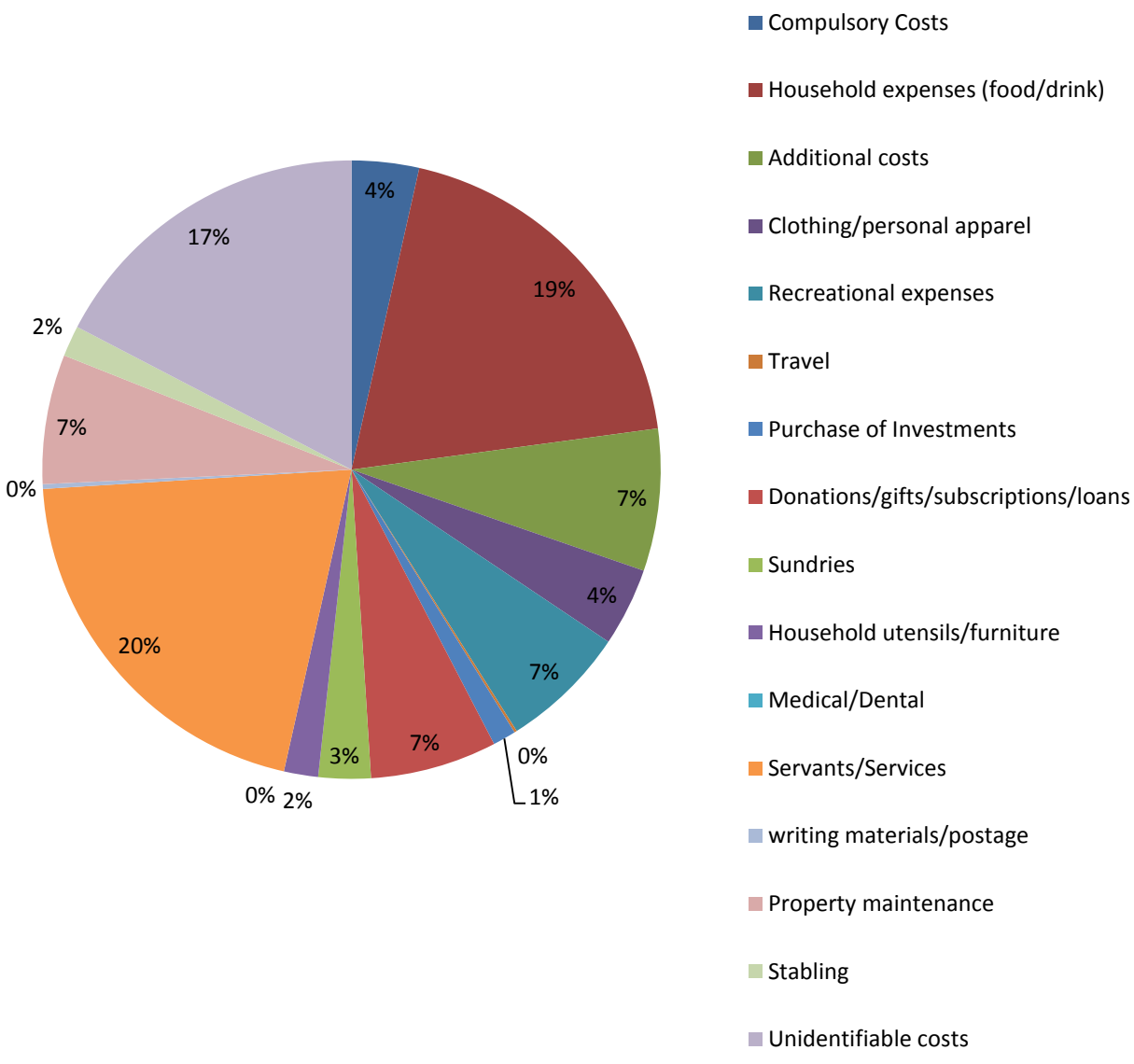
De Coetlogon Accounts: breakdown of expenditure, 1835



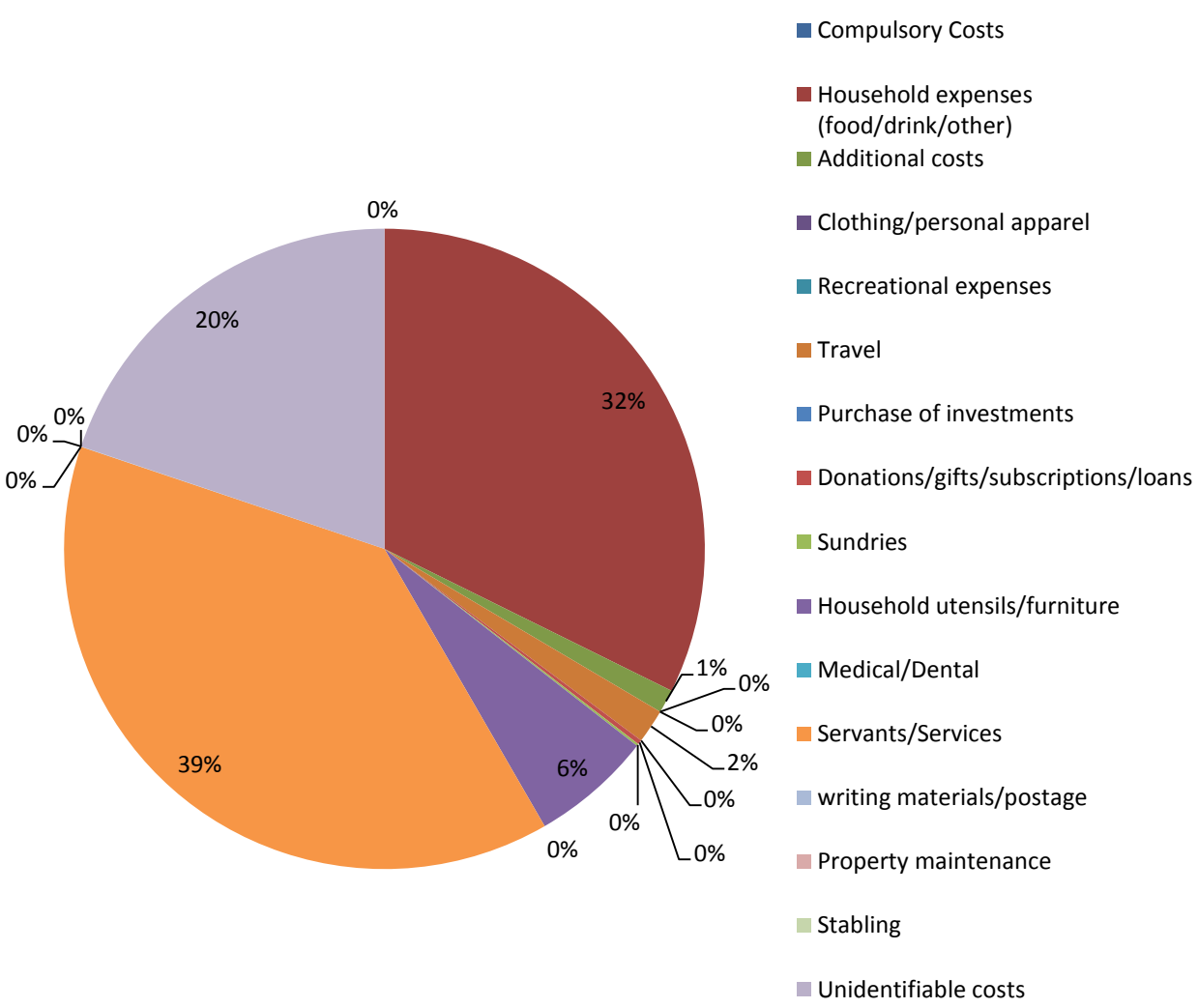
Mr E Johnston Accounts: breakdown of expenditure, 1858



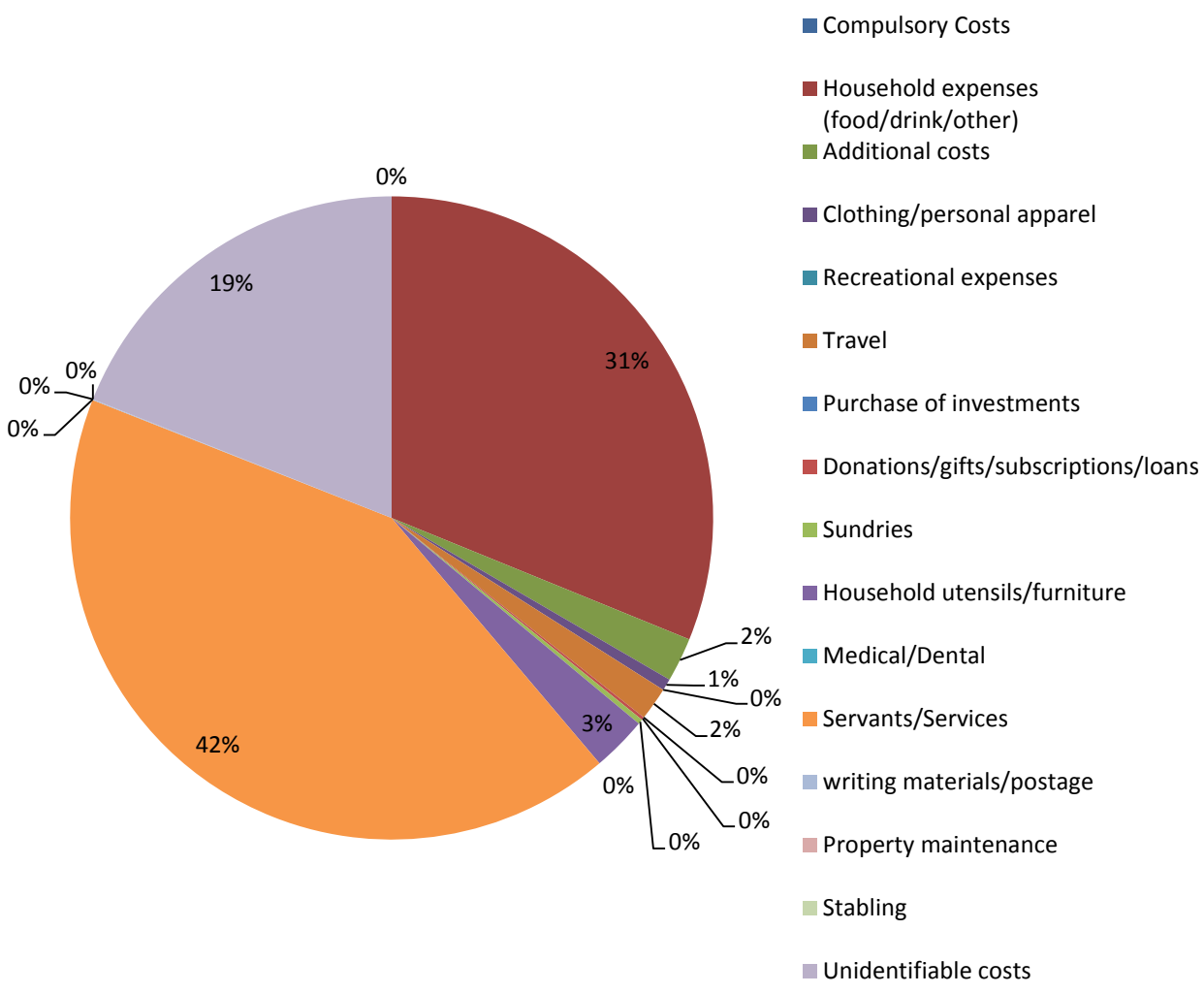
Mr E. Johnston Accounts: breakdown of expenditure, 1859



