Democratising Knowledge and Visualising Progress: illustrations from *Chambers's Encyclopaedia, 1859–1892*

Rose Roberto

Department of Typography and Graphic Communications
University of Reading
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Abstract

In the 19th century, the Scottish firm of W. & R. Chambers transformed the publishing model of encyclopaedias from a book aimed at the elite to a tool for mass education. This multidisciplinary study examines the design of the first two editions of *Chambers's Encyclopaedia*, focusing on their illustrations and the woodblocks used to print them. The business history of the Chambers firm, operating between the 1850s and 1890s, has not been researched before, nor has Chambers's relationship with a transatlantic partner, J.B. Lippincott of Philadelphia, been studied in-depth. Together, both firms produced *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge for the People* (1859-1868) and *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge, New Edition* (1888-1892).

This thesis draws on research methods that include deep reading of printing artefacts and publisher archives, visual content analysis of 7322 images in *Chambers's Encyclopaedia*, and secondary sources such as historic library catalogue records and historical newspaper articles. Data on other illustrations was compiled from the *Penny Cyclopaedia* (1833-1843) and the *English Cyclopaedia* (1854-1862), the eighth (1853-1860) and ninth (1875-1889) editions of *Encyclopaedia Britannica*, and *Johnson's Universal Cyclopaedia* (1876). Additionally, to ascertain the publisher's marketing claims of high-quality authoritative content, the accuracy of illustrations and the images' usefulness in instructing non-experts was tested by a structured image analysis survey designed by the author, that gathered qualitative information through a selection of the most frequently illustrated subjects.

The thesis is organised into Content, Production, and Reception sections, and the study's main findings are: After building a reliable reputation as a publisher of educational works, Chambers embarked on a well-lauded encyclopaedia project. Chambers chose wood-engraved illustrations to communicate complex information, because wood-engravings appealed to mass audiences and the technology behind them was cost-efficient compared with other printing methods of the time. Subject trends and trends in illustration styles evolved through the decades from the 1850s to the 1890s, as did the styles of graphics for displaying information. A formal legal contract was drawn so that both Lippincott and Chambers could claim relevant copyright in their respective countries. Finally, evidence is presented that indicates where hundreds of Chambers images were reused in other subsequent British and American publications.

Acknowledgements
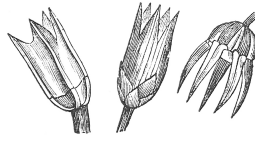
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1   Introduction

The Scottish firm of W. & R. Chambers provides an interesting case study of the history of the book and the history of 19th-century publishing, particularly for mass education and what would evolve into a genre known as reference books. Founded by two brothers, William (1800 - 1883) and Robert (1802 - 1871) in the first half of the 19th century, the firm grew over several decades, transforming from small-time bookseller and hand-press printer, into a reputable publisher of educational books and periodicals that were sold globally. By the time W. & R. Chambers began taking subscriptions for the first edition of its illustrated encyclopaedias in 1859, it was a commercial success internationally, having outlived several rival publishers of cheap instructive print. The first edition of *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge for the People* (First Edition) was published as a serial in 1859, then issued as bound volumes between 1860-1868. *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge, New Edition*, which will be referred to here as the Second Edition, was published in bound volumes between 1888-1892.[1] See Figure 1.1. Subsequent editions of *Chambers's Encyclopaedia* were produced between 1923 and 1927, in 1935, in 1950 and finally in 1966.

Encyclopaedias are a snapshot of a particular time, place and world view. Like museums, they have been heavily curated and the collections within reflect evidence of particular narratives of history, science and culture. The meta-narrative, the narrative about the narrative of creating knowledge, is not only intriguing, but provides a key to understanding how the past relates to us and allows us to reflect on questions related to the flow of information in society and the process of democratising knowledge. As the title of the thesis is 'Democratising Knowledge,' the themes of encyclopaedias as repositories and conveyers of information runs through this study, which also considers the philosophy of a democratisation of knowledge made explicit in the encyclopaedia's sub-title: 'A dictionary of universal knowledge for the people'.

The title 'Democratising Knowledge' was chosen because it refers to two ambitions fundamental to the Chambers company. First, to their use of illustrations to convey com-

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[1]The First Edition was updated and reprinted by both the Chambers firm and their American partners. The First Edition reprinted in 1870, the Second Edition was reissued in 1901.
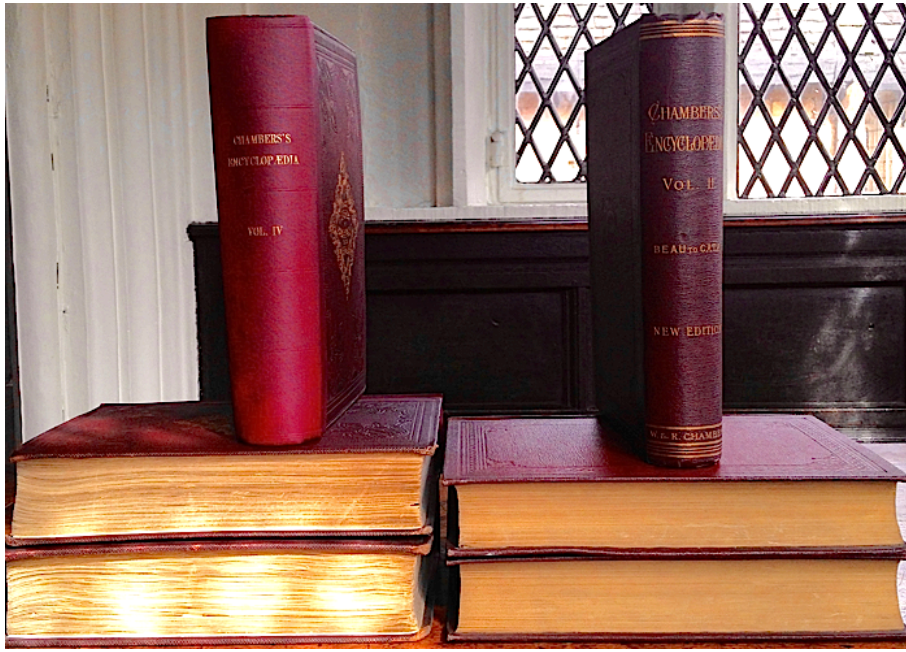
Figure 1.1: *Chambers's Encyclopaedias* First Edition (K.8.1-10, left), Second Edition (I.4.49-58, right) housed in Main Collection, Chetham's Library, Manchester.

plex information visually, and in a succinct way, to people with varying degrees of literacy. Second, it refers to the W. & R. Chambers business philosophy of producing affordable, accessible publications, as described in the opening notice to Volume 1 of the 1860 *Chambers's Encyclopaedia*:

> *The information may be characterised as non-professional, embracing those points of the several subjects which every intelligent man or woman may have occasion to speak or think about. At the same time every effort is made that the statements, so far as they go, shall be precise and scientifically accurate.* [2]

This multidisciplinary study between the University of Reading and National Museums Scotland, looks at print and publishing history, the history of society through science and technology, and cultural history through artefacts that were typical of their time. It examines the first two editions of *Chambers's Encyclopaedia*, focusing particularly on their illustrations, the woodblocks that created the illustrations and the image-making and publishing ecosystem in which the Chambers firm operated. Through a specific collection of images, and physical objects associated with those images, this study will compare Chambers to other encyclopaedias and narrate a part of history set in the second half of the 19th century. In doing so it makes important original contributions in the following three areas:

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[2]Findlater, A., ed (1868)
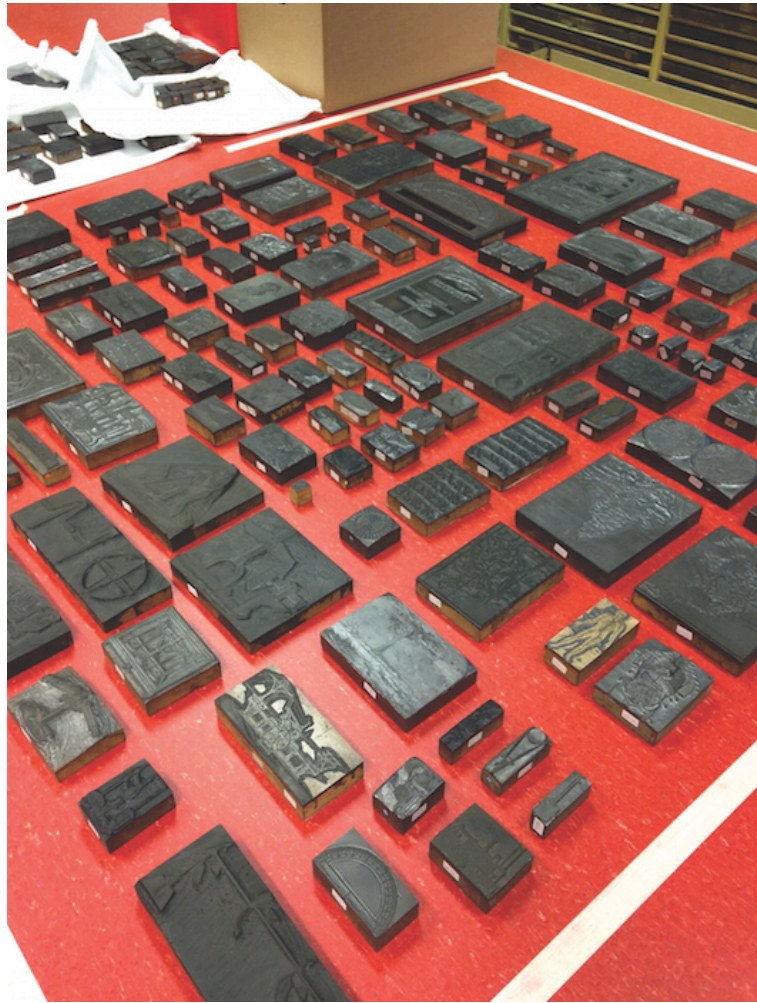
Figure 1.2: Sample of woodblocks in the W. & R. Chambers collection (T.2011.56), in the National Museums Collections Centre, Edinburgh.

First, it examines a part of the history of W. & R. Chambers that has not been studied before. In-depth studies of the Chambers firm that have been produced by Fyfe and Cooney are focused on the founders of the firm, and the firm's early years up to 1868.[3] Other studies have looked at a book called *Vestiges of the Natural History of Creation* written by Robert Chambers but published anonymously in 1844, and how this early work on evolution relates to the history of scientific ideas.[4] Another article mentions a 20th-century edition of *Chambers's Encyclopaedia* and how it was marketed to an Australian audience. [5] Yet another study looks at the history of two of Chambers's dictionaries, only briefly speaking about the images in the dictionary in passing as the study focuses on its linguistic and

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[3]Cooney (1970); Fyfe (2012); Cooney (2006)
[4]Secord (1989); Schwartz (1999); Secord (2001); Lightman (2014);
[5]Jones (2006)
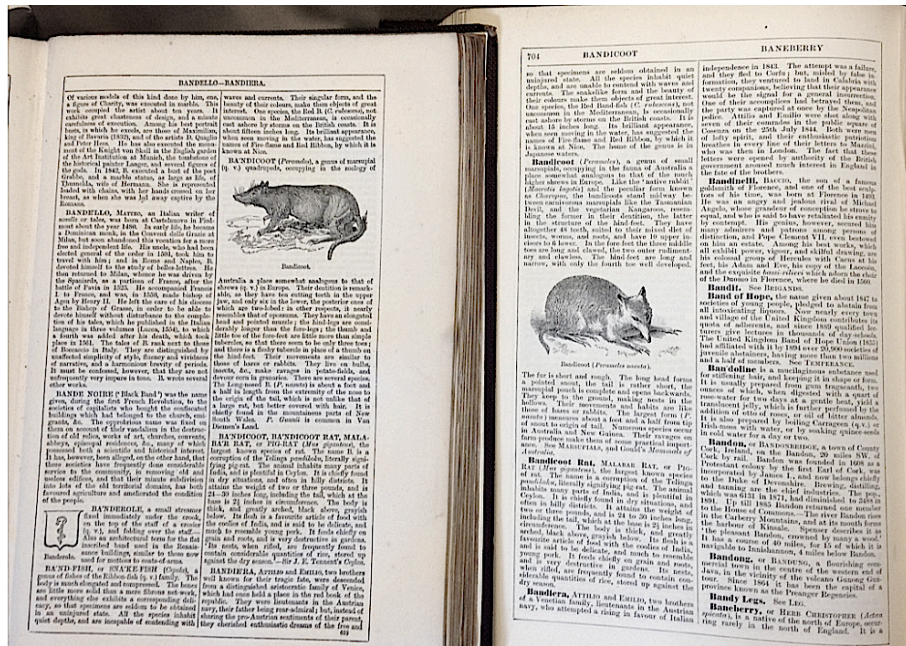
Figure 1.3: 'Bandicoot' entry in First Edition (K.8.1-10, left) and Second Edition (I.4.49-58, right) showing page layout and illustration in *Chambers's Encyclopaedia*. Volumes housed in Main Collection, Chetham's Library, Manchester.

language features.[6] In contrast, this research looks at period of the firm when the founders were in the process of letting the next generation of Chambers take over, and handed on a well-established family firm to them. It also covers the production relationship of the firm with a transatlantic partner, J.B. Lippincott of Philadelphia, and the work done between them on the encyclopaedias. Exploring this relationship touches on 19th-century communication and printing technologies.

Second, this project is one of the first to look at design and production of a specific 19th-century reference work. See Figure 1.3. Many studies of encyclopaedias focus on the 18th century and the characters which created those works.[7] Studies by scholars such as Yeo, Loveland, Spree and more recently Schopflin, focus on subject analysis of the text or aim to showcase the evolution of ideas as reflected in encyclopaedias. Other studies look at how 19th-century encyclopaedias reflect nationalism or acted as vehicles for nation building.[8] Furthermore, encyclopaedias, as a genre, are mentioned in histories and reviews of reference works[9] and some scholars have even investigated a specific aspect of

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[6]Kaminski (2013)

[7]Darton (1987); Blom (2004)

[8]Belgum (2013); Kavanagh (2010); Collison (1966); Yeo (1991)

[9]Bates (1986); Collison (1966); Couch (1962); Kafker (1981); Kister (1994); Katz (1998)

Figure 1.4: Woodblocks (next to their illustrations) for the entry 'Apollo' in First Edition (T.2011.56.214, left) and Second Edition (T.2011.56.213, right). Woodblocks held in the National Museums Collections Centre, Edinburgh.

the first edition of *Chambers's Encyclopaedia's* subject coverage on animals or race [10] or specific producers of textual content and source material for its maps.[11]

This thesis, in contrast, studies both first and second editions of Chambers comparatively as physical objects. It also compares the visual features in *Chambers's Encyclopaedia* with several other 19th century encyclopaedias, asking what publishers of these encyclopaedias intended to impart to specific audiences. The founders of the Chambers firm had very specific ideas about what knowledge their audience should receive and worked out practical ways to get information to them through publishing images.

Many of the firms's images could be and were reused. When the Chambers firm or other publishers re-contextualised the images found in these works, meaning was ascribed to them as individual entities. Another original aspect of this thesis examines the meaning made from images, in terms of content, image production, and audience reception. While every effort has been made to use sources from the 19th century, to fill in some gaps in how general audiences can understand these illustrations, modern specialists from the subjects most frequently illustrated were asked to comment on a sampling of images, correlating to their area of expertise. The structured image analysis activity conducted on these experts, provided information about whether *Chambers's Encyclopaedia* illustrations were recognisable to general audiences and assessed their use in communicating subject information.

1.1   A note on terminology

A glossary of terms, provided for reference, is included at the end of this thesis. This section highlights terms that are used repeatedly throughout this work.

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[10]Schmitt & Loveland (2017) and Kowner & Skott (2015)
[11]Cooney (1999); Cooney (2005)

One of the questions that this thesis will address deals with the term 'the people'. The complete title for the first edition was *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge for the People*. 'The people' was a political term in the 19th century, and the term's meaning shifted over-time. During the 1830s, 'the people' was understood to mean the middle class; in the mid 1860s, it indicated the working class.[12] Carlisle makes the case that the term was very much dependent on who was being disenfranchised at different times in the 19th century and she states that the term 'the people' was especially linked to public debates related to the Reform Acts.[13] In this thesis, the term will be consistent with these shifting meanings. Therefore, I take statements by Chambers and other publishers such as Charles Knight (1791-1873), referring to 'the people' or the audience whom Chambers were trying to reach until the 1850s, as meaning the middle class[14] and *both* the middle and working classes from 1860 onwards.

'The masses' is also a term that is used in this thesis to indicate 'the populace and the ordinary people', especially 'those viewed in an economic or political context.' [15] Cultural critics in the 19th century, such as Matthew Arnold (1822-1888) and John Ruskin (1819-1900), and scholars today used the term in a way that seems interchangeable with 'the people' and they are quoted in secondary literature by contemporary scholars. Jonathan Rose opens *The Intellectual Life of the British Working Classes*, his study on British autodidact culture, by quoting Arnold's *Culture and Anarchy*, 1869:

> *Plenty of people will try to give the masses, as they call them, an intellectual food prepared and adapted in the way they think proper for the actual condition of the masses. The ordinary popular literature is an example of this working on the masses. Plenty of people will try to indoctrinate the masses with the set of ideas and judge-ments constituting the creed of their own profession or party. Our religious and political organisations give an example of this way of working on the masses...*[16]

Often the terms 'the people' and 'the masses' were used to provide a contrast with the 'upperclass' or 'elite' members of British Society. As many scholars and critics from the 19th century tend to use both terms widely and interchangeably in the literature, I

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[12]Carlisle (2012), p. 6

[13]There were two Reform Acts passed in 1832 and 1867, popularly known as the 'Great Reform Act' and the 'Reform Act of 1867.' The Great Reform Act provided the right to vote to adult men who owned property worth at least £10 and thus affected the middle class. The Reform Act of 1867 provided the right to vote to adult males in the working class.

[14]Defined by the Great Act as owning any property worth £10 per year

[15]The *Oxford English Dictionary* states that the term was first introduced in 1698 by J. Fryer and in 1701 by Jonathan Swift in this context, and in the year 1863, the term is used in terms of political representation as alluded to by Carlisle (2012), p. 6

[16]Rose (2001), p. 12

will follow their lead, and use these terms in a way that corresponds with the meaning described here, noting that terms related to British class can be problematic generally and their meaning can vary between geography as well as time period.[17] The nuances of this type of broader social and cultural study are outside the scope of this thesis.

Generally speaking, in common parlance, 'information', 'data', and 'facts' have the same meaning and are used interchangeably. Knowledge requires obtaining information, data, and facts as well as a set of skills allowing one to understand, analyse and synthesise the information. Knowledge is gained by experience or education (either through schooling or by extensive reading). Hence, to become knowledgable about a subject, means one can read and interpret facts collected about a subject and synthesise it with previously acquired knowledge.[18] In the context of the 19th century, however, 'while knowledge can represent a content-based set of facts' writes Rauch, the construction and development of knowledge was 'fetishized as something valuable for its own sake.'[19] He writes:

> *The expression* instruction and amusement, *which has been used to tout knowledge texts since the very early nineteenth century has a contemporary analogue in the newly coined word* infotainment. [sic.][20]

In the 19th century, there was a preoccupation with the value of knowledge and there were debates over what 'should count' as knowledge. [21] These debates were related to the possibility of individuals climbing up the social ranks of the British class system by gaining knowledge, but also, as alluded to by Rauch, knowledge did gain its own, tangible 'social and cultural currency', especially in the areas of science and technology. Many of the statements by publishers about 'useful knowledge' and 'information' were made in the context of marketing their products, so at times some statements made by different publishers seem contradictory. When I am presenting my own thoughts, I will use 'information' and 'knowledge' as understood in common parlance as stated above. If I present statements by historical publishers themselves, however contradictory, or by other scholars analysing historical publishers, I will point out how they mean 'information' or how they mean 'knowledge'. This thesis will not focus on the greater debates surrounding knowledge, but on the intent of a specific group of 19th-century publishers and what they deemed important information for their audiences and what they did to make their products with information accessible.

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[17]Rose (2001), p. 16. Rose notes that autodidact weavers in 18th-century Scotland had very good classical educations and higher literacy rates when compared with some of the aristocratic English at the same period, which goes to show that class or income did not indicate level of learning.

[18]The study of the Theory of Knowledge is called epistemology and its range is outside the scope of this thesis.

[19]Rauch (2001), p. 3

[20]Rauch (2001), p. 6

[21]Rauch (2001), p. 6

One final set of definitions worth covering are related to 'images' and 'illustrations' as well as terms for styles of illustrations. This thesis does look at how visual features of these historical works were used to communicate information, data, and facts, by publishers of encyclopaedias. The visual material in this study is composed mostly of prints created by the wood-engraved illustration process, so 'image' and 'illustration' will often be used interchangeably. Sometimes the term 'artwork' will also be used to refer to a specific illustration. This is because many of the wood engravers discussed here, also considered themselves to be artists. 'Artist' could be both a culturally loaded and confusing term in the 19th century, because there were different definitions about what constituted art and the idea of the hierarchy of genres of art was widespread.[22] High art was usually associated with painting and exhibitions at the Royal Academy, whereas the skilled work done in commercial sectors like publishing was considered by some 19th century critics to be artisan work, rather than art.[23] Since many wood-engravers mentioned here consider themselves artists, I acknowledge what they call themselves.

There were three general types of illustration styles in the nineteenth century, categorised in this thesis as 'facsimile', 'pictorial' and 'schematic'. These terms for 'facsimile' and 'pictorial' styles are used by scholars of 19th century visual and cultural history[24] but also from the writings of wood engravers themselves, such as W. J. Linton (1812-1897) who use 'interpretive' and 'pictorial' somewhat interchangeably. I have chosen to use the word 'pictorial' rather than 'interpretive' because 'facsimile' style illustration (meant to imitate the style of a photograph) was also very interpretive, as will be shown in subsequent chapters.

1.2   Research Questions

> *Interpretations of visual images broadly concur that there are three sites at which the meanings of an image are made: the site(s) of the production of an image, the site of the image itself, and the site(s) where it is seen by various audiences. Many of the theoretical disagreements about visual culture, visualities and visual objects can be understood as disputes over which of these is most important and why.* [25]

In an age when the internet and the ubiquity of digital images has made knowledge, as well as misinformation, more widely available than ever before, the history of the democratisation of knowledge has become extremely relevant. In the last few decades, there has been a 'visual turn' in the social sciences as numerous scholars use visual methodologies which combine qualitative and quantitative approaches. Gillian Rose states that

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[22]Benjamin (2000)

[23]Benjamin (2000), pp. 65-66

[24]Especially in the writings of Beegan (2008), De Freitas (1986), and Ivins (1996)

[25]Rose (2011), p. 16

there are three areas for researching images: production, content, and reception. These three categories were useful as a starting point for formulating research questions.

Content

1. What was the Chambers firm selling?

2. Is the content and design of *Chambers's Encyclopaedia* more appropriate and easier to understand for a general audience than other encyclopaedias preceding it?

3. What subjects were chosen to be illustrated, and were there any visual trends in these 19th-century encyclopaedias?

4. How did the style of illustrations impact the look and feel of both editions?

5. How were the values of the Chambers firm communicated through different decades through its encyclopaedias and through other Chambers publications? (This two part question will be answered partially in Chapter 2 (other Chambers publications) and partially in Chapter 4 (specific to the encyclopaedias))

Production

6. What were the main uses of illustrations in the 19th century and how did the different uses change the environment for printed material?

7. How did the firm's approach to making illustrated encyclopaedias change between the first and second edition?

8. How did the aesthetics of photography and the practicalities of production affect the design and number of wood-engravings in the second edition?

Reception

9. Who did Chambers see as their target audience?

10. How broad a section of society were 'the people' who could both afford and understand a publication such as *Chambers's Encyclopaedia* and how global was the audience for these images?

11. How did the public respond to the content, and the illustrations in particular, for both editions of this encyclopaedia?

12. What indicators were found that show that the encyclopaedias enhanced the firm's reputation for high quality educational material throughout the 19th century?

	Content	Production	Audience
Research Questions	What was the Chambers firm selling? How were the values of the firm communicated through different decades?	What were the main uses of illustrations in the 19th century and how did the different uses change the environment for printed material?	What was the Chambers firm selling? How broad a section of society were `the people' who could understand and access a publication such as *Chambers's Encyclopaedia*?
	Is the content and design of Chambers Encyclopaedia easier for general audiences to access than other encyclopaedias preceding it?	How did the firm's approach to producing encyclopaedias change between the first and second edition?	How did the public respond to the content, and the images in particular for both editions of this encyclopaedia?
	What subjects were chosen to be illustrated, and were there any visual trends in these reference books? How did the style of illustrations impact the look and feel of both editions?	How did the aesthetics of photography and the practicalities of production affect the design and number of wood-engravings in the second edition?	What indicators were found that show that the encyclopaedias enhanced the firm's reputation for high quality educational material throughout the 19th century?
Methodology	• Content & statistical analysis • Compare with 5 competitors • Literature searching in correlation to content analysis trends	• Content & statistical analysis • Archival Research (pay slips, employee records, etc.) • Deep reading of books and objects • Newspaper searching (ads and reviews - map locations)	• Archival Research (sales records, advertising, US co-publishers & distributors) • Audience survey • Newspaper searching (ads and reviews - map locations)

Figure 1.5: Diagram of research

Answers to some of these questions do not necessarily fit into just one of these categories, because production and content are inextricably linked, as will be shown in Chapter 3 which discusses the concept of a publisher's content machine or production model. Therefore, in addition to these broader categories, the chapters were organised according to questions and answers that are related to each other and by the methodology used. The research was also structured to collect both quantitative and qualitative data.

Figure 1.5: Diagram of Research, shows how different research questions were mapped to different methodologies. A quantitative framework for analysis helps place the works in the broader historical picture while also providing tools for understanding content and change over time. Examples of types of qualitative data collected included information gained from deep reading of works produced by the firm and the correspondence they and their American partners left behind, through literature searching, and the collecting of observations by survey participants who were asked to interact with the visual material from the first two editions of *Chambers's Encyclopaedia*.

A qualitative framework examines individual documents, artefacts and images at a micro-analysis level. It seeks to understand the purpose for which particular items were created and the prescriptions and practices that shape and surround that purpose. Exam-

ples of the types of quantitative data included the number of images and the frequency that certain subject categories of images appeared, and comparing those numbers proportionally with the same type of data from other encyclopaedias and their images in the 19th century. Other quantitative data collected included the measurements of woodblocks used to produce images in the encyclopaedia, and examining the size of page layouts in both editions. It also involved collecting data on illustration styles of images and looking for patterns of shared characteristics across similar entries and through the progress of time.

1.3 Methodologies

1.3.1 Materiality and deep reading of objects and archives

All of the material in the collections at the National Museums Scotland (NMS) and the National Library of Scotland (NLS), that was examined for this research, were things that were used by people who were part of the W. & R. Chambers firm, and the physicality of the collections provides a feel for their lives. 'Objects bear the marks of how they've been used, giving us access to ideas that may have been too fundamental to a person's life ever to have been written down'.[26] When one studies material culture, the meaning of an object is not simply in its physical form, but in the dynamic interaction of its physical form with our sensory experience.[27]

One of the benefits of the Collaborative Doctoral Partnership between NMS and the University of Reading is having access to the woodblocks that produced *Chambers's Encyclopaedia* and the business records and family archives of the W. & R Chambers firm on deposit at the NLS. During this research project, I have spent time in Edinburgh reading primary resource material from NLS archives, and directly handling museum artefacts at the NMS museum stores.

This NLS collection, WRC Dep 341 contains the records of projected sales, contracts with vendors who sold the encyclopaedia and other Chambers works, some payslips for people contracted to create artwork that would be engraved, and receipts of payment for a freelance wood-engraver. There was also a sizeable amount of the Chambers-side correspondence to American publishers J.B Lippincott, who produced American versions of both first editions. Further archival research led me to Philadelphia, particularly to the the Historical Society of Philadelphia (HSP) which houses the papers of the J.B. Lippincott firm and the Library Company of Philadelphia that holds 19th century print culture material. At the HSP, I was able to see the Lippincott-side correspondence in response to their business activities with Chambers. Between both archives, I found a wealth of data providing valuable insights into production practices, and editor intentions.

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[26]Barrett (2013)
[27]Dudley (2010)

Figure 1.6: Detail of *Chambers's Encyclopaedia* entry in Volume 27, 'Plate Book', circa 1900. J.B. Lippincott Company Records, Collection 3104. Historical Society of Pennsylvania, Philadelphia.

At the NMS, there also appear to be a handful of 'drafts' of images in the form of cooperface stereotype plates and blocks, that showed that publishing them could be a continuous process. Letters and drafts of works showed that even after a work was published parts of it could be revised in subsequent versions or reprints.[28] The archival material revealed idiosyncratic systems, such as account books which projected expenses of illustrations, and charted Chambers's switch in the 1870s to widespread use of stereotyping and electrotyping. In Philadelphia, records show that Lippincott held and stored 26 boxes of electrotype plates related to *Chambers Encyclopaedia* in a vault (Vault 4), that they would access when they decided to do reprinting.[29] See Figure 1.6.

Although the items in the W. &. R. Chambers collection are referred to here as 'woodblocks' there are in fact five types of objects housed in drawers at the NMS store. First, there are engraved wood blocks which have been created for printing from directly, that is the blocks were locked up in the forme and printed together with the metal type. Illustrations made from these prints were created directly from them. Although they vary in size, these blocks are fairly uniform in appearance, and they typify the majority of objects used to print images in the first edition of the *Chambers's Encyclopaedia*. Since many prints used in the First Edition have an older style, and look identical to other, older Chambers publication illustrations found in *Information for the People*, the prints indicate these blocks were used previously in other Chambers publications. More on about these objects and the images they were used to print will be discussed in Chapters 2 and 5.

The second type of object is also made from wood but while there is a clear image

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[28]Other archives and libraries were also consulted as they held material relevant to this research, including the Western Bank Library at Sheffield University and Sheffield City Libraries and Archives, both in Sheffield, as well as the libraries and special collections at the University of Reading.

[29]Pub Led. (ca. 1900), Plate Book, Volume 27. These plates seemed to have survived a fire which caused massive damage to Lippincott's headquarters in 1899 and cost $3 million worth of damage.

in the centre of the block, the background around the image's printing surface has not been cleared away with a burin.[30] This clearly shows that these blocks were not to be printed, but were used as templates for the creation of stereotype or electrotype blocks. Such blocks in the Chambers collection are also covered with graphite, and so must have been used to create electrotype blocks. The third and fourth types of objects are stereotype or electrotype copies of wood-engraved blocks. Some of them are finished and mounted on wood, others are in different stages of being processed. The final type of object, of which there are less than a handful of examples, are half-tone plates. None of the latter were used for the first two editions of the encyclopaedia.

1.3.2   Visual Content analysis

Visual content analysis is a technique for systematically describing written, spoken or visual communication. It provides a quantitative (numerical) description that is replicable. I used visual content analysis for three types of data that I collected. First, I used it with subject category frequency of images used to discover patterns between both Chambers editions, and to compare category frequency with other encyclopaedias. Secondly, I used it to compare dimensions of Chambers woodblocks in the W. & R. Chambers collection. Finally, as an aspect of an online survey specifically testing image accuracy and whether content within an image could be identified. The rationale for use of this technique in different areas are threefold. First, to establish intellectual control of the images. Second, to establish criteria for comparing different facets of the images and assessing if there was a means to test their objective accuracy. Third, because content analysis facilitates the sampling of large numbers of items and allows data reporting findings to be displayed clearly in graphs and tables.

In order to gain intellectual control of the images and their number, I counted all of the images in both editions, discovering that there were 4066 wood engraved images in the first edition and 3256 wood engraved images in the second edition. I then sorted all images into different categories using a data standard called CCO (Cataloguing Cultural Objects) designed by the Visual Resources Association (VRA) in association with the J. Paul Getty Museum. [31] A data standard was chosen to enable the comparison of measurable variables, which could then be extracted and interpreted. This data standard also provided a benchmark by which editorial and marketing claims made by the Chambers

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[30]See Chapter 2.4 for illustrations and a detailed explanation of wood engraving process

[31]VRA represents image media professionals from around the world and this data standard took years to develop and is very comprehensive. Among the users of CCO are the Yale Centre for British Art, The California Digital Library, and ArtStor, a Non-Profit Digital Image Library for Education and Scholarship used in many universities worldwide. The VRA website also lists national cultural projects using this standard in the US, South America, and across Europe.

firm, in terms of subject coverage and visual representation, could be measured and tested.

Categorising printed images allowed a way to see emerging patterns between the First Edition and the Second Edition. Using the same categories, I also performed visual content analysis on five other 19th-century encyclopaedias: the *Penny Cycylopaedia* (1828-1843), the *English Cyclopaedia* (1854-1862); the eighth and ninth editions of *Encyclopaedia Britannica* (1853-1860) and (1875-1889), and *Johnson's Universal Cyclopaedia* (1876).

These encyclopaedias were chosen for the following reasons. The *Encyclopaedia Britannica*, was published in Edinburgh and was a main competitor for *Chambers's Encyclopaedia* in the United States as well as in the UK. *Johnson's New Universal Cyclopaedia* was chosen because it was an example of a small cheap encyclopaedia in four volumes, it was published between the first and second edition of *Chambers's Encyclopaedia*, and it is specifically mentioned in correspondence from Lippincott to Chambers as being a competitor with the second edition of the American version of *Chambers's Encyclopaedia*.

The *Penny Cyclopedia*, and its later version, *The English Cyclopaedia* (see Chapter 3) were produced by Charles Knight who worked with the Society of the Diffusion of Useful Knowledge (SDUK). The SDUK and Chambers targeted similar 19th-century publishing markets. To a certain extent they also shared similar publishing goals of making prose and poetry cheap but high quality, and using of economies of scale to bring down the cost. Comparisons have been made between them, as publishers, by different scholars of the 19th century.[32]

This exercise allowed me to see that there seemed to be a high frequency of illustrations for these broad topics: natural history, medicine and science and technology imagery in Anglo-American encyclopaedias produced during this period.

Visual content analysis was conducted on woodblocks in the W. & R. Chambers collection to see if there were any patterns in image size between editions. Data was gathered on height and width of the printing surface of the blocks. Histograms showing the shift in image size can be found in Chapter 5, along with the data analysis for each graph. The blocks sampled were: two categories that were most frequently illustrated across both editions, two categories that changed the most between editions, and a general sample of a particular volume which contained all categories. The categories chosen for their frequency were 'vertebrates' and 'machines / vehicles', the two subject categories chosen because of their dramatic proportional change were 'maps' and 'humans / mythic figures', and a general sample of all of the blocks found of the first volumes of both editions. The general visual content analysis was conducted across the first volume to ensure that the subject categories sampled were not significant outliers when compared with other categories. However, because there were significantly fewer images between editions, and fewer blocks in the W. & R. Chambers collection at the NMS that represented the sec-

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[32]Fyfe (2012); Gray (2006)

	First edition blocks in Chambers collection	Second Edition blocks in Chambers collection
first volumes, all categories	322	221
vertebrates (mammals + birds)	227	72
machines and vehicles	61	101
maps	33	63
humans	38	32

Figure 1.7: Summary of W. & R. Chambers collection's woodblocks used to calculate visual content analysis shifts in distribution.

ond edition, measurement samples of the first volume of the first edition were compared with the first and second volumes of the second edition to make the numbers more equal. In other words, 323 blocks representing the first edition's volume one were compared with 122 blocks representing the second edition's volume one, plus 89 blocks representing the second edition's volume two, making the comparison between 323 first edition blocks and 211 second edition blocks. See Figure 1.7.

Blocks depicting birds and mammals, a subsection of vertebrates, were chosen because the vertebrates category was the most frequently illustrated subject across both editions. The third most frequently illustrated subject, 'machines / vehicles' , were sampled because the depiction of inanimate objects was a good contrast, not just with the subject of vertebrates, but also in illustration style across both editions. Other frequently illustrated categories, 'botanical specimens' and 'medical /anatomical' illustrations, were generally subcategories of natural history and biology subjects, so they shared too many similarities with vertebrate illustrations to be as meaningful as a comparison with 'machines / vehicles'. Interestingly, this comparison shows that not only were there more blocks in the collection, but that the blocks for the 'machines/ vehicles' category were much larger than the second edition.

Two other categories sampled because their frequency changed significantly between editions, and shown as charts in Chapter 5, were the human and mythic figures category which dropped by 50% and the maps category which nearly doubled. Another category that changed significantly between editions are micro-organisms. Although measurements were made of blocks from both encyclopaedia's editions, because of the very small sample size for maps about 20 blocks were found in the collections for both editions, the data is not presented with the other histograms as a visualisation, since the small sample size makes it difficult to present an accurate picture. Mathematics was also another category that greatly increased, but the schematic style of the mathematical and geometric

illustrations in the prints was very similar between editions, so for the purposes of this research is was not sampled.

The blocks were measured and plotted on a graph, with bins (markers for the series of intervals) 5 mm wide. The data for the height and width show the distribution patterns of woodblocks or their derivatives found in the NMS collections. These results indicate that science was important to *Chambers's Encyclopaedia*, but that editorial decisions seem to be favouring images of advancement in scientific technology.

See Appendix A for examples of every category.

1.3.3   Comparison with other encyclopaedias

When it was discovered that Chambers briefly held the stereotype plates for *Penny Cyclopaedia*, See Chapter 5, a sample of illustrations from *Penny Cyclopaedia*, was compared with a sample of illustrations from Chambers's first edition. The *Penny Cyclopaedia* consisted of 27 volumes, and a sampling of four volumes: Volume 1, Volume 9, Volume 17, and Volume 25 were conducted. However, a few illustrations in adjacent volumes: Volume 2, Volume 8, Volume 16, and Volume 24 and 27 were added to this comparative sampling exercise for two reasons. First, the *Penny Cyclopaedia* was bound in two-part volumes, that is Volume 1 and 2 were bound together making it easy to see what the next volume held. Second, prior to this, another research activity related to the *Penny Cyclopaedia's* coverage of a similar topics found in Chambers was conducted. For example, when examining coverage of the category vertebrates across all encyclopaedias, I noted that 'dugong' had is its own entry in Volume 6 of Chambers, but in the *Penny Cyclopaedia* this marine mammal is grouped with 'Porposse' [sic.] and 'whale' in Volume 27. As I had collected information on these illustrations previously, the information supplemented the comparative sampling activity.

1.3.4   Note on certain inconsistencies when comparing blocks and prints

The W. & R. Chambers collection has been catalogued as a group under the NMS's museum number T.2011.56. Most of the blocks related to the first edition of *Chambers's Encyclopaedia* are accounted for and sorted into drawers. They have also been scanned by volunteers along with their respective prints. The Second Edition blocks are in the process of being catalogued and scanned by another volunteer that comes in weekly. When individual blocks are chosen for physical display in the NMS galleries or photographed for virtual display on the NMS public website, they are individually registered and assigned a specific number in addition to the group museum number.

A significant amount of my time was spent examining wood-engravings in different categories, measuring them and making note of what was in the collection relative to the

prints in both volumes of the encyclopaedias. Using a visual content analysis tool, different categories were sampled, and histograms for the categories of mammals and birds (a subsection of vertebrates), maps, human and mythic figures, and machines and vehicles were taken, as was sampling of all images in the first three volumes of both editions regardless of their topics. This activity was only undertaken with categories where there was a significant numbers of blocks available to extrapolate some information.

When examining the actual wood blocks themselves, I found that my initial counting of illustrations, based on counting prints in the books, differed with the count of the blocks themselves for three major reasons. First, because blocks which were used to print an image for the book are missing. Second, in some instances, the Chambers collection contained duplicate images: a woodblock master image with its stereotype or electrotype derivative, and on occasion all three versions of the same image as different media type would be present. Third, since there are duplicates of a particular image because some prints were actually made from more than one block. For example, the final image appearing in the encyclopaedias would be a composite of two or more blocks printed together. Instances of this seemed to be more common in the first edition, rather than the second edition.

On the other hand, with the second edition I found that sometimes the reverse was true. What I had counted as two or more separate illustrations, were actually prints made from one block, or stereotype and electrotype plates. This was especially true for images that had been created by a stereotyping or electrotyping process. For example, the printed image used for the entry 'surveying' looks very similar in both editions, with the exception of the printed image's size, which looks narrower in the second edition. See Figure 1.8.

Although Volume I seems to show the surveying image as one print, Figure 1.9 shows scanned copies of woodblocks in the W.&R. Chambers collection used to print the image. When these woodblocks are studied next to the book print, one learns that five separate wood blocks would have been used to print this image in the first edition. One also learns that one of the woodblocks is not accounted for in the Chambers collection. However, in the second edition, only one large stereotype plate was used to print the similar image. (See figure 1.9) From looking at the printed illustrations, it seems that the image in the first edition is larger than its counterpart image in the second edition. In fact, the image in the first edition is made of a composite of smaller blocks. The image in the second edition is one large plate. This is an extreme example, but there are other instances where this occurs.

Therefore, one can conclude that unless every woodblock or derivative stereotype or electrotype is accounted for, and there there is only one copy of it in the collection, the total number of illustrations divided into different categories will not correspond exactly to the total number of images in Figure 1.10. Regardless, the categories and their numbers do provide fairly good estimates of what was considered editorially important enough to
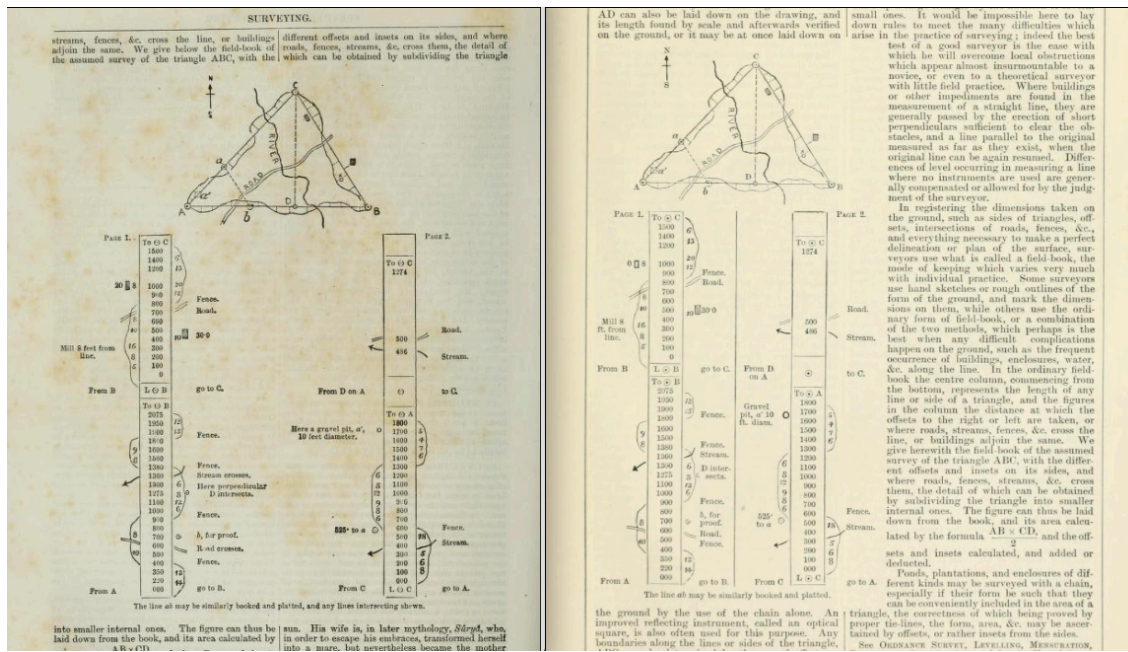
Figure 1.8: Side-by-side comparison of printed illustrations explaining the concept of land surveying in the First Edition (left), with Second Edition (right).

include in major reference works such as this and is still a valid baseline for continued intellectual control over the collection.

1.4   Structured image analysis by experts

Structured image analysis is a type of direct analysis that focuses on handling images as data, regarding the subjects that they record. This type of analysis seeks information on the subjects seen in the images or may extract understanding regarding the making and functions of images as well as the perspective of their makers.[33] This approach provides opportunities to respond to larger patterns within a whole data set. Collier and Collier provide a model for analysing photographs that Van Leeuwen and Jewitt break down into four stages and apply to all images in general. In the first stage and second stages, data is observed as a whole and is recorded. These stages overlap with activities conducted for visual content analysis.

The third stage requires structuring a deeper analysis with specific questions based on statistical information. From content analysis data gained from the first two stages, pointing to categories that were most frequently illustrated than others, a select sample from these image categories were interrogated with specific questions. In the fourth stage information obtained by this method was analysed with visual records overall.

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[33]van Leeuwen & Jewitt (2014), p. 38 - 39
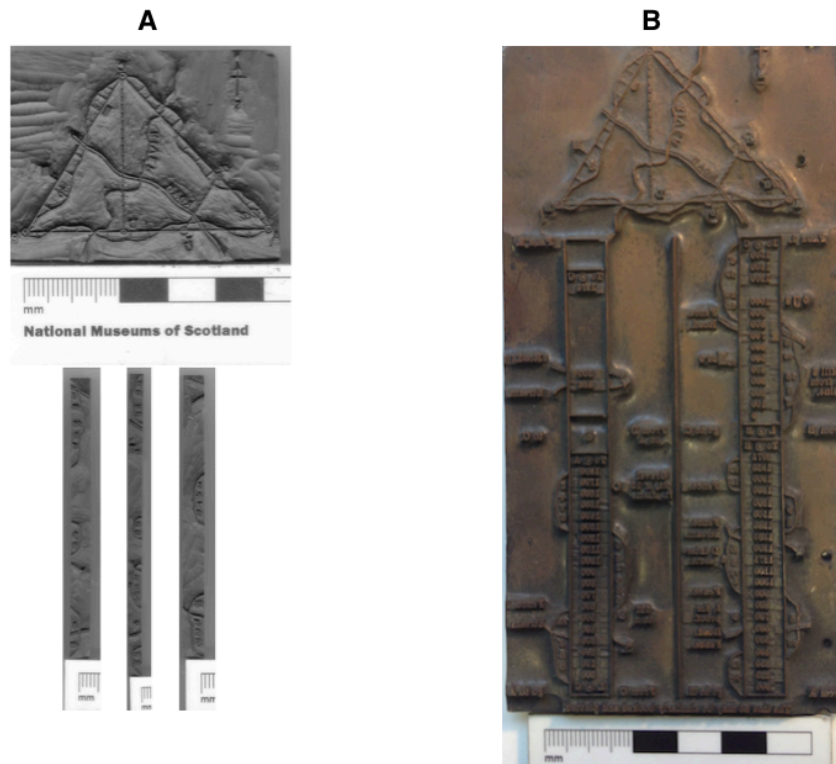
Figure 1.9: Side-by-side comparison of First Edition blocks labeled 'A' (left), used for land surveying illustration with Second Edition electrotype labeled 'B' (right). Collection number T.20011.56. National Museums Collections Centre, Edinburgh.