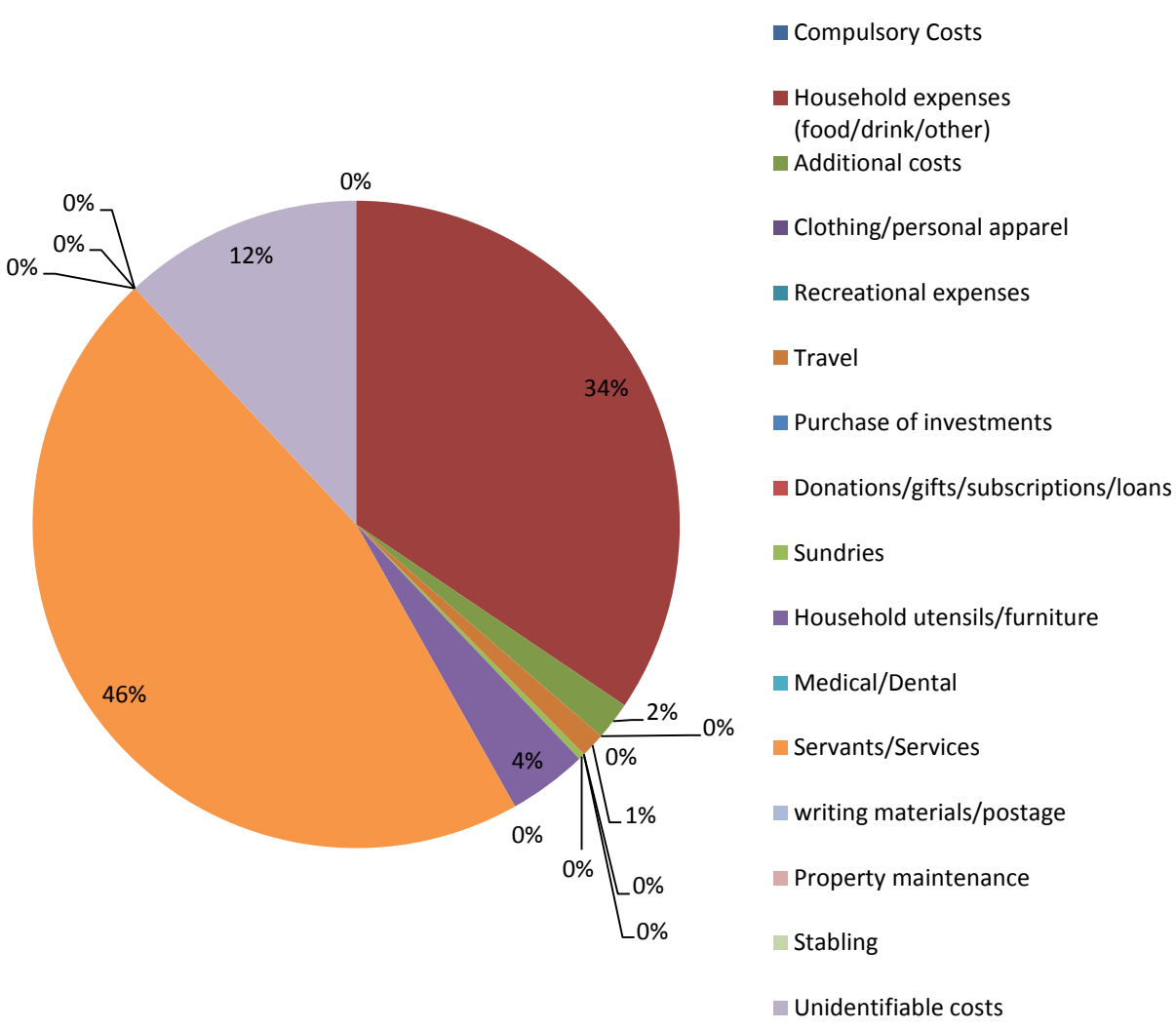
Mariabella Howard Accounts: breakdown of Household expenditure, 1843



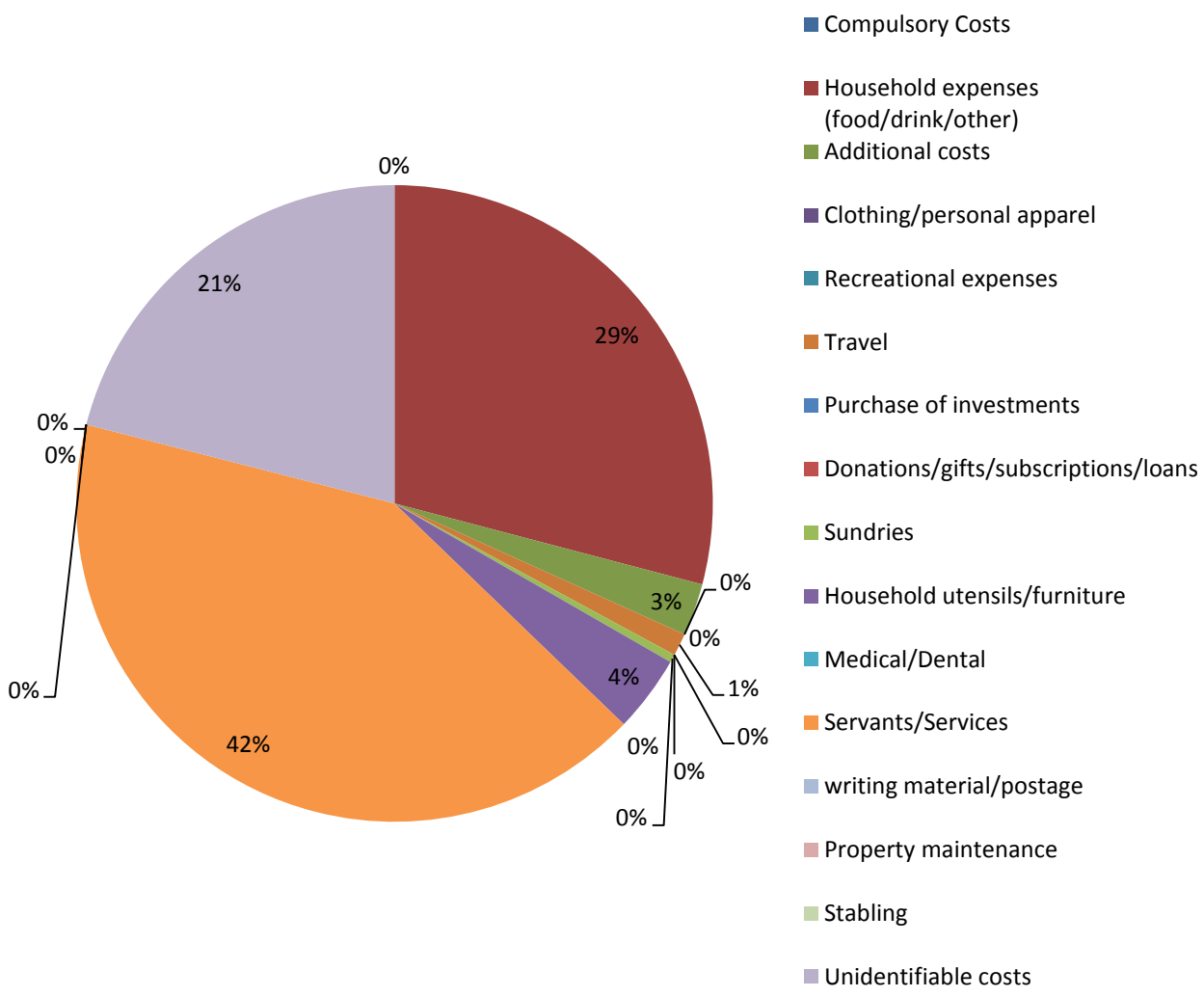
Mariabella Howard Accounts: breakdown of expenditure, 1844