1.4.1 Why was this approach used?

Michael Twyman proposed a model which considers the graphic aspects of language. [34] In this paper he states that language can be broken into two domains: what can be heard (aural), and what can be seen (visual). This idea is relevant to this thesis because certain images can function as a visual part of language. Like all languages, information can be communicated through either an aural mode or a visual mode. One aspect of this study examines images that communicate different aspects and layers of information.

Since different professional communities have their own language, both visual and aural, it seemed logical to see if the images in Chambers could communicate aspects of a subject domain that, as a non-member of a professional community I would miss. The aim of the structured image analysis survey was to see if the images themselves could communicate directly with people whose understanding would be informed by relevant training/expertise, and who could comment on different aspects of the image content.

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[34]Twyman (1979)

	illustrations	maps	tables
1st Ed.	4066	33	506
2nd Ed.	3256	48	570
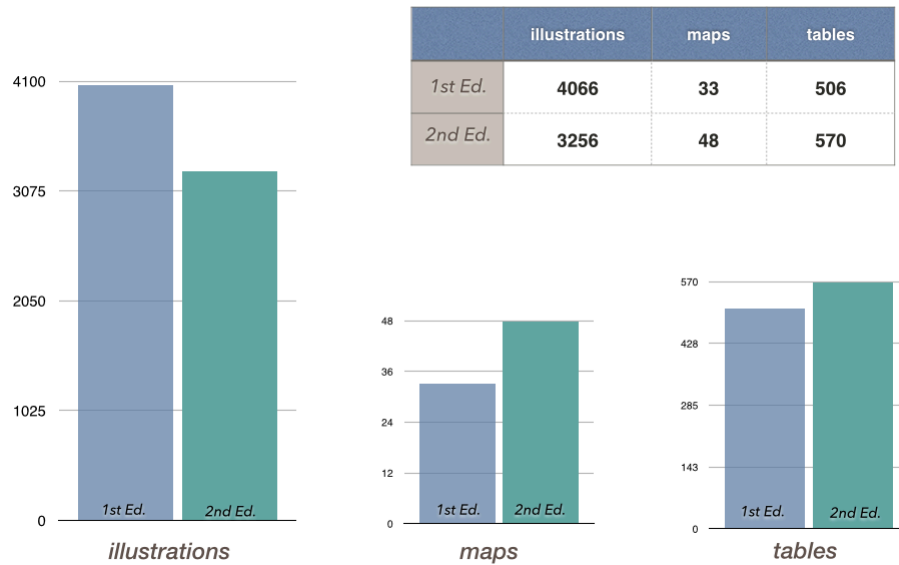
Figure 1.10: Graphical and tabular elements of *Chambers's Encyclopaedia*.

1.4.2   Expert Survey Content and Administration

The expert Survey was conducted online through the BOS Online Survey Tool for academic research. BOS is available to staff and students at University of Reading. The BOS system anonymised each participant and assigned each one a code.

Through the BOS as a survey tool, questions were posed which asked experts in three different subjects for their feedback on accuracy of images related to their area of expertise. The survey also asked for feedback regarding the usefulness of specific images for teaching non-experts, since instructing non-experts on various topics is the *raison d'être* for encyclopaedias.

The categories chosen to be surveyed were the among the most frequently illustrated: vertebrates, botanical specimens and medical images, based on the visual content analysis exercise mentioned above. (See Chapter 3: Visual Content and Form for findings). The survey was designed to test an 'average' type of image a reader might encounter when picking up the encyclopaedia. The questions of the survey queried whether they could identify an image, if the image looked accurate, and if they believed the image was useful in teaching technical details of their subject to someone who was not an expert. The goal of this exercise was to gain qualitative information that evaluated illustration content.

It was important that this online survey create conditions for the images to be regarded as an entity of visual communication in their own right, therefore, subject participants did not know, before-hand, that these images were from the 19th century or that they were from an encyclopaedia. This study looked to record honest and unbiased feedback about initial impressions of the images chosen and aimed to see if illustrators and wood engravers

were able to visually translate and communicate subject topics. One of the challenges with researching audience and reception in *Chambers's Encyclopaedia* is limited primary resource documents about the encyclopaedia's images specifically. The survey data collected, provided a sample of the range of images and their accuracy. Based on the answers, participants were able to bring their work or education background knowledge into use when looking at specific images and explaining whether they recognised what the illustrator was attempting to depict.

Historians of science or medicine were not asked to complete the survey, because it was likely they might know too much about the context of the image, and judge the image based on historical knowledge of the subject's development, rather than on the subject depicted in the image, itself. In contrast to historians of science, it was felt that an expert in a certain field, such as a nurse or a general practitioner who looks at the living human body every day and must explain medical concepts simply to their patients, would be better suited to participate. In other words, the survey needed people who could comment on the veracity of the image because they had some knowledge of the field. In addition, he or she would be well-placed to talk about subject accuracy and usefulness. The same thing could be said for ornithologists and botanists. These experts spend much time looking at organisms, both living and non-living, and if they are responsible for teaching, their engagement with the public makes them a good judge of what non-experts might understand. The survey was set up to allow participants the opportunity to provide honest and unbiased feedback about their initial impression of the bird, plant or medical images. Although the category 'machines and vehicles' was the third most frequently illustrated subject, it was felt that it would be difficult to get experts who were not also historians of science and technology to evaluate these illustrations.

There were some interesting revelations about the illustrations themselves, which will be discussed in-depth in Chapter 6 on audience, but which also ties into Chapters 2 and 3 on changing pictorial syntaxes. The third section asked them to read 2 short passages of text from the encyclopaedia edition that accompanied the illustration, and if the textual information was accurate. There was also a short question about how well the image and the text went together.

The other advantage of choosing birds, plants, and anatomical images was that although the science for studying them has changed since the late 1800s, what the images depict has not changed and was recognisable to experts today. This method provided both qualitative and quantitative data.

Vertebrate-subcategory, Birds: Of hundreds of illustrations in the vertebrate category found in *Chambers's Encyclopaedia*, five images of birds were chosen for the expert survey: grebe, pigeon, puffin, swift, and tit. (See Chapter 5) These particular species were chosen because all were illustrated in both first and second editions of *Chambers's Encyclopaedia*

and a major part of greater research involves comparing how and why image styles changed between the 1860s and the 1890s. These five also represent different types of birds which occupy different habitats: water, high cliffs dwellers, and birds that could live in both urban and rural environments. Only five birds were sampled to ensure that the survey was not overly long so as to encourage a high completion rate and to minimise survey fatigue as this type of structured visual analysis can be a time consuming and exhausting process[35] The online survey was approved by the University. The questions on the online survey complied with the University's ethics policy.

Sixty-five people completed the online bird survey and gave their impressions and comments on grebes, pigeons, puffins, swifts, and tits. Three participants were known to the author via their work at University of Reading or The Greater Farallones National Marine Sanctuaries, in California, USA.[36] When other bird experts based in England and Scotland were invited to participate, but declined to respond, an appeal was placed on the listserv of the Ornithological Societies of North America (OSNA), to which 62 others responded enthusiastically. In follow-up questions, more than 20 people responded that they were based in different parts of Canada and the United States. Some were affiliated with universities, some with governmental agencies, some were environmental business consultants. A few reported that they worked for wildlife conservation non-profit organisations. An individual responded that she had been observing birds for over a decade as a personal hobby after retirement, another that he had authored field guides on birds for his local region. From many of their answers, it seemed clear that participants also engaged in some sort of teaching, both formally and informally where they imparted knowledge about bird identification.

Botanical illustration category: Twenty three people completed the online botanical survey and gave their impressions on illustrations of these plants or trees: almonds, banyan, barley, flax, olive, and vanilla. These particular illustrations were chosen because depictions of these items appeared in both first and second editions of *Chambers's Encyclopaedia* and the illustration styles varied between editions. Two people were known to the author via the University of Sheffield or Sheffield Botanical Garden. Nearly a third of the respondents were associated with the University of Reading's Department of Agriculture and responded to the survey based on a personal appeal by someone known to them from the Department of Typography. An Associate Professor in the Department of Agriculture further passed the link of the survey to fellow biologists in Europe that he was collaboration with on various projects and the survey was also placed on the PLANT-

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[35] van Leeuwen & Jewitt (2014), p. 43

[36] The National Marine Sanctuaries operate under the governance of National Oceanic and Atmospheric Administration (NOAA) and works to protect the wildlife, habitats, and cultural resources of marine environments covering an area of 3,295 square miles off the northern and central California coast.

BIOMECHANICS list-serv, on JISC.ac.uk. In follow-up questions, more than half of the people responded that they were based in different parts of Europe and the UK. Most were affiliated with universities and many were engaged in teaching, if they were not PhD students.

Medical illustration category: Twenty one people completed the online medical survey and gave their impressions on illustrations of: the abdomen, the ear, the pallet, the brain, and compact bone. As with the two previous categories, the subjects depicted here were found in both editions of the encyclopaedias. Information about the medical survey was passed by word of mouth by NHS employees to their colleagues. The overwhelming number of survey participants resided in England. Two doctors surveyed resided in the US and two resided in the Netherlands. The author was not successful in getting participants from list-servs. In fact, the people in the medical field who provided assistance as well as those who did completed the survey, discouraged their use, as the medical community list-servs served specific purposes and were not receptive to outsiders.

1.4.3 Expert Survey goals and challenges

One of the main challenges with setting up this survey was selecting images and then finding experts, especially in the scientific fields, because science and medicine have changed considerably since the 1800s. Contemporary work in the three areas now uses biomedical technology and high resolution sophisticated imaging techniques, so modern bias and research practices do come across in certain answers. For example, some participants expressed the expectation that bird illustrations should have been in colour, because most contemporary illustrations of birds show plumage as identifying characteristics. Medical professionals wondered why images of human anatomy were not rendered as 3-D images. Some botanists complained that proper identification required looking at the entire plant holistically, not just illustrations of parts of some dead specimens, and that some of the images were not technical enough. Nowadays, chemical as well as visual analysis is often made on plants and their environments. These expressions of modern bias were accounted for when analysing the data and were mitigated to some extent with open-ended questions.

Initially, I expected to receive about a dozen responses for each category at the most, since getting responses at the outset was difficult. However, there were more than 20 responses for two of the surveys that were placed on list-servs. For one of the surveys, there were 65 responses in total. Had I known there would have been a large data set, the process of delivering the online survey and some of the questions on it would have been conceived with more scientific rigour. For example, the participants would have seen images they were being tested on in a randomised order and there would have been a larger pool of illustrations for them to evaluate. Unfortunately, since I thought I would be

dealing with a smaller sample of experts, I did not construct the survey to function with these variables. Yet overall, the survey was useful as it was originally intended to be – as a means of collecting qualitative data.

The qualitative, open-ended questions allowed participants to provide nuanced answers and make insightful comments that added to the data I collected. For example, it appears that experts sometimes did not want to definitively state they *could* identify a species if they felt they did not have enough information, by modern standards. Yet, when asked to give their impression of a bird or a plant, for example, the participants *could* often identify the organism to the genus level, if not to a specific species. Participants often made observations about illustration backgrounds or other subject-specific clues in particular images that I had overlooked, but were useful to members of a discipline. Their comments demonstrated how they were engaging with what they saw. Had I only asked binary or multiple choice questions, I would not have learned about some of the subject discipline processes experts go through to evaluate a subject sample in their respective fields.

1.5   Collections consulted

1.5.1   W. & R. Chambers & material at NMS and NLS

This study uses material culture in the form of nearly 7000 woodblocks, stereotypes, electrotypes alongside the 20 volumes of encyclopaedias. (See Figure 1.2.) In many cases, a side-by-side comparison of blocks and their prints has been possible, as in Figure 1.4. The ability to physically compare woodblocks with their prints allows one to gain an insight into the 19th-century editorial process, because sometimes the final print is altered, reduced or enlarged and that can be detected by looking at woodblocks or their derivatives which can show signs of being modified and repaired. If too many objects of the same kind are missing from the collection or if the original owners have moved and arranged certain items separately from the other objects, that could also indicate something about the production workflow process or the objects' possible reuse. The woodblocks themselves, also have traces of their former lives in the form of ink or graphite residue. Ink indicates an item was printed from directly, graphite that it may have been used in the process of creating a derivative electrotype. This is not something that can be assessed by the illustrations alone.

One final note, extensive background and historical context is provided in Chapter 2 and in several chapters of this thesis, in order to allow one to better understand the specific argument made about the works of the Chambers's firm better. The illustrations from the firm's encyclopaedias, also need to be understood and studied in different layers. Depending on what aspect of an image is being examined, different meanings can be made from the images.

1.5.2   W. & R. Chambers as a business entity and donor

Seven of the ten biggest global publishing groups that operate within the general book market are European, and the industry's most profitable segment is made up of companies specialising in educational, scientific and professional or trade publications. Anglo-American companies have traditionally dominated academia and the science publishing.[37] One of those companies, Hachette UK, is owned by Hachette Livre, a transnational corporation and one of the world's largest trade and educational publishers.[38]

The Chambers Harrap Publishers Ltd (CHPL) was formed after both W. & R. Chambers Limited and Harrap Limited were acquired by the French publishing conglomerate Groupe de la Cite in 1992, with the two businesses merging.[39] In 2009, due to economic pressures, the offices of the Chambers firm were closed and its titles were moved from

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[37]Rønning, H & Slaata (2011)
[38]Milliot (2016)
[39]*Publishers Weekly* (2018)

Edinburgh to London to be managed by Hodder Education, a part of the Hachette Livre UK group of publishers,[40] with the Harrap portion of CHPL moving to Paris.

However, in the early 1980s, when the W. & R. Chambers firm was still located in Edinburgh, the W. & R. Chambers collections of archives and woodblocks were part of the Chambers family property. When the firm was in the process of moving from their premises on Thistle Street to Hill Street, Anthony Stuart Chambers (1918 - 2007), 'Tony Chambers' contacted the National Library of Scotland, because the Library already had some Chambers papers on Temporary Deposit.[41]

In 1982, a NLS Assistant Keeper went to Thistle Street to 'examine records in store and to advise on destruction, preservation, or transfer to NLS.' This long memo of 14 September 1982 includes the note that 'The cellar also contains thousands of wooden and copper printing blocks in trays...These might be transferred to the Royal Scottish Museum.'[42]

On 24 December 1982, Tony Chambers received a letter from James L. Wood, the curator of Engineering and Industry, at what was then the Royal Scottish Museum. Wood confirmed the collection of wood blocks, stereotype plates and book bindings had arrived safely at the museum. From the letter it seems clear that the original intention of the curator was to select a range of blocks from the material but not keep the entire collection. Some letters are also exchanged between Wood and Professor E.F. D Roberts in early 1984 indicating that many blocks were being cleaned and sorted and asking for his assistance regarding use of volumes from original *Chambers's Encyclopaedia* publications. He notes that although some drawers were labeled, 'the contents have become somewhat mixed up.'[43]

After some months of trying to make sense of all this material, staff at the NMS decided in the mid-1985 to concentrate on two publishing ventures for which 'W. & R. Chambers were well-known for', writes Allen, who was a new curator in 1994, *Chambers's Encyclopaedia* and the *Book of Days*. However, although many First Edition blocks were sorted, they were not individually registered in the museums's catalogue. Items need to be officially registered if they are to be put in a NMS exhibition or photographed for a digital project.[44]

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[40] Neilan (2009)

[41] The National Library Keepers were in the process of sorting and listing a collection of Chambers business papers, hoped that after this initial work was done, the papers could then be on permanent deposit at the library. The collection, or at least some of it, was recorded as a Temporary Deposit on 10 October 1979. A letter of 5 December 1989, confirms that the Chambers papers became part of permanent Deposit in 1989.

[42] Chambers family to J.L. Wood (1984) (NLS, Administrative papers for Dep. 314)

[43] Chambers family to J.L. Wood (1984)

[44] See online resource related to this thesis: nms.ac.uk/chambers

1.5.3 J.B. Lippincott and Lippincott Archives

Joshua Ballinger Lippincott was born in Juliustown, New Jersey, in March 1813. As a teenager, Lippincott entered the book trade as an employee of David Clark, book binder and bookseller. About 1831 Clark's business failed, and the 18 year-old Lippincott was put in charge of the business at the request of its creditors. For several years in the mid-1830s, the firm traded as Clark and Lippincott, but by 1837 Lippincott had established himself in business as J. B. Lippincott & Co., Booksellers & Stationers, at Clark's old address. Under this name, over the following decades the firm became an established publisher of books, including Bibles and religious texts.

In late 1849, Lippincott purchased the extensive book-jobbing and stationery business of Grigg, Elliott & Co., a firm that traced its origins back to Warner & Johnson's partnership of 1792, and together with the junior partners of the older firm reorganized as Lippincott, Grambo & Co. on 1 January 1850. In June 1855 the firm was again reorganized as J. B. Lippincott & Co., and continued to trade under this name until its incorporation as a private company, J. B. Lippincott Co., until 1885. In 1861, the firm moved to 715-717 Market Street, where it proceeded to build an extensive book publishing, importing, retailing, wholesaling, and manufacturing business. The firm moved to this location in 1863 and by 1871 occupied two large, connected buildings that stretched back to Filbert Street, the retail and wholesaling departments and publishing offices in front, facing Market Street, and the manufacturing establishment in the rear. These buildings were gutted by fire on the final days of November 1899, and by August 1901 the firm had moved to a new building in Washington Square, where it remained until its removal in 1999 to its current offices in the Penn Mutual Building, 530 Walnut St.

Joshua B. Lippincott died in January 1886, and the company, which had been recently incorporated, passed in equal parts to his three sons.

The Lippincott Archives were donated to the HSP in 2008. Due to a massive the fire in 1899 which destroyed the Lippincott's Philadelphia headquarters, it was believed that most of the archives of the early history were were destroyed, therefore the Lippincott Archives (HSP Collection 3104) have been underused. It consists of 96 boxes. The bulk of the records are from the 1880s-1920s. Records from the 1860s-1910s were consulted for this study.

1.5.4 Other Archives, Libraries and Museum collections consulted

National Museums Scotland, Edinburgh, UK

1. Main library collection

2. Department of Science and Technology library collection

National Library of Scotland, Edinburgh, UK

1. W. & R. Chambers Archive

2. Main library collections

Historical Society of Pennsylvania, Philadelphia, USA J.B. Lippincott Archives
British Library, London, UK

1. *Chambers's Encyclopaedia*, First Edition, serialised

2. *Penny Cyclopaedia*

3. *People's Cyclopaedia*

4. *Webster's Dictionary*

5. *Johnson's Universal Cyclopaedia*

Chetham's Library, Manchester, UK

1. *Chambers's Encyclopaedia*, First and Second editions

2. *Encyclopaedia Britannica*, Ninth edition

University of Manchester, UK

1. Walter Crane Archives

2. *English Encyclopaedia*, Arts & Sciences and Natural History divisions

The Portico Library, Manchester UK

1. *Information for the People*

2. *English Encyclopaedia*, Biography and Geography divisions

University of Reading, UK

1. Special Collections, Records of A. & C. Black Publishers Ltd.

2. Main collections

3. Typography collections, Reeves Collection of Woodblocks

University of Sheffield, UK

1. Special Collections, *Penny Cyclopaedia*

2. Main collections

University of Pennsylvania

1. *Home Life in All Lands* Volume 1
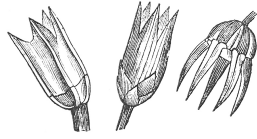
2. Main collections

Libraries & Archives, Sheffield City Council , UK

1. *Encyclopaedia Britannica*, Eighth edition

2. Main collections

Scotland's People (Online), National Records of Scotland, UK

2   W. & R. Chambers & the print ecology

This chapter provides a broad context of the print ecology in which W. & R. Chambers operated in the Victorian era and discusses the following points that are relevant to understanding the context of this thesis. Firstly, the Chambers firm operated in a larger print ecosystem. The firm was influenced by, and had influence on, others in the same system. Secondly, the wood-engraving trade was also part of the same capitalistic environment and was affected by the same market forces. Furthermore, professional wood engravers, themselves, impacted the print industry. Thirdly, several dynamic individuals in the printing industry had influence over illustration and the presentation of images for readers of printed materials. Their influence spanning decades. (See 'Historical people mentioned in the body of thesis' following the Conclusion.) This chapter will show how many of these individuals created special niches for illustrated works that grew and expanded working trade practices.

This chapter also broadly explores the research questions 1, 6 and 9 raised in the introduction. 'What was the Chambers firm selling and who was seen as their target audience? What were the main uses of illustration in 19th century, and how did the different uses change the environment for printed material? As this chapter provides a historical context, these questions are partially answered here in general terms and will be partially answered in more specific terms in subsequent chapters.

The W. & R. Chambers firm evolved and reinvented knowledge-based products, and these new products allowed the firm to thrive for the greater part of two centuries. In order to understand W. & R. Chambers in the 19th century, it is crucial to know that the Chambers firm built their success from serial publishing. Special attention will be paid to analysing why certain visual trends emerged in the mid to late 19th century, along with trends in the growth then contraction of the wood-engraving trade. The professionalisation and then de-professionalisation of the British wood-engraving trade will also be covered through three different eras in illustrated British periodicals, defined here as the decades of the publicists (1830s - 1840s), the decades of the wood engravers (1840s - 1850s), and decades of market diversification and fragmentation (1860s-1900). These eras will be examined through examples from specific illustrated publications established dur-

ing those years including *The Penny Magazine* (1832-1845) and *Information for the People* (1845). It will also examine visual trends in the *Illustrated London News* from 1842 to 1869 and *Punch* magazine[1] illustrations in the 1850s, 1870s, and 1890s. General observations in illustrations can be linked with visual trends found in Chambers publications, while other publications will also be referred to in order to corroborate or contrast styles and layouts, and to show the influence of British engravers on the printing industry. While Chapter 4 on Visual Content and Form will provide special attention to analysing the illustrations specific to selected 19th-century encyclopaedias, including *Chambers's Encyclopaedia*, this chapter will provide an overview of the Chambers brand and how that brand became associated with quality educational works, and later with school textbooks and general reference works. In addition, this chapter shows how wood-engraved illustrations dominated the 19th-century print media landscape and how the commercial wood-engraving trade of the 19th century is linked to the rise of journalism as a profession.

This chapter also seeks to emphasize that although the Chambers firm had Scottish roots, the firm inhabited a significantly globalised world, not only because of the expanding British Empire, but because business success, for Chambers or any other firm, meant having a keen awareness of potential markets, and taking advantage of national and international trade networks 'designed for the transfer of information, merchandise and credit'.[2] Great Britain was the chief source of foreign books imported in the United States, and was a significant exporter to German, French, and Canadian publishing markets, as well.[3]

2.1   Illustrations and the printing trade

In the first edition of *Chambers's Encyclopaedia*, the entry 'illustrated publications' states the following:

> *Latterly, illustration has consisted for the greater part in wood-engravings, for they possess the inestimable advantage of being printed with the letter-press, and in the hands of high-class artists, the design and execution of these embellishments have reached extraordinary perfection. Executed with comparative cheapness and rapidity, wood-engravings have been largely employed to illustrate a class of popular periodicals, and encyclopaedias, and newspapers. The* Illustrated London News *was the first, and continues to stand at the head of illustrated newspapers.*[4]

The wood-engraving method of producing illustrations was widespread. The quote above from *Chambers's Encyclopaedia* states that wood-engraving was used to produce im-

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[1]*Punch* lasted from 1841 until 2002.

[2]Winship (1999), pp. 102-103.

[3]Winship provides several tables of comparative data from 1828 to 1868 on the growing foreign trade in books between Great Britain and the United States. See: Winship (1999), pp. 111-119.

[4]Findlater, A., ed (1870), Volume 5, p. 520

ages in popular periodicals, newspapers and encyclopaedias (or other reference books), and it makes a distinction between 19th-century newspapers, such as *The Times* and the *Scotsman*, with the periodical press such as the *Illustrated London News* and *The Graphic*. Newspapers covered general topics and were of a time-sensitive nature, therefore tended to be published daily. Newspapers in Britain rarely used illustrations until the late 19th century,[5] when the half-tone block made possible the reproduction of photographs together with the text.[6][7][8]

According to Gernsheim, *Illustrated London News* and other leading illustrated weeklies or monthlies functioned like magazines, rather than newspapers.[9] Furthermore, magazines tended to 'delve further into subject matter than newspapers' because of the extra time given to a writer 'to craft provocative and insightful pieces'.[10]

Figure 2.1 shows two weekly periodicals. On the left, is the cover from an issue of *Chambers's Information for the People*, featuring a map of the United States in the 1830s. The accompanying article encouraged Scottish people to emigrate in order to improve their lives, especially if they had no prospects of a better future in their place of birth. On the right, is a cover from an issue of the *Illustrated London News* featuring Andrew Carnegie (1835-1919), a Scottish-born American industrialist turned philanthropist, whose family did immigrate to the United States in 1848, when he was 13 years old.[11] Carnegie is best known for his charities which funded the establishment of libraries, or provided money in the form of grants for student tuition or for academics undertaking advanced research. These two images encapsulate what this chapter is about: an interconnectedness of the 19th-century visual world that will be told through periodical illustrations and the social impact of the changes in relief image making technologies between the 1830s and the

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[5]On 10 January, 1806 *The Times* included an illustration produced by wood-engraving to depict the funeral car of Admiral Horatio Lord Nelson (1758 - 1805), that was prepared in advance and was unable to include last-minute changes in the funeral car's arrangement. Twyman (1970), p. 95. Nelson died in battle fighting the French and Spanish on 21 October 1805, but his body was preserved in brandy and transported back to England where he was given a state funeral the following January reported in *The Times*. *BBC History* (2018)

[6]Gernsheim & Gernsheim (1969), p. 453

[7]A search in the British Newspaper Archive database for three papers *The Glasgow Herald* , *The Scotsman*, and the *Aberdare Times* shows regular illustrations respectively appearing in 1882, 1899, and 1889.

[8]Brake & Demoor (2009), p. 3. The word 'press' obscures distinctions that subsequent historians and critical theorists of illustrations and journalism tend to make between newspapers and magazines and books.

[9]Gernsheim & Gernsheim (1969), p. 453. Gernsheim also notes that by mid century, ILN used photographs as the basis for wood-engraved illustrations.

[10]Tibbs (2006)

[11]The short article accompanying this illustration reports that Carnegie has just set up the Carnegie Hero Fund, awarding civilians who performed acts of heroism in the United States and Canada, with financial assistance for those disabled or if killed helping others, for their surviving dependents. This was one of over twenty charities that Carnegie would eventually set-up.

Figure 2.1: Front pages (not to scale) of *Chambers's Information for the People*, 1832; *Illustrated London News*, 1908.

1890s. Furthermore, it shows the influence of Scottish attitudes and sensibilities in the greater world reflected in 19th-century print culture.

2.2   Legislation affecting the printing trade

The 'taxes on knowledge' often referred to in the study of print culture, were actually four separate taxes: the Newspaper Stamp Duty, the Pamphlet Duty, the Advertisement Duty, and the Excise Duty on Paper. These taxes were imposed from the reign of Queen Anne in 1712 onward, and had a dampening effect on press activity for much of the 18th and early 19th centuries.[12]

Newspaper Stamp Duty 1712–1855 Initially 1 penny, this stamp duty changed over the years, first to $1\frac{1}{2}$ pence in 1776, then 4 pence in 1815, and 7 pence in 1825. The 1815 amendment to this duty which increased it by 166% also made subterfuge more difficult with stricter punishments.[13] This was also the law that middle class and working class 'publicists' (see next section) actively campaigned against. In 1836,

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[12]Hewitt (2014), pp. 1-5
[13]Chalaby (1998), p. 9

the duty was reduced to back to 1 penny, changing the publishing market. It was finally repealed in 1855.[14]

Pamphlet Duty 1712–1833 This duty charged 2 shillings per sheet for pamphlets of less than 6 sheets. In 1815 it was raised to 3 shillings per sheet. However, this tax did not really provide profitable revenue for the government, and was repealed in 1833.[15]

Advertisement Duty 1712–1853 This duty charged 1 shilling per advertisement appearing in printed newspapers or periodicals. By 1757, it was raised to 2 shillings; in 1789 it was raised to 3 shillings; and finally in 1815 it was raised to 3 shillings 5 pence before it was repealed in 1853.

Excise Duty on Paper 1712–1861 There were 34 types of paper that were taxed. The duties ranged from 2 shillings - 15 shillings per ream according to the quality of the paper. This was the last tax to be repealed because it generated a very profitable income for the government. Between 1850 and 1861 revenue from this tax was £1 million per year.

The Excise Duty on Paper was particularly problematic for Scottish printers, as they were charged both at the site of paper production and again if the printed paper was sold in England.[16] Although the Chambers firm paid nearly 20 percent in excise duty on paper in 1855[17] since their publications used smaller type to use less paper, for other printers, the cost of this duty could account for between a quarter and a third of publication's revenue.[18] The repeal of these taxes not only impacted economic ecology of print, but as will be explained, affected a wider social ecology as well when more printed material became widely available.

The effects of these taxes were twofold. Firstly, they retarded the development of the newspaper industry in England, given that the 7 pence added tax to the price of a daily paper, made a newspaper prohibitively expensive for most general readers. So for example, in the 1830s, there were 11 daily newspapers servicing London's 1.7 million residents.[19]

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[14]Parliament (1860), 60 Geo.

[15]Oats & Sadler (2004), p. 247

[16]Morris (2015)

[17]Hewitt (2014), p.10. Hewitt cites a 15 May 1856 letter from Chambers to Herbert Ingram (1811 - 1860) British politician and founder of the *Illustrated London News*. The Chambers firm paid £12,780 11s 3d to use 378,000 pounds of paper. Out of £12,780, 19.4 percent or £2482 18s was for the tax on paper.

[18]The aim of the taxes were primarily to impose government censorship, and the secondary to generate revenue for the crown. These taxes were all repealed at different times in the 19th century due to various interest groups lobbying the government. Hewitt (2014)

[19]The Office for National Statistics census data for 1831 shows that there were 1,729, 949 people living in Greater London, with 1,515,557 of them living in Inner London. In the 1841 census, there are 1,917,013 in Greater London, with 1,661,346 in Inner London by the 1840s.

	Hollis's breakdown of 'unstamped' papers by category
104	focused mainly on political topics (e.g., *Poor Man's Guardian*)
12	belonged to trade unions
3	cooperatives (e.g., *Magazine for Useful Knowledge*)
26	humorous (17 out of these were 'radical')
15	focused mainly on religious topics
32	middle-class educational papers (e.g., *Chambers's Journal* and *Penny Weekly*)

Table 2.1: Categories of 200 prevalent 'unstamped' papers

In contrast, during the same period New York's 25,000 residents had access to 15 papers selling at lower prices.[20] Secondly, these regressive taxes led to the establishment of many 'illegal presses' seeking to evade tax payment, either through subterfuge, or by adhering to the letter of the law by not printing 'news'. Chalaby and Hollis refer to these as 'unstamped papers', part of what became known as the 'unstamped press'. Hollis writes about the unstamped press and identifies some 200 unstamped papers. Table 2.1 divides them into different categories.[21] Both Chambers and Knight publications fall into the category for middle-class educational papers with about 30 other titles.

Most of these unstamped papers had working-class associations and readers.[22][23] Working class papers often overtook legal daily press circulation in the first two decades of the 1800s. An example of an unstamped paper, which will be discussed in the next section, was an early edition of *The Poor Man's Guardian*, which was a working-class weekly newspaper and carried the motto, 'knowledge is power.' Established by Henry Hetherington (1792 – 1849), a Chartist and founding member of the London Working Men's Society, each issue was sold for a penny between 1831 and 1835.

However, not all periodicals listed in Table 2.1 were 'radical'.[24] In 47 out of the 200 cases, there were publications by religious or middle class educators who aimed to divert the 'masses' from 'seditious' or 'blasphemous' literature.[25] They provided material of a more edifying (spiritual or intellectual) nature. With the reduction of the Stamp Duty in 1832 to one penny, other new weekly papers servicing such readers started to flourish.

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[20]Population data from the US Census from 1830

[21]Based on data and categories from Hollis (1970), pp. 318-328 as reported by Chalaby (1998), p. 13.

[22]Leaders of the working classes felt that their class needed an outlet of expression not provided by means available to higher classes.

[23]*Criminal Libel Act* 1819; Thomas (1916), pp. 248-249

[24]Readership for the unstamped press was always 20-30 times actual sales. Chalaby (1998), pp. 16-17

[25]See Glossary of terms before Appendix section.
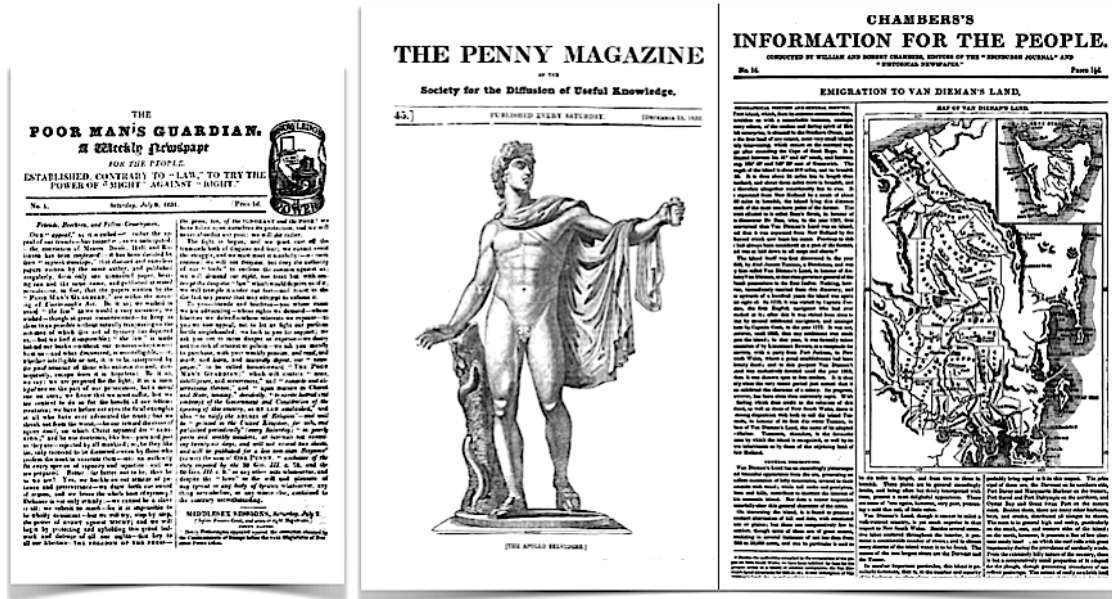
Figure 2.2: Front pages (not to scale) of *The Poor Man's Guardian*, 1832; *The Penny Magazine*, 1832, and *Chambers's Information for the People*, 1835.

Weekly papers began outselling the unstamped press due to their well-edited and copiously illustrated pages, which also featured fiction, attracting new readers willing to spend one penny a week on reading material.[26] Two examples of edifying papers, *Chambers's Information for the People* and the *Penny Weekly* were produced by men like the Chambers brothers and Charles Knight.

2.3   The Age of Publicists

In *The Invention of Journalism*, Chalaby argues that the journalistic field developed during the second half of the 19th century in Britain, and that the emerging profession began to make the claim that their writing was neutral and objective.[27] He contrasts 'journalists' who evolved after the 1850s with the printers and writers like Henry Hetherington who arose during the era of taxes on knowledge. Chalaby uses the term 'publicist' to describe driven individuals, whose strong personalities and value systems were deeply ingrained in the material they published in the first few decades of the 1800s.

Hetherington, the Chambers brothers, and Charles Knight (1791-1873) could be described as publicists. Qualities of publicists included representing and advocating on behalf of a social class and viewing the political process from a certain point of view. Publicists, according to Chalaby, felt an immense sense of duty towards changing society, not just the

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[26]Weedon (2003), p. 114
[27]Chalaby (1998), p. 311

social class they represented, but all of society according to principles in which they believed. They experienced their convictions with great intensity and showed their commitment to their convictions in their writings or speeches, constructing a 'correct' perspective of the world. They were often directly involved in politics and were prominent members of the society that their paper represented.[28] In other words, the writings of publicists were *not* neutral and objective—nor did they aspire to be, as journalists did. Their writings aimed to introduce readers to the belief systems held by individual publicists, and took for granted that readers would see the truth in their arguments.

Figure 2.2 provides examples of front pages of these titles from left to right: *The Poor Man's Guardian*, March 24 1832; *The Penny Magazine*, December 15, 1832, and *Chambers's Information for the People*, No. 14, 1835. The visual orientation of these papers is quite striking. *The Poor Man's Guardian* is mostly text; *The Penny Magazine* and *Chambers's Information for the People* use very large illustrations. The three sample publications in this figure were respectively produced by Hetherington, Knight, and the Chambers firm. All three publications, and the men behind them, will be discussed here to provide examples of a range of cheap periodicals available to readers before the so-called age of professional journalism. The founders of these papers were also very different from each other.

Charles Knight, in association with the Society for the Diffusion of Useful Knowledge (SDUK), produced the *Penny Magazine*. Knight was involved with the SDUK from 1827 to 1846, but his career as an English educator and printer began before and lasted after his association with the SDUK, as will be discussed later in this chapter. Yet, he is best remembered for his work with the SDUK, because the *Penny Magazine*, the *Penny Cyclopaedia*, the *British Almanac*,[29] and the *Library of Entertaining Knowledge* were very high profile publications. The Society was run by a committee of well-to-do persons, and was associated with faculty of University College London. The stated aim of the SDUK was to provide articles and books on scientific, artistic and cultural knowledge, thereby 'improving' their readers' minds, as well as instilling middle-class values and a strong, Protestant-work ethic. The SDUK took on the role of an intermediary between authors and publishers by advising, funding and promoting publications.[30] The founder of the SDUK, Henry Brougham (1778–1868) expressed the mission of the society's publications was to impart 'useful information to all classes of the community, particularly to such as are unable to avail themselves of experienced teachers, or may prefer learning by themselves'.[31]

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[28]Chalaby (1998), pp. 16-17

[29]A more lengthy comparison between the *Penny Cyclopaedia* with *Chambers Encyclopaedia* will appear in subsequent chapters. The *British Almanac* will also be touched upon in Chapter 3.

[30]Gray (2006)

[31]Gray (2006), p. 43. Gray quotes SDUK papers, *Prospectus*, p.1 after extensive research on the Archives of the SDUK, held at University College London. Unfortunately the archives of Charles Knight were destroyed in the London Blitz of 1941.

In contrast, the Scottish firm of W. & R. Chambers, founded in May 1832 by brothers William (1800-1883) and Robert (1802-1871) Chambers, was not a charity like the SDUK. The publications from the firm, however, did espouse similar educational aims. As stated in the introduction, over many decades, the W. & R. Chambers evolved from a small-time bookselling and hand-press printing business to become a major publisher with an international reputation, and operated as a family business until the 1980s. In the 1830s, it was very much a small family business focused on growth. Since the firm grew in the age of 'publicists' but functioned as a sustainable business, rather than as a charity, it had the advantage of economic resilience gained during early years, combined with vision and sense of purpose and clear message to convey. Most of the content they published reflected Victorian ideas of progress and self-improvement.[32]

Due to his prolific writing of books as well as articles, Robert Chambers has been characterised as a journalist. However, when reading through his works, especially many of his early articles, Robert seems to embody the values of a publicist, rather than a journalist.

> *Unlike journalists and their pretences to be objective, publicists are very combative. They also have few doubts on the rightfulness of their creed, and of its superiority over other doctrines.*[33]

Robert Chambers's writing, which began appearing in the 1830s, conveyed his opinions on subjects that personally interested him. Unlike journalists who wrote about particular stories that were current, Robert Chambers writing returned to certain topics that interested him personally, and provided him with a means of communicating the message of progress. For instance, it appears that because Robert Chambers admired new technology and believed that technology was a way to improve people's lives, he wrote many articles on science and technology topics. Note the enthusiam in the article 'Printing' from *Chambers's Information for the People*:

> *...with the introduction of the steam–presses, which we have now described, the profession of the printer has within these few years undergone a most extraordinary revolution; and although, perhaps, fewer hand–press–men are now employed than formerly, the increase of employment to compositors, engineers, bookbinders, book–sellers etcetera* [sic.] *must be very great. The principal advance of the profession has been since the year 1832, when the printing of cheap literary sheets rose into importance, and by a fortunate coincidence the patents of various machines having about the same time expired, a new impulse was given to the trade.*[34]

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[32]Chalaby (1998), p. 16-17
[33]Chalaby (1998), p. 16
[34]Chambers & Chambers (1842*a*), p. 637

The tone of the text shows delight in machines and how printing presses in general benefitted peoples lives – not only by enabling people to read cheap, edifying literature, but by leaving behind the older hand press, the printing industry could employ people in other areas of the trade that involved tasks with less drudgery than before. The introduction of steam presses meant fewer press men engaged in low-skilled, repetitive, and mentally unsatisfactory work, and this article concludes that this was an improvement to their work situation and quality of life.

Notions of 'progress', born out of the Industrial Revolution became a specific concept that encapsulated capitalism, separation of church and state, individual rights and universal education.[35] In contrast to 20th-century cultural relativism, progressivism was based on the belief that history was moving in a certain inevitable direction toward a specific goal. All life on Earth, including human societies, developed from a primitive state to a more sophisticated stage. Progress and progressivism enabled an optimistic world-view that allowed Victorians to identify their species, and their own capitalistic civilisations in the West, as the high point of universal development. Not only did these beliefs provide a structure in which to classify the natural world and human societies, it provided them with a moral mandate to judge (by their own standards) 'others' who were 'primitive'. People or things who did not measure up to their standards could be pushed aside or remade so as to make room for further progress.[36]

> *Man is capable of informing himself; the means of doing this are within his power. If he were truly informed, he would not weep over his follies and errors…each generation may improve upon its preceding one, and each individual, in every successive period of time, may better know the true path, from perceiving how other have gone before them. There can be no miracle in this. It will, at best, be a slow progress; and wisdom arrived at in one age must command the respect of the succeeding ones…*[37]

The excerpt above from 'The Private Duties of Life' was likely written by Robert Chambers; although he did not sign his name to this particular article in *Information for the People*, many unsigned articles were his, and he edited the issue. While the rest of the article states that not anyone can be born into favourable economic circumstances, clearly this writing expresses a deeply held belief that it was in anyone's power to improve his or her individual situation in life, especially if they were given tools to gain knowledge. Moreover, in his writing he conveys over and over again that taking the initiative to improve oneself is not just a right, it is an individual's duty.

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[35] Karnow (1989), p. 175
[36] Bowler (1989), p. 14
[37] Chambers & Chambers (1842*a*), p.106

While William Chambers was not as prolific a writer as his brother, he also displays many of the traits of a publicist. Another writer-publicist, Samuel Smiles (1812 – 1904), profiles William Chambers in a best selling book at the time, *Self-Help: with Illustrations of Character and Conduct* (1859), which presents 750 role models (less than 10 are women) who have improved their lives through seizing any opportunity to gain an education, by persevering during difficult circumstances such as poverty or family death, and by displayed determination to perfect any natural talents with which they may have been born. Above all, these role models avoid idleness and self-pity.

Like many other publicists, William Chambers was involved with local politics, and served as Lord Provost in Edinburgh from 1865-1869. In that capacity he was responsible for overseeing the restoration of St Giles Cathedral and for an ambitious programme of slum clearance and new buildings in Edinburgh's Old Town. In Peebles (the home town of the Chambers family), William was also known for establishing the Chambers Institute, which now functions as the main public library and museum and art gallery. Local history literature in the area refers to him as a leading Victorian philanthropist.[38]

Through papers like *Chambers's Edinburgh Journal*, as well as *Information for the People* and *Penny Magazine*, the working classes could access sophisticated literary and historical discussions on authors like Homer, Herodotus, Livy, Tacitus, Petrach, Boccaccio, Chaucer, and Defoe in serial form.[39] The Journal inspired reflection of the greater world by publishing first-hand accounts of travellers and expatriates, and provided practical ways for readers to navigate unfamiliar situations and can be seen as messages of optimism and encouragement.[40] Chambers stated that their publications contained non-professional information 'embracing those points of the several subjects which every intelligent man or woman may have occasion to think or speak about'.[41] The idea of progress will be expanded upon more fully in the next chapters analysing the transition of content in their encyclopaedias.

W. & R. Chambers's business philosophy was to produce affordable publications to improve people's lives though education and useful knowledge. When *Chambers's Edinburgh Journal*, which launched in 1832 as a 16-page weekly, double, crown 8vo[42] paper-size layout, it sold for one penny and included articles on history, religion, language, and science. Because of these subjects, it was exempt from the Newspaper Stamp Duty and held up as an alternative to radical and sensational literature. It offered interesting articles on practical subjects and it fit well in the cheap weekly newspaper market of the 19th century.

Based on the aims of Chambers and Knight, and the overall content of all their publica-

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[38] Peebles-Civic-Society (2015)
[39] Rose (2001), p. 187
[40] Hogg (1833), p. 86
[41] Findlater, A., ed (1868), p. i
[42] double crown 8vo = 76.2 x 50.8 cm

tions, some scholars have compared *Chambers's Edinburgh Journal* with *Penny Magazine*.[43] However, I would argue that a more apt comparison with *Penny Magazine* is *Information for the People*, which was formatted more like a magazine, although it also had elements of what would become serialised books, while the Journal's basic layout looked like it was attempting to emulate the daily newspaper rather than the magazine format. Another reason I don't think the Journal is a good comparison was because it was in press for over a century, from 1832 to 1956. It makes more sense to compare periodicals which chronologically spanned the same time-period. Furthermore, compared with *Penny Magazine*, the Journal was larger than average periodicals, presented more textual content, and did not have larger illustrations found in *Penny Magazine* or *Information for the People* during its early years. It was the distinctive and attractive layouts in both *Information for the People* and *Penny Magazine*, especially when compared to other penny press works, that made both Knight and Chambers publications appealing. As can be seen in Figure 2.2 *The Poor Man's Guardian* only used a wood cut illustration incorporated into its masthead.

The *Penny Magazine* contained useful articles explaining technology, history, and art. Bennett writes that among the most striking characteristics of the *Penny Magazine* was the ratio of illustrations to textual content. During the first two years of the issues he surveyed, he found that 10 % of the content comprised illustrations. During the next two years when Knight's system of production had more experience, the *Penny Magazine* was composed of 24 % illustrations. In the following 10 years, illustrations then made about 18% of the magazine's content.[44] Bennet writes that the illustrations were not embellishments, but well-composed and well executed drawings, 'sensibly integrated' with the 4 or 5 articles of each issue. Each article averaged about 2,000 words[45] within its eight-pages. The size of the early *Penny Magazine* was a double, foolscap 4to [46], the page area averaging 523.3 cm^2.[47]

The initial layout of *Information for the People*, published in the 1830s was divided into three columns, under the periodical's simple masthead,[48] and it was very text heavy compared with *Penny Magazine*. The total number of illustrations during its initial 48 issue print run was just over 100. Twenty-two of those issues did have large illustrations which took up one third or nearly half of the title page, and they were mostly of large maps, as well as a handful illustrations with scenes from foreign countries. For each issue, the articles

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[43] Gray (2006), p. 53 and Fyfe (2012), p. 24.

[44] Illustrations composed 18% of the *Penny Magazine* from 1835-1845, with the exception of the year 1840, according to Bennett's study. Bennett (1984), p. 129

[45] Bennett (1984), pp. 129-130

[46] foolscap 4to = 68.6 x 43.2 cm

[47] Only 25 percent of the average *Penny Magazine* page was not filled. The later *Penny Magazine* had a slightly smaller page area of 440.0 and left 29 percent unfilled. Bennett (1984), pp. 129-130

[48] The later editions of *Information for the People* were in two column layouts

and the text were dedicated to specific topics. In particular, eight issues, using small illustrations that fit neatly into each column, were used as a means of explaining scientific and engineering subjects, such as mechanics, steam engines, electricity, printing, and optics.[49] While fine art was discussed in *Information for the People*, it was scientific and geographic issues that were illustrated heavily when compared to Knight's *Penny Magazine*.

Throughout his long publishing career, Knight's work showed he valued illustrations as well as a love of knowledge. One could argue that he believed that illustrations were essential for conveying knowledge. A book of his published in 1853, entitled *Knowledge is Power*, written after his association with the SDUK had ended, contains 53 illustrations, some of them taking up more than half the page.[50] Of images, Knight wrote: 'we cannot be surrounded too much with the beautiful in art; in civic halls, and wherever men congregate together for public business, or meet for social purposes'.[51] Knight was eager to provide generous images to reach out to the 'artistically unsophisticated semi-literate public' and to offer previously unavailable access to beautiful artwork.[52] His publications had great impact because many illustrations he commissioned were from engravers William Harvey (1796–1866) and John Jackson (1801–1848), who were among the well-known former apprentices of Thomas Bewick (1753–1828). Bewick was known for popularising wood-engraving, and these wood engravers will be discussed in the next section of this chapter.

Knight could be characterised as being very bold. He took risks that no other commercial publisher was willing to take and overcame many obstacles erected by UK legislation as well as from the SDUK.[53] He accepted these challenges because he believed in the educational goals of the Society, and although when his association with the SDUK ended in disillusionment, both Knight and the Society maintained that the original SDUK goals of providing knowledge 'at the cheapest rate possible' was acheived, as well as the creation of a popular taste for art.[54]

Hetherington also fits into Chalaby's definition of a publicist, although one of a more radical flavour. Hetherington believed in improving the working conditions factory work-

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[49]The following figures were based on my studying a digitised version of *Information for the People* provided by the Hathi Trust. Accessed May 1[https://catalog.hathitrust.org/Record/100258793]. Issue 25 on 'Mechanics' contained 33 illustrations. Issue 28 on 'Steam Engine' contained 1 illustration. Issue 33 on 'Electricity' contained 8 illustrations. Issue 35 on 'Printing' contained 3 illustrations. Issue 39 on 'Hydrostatics and Hydraulics' contained 16 illustrations. Issue 41 on 'Pneumatics, acoustics and aeronautics' contained 20 illustrations. Issue 43 on 'Optics' contained 16 illustrations. Issue 47 on 'Architecture' contained 7 illustrations

[50]Knight (1859). Figures are based on counting illustrations in the digitized version of *Knowledge is Power*, by Charles Knight. Accessed May 1 [https://catalog.hathitrust.org/Record/011548470]

[51]Gray (2006), p. 157 and p. 175. Gray quotes from a speech given by Knight on 3 March 1848.

[52]Gray (2006), p. 157

[53]Gray (2006), p. 65

[54]Gray (2006), p. 67

ers and promoting experimental socialistic communities. Hetherington was influenced by the writings of Robert Owen (1771-1858), a textile manufacturer and social reformer, who owned mills in New Lanark, Scotland, and in both Manchester and London, England.[55] While Knight and the Chambers brothers laboured unobtrusively, avoiding the taxes on knowledge by carefully ensuring their publications did not contain recent events that could be classified as news, and were written in a manner that was not prone to cause controversy or catch the notice of government censors. Hetherington tested the boundaries of the UK government's enforcement[56] After hiring hundreds of paper sellers who openly flouted the stamp tax, Hetherington was imprisoned for six months between 1831-1832, in 1833, and for two months in 1836 because the paper openly criticised the government. During the periods when he was arrested, the issue of *Working Man's Guardian* was sold out.[57] However, he continued publishing because he believed that his pamphlets were instrumental in the political education of working class.[58] Clearly, while the publicists of this period had similar sounding philosophies and slogans, their papers reflected different aims. Knight and Chambers seemed to want to integrate the ambitious working classes into the current economic hierarchical system, using images to appeal to them and draw them into the larger world, Hetherington's advocacy called for a more dramatic system overhaul.

Some articles from Chambers indicate why their publications took a different direction from Hetherington in the years leading up to the 1850s, and why their publications focused more on practical information. The Chambers firm disliked promoting specific religious doctrine and blatant political rhetoric. The *Chambers Edinburgh Journal* also criticised the assumption the the poor should rely on the Church of Scotland or the 'Kirk', as well as other religious organisations. The Journal stated that poor relief should come from governmental bodies throughout Britain, and that it was the state's responsibility to provide public welfare and education.[59] Scholnick states that Chambers believed that some social practices in Scotland contrasted with the social practices of the English Tory elite, and that it made the Scottish people more resilient to adversity.

An article, from the Journal's first year, 'Popular Information on National Institutions:

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[55] Owen also travelled to the United States, where he set up a short-lived socialistic community. Owen advocated for eight-hour work days and for childcare and early education. Rees (1959). Online at: http://wbo.llgc.org.uk/en/s-OWEN-ROB-1771.html

[56] Publishers, editors and printers could face severe prosecution for producing the most radical of papers. The owners of these unstamped newspapers also risked having their presses and stocks seized or destroyed. It took certain types of people to fund and produce these types of papers–people who were less concerned with revenue and often had other motivations for publishing, which were just as important to them.

[57] Hollis (1970), pp. 116-117

[58] Hollis (1970), p. viii

[59] Scholnick (1999*a*), p. 325

Schools,' published on August 18, 1832 states:

> *It is now fully understood among inquiring minds, that in almost no civilized coun-*
> *try in Europe is education less generally diffused, or ignorance more prevalent, than*
> *in England. It has happened through the extreme carelessness of those to whose man-*
> *agement the country was committed . . . that the great mass of people, whether in*
> *trade or agriculture, are totally ignorant of the first rudiments of letters, and have*
> *not the smallest knowledge of the art of writing. I have often been astonished at the*
> *quietness of the intelligent newspaper and periodical press under this melancholy*
> *state of things.*[60]

In many of the Journal's early articles, there was a message from Chambers that in the emerging technical world, 'basic literacy was a necessary condition to escape poverty' [sic].[61] However, while the Chambers firm saw that there was potential for many readers, the market price of their publications had to be available at a low price to have the desired effect.

One final point to be made in this section is that many publications produced in the 19th century would not be be considered periodicals today. During the early years of the 19th century, 'serial' seems to have two different definitions–a periodical with miscella-neous content, such as newspapers and magazines; or 'books issued in slices'.[62] This created a grey area between book slices found in 'tracts', and journals, especially when it came to non-fiction works.[63] The first iteration of *Information for the People*, produced prior to the 1832 material presented here, provides an example of this. Scholnick found that much of the text printed in *Information for the People* were based on earlier articles appearing in pamphlet or tract format that sold well. The information, especially on emigration, was updated and then reused.[64] It is probably not surprising that many others besides myself might not fully classify it as part of the periodical press, although it was issued as part of a serial. Other publications by Chambers, especially non-fiction ones like encyclopaedias, could even be considered as one book issued in parts.

Part-issue books were normally distributed in 20 parts, with parts 19 and 20 issued as one number.[65] In practice, there is a lot of overlap between both types of serials, and often publishers, especially in the early years, including Knight, Chambers, and publishers less brazen than Hetherington were were intentionally confusing to avoid paying taxes on

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[60]Scholnick (1999*a*), p. 339 quotes 1832 article.

[61]Scholnick (1999*b*), p. 13

[62] Rota (1998), p. 183

[63]The grey area is that works could be both a 'periodical with miscellaneous content' and a book issued in slices

[64]Scholnick (1999*b*)

[65]Law & Patten (2009), p. 148

knowledge. There was a clear market for serials, and booksellers liked to carry them because of the great possibility that repeat customers who came for one item, would impulse buy their other wares once in their shops. Customers also liked the formats because it offered expensive publications on an instalment plan.[66] It has been previously mentioned that the weekly periodical market created after 1836 outcompeted most of the unstamped press. Both Knight and Chambers used the serial format to their advantage in imparting information to the working classes, by relying on the strategy of printing on economies of scale. *Information for the People* began selling 18,000 issues on average when it was first published in the 1830s, however, the bound second edition in 1842 sold close to 45,000 copies.[67]

2.4   The appeal of beautiful, cheap images

Illustrations in 19th-century publications in the West were generally produced by one of three methods of printing — intaglio, planographic and relief. In the second half of the 1800s, relief methods such as woodcuts or wood-engravings, and their derivatives had the great advantage over other methods, because relief-method images could easily be printed together with metal type, meaning that images and text could be integrated on the page. With intaglio methods this was not possible without engraving the entire text, which was not really feasible. In planographic printing a print taken from the metal type could be transferred to the stone using transfer paper, but this was a much slower and more expensive process.[68] For intaglio and planographic methods, the images created would usually be printed on a separate sheet of paper and later bound with the rest of the book or periodical. Using separate paper and printing processes often meant extra time and cost of labour, so publishers like Knight and Chambers, who desired publications with images, but wanted to keep costs down, found an integrated relief system to be a good option.[69]

Schrock writes that 'Modified during the nineteenth century, wood-engraving proved economical and efficient enough to meet the needs of book and magazine publications and

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[66]Rota (1998), p. 184

[67]Fyfe (2012), p. 69

[68]In the intaglio method, the image to be printed is incised or etched into the metal surface, which is then filled with ink. The ink is transferred on to paper with a tremendous amount of pressure from the printing press. Examples of intaglio are steel engraving and copper etching. Gaskell (1972), p.156. The planographic method is a chemical process relies on the principle that oil and water don't mix. For this process, a drawing could be made with a greasy crayon on either a stone or metal plate with different grades of abrasive surface. Gaskell (1972), p. 267. The surface of the stone was then treated with an acid and gum Arabic mixture, allowing the ink to go into the pores of the stone. After the stone has been wet, ink is then applied to the wet surface, where the stone's drawing lines attract the ink but repel the water. Examples of planographic methods of printing are lithography and chromolithography.

[69]Lithography was used for inserted advertisements in American periodicals, as they were a cheap method of printing that would need to be printed separately and provided by advertisers. See Reed (1997), p. 19
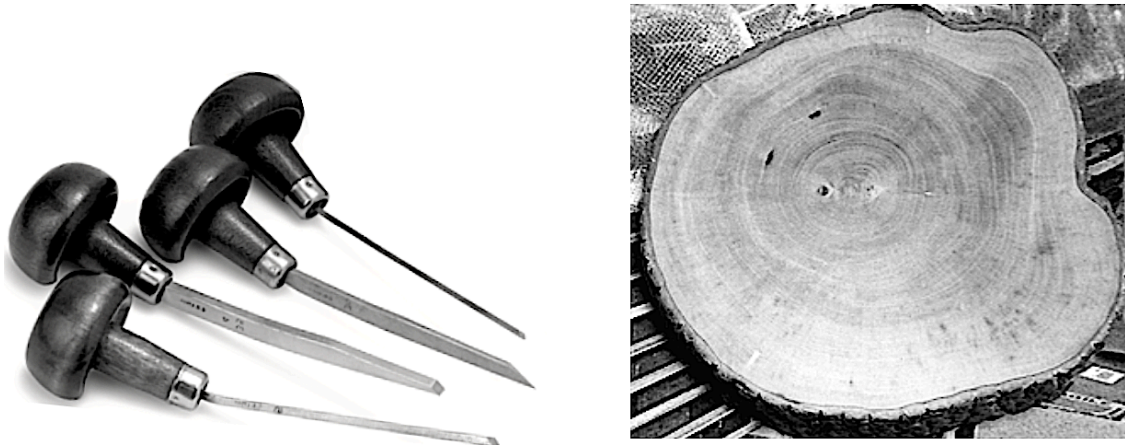
Figure 2.3: Burins used for incising wood blocks and cross-section of box wood. Items held by Chris Daunt, Gateshead.

paved the way for modern book production'.[70]

Wood-engraving can refer to the process of engraving in the wood block using a burin or graver, the resulting engraved block, and the prints taken from it. In wood-engraving, images are carved into the end grain block of a piece of wood, usually boxwood because of its hard and durable surface. See Figure 2.3 for a sample of tools and a photograph of the end grain portion of the trunk, prior to it being cut and carved. The portion of the wood that is carved away remains un-inked, while the portion that remains is inked and prints the image. Wood-engraving was used in 18th century, along with another relief method called 'wood cutting.' However, unlike wood cuts, which could be crude, images from wood-engraving showed fine, precise and skilled work because of the tools used. The end grain of hard wood also provided a better medium for cutting fine lines for shading or outline.[71] In contrast, the wood cutting method used the plank or side of a tree, rather than the end grain, and the traditional tools for woodcuts tend to be knives. Therefore images made from wood cuts, rather than wood-engravings, tended to be less refined and detailed. See Figure 2.4. Thomas Bewick (1753-1828), who was originally trained as a copper engraver, popularised wood-engraving in the early 19th century. Many of the burins he used were based on his work engraving metal.

Two of Thomas Bewick's books, *A General History of Quadrupeds* and *British Birds*, depicted animals with fine details that highlighted the sharp and narrow lines of fur or feathers and made illustrations through this relief process popular. Bewick was influential because of his techniques, and because well-known former pupils such as William Harvey

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[70]Schrock, N.C. ed (1976), p. 1
[71]Beedham (1948), p. 14
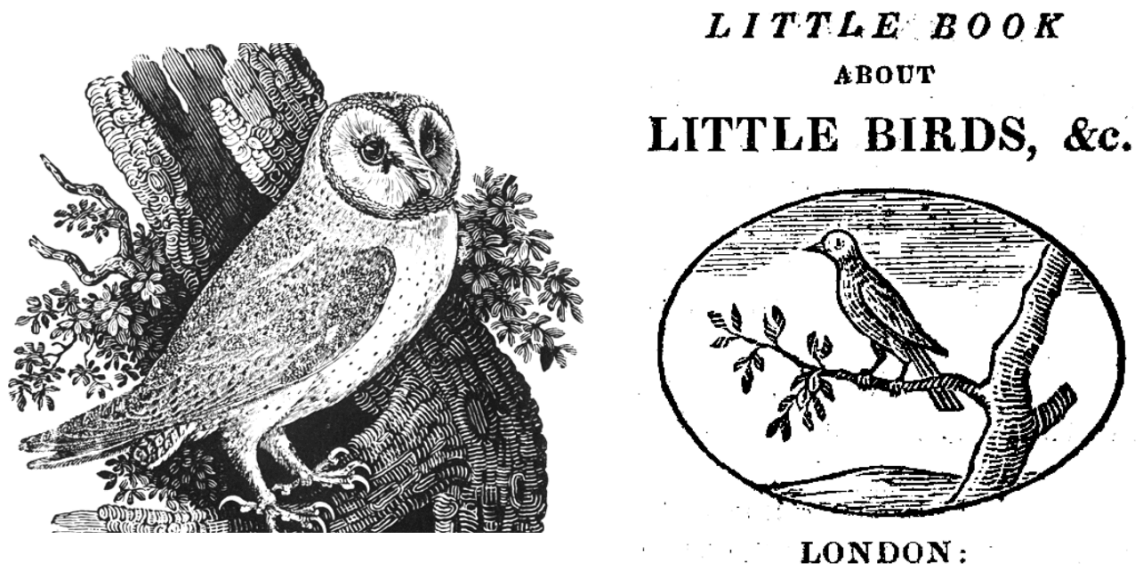
Figure 2.4: Difference in illustration quality. On left: Print of wood-engraving by Thomas Bewick 'Yellow owl' from *A History of British Birds*, 1843 edition. On right: Detail of print of wood cut title page in *A Little Book About Birds*, 1826

(1796-1866), John Jackson (1801-1848), and Ebenezer Landells (1808-1860) spread his methods from Newcastle to London, Paris, Berlin and North America. One of the key areas of illustrative advancement in the 19th century was the adoption of wood-engraving in the publishing process. Wood-engraving succeeded copper plates in the first decade of the nineteenth century for the vast majority of cheap publications.[72] Through Bewick's works and the work of his apprentices, wood-engraving became a dominant method of print making in the 19th century, particularly given the appeal to many viewers of the romantic styles and very detailed interpretations of animals and scenes favoured by engravers of the period.[73]

2.5   The Rise of Wood Engravers and wood-engraving firms

When it came to the rise of the illustrated press, Brake and Demoor point out there were two separate rhetorical arguments in favour of and in opposition to illustration for the masses. One camp connected illustration to high culture and fine art prints. Publicists and advocates for use of illustration argued that cheap prints were being exported to the working classes in the name of their health, education and for the sake of altruism. In the camp opposed to use of illustration for mass markets, critics argued that illustration was frivolous, ornamental and anti-intellectual, because the pictures sought to appeal to the

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[72]Gaskell (1972), p. 266
[73]Uglow (2006), p. 400

emotions of readers, rather than to their rational nature. [74] Nevertheless, as this section will show, illustrations were big business and wood engravers influenced the establishment of the illustrated press in the mid-century both in Britain and in the United States.

Wood engraver and artist, Ebenezer Landells was instrumental in the founding of *Punch* magazine (1841-1992) and the *Illustrated London News* (ILN). Born in Newcastle, Landells was a former apprentice to both Thomas Bewick and Isaac Nicholson (1789-1848).[75] Landells moved to London in 1829, setting up his own wood-engraving business not long after he arrived. While Landells was not long associated with *Punch* because business difficulties forced him to sell his one-third share in the magazine, and his role as chief wood engraver was given to Joseph Swain (1820-1909), his career as ILN's first artist correspondent, lasted decades–from his first sketch of Queen Victoria visiting Scotland, until his death in 1860.

Landells also was involved in the establishment of other illustrated periodicals between 1830 and 1850.[76] He served as a mentor and professional mediator for the Dalziel Brothers, who obtained commissions to make woodblocks for both *Punch* and the ILN, through him, and for Charles Knight publications through their mutual association with William Harvey.[77] The Dalziel family was originally from Northumberland, but the eldest brother and founder of the firm, George Dalziel (1815-1902) was trained in London. Dalziel also did work for the Chambers firm which is discussed in Chapter 5.

Maidment notes that there were two schools of wood engravers illustrating for ILN, *Punch*, and several of Landells' other papers like the *Illuminated Magazine*, that had learned their trade through the wood-engraving apprentice system. The first one was Newcastle-based and associated with Bewick; the other one was from the 'London School', and based on the black-line wood-engraving tradition from John Thurston (1774-1822) and Allen Robert Branston (1778-1827). Like Bewick, both Thurston and Branston originally trained as copper plate engravers, then shifted their businesses to wood-engraving. William James Linton (1812-1897) who became quite well-known during this period for political activism as well as engraving skills, was trained by pupils of Branston in the London School.[78] Linton, Landells, and the Dalziel Brothers, writes Maidment, 'formed a direct line of decent from the first generation of masters of the trade'. The borrowing of

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[74]Brake & Demoor (2009), p. 5

[75]Nicholson was also Bewick's former apprentice. Maidment cites different sources disputing how long Landells was taught by Bewick. Maidment (2009), p. 28.

[76]Maidment (2009), pp. 17-31

[77]Dalziel & Dalziel (1901), p. 22

[78]Linton was trained by George Wilmot Bonnoer (n.d.) student of Robert Branston (1778–1827). Bonnoer was also a nephew of Robert Branston's father. Linton trained as a journeyman with William Henry Powis (1808–1836), John Thompson (1785 –1866), and John Orrin Smith (1799–1843). Smith became his business partner and together they produced work for the ILN, before Smith's death.

Figure 2.5: Influence of 18th century artistic sensibilities in page layouts from *Illuminated Magazine*, 1843 and *Chambers's Miscellany of Useful and Entertaining Tracts*, 1845. Images not to scale.

older 18th century motifs inspired by copper plate engravings combined with new urban aesthetics on the medium of boxwood 'created new visuals for an emerging printing industry.'[79] Maidment points out that Linton, Landells and Harvey, unabashedly borrowed from different older genres, and by the 1840s, numerous periodical titles had an illustration interconnectedness.[80] This is true not just for periodicals produced in London, but elsewhere, also.

Many periodical mast heads and illustrations within mid-century periodical texts are direct translations of 18th-century copper engraved motifs. Or, they are based on decorative tail-pieces and end-pieces that 18th-century book conventions used to begin and end chapters. Figure 2.5 demonstrates this with the layout and visual details from *Illuminated*

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[79]Maidment (2009), p. 28
[80]Maidment (2009), p. 32

Magazine and *Chambers's Miscellany of Useful and Entertaining Tracts*.[81][82] Notice that on the left side of Figure 2.5 there is a small illustration at the end of the article's two-column block of text, that appears like a tail piece common in many late 18th-century novels. Also, judging by their tricorne hats and the ruffle collars peeking out of close-fitting, long-waisted coats, the males in the illustration from *Illuminated Magazine* seem to inhabit a scene set in the 18th century. Likewise, on the right side of Figure 2.5, a block of text is followed by a tail piece illustration in a similar page layout with two notable differences. First, the issue of Chambers Miscellany uses a single-column block of text; second, the Chambers illustration attires its men in 19th-century clothing—one man in a bowler, one in a top hat, and both men wearing long trousers. Despite these differences, both images have a similar visual style — that is the illustrations provide some background details before the vignette fades into a white background. The Chambers illustration shows one sober man, in a top hat, helping a drunken man home, while the article, 'The Temperance Movement' communicates how becoming drunk is a vice that distracts people from being productive in life. This overall message is consistent with Chambers's self-improvement philosophy and their other publications.

Figure 2.6, shows a print and large woodblock designed in Edinburgh. It is the cover of a part-issue serial from the Chambers firm and the woodblock used to print it. This cover illustration is from the first edition of *Chambers's Encyclopaedia*, sold in parts starting in 1859, which allowed subscribers to buy weekly parts, divided into 520 instalments at a penny and a half each. The green paper cover was an inexpensive and attractive way to bind and protect each part for sale and distribution. On the inside cover were advertisements of other Chambers's publications or sponsored ads from local businesses.

What is most noticeable on this cover are the elaborate images. Near the top of the page is the head of a Roman soldier, and on both sides, under him are eight rondelles affixed to columns inspired by classic architecture that frame the entire title, *'Chambers's Encyclopeadia: A Dictionary of Universal Knowledge for the People.'* Decorative foliage and banners highlighting subjects contained within the work seem to be borrowed from a combination of Renaissance and Baroque ornamentation. These were typical design motifs, common to other periodicals, not just Chambers, and can be seen in many serials and periodicals in the mid-century.

Other visual influences from continental Europe can be seen in Figure 2.7 which shows the front page of *Punch* magazine, volume 3. The illustration includes motifs common in 18th-century metal engraving, such as grapes and putti, although they are in more cartoon-ish in form. The name 'Punch' comes from the Italian puppet show, 'Punch and Judy', first

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[81]*Illuminated Magazine*, 1843. 'Beaus of England' from Volume 1, p. 6
[82]'The Temperance Movement', Chambers & Chambers (1845), p. 32
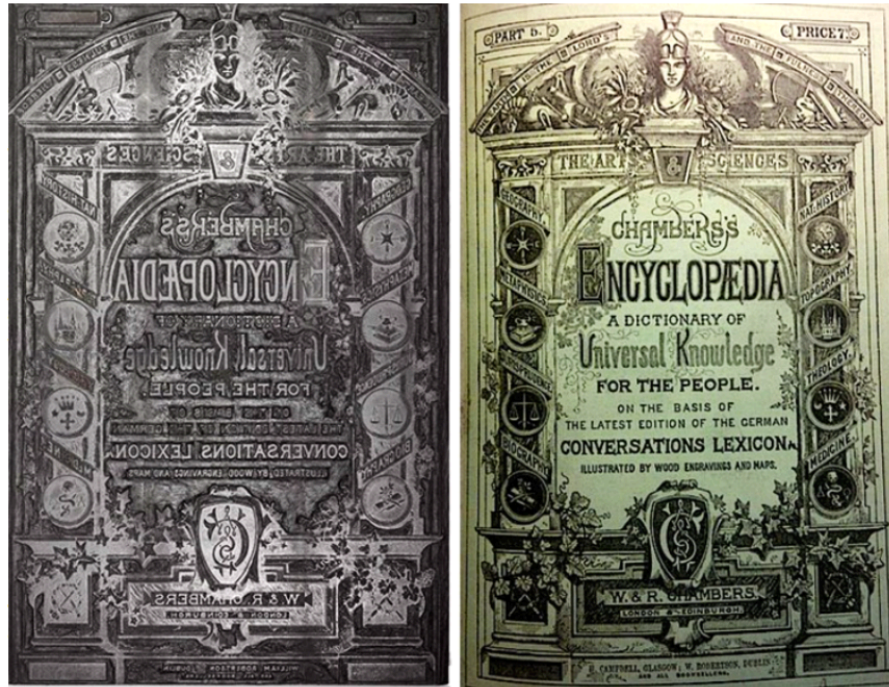
Figure 2.6: Woodblock (T.2011.56.240, left) and print (Wq1/6960, right) of monthly serial issue cover of *Chambers's Encyclopaedia*. Woodblock from W. & R. The National Museums Collections Centre, Edinburgh. Photograph of cover print from *Chambers's Encyclopaedia*, British Library, London.

appearing in England in 1662 and known for its topical humour.[83] The main *Punch* figure is reminiscent of 18th-century caricature. Caricature as an art form was perfected by the British visual satirists William Hogarth (1697-1784) and James Gillray (1756-1815).[84] Hogarth engraved many of his own paintings on copper to create prints for wider distribution, and *Punch's* visual content gives a nod to this tradition. Furthermore, the subtitle 'The London Charivari' makes clear the influence of the French satirical humour magazine *Le Charivari*.

Inspired by *Le Charivari's* use of political satire and wood-engravings, Landells, and later Swain, provided the characterising visual features of *Punch*, known not just for illustrations but also for its well-written and witty content.[85] Subjects depicted in *Punch's* illustrations were immediately recognised by 19th-century audiences. They included illustrations of real people such as Queen Victoria and Charles Darwin, as well as cartoons which were symbolic representations or metaphors for people, topics, or current events.

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[83]When visiting London, one can view the blue plaque historical marker in Covent Garden marking the spot where Samuel Pepys observed the puppet show.

[84]Rowson (2015)

[85]Young (2007), p.17

Figure 2.7: *Punch, or the London Charivari*,Volume 3 Cover. 'E. Landelles', signature can be seen at the bottom right.

Figure 2.8, for example, features a cartoon that explicitly satirises W. & R. Chambers's *Information for the People* as well as Charles Knight, Samuel Smiles and other aforementioned publicists with their educational pamphlets. The text in the article below it pokes fun of the patronising tone of publications produced by the SDUK and other like-minded charities.[86]

The business strategy for this publication was successful, and two years after it launched in 1841, *Punch* was a top selling publication. By 1844, *Punch* sold almost 23,000 copies, and by 1846 these numbers more than doubled.[87] Making an appearance as the subject of

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[86]The term, 'cartoon', was first coined by *Punch*. However, unlike 18th century examples of political or social caricatures from Gilray or Hogarth, the caricature illustrations and cartoons found in *Punch*, were never as crude, although their sensibility did change over time. In its early years, it had a more 'radical' bent, but over the years became more conservative in tone in order to appeal to the middle and upper middle classes.Altick (1997), p. xix. Much satire that *Punch* included was characterised as 'establishment' and 'gentle,' Young (2007), p. 28 while at the same time, it visually reflected the political and social topics of mainstream British papers.

[87]Altick (1997), p. 38

PUNCH'S INFORMATION FOR THE PEOPLE.—NO. 2.

THE THERMOMETER.

General Description.—The thermometer is an instrument for showing the *temperature ;* for by it we can either see how fast a man's blood boils when he is in a passion, or, according as the seasons have occurred this year, how cold it is in summer, and how hot in winter. It is mostly cased in tin, all the brass being used up by certain lecturers, who are faced with the latter metal. It has

Figure 2.8: *Punch*, satires *Information for the People*, and publishers selling middle-class 'improvement' literature.

a *Punch* cartoon, indicates that Chambers was a well-known publisher and known to the general population.

In the days of Bewick, Thurston, and Branston, master engravers drew and engraved their own work. By the mid-1800s, wood engravers became experts at 'translating' the work of artists or advising them on how to best draw for the new medium. Joseph Swain provides a good example of tasks engravers dealt with if they worked for their own firm, were directly employed by a specific publisher, or as in the case of Swain, directly contracted by *Punch*, though set up in his own business.[88] Many prints that appeared in *Punch*, *Cornhill*, and *Once A Week*, for example, show Swain's signature along with artists such as John Leech (1817-1864), Charles Samuel Keene (1823-1891), George du Maurier (1834-1896), and John Tenniel (1820-1914). The work of wood engravers in collaboration with

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[88]De Freitas (1986), p. 286

artists aimed to create images that were both sophisticated and simple at the same time.[89] Stevens suggests that the appropriate metaphor for wood engravers of the mid-19th century is that of a modern-day ghost writer. Professional wood engravers 'did not cut the line, but rather everything around it'. Stevens states that style and talent are present, but in a peculiar double-voiced way. [90] Joseph Swain, himself, writes that the highest compliment paid to him was made by artist-illustrator Frederick Eltze (active 1864-1870). Eltze asked him, 'How is it you are able to preserve the character of each artist's drawing in the way you do? When I look over my engravings I can generally tell who the engraver is, but when I look at your work I can see at once who the artist is'.[91] It seems that the trade of the wood engraver was not only adaptable to new avenues of employment as the business of periodicals expanded, but also an evolving set of skills. 'Wood engravers [sic] looked at lines, shapes, textures and tones for their own sake, considering how to re-create them in wood, in print,' writes Stevens.[92]

The skill set described by Swain, and explained by Stevens, was often difficult for people who read periodicals and looked at periodical illustrations at the time to appreciate. Prints produced by wood-engravings were made to capture illustrations or works of art that had been transcribed onto wood. However, once the wood-engraving print had been made, Adamson finds that that what was admired was the work of the original illustrator or artist, rather than the skill involved in transmitting that work via a wood-engraving– unless of course, the person was both illustrator/artist and engraver. Adamson calls this 'indexicality', that is, when the process of creation hides the creative skills used to make it. Adamson writes 'the more skilled an artisan, the more likely their skill will be taken as "merely" mechanical', and overlooked.[93] When photography was combined with wood-engraving, which started in the later-half of the century, Adamson states a 'double index' was created, because the skill of the photographer and the skill of the engraver translating the work were both hidden. This double index would prove to be problematic for aspiring wood engravers hoping to follow in the footsteps of Swain, Landells, and Linton.

The age of the wood engraver would not be complete without noting the influence of British wood engravers who worked and trained in England, then emigrated to the United States. This shows that not only was the content of British printed material exported to the United States, but also a taste for British visual styles. Two examples presented in this thesis are mentioned in the second edition of *Chambers's Encyclopaedia*, Volume 6. Frank

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[89]Maidment (2009), p. 29

[90]Stevans (2017), p. 6

[91]Quote from De Freitas (1986), p. 286. Limited information could be found on Eltze. Although Swain wrote about him in Macleod (1889), I have found no birth or death dates associated with him, only that he was from originally Germany.

[92]Stevans (2017), p. 28

[93]Adamson (2013), pp. 151-152

Leslie (1821-1880), who will be discussed here, and William James Linton (1812–1897), who'll be mentioned further in Chapter 5. The first example's entry reads:

> *Leslie, FRANK, publisher, was born at Ipswich in 1821, his proper name being Henry Carter, and at seventeen was placed in a mercantile house in London. 'Frank Leslie' was the name he adopted in sending in sketches to the* Illustrated London News, *and the success of these determined him to join the staff of that paper...*[94]

Thus we are introduced to Carter, who was induced to give up his father's dry goods business, gained employment at the *Illustrated London News*, and by the age of 20 became superintendent of the engraving department. During his six-year tenure at ILN, he studied the various branches of the publication business, and became an expert in the operation of 'overlaying' wood-engravings — the system of regulating light and shade effects.[95] While at the ILN, Leslie also absorbed 'a strong sense of self-importance about pictorial journalism as an archive of contemporary culture and a conveyor of news'[96] and he brought this sensibility with him when he arrived in New York in 1848. Leslie set up a very successful wood-engraving business, among his first clients were circus showman, P.T. Barnum (1810-1891) and the Boston-based periodical, *Gleason's Pictorial*. Nothing was comparable to his work in America at the time.[97]

In the 1850s, Leslie began publishing the first of his illustrated journalistic ventures, some weekly, some monthly and some annually. *Frank Leslie's Illustrated Newspaper* (1855-1922), later renamed *Leslie's Weekly,* was the most well-known and longest running of his periodicals, although many of his other titles flourished for decades, partially because he had created one of the largest establishments for producing wood-engraving in the United States. [98] Leslie introduced the overlaying system he learned at ILN to the United States. Many of his weekly papers were a large quarto in size (24.2 x 30.5 cm), consisting of 16 pages per issue, which combined between 16 to 32 illustrations with text containing literature, war stories, political commentary, arts, science, and travel narratives. Leslie maintained a well-paid staff of correspondents and sent them around the world to make reports and send back pictures[99] The mastheads for many of his American periodicals share visual similarities with the ILN's masthead. See Figure 2.9.

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[94] *Chambers's Encyclopaedia*, Volume 6, p. 589, Patrick, D., ed (1890*a*)

[95] Huntzicker (1989), p. 209

[96] Huntzicker (1989), p. 210

[97] Brown (2002), p. 8

[98] Frank Leslie is a colourful character in the history of printing. Some of his publication businesses failed because while they *were* thriving, he went on extended trips for social reasons, leaving the country sometimes for over a year. Upon his death, his second wife, Miriam Follin Leslie, legally changed her name to 'Frank Leslie' in order to run his publishing empire. See Brown (2002) and Stern (1951).

[99] Huntzicker (1989), p. 213

Figure 2.9: Masthead for *Illustrated London News* or ILN (top) compared with masthead for *Frank Leslie's Illustrated Newspaper* (bottom).

Many of the illustrations printed in his papers, especially *Leslie's Weekly*, were very large, some taking up the entire page.[100] As with ILN, *Punch* and later, *The Graphic*, illustrations were drawn in reverse on the back side of a woodblock. As Box and other wood that is used for wood-engraving has a narrow trunk size, smaller woodblocks were joined to allow a larger printing surface. Many large-front page images, illustrating headlines and main stories, were drawn across several joined wood blocks. When speed was important for the process, a master engraver would then engrave across the joins. Next, the blocks would be separated and each block would be given to a different person, who was then responsible for engraving details on their piece for the larger image. When each engraver finished his or her segment, the blocks would then be united and rejoined, sometimes with glue and sometimes with bolts, depending on the size of the overall image and the number of copies in the print run.[101] Some of Leslie's front page illustrations could contain as many as 32 blocks, that were joined by this method of bolts.[102] A smaller example of

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[100]Brown (2002), p. 39
[101]Brown (2002), p. 237
[102]Huntzicker (1989), p. 213
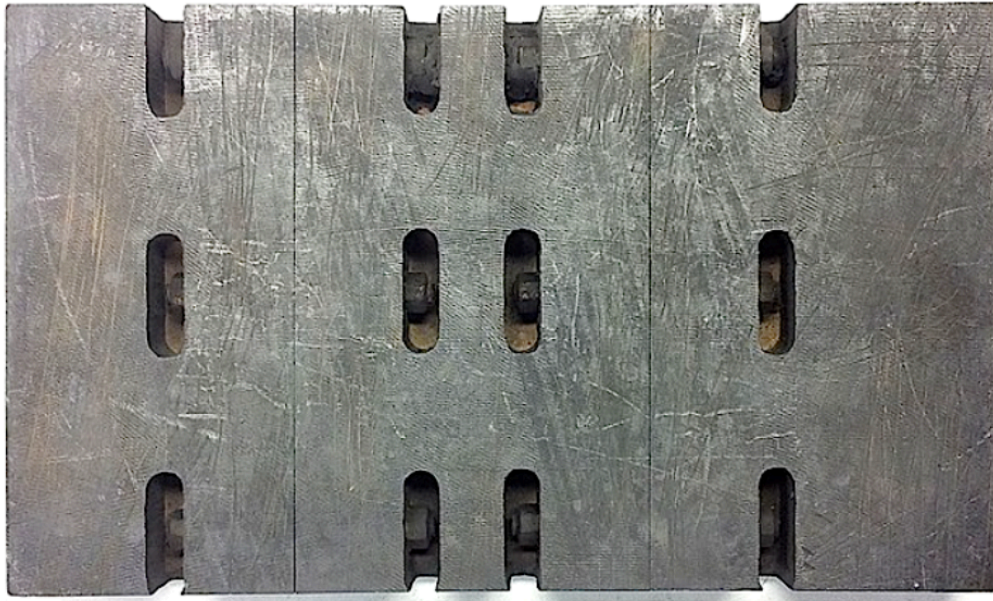
Figure 2.10: Underside of woodblocks joined by bolts from the W. & R Chambers collection (T.2011.56), at National Museums Collection Centre, Edinburgh. Photo by Rob Banham.

bolted blocks, used for Chambers's publications can be seen in Figure 2.10.[103] While this example was not used to publish a large circulating periodical, it shows that printing techniques innovated by newspapers and periodical press would be copied by other printers and publishers. (Chapter 5 discusses production and use of woodblocks directly related to *Chambers's Encyclopaedia*.)

2.6   Wood-engraving develops into a 'factory system'

Under Bewick in Newcastle and Branston and Thurston in London, the wood-engraving trade had been run like a business since the mid-1750s. However, under their pupils, 'the scale of their ventures and the extent of their reponsibilities' dramatically expanded by the mid 1840s.[104] Men like Landells, Swain, and the Dalziel brothers adapted to changes and opportunities occasioned by such a mushrooming pictorial press and the advance of cheap publishing in the early to mid-Victorian period. Their knowledge and position within the production process allowed them to be identified as the best placed to fill the increasingly

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[103]Based on evidence from the Chambers's collection at the National Museums Scotland, and the archival evidence at the National Library of Scotland, the Chambers firm had no reason to join more than five of their own blocks for any of their publications.

[104]De Freitas (1986), p. 306

professional positions of art director and supervisor to publishers, thereby extending their influence.[105]

> *For three or four decades from the 1830s wood-engraving was an occupation that enabled men of ambition to move with relative ease through the stages of apprentice or improver to journeyman and on to becoming an independent master. Commercial engraving on wood was an occupation... where the ethos of self-help could mean some-thing in practice...to the ambitious man.*[106]

As the previous section has shown, the wholesale adoption of wood-engraving in the early decades of the 19th century made it an integral part of print production. Wood-engraving was considered a respectable, stable profession for visual artists to flourish within. The price of illustrations was high and a good living could be made from it, so many parents, paid for their sons to be apprentices for 7 years, learning the methods of Thomas Bewick and his former pupils. After their apprenticeship was completed, the young adults served as for several years as journeymen, with the expectation of eventually achieving master engraver status themselves. As Lindley has noted, such positions were highly sought after for their class distinction: 'Master engravers occupied a place in society above humbler compositors, machine minders, and journeymen of the printing trade' [107]

Prominent engravers could potentially retire to comfortable homes after a long life in the business settling into neighbourhoods populated by writers and artists. Master engraver Edmund Evans (1826-1905), for instance, who specialised in colour printing, was able to retire to an extensive house in the Surrey countryside.[108] When he passed away, Evans left over £10,000 to members of his family, and this fortune was from engraving.[109]

However, there was a contrast between early wood-engraving pioneers such as Bewick and his students, and the wood engravers of the generation following them. While the students of the wood-engraving masters established businesses and influenced the direction of print as a visual media, Chalaby notes that dependency on the open market for survival forced newspaper and press proprietors to be fiercely competitive, ruthlessly cost-efficient, business minded, and focused on creating a circulation that generated surplus income to invest in further production.

While the former worked in press contexts that were fairly straightforward in terms of output, the wood engravers later in the century faced a different atmosphere, in the era of market diversification and fragmentation, where work produced had to straddle deadlines

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[105]De Freitas (1986), p. 303
[106]De Freitas (1986), p. 301
[107]Lindley (1970), p. 7
[108]De Freitas (1986), p. 299
[109]De Freitas (1986)

and cultural demands made by increasingly energetic and time conscious journalists and newspaper mangers who were now replacing publicists.

Chalaby states that 1855 is a watershed year for journalism, when the last taxes on knowledge were repealed. Even for newspapers that had operated since the 1700s, the way they did business changed. For example, *The Glasgow Herald* was able to become the first national daily paper based in Scotland, after the repeal of taxes.[110]

Another paper, *The Scotsman* started in 1817, reinvented itself and notes 1855 as key time for the Edinburgh-based paper. As Albert Morris writes:

> *The abolition of advertisement duty in 1853 and the repeal of the newspaper stamp duty in 1855 spectacularly boosted advertisements and sales of daily newspapers. On the first stamp-duty-free day, The Daily Scotsman (priced at 1 penny) was launched with front-page advertisements and a daily circulation of 6,000 copies.*[111]

After the 1860s, the character of the press greatly changed. Economic profit became the main motivation for owning a newspaper or a periodical, and capitalist ethos began to prevail across the British news industry. The 'news value of an event was not defined by its intrinsic significance but by presumed interest to readership'.[112] This awareness by journalists of market appeal is reflected in the enormous circulation growth of daily papers. Chalaby writes that journalists in the second half of the 19th century looked to make profits, while those publicists who had established papers earlier were motivated by a personal commitment that enabled democracy to flourish, because the majority wrote passionately about issues that directly affected them.[113]

> *The repeal of the taxes between 1855 and 1861 changed all this and opened up the possibility of selling newspapers for one penny, and a few decades later, for a half-penny. This price, affordable for more people, greatly enlarged the market of newspaper readers. From that time on, newspaper owners and journalists have competed for shares in this market. Through diverse mechanisms, these competitive struggles have created the journalistic field.*[114]

In other words, after the 1840s 'this situation had changed for those' working for illustrated newspapers and magazines with uncompromising publication dates allowing no delays.[115] The mid century underwent technology shifts, workflow changes, and changes

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[110]Terry (2011), Chapter 2. First established in 1783 as a weekly, it operates today as *The Herald*, and is one of the longest running papers in the world. Reid (2006).

[111]Morris (2015)

[112]Chalaby (1998), p. 84

[113]Chalaby (1998), p. 81

[114]Chalaby (1998), p. 32

[115]De Freitas (1986), p. 252

Figure 2.11: Pictorial syntaxes are marks used to represent objects or scenes in a two-dimensional space. 'Apollo Belvedere' presented in different wood-engraved pictorial syntaxes from Charles Knight (1832, left) and Chambers publications (1860, middle and 1888, right). Images are not to scale.

in the economy for printing.[116] The meaning behind these changes is indicative of an evolution in the 19th century printing environment and encompassed the following. First, while the wood engravers in the first half of the century looked to the 18th century for inspiration, the technology of photography, and the aesthetics of photographic images was gaining popularity. Therefore, illustration styles, show a move away from 'interpretive' or 'pictorial' style toward more frequent use of 'facsimile' style. These styles will be expanded upon below and in Chapter 4. Second, in order for wood engravers to deliver their illustrations by specific publication deadlines and cope with new pressures of time, apprentice training and production workflow needed to be enhanced.

2.6.1   Illustration styles, pictorial syntax, and specialisation

There were two general types of illustration practices in the nineteenth century, labeled as 'facsimile' and 'interpretive'[117] or 'pictorial.'[118] As stated in the introduction, I will use the term 'pictorial' here, because I believe that there was a fair amount of interpretation that needed to be done in 'facsimile' style illustration as well. Both styles were taught in the engraving practices set up by Thomas Bewick and his acolytes. To be a master wood engraver in the mid-century required knowing both facsimile and pictorial styles. Mastering the pictorial style, meant learning to proficiently create different pictorial syntaxes. A pictorial syntax is a set of marks used by artists, draughtsman, or print makers to create a

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[116]Gaskell (1972), p. 267
[117]Beegan (2008), p. 186
[118]Beegan (2008)

Figure 2.12: Details of illustrations depicting ladies at parties in *Punch* from left to right: 1851, 1871, and 1891.

three-dimensional representation of an object or scene in on a two dimensional space. For instance, Figure 2.11 shows three different pictorial syntaxes are being utilized to depict the same object, *Apollo Belvedre*, a well-known statue housed in the Vatican. The examples of *Apollo Belvedre*, from left to right in Figure 2.11 are taken from the cover illustration of *Penny Magazine*, December 15, 1832; from an entry in *Chambers's Encyclopaedia*, first edition, 1860, Vol 1, page 315; and from the entry in *Chambers's Encyclopaedia*, second edition, 1888, Vol 1, page 336. Although viewers can see it is the same object, visually each representation is markedly different from each other.

Changes in pictorial syntax will be explored further in Chapters 4 and 5, but it will suffice to say for now that around the 1850s and 1860s photography began influencing many illustration styles, which can be seen by examples from the periodical press when looking at complete print runs of *Leslie's Weekly*, the ILN or *Punch*. See Figure 2.12 depicting the following cartoons: 'Awful Occurrence at an evening Party', 1851[119], 'Served out for staying home', 1871[120], and 'Feline Amenities', 1891[121] Illustrations of social events such as parties were common in *Punch*. What can be seen here is not just the changing style of fashion, but the way the women are being depicted. As the decades progress, the illustration style is becoming more and more photographic, which is best observed in the shading effects on the women's faces and the drapery of their gowns.