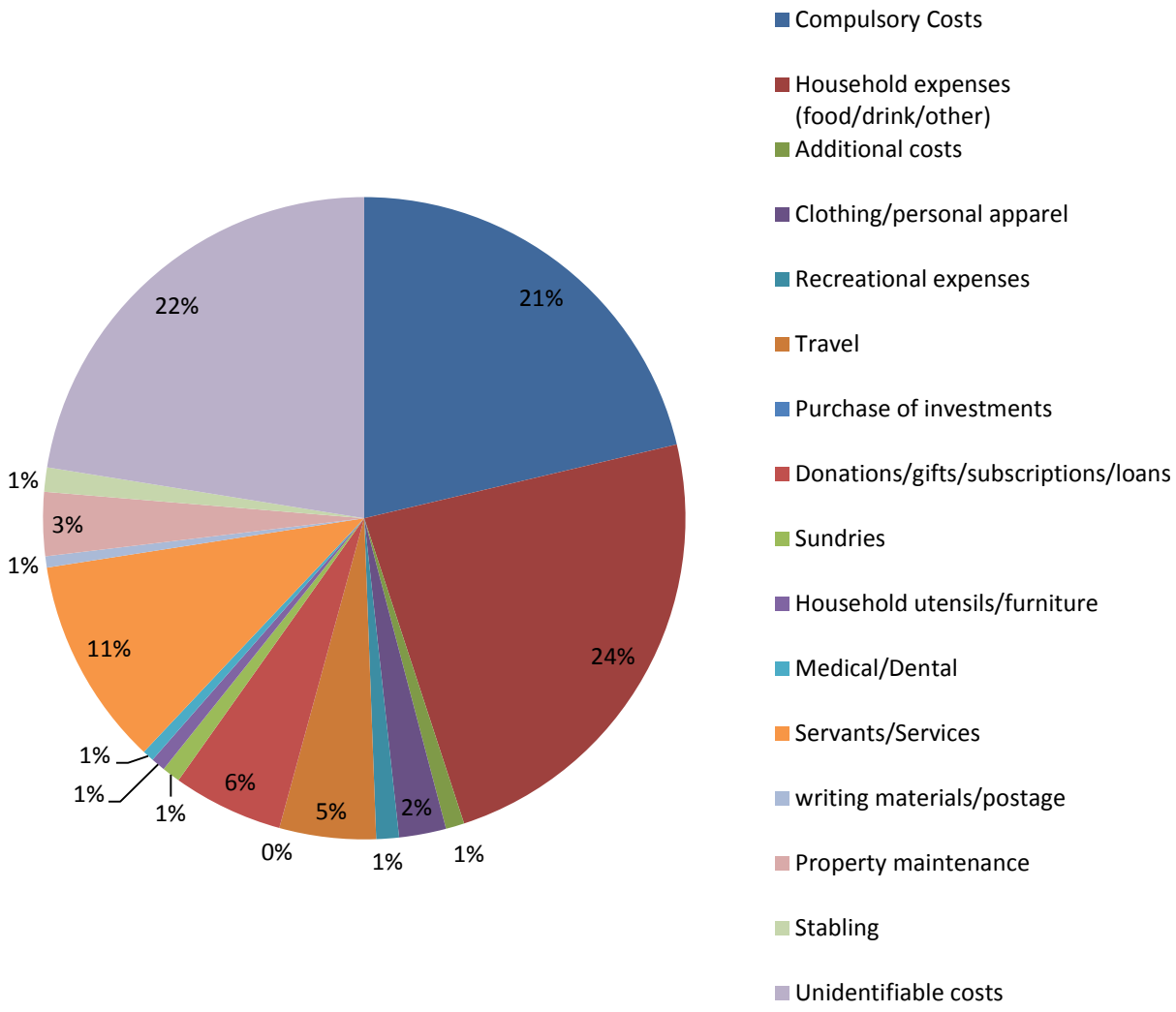
Mariabella Howard Accounts: breakdown of expenditure, 1845



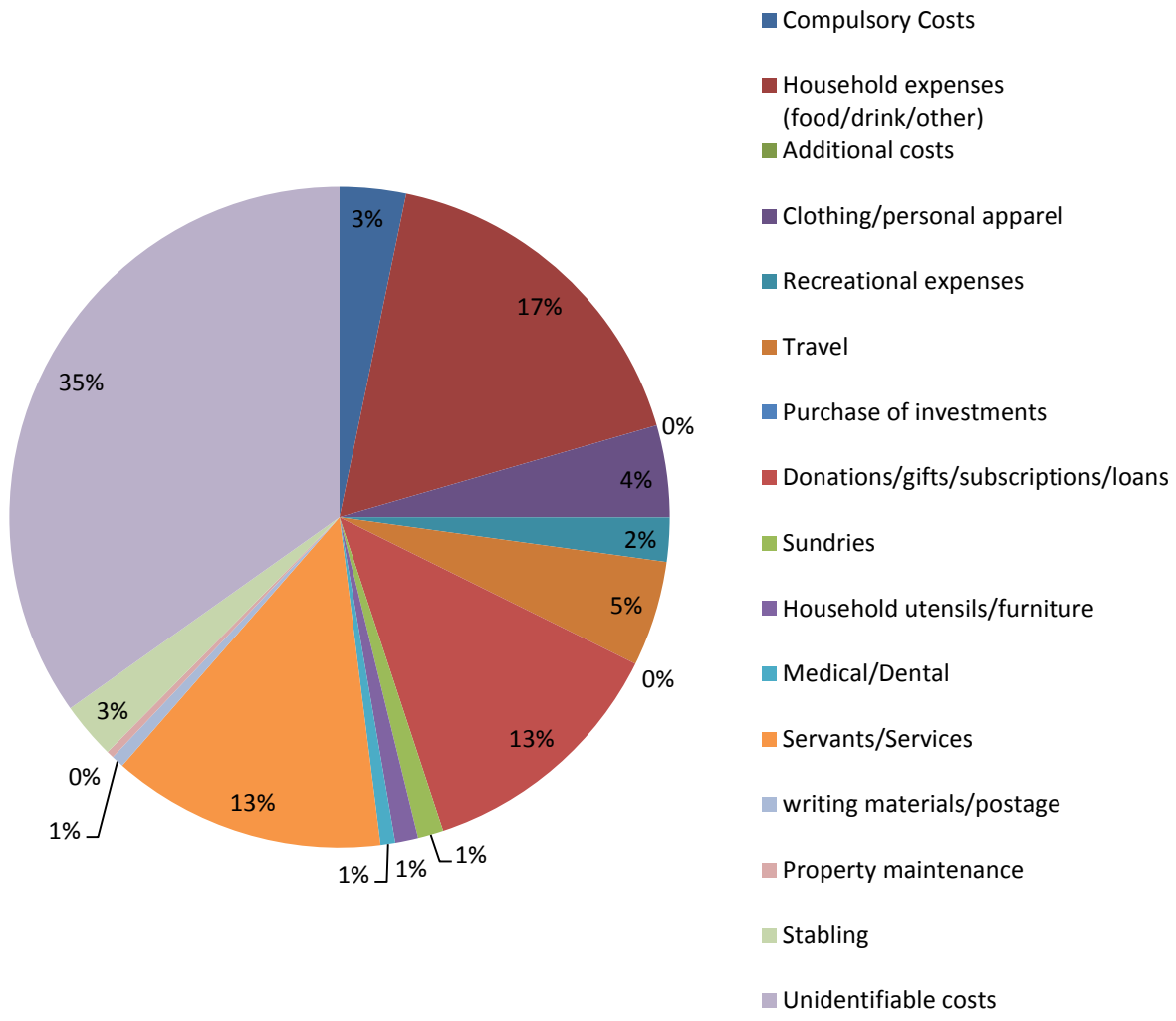
Mariabella Howard Accounts: breakdown of expenditure, 1846



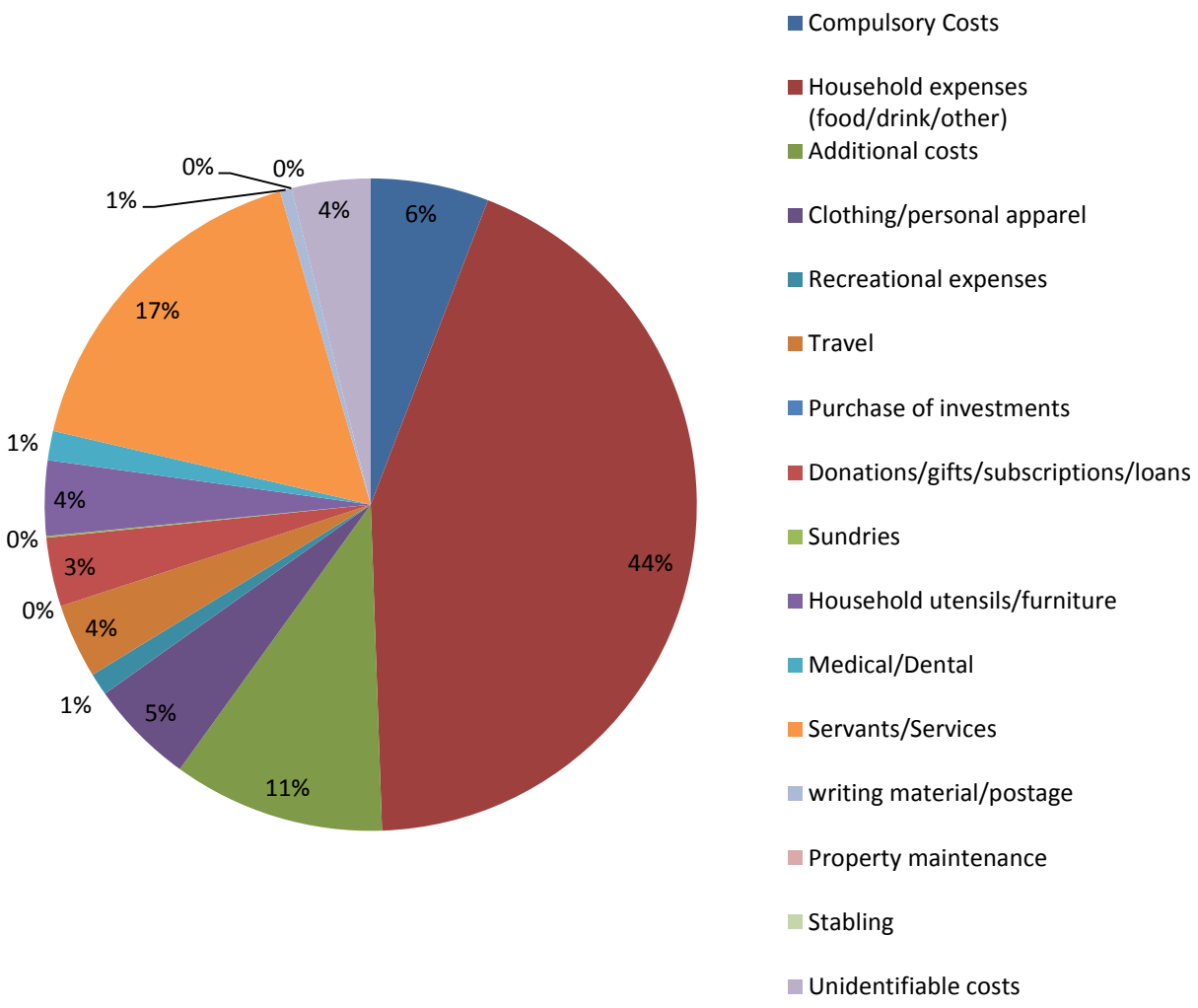
Rev William Stracey Accounts: breakdown of expenditure, 1852