The changes in style of illustration are also a visual manifestation of wood-engraving

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[119] *Punch Magazine* (1851). Volume 21, p. 35
[120] *Punch Magazine* (1871). December 23, 1871, p. 262
[121] *Punch Magazine* (1891), June 20 1891. Volume 21, p. 35

work practices that were evolving behind-the-scenes. As mentioned previously, apprentices of the wood-engraving trade until the 1840s learned to draw on wood themselves, as a way to further exercise image translation skills. Bewick mentions drawing commercial illustrations for Newcastle companies as part of his own apprenticeship.[122] However, learning to engrave in the facsimile style meant using a pictorial syntax that replicated an image created by a photographic method. Beegan states this involved 'abandoning the linear web of the existing code', referring to pictorial syntaxes, and gradually adopting a tonal code of 'shorter strokes and scratches', which often meant the wood engraver used one graving tool, rather than a range of them, as was the case with the interpretive method.

The demand for wood engravers that accompanied the cessation of the 'taxes on knowledge' saw the shortening of apprenticeship lengths, generally from seven years to five years by the 1840s, [123] then down to three or two years by the 1850s.[124] Some firms that required a steady stream of illustrators and wood engravers to keep up with the work they were getting from the the periodical press began establishing bespoke on-the-job training for new recruits. *The Graphic*, for example, established its own school specifically to train wood engravers on-the-job. It was implied by accounts at the time, that the training at *The Graphic* was less extensive than traditional training within the master-apprentice system.[125] These time frames were by no means consistent across the trade, and there were extensive periods when certain firms would poach each other's staff instead of training in-house, as was the case of the rivalry between ILN and *The Graphic*.[126] But practices such as outsourcing wood blocks to freelancers, or working through the night to meet deadlines, as mentioned by staff of the Frank Leslie and ILN newspapers, became common practice by the mid-1850s.[127] Keeping up with this rapid pace inevitably affected other working conditions of the wood engravers. Those who were trained later in the century were not necessarily able to advance through the ranks as Landells had.

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[122]Bewick (1862), p. 57

[123]De Freitas (1986), pp. 89, 339

[124]De Freitas (1986), p. 306 Many apprenticeships varied by location as well as by time period. Thomas Bewick only trained his younger brother, John Bewick (1760–1795) for 5 years. A notice for an apprentice wood engraver in Liverpool in 1869, specifies a 4-year contract. See De Freitas (1986), p. 339

[125]Beegan (2008), p. 89 and De Freitas (1986), p. 254

[126]De Freitas (1986), p. 254

[127]De Freitas (1986), p. 302

London Daily Papers at the start of Journalism Era*

*Data from Jean K. Chalaby, 1998, based on Mitchell's Newspaper Directory

Freelance wood engravers in Edinburgh*

*Data from Fiona (née Houston) Marynoga 2000 M Litt Disseration data
from Post Office Directories
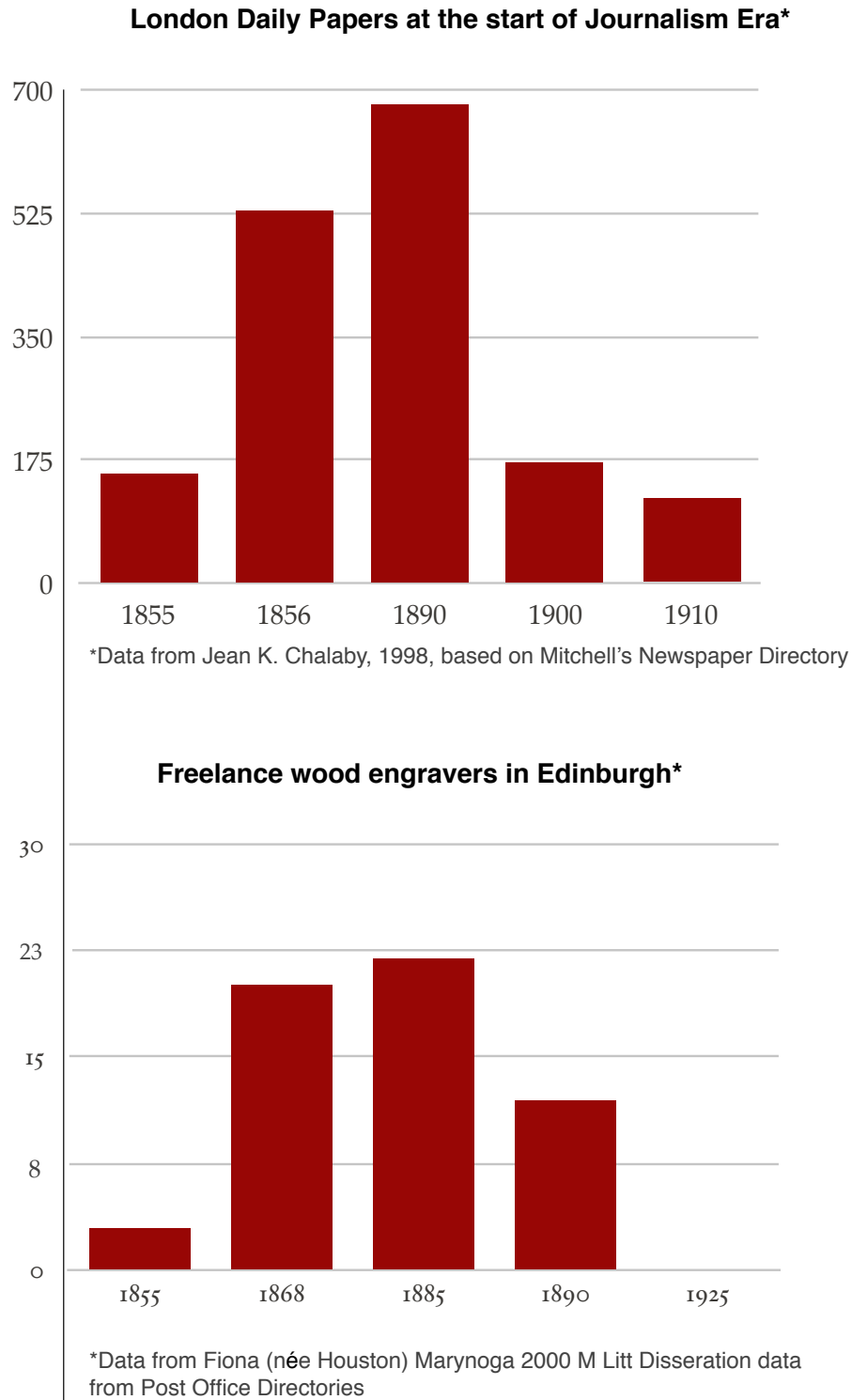
Figure 2.13: Top: Growth of London Daily Papers during given years.
Bottom: Freelance wood engravers in Edinburgh, based on data from Houston's
study.

J.B. Groves, whose career as a wood engraver spanned 40 years, says:

> *After the close of the Crimean war, when the era of peace and prosperity had come,*
> *then the demand for wood blocks increased enormously; engraving establishments*
> *here opened in Edinburgh, Birmingham, Manchester and other provinces and towns*
> *[and] this demand gave rise to shops full of draughtsmen.*[128]

According to Houston, in Scotland most engravers tended to operate as individuals rather than as firms, such as was generally the case in London.[129] In analysing the number of engravers registered in Post Office Directories during various years, Houston concluded that although actual numbers of engravers were smaller, there was proportional correlation with demand for their engraved work that matched their counterparts in London and other major cities. See Figure 2.13.[130] Houston notes that by the 1880s, wood engravers were out numbering other engravers in both Edinburgh and Glasgow. Data from De Freitas' work in London at the time also confirms the growing trend in wood engravers during the same decades, namely that there is a rapid growth in the number of both newspapers and wood engravers at the beginning of this period after taxes were removed, a spike, and then a sharp decline. See Figure 2.13 By reviewing both data on daily and weekly papers in London and growth of wood engravers in Edinburgh together, a proportional correlation between daily papers and number of wood engravers can be made. The patterns of rising and declining papers and wood engravers were consistent in major UK cities in the 19th century.

2.6.2   Division of labour

One of the ways that the wood-engraving trade was turned into a de-skilled work-force over several decades was through division of labour. With publishers commissioning large illustrations by set deadlines, it was more likely to result in illustrations being outsourced. As previously mentioned with the *Frank Leslie Newspaper*, large-front page images would be accomplished by many hands working on separate blocks that would be united by a master engraver.

The other type of division involved assistants, rather than apprentices, only trained to complete certain tasks. An older specialisation, perhaps going back to the time of Bewick in the late 18th century, is specialisation based on type of illustration produced. For example, some wood engravers specialised in botanical illustrations, and they were nicknamed 'pruners.' Some specialised in engraving animals or details of peoples faces,

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[128]Groves, JB. quoted De Freitas (1986), p. 307
[129]Houston (2000), p. 11
[130]Data from Fiona (nèe Houston) Marynoga 2000 M Litt Disseration data from Post Office Directories

and were called 'butchers'. Those that primarily worked on making illustrations of clothing or drapery were referred to as 'tailors'; while those that created machine illustrations were referred to as 'mechanics'.[131] Wood engravers and wood-engraving firms that operated under this division, accepted work as it came, so a journeyman employed there might one day be working on book illustrations, the next working on posters or advertisements.

The majority of illustrated work from the mid-late 19th century can be found in catalogues, broadsheets, leaflets, magazines, product labels, and advertisements. Many wood engravers didn't usually sign their work, especially if they were producing ephemera documents like advertisements. The ones that did were usually famous illustrators or painters with artistic reputations already.[132] Wood-engravings with 'status' were more likely to be signed, therefore, an expensive book would be more likely to include credits for the engraver in the form of signatures. Chapters 3 and 5 briefly discuss *Chambers's Book of Days*, with blocks that were signed by engravers from Dalziel Brothers. Groves speculates that it is at this point the divide between categories of wood engravers who were 'mechanical' as opposed to those who were 'pictorial' began. Although there seems to be evidence of earlier divisions along these lines, nevertheless, there is something to be said about this trend even though its beginnings are not clear.[133] Illustrators or engravers who produced scientific works, mathematics or technological depictions, areas that sometimes required some degree of understanding of the image's subject, did not seem to gain the public re-known as those wood engravers who illustrated for literature, works of art, and poetry books. For instance, Edmund Evans, an apprentice of Landells, became known for engraving the children's books of Walter Crane (1845-1915), Randolph Caldecott (1846-1886), and Kate Greenway (1846-1901), while the wood engravers who laboured on the technical drawings for Chambers's *Information for the People* worked anonymously.

What is known about one particular person in the trade, J.R. Pairman (1837-1908) an artist and wood engraver for the firm of W. & R. Chambers from 1858 - 1908, after some research was conducted on him, is that much of his work is unsigned. Other sources revealed that he was responsible for illustrations in William Chambers' 1864 publication *History of Peebleshire*. His name does appear on the frontispiece of the *Memoir of Robert Chambers with Autobiographic Reminiscences* by William Chambers of 1872.[134][135] See Figure 2.14

Pairman's career trajectory seems to have many parallels with Landells and Swain in London. For instance he worked his way up from an apprentice wood engraver to Director

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[131]De Freitas (1986), p. 347

[132]Sometimes famous works became appropriated by advertisement in the case of 'A Child's World' by John Everett Millais which became 'Bubbles' for a Pears Soap advertisment

[133]De Freitas (1986), p. 355

[134]*Athenaeum Athenaeum, The* (1908)

[135]*Otago Witness Otago Witness* (1908).

Figure 2.14: Frontispiece of the *Memoir of Robert Chambers with Autobiographic Reminiscences by William Chambers*, 1872. 'J. R. Pairman' is signed on the bottom left.

of the Art Department, and worked with the same publisher for a long period. (Chapters 4 and 5 will discuss more of what is known about him, his contribution to the firm, and to both editions of *Chambers's Encyclopaedia*, in particular.) Yet, unlike Landells, Pairman did not start his own wood-engraving firm; nor write much about himself. He did, however, write about wood-engraving in both the first and second edition of the encyclopaedia. He is credited with writing the entries on 'wood-engraving' as well as with five other articles in the second edition. In a newspaper article covering the celebration of his 50th anniversary at the Chambers firm, Pairman recalls that for some decades the firm had about 10 wood engravers working alongside him based at the firm's headquarters in Edinburgh. But the article then states that Pairman was among the last of that profession in Edinburgh. In his last post at the firm, he had served as Director of the Art Department, and the people employed under him had a different set of skills required by the firm. It is likely that many of the new skills required by the firm, had to do with changes in printing technology.

2.6.3   Changes in technology

Boxwood is a solid material and can withstand a great deal of use.[136] For instance, the blocks used for the 1882 Christmas issue of the ILN printed approximately 425,000 impressions and were still usable.[137] However, as the printing and publishing business became even more and more commercial and competitive, methods to duplicate blocks, such as through stereotyping and electrotyping (which will be discussed in the next section of this chapter), became more widely used. These duplication methods allowed more than one machine to print simultaneously.[138] This was advantageous for publishers who wanted to print issues of journals and distribute them as quickly as possible to disparate local markets. For example, the W. & R. Chambers firm printed its Journal in London as well as in Edinburgh, where the firm was based, to accommodate English sales of the Journal which accounted for over 70 percent of the total.[139]

Advances in image and print reproduction technology fed into the aforementioned competitive cycle. The 1860s witnessed the widespread use of two technological breakthroughs that saved the newspaper industry time and money. First came the more widespread use of stereotyping, which enabled production of newspapers from plates. This allowed for multiple copies of works to be printed on several machines at the same time, making production faster and more cost effective. Second came the use of web fed rotary presses.[140] By 1863, *The Times* had plates that were cast to fit the curved cylinders of rotary presses.[141] These two technologies worked in conjunction with one another: rotary presses were dependent on curved, stereotyped plates to produce printed material efficiently and swiftly.

Stereotypes were made by creating a mould or matrix in papier mâché from a woodblock or a forme of type, and then making a cast in metal for duplication. Stereotypes were first produced in 1725 in Glasgow by William Ged (1699–1749), who created copies by using a plaster mould. Another pair of Glaswegians, Andrew Foulis (1712–1775) and Alexander Tillock (1759–1825), built on this work in 1784. Stereotyping was in common use in the printing trade by the 1830s. However, the use of stereotype plates for newspapers was of a different magnitude.[142]

As Michael Twyman points out:

> *Up to this point in time all machines used in the newspaper industry had to be sheet-fed by hand, and most had printed only on one side [in] 1862 John Walter III*

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[136]Conway (2016), p. 227

[137]Jackson & Chatto (1861), p. 326

[138]Newell (1952), p. 262

[139]Fyfe (2012), p. 117

[140]Chalaby (1998), p. 42

[141]Newell (1952), p. 262

[142]Newell (1952), p. 262
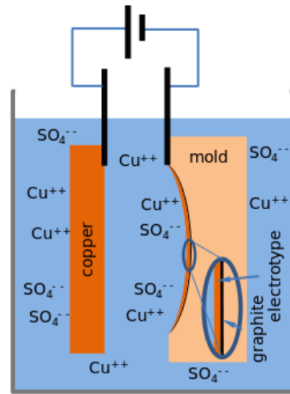
Figure 2.15: A schematic drawing showing how the copper interacts with mould in chemical bath, by Easchiff CC BY-SA 3.0t.

embarked upon a project to design a reel-fed rotary machine... In 1869, it produced about 10,000 perfected sheets of an eight-page paper in an hour [for *The Times*][143]

Information for the People provides a good example of how the Chambers firm used stereotypes. Of the 50 topics covered in this series, each part sold at least 16,000 copies. Some issues on popular topics, like how to emigrate to North America sold up to 47,000 copies. Reprints for any back issues were easy to produce quickly because they were stereotyped. All these new titles were illustrated with wood-engravings. Some of Chambers's budget projections in account books show that wood-engravings for works produced in the 1860s-1870s could be a significant proportion of the total project's budget.[144]

Fyfe writes that W. & R. Chambers was one of the first publishers to embrace the latest innovations of the Industrial Revolution in printing processes and machinery, making great use of machine-made paper, stereotyping, and steam-powered printing machines.[145] In account books of the W. & R. Chambers firms, it is possible to see what was budgeted for different categories of expenses in certain years. In an 1859 ledger, there is a line item for wood-engraving expenses of £218 for the first edition of the *Chamber's Encyclopaedia* out of a total of £1854, which means that wood-engravings are approximately 12% of the total budget. Another line item is stereotype plates, but the cost is only £1 and 12 shillings, so this expense is not even one percent of the total.[146] However by the time of the second edition, indicated in an 1891 ledger, wood-engravings are budgeted at £409 out of a total

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[143]Twyman (1970), p. 55

[144]Records show that this changed later in the period, so that wood-engravings were always grouped with expenses from stereotypes or electrotypes. Pub Led. (1859) and Pub Led. (1891*a*).

[145]Fyfe (2012), p. 64

[146]Pub Led. (1859), p. 90
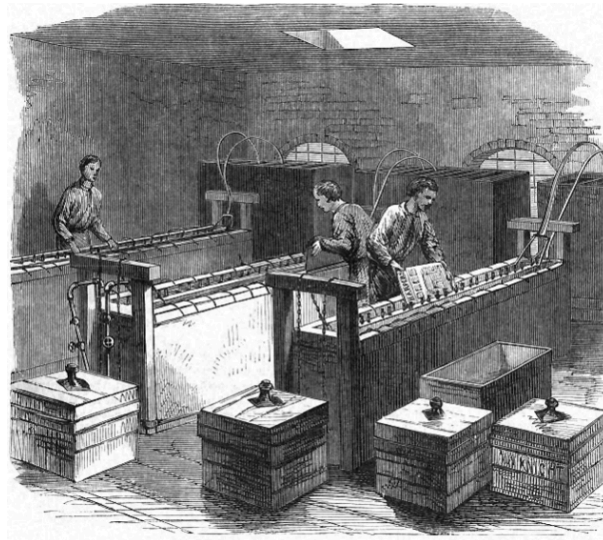
Figure 2.16: Harper & Brother's Battery Room where electrotypes are prepared in by submerging copper and wax mould into a chemical bath. Notice batteries in this image which supply positive and negative charges.

projection of £5244. It seems that the wood-engravings are approximately 8% of the total budget. Interestingly, a line item also exists for electrotypes for £180, which is 3% of the total budget.[147] What this seems to indicate, for the Chambers firm at least, is that although the percentage a publisher could spend on artwork between the middle of the century and the end of the century is roughly the same, the focus of where the expenditure is made was different. The records also indicate that electrotyping was being used to reproduce images for the Second Edition, and had replaced stereotyping by this time.

Studying data from the publisher Macmillan, Weedon finds the peak time of using stereotypes and electrotypes is between the 1870s and 1880s, where one in five impressions were made from electrotypes, and one in three from stereos.[148] Like stereotyping, electrotyping involved using a mould to make a copy of the wood engraved image. Electrotypes share the same principle of being made from a mould, like stereotypes. However, the method of creating a plate from a mould is very different. Stereotyping is an entirely mechanical process; while electrotyping is an electrochemical process.

The first part of the process involves wax to be pressed against a woodblock or a page of type in order to create a wax mould. The mould is then covered with graphite, because graphite conducts electricity. Next, the graphite-covered wax mould is attached to an anode, through which flowed an electrical current. The cathode is attached to a sheet of copper. Both wax mould and copper sheet are submerged in a chemical bath of copper

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[147]Pub Led. (1891a), p. 109
[148]Weedon (2003), p. 75

Figure 2.17: Stereotype (T.2011.56.225, left) and electrotype (T.2011.56.224, right) of the same map showing 'Baltic Sea', National Museums Collection Centre, Edinburgh.

sulfate ($CuSO_4$) and sulfuric acid (H_2SO_4) and an electrical charge is sent through both. See Figure 2.15. The electric current causes copper atoms to leave the plate of copper and 'grow' on the surface of the wax mould making an exact copy of the original wood block or page of type. The copper surface is then backed with type metal and affixed to wood blocks, which will be used for printing.

After 1872, when mechanical electrical generators (dynamos) became available, dynamos were used as a power source to create electrotypes as shown in Figure 2.16. Plating dynamos sped up the electrotyping by 20 times, so that an electrotype printing plate could be deposited in less than two hours, thus it became a much cheaper alternative to stereotyping.[149] It also had the advantage of being an exact copy of the wood engraved image, whereas the stereotype might be a little bit smaller then than the original, since stereotypes were made from hot metal poured into a papier-mâché mould. The papier-mâché could shrink as it dried, or the metal as it cooled. This can be seen in a side-by-side comparison of the same map in the figure above, where the picture area of the stereotype is .2 cm smaller than the electrotype. The stereotype on the left and electrotype on the right.[150] Stereotypes and electrotypes could be affixed to woodblocks and then be placed alongside metal type in a forme and printed.

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[149]Hatch & Steward (1918), p. 4

[150]In the case of the 'Baltic Sea', two electrotypes were found in this collection, and one stereotype, but no woodblock. The stereotype and the electrotype in this case, both measured 6 cm x 6.6 cm, because there is text at the bottom of the electrotype, and a strip of metal (that would not be printed) at the top of the stereotype. But if one measures just the printing surface of both electrotype and stereotype, there is only .2 difference.
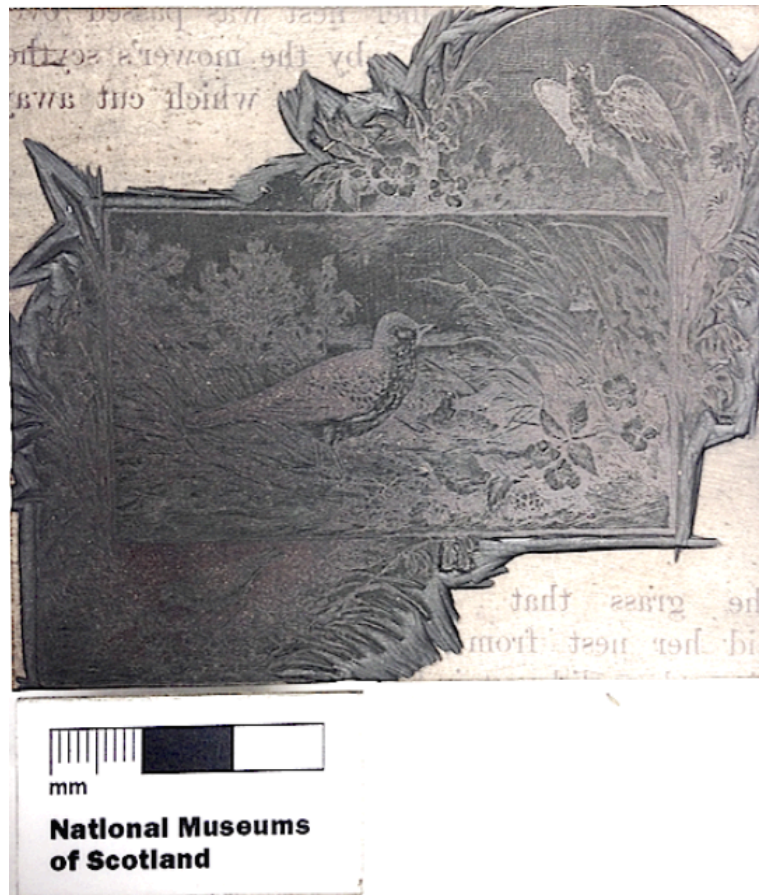
Figure 2.18: Wood block used in the production of *Chambers's Expressive Reader* series. W. & R. Chambers (T.2011.56) National Museums Collections Centre, Edinburgh.

By the late 1890s, use of both stereotype and electrotypes declined significantly in British publishing houses according to Weedon. Newer technologies were competing with the skilled wood engraver. Twyman divides the newer methods into two broad categories. Those that reproduced an artist's line drawing, and those that reproduced a photograph or tonal drawing.[151]

2.6.4   Technology replacing traditional skill

As previously mentioned, in the second half of the nineteenth century, draughtsmen were being encouraged to use photography to aid their image making, in addition to just mimicking qualities of photographs. In 1860, engraver Thomas Bolton (n.d.) invented a process for exposing a photograph directly onto a woodblock. This meant that the artist's original drawing, which had up until then been made directly on the block, could be pre-

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[151]Twyman (1970), p. 30

served, by photographing it. The photograph could then be exposed on the block and the wood engraver could make a direct translation of the tones of an actual photograph. To guide the engraver's work, he or she could reference the original work of art itself in addition to the image on the block. See Figure 2.18, of a wood block used in the production of *Chambers's Expressive Reader* series. Note that a photograph taken of another text and its illustration has been exposed onto this block. The illustration portion has been cleared away from the block, so it is likely this block was intended to create a derivative, such as an electrotype. This is the type of process that Linton, and many traditionalists had strong objections towards.

Another technology that developed at this time was the half-tone process. George Meisenbach (1841-1912) patented a half-tone process using single lined screens which were turned during exposure to produce cross-lined effects. Founding a company in London in 1884 to market the new technology, he achieved commercial success with this process, which he called relief halftone, and by the 1890s numerous journals were carrying half-tone images.[152] An example of a print made by this method can be seen in Figure 2.19 in the ILN cover illustration featuring Andrew Carnegie (1835-1919), Scottish-American industrialist turned philanthropist. The images produced by this technique began to replace wood-engravings, which as shown previously with Figure 2.12 had, ironically increasingly turned to copying the tonal qualities of photographs in their facsimile style illustrations. In 1901, George and Edward Dalziel admitted that before the turn of the century, the standard of commercial process engraving was high enough that the days of professional wood engravers was finally over, a point brought home in the data on wood engraver numbers compiled by Houston's data on the decline of wood engravers.

Twyman writes that among the reasons for the success of process engraving was cheapness of process, compared with time and expense inherent in wood-engraving. Process engraving could cost a fifth of a similar wood-engraving. As Twyman comments, 'At that time the cost of an average quality wood-engraving worked out from 3s to 5s a square inch, while letterpress half tones cost between 8d and 1s 6d...process between 1s and 1s 3d, and those produced by the albumen and bitumen process between 2 1/2 and 6d 'with hand touching extra'. [153]

The reason such different processes became cheaper was that they relied less and less on the skilled labour and expertise required for wood-engraving, and more and more on automated processes that required a minimal, basic training before work could be produced. For instance, it cost a great deal less to pay someone to mind the chemical baths that electrotypes were stored in and to operate the mechanism to turn on voltage for the batteries, than to pay many wood engravers a decent salary.

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[152]Twyman (1970), p. 32

[153]Twyman (1970), p. 32
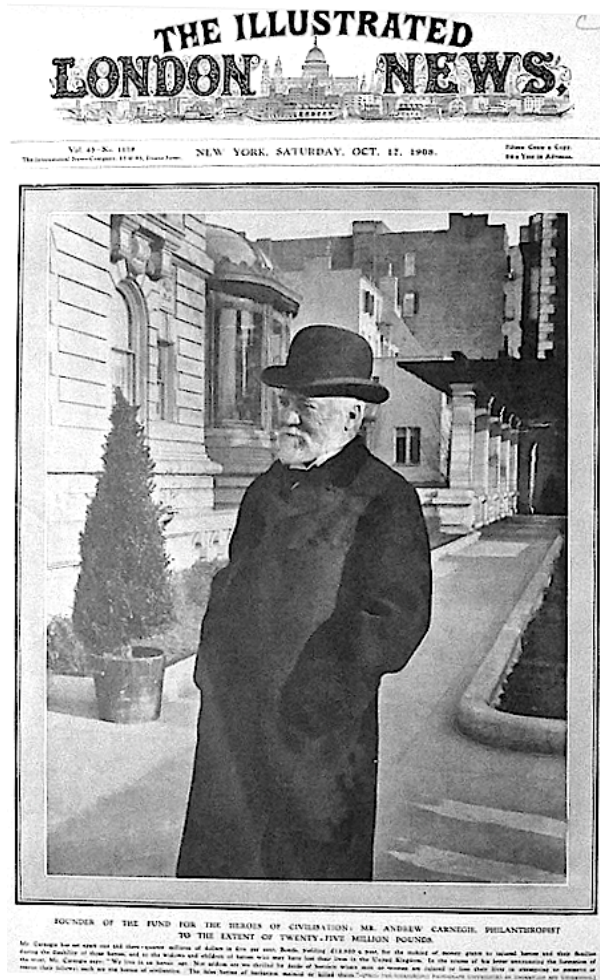
Figure 2.19: 1908 Half-tone print featuring Andrew Carnegie on the cover of ILN.

In the later years of the serial revolution 1880-early 1900, the competitive nature of the publishing market caused segmentation. Specific magazines were established catering to boys, girls, men, women, office workers of both genders, homemakers, men who like to hunt. For instance, Frank Leslie had many different titles that were marketed to women on home making or fashion. While Samuel Beeton (1830-1877) published the *Boy's Own Magazine* from 1855 to 1890. John Cassell wrote in 1858 that fiction may be made an appropriate vehicle for 'conveyance of useful lessons' including good morals, kind heartedness, noble ambitions, and the desire to promote moral and intellectual causes,[154] and titles specifically designed for specific audiences, using illustrations packaged with content targeted to that audience emerged. The printing legacy of specialisation and professionalisation of the sciences in the 19th century is with us still today. More than 100 years later, journals (online and print) are dedicated to branches of chemistry, medicine, and

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[154]Anderson (1991), pp. 120-121

geology. Other emerging professions, not science related, also began to have their own trade or professional journals. While some publishing firms, like Frank Leslie, did adapt to emerging markets, others instead transitioned away from only producing periodicals.

While still continuing to produce the *The Edinburgh Journal*, the Chambers firm took a different path from competing in the journalistic environment. Their Journal continued, but their business shifted to text books, as will be covered in the next section. Their books followed the trends of illustrations appearing more like photographs, until they would eventually be illustrated by photographs. In order to get the most of their investment, some of these images commissioned were reused in later publications while some were updated but clearly based on earlier illustration models (More in Chapters 4, 5, and 6).

Charles Knight also revised another illustrated project that he completed for the SDUK, the *Penny Cyclopaedia*, which had been issued in parts from 1828 to 1843 into a series of bound encyclopaedias called the *English Cyclopaedia*. More about this will be covered in subsequent chapters. After Knight's association with the SDUK ended in 1846, he continued publishing and writing until just before his death in the 1870s. He also launched the *Local Government Chronicle* in 1855, but as stated before, what he is best remembered for was for *Penny Weekly* and illustrated editions of *Pictorial Shakespeare*, *The Bible*, *Old England* and *The Land We Live In*.[155]

2.7   Evolving markets for practical matters and education

The book trade has always been a major industry in Scotland, and the paper industry, especially, served as a major part of the Scottish economy even before literacy was widespread.[156] In England and Wales during the 17th and early 18th centuries, there was no formal school provision, even for elite families. This began to change in the second half of the 18th century, as boarding schools were opened, and sons of parents who aspired to gentility began to be taught in them. As the 19th century progressed, and a wider concern about education grew, so grammar schools were endowed—15 new grammar schools were opened by the 1840s, and before the 1870s, 18 more were established.[157] New universities also emerged. What would become University College London (UCL) was established in 1829, followed by Kings College in 1831, and Durham University in 1832. Other institutions of higher learning in Birmingham, Bristol, Manchester, Leeds, Liverpool, Sheffield, which would become the six 'red-brick' universities in the major industrial cities of England, were established during this period. In addition, the Heriot-Watt University (est. 1821) and the University of Dundee (est.1881) opened in Scotland as alternatives to the medieval universities in Aberdeen, Edinburgh, Glasgow and St Andrews.

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[155] Gray (2006)

[156] Herman (2003), pp. 24-25

[157] Stray & Sutherland (2010), p. 361

Many textbooks of the 19th century were written by professors in these new universities, recruited by publishers who initially had ties with the universities. John Taylor (1781–1864), a professor at UCL, for example, was recruited by the SDUK to write content for their ambitious publishing programme. SDUK had other ties with UCL. Many professors like Taylor wrote books that they intended to use in their own courses, or for potential students to their courses. But publishers, especially SDUK, were happy to advertise their books for multiple markets—both autodidact and taught learner.[158]

In 1835, the brothers started work on *Chambers's Educational Course*, a series of short works and schoolbooks addressing the 'capacities of students at various developmental stages' eventually producing more than 100 titles in this series on almost every subject.[159] Its purpose was nothing less than to form 'a complete Course of Education, physical, moral and intellectual - theoretical as well as practical'.[160] In 1840 William reported that twenty-one volumes had been published, and series sales had reached 100,000 annually. One of these books, Robert Chambers's own *Introduction to the Sciences*, (1836), would be 'widely used in the schools,' selling 'over one hundred and twenty thousand copies by 1849.' [161]

By 1836, the Chambers firm stated that they had ambitions to expand education 'from the limited field which it has hitherto occupied, to an application to the whole of the human faculties, and the bringing out into full efficiency, for the benefit of society, the best mental qualities of every individual composing it.' [162]

The firm took previously published tracts, or successful series published in parts, revised and updated the content, and then published the works in the form of bound text books. This occurred with *Information for the People*, *Chambers's Miscellany*, and by the 1860s, the firm was poised to produce more stand-alone books or volumes related to each other in a series, rather than part-issue works (revised from their older tracts). These older works in various formats provided a blueprint for future text and reference books. In the case of *Chambers's Encyclopaedia*, as will be discussed in the next chapter, the first edition came out in different formats: Issued in parts (monthly or bi-weekly) in 1859, but also as bound in volumes from 1860.

Two pieces of government legislation happened to coincide with the Chambers firms ambitions of expanding their education market were: the 1870 Education Act for England and Wales which committed the government to provide elementary school places for all working class children and allowed local councils to create school boards to govern these schools; and the 1872 Education Act for Scotland which laid the basis for the modern education system for primary schools. These two Acts not only provided legal incentives

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[158]Gray (2006)
[159]Chambers Harrap (2009)
[160]Scholnick (1999*a*), p. 334
[161]IX: 445 (Aug. 8, 1840), p. 23
[162]Scholnick (1999*a*) cites of *Chambers's Edinburgh Journal*, Volume 209. Jan. 30, 1836

for expanding the education market, they also provided financial incentives for Chambers and other publishers.

The Scottish Education Act arose from the Royal Commission on Scottish Education, established in the 1860s to study the provision of Education in Scotland. Devine states that the most striking impression provided in the report, and relevant to publishing firms, was how much 19th century schooling varied. By 1851, the much-praised parochial schools of the Church of Scotland only provided education to 25% of the children in schools. Most surprising for the Commission was 'that 44% of all school were private and subscription foundations, outside of Church control all together'.[163] These private schools represented more than one third of all pupils in Scotland and included: schools originally established for street children but which had gradually evolved into schools for delinquents and truants; charitable schools offering free education, and private schools charging fees for middle class families.[164]

What these reports indicate is that although there was a culture of learning in Scotland throughout the 19th century, there was a definite need for material to provide self-education until the national systems of education were established and local boards to oversee them. Becoming an educated person, and education for all was not a given. It seems that much emphasis in the Chambers literature about educating oneself provided encouragement and inspiration despite the difficulties and hard work required. The message being drummed into readers by Chambers publications was that hard work, good habits, and the desire to improve oneself, would eventually yield material and spiritual rewards.

In 1863, the structure of government grants attempted to bring free market principles into the classroom. While a block grant had been provided before, from 1863 annual grants of 12 shillings were made available for each child. Four shillings was given up front for regular attendance of a child in a school, but the rest had to be earned by the child's performance on exams by government inspectors. Children were grouped by age onto different Standards, and no child was allowed to repeat a Standard. The results of these grants tied to school performance was the government saving money on education.

In 1861, £800,000 was allocated in the budget for schools. In 1865, with the new performance requirements, expenditure had dropped to £600,000 for the year for all schools it was supporting. Only after 1869, when schools learned how to 'teach to the tests' did expenditure go back to the £800,000 level. Publishers seized the market opportunity to create a series of books to help schools with these exams. Although the take up was slow for schools now lacking funding for books as well as other necessities, there were 6 series

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[163]Devine (1999), p. 393
[164]Devine (1999), p. 393

of readers on the market in 1865, and by 1876 there were around 15.[165] A letter to John Murray provides a cynical insight into the textbook market's opportunities and problems. The letter writer says 'it is difficult to displace even a bad book' once it has been accepted in schools. Many schools clung to books until they fell apart in the lean years of the 1860s.[166] What this seems to indicate is that once publishers established books that were going to be used in any school, that title had a long life in the education market.

The 1870 Education Act committed the government to provide elementary school places for all working class children and allowed local councils to create school boards to govern these schools. The local elementary school would also have access to central government grants with the payment by results framework. As with the 1863 law, it took years to get local council support and inspections going, and it was inhibited until 1880 when all schools—voluntary and state—could compel students to attend. However, Stray and Sutherland note that enforcing compulsory attendance was a struggle. By 1895 only 82% of children whose names were listed on the school registers were actually attending. Nevertheless, the markets for elementary textbooks grew with each decade. By 1882, 50 publishers were advertising textbooks in the *Publisher's Circular*.[167]

The 1872 Education Act for Scotland laid the basis for the modern education system for primary schools.[168] The most immediate thing it did was take over control for the country's education from the churches (with the exception of Catholic and Episcopalian schools) and place it under the direction of elected school boards. A non-sectarian system of state schools was established and was monitored by the Scottish Education Department (SED), initially located in London, but in 1885, moved to Scotland. [169] Unlike England, SED established compulsory schooling for the age group between 5-13 years (changed to 14 years in 1883) and by 1900 'illiteracy was eliminated in both the Highlands and Lowlands'.[170]

The 1870 and 1872 Education Acts changed the composition of teachers. Previously in Scotland, more men were teachers than women. In 1851, the proportion breakdown was 65% male teachers, 35% women teachers. By 1911, it was 70% women teachers to 30% men. Women were paid much less then men. The average salary for men ranged from £121-£145 per year; for women it was £62 - £72.[171] Quality of teacher training also varied, men were trained in subjects like science, mathematics, Greek and the classics;

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[165] Stray & Sutherland (2010), p. 369
[166] Stray & Sutherland (2010), p. 372
[167] Stray & Sutherland (2010), p. 371
[168] Knox (2011), p. 3
[169] Knox (2011), p. 3
[170] Knox (2011), p. 4
[171] Devine (1999), p. 6

while women's education comprised domestic economy, French and botany.[172]

One of the markets that publishers targeted from the late 1860s, were 'pupil teachers', who were teenagers apprenticed to existing teachers. They gave assistance in the classroom and were given some extra time to study each day. At the end of their five-year apprenticeship, they could be examined by a school board and become certified teachers.[173]

The 1870 Act and the 1872 Act, which both related to compulsory primary education, happened to coincide with what has been characterised as a mass production revolution in printing,[174] and it was possible for publishers to produce more school books. Accompanying formal schooling was the rise in the number of public examinations, and heated debates about content of books in schools.[175]

In the 1870s, Chambers did something quite innovative, they used what we would now call market research techniques to find out about their audiences. Correspondence in the Chambers Archives show that there were at least two small research teams visiting schools throughout Britain to assess and report on opportunities for new types of the text books aimed at the schools.[176] This seems to indicate that Chambers was focusing on the school markets that they anticipated with the 1870 and 1872 Education Acts. James Donald, the editor of two Chambers's dictionaries, was on a team speaking with numerous teachers and his notes sent back to the firm, on what teachers thought students needed, is likely to have had an impact on the firm's direction in subsequent years (details of this are outside the scope of this thesis).

Weedon writes that often the school book market at the end of the century had little to do with education itself. Official educational policy and education codes in Britain and the growing colonial English-speaking markets like India, could dictate the format and control of content through local school boards who 'approved' textbooks for their areas, and publishers competition for their approval was intense. Some publishers provided inducements like a certain free books for teachers.[177] 'At every level, educational publishing became a major industry in its own right during the nineteenth century' writes John

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[172]Knox (2011), p. 4

[173]Stray & Sutherland (2010), p. 368

[174]Stray & Sutherland (2010), p. 361, state that between 1875 - 1914 these innovations: rotary printing, hot metal type-setting, advances in lithography and photography, and the replacement of steam power with electricity, define the era.

[175]Stray and Sutherland note that it was important to everyone for books to be moral, and teach children moral lessons. However religion was a big issue and there was a struggle to provide Christian teachings that were non-denominational. Chambers publications would fit nicely in the moral edification niche since many characters in their histories, biographies and fiction are not necessarily religious figures, but provide moral instruction to readers in an entertaining way.

[176]Chambers firm with P. Thomson and J. Donald (1872).

[177]Weedon (2003), p. 138

Feather.[178] After the 1870 and 1872 Education Acts, 'successful educational publishing proved to be highly profitable.'[179] Publishers had played a key role in helping to create and sustain literacy, in the first part of the 19th century. In after compulsory schooling legislation was enacted, publishers roles shifted to directly providing reading material for the new socially and politically aware.[180]

By the 1890s there was no longer just a schoolbook market, the university book market also grew significantly with expansion of universities and college extension courses.[181] There also seems to have been growth in general of exams for every level of society, from civil servants serving abroad to new instruments in emerging professional fields, trying to establish the status of their profession.[182] If publishers (or former publicists) were interested in producing self-help material, text-books and reference genres were a profitable alternative to 'rat race' journalism. In fact, several publishing firms, including another Scottish-based one, John Murray, begin to see educational publishing as a more stable market.[183] After the 1850s, Murray and Chambers, and others begin to build up strong backlists that not only included fiction, but non-fiction and reference too.

2.8   Adapting the Chambers brand to fill different niches

> *The best way to create readers was through periodicals, but* [our competitors] *sheets were merely disjointed and unauthorised extracts from books, clippings from floating literature, old stories, and stale jocularities.*[184]

William Chambers, quoted above, stated that the success of the Journal and *Information for the People* was not only because of the irregular nature of their competition, but also the competition's low quality.[185] This was not a mistake he intended to make. When Robert Chambers became involved with the *Chambers's Edinburgh Journal*, it was not initially as an editor. His hesitation may have come from a past joint adventure, *The Kaleidoscope*, that was unsuccessful, but it was also due to the poor literary reputation of the cheap periodicals[186] identified in Table 2.1 at the beginning of this chapter. However, within five months, Robert saw the same potential that his brother saw, and both William and Robert were listed on the masthead as editors, and Robert became the main contributor. See Figure 2.20.

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[178]Feather (1988), p. 115
[179]Feather (1988), p. 116
[180]Feather (1988), p. 107
[181]Eliot & Freebury (2009), p. 693
[182]Stray & Sutherland (2010), p. 368
[183]Stray & Sutherland (2010), p. 367
[184]Chambers (1876), pp. 230-231
[185]Chambers (1876), p. 230
[186]Topham (2007), p. 156, Scholnick (1999*a*), p. 328
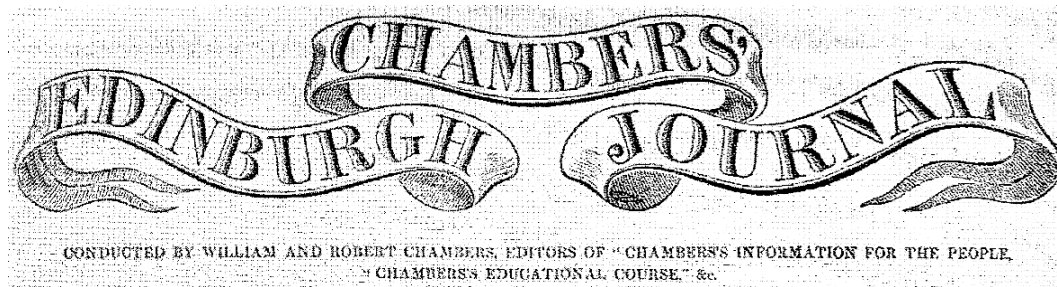
Figure 2.20: Masthead for *Chambers's Edinburgh Journal* conducted by William and
Robert Chambers.

Writing for the Journal, changed some of Robert Chambers' conservative views on
poverty and the transformative power of education.[187] After surveying early articles in the
Journal, Scholnick concludes that Robert's articles reflected the belief that while literacy
was necessary to escape poverty, it was not sufficient in itself.[188] The Journal made Robert
Chambers interested in the plight of the poor, but in a different way than radicals like
Hetherington. Robert's writing and choice of articles, showed his interest in providing
practical information that could help his readers immediately. Chambers writing was also
reflective of certain constraints on British class system, and he came to believe that for
some people, emigration *was* the only way to solve the situation of crippling poverty.[189]

> *It is a fundamental law of human nature, that mankind must disperse themselves*
> *over the whole earth, to seek out the best spot for their residence... Nearly the whole*
> *of the lands and manufacturers in the United Kingdom are passing into the hands*
> *of capitalists. The rich are becoming very rich, and the poor are sinking deeper and*
> *deeper into poverty and wretchedness. The small farmers and tradesmen of England,*
> *Scotland, and Ireland, are now placed in that peculiar condition, when emigration*
> *to a country less occupied and overdone than their own is almost imperative; for,*
> *looking around on all sides, they see little chance of rising into better circumstances,*
> *or of rearing their families in the comfortable reputable manner, which their feel–*
> *ings dictate. To such, therefore, British America offers a fair field for removal and*
> *settlement.*[190]

Among the many social problems faced in the 19th century were that wages in Scot-
land were low when compared with England. 'In 1860, Scottish wages were often up to

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[187]Scholnick (1999*a*), p. 324. Robert Chambers described himself as a political conservative with 'anti-
quarian' literary interests, but in 1847 in *Select Writings* states he is a utilitarian and progressive.

[188]Scholnick (1999*a*), p. 326

[189]Scholnick (1999*a*), p. 326

[190]Chambers & Chambers (1842*b*). No. 17, p. 272

one-fifth below those for the same English trades.'[191] Because of low wages, there was a large Scottish diaspora of people into the British Empire areas of Canada, Australia, New Zealand, India, and China. Herman writes about different waves of emigration to the United States of America throughout the 19th century, arguing that although the diaspora was small when compared with, for example the Irish – approximately 75,000 Scots immigrated to the United States at the same time 5 million Irish[192] arrived – the Scottish population of immigrants were able to make a large impact on their new homes, because upon arrival, they were classified as either skilled or semiskilled workers.[193] Additionally, what set them apart as a group, was a strong (Protestant) work ethic and high level of education that was part of their culture. Furthermore, because they didn't face religious and ethnic discrimination, many of them succeeded in the United States.

Four pamphlets that the Chambers firm published in the late 1830s were about emigration, or a 'poor man's guide' to travel as Scholnick characterises them. They explain how to emigrate to other countries and what to realistically expect when arriving. Scholnick finds that these four pamphlets were incorporated into the 1842 edition of *Information for the People*,[194] and all were illustrated with maps. These editions of *Information for the People* provided realistic warnings of hardship to be faced in a new land with inspiring vision that motivated them to leave; the successful emigrant was portrayed as a social hero by establishing a home abroad that opened the way for other Scottish settlers.[195] Although building life in a new country was hard work, it was worthwhile. There was a trend for guides published in the 1830s - 1840s to focus on North America but by the 1850s, travel guides started focusing on Australia and New Zealand.[196] In line with other guides produced in Britain, another widely-read book published by Chambers in 1851, was John Hill Burton's *The Emigrant's Manual: Australia, New Zealand, America, and South Africa*.[197]

Since the Chambers firm was committed to publishing material that was practical, and helpful to their audiences, they experimented with different affordable formats. In addition to publishing the Journal, Chambers also began an Early Readers series and produced serialised tracts issued between 1830-1850 including: *Chambers's Peoples's Editions* (of out of copyright fiction, or novels translated from foreign language fiction titles), *Chambers's Library for Young People* (poetry, essays, and stories meant to inspire and provide moral instruction), *Chambers's Historical Journal and Miscellany of Useful & Entertaining Tracts*,

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[191]Smout (1987), p. 112. By 1900, real wages in Scotland did climb and matched the rest of the UK, but part of the reason they did go up was because of massive immigration.

[192]Herman (2003), p. 368

[193]Herman (2003), p. 369

[194]Scholnick (1999*b*), p. 13

[195]Scholnick (1999*b*), p. 6

[196]Barnes et al. (2010), p. 598

[197]Wagner, T. S. (2016), p. 227

as well as adding to *Chambers's Educational Course* further mentioned below. These works were popular wherever the Scottish emigrants went, and *Information for the People,* sold especially well in the United States.[198]

2.9   Chapter 2 Conclusion

In 1859, the same year that *Chambers Encyclopaedia* was being issued as a part serial, The Chambers Institution was founded by William Chambers in his home town of Peebles. His bequest specified that the building, still in operation today, was to be used in a manner that enabled the 'social, moral and intellectual improvement of the community' of the Burgh and County of Peeblesshire through 'its use as a public Reading Library, Gallery of Arts and Museum of natural and other objects for the instruction of the public, and a great Hall for public meetings and exhibitions of various kinds.' A major extension to The Chambers Institution was built in 1912, and was funded by Andrew Carnegie, who cited William Chambers as influencing his own approach to philanthropy.[199]

In 1908, the ILN featured a half-tone print of Andrew Carnegie, who was a Scotsman that emigrated to the United States, an industrialist and later a renowned philanthropist. By all accounts he was extremely successful, because he accomplished his three goals in life which were: to spend the first third of it getting all the education he could; to spend the next third making all the money he could; to spend the last third giving it all away for worthwhile causes.[200] In *A Carnegie Anthology*, which contains a collection of many of the quotes that he has used for several speeches, are six quotations from William Chambers. One of them, used when Carnegie spoke at the Chambers Institute, reads:

> *The day is coming when the test will be neither how a man was born nor how much wealth he possesses, nor even how much he knows, but how he has served his fellows — what has he done to make the world, or the little spot where he was born better than when he found it.*[201]

Andrew Carnegie once said, 'I don't believe in God. My God is patriotism. Teach a man to be a good citizen and you have solved the problem of life.' Indeed, Carnegie's work ethic, material success, and his philanthropic career came from social values rather than religious values.[202]

> *Many of his* [Carnegie's] *biographers trace it back to the experience of having been the son of a Scottish weaver, who absorbed from that family a set of values; a belief*

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[198] Scholnick (1999*b*), p.14

[199] Scottish Historic Buildings Trust (2016), p. 1

[200] Wilson (1915)

[201] Wilson (1915), p. 95

[202] Sharpe (2013) Journalist Gillian Sharpe quotes Professor Eric Homberger in this article.

in democracy and a belief in 'a society that provides opportunities for everyone' and
not just the super-rich... (although) we can't say the moment it began but I think
we can trace its source back to Scotland.[203]

There is a complex physical and social context of use around any product that goes to market. Jodi Forlizzi call this 'The Product Ecology' and notes that certain factors evoke social behaviour around buying and selling an item. Certain products are inherently social and as part of their use require sharing with other people, while other items are meant for an individual to use alone. It is not too much to imagine that long-time subscribers to *Chambers's Edinburgh Journal* in the 1830s might purchase one of the many *Chambers's Educational Course* books for an older child to learn a specific skill, and then for a younger child, to make a selection from the *Chambers Early Reader* series. It would also seem natural that even an occasional reader of the Journal in the 1840s, who was considering moving abroad with his or her family to consult relevant issues of *Information for the People* which helped provide options. An emigration-focused issue might make the case for moving to Philadelphia or further west in the United States. Another issue focused on Canada and another one focused on New Zealand might help readers decide between Prince Edward Island or Wellington. All of the advantages and disadvantages were spelled out by *Information for the People*, which not only included letters reporting from Scots people settling there, they included practical information like maps, well-researched climate reports, and indicated possible trades and professions that were in need of being filled in particular geographical locations. Once a family relocated, it was possible for them to continue their subscription to the Journal. As indicated by the hundreds of letters the firm received, their readers were interested in continuing a connection with their home country.

Most products have emotional, symbolic or aesthetic facts which make possession of them desirable. [204] The idea behind the product ecology can be applied to any time and place that has a capitalist, industrial economy and to the study of how satisfaction or dissatisfaction can influence repeat purchases and loyalty to a brand, a firm, or a life-style represented by a suite of products. Many studies focusing on 19th-century material culture discuss how the purchase of certain products allowed them to construct a new identity for themselves. 'What is purchased and invested in became an affirmation of taste and the expression of one's personal order'.[205]

The people who purchased Chambers publications did so because they believed in the messages the publication provided, or because they found the publication useful and entertaining, and perhaps because Chambers reflected and articulated their own values. The

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[203] Sharpe (2013) Journalist Gillian Sharpe quotes Professor Eric Homberger in this article.
[204] Forlizzi (2008), p. 13
[205] Charpy (2015), p. 210

question that is raised in this chapter is, what was the Chambers firm selling? Furthermore, who did they see as their main audience? Chambers publications seem to provide more than practical advice, in many ways, one could argue they included a vision of a better life, and a connection to like-minded readers, who shared their aspirations and view of the world.

In the early decades of the 19th century, when certain taxes were still in operation, the devotion of a publicist was crucial for producing each weekly. In addition, Charles Knight and Chambers publications used attractive layouts, quality articles and illustrations which contributed to their financial successes.[206] With illustrations being used in less expensive publications, the use of images became an appealing and expected feature of new publications that were created, as the old taxes on knowledge were being repealed.

'Knowledge is Power' was a slogan affiliated with what Hollis called the 'pauper press,' but it was a term taken up by middle-class publicists such as Charles Knight, and to a certain extent W. & R. Chambers. Unlike Hetherington's message supporting a dramatic system overhaul, 'knowledge' and 'information' for them were a means of providing self-improvement literature for individuals who wanted to live within the current hierarchical social and economic ladder, but in a way that was self-determined. Both Knight and Chambers used images in their publications to appeal to broader audiences and draw them into a larger intellectual world, which they promised would be available to their readers interested in their own progress.

The historical circumstances that provided fertile ground for printed images to become abundant, particularly through the means of the illustrated press, were threefold. Firstly, there was the economic impetus provided by changes in British legislation, most prominently the removal of 'Taxes on Knowledge', which enabled more cost effective publishing to flourish in the second half of the nineteenth century. Secondly, there was the professional dimension, the manner in which journalism became a capitalistic enterprise, and a paralleling rise and fall of the wood-engraving profession within this enterprise. Thirdly, given that wood-engraving rose to prominence in the mid-century, then essentially declined when the periodical press adapted new technology to create images at the century's close, this chapter highlighted the effects of visual communication technologies developed from the 1830s through to the 1890s, the influence of publicists, wood engravers, and legislation on the print ecology and on other image making processes such as photography on wood engraved images.

However, returning to the question, what was the Chambers firm actually selling, as their product lines evolved through the decades of the 19th century, the simple answer seems to be: useful information to 'improve' the lives of readers. But I think it is more than this, given that the Chambers brothers were aware that many of their products would travel

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[206]Knight (1864), p. 406

as far as their readers did.[207] Although the following quote is specific about immigration to North American, the message that they are trying to convey seems to apply to all their publications.

> *The poorest individual, if he acts prudently and is industrious, and has a common share of good fortune, will be able to acquire an independence in the the space of four or five years. He will have plenty to eat and drink, a warm house to reside in, and no taxes to pay, and this state of things surely forms a delightful contrast with those hardships and privations which are at present the lot of the labouring population of Great Britain.*[208]

One can argue that by producing publications with a certain educational character to them, in a manner that was financially successful, the Chambers brothers shared the three goals that Carnegie had, but in a way that allowed these aims to be accomplished throughout their lives at the same time rather than in three distinct phases. What the Chambers firm were selling, besides useful information and keys to understanding the world around them, seems to be the Scottish sensibility: the value of self-reliance, rationality, and what they believed were the keys to living a good life. W. & R. Chambers also used the resources of print culture to intertwine the idea of emigration with progress, and in doing so, developed a world-wide market for English Language publications, especially of their own works.

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[207]Hogg (1833)
[208]Chambers & Chambers (1842*b*). No. 17, p. 264

3 Textual content and form

In the last chapter, I discussed the concept of the product ecology and Forlizzi's suggestion that products have emotional, symbolic, or aesthetic qualities that impact their production, marketing and consumption. This chapter will take that idea further, arguing that not only did evolving products fill specific niche markets, but also that the success of certain products altered the surrounding environment, enabling other publishers to create similar products with their own modifications. The encyclopaedia, as a genre, altered between the early 19th century and 20th century. Encyclopaedias transformed from works aimed at the elite, to books that could be consulted and owned by a wider audience.

This chapter looks at both editions of *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge for the People* (First Edition) and *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge, New Edition* (Second Edition) tracing evolving design and organisation features in comparison with five other 18th- and 19th-century encyclopaedias: *Cyclopaedia: or, An Universal Dictionary of Arts and Sciences* (1728), produced in England, the *Encyclopédie, ou Dictionnare raisonné des Sciences, des Arts et Des Métiers* (1751–1772), produced in France, the *Penny Cyclopaedia* (1833-1843) and *English Cyclopaedia* (1854-1862) produced in England and the eighth and ninth editions of *Encyclopaedia Britannica* (1853-1860) and (1875-1889) produced in Scotland. While studies of the 18th-century works have been done before, the changing business structures behind publishing reference works from the 18th- to the 19th-century has not been looked at in-depth. Nor have comparative studies examining encyclopaedia publishers, such as the Chambers firm and Charles Knight, who were targeting their publications at cheap markets, been examined in terms of their illustrations and design.

This chapter will answer the following two questions (that correspond with questions 8 and 2 in the Introduction): First, to what extent did the practicalities of production generally impact the *Chambers's Encyclopaedia's* stated aims of being easy to use? Second, is the content and design of *Chambers's Encyclopaedia* more appropriate and easier to understand for a general audience than other encyclopaedias preceding it? I will argue that the stated purpose of encyclopaedias by publishers like Charles Knight and W. & R. Chambers did affect the design of their works, making them different from encyclopaedias that

came before them, and that their simplified formats impacted other English-language encyclopaedias. Furthermore, the growth of encyclopaedias will be discussed in relation to Chambers's stated intention of making works with information relevant to 'the people.' This chapter will also discuss who Chambers believed 'the people' that they were marketing to were, and who in practice were their readers. Finally, this chapter lays the foundation for further chapters on image content and production.

3.1 Overview of the encyclopaedia genre

As Jeff Loveland explains in the article, 'Why Encyclopaedias Got Bigger... and Smaller', during the period between 1690-1840 the scope of encyclopaedias expanded with the increasing knowledge about the world, but then after this period they stabilized into a specific form and average size. The main reason had to do with economics and publisher intent.[1]

> *Encyclopaedias do not always function as they are designed to do; their social and cultural connotations sometimes overshadow their intellectual purposes.* [2]

Victorian publishers and advocates for progress and self-improvement transformed the concept of an encyclopaedia into what is generally thought of today, because they were creating a genre suitable for the middle class market, or those aspiring to join the middle class. Michael Bhaskar sees publishers undertaking four activities: framing, modelling, filtering and amplifying. He states that content can not be uncoupled from publishing; that the way we experience a given work is a critical part of what defines it.[3] Content must be framed, that is: packaged for distribution and presented to an audience. It is packaged according to a model.

> *Publishers tend to use models not to understand the world, but to do things in it. They don't have models "of" so much as models "for"... Publishing models are premised on an interpretation of the world, but unlike academic models they primarily guide actions. They are motivations as much as explanations.*[4]

In other words, models help publishers to organise and market their content. Bhaskar writes that publishing models are more like metaphors, than 'unbending descriptions.' [5] Furthermore, he states that an encyclopaedia is a model for a type of publication that can only exist in a specific time and place according to the technologies and knowledge of that time. 'When a publisher chooses which model will be followed to frame content... that

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[1]Loveland (2012)
[2]Loveland (2012)
[3]Bhaskar (2013), p. 89
[4]Bhaskar (2013), p. 139
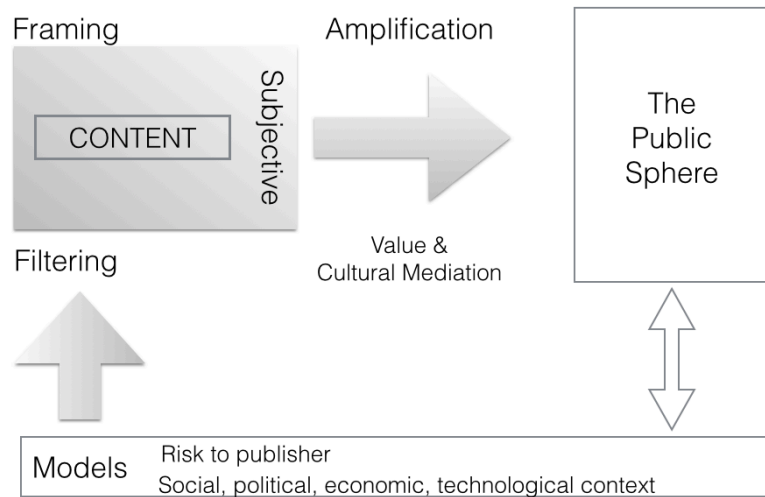[5]Bhaskar (2013), p. 139

Bhaskar's Content Machine

Figure 3.1: Diagram of a publisher's 'content machine'.

content will be filtered, or selected, and then amplified through the act of publishing.'[6] When enough publishers are following very similar models, new types of genre emerge, because publishing is part of a 'social nexus.' Figure 3.1[7] is a simplified diagram based on what Bhaskar calls a 'Content Machine' or a visualisation of his theory of publishing. Much of this chapter will cover the framing of content by publishers of cheap publications into a specific genre they could package and sell to 19th century audiences, after the publisher had mediated the content.

Eisenstein details earlier 'revolutions,' or intellectual and cultural movements, caused by books and other printed works that directly impacted the economic and cultural elite prior to the 19th century.[8] However, from the 1800s onwards, a different sort of information revolution was occurring that had to do with the distribution of information to the middle and lower classes. As stated in the introduction, there were debates among 19th-century politicians, social critics, and writers of the time over the rights of 'the people' or 'the masses.' One strand of debates centred on which of 'the people' should be allowed to vote or who posed a threat to the status quo,[9] another strand of debate centred on how

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[6]Bhaskar (2013), p. 163

[7]Bhaskar (2013), p. 168

[8]Eisenstein (2012). Elizabeth Eisenstein has argued that the ability to print and distribute material was responsible for several intellectual and social movements, such as the Protestant Reformation, the Scientific Revolution, and the Enlightenment and the Industrial Revolution.

[9]Royle (2000), p. 10. Royle argues that fears of a French-style revolution in Britian were real, but did not come to pass because the British ruling class reluctantly compromised and conceded some of its power

'the people' could become qualified to participate in the democratic process.[10]

The view that many middle-class publishers, educators, and reformers took was that 'the people' might also be 'improved' with the 'right sort' of reading material that emphasised middle class values – material that was provided by Chambers or other publicists like them.[11]

In the Preface for *Information for the People*, for example, the stated aim of the editors is to provide:

> *...a body of scientific and general knowledge suitable to the wants of the middle and labouring classes...that may serve to* instruct, *[and]...to* refine...*and to awaken the higher powers of thought–reflection, imagination, and taste– and to nourish at the same time the finer of the moral feelings...*[12]

The encyclopaedic genre, that persisted into the 20th century was greatly influenced by what educators and publishers in the 19th-century thought was important enough for 'the People' to know. Looking back at Bhaskar's Content Machine, in the case of Chambers, 'a body of scientific and general knowledge' was being amplified by the design of how their reference works were arranged, laid out and printed.

3.2 Historical encyclopaedia models

Encyclopaedias in some variation have been around since ancient Rome.[13] 'Encyclopaedia' comes from Greek, meaning circle of knowledge. Encyclopaedias greatly evolved in the 17th, 18th and 19th centuries,[14] and more rapidly during the late 18th and 19th centuries. Before the 18th century, it was believed that these books could encompass all of human knowledge. However, the Enlightenment in Western Europe transformed notions of knowledge and the authority of wisdom handed through the ages.[15] The Scientific Revolution and new methods of gathering data based on direct observation also opened the door to alternative ways of understanding society and nature, and older encyclopaedias as well as other knowledge sources were no longer just copied unquestionably.[16] Summarising this Enlightenment idea about knowledge D'Alembert wrote:

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reflected in the Reform Acts. See introduction.

[10]Rose (2001), p. 187; Robertson (2013), p. 37 and Woodson-Boulton (2012), p. 12

[11]See previous chapter for discussion on publicists vs. journalists.

[12]Chambers & Chambers (1842*a*)

[13]Katz (1998) pp. 21-24. The earliest known compiler of encyclopaedic knowledge was Cato (234-149 BC) who wrote an encyclopaedia in 184 BC. Other early examples which survive only in fragments were written by Celsus (14-37 AD) and Quintilian (c 30-100 AD)

[14]Kafker (1981)

[15]Rauch (2001), pp. 33-34

[16]Rauch (2011)

Years	Encyclopaedia Title	Country	Editor/Publisher	Other notes	Vols.
1768 - 1771	*Encyclopædia Britannica (1st)*	Scotland	William Smellie		3
1777 - 1784	*Encyclopædia Britannica (2nd)*	Scotland	James Tytler		10
1788 - 1797	*Encyclopædia Britannica (3rd)*	Scotland	Colin Macfarquhar & George Gleig		18
1801 - 1803	*Encyclopædia Britannica Supplement*	Scotland	George Gleig		
1801 - 1810	*Encyclopædia Britannica (4th)*	Scotland	James Millar		20
1815 - 1817	*Encyclopædia Britannica (5th)*	Scotland	James Millar	Sold to Archibald Constable in 1816	20
1816-24	*Encyclopædia Britannica (6th)*	Scotland	Charles Maclaren	Sold to Adam Black in 1826	21
1830 - 1842	*Encyclopædia Britannica (7th)*	Scotland	Macvey Napier, assisted by James Browne, LLD		21
1853 - 1860	*Encyclopædia Britannica (8th)*	Scotland	Thomas Stewart Traill		21
1876-1889	*Encyclopædia Britannica (8th)*	Scotland	A. & C. Black		25

Figure 3.2: *Encyclopaedia Britannica* timeline, 1st- 9th editions

> *All our direct knowledge can be reduced to what we receive through our senses; whence it follows that we owe all our ideas to our sensations. This principle of the first philosophers was for a long time regarded as an axiom by the scholastic philosophers. They respected it merely because it was ancient, and they would have defended 'substantial forms' and 'occult qualities' with equal vigour.*[17]

By the 18th century, expert accounts and scholarship were included in encyclopaedias, although it was starting to be understood that there was too much information to fit neatly into one set of books, that knowledge would continue to grow.[18]

The most prominent example of the encyclopaedia genre is the *Encyclopaedia Britannica*. Like *Chambers's Encyclopaedia*, it has Scottish origins. Figure 3.2 shows the timeline of *Encyclopaedia Britannica* from the first edition until the ninth edition, and provides a visualisation of Loveland's observation of encyclopaedias expanding. The first edition of *Encyclopaedia Britannica* (1768-1771), was a three-volume set. By the second edition, the work had grown to 10 volumes, and by the fourth and fifth editions, it had grown to 20 volumes. In the period being studied here, the 8th and 9th editions of Britannica con-

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[17] English translation of D'Alembert, Jean le Rond. 'Preliminary Discourse.' The Encyclopedia of Diderot & D'Alembert Collaborative Translation Project. Translated by Richard N. Schwab and Walter E. Rex. Ann Arbor: Michigan Publishing, University of Michigan Library, 2009. Web. 10 October. 2017. <http://hdl.handle.net/2027/spo.did2222.0001.083>. Trans. of 'Le Discours préliminaire,' de *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, vol. 1. Paris, 1751.

[18] Katz (1998)

tained the largest number of encyclopaedia volumes, and had grown to 21 and 25 volumes respectively.[19]

Two other famous encyclopaedias of the 18th century, the *Cyclopaedia: or, An Universal Dictionary of Arts and Sciences* (1728), produced by Ephraim Chambers[20] (1680–1740) and the *Encyclopédie, ou Dictionnare Raisonné des Sciences, des Arts et des Métiers* (1751–1772), edited by Denis Diderot (1713–1784) and Jean-Baptiste le Rond D'Alembert[21] (1717–1783) are important because they borrowed their alphabetical organisation from dictionaries. This alphabetical arrangement strongly influenced successive English and French encyclopaedias.[22] Dictionaries have much in common with encyclopaedias. Dictionaries are concerned with words and language; encyclopaedias concerned with topics.[23][24] However, Loveland finds that before 1750 the term 'dictionary of arts and sciences' was used in a liberal way to refer to proto-encyclopaedias.[25] Paul Luna states that for a time, mainly in the early 19th-century, alphabetical order and length of some entries makes these two genres interchangeable. He shows that in the 19th century, editors of both genres were still experimenting with design and layout. [26]

Ephraim Chambers's *Cyclopaedia*, was completed in two volumes. In addition to alphabetical order, it provided relatively easy-to-read articles, put emphasis on the arts and summaries of philosophical systems, and introduced cross-referencing for many subjects [27][28]. The cross references are in fact much denser than in the *Encyclopédie*.[29] It influenced many other encyclopaedias and was meant to be the model for Diderot's *Encyclopédie*.[30] The term 'encyclopaedist' was coined to refer to the contributors of the *Encyclopédie*, a

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[19]After the 9th edition, *Encyclopaedia Britannica* became a different entity. In the 20th century, the Britannica was purchased by American businessmen who revised it, making it less scholarly. The '10th edition' contained 11 volumes which supplemented the 9th edition, but the 11th edition printed in the United States was a new work with different aims. The mode of selling and distribution also differed, relying on door-to-door sales. In the 1960s its content was heavily criticised by many sources for being out of date, most prominently by Einbender (1962). Printed volumes in the late 20th century numbered 32 volumes, but other digital formats now exist for this work.

[20]Ephraim Chambers is not related to Robert and William Chambers

[21]D'Alembert ceased his role as co-editor in 1759 and the work was completed by Diderot.

[22]Katz (1998), p. 49. Citing Rey and Collison, Katz translates and summarises Alain Rey's *Encyclopédies et dictionnaires*, published in 1982 by Pressess Universitaries.

[23]Luna (2013), p. 172. Luna states dictionaries and encyclopaedias, in our sense of the words, were only beginning to be separated, but the best-defined genre to which any proto-encyclopaedia belonged was clearly a general one rather than one as specific.

[24]Katz (1998)

[25]Loveland (2013)

[26]Luna (2013)

[27]Katz (1998)

[28]Collison (1966)

[29]Loveland (2013)

[30]Collison (1966)

book created for the literary elite and regarded by them as a work of scholarship. Most who contributed to encyclopaedias were well-known scholars or philosophers and polymaths. For example, Diderot wrote articles in the *Encyclopédie* on subjects as disparate as economics, mechanical arts, philosophy, politics, and religion.[31]

Herman makes a distinction between the *Encyclopaedia Britannica* produced in Edinburgh and the *Encyclopédie* published in Paris, although both are products of the European Enlightenment era, which placed human thought as the primary source of authority and legitimacy. Namely, the French work reflects the period and place; the Scottish work was additionally made to create a lasting legacy that could be adapted as the years passed.[32] As exemplified in the *Encyclopédie*, the French Enlightenment was very much concerned with individual liberty and religious tolerance, in opposition to an absolute monarchy and the authority of the dogmas of the Roman Catholic Church. [33] As a historical testament to the French Enlightenment and French Revolution, the *Encyclopédie* reflects politics, religious controversy, and a spirit of general combativeness couched in wit. The tone of the *Encyclopédie* was openly subjective. Blom provides examples of Diderot using the *Encyclopédie* as means of dialogue with readers as well as contributors. Diderot would often expand on topics or contradict what contributors had written underneath their entries, if he did not think contributors covered a subject well or if he disagreed with what they wrote.[34]

In contrast, while the general humanist values and rational outlook of the Enlightenment were shared between France and Scotland, the Enlightenment that unfolded in Scotland had a different flavour, and Herman further argues, a more pragmatic bent.[35] Applied knowledge in the fields of medicine, law, economics and engineering were areas where the Scots particularly excelled. Furthermore, the great thinkers of the Scottish Enlightenment were teachers, university professors or clergymen who also took on an educational mission and the belief that knowledge would grow.[36]

> [Edinburgh]...*has been known for its educational institutions, and these draw many inhabitants to the city for the benefits they offer. At the head of these, is of course, the university, and these are besides theological halls connected with the Free Presbyterian, and other churches, and normal schools for training teachers. The High School and the Academy, and many of its private schools have attained a high repu-*

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[31]Blom (2004)

[32]Herman (2003)

[33]Gay (1996)

[34]Blom (2004), p. 151

[35]Herman (2003)

[36]Herman specifically mentions Francis Hutcheson (1694–1746), Adam Ferguson (1723–1816) and Thomas Reid (1710–1796) as examples of Enlightenment figures who were both teachers and clergymen as well as philosophers.

tation; but the most noteworthy feature perhaps is the exceptionally large sum which is annually derived for educational purposes from bequests led by citizens.[37]

Not only was education and the idea of passing on learning to the next generation paramount in Scotland, as reflected in the *Encyclopaedia Britannica*, the less overtly subjective style of language in Britannica was a contrast to the French work. Herman believes that the Britannica reflects qualities that are part of Scotland's 'national character.'[38]

> *The goal of the intellectual life was to understand in order to teach others, to enable the next generation to learn what you yourself have mastered and build on it. From the Scots' point of view the advancement of human understanding was an essential part of the ascent of man in history.*[39]

Like many encyclopaedic projects in the late 18th and 19th century, the *Encyclopédie*, took over 20 years to complete because it was managed by philosophers and scholars.[40] In the same amount of time, two editions of Britannica had been completed, and throughout its history, Britannica was managed by different editors with some experience as printers and newspaper publishers.[41] Since its inception, the *Encyclopaedia Britannica* embodied the notion that knowledge would expand, and that a work such as Britannica needed to be flexible enough to allow changes with subsequent editions,[42] although the subsequent editions were clearly following a basic template.

Another reflection of the environment in which the *Encyclopédie* was developed in contrast to the 18th century *Encyclopaedia Britannica* is the backdrop of the French Revolution. Collison writes that a 'great danger' to the completion of 'first class encyclopaedias' include 'war and revolution'.[43]

In addition to solidifying alphabetical order, established in the 17th century, the *Encyclopédie*, the Britannica, and Ephraim Chambers's *Cyclopaedia* contributed to a system of knowledge through long essays at the beginning of each of these works and sometimes a visualisation of their knowledge system. (See Figure 3.3. A larger version will be in Appendix B.) While these essays sought to enlighten readers and explain how their books made them different from the encyclopaedias of the past, they reflect that the editors

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[37]Patrick (1889) Volume IV, p. 201

[38]Herman (2003)

[39]Herman (2003)

[40]Loveland (2012), p. 246 and Yeo (2007), p. 58

[41]Colin Macfarquhar (1745–1793, Andrew Bell (1726–1809) and James Tytler (1745–1804) are among the editors of the first editions with business and management experience. Even Archibald Constable (1774–1827), who faced bankruptcy through over-speculation and complications resulting from the 1826 financial crash, managed to complete new editions of Britannica. Britannica entry (1911*a*)

[42]Herman (2003)

[43]Collison (1966), p. 200

MAP of the SYSTEM
of HUMAN KNOWLEDGE

UNDERSTANDING

MEMORY	REASON	IMAGINATION

HISTORY

SACRED (HISTORY OF PROPHETS)
ECCLESIASTICAL
CIVIL, ANCIENT & MODERN — CIVIL HISTORY, (*properly said*) { MEMORIES / ANTIQUITIES / COMPLETE HISTORIES
LITERARY HISTORY

UNIFORMITY OF NATURE — CELESTIAL HISTORY
HISTORY { OF METEORS / OF LAND AND SEA / OF MINERALS / OF PLANTS / OF ANIMALS / OF ELEMENTS

DEVIATIONS OF NATURE — CELESTIAL WONDERS / LARGE METEORS / WONDERS ON LAND AND SEA / MONSTROUS MINERALS / MONSTROUS PLANTS / MONSTROUS ANIMALS / WONDERS OF THE ELEMENTS

NATURAL

WORK USES OF GOLD AND SILVER — MINTING / GOLDSMITH / GOLD SPINNING / GOLDDRAWING / SILVERSMITH / PLANISHER *etc.*

WORK AND USES OF PRECIOUS STONES — LAPIDARY / DIAMOND CUTTING / JEWELLER, *etc.*

WORK AND USES OF IRON — LARGE FORGES / LOCKSMITH / TOOL MAKING / ARMORER / GUN-MAKING, *etc.*

USES OF NATURE — ARTS CRAFTS MANUFACTURES

WORK AND USES OF GLASS — GLASS MAKING / PLATE-GLASSMAKING / MIRROR MAKING / OPTICIAN / GLAZIER, *etc.*

WORK AND USES OF SKIN — TANNER / SHAMMY-MAKER / LEATHER MERCHANT / GLOVE MAKING, *etc.*

WORK AND USES OF STONE, PLASTER, SLATE *etc.* — PRACTICAL ARCHITECTURE / PRACTICAL ROOFITURE / MASON / TILER, *etc.*

WORK AND USES OF SILK — SPINNING / MILLING / WORK *like* / VELVET / BROCADED FABRICS, *etc.*

WORK AND USES OF WOOL — CLOTH-MAKING / BONNET-MAKING, *etc.*

WORK AND USES, *etc.*

PHILOSOPHY — SCIENCE OF NATURE

SCIENCE OF GOD — GENERAL METAPHYSICS, *or* ONTOLOGY, *or* SCIENCE OF BEING IN GENERAL, OF POSSIBILITY, OF EXISTENCE, OF DURATION, *etc.*
NATURAL THEOLOGY
REVEALED THEOLOGY — RELIGION / *whereby, through abuse* / SUPERSTITION
SCIENCE OF GOOD AND EVIL SPIRITS — DIVINATION / BLACK MAGIC

PNEUMATOLOGY OR SCIENCE OF THE SOUL — REASONABLE / SENSIBLE

SCIENCE OF MAN

LOGIC
ART OF THINKING — APPREHENSION / SCIENCE OF IDEAS / JUDGEMENT / SCIENCE OF PROPOSITIONS / REASONING / INDUCTION / METHOD — DEMONSTRATION { ANALYSIS / SYNTHESIS / NATURAL
ART OF RETAINING — MEMORY — ARTIFICIAL { PRENOTION / EMBLEM
SUPPLEMENTS TO MEMORY — WRITING / PRINTING — ALPHABET / CIPHER — ARTS OF PRINTING, READING, DECIPHERING — ORTHOGRAPHY
GESTURE — PANTOMIME / DECLAMATION
SIGNS — CHARACTER — IDEOGRAMS / HIEROGLYPHICS / HERALDRY / *BLANSONRY*

ART OF COMMUNICATING
SCIENCE OF THE INSTRUMENT OF DISCOURSE — GRAMMAR — PROSODY / CONSTRUCTION / SYNTAX / PHILOLOGY / CRITIQUE
SCIENCE OF THE QUALITIES OF DISCOURSE — RHETORICS / MECHANICS OF POETRY
PEDAGOGY — CHOICE OF STUDIES / MANNER OF TEACHING

ETHICS
GENERAL — GENERAL SCIENCE OF GOOD AND EVIL, OF DUTIES IN GENERAL, OF VIRTUE, OF THE NECESSITY OF BEING VIRTUOUS, *etc.*
PARTICULAR — SCIENCE OF LAWS OD JURISPRUDENCE — NATURAL / ECONOMIC / POLITICAL — INTERNAL AND EXTERNAL COMMERCE ON LAND AND SEA

METAPHYSICS OF BODIES *or*, GENERAL PHYSICS, OF EXTENT, OF IMPENETRABILITY, OF MOVEMENT, OF WORD. ETC.

MATHEMATICS
PURE — ARITMETIC — NUMERIC / ELEMENTARY / ALGEBRA — INFINITESIMAL { DIFFERENTIAL / INTEGRAL
GEOMETRY — ELEMENTARY (MILITARY ARCHITECTURE, TACTICS) / TRANSCENDENTAL (THEORY OF COURSES)
MIXED — MECHANICS — STATICS { STATICS, *properly said* / HYDROSTATICS — DYNAMICS { DYNAMICS, *properly said* / BALLISTICS — HYDRODYNAMICS { HYDRAULICS / NAVIGATION, NAVAL / ARCHITECTURE
GEOMETRIC ASTRONOMY — COSMOGRAPHY { URANOGRAPHY / GEOGRAPHY / HYDROGRAPHY — CHRONOLOGY / GNOMON
OPTICS — OPTICS, *properly said* / DIOPTRICS / PERSPECTIVE / CATOPTRICS
ACOUSTICS / PNEUMATICS / ART OF CONJECTURE — ANALYSIS OF CHANCE
PHYSICOMATHEMATICS

ANATOMY { SIMPLE / COMPARATIVE
PHYSIOLOGY
HYGIENE — HYGIENE, *properly said* / COSMETICS (ORTHOPEDICS) / ATHLETICS (GYMNASTICS)
MEDICINE — PATHOLOGY / SEMIOTICS
ZOOLOGY — TREATMENT { DIETE / SURGERY

POETRY — PROFANE / SACRED
NARRATIVE — EPIC POETRY / MADRIGAL / EPIGRAM / NOVEL, *etc.*
DRAMATIC — TRAGEDY / COMEDY / PASTORAL, *etc.*
PARABLE — ALLEGORY
MUSIC — THEORY / PRACTICE / INSTRUMENTAL / VOCAL
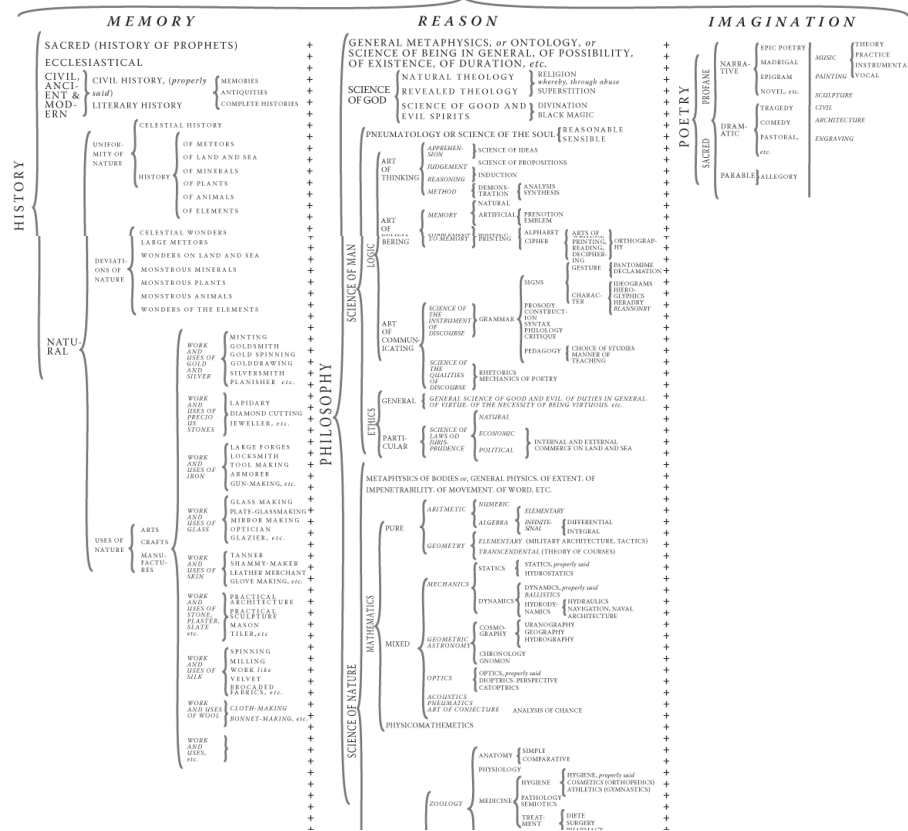PAINTING
SCULPTURE
CIVIL
ARCHITECTURE
ENGRAVING

Figure 3.3: English translation of '*Système Figur"e des Connaissances Humaines*' or 'Map of Knowledge' in *Encyclopédie* A larger version in its original language is in Appendix B.

assumed prior knowledge of classical education or presented insider references that only elites would understand. The perception that these articles or treatises were needed at all, changed in the early 19th century, along with the notion of what was information.

> *A gentleman was expected to have had a classical education to have an understanding and appreciation of politics and economics. This is why so many eighteenth and nineteenth century texts, whether they are novels, newspapers, pamphlets or speeches, use subtle references and quotations to classical works and poetry.* [44]

While Fyfe speculates that Chambers's use of 'information' in its publications as opposed to 'knowledge' may have had marketing intentions of differentiating the Chambers

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[44] Weller (2009)

firm from the Society for the Diffusion of Useful Knowledge (SDUK), she also suggests that 'knowledge', especially 'Christian knowledge' was a loaded term, and seems to be associated with spiritual literature and the charities that produced moralising material. 'Information' on the other hand, seemed to imply unprocessed and unbiased facts.[45]

Weller further notes a general change in Britain occurring throughout the 1800s – the use of the word 'information' has shifted its meaning. Information was becoming a cultural commodity embedded in material form.[46] While being an educated person was connected with class and social status, having access to information could be an ambition for those even of limited means. In his study of the intellectual life of the working classes, Jonathan Rose notes that:

> *Educated people commonly (though not universally) found something profoundly menacing in the efforts of working people to educate themselves and write for themselves. As* [Matthew] *Arnold predicted, culture was a force for equality and a destructive force for ideology, including the ideology supporting the British class structure. That hierarchy rested on the presumption that the lower orders lacked the moral and mental equipment necessary to play a governing role in society. By discrediting that assumption, autodidacts demolished justifications of privilege.*[47]

It has been argued that works by Chambers were radical, but in a less threatening way than some of the other advocates of the working class.[48] (See Chapter 2, Section 3: The Age of Publicists.) Economic inequality rested on inequality of education, writes Rose. With their 19th century-publications, the Chambers firm seemed keen to provide a way to empower people through knowledge and information.

3.3 Genres for 'The People'

As stated in the introduction, 'the people' was a political term in the 19th century, whose meaning shifted over-time. During the 1830s, 'the people' was understood to mean the middle classes; in the mid 1860s, it indicated both the middle and the working class.[49] However, based on articles that appeared in Chambers publications, for example, on emigration (covered in Chapter 2) their works also appear to be aimed at people *trying* to become part of the middle-class, or people who were in the lower-middle class but desired to rise socially and economically. In other words, Chambers readers seemed to be trying to improve their current circumstances, by gaining knowledge about the world.

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[45]Fyfe (2012)

[46]Weller (2009)

[47]Rose (2001), p. 20

[48]Scholnick (1999*a*)

[49]Carlisle (2012), p. 6

As was shown in the last chapter, social historians and scholars of the 19th century often compare the firm of W. & R. Chambers with the SDUK and Charles Knight (1791–1873), because of the audiences they were trying to reach. Both Chambers and SDUK produced cheap, printed material that were aimed at 'the people.' Both were also early adopters of steam printing presses, and their publishing models relied on printing and selling on economies of scale, to keep costs low for their customers. Knight and Chambers were also two of many publishers, engaged in a movement of high-minded support of universal education and self-betterment, but they are among the better remembered publishers from the 1830s because their content machines or publishing models worked with illustrated periodicals. (See reference to Hollis's study in Chapter 2, noting there were about 30 other publishers with similar goals to Chambers and Knight.)

Both Chambers and SDUK produced well-known and highly regarded periodicals – *Chambers's Edinburgh Journal* and *The Penny Magazine* respectively – which focused on publishing useful information for the masses.[50] [51] Furthermore, both produced illustrated encyclopaedias with high quality wood-engravings and article entries contributed by experts in different subject areas. Knight wrote that he believed that the power of the printed word could 'effect the moral improvement' of the 'lower classes'.[52] [53]

The *Penny Cyclopaedia* was produced or 'conducted' [54] by Charles Knight when he was associated with the SDUK between 1827-1846 and the Society acted as an intermediary between authors and printers.[55] (See Chapter 2, Section 3: The Age of Publicists.) According to Gray, while Knight's collaboration with the SDUK produced important works, such as *The Penny Weekly*, the *British Almanac*, and the *Library of Entertaining Knowledge* series, his relationship with them was complicated.[56] Like William and Robert Chambers, Charles Knight was an enthusiastic and dedicated worker, committed to the cause of popular education. Using his experience as a newspaper publisher, book editor and printer, 'Knight carefully navigated through the volatile book market and periodical press on behalf of the SDUK... often over-extending himself on behalf of the SDUK' and sometimes using his independent publishing income to help finance SDUK works.[57] One of the projects that had potential to be successful and which was highly influential, was *The Penny Cyclopaedia*.

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[50]Law & Patten (2009), p. 164

[51]Fyfe (2012), p. 8

[52]Feather (1988), p. 111

[53]Gray (2006), p. 53

[54]Charles Knight referred to himself as the 'conductor' rather than editor

[55]Gray (2006)

[56]Gray (2006)

[57]Gray (2006)

3.3.1   Comparisons of Knight vs Chambers encyclopaedias

In the preface of *The Penny Cyclopaedia* these are the stated aims:

> *The plan of this work differs in considerable degree from most other Cyclopaedias.*
> *These have generally given elaborate treatises on each branch of knowledge, often*
> *referring for the explanation of each term, as it occurs in the alphabetical order, to*
> *the general treatise. The plan of the* Penny Cyclopaedia, *as it is specially intended*
> *as a book reference, is not to attempt to form systems of knowledge, but to give pretty*
> *fully, under each separate head, as much information as can be conveyed within*
> *reasonable limits. But whilst it endeavours to present in detail the explanation of*
> *these terms of Art and Science, the right understanding of which is independent*
> *of any system, it also attempts to give such general views of all great branches of*
> *knowledge, as may help to the formation of just ideas on their extent and relative,*
> *importance, and to point out the best sources of complete information.*[58].

The preface of the first edition of the *Chambers's Encyclopaedia*, also includes a justification of the removal of the standard large treatises:

> *The general character of the work, now thus far advanced, is indicated by its title*–A
> Dictionary of Universal Knowledge for the People...*The information given may*
> *be characterised as* non-professional, *embracing those points of the several subjects*
> *which every intelligent man or woman may have occasion to speak or think about.*
> *At the same time, every effort has been made that the statements, so far as they go,*
> *shall be precise and scientifically accurate. One great aim in the arrangement of*
> *the work has been to render it easy of consultation...and distinguished on one hand*
> *from a collection of exhaustive treatises, and on the other, from a set of Dictionaries*
> *of special branches of knowledge.*[59]

The approach outlined by both Knight and Chambers is a more democratic way of structuring information. This model of an encyclopaedic frame allows readers to help themselves to whatever information they want and to browse freely. Information is also divided into small, easily digestible units that are easy for people to process, with cross references to further information if they want to explore a topic further. Readers do not need to be aware of the Baconian philosophy that influenced other encyclopaedias or be told that human knowledge is divided into memory, reason or imagination as previously shown in Figure 3.3. Or that older systems called certain branches of knowledge 'the trivium' – composed of grammar, logic and rhetoric. Many of the essays at the beginning of other

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[58]Knight, C., ed (1833*a*)
[59]Findlater, A., ed (1868)

well-known encyclopaedias before the 19th century (and some well into the 19th century like the *Encyclopaedia Britannica*) still contained these treatises as a way of not only organising knowledge, but as a way of framing the entries within the volumes. As discussed earlier in this chapter, many previous encyclopaedias had other agenda, for instance the *Encyclopédie* aimed to expand secularism and was in many ways an intellectual and political dialogue among elites.[60][61] However, when Charles Knight, acting as encyclopaedia editor and Andrew Findlater, editor of the first edition of *Chambers's Encyclopaedia*, decided to remove the essays for reasons stated above, they were democratising knowledge in a radical way.[62] While the editors made decisions over what went into the volumes, they essentially stated the volumes didn't need a further layer of overt mediation – mediation that also had implications regarding class and elite educations, to which Weller referred.

Weller writes that at the end during the 19th century, information became less associated with 'rhetorical argument' practiced by those with a classical, elite education, and information was valued in its own right, as a commodity that any person could aspire to obtain.[63] With this change, she argues, perceptions of information were transformed and became modern, in our sense of the word. Information became associated with speed. It could overcome distance, and like other commodities, information could be delivered according to schedules set by publishers on an industrial scale.

> *Thus everything is given that is a requisite of a generally well informed man in the less highly educated portions of society, and nothing omitted appertaining to intellectual cultivation, excepting subjects of professional or local interest...embracing only the more important departments of general knowledge... to afford the means of self-education and to introduce into the mind, thus liberated and expanded, a craving after still further advancement.*[64]

The model of encyclopaedia presented by Knight and Chambers places no penalty on readers for not having an upper class, classical education. No judgement is placed on them for what they don't already know, nor any expectation that they accept a philosophical world view to gain access to information. Furthermore, the new design of these encyclopaedias where readers quickly have access to the entries themselves, amplify this

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[60]Blom (2004), p. xxi

[61]Yeo (1991), p. 30

[62]Evidence seems to point to certain aspects of *Penny Cyclopaedia* being an influence on the first edition of *Chambers's Encyclopaedia*. See Chapter 1 for a discussion on how Knight's use for wood engravers shaped cheap periodicals. See Chapter 5, which shows that the Chambers firm had possession of the stereotype plates from three publications by Knight. It is likely that the Chambers brothers and the Findlater had seen the printed version of the *Penny Cyclopaedia* which had been in circulation for over 30 years at this point.