Rev William Stracey Accounts: breakdown of expenditure, 1853



Smith Accounts, breakdown of expenditure, 1864



APPENDIX I

Taxonomy used at the 1862 International Exhibition

SECTION I – RAW MATERIALS

I Mining, Quarrying, Metallurgy & Mineral Products

II Chemical Substances & Products and Pharmaceutical Processes

a) Chemical Products
b) Medical & Pharmaceutical Products & Processes

III Substances Used for Food

a) Agricultural Produce
b) Drysaltery, Grocery & Preparations of Food Sold for Consumption
c) Wines, Spirits, Beers, Other Drinks & Tobacco

IV Animal & Vegetable Substances used in Manufactures

a) Oils, Fats and Wax & their Products
b) Other Animal Substances used in Manufactures
c) Vegetables Substances used in Manufactures
d) Perfumery

SECTION II - MACHINERY

V Railway Plant including Locomotive Engines & Carriages

VI Carriages not connected with Rail or Train roads

VII Manufacturing Machines & Tools

a) Machinery employed in Spinning and Weaving
b) Machines & Tools employed in the manufacture of Wood, Metal &c

VIII Machinery in General

IX Agricultural & Horticultural Machines and Implements

X Civil Engineering, Architectural & Building Contrivances

a) Civil Engineering & Building Contrivances

b) Sanitary Improvements & Constructions
c) Objects shown for Architectural Beauty

XI Military Engineering, Armour and Accoutrements, Ordnance & Small Arms

a) Clothing & accoutrements
b) Tents, Camp Equipages & Military Engineering
c) Arms & Ordnance

XII Naval Architecture

a) Ships for purposes of War & Commerce
b) Boats, Barges & Vessels for Amusement
c) Ships' Tackle and Rigging

XIII Philosophical Instruments

XIV Photographic Apparatus & Photography

XV Horological Instruments

XVI Musical Instruments

XVII Surgical Instruments & Appliances

SECTION III – MANUFACTURES

XVIII Cotton

XIX Flax & Hemp

XX Silk & Velvet

XXI Woollen & Worsted

XXII Carpets

XXIII Woven, Spun, Felted and Laid Fabrics

XXIV Tapestry, Lace & Embroidery

XV Skins, Furs, Feathers & Hair

a) Skins & Furs
b) Feathers & Manufactures from Hair

XVI Leather

a) Leather & Manufactures generally made of Leather
b) Saddlery & Harness

XVII Articles of Clothing

a) Hats and Caps
b) Bonnets & General Millinery
c) Hosiery, Gloves & Clothing
d) Boots & Shoes

XVIII Paper, Stationery, Printing & Bookbinding

a) Paper, Card & Millboard
b) Stationery
c) Plate, Letterpress and other modes of Printing
d) Bookbinding

XIX Educational Works & Appliances

a) Books & Maps
b) School Fittings, Furniture & Apparatus
c) Appliances for Physical Training including Toys & Games
d) Specimens & Illustrations of Natural History & Physical Science

XXX Furniture & Upholstery

a) Furniture & Upholstery
b) Paper Hangings & General Decoration

XXXI Iron & General Hardware

a) Iron Manufactures
b) Manufactures in Brass & Copper
c) Manufactures in Tin, Lead, Zinc, Pewter & General Braziery

XXXII Steel Cutlery & Edge Tools

a) Steel Manufactures
b) Cutlery & Edge Tools

XXXIII Works in Precious Metals, their Imitations & Jewellery

XXXIV Glass

a) Stained Glass & Glass Used in Buildings and Decorations
b) Glass for Household Use & Fancy Purposes

XXXV Pottery

XXXVI Dressing cases, despatch boxes & travelling cases

SECTION IV – FINE ART

XXXVII Architecture

XXXVIII Paintings in Oil & Watercolours & Drawings

XXXVIIIA Art Designs for Manufactures

XXXIX Sculpture, Models, Die-sinking & Intaglios

XL Etchings & Engravings

Appendix J

Table listing prizes and acknowledgements for 'cheapness' or 'economy' at the International Exhibition of 1862

Exhibition nation	Prize Medal	Honourable Mention	No Commendation
Britain	None	1. R. Allison & Sons; 'Honourable Mention awarded for 'goodness and cheapness of piano' (no price is stated in the Illustrated Catalogue however)[717] 2. F. Priestley; 'Honourable Mention awarded for 'good workmanship and cheapness in piano'. Patent 'siren' piano, 22 guineas.[718] A description of the piano in *The Standard*, 25 October, indicates it was very small, just 40 inches high and 20 inches wide) 3. Oetzmann & Plumb; Honourable Mention	1. Chappell & Co; 10 guinea educational piano[719] 2. W. G. Sparks; Trichord cottage piano from 50 guineas, superior cottage piano from 25 guineas[720]

[717] *Medals & Honourable Mentions Awarded by the International Juries*, p.217
[718] *The Illustrated Catalogue*, Vol II, p.114.
[719] *The Illustrated Catalogue*, Vol II, p.96; *Chappell & Co's Illustrated Catalogue of Music and Musical Instruments for 1862* (London: Chappell & Co, 1862), p.2. There is some doubt about the price of this instrument as *Reports by the Juries*, p.6 states that it retailed at 8 guineas.
[720] *The Illustrated Catalogue*, Vol II, p.114.

		awarded for 'useful and cheap pianos'. No pricing details were included by *The Standard*, 25 July stated that the piano was 'the cheapest instrument in the Exhibition'.	
Grand Duchy of Hesse	None	None	C. L. Gluck; demi-oblique pianino 450 fl (£38)[721]
Prussia	C. Bechstein; Prize medal awarded for 'excellence of construction combined with cheapness in piano'. Two large concert pianos without ornaments, No. 1, 700 Th (£105), No.2, 566 ½ Th (£85).[722]	None	1. W. Hartmann; 'large size concert pianino' 220 Th (£33), 'small size low pianino' 180 Th (£27)[723] 2. F. Oberkruger; pianino 220 Th (£33)[724]
Wurtemberg	1. Hundt & Son; Prize Medal awarded for 'good work and cheapness in piano'. Cottage piano, 7 octs in nutwood ornamented with rosewood, £42; Square piano 6 ½ octs in polysander wood, £25.[725] 2. Schiedmayer & Sons; Prize Medal awarded for 'excellence of construction	None	None

[721] *The Illustrated Catalogue*, Vol IV, p.37
[722] *The Illustrated Catalogue*, Vol IV, p.82.
[723] *The Illustrated Catalogue*, Vol IV, p.82
[724] *The Illustrated Catalogue*, Vol IV, p.83.
[725] *The Illustrated Catalogue*, Vol IV, p.160.

	combined with cheapness of pianos'. Grand piano, 7 octs in rosewood, £60; Cottage piano, 7 octs in oak, gothic, £42; Square piano, 7 octs in nutwood £33.[726]		
Frankfurt	None	C. A. Andre; Honourable mention awarded for 'cheapness and good workmanship in pianos'. Grand 'Mozart' piano in polysander wood, 840 fl (£70)[727]	None

[726] *The Illustrated Catalogue*, Vol IV, p.161.
[727] *The Illustrated Catalogue*, Vol IV, p.21

BIBLIOGRAPHY

Manuscript sources

British Library Collections (A. J Hipkins and J.W Davison papers)

BL Add.41636, f.34, Letter from Mr Negan to A. J. Hipkins, 19 February 1887

BL Add.41636, f.64-5, Letter from Clara Schumann to A. J. Hipkins, 13 March 1871

BL Add.41636, f.66-7, Letter from Clara Schumann to A.J. Hipkins, 18 March 1871

BL Add.41637, f.8-9, Letter from William Morris to Broadwood, 17 March 1883

BL Add.41637, f.89-90, Letter from Ellis to A. J. Hipkins, 15 August 1884

BL Add.70920, f.146-7, Letter from Walter Stewart Broadwood to J. W. Davison, 10 October 1851

Royal Commission Archives, Imperial College, London

Letter from Collard to the Royal Commissioners, dated 7 August 1851, RC/A/1851/405

Letter from Collard to the Royal Commissioners, dated 18 August 1851, RC/A/1851/428

Letter from the Class X Jury to the Royal Commissioners, 6 November 1851, RC/A/1851/678

Letter from the Class X Jury to the Royal Commissioners, undated, RC/A/1851/400

Sterndale Bennett, William. Exhibition Diary, undated, RC/I/25

London Metropolitan Archives

Charles Frederick De Coetlogon Accounts 1832 ACC/0268/009; 1835 ACC/0268/011

Edmund Johnston Accounts 1858-1859 ACC/1292/181

Frederick Carpenter Accounts 1856-1859 0/96/001

Mariabella Howard Accounts 1843-1846 ACC/1017/1394-96

Rev William James Stracey Accounts 1852-1854 ACC/1360/497

Smith Accounts 1853 B/SK/002; 1854 B/SK/003

Surrey History Centre

Broadwood piano price lists, 1844-1860, 2185/JB/7611

Broadwood porter books, 1851, 2185/JB/42/46

Broadwood business account ledgers, 1833-1850, 2185/JB/17/1-2

Comparison Chart of Broadwood piano and Streicher piano recording string length and striking distance, c.1856, 2185/JB/6/4/21B