[63]Weller (2009)

[64]Chambers & Chambers (1874) *Information for the People*

content along the lines that Bhaskar mentions in this theory of publishing. In contrast, the introductory treatise of the 8th edition of Britannica seems to amplify the messages of Dugald Stewart (1753– 1828), James Mackintosh (1765–1832), Richard Whately (1787–1863), John Playfair (1748–1819), and John Leslie (1766–1832), whose own treatises take up the entirety of Volume 1 of this edition.

A criticism made by the Chambers firm of early 19th-century encyclopaedias was their size and their cost. In *Information for the People*, they state:

> *While little doubt can be entertained as to the value of the greater part of the works published in this country as Encyclopaedias or Dictionaries of General Knowledge, it must be equally clear that they are unfit by their size and price for the libraries of a large portion of the middle and the whole of the working classes.*[65]

Charles Knight was not completely satisfied with the production process of the *Penny Cyclopaedia* or the time-scale in which the work was delivered, due to the fact that he did not have complete control of the project from start to finish – instead he had to defer to the SDUK committee.[66] After the SDUK was dissolved in 1848, accepting Knight's offer of £6500 to buy the stereotype plates of works published under the SDUK's superintendence, 'Knight was free to recycle, reuse and revise' the Society's 20-year output, because he owned the copyright for the material he had worked on.[67] The *English Cyclopaedia*, that Knight later published, was based on the *Penny Cyclopaedia*, but with updated entries. In the Preface of the *English Cyclopaedia*, Knight explained that there were four divisions in this new work: I-Geography made of 4 volumes; II-Natural History made of 4 volumes; III-Arts and Sciences made of 6 volumes and 2 supplements, and IV-History, Biography, Moral Sciences and Literature made of 6 volumes.

> *During the progress of the publication, the Conductor [Knight] has become more and more satisfied that the plan of issuing 'The English Cyclopaedia' in Four Divisions is a judicious arrangement. It has the obvious advantage of completing, in a comparatively short time, large departments of knowledge with the most recent information.*[68]

In an advertisement of 1862 for the publication, Knight further explained that by organising the new encyclopaedia into smaller parts, this work was able to be issued quickly and the individual entries were better connected to other entries on the same subject.

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[65] *Information for the People*, Chambers & Chambers (1842*c*)

[66] Gray (2006), p. 55

[67] Gray (2006), p. 56

[68] Knight, C., ed (1859), p. vii

As separate works, the nature of the Cyclopaedia of Geography, of Biography, of Natural History, and of Arts and Sciences, is sufficiently clear. If the English Cyclopaedia had been arranged into two Alphabets, rather than four, the one department might have been called Literary *and the other* Scientific.[69]

It is also implied that each division can be purchased separately, and this advertisement is actually trying to encourage potential customers to purchase more than one division. A high profile customer who wrote about owning one division was British naturalist, Alfred Russell Wallace (1823–1913).[70] In the advertisement quoted above, Knight explains that natural history and arts and sciences divisions go well together to cover science, and that the geography division naturally goes with history and biography divisions to create works dedicated to letters and literature. Since this was text from the advertisement at the beginning of the volume, Knight seems to be trying to turn a customer of one division into a customer of at least one more division. The text here appeals to a reader's possible interest in either science or literature and history.

The *Penny Cyclopeadia*, *Chambers's Encylopaedia* and *The English Cyclopaedia* eschewed the essays and embraced alphabetical organisation, which Knight and Chambers stated was more intuitive than older encyclopaedias. As will be discussed in the next chapter, there was also a change in the way illustrations were used to convey information and attract readers. In comparison to the Britannica, both encyclopaedias produced by Knight had a high proportion of natural history illustrations; while the 8th edition of Britannica most frequently illustrates mathematics. One could argue that the high number of wood-engraved illustrations of appealing animals, as opposed to mathematical diagrams, reflects the different target audiences Knight intended for his encyclopaedias. It also seems that in his judgement, the presentation of mathematical diagrams might be either too sophisticated or too irrelevant for general audiences, and by not attempting to have as many illustrations of this kind as Britannica, Knight's encyclopaedias became both more enjoyable to explore for a new reader as well as more accessible.

In a similar fashion, the Chambers firm hoped to appeal to a broad spectrum of audiences with more affordable works. In the preface of *Information for the People*, which has been characterised by many historians as 'encyclopaedia-like', the editors state that Chambers publications are an effort:

> *...to place a work of an encyclopaedia* really *within the reach of the working-classes (sic.) and those next above them.*[71]

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[69]Advertisment. Knight, C., ed (1859)

[70]Wallace (2013), p. 39 Transcriptions of Wallace's letters mention that he has acquired the four volumes of Knight's encyclopaedia on natural history. N4:12ff; vols. 1-2 to Stevens 12 May 1856. Annotated copies of vols. 1-2 are in the Linnean Society Library.

[71]Chambers & Chambers (1842*c*)

Further in the preface, the editors stated that their publishing strategy involved se-
lection of 'only the subjects on which it is important that the classes in question should
be informed.' Therefore, subjects such as biography and topography and other subjects
thought important were covered in a way that these classes of people were assumed to
understand.[72] In direct correlation with Bhaskar's publishing model, Chambers's editors
explained here that they selected and filtered content, and by packaging and distributing
the content in an inexpensive way, more of their target audience was able to access their
material.

The Chambers firm began issuing the first edition of *Chambers's Encyclopaedia* in parts
starting in 1859. The parts were sold by subscription. Subscribers were given the option
of buying weekly parts in 520 instalments at a 1 and 1/2 pence each or purchasing the
same sheets bundled monthly at 7d. In 1860, the firm began producing the same sheets in
bound editions, originally to span eight volumes, but the content expanded to ten volumes
produced within an eight year framework.[73] [74]. According to archival records, orders
were steady, but initially slow. After 1868 when the full ten-volume set was complete, the
encyclopaedias eventually provided a steady income for the firm. In contrast, the ninth
edition of Britannica cost 30 shillings per volume, and there were 25 volumes.[75]

In terms of affordability, therefore, *Chambers's Encyclopaedia* was much cheaper than
Britannica, and it had the advantage that it could be paid for in more affordable instal-
ments. Salaries varied during the mid-19th century by geography as well as by type of
employment, but as a rough guide in the 1860s, an engineer (considered middle class)
could earn £110 per year,[76] a footman would earn just under £30 per year, and a maid
about £3 5s per year. [77] Since the total cost of the entire Britannica was more than £37, or
more than a footman's annual salary, it was therefore out of reach as a purchase. However,
at £4 10s in total, paid by instalments for *Chambers's Encyclopaedia*, this work could be
within the reach of footman's salary. [78]

The Penny Cyclopaedia, because of the way it had been organised through the SDUK,
was not quite the low-cost product that Knight had hoped it would be at £8. Writing
about the cyclopaedia project in his autobiography, Knight laments that 'I struggled until
the end [to complete it].' [79] Knight had intended the work to be completed in seven years,

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[72]Chambers preface-1842 *Information for the People*

[73]Fyfe (2012). The price for sheets was 5 shillings 7 pence.

[74]WRC 341-611

[75]Source: Advertisement in Blacks lists price.

[76]Skipper & Landow (2003)

[77]Weedon (2003), p. 114

[78]Although many people did not often purchase an entire run of an encyclopaedia, they could access it
through a subscription library. See Chapter 6

[79]Knight (1864), p. 334

filling 8 large volumes.[80] The advertisement in Volume VI, dated 21 April, 1836, No. 339 states:

> *In order to comply with the wishes of the bulk of the Subscribers to the Cyclopaedia, it is the intention of the [SDUK] Committee, upon the completion of the letter B, to publish at the rate of three volumes annually, instead of two; so that the entire work may be published in little more than four years from the present time. The monthly parts will therefore be raised to 18 pence each and four parts will complete a volume, instead of six.*

Instead, despite this notice of the increase to 18 pence and the promise *The Penny Cyclopaedia* would be done after four more years, the project ended up taking 11 years and containing 27 volumes all together. It took longer to produce and was actually more expensive than *Chambers's Encyclopaedia*. As indicated in Chapter 2, the success of the SDUK and of Charles Knight is usually associated with the early and mid part of the 19th century. However, the SDUK operated as a charity, and Knight had to answer to a 'well-meaning if often intrusive board' governing the SDUK.[81] This model was unsustainable, long-term, and was not helped by external factors like the the taxes on paper, advertising, and newspapers, all of which affected Knight's publishing work with the SDUK. After many of Knight's pioneering efforts showed promise, in the mid century the taxes on knowledge were removed, and the gates for this market were opened to other middle-class, professional business men producing cheap, illustrated publications that competed with SDUK publications.

In contrast, the Chambers firm was run as a family business from its start in 1819 as a printing business, and continuing as the firm turned to publishing in 1832. The family exercised control over titles, stock and their workforce, which was integral to the firm's success and profits. W. & R. Chambers operated into the 20th century as a family firm and still exists today as part of an international global conglomerate.[82]

Charles Knight had very clear ideas about the *Penny Magazine*, the *Penny Cyclopaedia* and other works, published while he worked with the SDUK between 1827 and 1846, unfortunately he did not have complete control over his workflow. A further illustration of the contrast between Chambers and the Knight can be seen in how both publishers approached the genre of the almanac, a long-established form that was aimed at a populist readership. Knight produced the *The British Almanac of the Society for the Diffusion of Useful Knowledge*, first published in 1829[83]; Chambers produced the *Book of Days* in 1864.

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[80]Knight, C., ed (1833*a*)

[81]Gray (2006), p. 53

[82]Chambers Harrap Publishers Ltd website

[83]*The British Almanac* and the *Companion to the British Almanac* was published annually between 1829 - 1874, by Knight and then other publishers after the SDUK disbanded and Knight's death. The title has

The almanac is a reference book published annually that contains statistical, tabular, and general information. Although it is not a serial, per se, as an annual it does rely on repeat business from the same customers. Before the 20th century, almanacs were usually arranged according to the days, weeks, and months of the year. Although there are examples of mid 19th-century almanacs aimed at the middle and upper classes,[84] as a genre they were primarily directed at the masses. Almanacs were often looked upon as 'vulgar' because they contained stories of sensational and violent events, astrology, and irreverent cartoons and poetry. When printing was first established in the 1450s, almanacs became one of the most inexpensive items to produce because they served as a medium for local businesses. Almanacs were often given away as a means of advertising and the study by Perkins reveals that they were common in most homes, even if there were no other reading materials. They were suitable for the illiterate and near-literate because some information was standard year to year, and symbols were widely used along with rough woodcut illustrations. Sales of almanacs tended to thrive in times of acute crisis and social unrest because they provided people with 'authoritative' advice in areas of their life 'where they felt they had the least amount of control.' [85] 'Rationalists detested these works' because they were seen as 'blind acceptance of tradition and superstition.'[86]

When Knight first got involved with the SDUK, his first major book project was an almanac for the lower classes. Knight wrote that he wanted to 'civilise' his readers, and Gray believes he did this to make a mark for himself as an ambitious popular educator. He believed there could be a successful steady demand for this genre from urban middle classes and artisans and he wanted to expand that market and 'uplift lower classes into it.'[87] Knight's successes with his *British Almanac* and *Penny Magazine* provided him with the encouragement to begin the Cyclopaedia project, which unfortunately had problems common to encyclopaedias in the 18th and early 19th century. While initially the *Penny Cyclopaedia* seemed cheaper for each part, overall the *Penny Cyclopaedia* cost the subscribers more than either *Chambers's Information for the People* or either edition of *Chambers's Encyclopaedia*.

In contrast to the SDUK, at the same time in the 1830s and 1840s, Chambers focused on producing cheap educational works. Aileen Fyfe, among others, has compared *Information for the People* with *Penny Cyclopaedia*, in terms of what similar audiences of the time might have been able to get from both serials, concluding that *Information for the People*, was the cheaper book series overall.[88] While I disagree with the view that *Information*

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variations.

[84]Godburn (2016), p. 58

[85]Perkins (1996), p. 154.

[86]Skouvig (2011) p.101.

[87]Gray (2006), pp. 48-49

[88]Fyfe (2009), p. 581

for the People is an encyclopaedia[89] and liken it more to a periodical turned book series (see Chapter 2), I do agree with her main point that Chambers' products provided better value for money than Knight's publications, and that Chambers produced work more efficiently as the decades of the 19th century unfolded. By working on smaller projects and carrying them out to completion, the Chambers firm was building experience working in emerging capitalistic markets (rather than relying on the good will of donors or charitable organisations for their business), building up an impressive stock list of titles, and promoting a brand. By meeting deadlines and providing quality content as advertised to their customers, their reputation and their place in the low-price print ecology grew and thrived.

The fact that Knight reissued the *Penny Cyclopaedia* under the name *English Cyclopaedia*, as separate divisions years later when he had more control over the project, and only took a few years to revise each division,[90] shows that he was adapting a publishing model and production workflow that, in part, was similar to Chambers. However, when Knight began the *English Cyclopaedia*, he was still tied to the late 18th century models of encyclopaedias. When a publisher is producing more than 20 volumes that are parts of one work, it seems their content machine is geared towards an educated, upper class audience who can afford to invest more time and resources waiting for its completion – more so, than a publisher who creates a series of smaller stand-alone, less expensive products. While these were not his stated aims, and presumably the monthly purchase made it affordable for at least some middle class readers, it seems that Knight had three goals with the *Penny Cyclopaedia*: produce a work that was scholarly, a work that was beautiful, and a work that was intended to be used by general audiences. However, because the publishing model he followed was not the most effective for these tasks, he only succeed in producing a beautiful and scholarly work, not one that could be purchased in full by the working class.

When the Chambers firm embarked on creating its encyclopaedia, it had several decades of experience, spent creating a sustainable business, which produced timely and well-regarded print material. Although it was subtitled 'A Dictionary of Universal knowledge for the People,' a long title reminiscent of the 18th or early 19th-century works, I argue that the model for this publication was not built following the approaches of past publishers. The Chambers firm was following publishing models that they already had. For example, in the period between 1830-1850, the firm published several series, including the *Peoples' Editions of fiction & foreign literature*, *Chambers's Library for Young People*, and *Chambers's Educational Course*. The firm also published the *Cyclopaedia of English Literature*, in 100 parts released between 1844 and 1855 priced at 1 1/2 d per part.[91] In the period between

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[89]Chambers initially made the marketing claim that it was like an encyclopaedia

[90]Knight completed the natural history section in only two years

[91]Fyfe (2012), p.84.

1850-1880 the firm published: *Chambers's Elementary Science Manuals*, *Chambers's Social Science Tracts*, the *Chambers's Etymological Dictionary of the English Language*, in addition to textbooks, science books and histories. See Appendix C for a list of popular titles. Nevertheless, all of these book series and individual titles are examples of works that were planned ahead of time, organised and packaged according to a perceived market, and then executed according to a pre-determined printing schedule. In pricing, Chambers products also seem remarkably consistent. In terms of what they were charging for parts as late as 1868, they managed to keep the rate for parts at 1 1/2 pence. The sheer volume of completed titles demonstrate the firm's professionalism, and on a wider level, show that the consumer cost declined for printed reading material. The preface for Chambers's *English Dictionary* states, 'the object of this work is to provide, within reasonable limits, and at a moderate price, a Dictionary of the English Language...for general use.' [92] With every publication, the firm's main goal was to produce a work that was affordable, useful and profitable for the firm.

While it was impossible to avoid unexpected problems[93] production delays of many months or even years, did not affect Chambers like they did with many other encyclopaedia projects. The management established during the firm's early decades carried it through the rest of the 19th century through changes in markets, legislation and printing technology. (See Chapter 2 and Chapter 5.) By the 1870s, although the Chambers firm always remained in family hands, the business was now being passed to the next generation of Chambers, with Robert Chambers Jr. (1832 –1888), and the younger brothers of the family taking on more responsibility.

W. & R. Chambers had many advantages that Knight did not. First, it did not have to pay a crippling tax on paper, as Knight had to with the earlier *Penny Cyclopaedia*. Moreover, the cost of paper went down in the 1850s when cheaper sources of paper were used.[94] Having a better content machine also meant having fewer vocal critics than Knight did on his encyclopaedia project.[95]

While Knight worked on an almanac project early, it was only after the first edition of *Chambers's Encyclopaedia* began, that Chambers started work on their almanac, the two volume *Book of Days* published in 1864. But this reference book was not a 'cheap work' like

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[92]Donald, J. ed (1872)

[93]Fyfe lists several challenges to their international trade like workers striking, products not reaching their destinations because of shipwrecks or fires or other acts of God, transatlantic competition will be discussed in Chapter 6 along with a fire on the J.B. Lippincott premises. Fyfe (2012), pp. 210, 228-237, 248-249

[94]Esparto grass combined with 5 to 10 percent wood pulp was used to make paper in the British printing industry from 1850 onward.

[95]Knight writes in biography that he felt very disheartened by public criticism of his work and his dealings with the SDUK, Knight (1864), pp. 200-205. His statement contrasts with positive reception of *Chambers's Encyclopaedia*, see Chapter 6.

the traditional almanacs Knight had worked in opposition to; it had lavish illustrations and was on the higher end of Chambers works, retailing between £1 – £2 for a two-volume set. As a genre, the almanac had gone up market thanks to the work of Knight and other professional publishers.[96] The *Book of Days* was influential in American and British markets, setting the template for other works like it.[97] However, the encyclopaedia was replacing the almanac's function of being the main book to consult for miscellaneous information in the home. Many middle class homes did aspire to have a complete set of an encyclopaedia, and one that was available at a reasonable price was produced by the Chambers firm.[98]

In 1862, historian and literary critic David Masson (1822–1907) acknowledged that 'universal knowledge was impossible,' but he wrote that the useful knowledge contained in them had value:

> *One need not be afraid of speaking too highly of the services rendered in the case of learning by good Encyclopadias, not only to the public at large, but also to the wisest and most learned. These services are great and splendid. An encyclopaedia in any man's house is a possession in itself for him and his family; an encyclopaedia chained at Charing Cross for public reference would be a boon to London worth fifty drinking fountains.[99]*

During the first half of the 20th century, when Britannica passed into the hands of American publishers, *Chambers's Encyclopaedia* assumed the position of the largest and most distinguished general multi-volume encyclopaedia published in the United Kingdom.[100] It seems that Chambers and professional publishers like them, took three genres, the encyclopaedia and the dictionary, which had been been aimed at the upper classes in the previous centuries and the almanac cheaply sold to lower classes and made all three into modern reference book genres, marketable to and affordable for 'the people' who in the second half of the 19th century meant *both* middle and lower classes. While Chambers was not the only publisher revising earlier publication models in the 19th century, the firm's output was substantial and influential.

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[96]Numerous publishers had worked on making the almanac genre more factual and relevant. Benjamin Franklin (1706–1705) grew profitable with his *Poor Richard's Almanack* which aimed to edify, and impart scientific or practical information.

[97]Katz (1998), p. 120. Katz provides the example of *Red Letter Days* but unfortunately in a printing error, a footnote was cut off from the index page, so this reference is not traceable.

[98]Katz (1998), p. 120

[99]Masson (1862), p. 366

[100]Kister (1994), p. 302

3.4 Chapter 3 Conclusion

Jeff Loveland observed that it was after the 1840s when encyclopaedias began to grow physically smaller because the expected readers of encyclopaedias were no longer polymaths – they were 'the People.' Once the audience of the publication is kept in mind, the businessmen who ran publishing houses developed more suitable, sustainable models to reach that audience.

The changing business structures which created different genres of reference works between the 18th- to the 19th-century have been examined in this chapter, comparing the encyclopaedic works as well an almanac produced by Charles Knight with similar Chambers publications. This chapter shows how the publishing model or content machine, used by the Chambers firm made the work easier to use and access than encyclopaedias that had come before it, by being more affordable, having fewer volumes, and presenting a more manageable knowledge-based product for an audience that the publishers expected to have busy schedules. Chapter 5 will expand on the production and reception of the encyclopaedia, comparing affordability between editions. However, this chapter shows that the genre designed with the First Edition reference book, could be consulted at the convenience of the purchaser. It was meant to provide a service to them.

Between the 18th and 19th centuries, new genres of reference books were developed by professional publishers to meet new markets and fill new expectations. Their decisions on what to include and how to structure and produce these works changed the nature of the genre, as well as the target audience. The Chambers firm encyclopaedia model was different from the encyclopaedias that came before, because it looked more to its own models of producing cheap content at a level pitched for 'the people' or the non-elite. The 9th edition of Britannica, produced after the first *Chambers Encyclopaedia* was released, was published without the opening dissertations which had been standard practice to include since the 1700s. While it has been lauded as the 'scholarly edition' for use of many prominent scholars, in terms of organisation, it was adapting to resemble some of the features of more modern encyclopaedias,[101] notably the Chambers model.

The Chambers firm drew on years of experience producing cheap educational material, that was attractive, and produced on time. Compared with predecessors mentioned here, it was more appropriate for general audiences because the first edition of *Chambers's Encyclopaedia* was 'more grounded in the experience of the average person than the Britannica was' [grounded].[102] Although Knight did have some organisational and administrative challenges, and did not achieve his goal of making the *Penny Cyclopaedia* available to more readers, his encyclopaedia did have some influence on the first edition of *Chambers's Ency-*

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[101]Encyclopedia Britannica (1875)
[102] Katz (1998)

clopaedia not just in some of the organisational content as described in this chapter, but in terms of illustration topics and illustration styles, as will be explored in the next chapter.

The next chapter will also expand on the fact that encyclopaedias regularly began to carry illustrations and tabular elements, and they became structured in a way to represent order and or control of the world intellectually. Publishers, including Chambers, produced a boom in commercial encyclopaedia publishing formats, that was only replaced with digital and online formats in the late 20th century.
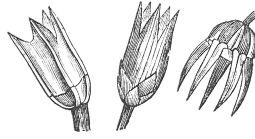
4   Visual content and form

The last chapter covered the origins of 19th-century encyclopaedias and models that publishers used to frame the content they were selling. It looked at intellectual organisation and how the encyclopaedia was marketed to different audiences. This chapter will focus discussion on visual content, graphical and tabular organisation, and overall design and presentation in both editions of Chambers, which served to aid encyclopaedia readers with understanding complex subject information. The results of comparisons between Chambers first and second edition, that analysed the illustration content and the illustration styles between them, will be discussed here. Other data collected on illustrations from five other encyclopaedias, specifically the *Penny Cyclopaedia* (1833-1843) and the *English Cyclopaedia* (1854-1862) produced in England; the eighth and ninth editions of *Encyclopaedia Britannica* (1853-1860) and (1875-1889) produced in Scotland, and *Johnson's Universal Cyclopaedia* (1876) produced in the United States, will also be presented here. These five particular encyclopaedias were chosen because they were in either in direct market competition with one of the first two editions *Chambers's Encyclopaedia*, or in the case of *Penny Cycylopaedia*, because there is evidence to show that it influenced the first edition of *Chambers's Encyclopaedia*. The data on illustration style and subjects depicted from Penny will be correlated with data collected on Chambers illustrations.

This chapter answers several questions (correlated with questions 3, 4, 8 and 5 in the Introduction): First, what subjects were chosen to be illustrated, and were there any visual trends in these reference books? Second, how did the style of illustrations impact the look and feel of both editions of *Chambers's Encyclopaedia*? Third, how did photography affect the design of wood-engravings for the second edition? Fourth, how were the values of the Chambers' firm communicated visually through different decades in its first two encyclopaedia editions?

Structurally, this chapter will first compare how features such as illustrations, fold-out maps and tables were used in the first two Chambers editions. Next, it will focus on data collected about illustrations across all the encyclopaedias named above, presenting the results of the visual content analysis exercise and reporting on trends for topics and illustration styles. Since there will be numerous comparisons in this section between

Chambers's Encyclopaedia editions, for the sake of brevity, this chapter will often simply refer to the 'First Edition' (1859-1868) edited by Andrew Findlater or the 'Second Edition' (1888-1892) edited by David Patrick.

Throughout this chapter, I will make the case that by selecting certain subjects and amplifying that content, the editors of all these particular encyclopaedias were hoping for market success, so they made certain choices. The data gathered reveals that natural history, medicine, technology and engineering were popular illustration topics in the encyclopaedias reviewed here. Data also shows that aesthetics in illustration changed. There is a notably higher proportion of illustrations that appear to look like photographs in the second edition of Chambers. More broadly, there was a shift in the manner of presenting information between the middle and the end of the 19th century. I believe that because of the data gathered from Chambers showing an increase in the use of tables and the prioritisation of statistical information between editions, a link can be made to other printed information appearing in urban centres towards the end of the 19th century—namely in schedules for steam powered transport, like ships and trains as well as the fact that statistical information, in general, was being collected, published and read.

Printed material in the industrial world was designed to facilitate quick comprehension to readers on the move, and had to be presented in such a way that immediately communicated complex information. As stated in Chapter 2, W.& R. Chambers was part of a wider print ecology, and the first two editions of the firm's encyclopaedia, and the images within them visually reflect this changing environment in the 19th century.

4.1   Summary of visual elements in *Chambers's Encyclopaedia*

In the second edition of *Chambers's Encyclopaedia*, the entry for 'Illustration of books' begins with this passage:

> *Since man first discovered how to convey his thoughts to others by means of writing, he seems to have felt the want of some method of illustration or embellishment. From the Egyptian papyrus down to the invention of printing this was supplied by pictures, coloured or uncoloured, engravings, carvings, &c., executed by hand...*[1]

The rest of the entry then chronicles the history and processes used in book illustration from relief methods, to intaglio methods, and covers planographic methods such a lithography. The entry for 'illustration of books' then ends with this paragraph directly speaking about wood-engravings:

> *Generally, it may be said that [wood-engraving is] more suited for subjects on a large [rather] than on a small scale, unless they are very slight, in which case they*

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[1] *Chambers's Encyclopaedia*, Volume 6, p. 81 Patrick, D., ed (1890*a*)

	Illustrations	Fold-out maps	Tables
First Edition	4066	33	506
Second Edition	3256	58	567

Table 4.1: Breakdown of images and graphical elements and their proportions in *Chambers's Encyclopaedia*.

can never pretend to be more than sketches. The great advantage is that of price and this of course tells more in large than small subjects. In the present work, for instance, it is found that wood-engraving is much more suitable than any other process, and all illustrations, except [fold out] maps, are presented in this manner. This holds good especially where good photographs from nature can be got for the reproduction, such as architecture, flowers, &c... In wood-engraving the photograph can be transferred direct on to the wood and engraved without further expense for drawing, and the result, both artistically and from a printing point of view is much more satisfactory... for finished picture work, good wood-engraving has not been superseded.[2]

According to these passages, as far as the Chambers firm is concerned, text and images inherently go together, since both forms of visual communication complement one other. Furthermore, when large amounts of text are presented, especially when discussing a large topic, or multiple topics together, Chambers found that wood-engraving as a printing method, suited their purposes – presenting the encyclopaedia, itself, as a clarifying example of how book illustration can be produced. These passages also highlight Chambers's use of illustration based on photos — essentially lauding it as the best medium for translating photographs into print.[3] It is important to keep these statements in mind when reviewing what the Chambers's firm presented to their readers. The influence of photography will be returned to when discussing evolving styles later in the chapter.

Table 4.1 shows the results of a visual content analysis exercise. It provides a numerical breakdown of graphical elements used in the First Edition in comparison with the Second Edition. It lists the total number of wood-engraved illustrations, the total number of fold-out maps, and the total number of tables. One can easily see here that there is a reverse correlation between illustrations and graphical elements—the second edition lost 810 illustrations when compared with the First Edition; while the Second Edition gained an additional 25 fold-out maps and nearly 60 tables. An example of a fold-out map,

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[2]Patrick, D., ed (1890*a*), Volume 6, p. 83

[3]See Chapter 1 Section 2.4.1 for additional information on Illustration styles, pictorial syntax, and specialisation. This will also be covered later in depth in this chapter.

Figure 4.1: 'Physical map of Africa', a fold-out plate, in *Chambers's Encyclopaedia* in the second edition, Volume 1, 1888.

produced by typo-etching[4] can be seen in Figure 4.1. Some fold-out plates have two maps printed on both recto and verso. In the case of entries for 'Europe' and 'Italy', historical maps showing past political territories were included in the Second Edition, allowing a comparison with the political boundaries that were current when *Chambers's Encyclopaedia* was printed between 1888 and 1892.

The revelation that there were more illustrations in the First Edition than in the Second Edition, came as a surprise because labour and paper production costs dropped by the 1880s and technology allowed printing speed to increase during the time of the second

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[4]Patrick, D., ed (1890*a*), Volume 6, p. 83. According to Chambers, in typo-etching, 'a polished brass plate is covered with a film of prepared wax, on which the lines are drawn with special etching needles which clear away the wax down to the metal. Letters and words are stamped through the wax with types of varying sizes as may be required. The wax, which is of course very thin, is added to by melting other wax over the surface with a heated pointed metal tool. This stream of melted wax is skilfully prevented from running into the lines or letters, and when thick enough to give sufficient depth to the finished block, an electrotype is taken from the plate, in which the cleared surface of the brass forms the raised lines, and the built-up wax the sunk or white parts.'

edition.[5] Therefore, one would have expected more illustrations in the Second Edition, not significantly fewer. Yet, this was not the case in *Chambers's Encyclopaedias*.

I believe that the following reasons account for the decrease in the number of illustrations between Chambers editions. Firstly, David Patrick's team of editors tended to include illustrations only if they aided in the explanation of an entry. Largely decorative images were excluded for some categories or greatly decreased in others. Secondly, for some topics, the illustrations that were chosen also tended to showcase inclusion of new knowledge in the volumes. The editors of the Second Edition seemed more selective, prioritising *what* would be represented and *how* it would be shown, and in line with their description quoted on the previous page, having fewer illustrations meant they would have saved costs on artwork. Additionally, between editions there were technology and workflow changes. This final point will be discussed at length in the next chapter which discusses production of the encyclopaedias more generally.

Besides wood-engravings, *Chambers's Encyclopaedia* had other features to appeal to potential readers, such as fold-out colour maps, printed by established Edinburgh cartographic publishers J. Bartholomew and W. & A. K. Johnson. However, while political maps were included in both editions, updated to reflect changing political realities that occurred over a two-decade period, the Second Edition further included a significant number more displaying other types of data. For example, physical maps displayed features like volcanoes and land elevation, as well as wind and ocean currents as shown in Figure 4.1. Historical maps, such as those of Europe and Italy, reflected governing entities and their territories from that past, allowing encyclopaedia readers to compare past geography with their contemporary nation-state boundaries.[6]

When the Second Edition was reissued in 1901, Patrick stated with pride that the edition contained more information to keep pace with the progress of knowledge.

> *New census figures and new statistics have been introduced in thousands of cases;*
> *and space has been found even for a certain number of new articles.* [7]

While thousands may be an overstatement, unless Patrick is also referring to statistical information within the text, there were nearly 600 tables in the Second Edition. Furthermore, 59 *more* tables were added compared with the First Edition, while illustrations have decreased by 810 images. (See Table 4.1) However, some entries new to the Second Edition included more tables than others. The increase in these extra features in the Second Edition, when compared with the First Edition, suggests that the presentation of infor-

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[5]Weedon (2003), p. 71

[6]Some fold-out plates have more than one map, not noted in the encyclopaedias index.

[7]Patrick, D., ed (1901) 'Introduction'.

mation was related to a broader 19th-century interest in gathering numerical data on a wide variety of topics. This interest began in Scotland at the very end of the 18th century.

William Playfair (1759–1823), Scottish engineer, political economist, and British spy, was a key founder of what is now known as graphical statistics. [8] In 1786 he invented the line graph and bar chart. In 1801, he developed the pie chart and circle graph. These graphs and charts influenced statisticians and social scientists in England, France and other European countries. [9] An early result of this interest in collecting and studying numerical data was the establishment of the first statistical societies, beginning with the Statistical Society of London, organised by Adolphe Quetelet (1796–1874) and Charles Babbage (1791–1871) in February 1834. Government agencies in the UK, France and the US routinely collected information on weather, transport, industry, commerce as well as census data, and it became possible for people studying statistics to make data-driven discoveries.[10] This trend correlates with what Michael Friendly characterises as 'a golden age in statistical graphics' from 1850 to 1900. This data gathering, combined with new printing technologies, enabled people to come up with inventive ways of representing complex information in a graphical way.

The rise of crowded urban centres also contributed to the need for display of data that could be absorbed quickly. Large amounts of tabular and geospatial information were printed for the benefit of traveling readers, or people commuting to places of work through urban environs. Portable publications in the form of guidebooks, time-tables, and maps, served major cities such as Birmingham, Edinburgh, Glasgow, Manchester, Newcastle and London.[11] Other countries also produced guide-books which included transportation time tables, thus inspiring French[12] author Jules Verne (1828 – 1905) to write a best-selling novel about fictional characters capable of plotting a journey *Around the world in 80 days*, based on the global knowledge of industrialised transport.[13] Verne popularised science and technology in his 'well-researched stories.'[14] [15] The entry on 'Verne, Jules' in *Chambers's*

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[8] Friendly (2008), pp. 507-508

[9] Friendly (2008), pp. 501, 507

[10] Friendly (2008), p. 503

[11] Dobraszczyk (2012), Katz (1998), pp. 257-259 John Murray III wrote several guidebooks to different countries dominating the English travel guide trade. Scottish publisher Adam & Black produced best-selling guides to Edinburgh as well as England, Scotland, Wales and Ireland.

[12] Verne's mother, Sophie Allote de la Fuÿe, was half-Scottish

[13] Verne & Towle (1873), pp. 18-19 reveal the printed schedules of steamships from London to Suez, from Suez to Bombay, from Calcutta to Hong Kong, from Hong Kong to San Francisco, and from New York to Liverpool; as well as the printed schedules of trains from Bombay to Calcutta, from San Francisco to New York, and from Liverpool to London.

[14] *Herald Scotland* (2005) indicates that Verne travelled to Britain 14 times to do research and used Scottish geographic features in his stories. His first visit to Edinburgh was in 1859.

[15] Evans (1988), p. 2

AGRICULTURE IN 1ST ED. VOL 1, P.81
CHAMBERS'S ENCYCLOPAEDIA, 1860
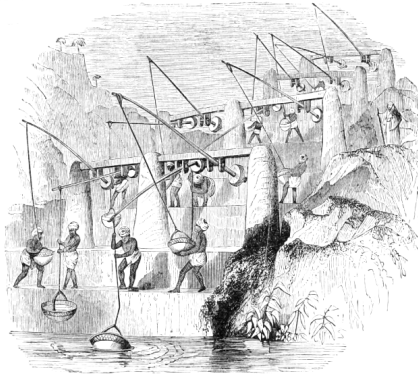
AGRICULTURE IN 2ND ED. VOL 1, P.100
CHAMBERS'S ENCYCLOPAEDIA, 1888

	1881.	1885.	1893.	OTHER GRAIN CROPS—	1881.	1885.	1893.
	cwt.	cwt.	cwt.		cwt.	cwt.	cwt.
WHEAT—				Barley	9,810,000	15,360,000	22,844,562
Russia	4,040,000	11,970,000	10,011,988	Oats	10,330,000	13,660,000	13,954,986
Germany	1,360,000	1,980,000	362,086	Peas	1,080,000	2,000,000	2,105,443
Turkey and Roumania	240,000	1,060,000	192,824	Beans	2,080,000	3,510,000	3,946,985
Egypt	1,070,000	100,000	10,586	Maize	33,420,000	31,460,000	32,965,503
United States	36,080,000	24,270,000	32,292,848	DEAD MEAT—			
Chili	1,090,000	1,620,000	2,580,147	United States—			
British India	7,330,000	12,170,000	6,196,096	nearly half being bacon	5,950,000	4,850,000	5,252,951
Australasia	2,970,000	5,270,000	2,589,588	Australasia	160,000	55,000	1,587,615
British North America	2,860,000	1,740,000	3,157,355	Total from all sources	6,830,000	6,710,000	9,304,664
Other Countries	50,000	1,280,000	8,048,470	Cheese	1,840,000	1,820,000	2,677,462
Total	57,090,000	61,460,000	65,461,988	Butter	2,040,000	2,400,000	7,327,474 / 1,299,970
WHEAT-MEAL AND FLOUR—				Margarine			
United States	7,600,000	11,730,000	16,709,328	Eggs (number)	756,600,000	1,002,000,000	1,325,518,320
Austrian Territories	1,100,000	1,820,000	1,090,614	Wool	lb.	lb.	lb.
Germany	1,400,000	1,400,000	116,164	Sheep, lamb, alpaca	184,550,000	238,180,000	677,947,464
Other Countries	1,300,000	900,000	1,368,285	LIVE-STOCK—			
Total	11,400,000	15,850,000	19,293,391	Cattle	319,000	373,000	340,045
				Sheep	935,000	750,000	67,682
				Pigs	24,000	16,000	138

Figure 4.2: Left: Illustration in 'Agriculture' used the First Edition, 1860, Right: Table of dated on crop production, used in the Second Edition, 1888.

Encyclopaedia states that he 'cleverly... gave ingenious verisimilitude to narratives of wild adventure carried out by the means of marvellous inventions.'[16] Verne's stories also show that printed guides, maps, and transportation schedules were commonplace items in 19th-century urban societies.

The presentation of more data in the following examples show that editorial priorities shifted between the First Edition and Second Edition. *Chambers's Encyclopaedia* increased the use of illustrations for specific purposes of instruction or providing an extra layer of information for clarity. However, if a table or map could convey more information succinctly, the editors sometimes chose to forego an the illustration in favour of presenting more information. The following case studies are samples from entries related to ships, as well as the entries on 'Agriculture', 'Parasites', and 'Edinburgh'.

4.1.1 Case studies of alterations between editions

Figure 4.2 shows how 'Agriculture' is represented visually in the two editions. In the First Edition, the image used displays the skills of a mid-nineteenth century wood-engraver who interprets a picturesque scene showing strong bodied men gracefully working with a shadoof, a device used for irrigation. In contrast to a well executed illustration, the Second Edition presents its readers with tables of data in its entry. In the First Edition, illustration is placed at the centre of page layout, presented halfway through the five-pages long 'Agriculture' entry. The Second Edition entry on 'Agricultural' is longer, at just over seven-pages long. It contains no illustrations at all. Instead, six tables of data are interspersed with the text. The table on the right of Figure 4.2 provides the largest example of

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[16] Patrick, D., ed (1892), Volume 10, p. 461. The entry on Jules Verne mentions other novels including his 'Glasgow worthies'.

all tables in the entry. This table on agriculture is organised into columns and rows, visually communicating industrial scale knowledge. Information on different crops such as wheat, oats, and barley production are presented during given years. Other tables in this entry show the number and value of cattle in the United Kingdom, the crops grown in Ireland, the amount of produce imported into the the United Kingdom from various countries, comparative data between UK agriculture and Continental Europe, as well as estimates of landowners and the amount of property each might own. This example demonstrates that between editions, the more decorative imagery of the First Edition is replaced with other visual elements that convey more data to readers.

The 'Agriculture' texts in both editions work in terms of being compatible with their respective graphic elements. Yet, this example highlights the markedly different styles of each edition's content. In the First Edition, the focus of the article is more historical, with an antiquarian reverence for ancient artefacts and documents. Instances of farming found in the Bible are mentioned, as is agriculture and animal husbandry in past civilisations through to modern times. In Chambers's second edition, there is more emphasis on the economic aspects of agriculture and what types of crops are best produced in different climates. Evidence and communication of certain scientific facts set the tone of the article which strives to explain the achievements of 'modernity'. The text seems to imply that living in competitive nation-states in Europe gave Europeans a technological, social, and political advantage. Despite their differing styles, the articles in both editions conclude with a message of 'progress' found in the West, highlighted by new technology. This message is consistent with other messages conveyed in Chambers publications. The Second Edition entry states:

> *Though Great Britain is the greatest manufacturing and mercantile nation in the world, agriculture is nevertheless her most important industry. Agriculture has profited greatly by the increasing of wealth flowing from other sources...vast strides of advancement have revolutionised ancient systems...* English *agriculture had gone through varied experiences of prosperity and depression. After the Repeal of the Corn Laws in 1846, its prospects were most gloomy, but it rose again with the revival and further development of trade, which was stimulated in an unprecedented manner by the vast increase in the application of steam in improving and hastening the means of transit by sea and land... Many machines and appliances altogether new have been placed in the farmer's hands, while those formerly possessed have undergone great improvement — all tending to increase their efficiency and lessen their cost.* [17]

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[17]Patrick, D., ed (1888*a*), Volume 1, pp. 98-99

PARASITE 1ST ED. VOL 7, P.265
CHAMBERS'S ENCYCLOPAEDIA, 1865

PARASITE IN 2ND ED. VOL 7, P.756
CHAMBERS'S ENCYCLOPAEDIA, 1891

Figure 4.3: Left: Illustration of a parasite used in the First Edition, 1865. Right: Table of data on parasites, used in the Second Edition, 1891.

In a similar vein to 'Agriculture', the First Edition contains an article on the topic of parasites with an illustration, but in the Second Edition, the entry on this topic contains a table of information, as can be seen in Figure 4.3. It is likely that the editorial decision to use a table of information, rather than an illustration, was influenced by a change in the state of knowledge between the First Edition and the Second Edition. More information was known about parasites after the 1870s, when further studies had been conducted on germ theory and microbiology. [18]

> *The study of bacteriology (see BACTERIA) has awakened the fresh interest in al–*
> *most every branch of medicine; and the subject possesses a large and extensive liter–*
> *ature of its own. The evolution of [germ] theory was due mainly to two factors: (1)*
> *The discussions and investigations which circled around the process of fermentation;*
> *(2) the application of more perfect microscopical methods to the study of the lowest*
> *forms of plant and animal life...The experiments of Pasteur and others on* Bacillus
> anthracis *indicate that by repeated cultivation process under special conditions it is*
> *possible to lessen the virulence of the most virulent of organisms and that inoculation*
> *with this altered bacillus confers immunity against further attack...Those and other*

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[18]Weber (2000); Patrick, D., ed (1888*a*) and Lerner & Lerner (2006) "Robert Koch." World of Microbiology and Immunology, edited by Brenda Wilmoth Lerner and K. Lee Lerner, Gale, 2006. Biography in Context.

PICTORIAL REPRESENTATION	FACSIMILE REPRESENTATION	SCHEMATIC REPRESENTATION

Edinburgh Castle from the Grassmarket.

View from Edinburgh Castle, looking eastward.

Environs of Edinburgh.

| EDINBURGH, 1ST ED. VOL 3 , P. 766 *CHAMBERS'S ENCYCLOPAEDIA*, 1862 | EDINBURGH, 2ND ED. VOL 4 , P. 199 *CHAMBERS'S ENCYCLOPAEDIA*, 1889 | EDINBURGH, 2ND ED. VOL 4 , P. 200 *CHAMBERS'S ENCYCLOPAEDIA*, 1889 |

Figure 4.4: Comparision of Edinburgh in first edition of *Chambers's Encyclopaedia* (left), with Edinburgh map and facsimile style illustration from second edition (middle and right).

kindred observations disclose a most hopeful development of the germ theory in the direction of preventative inoculation. [19]

In the First Edition, the illustration is part of the entry called 'Parasitic diseases,' specifically parasitic diseases found in humans. The entry is short, just over one page, and there are references to separate entries on 'Parasitic plants' and 'Parasitic animals'. Only two parasitic diseases are specifically mentioned, and the illustration in this entry is based on one that had been observed through a microscope by a Dr Carter, who had recently published a scientific paper. [20]

In the Second Edition, the entry for 'Parasitic animals', to which the table on the right of Figure 4.3 belongs, is just over 3 pages long. The entry for 'Parasitic diseases' is kept, but it has been shortened to half a column, and the bulk of information has been moved to 'Parasitic animals', which includes information on the evolution of parasites, environments in which they are found, and how their behaviour affects their host. A page-length table has been added to the Second Edition which classifies them by these categories: protozoa, sponges, worms, crustaceans, insects and vertebrates. [21] This Second Edition table is structured to present numerous facts in a logical and quickly digestible format for encyclopaedia readers.

The entry for 'Edinburgh' contains a final example of an illustration in the First Edition

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[19]'Germ' entry, Patrick, D., ed (1890*b*), Volume 5, pp. 168-169

[20]Findlater, A., ed (1865) Volume 7, pp. 264-265. Reference given in encyclopaedic text is to H.J, Carter, *Transactions of the Medical and Physical Society of Bombay.* circa 1850s Vol 5 and to Rev. M. J. Berkeley, *The Intellectual Observer: Review of Natural History, Microscopic Research, and Recreative Science*, 1863. Volume 2, p. 248

[21]At the time Chambers was published, only one parasitic vertebrate was known and listed – a hagfish. Today, more vertebrate parasites are known, including other fish (including sharks and eels), birds and bats.

being replaced with a different feature that contains more data. See Figure 4.4. In the First Edition, 'Edinburgh' contains an illustration to a scenic view of Edinburgh Castle from the perspective of the Grassmarket area. In the Second Edition, there are two new illustrations with very different illustration styles. One illustration is a city map of Edinburgh, the other illustration looks like it was based on a photograph of Edinburgh. Both the the aerial map view of the city, including its environs as well as the Firth of Forth, and the illustration which displays buildings of Edinburgh's skyline – familiar to anyone who knows the city – seem to serve the function of orienting readers into the physical space of this particular place. The map also provides geographic information, such as the main roads into the city, the names and location of different neighbourhoods and an idea of how large the Firth of Forth is, relative to Edinburgh.

Both editions of text seem to complement the images that were chosen to accompany it. The text from the 'Edinburgh' entry in the First Edition is descriptive and includes local history, mentioning monuments and landmarks. The article only takes up one page and a half. The opening text provides a flavour of the writing style:

> *Edinburgh, the capital of Scotland and chief town in the county of Mid–Lothian, occupies a picturesque situation on a cluster of eminences, at the distance of a mile and a half south from the Firth of Forth... about six miles in breadth.*[22]

In contrast the Second Edition text takes up four pages and includes more information about administrative functions of the local government, mentioning Scottish courthouses in Edinburgh, landmarks and other well-known public sites. Like the map and the realistic-seeming illustration, the text focuses on physical orientation, including coordinates for Edinburgh's latitude and longitude. A sample of this text, heavy with data, is given in these first two sentences:

> *Edinburgh, the capital of Scotland and county town of the shire of Mid–Lothian, is situated in 55° 57' N. Lat, and 3° 11' W. long. By rail it is 393 miles NNW. of London and 47 1/2 E. of Glasgow.*[23]

Unlike the new information in the 'Parasite' example, the cartographical coordinates may not have been new, but the desire of the editor to add as much factual information as possible to this article *is* new. It reflects an overall style and content departure from the previous edition.

Through these examples, the editors of the Second Edition demonstrate that they had different priorities compared to the First Edition. David Patrick and his assistants, are instead relying on other types of displays of data to communicate information to their

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[22]Findlater, A., ed (1868), Volume 3, p. 766
[23]Patrick (1889), Volume 4, pp. 198
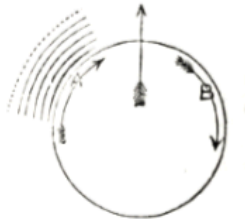
Fig. 1.

Horizontal section of a spherical bullet, **the** straight arrow shewing the direction of its for-ward motion or *motion of translation*, and the curved arrows that of its motion of rotation. The ball, in this instance, is supposed to have struck against the *right* side of the muzzle.
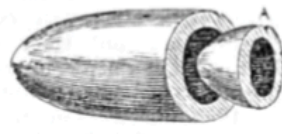
Fig. 2.—Minié Bullet.

Fig. 3.—Section of the Enfield Rifle.

a, groove; *b*, land.

Figure 4.5: Across top row: examples of illustrations for 'Rifle arms' in First Edition, Volume 8, 1867. The table and other illustrations on the bottom are from the entry for 'Rifles' are from second edition of *Chambers's Encyclopaedia*, Volume 8, 1891. The images are not to scale.

readers. In the First Edition, most entries for large countries contain demographic infor-mation, if not laid out in tabular form, as a list in the text, usually specifying population in different regions of that country. In the Second Edition, demographic tables are sup-plied, along with tables regarding relevant topics to that country like major industries and trading partners.

4.1.2 Case study: representing technology

When examining Volume 8 in both editions of *Chambers's Encyclopaedia*, one notices that under the *R* section, the entries for 'Rigging' and 'Rifles' present major differences—namely that one entry has been cut and the other one extended. In the First Edition, there

is an entry with illustrations called 'Rifle arms' that is 2 1/2 pages long. In the Second Edition, the 'Rifles' entry has expanded to 6 1/2 pages, with one of those pages containing two horizontally framed tables, one above the other. The table across the top is of a list of 'Rifles in the British Service from the Year 1800 to the Present Date' [1891], providing a physical description of the firearm by maker, and listing details such as barrel, bayonet and ammunition weigh and length. The table across the bottom lists military rifles in use in the principal armies of Europe and the United States immediately preceding the adoption of magazine rifles. It also provides numerical values for barrels and the weight and length of specific weapons. The weapons are categorised by country, and statistical lists document the velocities and the trajectory heights that these firearms and their ammunition produce. Unlike the other entries 'Agriculture' and 'Parasites' mentioned in the previous section, the Second Edition 'Rifles' entry does not reduce the number of illustrations with the addition of tabular information. In the First Edition, 'Rifle arms' takes up about five columns of text. The four illustrations fill up about one column of text, and show a cross section of different firearms barrels rather than of the actual weapons. Proportionally, the illustrations take up one fifth of the entry, the text takes up four fifths. In the Second Edition 'Rifle' takes up 11 columns of text, and the four illustrations in this edition take up a little bit more than one column of text [24] The two tables described above describing British, European, and American guns fill up an entire page, or two full columns. Proportionally, if we count tables and illustration together, the Second Edition entry on 'Rifles' has a ratio of nearly one-third graphical content and two-thirds textual content. It is a larger ratio of graphic material compared with the First Edition 'Rifle arms' entry which has a ratio of one-fifth illustrations and four-fifths text. In other words, not only is this a longer entry, but more information is being presented graphically in the Second Edition.

While it may appear that the increased space given to 'Rifles', and reduced space allocated for 'Rigging' prioritised the category of arms/armour over machines/vehicles in the Second Edition, visual content analysis, shows this not to be the case. See Figure 4.6 While there was a large drop in the number of machines/ vehicles, (the image frequency goes from 383 in the First Edition to 275 images in the Second Edition), it is consistent with the overall drop in numbers of illustrations between editions. Proportionally, machines/vehicles is still high. In fact, machines/vehicles are still one of the top four categories, compared with the arms/armour category that drops from 89 images in the First Edition down to 57 images in the Second Edition. Therefore, we need to look to other explanations to account for this shift that can be applied throughout the Second Edition.

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[24]The illustration of the Lee Metford Magazine rifle covers the width of one column and one half, which is 39.598 picas wide or 167.5 mm. 4.23 mm = 1 pica. More about encyclopaedia layout and printing measurements will be covered in Chapter 5, which is the production section.
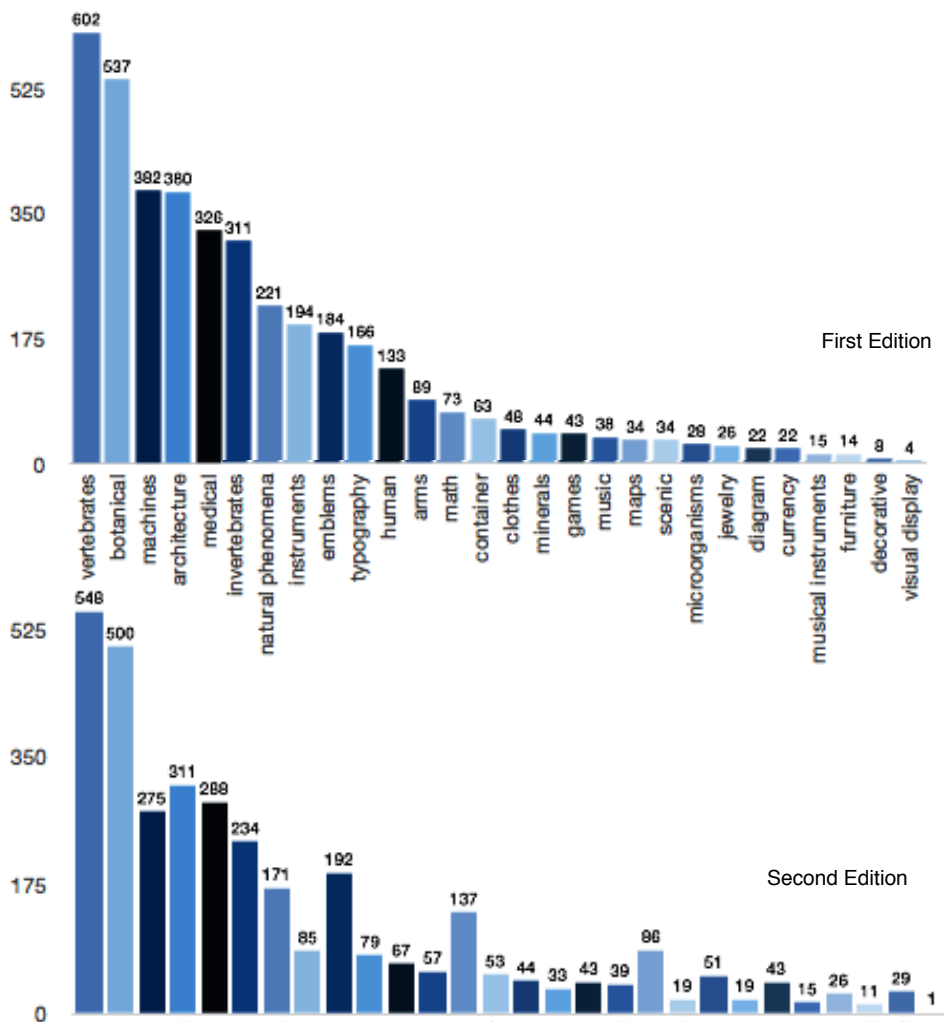
Figure 4.6: CCO categories used for visual content analysis between First edition (top) and Second (bottom). Table 4.2 displays numerical values next to their categories

4.2   Topical trends in encyclopaedias

The revelation that there was a decrease in illustrations between editions, leads us to the research question answered in this chapter: what subjects were chosen to be illustrated, and were there any visual trends in 19th century reference books? To answer to these questions, the following discussion will centre on images in terms of subject categories in the 19th century, as well as *how* certain categories were represented. The following trends were found using the content analysis tools described in the methods section, (Chapter 1, section 1.3.2) [25]

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[25] See Appendix A for visual examples of all topics here. Categories are based on CCO standard mentioned in the Introduction.

Category	1st ed	2nd ed	Category	1st ed	2nd ed
Vertebrates	602	546	Clothing/Textiles	46	44
Botanical specimens	537	506	Minerals/Geology	44	33
Machines/vehicles	382	275	Games/Sports	43	43
Architecture	380	506	Music	38	39
Medical specimens	326	506	Maps	34	96
Invertebrates	311	546	Scenic/Vistas	34	19
Natural Phenomenon	221	546	Microorganisms	29	51
Instruments, Scientific	194	85	Jewelry	26	26
Emblems	194	192	Diagrams	22	43
Typography/Alphabets	166	79	Currency	22	15
Human/Mythic Figures	133	67	Musical Instruments	15	26
Arms/Armour/Torture	89	57	Furniture/Domestic Obj.	14	11
Mathematics	73	137	Decoration patterns	9	29
Containers	63	53	Visual Display	4	1

Table 4.2: Number of illustrations per CCO category in first and second editions of *Chambers's Encyclopaedia*. Figure 4.6 shows this data as a historgram

As can be seen in Figure 4.7 and Table 4.2, both editions of *Chambers's Encyclopaedia* placed a heavy emphasis on natural history subjects.[26] Vertebrates and botanical specimens are the categories with the most illustrations, reflecting the wider popularity of 19th-century reading material on animals and the natural world. While the total number of illustrations went down in the Second Edition, vertebrates and botanical specimens actually increased in proportion to other illustrations in the encyclopaedia overall. The trend detected in my research between these two editions supports other studies of Victorian culture over the past 30 years on the growth of popular science, and its correlation with growing rates of literacy through the 19th century. For instance, Merrill writes that books on natural history were only marginally less popular than Dickens and that every newspaper had a natural history section.[27] More recent scholarship discusses the striking illustrations in books or in cheap guides produced by Rev J.G. Wood (1827–1889) or Philip Gosse (1810–1888) that sparked fashions for collecting natural objects or spotting different species on country walks.[28] Museum exhibitions, where people could interact on both a tactile and visual level, were also common ways that 19th-century people could

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[26]As explained in Chapter 1, Section 1.2 Research Methods, although *natural history*, itself, is too broad a subject and therefore not very useful in terms of categorisation for the purposes of visual content analysis, certain categories such a vertebrates, botanical specimens, and invertebrates are facets of the broader subject of 'natural history' or what is today called 'biology'.

[27]Merrill (1989)

[28]Lightman (2007), pp. 167-218 and Smith (2006)

RANGE OF CATEGORIES FREQUENTLY ILLUSTRATED, SHOWN BY NUMBER OF IMAGES PER TITLE

Encyclopaedia Name	Total no. of images	vertebrates	medical	botanical	architecture	mach /veh	maps	math
Penny Cyclopaedia	4942	848	640	382	253	260	201	450
English Cyclopaedia	5014	917	739	368	274	232	739	415
Chambers's Encyclopaedia, 1st ed.	4066	602	326	537	380	392	34	73
Johnson's Universal Cyclopaedia	2595	385	155	82	308	329	32	248
Chambers's Encyclopaedia, 2nd ed.	3256	548	288	500	311	275	96	137
Encyclopaedia Britannica, 8th ed.	4511	104	386	432	432	0	35	1333
Encyclopaedia Britannica, 9th ed.	6750	265	829	291	550	459	743	719

RANGE OF CATEGORIES FREQUENTLY ILLUSTRATED, SHOWN BY PERCENTAGE COMPARED WITH TOTAL NUMBER PER TITLE

Encyclopaedia Name	Total no. of images	vertebrates	medical	botanical	architecture	machine / vehicles	maps	math
Penny Cyclopaedia	4942	17%	13%	8%	5%	5%	4%	9%
English Cyclopaedia	5014	17%	15%	7%	5%	5%	15%	8%
Chambers's Encyclopaedia, 1st ed.	4066	15%	8%	13%	9%	10%	1%	2%
Johnson's Universal Cyclopaedia	2595	15%	6%	3%	12%	13%	1%	10%
Chambers's Encyclopaedia, 2nd ed.	3256	17%	9%	15%	10%	8%	3%	4%
Encyclopaedia Britannica, 8th ed.	4511	2%	9%	10%	10%	0%	1%	30%
Encyclopaedia Britannica, 9th ed.	6750	4%	12%	4%	8%	7%	11%	11%

* While images have been categorised as medical/anatomical, most images in 9th ed. are actually vertebrates being depicted from the inside as explained in Chapter 3.

Figure 4.7: Top subject categories depicted by wood-engraved illustrations

consume natural history,[29] while numerous local natural history societies emerged allowing them to share what they had seen or read. [30] Additionally, personal encounters with animals in traveling circuses, menageries, and zoological gardens were widely reported in Victorian illustrated periodicals. [31] The editors of both editions of *Chambers's Encyclopaedias* had a financial incentive for catering to a public interest in learning about animals and plants, and animals and plants provided good vehicles for communicating about science and self-improvement. The editors seem to be illustrating the entries that they thought would be popular and instructive.

The other editors of the works surveyed here, seem to have similar ideas when it comes to natural history. Illustration of natural history topics tends to range from 15% to 18% depending on encyclopaedic title. However, the visual content analysis categories show us that there were different editorial priorities for choosing illustrations within the field of natural history. As can be seen in Figure 4.7, not all encyclopaedias place a priority on the depiction of plants, indicated by the low number of botanical specimens illustrated in

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[29] Carroll (2007)
[30] Finnegan (2005)
[31] Cowie (2014)

Figure 4.8: Illustrations from *Johnson's Universal Cyclopaedia*, 1875. Left: Typical page layout with a large illustration. Right: Australian hunting scene

those works. For the *Penny Cyclopaedia* and the *English Cyclopaedia* natural history subjects were shown primarily by illustrations of vertebrates *and* invertebrates, particularly images of snakes and crabs. As a percentage, vertebrates and invertebrates each make up 17% of the total number of images used in *Penny Cyclopaedia*. Knight's reworking of these 20 plus volumes into the *English Cyclopaedia's* four divisions places most of its illustrations in the four volumes of the natural history division. Out of a total of more than 5000 illustrations, more than 3000 are found in these four volumes. The majority of illustrations in the other divisions are illustrations of ancient or contemporary coins, often used to depict rulers or people from antiquity and sometimes to represent the civilisations from whence they came, in addition to some architecture. The *English Cyclopaedia* retains the 17% proportion as the *Penny Cyclopaedia* of vertebrate illustrations, but invertebrates declines slightly to 16%.

Johnson's Universal Cyclopaedia, published in 4 volumes by Alvin J. Johnson & Co. of New York, proportionally matches the vertebrate illustrations in the first edition of *Chambers Encyclopaedia*, although it has far fewer botanical illustrations. The vertebrate illustrations that it does include are quite large in proportion to the page layout. See Figure 4.8. Many of the illustrations in these volumes depict animals that seem to be interacting with each other, posed either in familial ways such as the baboon mother and her baby as in Figure 4.8, or in a predator-prey dynamic. More research on American illustrations in

reference works needs to be conducted to see if dynamic or narrative poses was the norm for image styles, but these examples show that there was a very diversity of illustrations depicting similar topics.[32]

An exception to the supremacy of natural history illustrations within its pages is the *Encyclopaedia Britannica*. See Figure 4.7. The 8th edition of Britannica follows a completely different pattern from that of the other 5 encyclopaedias. As discussed in the previous chapter, Britannica was still following the earlier publishing model for producing an encyclopaedia. Now, we can see that there is a different approach to illustrations in *Encyclopaedia Britannica* as well. In the 8th edition there is still a dedicated volume containing only treatises, and over 270 of its illustrations are found in plates, rather than as wood-engravings integrated with its text. The 8th edition's most frequent wood engraved illustrations appear to be mathematics–1333 images, accounting for 30% of the total, followed very distantly by alphabets and typography, with 447 images, making up 10% of the total. Next, in terms of frequency, are both the topics of architecture and botanical illustration with 432 images each, making up 9.5% of the total.

The 9th edition of Britannica is different again from the 8th edition of Britannica as well as from other encyclopaedias in this survey. The top five categories are medical/anatomical illustrations–829 images, making up 12% of the total of 6750. Followed by maps–743 images, at 11%; mathematics– 719 images at 10.6%; and then architecture–550 images at 8% of the total. Like the 8th edition it still has nearly 200 illustrations that are found in its plates, but of those 198 images, 166 are now metal-engraved fold-out maps. The very high percentage of maps suggests that the publishing model being used by Britannica staff is in the process of evolving further from an 18th-century one to a model similar towards the other encyclopaedias mentioned here. These other books in the study by Chambers, Knight, and Johnson's, only used metal-engraved plates for fold-out maps, which were bound into the books.[33]

It is notable that in the 9th edition of Britannica, the overwhelming number of images that fall in the medical/anatomical category are skeletons of vertebrates, rather than medical illustrations of internal organs such as in Chambers. Figure 4.9 shows the range of illustrations from *Chambers's Encyclopaedia*, 2nd edition, Volume 1 and *Encyclopaedia Britannica*, 9th edition, Volume 18, that could be classified as medical/anatomical illustrations. While the other encyclopaedias in this survey, primarily depict the external form of

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[32]Lippincott Company with Chambers, 17 August (1874). Lippincott specifically mentioned this book was in direct competition with *Chambers's Encyclopaedia*, but it is unclear what the market share was for Johnson's when compared with other encyclopaedias.

[33]Using metal engraving for illustrated plates greatly increases the price of the work. Fold-out maps made from plates in both editions of Chambers were likely purchased from firms specialising in producing maps and atlases. Therefore, including maps as plates, because they were outsourced from other firms, often was not expensive the the maps were produced and bought in bulk, especially by the end of the century.

Organs of the Chest and Abdomen:

A, B, lungs; C, heart; OO, diaphragm; P, liver; Q, gall-bladder; R, spleen; S, stomach; T U V, colon; W, W, small intestines.

Fig. 1.—Skull of Naked-eared Cuscus (*Cuscus gymnotis*). After Peters.

Chambers's Encyclopaedia, 2nd Edition, Volume I, p10   *Encyclopaedia Britannica*, 9th Edition, Volume XVIIIi p 728
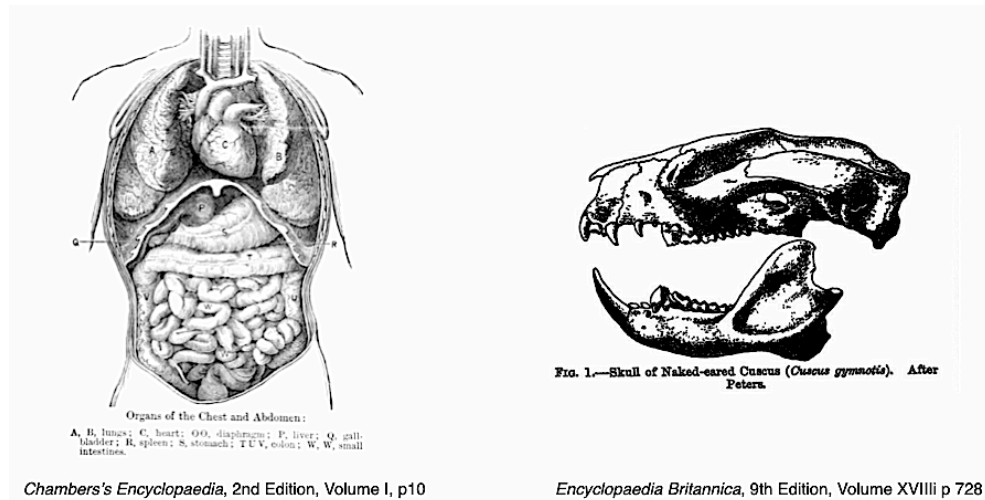
Figure 4.9: Different examples showing the range of what was classified as medical/anatomical illustrations under the CCO subject category.

vertebrates, Britannica's editors choose to illustrate an internal view of the same vertebrates showing bones and internal organs. If this is taken into account, and these illustrations are counted towards natural history broadly speaking, Britannica would have roughly the same proportion of illustrations at around 16% as the other encyclopaedias.

The next largest category for *Chambers's Encyclopaedias* are illustrations depicting machines or vehicles, followed by architecture or subjects related to the built environment. Schmitt and Loveland found that textually, British encyclopaedias provided more subject coverage of science and technology subjects in comparison to French and German encyclopaedias being produced between 1700 and the 1860s.[34] The high frequency of images relating to science and technology, not just in *Chambers's Encyclopaedia*, but in the *Penny Cyclopaedia*, in the *English Cyclopaedia* and in *Johnson's Cyclopaedia* shows the Anglo-American fascination with technological objects, and for engineering, not only seen in new machines, but in illustrations of structures from buildings to roads, to sources of energy. Eric de Maré writes that the two objects that best symbolise the Victorian age are the steam engine and the woodblock.[35] Indeed, numerous woodblocks of trains, steam engines, ships and other machines for producing paper, textiles, and printed works (amongst many others) have survived to the present day and can be found in the W. & R. Chambers collection at National Museums Scotland. Again, as a topic, illustrations of machines and vehicles populate all encyclopaedias surveyed here, with the exception of the 8th edition of Britannica.

Other areas of interest for this study, when trying to answer questions about why par-

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[34]Schmitt & Loveland (2017), p. 332

[35]De Maré (1980)

Fig. 5.—Different kinds of Bacteria (mostly after Koch):
A. Micrococci, in drinking-water; B. in splenic fever; C. in cholera (Koch); D. from surface of water; E. in splenic fever (in thread-form, and with incipient spores); F. Spirillum, from putrefaction; G. Spirochaete, from the teeth; H. in relapsing fever, from blood; I. different forms of cholera microbe (Koch).
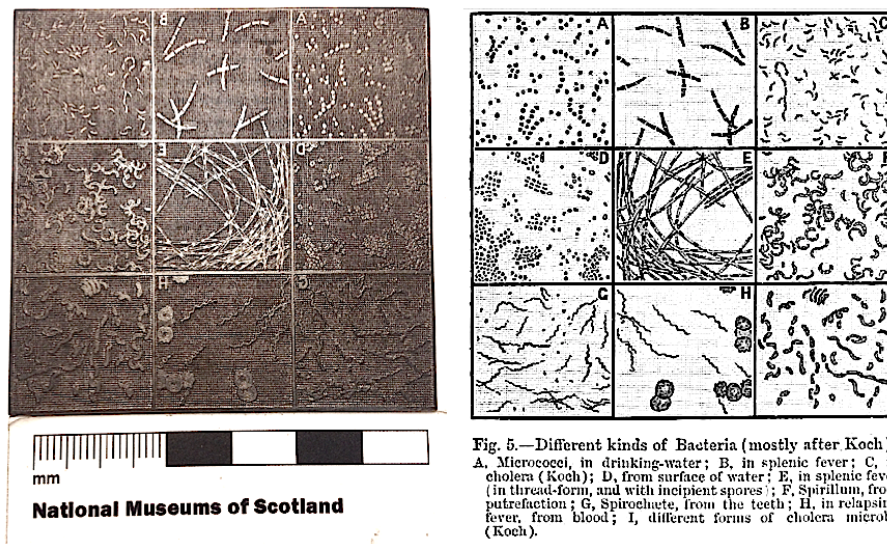
Figure 4.10: Electrotype plate of bacteria (left) with bacteria print in Second Edition (right), Volume 1. Electrotype from W. & R. Chambers collection (T.2011.56), National Museums Collection Centre, Edinburgh.

ticular categories of illustrations changed in number can be assessed by looking at four specific categories whose proportions changed significantly between Chambers's editions, either by increasing or decreasing in frequency. The categories to be discussed in the next section are: microorganisms, which nearly doubled from 29 images in the first edition to 51 in the second; diagrams, which doubled from 22 to 43 images; wood-engraved map prints, which jumped from 34 to 96, nearly tripling; and humans/mythic figures which dropped significantly from 133 images to 67.

4.2.1   Case studies: changes in topics and forms of illustrations

The first case study of a rising category has to do with bacteriology and germ theory, which were emerging areas of study in the 1870s and 1880s, as noted previously. Therefore, perhaps it is no surprise that as a topic, illustrations of microorganisms doubled proportionally in the second edition of *Chambers's Encyclopaedia*. Articles such as 'Anthrax', 'Germs', and 'Parasites', convey new discoveries made in studies of disease and health sciences, and in the Second Edition, new scientific understanding is introduced in the 'Bacteria' entry with new illustrations. Figure 4.10, shows the printed image and the electrotype used to make it.

Although illustrations were not always used in the Second Edition, as shown previously for certain topics, when tables might convey more information as was the case with 'Parasites', the entry for 'Bacteria' does show five new illustrations with captions that attribute
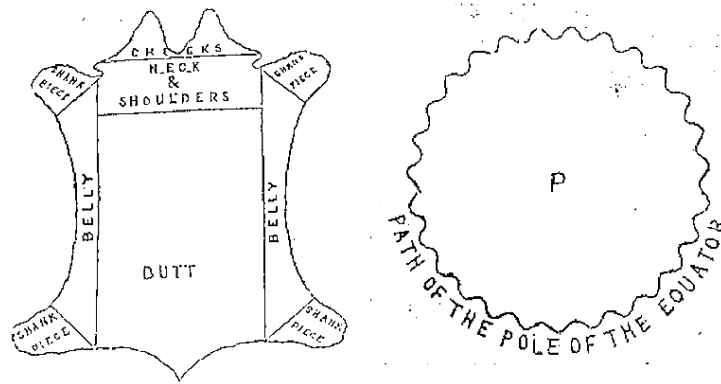
Figure 4.11: First Edition diagrams in *Chambers's Encyclopaedia* Volume 6, 1864. Left: From 'leather' entry. Right: From 'nutation' entry.

the works of either Friedrich Wilhelm Zoph (1846–1909) or Robert Koch 1843–1910) (seen in Figure 4.10) as their source of inspiration.[36] Both Zoph and Koch were German scientists, well-known at the time for studying plant disease and infectious diseases respectively. References to the titles of their original German works as well as the work by French scientist, Louis Pasteur (1822–1895) were given at the end of these entries.

The next CCO category to gain in number are diagrams, which are a type of schematic representation. Schematic illustration will be discussed further in the next section, which will detail different types of schematic illustration in *Chambers's Encyclopaedia*. However, for the purposes of clarity in this section, the term 'diagram' is used in this study to refer to illustrated abstractions that can only be understood by the entry's text or by image labels. Michael Twyman characterises these diagrams a having a non-linear open configuration.[37] Figure 4.11 provides two examples of diagram from the first edition, used to illustrate the entry 'Leather' in Volume 6, on page 67 and the entry for 'Nutation' in Volume 7, page 9. For the 'Leather' entry, the reader is meant to see how the skin and meat of an animal is butchered and prepared. However, no actual animal parts or final product from that animal is depicted. In the case of the 'Nutation' entry, the diagram shows the path of the planet Earth caused by precession as it rotates on its axis around the Sun. Again, the planet Earth, the Sun or the polar star are not being directly represented. The diagram visualises the concept of a gravitational wobble during the Earth's orbit. Although this category only consists of 43 illustrations in the Second Edition, it is indicative of the overall trend in Chambers to present more facts and more information through use of these graphical aids for learning.

Maps are another type of schematic representation. As mentioned previously there were two types of maps in Chambers divided here by printing process. One type that was

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[36]Patrick, D., ed (1888*a*), Volume 1, pp. 647-650

[37]Twyman (1979)
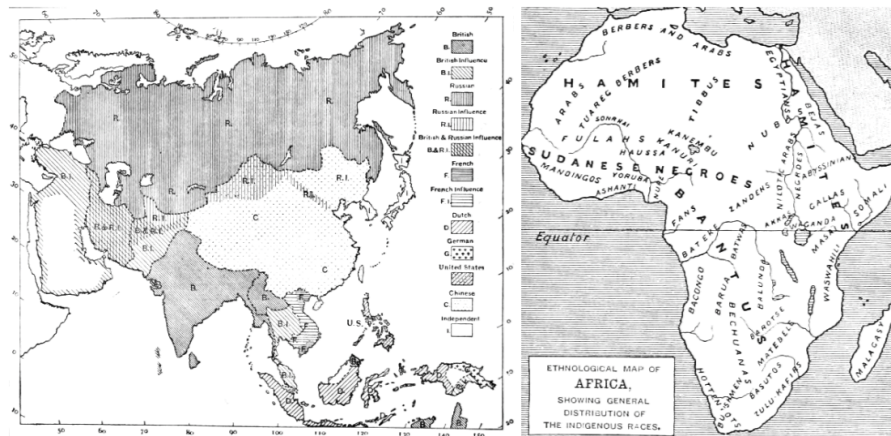
Figure 4.12: Map of Asia showing foreign powers 'spheres of influence,' (left from p. 493). Ethnographic map of Africa, (right from p. 85). Both images are from Second Edition, Volume I, Second Edition, 1860.

printed separately on fold-out plates; and integrated maps created by wood-engraving that are part of CCO subject categories, referred to in Table 4.2. It is likely that the number of maps in the Second Edition rose for similar reasons as the higher number of diagrams and number of microorganisms categories rose. Namely, because the editors sought to use types of graphic communication that conveyed large amounts of information quickly to readers, presented that information in new ways, and tied into the Chambers strategy of depicting science, technology and progress.

In the introduction to Second Edition, Chambers' stated aim was to provide more facts and more information as knowledge was growing. Not only had more of the world been explored in the 20-year period between the first and second editions, cartography and other methods of presentation of information had also advanced. 'New census figures and new statistics have been introduced' stated Patrick with pride.[38]

Many of the maps chosen also convey additional information, more subtle information that reflects political bias or an extra layer of meaning that can be interpreted by people with certain types of cultural or insider knowledge. Maps literally and figuratively reflect the state of the world and the people in it at a given time, as well as aspirations for order and control. Chambers's Second Edition not only contains more maps, but more types of maps. Maps that showed physical features like mountains, rivers and deserts. Maps that showed weather patterns of currents and winds. Furthermore, there were new maps that displayed ethnographic and linguistic diversity in geographical regions. The Second Edition didn't just show political borders, it also showed European spheres of influence as well as aspirations for colonial territories. See Figure 4.12. Many of the maps contained in

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[38]Patrick, D., ed (1901)

HISTORIC PORTRAITS   DECORATIVE FLOURISHES   RELIGIOUS FIGURES   MYTHIC CREATURES
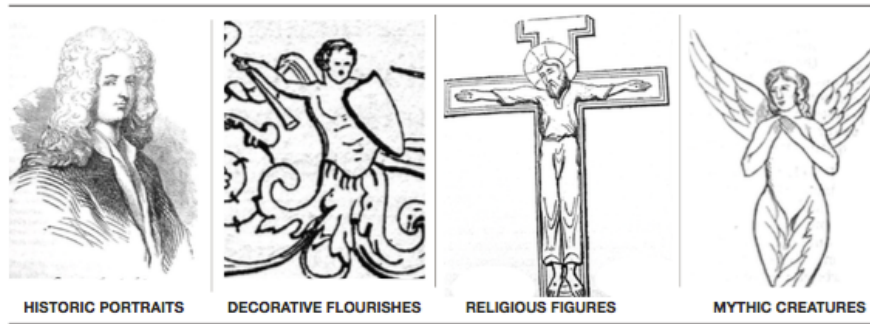
Figure 4.13: Examples of four types of 'human or mythic figures' that significantly decline in number in the Second Edition

ANCIENT CIVILISATIONS

MEDICAL OR TECHNICAL CONCEPT DEMONSTRATION

FOREIGN COUNTRIES

SPORT DEMONSTRATION
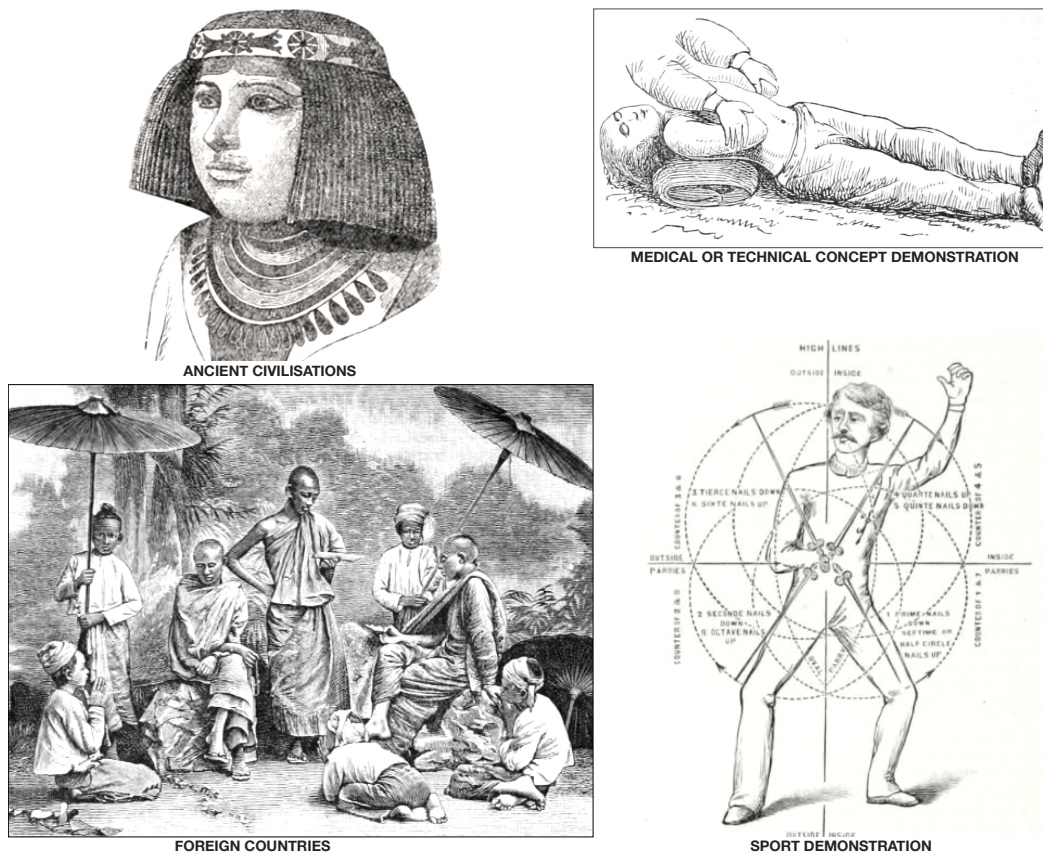
Figure 4.14: Examples of four types 'human or mythic figures' well represented in both editions.

these 19th-century encyclopaedias visually reflect the expanding British Empire and the expansion of industrialised societies.

The final category that will be mentioned in this section is human/mythic figures, which declined substantially between editions. Illustrations were placed in this category if the dominant visual representation was the depiction of people – historical or imagined be-

Figure 4.15: Stereotype plate (T.2011.56.309, left) and print (right) engraved to illustrate German 15th-century wood cutting techniques. National Museums Collections Centre, Edinburgh. The illustration appears in 'Chambers tracts on Wood-engraving' in 1845, 1868 and 1892.

ings, such as deities, heroes, and magical entities from folk tales, myths or legends.[39] This category was further subdivided into illustrations that were kept, discarded, or remained between editions.

As seen in Figure 4.13, the subcategory sorting activity indicated that historic portraits and decorative flourishes only appear in *Chambers's Encyclopaedia*, first edition. Religious figures and mythic creatures significantly decline between first and second editions. While images depicting deities and other mythological beings were retained, they greatly decreased in number.

In contrast, examples seen in Figure 4.14 show the four types of illustrations that persisted into the next edition were depictions of people in these areas. In images showing the ancient past, often drawn from art, such as paintings, sculpture, relief or from objects such as coins or vases; in images meant to show the appearance of foreign people; images that were didactic in some way; and images that demonstrated a medical or technical concept. Other examples found in the Second Edition, demonstrating some nuance to what was kept might be the illustration of *Apollo Belvedere*, a statue depicting the god Apollo, by a 4th-century Greek sculptor named Leochares, was retained in both first and second editions. (See Chapter 2, Figure 2.10) Housed in the Vatican, this statue of Apollo was featured not just in Chambers' works, but also featured in Knight's publications, most prominently as the cover for an 1832 edition of *Penny Magazine*. Although the *Apollo Belvedere* statue was surrounded by some controversy,[40] it served as a model that was copied repeatedly by many aspiring European artists. It was deemed a significant topic

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[39]See Appendix A.

[40]John Ruskin (1819–1900) and Walter Horatio Pater (1839–1894) were particularly critical of artistic aspects of the work.

on its own, so editorially it seems like it was worth keeping for Chambers editors. The Chambers entry describes it as 'The most famous representation of the god is the *Apollo Belvedere* in Rome, a figure in which are combined the highest intellect with the most consummate physical beauty.'[41]

However, as demonstrated throughout this chapter, simply because an entry with an illustration of a great work of art appeared in the First Edition, did not mean the illustration or the entry itself, would be retained into the Second Edition. As a category, humans/mythic figures, make this principle of visually enhancing and reorganising content between editions very obvious. There were three illustrations depicting the historical and religious Jesus Christ in the First Edition. However, in the Second Edition, there are no depictions of Jesus in either in the entry for 'Christianity' or in 'Jesus Christ'. Perhaps the editors believed their readers could easily see an image of Jesus when attending Sunday services, therefore prints showing paintings like *Ecce Homo*, used in the first edition[42] were dropped. However, despite the lack of a representation of Jesus himself, pictures of saints do appear in Second Edition entries like 'Wood-engraving,' which used the illustration of saints to demonstrate German 15th-century wood cutting techniques. The religious illustrations in this particular entry served the same purpose in the same entry in the First Edition — to provide a history of the trade and show the results of different printing techniques. As an article itself, 'Wood-engraving' expanded in the Second Edition, adding two new pages of text and illustrations which incorporated newer techniques for wood-engraving.

In the NMS collection there is both a wood block of 'St John Preaching the Apocalypse', and a stereotype of the same image. It is possible they were both used in the First Edition, it is unclear why the same image was reused in the Second Edition. Unlike the 'Apollo Belvedere' illustration which was altered slightly between editions, [43]'St John Preaching the Apocalypse' looks the same in both editions. A couple of reasons to account for reuse of this particular image, could be that some illustrations were considered important enough as a subject matter in itself to be retained and could have been included as an acknowledgement of earlier treaties (from previous Chambers publications) on illustration in Fig 4.15. Arguably, these particular illustrations of human/mythic figures could have been retained simply for convenience. Many of the illustrations in the 'Wood-engraving' entry, such as one illustration of 'St John Preaching the Apocalyse', appeared in the first edition, as well as other older Chambers tracts on Wood-engraving. The illustration appears in Chambers tracts on Wood-engraving in 1845, 1868 and 1892. [44] It could be

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[41]Patrick, D., ed (1888*a*), Volume 1, p. 336

[42]Patrick, D., ed (1889), Volume 3, p. 749, 1862

[43] See Chapter 2 for pictorial syntax

[44]*Chambers's Miscellany of Useful and Entertaining Tracts* was published 1845-1847, 1857-58, and 1868.

Figs. 3, 4, and 5, show the nature of this progression.
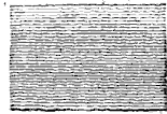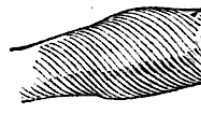
Having cut one or more of these early exercises, the parts of the block not to be printed must be lowered with a flat or gouging tool, so as to leave no parts so high as the lines.

Perfected in the art of cutting lines straight, bent, and waved, the learner may proceed to cross-hatching, which consists in cutting lines at different angles, and of different lengths, across other lines, with the view of expressing graduated depths of shade. The varieties of hatching are endless, from light tones, up to the darkest shadows. Fig. 6 represents a familiar kind of cross-hatching.
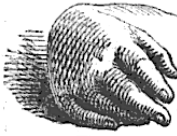
These specimens are given, more for the purpose of showing what cross-hatching is, than of inducing learners to prosecute this kind of engraving. Cross-hatching should always be sparingly employed, and in no case when an effect can be attained by simple lines; for it introduces complexity, and often too much minuteness of detail. "A good engraving," as Jackson observes, "viewed as a *work of art*, is *not* good in proportion, as many of its parts have the appearance of fine lace."

Figure 4.16: Detail from article on 'Wood-engraving' in *Chambers's Miscellany*. The layout and choice of images demonstrates how illustrations serves the purpose of instruction

that having an illustration model, readily on-hand, speeded the production process from woodblock to stereotype plate. This particular work will be discussed further in Chapter 5 (under section where Chambers sourced their material). But it could also be that this illustration's history seems to go back further than Chambers. This illustration was used by other 19th-century writers who wrote about wood-engraving history, such as John Jackson. [45] It could well be that Chambers wished to show a direct connection with other wood engravers.

Returning to the category about human/mythic figures, and the desire to produce a Second Edition encyclopaedia that contained and visually displayed more information, its important to reiterate how Chambers saw a distinction between illustrations for embellishment, and illustrations that provided instructive aid. A passage from an article on wood-engraving as far back as the 1840s, shows that for the firm there were different uses for wood-engraving.

During the last twenty years, it will have been observed how great has been the increase of works containing wood-engravings either for the purpose of illustration or embellishment...[46].

This series appears to have been re-titled *Chambers's Miscellany of Instructive and Entertaining Tracts* from 1869 onward.

[45] Jackson & Chatto (1861)

[46] Chambers & Chambers (1846) *Chambers's Miscellany of Useful and Entertaining Tracts* Vol.XI, No.85,

STORY OF VALENTINE DUVAL.

a large tract of land for them, by which means they were enabled to extend their charity. Finding that all his family were dead, he purchased the cottage at Anthenay in which he was born, and on its site built a house for the reception of a schoolmaster, where the children of the village who were unable to pay were educated.

When the Duke of Lorraine died, in 1729, his son the Duke Francis removed to Tuscany; and notwithstanding the endeavours made to retain Duval at Luneville, he followed the fortunes of the young prince, and continued to hold the office of librarian. When the Duke Francis was raised to the throne of Germany by his marriage with Maria Therese, Duval still remained near him, and had apartments in the royal palace. All these favours did not render him either vain or proud. His dress and his habits were alike plain and unostentatious: dividing his time between study, walking, and the society of a few select friends, his life glided on peacefully and agreeably.

Never wishing to make a parade of his knowledge, his frequent reply when questions were asked was, "I know nothing." On one occasion, while conversing with some ignorant person, he made use of this expression, to which the other replied, "The emperor pays you for your knowledge."

"The emperor," said the librarian, "pays me for that which I know; if he paid me for that of which I am ignorant, all the treasures of his empire would not suffice."

His life, sober, active, and accustomed to fatigue, was prolonged to an advanced period, and he died on the 3d of September 1775, at the age of eighty years. Amongst many other charitable bequests which his will contained, was one in which he gave 10,000 florins for the endowment each year of three poor children of Vienna.

Figure 4.17: Detail from 'Valentine Duval' layout in *Chambers's Miscellany* with a tailpiece illustration.

In the text of this work, examples are given of woodcuts [47] being used to attract and inspire illiterate people to enjoy the Bible. 'By such devices was the piety of our forefathers excited.'[48] The article further notes that because the medium of wood-engraving was capable of rendering fine details, the medium could be used to convey important information. A detail of the article, seen in Figure 4.16, uses illustration to convey specific information. It shows how different lines achieve different types of pictorial syntax. The images used in this article complement the instruction provided in the text.

On the other hand, Figure 4.17 from *Chambers's Miscellany* shows a wood-engraving

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p. 1

[47] See Chapter 1 for an explication of the difference between a woodcut and a wood-engraving

[48] Chambers & Chambers (1846) *Chambers's Miscellany of Useful and Entertaining Tracts* Vol.XI, No.85, p.2

used to embellish a story. The layout looks similar to the layout in Landell's *Illuminated Magazine* mentioned in Chapter 2. This tail piece has been inspired by 18th-century copper engraving styles. Both Figure 4.16 and Firgure 4.17 provide examples from earlier Chambers publications to demonstrate how illustration for embellishment or instruction could be achieved for Chambers publications over different decades.

Observations gained from particular case studies of different CCO categories which show large proportional changes between different categories of illustration, lead one to conclude that the shifts occurred because the Second Edition seemed to value illustrations that convey information focused on modernity or which served some practical function. That is, the number of illustrations in the Second Edition rose if they graphically explained information or if they showed a person, a place or an object that the editors didn't think the readers would know about because the information was new or the place or people were foreign.

4.3   A shift in the frequency of certain illustration styles

As stated by J.R. Pairman below, the artist's understanding of the wood-engraving process was as important as their level of skill.[49]

> *The first and most important requisite* [for book illustrations] *is to obtain drawings suitable for the purpose and these should be made by artists who have studied the capabilities and requirements of various methods* [of wood-engraving][50]

One of the best indicators of how encyclopaedias were changing visually can be seen in Figure 4.18, which depicts four instances of the 'Green Woodpecker' in encyclopaedias previously surveyed. Also included for comparison in Figure 4.18 is a 'California Woodpecker' from Britannica and two contemporary illustrations from the Royal Society for the Protection of Birds (RSPB) website that helps members of the public identify different species of birds. While four of the illustrations claim to be showing the same species, it is clear that the woodpeckers are depicted in very different ways. One could argue that the Second Edition Chambers bird illustration is the closest to the male adult Green Woodpecker illustration, but that the *Penny Cyclopedia* bird has similar patterns and features of the juvenile. What this group of illustrations indicates is that not only are the illustration styles shifting, but that the models for illustration are also changing. Figure 4.18 highlights two of the three specific styles of illustration that this section will discuss.