Inventory of parts used to make Broadwood Amboyna Grand Pianoforte No 17842, undated, 2185/JB/84/2

Letter from A. G. Robertson (piano retailer in Edinburgh) to Broadwood, 26 January 1836, Surrey History Centre, 2185/JB/6/4/37

Letter from Daniel Rose to Broadwood, 6 August 1838, Surrey History Centre, 2185/JB/6/4/59d

Letter from Louise Dulcken to Broadwood, 10 October 1838, Surrey History Centre, 2185/JB/87/6

Letter from James Shudi Broadwood to Henry Fowler Broadwood, 28 August 1839, Surrey History Centre, 2185/JB/6/4/12

Letter from Andrew Ure to Broadwood, 7 September 1839, Surrey History Centre, 2185/JB/6/4/49

Letter from Henry Fowler Broadwood to M. Moseley (piano retailer in Dublin), 27 March 1840, Surrey History Centre, 2185/JB/6/4/42

Letter from James Shudi Broadwood to Thomas Broadwood, 20 August 1840, Surrey History Centre, 2185/JB/6/3/11

Letter from William Sterndale Bennett to Broadwood, 8 July 1841, Surrey History Centre, 2185/JB/87/8

Letter from M. Moseley to Broadwood, 13 December 1841, Surrey History Centre, 2185/JB/6/4/43b

Letter from Andrew Oborne to Broadwood, 30 October 1844, Surrey History Centre, 2185/JB/6/4/44

Letter from Francis Allan to Henry Fowler Broadwood, 10 November 1844, Surrey History Centre, 2185/JB/6/4/34

Letter from Sir Charles Halle to Broadwood, 30 December 1852, Surrey History Centre, 2185/JB/87/10

Letter from John Barnett to Broadwood, 18 December 1856, Surrey History Centre, 2185/JB/6/4/21A

Letter from George T. Smart to Broadwood, 26 June 1858, Surrey History Centre, 2185/JB/87/11

Letter from Francis Allan to Henry Fowler Broadwood, 27 September 1859, Surrey History Centre, 2185/JB/6/4/23

Letters from Francis Allan to Broadwood, 1860, 2185/JB/6/4/24A, 24B and 25.

Letter from Francis Allan to Henry Fowler Broadwood, October 1862, Surrey History Centre, 2185/JB/6/4/29

Letter from Henry Fowler Broadwood to Andrew Oborne, 2 January 1867, Surrey History Centre, 2185/JB/6/4/45

Letter from A. G. Wornum to Broadwood, 19 August 1868, Surrey History Centre, 2185/JB/6/4/63

Cornwall Record Office

Letter from Mr Whinstanley to Broadwood, 20 October 1820, Cornwall Record Office, R/S/1282

Letter from Mr Whinstanley to Broadwood, 28 October 1820, Cornwall Record Office, DDR (S) 1/284

Norfolk Record Office

Letter from Kate Palmer to Rev E. Postle, 8 May 1849, Norfolk Record Office, FX 181/1

Digitised Collections

The Carlyle Letters online (accessed 10 May 2015)

http://carlyleletters.dukeupress.edu/

Letter from Thomas Carlyle to Jane Welsh Carlyle, 17 August 1831.

Letter from Thomas Carlyle to Jean Carlyle Aitken, 28 September 1843.

Letter from Thomas Carlyle to Jean Carlyle Aitken, 12 November 1843

Letter from Jane Welsh Carlyle to Thomas Carlyle, 7 September 1846

Queen Victoria Journals online (accessed 20 February 2016)

www.queenvictoriajournals.org/search/results.do?QueryType=articles

Journal entry, 19 May 1851, Volume 31, p.251

Sebastien Erard Archive online (accessed 26-27 February 2016)

www.sebastienerard.org/en

Letter from Pierre Erard to Maison Erard, 31 July 1851

Letter from Pierre Erard to M. Duyityros, Maison Erard, 15 July 1851

www.historicaldirectories.org (accessed 10-11 January 2012)

Charles Booth Archive online (accessed 2 and 7 January 2016)

http://booth.lse.ac.uk/cgi-bin/do.pl?sub=view_booth_and_barth&args=528500,179300,1,large,0

http://booth.lse.ac.uk/static/a/2.html#x

The National Archives online (accessed 5 February 2016)

http://www.nationalarchives.gov.uk/victorians/IndexOfResources4.aspx

Wikipedia online resources

https://upload.wikimedia.org/wikipedia/commons/5/57/Crystal_Palace_-_plan.jpg (accessed 5 February 2016).

Exhibition Literature

1851 Exhibition

A Guide to the Great Exhibition containing a Description of Every Principal Object of Interest with a Plan pointing out the easiest and most systematic way of examining the contents of the Crystal Palace (London: George Routledge & Co, 1851)

Catalogue of the Valuable Collection of Miscellaneous Goods and Works of Art in The Belgian Division of the Great Exhibition (London: J. Davy & Sons, 1851)

First Report of the Commissioners for the Exhibition of 1851 (London: W. Clowes & Sons, 1852)

Reports by the Juries on the Subjects in the Thirty Classes into which the Exhibition was divided by Authority of the Royal Commission, in Two Volumes, including Redgrave's Supplementary Report (London: W. Clowes & Sons, 1852)

The Crystal Palace and its Contents: an Illustrated Cyclopaedia of the Great Exhibition of the Industry of all Nations (London: W. M Clark, 1852)

The Official Descriptive and Illustrated Catalogue by Authority of the Royal Commission in Three Volumes (London: W. Clowes & Sons, 1851)

Babbage, Charles. *The Exposition of 1851 or Views of the Industry, the Science and the Government of England* (London: John Murray, 1851)

Cassell, John. *The Illustrated Exhibitor* (London: John Cassell, 1851)

Ellis, Robert. *Introduction to the Official Descriptive and Illustrated Catalogue* (London: 1851)

Exhibition Prospectuses for J. Kirkman & Son, Thomas Woolley, Towns & Packer, J. Brinsmead, W. Jenkins & Sons, Ennever & Steedman, Cadby, J. & J. Hopkinson, George Luff & Son, W. Stodart & Son, Lambert & Co, G. Peachey, Erard, A. Dimoline, Robert Addison, Richard Hunt, Van Overbergh, Franche, M. Herding and Domeny (London: The Commissioners, 1851), University of Reading Special Collections, Great Exhibition Oversize 09

Hensman, Henry. 'On Civil Engineering and Machinery Generally', in *Lectures on the Results of the Exhibition delivered before the Society of Arts, Manufactures and Commerce* (London: David Bogue, 1852), pp. 303-330

Hunt, Robert, ed. *Hunt's Handbook to the Official Catalogues: a Explanatory Guide to the Natural Productions and Manufactures of the Great Exhibition of the Industry of all Nations, 1851 in Two Volumes* (London: W. Clowes & Sons, 1851)

Pole, William. *Musical Instruments in the Great Industrial Exhibition of 1851* (London: 1851)

Reid, T. Wemyss, *Memoirs and Correspondence of Lyon Playfair, First Lord Playfair of St Andrews* (London: Cassell, 1899)

Tallis, John. *Tallis's History and Description of the Crystal Palace and the Exhibition of the World's Industry in 1851 in Two Volumes* (London: J. Tallis, 1852)

Whewell, William. 'The General Bearing of the Great Exhibition on the Progress of Art and Science', in *Lectures on the Results of the Exhibition*

delivered before the Society of Arts, Manufactures and Commerce (London: David Bogue, 1852), pp. 1-25

Wornum, Ralph Nicholson. 'The Exhibition as a Lesson in Taste', in *The Art Journal Illustrated Catalogue: The Industry of All Nations, 1851* (London: George Virtue, 1851)

1862 Exhibition

List of Pianofortes and of various samples and models intended to illustrate the principles of their manufacture (London: W. S. Johnson, 1862)

Medals & Honourable Mentions Awarded by the International Juries (London: George E. Eyre & William Spottiswoode, 1862)

Reports by the Juries on the Subjects in the Thirty-Six Classes into which the Exhibition was Divided (London, 1863)

The International Exhibition of 1862: The Illustrated Catalogue of the Industrial Department in Four Volumes (London, 1862)

Report of the Commissioners for the Exhibition of 1862 (London: George E. Eyre & William Spottiswoode, 1863)

Nineteenth-Century-Newspapers

May-October 1851

Freeman's Journal and Daily Commercial Advertiser

Jackson's Oxford Journal

Lloyd's Weekly Newspaper

Reynolds' Newspaper

Trewman's Exeter Flying Post and Plymouth and Cornish Advertiser

The Aberdeen Journal

The Belfast News

The Bury and Norwich Post and Suffolk Herald

The Caledonian Mercury

The Daily News

The Derby Mercury

The Era

The Essex Standard and General Advertiser for the Eastern Counties

The Examiner

The Glasgow Herald

The Huddersfield Chronicle and West Yorkshire Advertiser

The Lancaster Gazette and General Advertiser for Lancashire, Westmorland and Yorkshire

The Leeds Mercury

The Manchester Times

The Morning Chronicle

The Morning Post

The Newcastle Courant

The North Wales Chronicle

The Nottinghamshire Guardian

The Preston Guardian

The Standard

The Times

The York Herald and General Advertiser

May-October 1862

The Belfast News

The Daily News

The Era

The Leeds Mercury

The Morning Post

The Standard

Nineteenth-Century Magazines and Journals

Newton, W. *The London Journal of Arts, Sciences and Manufactures and Repertory of Patent Inventions, Volume 39* (London: W. Newton, 1852)

Punch, XXVIII (London, 1855)

The Art Journal, Volume IV (London: George Virtue, 1852)

The Art Journal Illustrated Catalogue: The Industry of All Nations, 1851 (London: George Virtue, 1851)

The Expositor: an Illustrated Recorder of Inventions, Designs and Art Manufacturers, Volume II (London: Joseph Clayton. 1851)

The Magazine of Domestic Economy (London: W. S. Orr & Co, 1840)

The Magazine of Domestic Economy (London: W. S. Orr & Co, 1841)

The Transactions of the Provincial Medical and Surgical Association, Worcester, 16 (1849)

General Sources

Abey-Koch, Madelaine. ‘A History of Housekeeping’, *The National Trust Manual of Housekeeping* (London: Butterworth Heinemann, 2006), pp.21-33

Appadurai, Arjun. ‘Introduction: Commodities and the Politics of Value’, in *The Social Life of Things: Commodities in Cultural Perspective*, ed. Arjun Appadurai (Cambridge University Press, 1986), pp.3-63

Aslin, Elizabeth. *Nineteenth-Century English Furniture* (London: Faber & Faber, 1962)

Auerbach, Jeffrey A. *The Great Exhibition of 1851: A Nation on Display* (New Haven & London: Yale University Press, 1999)

Babbage, Charles. A *Chapter on Street Nuisances* (London: John Murray, 1864)

Banham, Joanna, MacDonald, Sally & Porter, Julia. *Victorian Interior Design* (London: Cassell, 1991)

Barringer, Tim. ‘Sonic Spectacles of Empire: the Audio Visual Nexus, Dehli-London, 1911-12’, in *Sensible Objects: Colonialism, Museums and Material Culture*, ed. Elizabeth Edwards, *et al* (Oxford: Berg, 2006), pp.169-97

Barzun, Jacques. *New Letters of Berlioz 1830-1868* (New York: Columbia University Press, 1954)

Bass, Michael T. *Street Music in the Metropolis* (London: John Murray, 1864)

Bates, Eliot. ‘The Social Lives of Musical Instruments’, *Ethnomusicology, 56* (2012), 363-395

Beaupain, René. *La Maison Erard: Manufacture de Pianos, 1780-1959* (Paris: L’Harmattan, 2005)

Bell, Acton. [Bronte, Anne] *The Tenant of Wildfell Hall* (London: T. C. Newby, 1848)

Bell, Currer. [Bronte, Charlotte] *Jane Eyre: An Autobiography* (New York: Harper & Bros publishers, 1850)

Bennett, Tony. 'The Exhibitionary Complex', in *The Nineteenth Century Visual Culture Reader*, ed. Vanessa R. Schwartz & Jeannene M. Przyblyski (London & New York: Routledge, 2004), pp.117-30

Berg, Maxine. 'From Imitation to Invention: Creating Commodities in Eighteenth-Century Britain', *The Economic History Review, 55* (2002), 1-30

Berg, Maxine. *Luxury and Pleasure in Eighteenth Century Britain* (Oxford University Press, 2005)

Berg, Maxine. 'New Commodities, Luxuries and their Consumers in Eighteenth-Century Britain', in *Consumers and Luxury: Consumer Culture in Europe 1650-1850*, ed. Maxine Berg & Helen Clifford (Manchester: Manchester University Press, 1999), pp.63-85

Berlioz. *Autobiography of Louis Hector Berlioz from 1803 to 1865 comprising his travels in Italy, Germany, Russia and England, Volume 1,* trans. Rachel (Scott Russell) Holmes and Eleanor Holmes, (London: Macmillan & Co, 1884)

Berlioz, Hector. *A Treatise upon Modern Instrumentation and Orchestration*, trans. Mary Cowden Clarke (London: J. Alfred Novello, 1856)

Berlioz, Hector. Macdonald, Hugh. ed. *Selected Letters of Berlioz*, trans. Roger Nichols (London: Faber & Faber, 1995)

Berlioz, Hector. Cairns, David. ed. and trans. *The Memoirs of Berlioz* (London: Everyman Publishers Plc, 2002)

Best, Geoffrey. *Mid Victorian Britain 1851-1871* (London: Weidenfeld & Nicolson, 1979)

Bie, Oscar. *A History of the Pianoforte and Pianoforte Players*, trans. E. E. Kellert and E. W. Naylor (New York: Da Capo Press, 1966)

Bijsterveld, Karin. *Mechnical Sound: Technology, Culture and Public Problems of Noise in the Twentieth Century* (Cambridge, Mass & London: MIT Press, 2008)

Boot, H. M. 'Real incomes of the British Middle Class 1760-1850: the Experience of Clerks at the East India Company', *The Economic History Review, 52* (1999), 638-668

Bourdieu, Pierre. *Distinction: A Social Critique of the Judgement of Taste*, trans. Richard Nice (London: Routledge & Kegan Paul Ltd, 1986)

Bourdieu, Pierre & Wacquant, L. J. D, *An Invitation to Reflexive Sociology* (Cambridge: Polity Press, 1992)

Bowett, Adam. *Woods in British Furniture Making, 1400-1900: an Illustrated Historical Dictionary* (Wetherby: Oblong Creative, 2012)

Bowley, Arthur L. 'The Statistics of Wages in the United Kingdom during the Last Hundred Years: Agricultural Wages', *The Journal of the Royal Statistical Society, 61* (1898), 702-722

Bowley, Arthur L. 'The Statistics of Wages in the United Kingdom during the Last Hundred Years: Wages in the Building Trade, Part VIII', *The Journal of the Royal Statistical Society, 64* (1901), 102-112

Branca, Patricia. *Silent Sisterhood: Middle Class Women in the Victorian Home* (London: Croom Helm, 1975)

Brewer, Ebenezer Cobham. *Sound and its Phenomena* (London: Longman, Brown, Green and Longmans, 1854)

Brinsmead, Edgar. *The History of the Pianoforte* (London: Cassell, Petter and Galpin, 1870)

Burgan, Mary. 'Heroines at the Piano: Women and Music in Nineteenth Century Fiction', *Victorian Studies, 30* (Indiana University Press, 1986), 51-76

Burnett, John. *A History of the Cost of Living* (Harmondsworth: Penguin, 1969)

Burrowes, J. F. *A Guide to Practice on the Pianoforte* (London: J. F. Burrowes, 1841)

Buzard, James. 'Conflicting Cartographies: Globalism, Nationalism and the Crystal Palace Floor Plan', in *Victorian Prism: Refractions of the Crystal Palace*, ed. James Buzard, *et al* (Charlottesville & London: University of Virginia Press, 2007), pp.40-54

Caddy, Florence. *Household Organisation* (London: Chapman & Hall, 1877)

Cantor, Geoffrey. *The Great Exhibition: A Documentary History in Four Volumes* (London: Pickering & Chatto, 2013)

Carew, Derek. *The Mechanical Muse: the Piano, Pianism and Piano Music, 1760-1850* (Aldershot: Ashgate, 2007)

Casteras, Susan & Parkinson, Ronald, ed. *Richard Redgrave 1804-1888* (New Haven & London: Yale University Press, 1988)

Cleophas, Eefje & Bijsterveld, Karin. 'Selling Sound: Testing, Designing and Marketing Sound in the European Car Industry', in *The Oxford Handbook of Sound Studies*, ed. Trevor Pinch & Karin Bijsterveld (Oxford: Oxford University Press, 2012), pp.102-124

Clinkscale, Martha Novak. *Makers of the Piano Volume II, 1820-1860* (Oxford: Oxford University Press, 1993)

Closson, Ernest. *History of the Piano*, trans. Delano Ames, ed. and rev. Robin Golding (London: Elek, 1974)

Cox, H. Bertram & Cox, C. L. E. *Leaves from the Journal of Sir George Smart* (London: Longmans Green & Co, 1907)

Crombie, David. *Piano* (London: Balafon Books, 1995)

Cunnington, C. Willett & Cunnington, Phillis. *Handbook of English Costume in the Nineteenth Century* (London: Faber & Faber, 1959)

Czerny, Charles. *Letters to a Young Lady on the Art of Playing the Pianoforte*, trans. J. A. Hamilton (London: Robert Cocks & Co, 1839)

Davis, John R. *The Great Exhibition* (Stroud: Sutton Publishing, 1999)

Dawe, Kevin. *The New Guitarscape in Critical Theory, Cultural Practice and Musical Performance* (Farnham: Ashgate, 2010)

De Vries, Jan. 'Between Purchasing Power and the World of Goods: Understanding the Household Economy in Early Modern Europe', in *Consumption and the World of Goods*, ed. John Brewer & Roy Porter (London & New York: Routledge, 1993), pp.85-123

Dodd, George. *Days at the Factories, or, The Manufacturing Industry of Great Britain described and illustrated by numerous engravings of machines and processes* (London: Charles Knight & Co, 1843)

Dolan, Emily I. *The Orchestral Revolution: Haydn and the Technologies of Timbre* (Cambridge: Cambridge University Press, 2013)

Dolge, Alfred. *Pianos and their Makers: a Comprehensive History of the Development of the Piano* (New York: Dover Publications Inc, 1972)

Edwards, Clive D. *Victorian Furniture: Technology & Design* (Manchester & New York: Manchester University Press, 1993)

Edwards, Steve. 'The Accumulation of Knowledge, or, William Whewell's Eye', in *The Great Exhibition of 1851: New Interdisciplinary Essays*, ed. Louise Purbrick (Manchester & New York: Manchester University Press, 2001), pp.26-52

Egan, M. David. *Architectural Acoustics* (New York: McGraw Hill Inc, 1988)

Ehrlich, Cyril. *Social Emulation & Industrial Progress: The Victorian Piano* (Belfast: Queen's University of Belfast, 1975)

Ehrlich, Cyril. *The Piano: A History* (London: J. M. Dent & Sons Ltd, 1976)

Exposition Universelle de 1855, Notice sur les travaux de mm Erard, facteurs de pianos et harpes (Paris: 1855)

Fauser, Annegret. *Musical Encounters at the 1889 Paris World's Fair* (Rochester: University of Rochester Press, 2005)

Flanders, Judith. *The Victorian House: Domestic Life from Childbirth to Deathbed* (London: Harper Perennial, 2003)

Flint, Kate. 'Exhibiting America: The Native American and the Crystal Palace', in *Victorian Prism: Refractions of the Crystal Palace*, ed. James Buzard, *et al* (Charlottesville & London: University of Virginia Press, 2007), pp.171-85

Foucault, Michel. *The Order of Things: An Archaeology of the Human Sciences* (London & New York: Routledge, 2002)

Fraser, Flora. *Maud: The Illustrated Diary of a Victorian Woman* (San Francisco: Chronicle Books, 1987)

French, H. R. 'The Search for the 'Middle Sort' of People in England 1600-1800', *The Historical Journal, 43* (2000), 277-293

Ffrench, Yvonne. *The Great Exhibition: 1851* (London: The Harvill Press, 1951)

Gadd, Graham. *The British Art Piano and Piano Design: The Handiness of an African Elephant, Volume 1* (Very Yellow Press, 2006)

Ganz, A. W. *Berlioz in London* (London: Quality Press Ltd, 1950)

Geary, Eleanor Margaret. *Musical Education with Practical Observations on the Art of Pianoforte Playing* (London: D'Almaine & Co, 1851)

Gibbs Smith, C. H. *The Great Exhibition of 1851* (London: Her Majesty's Stationery Office, 1950)

Gillooly, Eileen. 'Rhetorical Remedies for Taxonomic Troubles: Reading the Great Exhibition', in *Victorian Prism: Refractions of the Crystal Palace,* ed. James Buzard, *et al* (Charlottesville & London: University of Virginia Press, 2007), pp.23-39

Goldsmith, Mike. *Discord: The Story of Noise* (Oxford University Press, 2012)

Good, Edwin M. *Giraffes, Black Dragons and Other Pianos: a Technological History from Cristofori to the Modern Concert Grand* (California: Stanford University Press, 2001)

Grover, David S. *The Piano: its Story from Zither to Grand* (London: Hale, 1976)

Gunn, Simon. 'Class Identity and the Urban: the Middle Class in England c.1790-1950', *Urban History, 31* (2004), 29-47

Gurney, Peter. 'An Appropriated Space: the Great Exhibition, the Crystal Palace and the Working Class', in *The Great Exhibition of 1851: New Interdisciplinary Essays*, ed. Louise Purbrick (Manchester & New York: Manchester University Press, 2001), pp.114-45

Gurney, Peter. 'A Palace for the People? The Crystal Palace and Consumer Culture in Victorian England' in *Victorian Prism: Refractions of the Crystal Palace*, ed. James Buzard, *et al* (Charlottesville & London: University of Virginia Press, 2007), pp.138-150

Hall-Witt, Jennifer. *Fashionable Act: Opera and Elite Culture in London 1780-1850* (Durham: University of New Hampshire Press, 2007)

Harding, Rosamond E. M. *The Piano-Forte: its History traced to the Great Exhibition of 1851* (Old Woking: Gresham Books, 1978)

Harrison, Sidney. *Grand Piano* (London: Faber & Faber, 1976)

Haweis, Mary Eliza Joy. *The Art of Decoration* (London: Chatto & Windus, 1881)

Hendry, Frances Mary. *The Crystal Palace: the Diary of Lily Hicks, London, 1850-1851* (London: Scholastic, 2001)

Hendy, David. *Noise: A Human History of Sound & Listening* (London: Profile Books, 2013)

Hibbard, Andrea. 'Distracting Impressions and Rational Recreation at the Great Exhibition', in *Victorian Prism*, ed. James Buzard, *et al* (Charlottesville & London: University of Virginia Press, 2007), pp.151-67

Higgins, William Mullinger. *The Philosophy of Sound and History of Music* (London: W. S. Orr & Co, 1838)

Hipkins, Alfred J. *A Description and History of the Pianoforte and of the Older Keyboard Stringed Instruments* (New York & London: Novello Ewer & Co, 1896)

Hoadley, R. Bruce. *Understanding Wood: a Craftsman's Guide to Wood Technology* (Newtown, CT: The Taunton Press, 2000)

Hobhouse, Hermione. *The Crystal Palace and the Great Exhibition: a History of the Royal Commission for the Exhibition of 1851* (London & New York: Continuum, 2002)

Horrell, Sara. 'Home Demand and British Industrialisation', *The Journal of Economic History, 56* (1996), 561-604

Horrell, S. & Humphries, J. 'Old Questions, New Data and Alternative Perspectives: Families' living standards in the Industrial Revolution', *The Journal of Economic History, 52* (1992), 849-80

Huneker, James. *Chopin: The Man and his Music* (Project Gutenberg, 2004)

Jackson, R. V. 'The Heights of Rural Born English Female Convicts transported to New South Wales', *The Economic History Review, 49* (1996), 584-90

Jervis, Simon. *Victorian Furniture* (London & Sydney: Ward Lock & Co Ltd, 1968)

Johnson, James H. *Listening in Paris: a Cultural History* (Berkeley & Los Angeles: University of California Press, 1995)

Johnson, Paul & Nicholas, Stephen. ‘Male and Female Living Standards in England and Wales, 1812-1857: Evidence from Criminal Height Records’, *The Economic History Review, 48* (1995), 470-481

Joy, Edward. *Furniture* (London: The Connoisseur, 1972)

Kentner, Louis. *Piano* (London: MacDonald & Janes, 1976)

Krebs, Stefan. ‘Sobbing, Whining, Rumbling: Listening to Automobiles as Social Practice’, in *The Oxford Handbook of Sound Studies*, ed. Trevor Pinch & Karin Bijsterveld (Oxford University Press, 2012), pp.79-101

Kriegel, Lara. *Grand Designs: Labour, Empire and the Museum in Victorian Culture* (Duke University Press, 2007)

Kriegel, Lara. ‘Narrating the subcontinent in 1851: India at the Crystal Palace’, in *The Great Exhibition of 1851: New Interdisciplinary Essays*, ed. Louise Purbrick (Manchester & New York: Manchester University Press, 2001), pp.146-78

Latour, Bruno. *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005)

Laurence, Alastair, *Five London Piano Makers* (London: Keyword Press, 2010)

Laurence, Alastair, *More London Piano Makers* (London: Keyword Press, 2015)

Lawrence, Alastair. ‘The Evolution of the Broadwood Grand Piano, 1785-1998’, Ph.D. Diss, University of York, 1998

Leppert, Richard. ‘Material Culture and Decentred Selfhood (Social-Visual Typologies of Musical Excess)’, in *Critical Musicological Reflections: Essays in Honour of Derek B. Scott*, ed. Stan Hawkins (Farnham: Ashgate, 2012), pp.101-125

Leppert, Richard. *The Sight of Sound: Music, Representation and the History of the Body* (Berkeley: University of California Press, 1993)

Lindert, P. H. & Williamson, J. G. 'English workers' living standards during the Industrial Revolution: a New Look', *The Economic History Review, 36* (1983), 1-25

Loesser, Arthur. *Men, Women and Pianos: A Social History* (London: Gollancz, 1955)

Loudon, John Claudius. *An Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture* (London: Longman, Orme, Brown, Green and Longmans, 1839)

Loudon, John Claudius. *The Suburban Gardener* and Villa Companion (London: Longman, Orme, Brown, Green and Longmans, 1838)

Lunn, Henry C. *Musings of a Musician: a Series of Popular Sketches Illustrative of Musical Matters and Music* (London: Robert Cocks & Co, 1854)

Lustig, Jodi. 'The Piano's Progress: the Piano in Play in the Victorian Novel', in *The Idea of Music in Victorian Fiction*, ed. Sophie Fuller & Nicky Losseff (Aldershot: Ashgate, 2004), pp.83-100

Mactaggart, Peter & Ann. ed. *Musical Instruments in the 1851 Exhibition* (Welwyn: Mac & Me, 1986)

Mawson, David Graeme. 'The Piano Music of Sterndale Bennett in the Context of Nineteenth-Century Pianism: a Practice Based Interpretative Study with Critical Commentary', Ph.D. Diss, University of Leeds, 2007

Mayhew, Henry. *London Labour and the London Poor: A Cyclopaedia of the Condition and Earnings of those that will work, those that cannot work and those that will not work*, Volume IV (London: 1861-1862)

Meissner. *Meissner's Modern Practical System of Tuning the Pianoforte for the use of Amateur Pianists, Tuners &c* (London: D'Almaine & Co, 1841)

Message, Kylie & Johnston, Ewan. 'The World within the City: The Great Exhibition, Race, Class and Social Reform', in *Britain, The Empire and the World at the Great Exhibition of 1851*, ed. Jeffrey A. Auerbach & Peter H. Hoffenberg (Farnham: Ashgate, 2008), pp.27-46

Miller, Andrew H. *Novels Behind Glass: Commodity Culture and Victorian Narrative* (Cambridge University Press, 1995)

Mitchell, B. R. *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962)

Mobbs, Kenneth. 'A Performer's Comparative Study of Touchweight, Key-dip, Keyboard design and Repetition in Early Grand Pianos c.1770 to 1850', *The Galpin Society Journal, 54* (2001), 16-44

Moscheles, Charlotte. *Life of Moscheles with Selections from his Diaries and Correspondence by his Wife in Two Volumes*, trans. A. D. Coleridge (London: Hurst & Blachett, 1873)

Musgrave, Michael. *The Musical Life of the Crystal Palace* (Cambridge: Cambridge University Press, 1995)

Nenadic, Stena. 'Businessmen, the Urban Middle Classes and the "Dominance" of Manufacturers in Nineteenth-Century Britain', *The Economic History Review, 44* (1991), 66-85

Nicolson, Malcolm. 'Having the Doctor's Ear in Nineteenth-Century Edinburgh', in *Hearing History: A Reader*, ed. Mark M. Smith (Athens & London: University of Georgia Press, 2004), pp.151-68

Nobbs, Christopher. 'A comparison of the Piano Actions of Broadwood, Pleyel and Erard', in Alec Cobbe, ed. *Chopin's Swansong: the Paris and London Pianos of His Last Performances now in the Cobbe Collection* (London: The Chopin Society, 2010), pp.38-44

Northcott, Richard. *The Life of Sir Henry R. Bishop* (London: Press Printers Ltd, 1920)

Orrinsmith, Lucy. *The Drawing Room: its Decorations and Furniture* (London: Macmillan & Co, 1877)

Panton, Jane Ellen. *From Kitchen to Garret: Hints for Young Householders* (London: Ward & Downey, 1888)

Parkin, P. H & Humphreys, H. R. *Acoustics, Noise and Buildings* (London: Faber & Faber, 1969)

Parliamentary Session Papers, 31 January-17 July 1837; Returns by Inspectors of Factories

Patents for Inventions. Abridgments or Specifications relating to Music and Musical Instruments (London: The Office of the Commissioners of Patents for Inventions, 1871)

Paterson, Michael. *Life in Victorian Britain: A Social History of Queen Victoria's Reign* (London: Constable & Robinson Ltd, 2008)

PSA 198: 2012 Specification for Managing Environmental Conditions for Cultural Collections (British Standards Institution, 2012), pp.36-37

Peck, John Lord. *Dress and Care of the Feet* (London: William Tegg, 1872)

Peter, Philip Henry. *The Life and Works of Cipriani Potter (1792-1871)*, D.Phil Diss, partial submission, North Western University

Pevsner, Nikolaus. *High Victorian Design* (London: Architectural Press, 1951)

Picker, John. 'The Soundproof Study', in *The Sound Studies Reader*, ed. Jonathan Sterne (New York & London: Routledge, 2012), pp.141-51

Pickstone, John V. 'Museological Science? The Place of the Analytical/Comparative in Nineteenth- Century Science, Technology and Medicine', *The Journal of the History of Science, 32* (1994), 111-138

Piehler, Liana. *Spatial Dynamics and Female Development in Victorian Art and Novels: Creating a Woman's Space* (New York: Peter Lang Publishing Inc, 2003)

Pinch, Trevor J. & Bijker, Wiebe E. 'The Social Construction of Facts and Artifacts: or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other', in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology,* ed.

Wiebe E. Bijker, *et al* (Cambridge, Mass & London: The MIT Press, 2012), pp.11-44

Pinch, Trevor & Bijsterveld, Karin 'New Keys to the World of Sound', in *The Oxford Handbook of Sound Studies*, ed. Trevor Pinch & Karin Bijsterveld (Oxford: Oxford University Press, 2012), pp.3-35

Pugin, A. W. N. *Contrasts, or, A Parallel between the Noble Edifices of the Fourteenth and Fifteenth Centuries and Similar Buildings of the Present Day showing the Present Decay of Taste* (London: A. W. N. Pugin 1836)

Pugin, A. W. N. *The True Principles of Pointed or Christian Architecture* (London: John Weale, 1841)

Purbrick, Louise. 'Introduction', in *The Great Exhibition of 1851: New Interdisciplinary Essays*, ed. Louise Purbrick (Manchester & New York: Manchester University Press, 2001), pp.1-25

Redgrave, Frances Margaret. ed. *Richard Redgrave: A Memoir* (London,1891)

Rice Hollis, Helen. *The Piano: a Pictorial Account of its Ancestry and Development* (London: David & Charles, 1975).

Richards, Thomas. *The Commodity Culture of Victorian England: Advertising and Spectacle, 1851-1914* (Stanford University Press, 1990)

Rimbault, Edward F. *The Pianoforte, its Origin, Progress and Construction* (London: Robert Cocks & Co, 1860)

Ritterman, Janet & Weber, William. 'Origins of the Piano Recital in England 1830-1870', in *The Piano in Nineteenth Century British Culture: Instruments, Performers and Repertoire*, ed. Therese Ellsworth & Susan Wollenberg (Farnham: Ashgate, 2007), pp.171-91

Rivers, Shayne & Umney, Nick. *Conservation of Furniture* (London & New York: Routledge, 2003)

Rutten, Maximiliaan. 'The Art Case Piano', *The Galpin Society Journal, 58* (2005), 168-72

Schwartz, Hillel. 'On Noise', in *Hearing History: A Reader,* ed. Mark M. Smith (Athens, Georgia & London: The University of Georgia Press, 2004), pp.51-3

Scott, Derek B. *The Singing Bourgeois: Songs of the Victorian Drawing Room and Parlour* (Milton Keynes: Open University Press, 1989)

Siepmann, Jeremy. *The Piano* (London: Carlton Books Ltd, 1996)

Slater's Directory of Berkshire, Cornwall, Devon, Dorset, Gloucestershire, Hampshire, Somerset, Wiltshire and Wales 1852-53

Smith, Bruce R. *The Acoustic World of Early Modern England: Attending to the O Factor* (Chicago & London: University of Chicago Press, 1999)

Solie, Ruth A. *Music in Other Words: Victorian Conversations* (Berkeley & London: University of California Press, 2004)

Sonevytsky, Maria. 'The Accordion and Ethnic Whiteness: Toward a New Critical Organology', *Journal of the Ethnomusicology Programme, University of Sheffield, 50* (2008), 101-118

Sparling, Tobin Andrews. *The Great Exhibition: a Question of Taste* (New Haven: Yale Centre for British Art, 1982)

Stanton, Phoebe. *Pugin* (London: Thames & Hudson, 1971)

Sterndale Bennett, J. R. *The Life of William Sterndale Bennett* (Cambridge University Press, 1907)

Sterndale Bennett, William. Temperley, Nicholas. ed. *William Sterndale Bennett 1816-1875: Lectures on Musical Life* (Woodbridge: The Boydell Press, 2006)

Sterne, Jonathan. *The Audible Past: Cultural Origins of Sound Reproduction* (Duke University Press, 2003)

Strauss, Dr G. L. M. *et al*, *England's Workshops* (London: Groombridge & Sons, 1864)

Sumner, William Leslie. *The Pianoforte* (London: MacDonald & Co, 1971)

Swan, Annalyn. 'Enlightenment's Gift to the Age of Romance: How the Piano Came to be', in *The Lives of Pianos*, ed. James R. Gaines (New York: Holt, Rinehart & Winston, 1981), pp.41-73

Teukolsky, Rachel. 'This Sublime Museum: Looking at Art at the Great Exhibition', in *Victorian Prism*: *Refractions of the Crystal Palace*, ed. James Buzard, *et al* (Charlottesville & London: University of Virginia Press, 2007), pp.84-100

Thackeray, W. M. *Men's Wives* (New York: D Appleton & Co, 1852)

Thackeray, W. M. *The Newcomes: Memoirs of a Respectable Family* (London: Bradbury & Evans, 1864)

Thackeray, W. M. *Vanity Fair* (London: Bradbury & Evans, 1853)

The Guard (London: 1854)

The Victorian Cabinet-Maker's Assistant (London: Blackie & Son, 1853; republished by New York: Dover Publications Inc, 1970)

Thompson, Emily. *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America 1900-1930* (Cambridge & London: The MIT Press, 2002)

Trentmann, Frank. *Empire of Things: How We Became a World of Consumers, from the Fifteenth Century to the Twenty-First* (London: Allen Lane, 2016)

Tresch, John & Dolan, Emily I. 'Toward a New Organology: Instruments of Music and Science', *Osiris 28* (2013), 278-98

Verdon, Nicola. 'A Diminishing Force? Reassessing the Employment of Female Day Labourers in England Agriculture c 1790-1850', in *Women, Work*

and Wages in English Society, 1600-1850, ed. Penelope Lane, *et al* (Woodbridge: The Boydell Press, 2004), pp.190-211

Vickery, Amanda. 'His and Hers: Gender, Consumption and Household Accounting in the Eighteenth Century', *Past and Present, Supplement 1* (2006), 12-38

Von Helmholtz, Hermann L. F. *On the Sensations of Tone*, trans. Alexander J. Ellis (New York: Cosimo, 2007)

Wainright, David. *The Piano Makers* (London: Hutchinson & Co Ltd, 1975)

Wainright, David. *Broadwood by Appointment: A History* (London: Quiller Press Ltd, 1982)

Walsh, J. H. *A Manual of Domestic Economy: suited to families spending from £100 to £1,000 a year* (London: G. Routledge & Co, 1857)

Walton, Whitney. *France at the Crystal Palace: Bourgeois Taste and Artisan Manufacture in the Nineteenth Century* (Berkeley: University of California Press, 1992)

Weale, J. ed. *The Pictorial Handbook of London Comprising its Antiquities, Architecture, Arts, Manufactures, Trade, Social, Literary and Scientific Institutions, Exhibitions and Galleries of Art* (London, 1854)

Weathergill, Lorna. 'The Meaning of Consumer Behaviour in Late Seventeenth and Early Eighteenth Century England', in *Consumption and the World of Goods*, ed. John Brewer & Roy Porter (London: Routledge, 1993), pp.206-25

Weber, Gottfried. *The Theory of Musical Composition* (London: Robert Cocks & Co, 1851)

Weber, William. *The Great Transformation of Musical Taste: Concert Programming from Haydn to Brahms (*Cambridge & New York: Cambridge University Press, 2008)

Webster, Thomas. *An Encyclopaedia of Domestic Economy* (London: Longman, Green, Longman & Roberts, 1861)

Weliver, Phyllis. *Women Musicians in Victorian Fiction, 1860-1900: Representations of Music, Science and Gender in the Leisured Home* (Aldershot: Ashgate, 2000)

Williams, John Paul. *The Piano* (London: Aurum Press Ltd, 2002)

Williamson, Jeffrey. 'Earnings Inequality in Nineteenth Century Britain', *The Journal of Economic History, 40* (1980), 457-75

Winter, Robert S. 'Striking it Rich: The Significance of Striking Points in the Evolution of the Romantic Piano', *The Journal of Musicology, 6* (1988), 267-92

Wolfenden, Samuel. *A Treatise on the Art of Pianoforte Construction* (Surrey, Gresham Press, 1975)

Wood, George Henry. 'The Statistics of Wages in the United Kingdom during the Last Hundred Years: The Cotton Industry, Part VX', *The Journal of the Royal Statistical Society, 73* (1910), 128-163

Yonge, Charlotte Mary. *The Heir of Redclyffe* (London: John W. Parker & Son, 1854)

Yorke, James. *Keyboard Instruments at the Victoria & Albert Museum* (London: Victoria & Albert Museum, 1986)