There are three general illustration styles that all images in the encyclopaedias surveyed here fall into: pictorial style, facsimile style, and schematic style. Examples of each style

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[49]J.R. Pairman is credited with writing the article 'Illustration of books' 2nd edition

[50]Patrick, D., ed (1890*a*), Volume 6, p. 83

Green Woodpecker
Penny Cyclopaedia, 1832
English Cyclopaedia, 1854

Green Woodpecker
Chambers's Encylopaedia, 1860-1868

Green Woodpecker
Johnson's New Cyclopaedia, 1876

Californian Woodpecker
Encyclopaedia Britannica, 1886

Green Woodpecker *Chambers
Encyclopaedia*, Edition 2, 1888-1892

Green Woodpeckers from *RSPB* website
Modern illustration of male and juvenile
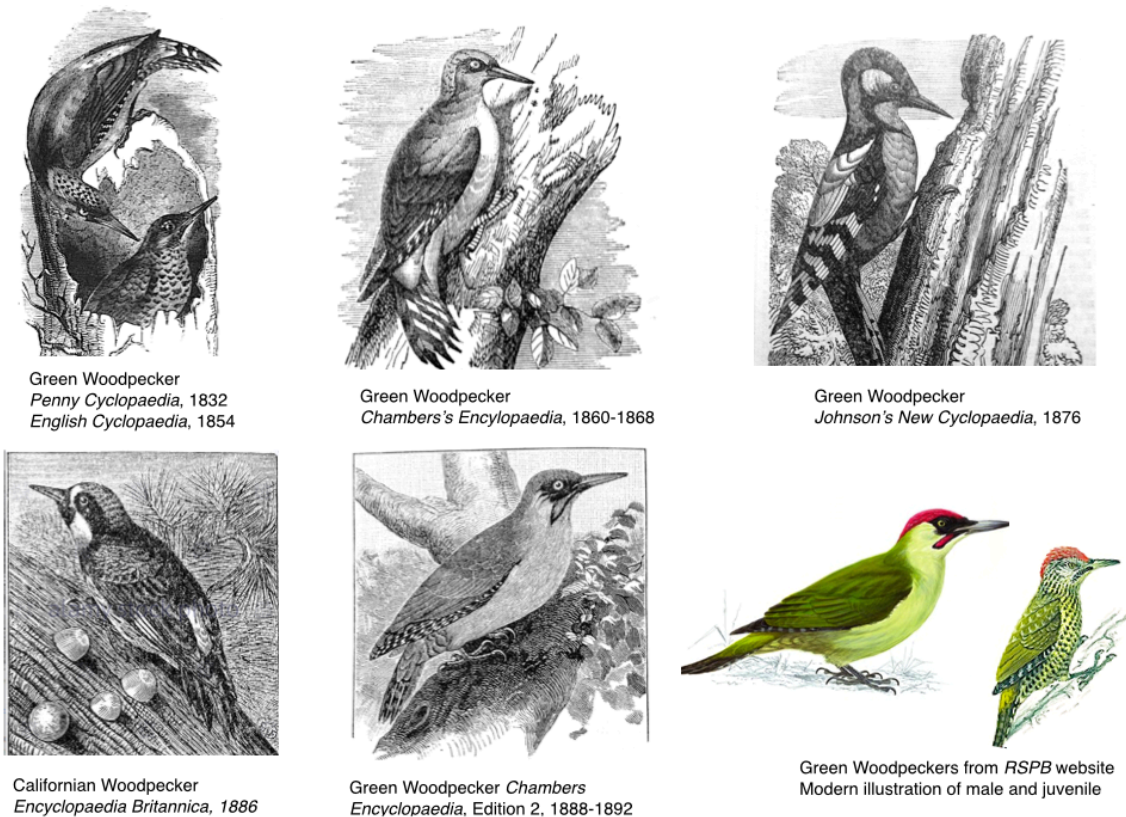
Figure 4.18: Changing illustration styles of 19th-century woodpecker compared with modern illustrations

are in Figure 4.19 across the categories of vertebrates, botanical specimens, architectural and domestic objects, and anatomical/medical illustrations. [51]

What is classified as 'pictorial style' has roots in 18th-century aesthetics when the concepts of the beautiful, the sublime, and the picturesque were tied to ideas of 'good taste' in visual art, literature, and music. As mentioned in Chapter 2, the visual aesthetics of 18th-century copper-plate engravings profoundly influenced wood-engraving, not just in books but in the illustrated newspapers, journals, and magazines as well. In the early 19th century, Charles Knight, John Ruskin (1819–1900), and others, believed that the visual arts had transformative power for urban audiences.[52] Wood-engraved illustrations

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[51]In my research, the terms 'pictorial' and 'facsimile' originate from Beegan (2008) and 'schematic' is a term from Twyman (1979). However, the terms are used by others, from Lindley (1970), to Anderson (1991), to Belknap (2016). The 19th-century wood-engravers, themselves, also differentiate between 'facsimile' illustrations and 'pictorial' illustrations. See De Freitas (1986) and Jackson & Chatto (1861).

[52]Woodson-Boulton (2012) p.85-87. Another reformer, Sir Henry Cole (1808–1882), known for developing the first commercial Christmas card in 1843, wrote about using design and art education to improve the lives of 19th-century working classes through local museums and galleries. Cole's work was concerned about artisanal training and industrial design, and he influenced the Great Exhibition of 1851.

PICTORIAL REPRESENTATION	FACSIMILE REPRESENTATION	SCHEMATIC REPRESENTATION

Figure 4.19: Examples of pictorial, facsimile and schematic illustration styles for vertebrates (top row), botanical specimens (second row), furniture/domestic objects (third row), and medical/anatomical (last row).

produced earlier in the century had visual qualities giving an impression that they might be drawn from an artist's imagination or a romanticised vision of a scene, although the image

Figure 4.20: Enlarged detail of an illustration copied from Thomas Bewick's *History of British Quadrapeds* found in *Chambers's Encyclopaedia*, second edition, Volume 10. 1892.

may actually be based on real objects or settings, such as the illustrations of a bulldog, an apple tree, the Bed of Ware, or a carnivore skull, seen in Figure 4.19.

Although many pictorial style illustrations, especially those created by highly-skilled engravers like Bewick and his apprentices,[53] could be accurate, the priority for illustrations with this style was to capture the 'essence' of an idea behind a person, place, or object and relate it to readers. John Ruskin, art critic, artist, Victorian social thinker and philanthropist wrote about aesthetics, Romantic sensibility, and a dislike for 'mechanical' aspects of the industrialisation. Ruskin also believed that deeper truths could be revealed through imagination and artistic expression. [54] Ruskin writes in 1847:

> *I know the pines are spruce fir* - Pinus nigra - *of such and such an age; that the rocks are slate of such and such formation; the soil, thus, and thus; the day fine, and the sky blue. All this I can at once communicate in so many words, and this is all which is necessarily seen. But it is not all the truth; there is something else to be seen there, which I cannot see but in a certain condition of mind, nor can I make any one else see it, but by putting him into that condition, and my endeavour in description would be, not to detail the facts of the scene, but by any means whatsoever, to put my hearer's mind into the same ferment as my mind.* [55]

In addition to emotional expression of 'deeper truths,' illustrations in this style could often serve metaphorical purposes. The Second Edition of *Chambers's Encyclopaedia* entry

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[53]William Harvey's work was both accurate and beautiful. Knight (1864), pp. 384-385

[54]Sprinker (1979)

[55]Letter from John Ruskin to Rev. W. L. Brown, September 28, 1847 Sprinker (1979)

on 'Wood-engraving', shows a copy of a ewe, originally engraved by Thomas Bewick as a tail piece illustration for *A History of Quadrapeds*. The entry also quotes Bewick's contemporaries, telling readers that that his work is not only beautiful but spoke to higher truths through illustrations. Figure 4.20, shown in the entry, asked people to have empathy for the unfortunate, represented by the ewe. The message the Bewick illustration conveyed was for readers to recognise and acknowledge the plight of the poor.

> *Bewick's works are also famous for their collection of tailpieces which display an infinite amount of humour and pathos... a copy of one of them – a poor ewe, in the starvation of winter, picking at an old broom in from of a ruined cot– a scene, trifling as it seems, which tells a woeful tale of suffering.* [56]

In contrast to pictorial-style illustration, which could be decorative, and not directly related to the text, the idea of facsimile-style representation was to depict an object in as realistic a way as possible; or to show how it would be encountered in the real world. Sometimes, the emphasis was not just on realistic illustration, but also on illustrating an object from a different point of view. [57] In the early-mid 19th century, trade catalogues contained illustrations that mimicked reality, attempting to sell their products by depicting them as they looked.[58] As previously stated in Chapter 1, facsimile and pictorial style drawing were both taught by masters in the wood-engraving apprentice system, until the 1850s. [59] Therefore, it is not surprising that both editions of Chambers have facsimile style illustrations in them as well as pictorial. Some Chambers illustrations, clearly state in their captions, 'from a photograph', as can be seen in Figure 4.21, in the illustration of Japanese Ambassadors. The origin of this image and the source of several other illustrations from both editions *Chambers's Encyclopaedia* will be discussed further in Chapter 5.

Figure 4.21 also provides an example of other Chambers publications between the first and second edition which used facsimile style illustrations. Next to the Japanese Ambassadors is a detail of the Walter Press used in the article on printing presses and the history of lithography in *Chambers's Information for the People*.

By the second edition of Chambers, many illustrations were based on photographs, and the captions indicated their origin. For instance, the 'corded poodle' was a photograph by Gambier Bolton (1854–1928), and used as the model for the illustration in the entry of 'Poodle' in Volume 8, page 310. Bolton was a prolific photographer of natural history subjects and was a source of popular photographs for Chambers publications. He was

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[56] Patrick, D., ed (1892)

[57] Lindley (1970), p. 55

[58] Lindley (1970), p. 97

[59] See Chapter 1, Apprentice training became variable due to the nature of deadlines associated with the periodical press.
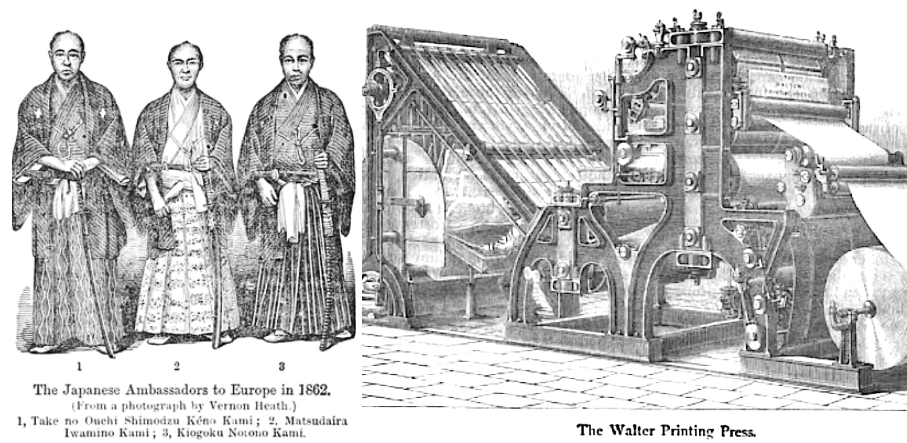
Figure 4.21: Two facsimile style illustrations. Left: Japanese Ambassadors from *Chambers's Encyclopaedia*, 1863. Right: The Walter Press from *Information for the People*, 1875
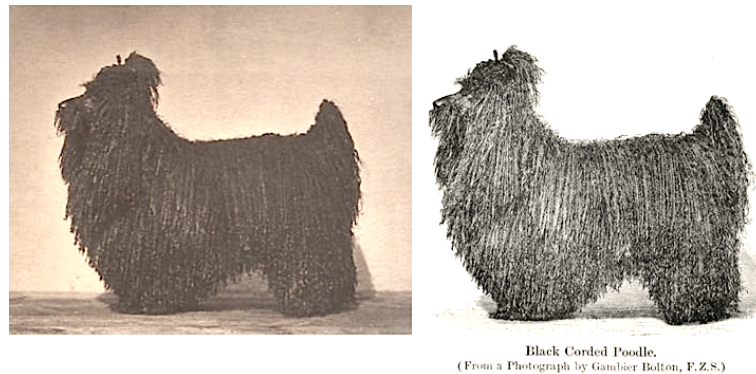
Figure 4.22: Corded Poodle photograph by Gambier Bolton and 'Poodle' illustration in Chambers, 1891

known in the late Victorian era for his candid images of wild animals in captivity and in nature.[60] More will be said about him in the next chapter.

Finally, the third style present in these encyclopaedias is schematic illustration. 'Schematic' has two meanings in relation to illustrations, both of which apply to the illustrations in the encyclopaedias. *The Cambridge Dictionary* states that a schematic illustration shows the main form and features of the object or person, usually in the form of a drawing, in order to help people to understand it. Examples include a medical diagram that explains how an internal organ operated, or a plan, labeled to show how a specific machine was assembled.[61] *Chambers's Encyclopaedia* contains schematic illustrations of the kind that range

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[60]Bonhams (2014)
[61]Cambridge University Press (2017)

Pure linear   Matrix   Non-linear directed

Linear interrupted   Pictorial, verbal, numerical graphic in non-linear open configuration
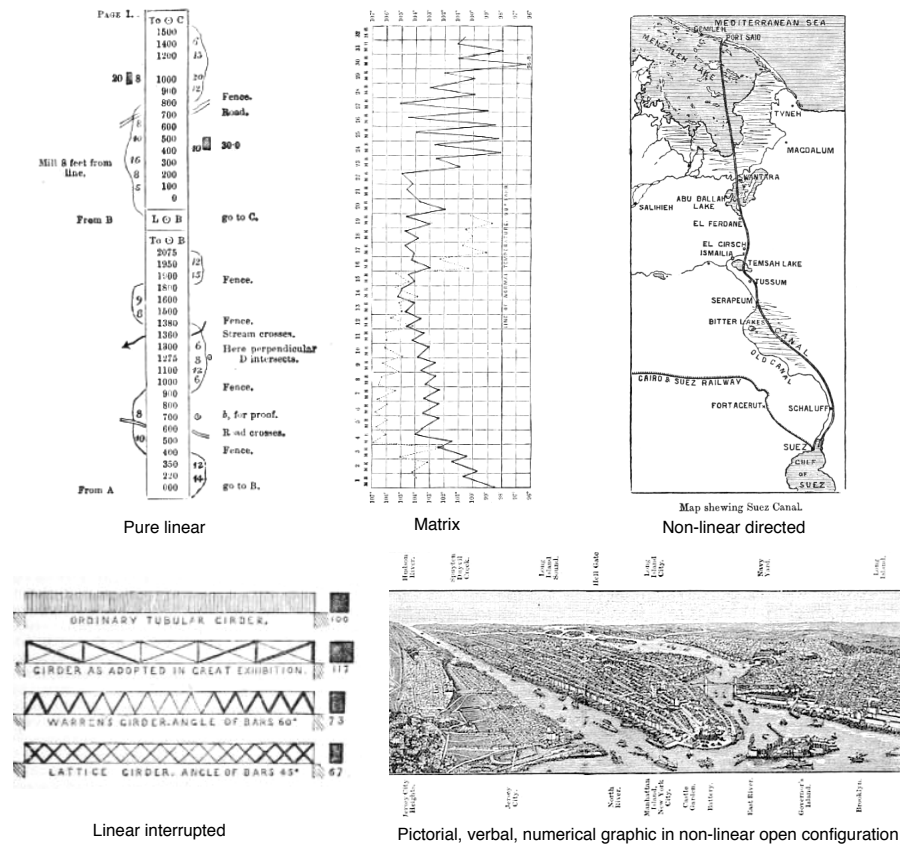
Figure 4.23: A sampling of different types of schematic illustrations found in both editions of *Chambers's Encyclopaedia* as designated by Twyman's *Study of Graphic Language*

from detailed and highly-technical objects, to simple line drawings conveying very abstract ideas. The second meaning of schematic illustration is a drawing or sketch showing how a system works at an abstract level, such as in Figure 4.11.

Michael Twyman identified some 36 general categories of graphic communication and an approach to describe them in *A Schema for the Study of Graphic Language*. He found that 10 are most commonly used by graphic design professionals.[62] Of those most commonly used, eight of them—pure linear, linear interrupted, list, linear branching, matrix, non-linear directed viewing, and non-linear open[63]—are the types of schematic illustration found in *Chambers's Encyclopaedia*. Figure 4.23 shows five of them *Chambers's Encyclopaedia* examples. Figure 4.11, showing diagrams of leather and nutation mentioned previously, are in a non-linear open configuration. Mentioning these types of schematic illustrations provide a visual context for schematic images present in these volumes.

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[62]Twyman (1979), p. 142

[63]These definitions, and other schema definitions by Twyman, are found in Twyman (1979).
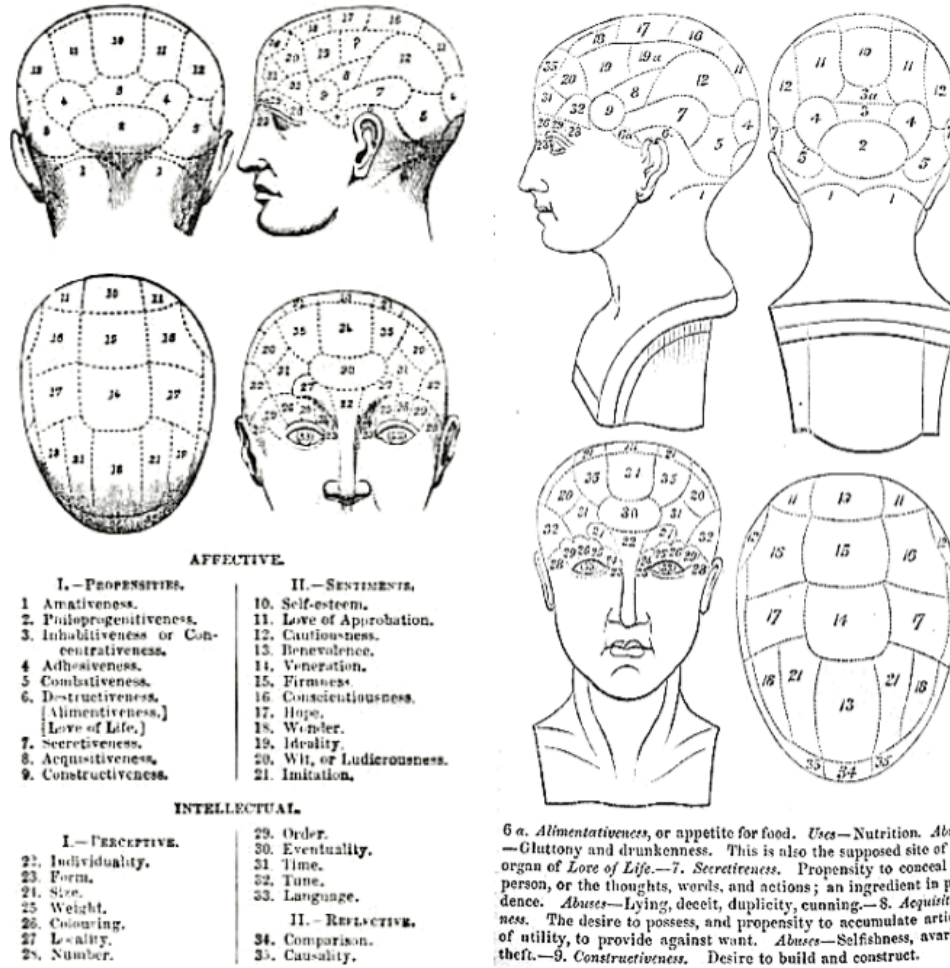
Figure 4.24: Left: Phrenology diagram in *Chambers's Encyclopaedia*, Volume 7, 1865. Right: Phrenology diagram in *Encyclopaedia Britiannica*, Volume 17, 1868

Schematic illustrations can be used in any topic, as shown in Figure 4.19, a matrix of four different subject category examples representing vertebrates or botanical specimens can be depicted in pictorial, facsimile or schematic illustration styles depending on editorial choice. Some topics lend themselves to being illustrated by one style or another, and in some cases, two or more encyclopaedias may end up choosing a very similar illustration for their entry based on the common convention and understanding of a topic at the time. Chambers Encyclopaedia used a 'schematic' phrenology diagram to illustrate its entry 'Phrenology'. Interestingly, the eighth *Encyclopaedia Britannica* phrenology illustration is virtually identical to the phrenology illustration in *Penny Cyclopaedia*.

Americans and Britons encountered phrenology in some form or another throughout the 1800s. Phrenology was a pseudo-science, largely discredited in 1810 by the scientific

community, but nevertheless popular with different individuals.[64] It was also crowd pleasing enough that after 1860, over 150 phrenology 'professors' could practice their trade on the piers of Blackpool and Brighton' in the UK, and keep thousands of travelling phrenologists in the US employed throughout the nineteenth century.[65] It propagated the idea that the human mind could be categorised into different mental faculties, with each faculty represented by a different area of the brain. On the head the development of these areas could be studied by analysing bumps, which developed where areas of the brain were active.[66] People who studied phrenology often used charts similar to the schematic style illustrations seen in the 'Phrenology' entries in order to read bumps on their own head or to have a practical 'professor' of phrenology make a reading for them. Therefore, it is understandable why this these diagrams would be used to explain phrenology in encyclopaedias entries. 'The following is a representation of the human head from four points of view, showing the positions of the cerebral organs according to Spurzheim and Combe...' states the text in the Second Edition 'Phrenology.' [67]

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[64]Alfred Russell Wallace (1823-1919) took phrenology seriously, as did Robert Chambers for a time. Sysling (2018). Robert Chambers was friends with George Combe (1788-1858) founder of the Edinburgh Phrenology Society. The Chambers firm also printed an inexpensive people's version of Combes' *Constitution of Man* that sold more than 40,000 copies according to Scholnick (1999*a*).

[65]Sysling (2018) p.267

[66]Sysling (2018) p.261

[67]*Chambers's Encyclopaedia*, second edition, Vol. 8, p. 156

First Edition	Volume 1	Volume 2	Volume 5	Volume 7	Volume 9	Average
Pictorial Percentage	0.54	0.45	0.43	0.37	0.46	0.45
Facsimile Percentage	0.07	0.07	0.03	0.05	0.13	0.07
Schematic Percentage	0.39	0.47	0.54	0.58	0.40	0.48
Other	0.00	0.01	0.00	0.00	0.01	0.00
Total	1	1	1	1	1	1.00

Second Edition	Volume 1	Volume 3	Volume 5	Volume 7	Volume 9	Average
Pictorial Percentage	0.23	0.15	0.10	0.15	0.13	0.15
Facsimile Percentage	0.38	0.32	0.36	0.36	0.37	0.36
Schematic Percentage	0.38	0.54	0.54	0.48	0.49	0.48
Other	0.01	0.0	0.00	0.02	0.01	0.01
Total	1	1	1	1	1	1
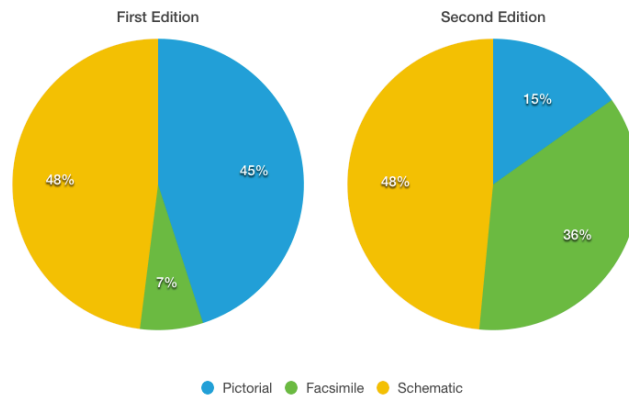
Figure 4.25: A sampling of pictorial, facsimile and schematic illustrations by volume, calculating average frequency of style used across both editions

The definitions and examples just provided are mean to help with understanding Figure 4.25, which shows a breakdown of how these three image styles were employed across both editions. Pictorial imagery appears 45% of the time in the first edition, but only 15% of the time in the Second Edition. Facsimile illustration only appears 7% of the time in the first edition, but 36% of the Second Edition. The use of schematic illustration, however, remained consistent at 48% in both editions.

However, this consistency does not mean that the same schematic illustrations were reused, as was the case with phrenology. The subject categories of mathematics, diagrams, and maps, which by nature use schematic representation, increased in frequency in the Second Edition. Additionally, were there were subject categories that dropped in frequency of use, for example in human/mythic figures there was a shift to different illustration styles, with images of humans that *were* kept, presented more frequently in either facsimile style illustrations or in images that were part of schematic diagram of some sort, to teach a particular concept.

An example of how use of schematic drawings changed would be in the entry for 'Fencing'. In the First-Edition entry, there were six schematic illustrations depicting different
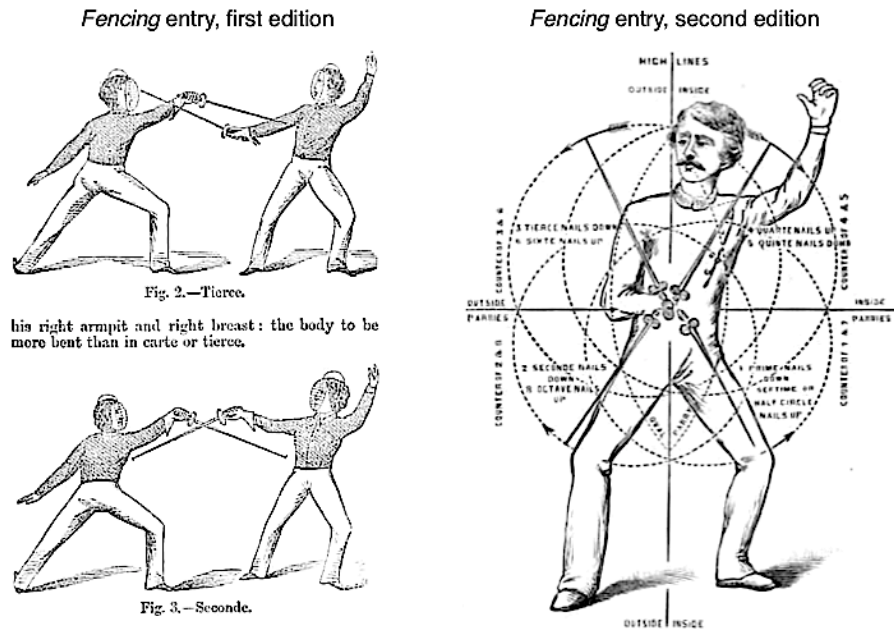
Figure 4.26: Left: A sampling of two of six fencing illustrations used in the first edition of *Chambers's Encyclopaedia* Right: One diagram illustration used to depict fencing in *Chambers's Encyclopaedia*, second edition

moves or stances for this activity shown.[68] However, in the Second Edition, this is replaced with one large illustration in a schematic style, attempting to convey the same information in one image.[69] See Figure 4.26. Replacing six small illustrations with one larger illustration seems to be an editorial decision aimed at the efficiency in producing content, and as will be covered in the next chapter, likely helped to save time in coordinating publication with a transatlantic partner.

I found that two subject categories that were well represented in both editions, architecture and medical/anatomical images, abundantly used schematic illustration to highlight certain features of specific subject topics. For example, for architecture, the encyclopaedia details parts of buildings such as arches, windows or pillars. For medical/anatomical images, parts of skulls or parts of internal organs, would be illustrated and labeled.

4.3.1   Illustration styles and clarity of content

Clearly, the use of different illustration styles by the Chambers firm changed over the decades in the 19th century and these shifts seemed to align with other external factors, such as the popularity of natural history images, and a growing preference for facsimile

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[68]Findlater, A., ed (1862),Volume 4, p. 284
[69]Patrick (1889),Volume 4, p. 578.

style illustration. A question raised here, and explored further in Chapter 6 on encyclopaedia reception is: Did these changes in illustration style impact the clarity of the encyclopaedias visual content? The answer depends on which particular image is being examined.

As stated in the Introduction, one of the methods used for research was a structured image analysis survey by experts, which sought to test if information imbedded in the illustration was communicated adequately enough that they, as subject experts, were able to identify an object being depicted in the illustration. They were also asked to provide feedback after viewing illustrations, determining if in their expert opinion the image was accurate, and if they had a preference for a First Edition illustration or a Second Edition illustration, when both were depicting the same subject. This last question on the survey aimed to test if there was a significant difference from an encyclopaedia readers point of view in terms of subject clarity brought about by the style of presentation from an illustration.

Overall, the answer seems to be 'no' to modern subject experts that were surveyed online and asked to look at a sample of images. The visual information contained in a 19th century illustration was communicated to them in the 21st century. Furthermore, although sometimes the experts used different terms when asked to comment or react to a particular image, many of their statements showed topical understanding regardless of whether an illustration was in pictorial, facsimile, or schematic style.

During the online survey where medical experts looked at images depicting a brain from the first and second editions of *Chambers's Encyclopaedia*, one medical expert commented that the illustration in the first edition 'seems more of an artistic impression', while the image of the brain in the Second Edition 'seems to be more of an instructional aid.' The images in *Chambers's Encyclopedia*, were apparently accurate enough for the expert to further write that the brain illustrations 'are orientated at 90 degrees to each other, showing Coronal/saggital' features[70] Another survey participant looking at medical/anatomical images easily identified the organ by stating, 'These are different sections of the brain,' but that Second Edition illustration 'looks slightly more realistic.' A third survey participant made the observation that the difference between the first edition abdomen illustration and the Second Edition one, is that the Second Edition abdomen 'is more schematic.' [71]

A revealing statement, made by a survey participant was that in the medical field, it was *expected* to see labels on all medical or anatomical diagrams, as the labels with the illustrations conveyed information together.[72] This survey participant observed that the

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[70]Expert survey, participant number 266527-266519-23659394

[71]Expert survey, participant number 266527-266519-24476696

[72]W.J.T. Mitchell describes the phenomena of creation of images that are integral to understanding the text as 'image-text'. Mitchell (1986)

brain illustrations were 'similar to a Ct/MRI of the brain' but appeared to drawn 'with some extra detail for teaching purposes.'[73] This implies that if an image is drawn in the field of medicine, there is an expectation of didactic intent. It is worth pointing out that the word 'schematic' was used by survey participants themselves to describe the types of images they were used to seeing. Many sources of images for the encyclopaedia, which will be discussed in the next chapter, came from respected publications in particular fields of expertise. Figure 4.25 shows that the wood-engravers were capable of producing different illustration styles throughout the 19th century. However, what was chosen to be illustrated, and the illustration style used, often had little to do with the wood-engraving profession, and much to do with the publishing trade overall and their desire to attract new audiences. The practicalities of running a printing or publishing firm caused trends in subject specialism and catered to the growing popularity of photographs. As will be explored in the next chapter, there was sometimes a long process, with many stages that involved commissioning an image, hiring an artist who drew an initial sketch of a subject, and the wood-engraver that would eventually make the printed illustration reading for the encyclopaedia.

4.4   Chapter 4 Conclusion

This chapter discussed changes in content from the First Edition to the Second Edition. It demonstrated that the Second Edition editors were interested in communicating large amounts of factual information in a more concise fashion than the editors of the First Edition. Their priorities led them to use 810 fewer illustrations than the First Edition, but also led them to use a higher number of fold-out maps and tables that visually presented larger sets of data. Images from the First Edition have a higher percentage of illustrative material with decorative and pictorial styles. In the Second Edition, the editorial priority favoured facsimile illustrations, and in one category which decreased substantially, humans/mythic figures, illustration were kept if they showed foreign peoples, ancient peoples, or were a means to demonstrate a medical or technical concept. Essentially this subject category case study shows that illustrations were more likely to be used if they showed readers something they were not expected to know about, or if the illustrations were tools for communicating practical, yet abstract information.

   The research presented here shows that most frequently illustrated subjects across all encyclopaedias surveyed had to do with natural history or science and technology. James Secord notes that in the 19th century, middle-class publishers and radical agitators alike valued scientific material for a perceived propaganda value, using established knowledge to comment on the rights and wrongs of society; in contrast, working-class readers, sought to

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[73]Expert survey, participant number 266527-266519-23575516

participate in science [74] This could help explain why, besides numerous illustrations of natural history specimens, other images frequently appearing in these encyclopaedias favour structures of buildings, roads and bridges or sources of energy, power, and movement, like machines and vehicles. The illustrations scattered throughout the encyclopaedias surveyed here reflect interest in scientific knowledge, but also an appreciation for appealing subjects.

This can be clearly demonstrated in a table in the entry for Second Edition entitled 'Chief Navies of the World', in which data is broken down by country, and includes number of battleships, men, and annual maintainance costs.[75] Their inclusion not only showcases new technology, with these illustrations of ships, the entire entry also highlights global innovation and competition, which is perhaps not surprising, given what ships do – cross international waters, engage in commerce or warfare, spread ideas and goods. In the age of steam, shipping activities throughout the 19th century became faster, and by the 1860s, transatlantic travel time dropped from 3 weeks in the 1830s to 8 or 9 days due to more ships made from steel, powered by steam.[76] In fact, much of the international business of Chambers was conducted by steam-ship.[77] What can be inferred by the entry for both 'Rifles' and 'Navies' is that what the editor regarded as old knowledge is being replaced with new knowledge that highlights technology and modernity. This can be seen, not just in the choice of images to be included, but in the way that certain styles of images take priority over others. For example, six of the new illustrations in the 'Navy' entry use schematic representation to depict the ships or naval defence equipment. The treatment of each entry in both editions of *Chambers's Encyclopaedia* provides an illuminating example of what Andrew Findlater, as editor in 1860, regarded as important visually versus what David Patrick, working as editor in 1888, placed importance on for the later edition of the encyclopaedia.

Earlier in the chapter, it was mentioned that Chambers editors likely removed 'Rigging' in order to make space for 'Rifles' in the Second Edition. However, all the information about 'Rigging' and ships does not seem to have been completely cut from the Second Edition. It was repurposed, and added elsewhere.

In another entry 'Navy', illustrated by depictions of ships, there is another contrast between the two editions. The First Edition has three illustrations of ships with sails, shown across the top of Figure 4.27. Furthermore, in the text and captions, the utilisation of metal plating to protect the ship's hull is being emphasised, as this was a necessary advancement in the history of ship building, allowing for bigger ships that could stay at sea longer. In the Second Edition, the entry for 'Navy' contains 12 illustrations of ships,

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[74]Secord, J. A. (2009), p. 446.

[75]Patrick, D., ed (1891*a*), p. 414

[76]Stopford (2009).

[77]Fyfe (2012), pp. 177-181. Chambers firm to Appleton, July (1855).

Fig. 1.—The *Great Harry.*

Fig. 2.—The *Duke of Wellington* screw line-of-battle ship, 131 guns.
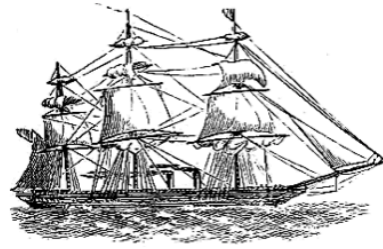
Fig. 3.—The *Warrior* armour-plated screw frigate, 32 guns.
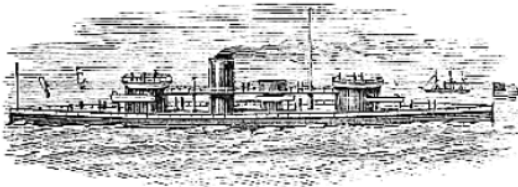
Fig. 4.—American Turret-ship, *Miantonomah.*
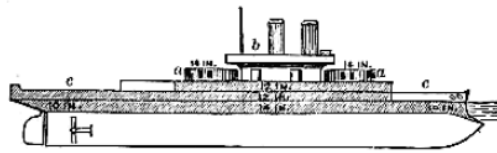
Fig. 7.—Diagram showing Disposition of Armour in H.M.S. *Devastation* (1872), twin-screw double-turret battle-ship, 1st class, four 29-ton guns in pairs in turrets. 9330 tons, 7000 H.P.

a, a, turrets ; *b,* superstructure ; *c,* upper deck.
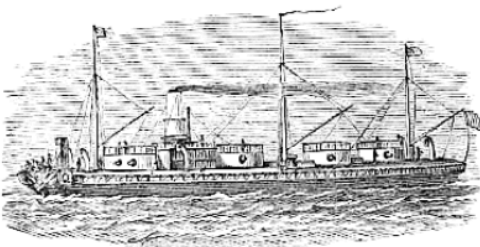
Fig. 5.—Turret-ship, *Royal Sovereign.*
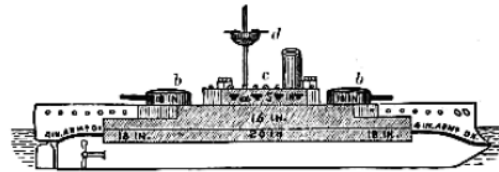
Fig. 11.—Diagram showing Disposition of Armour in H.M.S. *Trafalgar* (1888), twin-screw double-turret battle-ship, 1st class, with armoured central battery. 11,940 tons, 12,000 H.P., four 67-ton guns in turret (*b*); eight 40-pounder quick-firing guns in central battery (*a*); twelve 6-pounder quick-firing guns on spar-deck (*c*); fighting top with two 6-pd. q.-f. guns (*d*).

Figure 4.27: Examples of different types of ships in the entry for 'navy'in first and second editions of *Chambers's Encyclopaedia*. The top three ships with sails across the top were in the first edition. The images labeled Fig. 4 and Fig. 5 appear in both editions, though in the first edition, are in other entries. The images labeled Fig. 7 and Fig. 11 only appear in the Second Edition.

three of them are vessels with sails that look identical to those in the first edition. However, the entry contains six other illustrations, five of which are of steamships.[78]

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[78]In Figure 4.27 the steamships labeled Fig. 4 - American Turret-ship *Miantouomah* and Fig.5 - Turret-ship *Royal Sovereign* are also from the first edition but not under the entry for 'Navy'. They both appear under the entry for 'Turret ship', Volume 9, p.598.

The idea of reuse and repurposing of content and illustration in Chambers will be covered more in the next chapter, which will discuss the production mechanisms and logistics needed coordinate both editions of Chambers. It will also look at how co-publishing an encyclopaedia with transatlantic partners, was another contributing factor to having fewer images in the Second Edition.
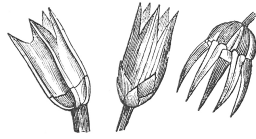
5 Production of *Chambers's Encyclopaedia*

Following on the last chapter which discussed trends in illustration subjects, illustration styles, and information display within *Chambers's Encyclopaedia*, this chapter will address the following questions: First, how did the firm's approach to production change between the first and second edition? To what extent did the practicalities of production limit the number and size of illustrations? How did the the publishers plan to distribute *Chambers's Encyclopaedia* and what sort of networks were established to help their reputation and protect and enhance their business interests? (These questions will help address the broader questions posed in questions 7 and 8 of the Introduction.)

This chapter provides a broad timeline of the production of *Chambers's Encyclopaedia* by presenting information roughly in chronological order based on what is known from archival and other sources. While the records of those contributing to the illustration process are less-straight forward than some of the records of the textual contributors, the books and the illustrations themselves yield much information, though not necessarily a complete picture. Indirect information is also presented in order to provide some context to why certain types of source material for illustrations were used and how they might have been obtained. Studies of the data gathered from artefacts in the W. & R. Chambers collection at National Museums Scotland are also presented here.

Finally, this chapter aims to make some connections between the firm and the broader print ecology mentioned in previous chapters and how outside events might have influenced some decisions that Chambers undertook in relation to the encyclopaedias, such as transatlantic copyright.

1852	Discussion with Brockhaus for German-language *Conversations Lexicon*
1853	Translation from German to English begins; London office opens
1854	Chambers takes possession of plates for *Penny Cyclopaedia*
1856	Artists in Edinburgh commissioned to draw illustrations for Chambers entries
1858?	W.S. Orr begins working for the Chambers firm
1858	Chambers decides not to reissue *Penny Cyclopaedia*
1859-60	First Edition part-issue serial and Volume 1 released in UK
	Orr begins commissioning further artwork on *Chambers's Encyclopaedia*
1861	First Edition part-issue serial and Volumes 1 and 2 released in US
	First Edition part-issue serial and Volume 3 released in the UK
	W. Crane makes illustrations for *Chambers Encyclopaedia*
1862	First Edition part-issue serial and Volume 4 released in UK
	First Edition part-issue serial and Volumes 3 and 4 released in the US
1863	First Edition part-issue serial and Volume 5 released in UK and US
1864	First Edition part-issue serial and Volume 6 released in UK and US
	Gallery of Geography* and *Gallery of Nature** published in UK
1865	First Edition part-issue serial and Volume 7 released in UK and US
1866	First Edition part-issue serial and Volume 8 released in UK and US
1867	First Edition part-issue serial and Volume 9 released in UK and US
1868	First Edition part-issue serial and Volume 10 released in UK and US
1870-74	Updated First edition reissued in the US
1874	Letter between Lippincott and Chambers with new terms for First Edition
1886	Correspondence regarding Second Edition; Contract drawn up
1888	Second Edition, Volume 1 and Volume 2 released in UK and US
1889	Second Edition, Volume 3 and Volume 4 released in UK and US
1890	Second Edition, Volume 5 and Volume 6 released in UK and US
1891	Second Edition, Volume 7 and Volume 8 released in UK and US
1892	Second Edition, Volume 9 and Volume 10 released in UK and US
1893	*A Course on Zoology: Designed for Secondary Education*,* published in US
1897	*Chambers's Elementary Science Readers: Book* 2*, published in UK
1907-11	*Home Life in all Lands: Books 1-3*,* published in the US

* Subsequent titles known to contain illustrations from *Chambers's Encyclopaedia.*

Figure 5.1: Publishers timeline for *Chambers's Encyclopaedia,*1852-1911

5.1   The First Edition

5.1.1   From a translation to reprinting

Sondra Miley Cooney makes two suggestions on how the founders of the Chambers firm would have become acquainted with Heinrich Brockhaus (1804-1874), of the German firm F.A. Brockhaus.[1] One possibility was that they met in London at the Great Exhibition of 1851, which the Chambers brothers attended, and where Brockhaus exhibited and won a prize for a collection of 356 volumes his firm published in 1850. Another possibility was they could have met at an earlier date after the seventh edition of *Conversations Lexicon* had been published and translated into English.[2] Either way, negotiations began between the two firms in 1852, when a letter dated 13 August suggested that Chambers pay Brockhaus the sum of £100 for the rights to translate and republish the tenth edition of *Conversations Lexicon* which would need to be largely rewritten, to account for differences between English and German. More than a month later, the final amount reached in an agreement dated 27 October, was the sum of £400 to Brockhaus. [3]

   The book that was eventually published was entitled *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge for the People*, and it was not a direct translation. The opening 'Notice' explains:

> *With a view to bring back the Encyclopaedia to its original purpose of a Dictionary of Knowledge...the Germans formed the plan of their* Conversations-Lexicon [sic], *a work which, extending to a long series of volumes, has passed through ten editions, and obtained a world-wide celebrity. Believing that a translation of the latest edition of* [Conversations-Lexicon] [sic.], *a well-conceived and laboriously executed work would be generally acceptable, the Editors made an arrangement for that purpose with the proprietor, Mr. Brockhaus of Leipsie.*[sic.] *After some time, however, had been spent in translating, the task of adapting the information to English requirements was found so difficult, that the resolution was taken to bring out a substantially new work, following in its construction the admirable plan of the* Conversations Lexicon, *but making use of its valuable matter, only so far as it might be found suitable.*[4]

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[1]Cooney (1999), p.17. Heinrich Brockhaus, with his brother Friedrich Brockhaus (1800-1865), ran F.A. Brockhaus upon the death of their father, founder Friedrich Arnold Brockhaus (1772-1823). Friedrich retired in 1850. Britannica entry (1911*b*)

[2]Cooney (1999), p. 17

[3]Cooney (1999), p. 17

[4]Findlater, A., ed (1868) Chambers were planning on translating the 10th edition of *Allgemeine deutsche Real-Encyclopädie für die gebildeten Städe Conversationlexicon*, 15 volumes. It was issued between 1851-55 and sold 300,000 sets. This German edition came immediately after the 9th edition was published between 1844-49. Collison (1966), pp.166-167

Cooney's extensive research on the First Edition's text and contributors shows that in total there were 240 contributors.[5] Some articles are not attributed to specific people, but there is good evidence to suggest that the editor, Andrew Findlater, assistant editor John M. Ross (1833-1883), and other staff including Robert Chambers contributed entries to the encyclopaedia.[6] In addition, two people, Joseph Gostick (1814-1887)[7] and John Montgomery (n.d.), among others, were paid for their services translating some of the original *Conversations Lexicon*, although as noted above, Chambers eventually produced an original work.

The 1850s was an exciting time that presented many opportunities and challenges for the Chambers firm. Not only contemplating this new encyclopaedia project, in 1853, William and Robert decided to open their own London-based-office, and tasked their younger brother David Noble Chambers (1820-1871) with running it. This decision was based on two factors. First, there was the competitive environment of the press in 1850s that the *Chambers's Edinburgh Journal* faced, referred to in Chapter 1, as a transition from the era of publicists to the era of journalists, with the removal of taxes on knowledge. Second, the Chambers brothers had lost faith in the ability of William Somerville Orr (1801?–1873), who was serving as their London agent, to promote the business interests of the Chambers firm.

The London agent had a significant role because more than two thirds of the income from the *Chambers Edinburgh Journal* came from the London (and English) market. Orr had served as the firm's London agent from the 1830s - 1853.[8] Cooney believed there was a personal friendship between the Chambers brothers and Orr, and this is part of the reason they continued to use his services although some of his business practices made them wary.[9] Orr, a fellow Scotsman who moved to London in the 1830s, had set up his own bookselling and printing establishment. Orr acted on behalf of the Chambers firm, when it came to printing, marketing, and selling the Journal in London, and in the 1830s and 1840s they needed 'to rely on Orr's on-the-ground knowledge for day-to-day business in the English book trade.'[10] Stereotypes of the Journal were sent by train so that they could be printed in London and issued on the same day that they were issued in Edinburgh. Fyfe argues that by the early 1850s, with improved communications, like the

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[5]Although 109 names were specifically mentioned in the tenth volume, she found that 150 people that were responsible for writing nearly 4600 articles, and others were paid to write one article. Cooney (1999), p. 17

[6]Cooney (1999), p. 18. Andrew Findlater had 5 editorial assistants. Collison (1966), p. 188.

[7]Bents (1845) Gostick also translated *The Spirit of German Poetry: a series of translations from the German Poets* (1845), published by W. Smith

[8]Cooney (2006)

[9]Cooney (2006)

[10]Fyfe (2012), pp. 256-257

telegraph, and further advances in transport (railways and steamship) networks between Edinburgh and London, and Glasgow and Dublin, William and Robert realised that they could take on a greater number of decisions in a timely manner, and didn't need to rely on Orr's services.

The main concerns regarding Orr were threefold. First, Orr misrepresented himself as being a more significant partner and part owner in the stake of the Journal to other publishers in London, when his involvement was actually limited to selling Chambers publications. When Orr's business dealings with other publishers turned sour, those publishers or their agents would try to claim what they thought were Orr's shares in the Journal's profits. Secondly, Orr was not a sole agent for the Chambers firm. He also printed and sold other periodicals in direct competition with the Chambers firm. Finally, and not insignificantly, Orr over extended himself financially and owned money in the thousands of pounds to Chambers.

Two of those concerns are voiced in letters about him in the Chambers archive. Orr had claimed that he provided Chambers with a good service in London on behalf of the firm through the years. The Chambers brothers disputed this, stating that his interests were not necessarily in line with their own.

> *From the first to last, your concern in London can hardly have realised less from our publications than from forty to fifty thousand pounds – a fortune in itself – independently of all other advantages. In 1852, it appeared that for the preceding years you had been profiting from the English sale of the Journal to the extent of 1900£ a year even taking its circulation at the lowest amount, while our remuneration had been at that rate of 391£ per annum.* [11]

Orr also seemed to have a conflict of interest, since he also acted as an agent for two competitors of *Chambers's Edinburgh Journal*. The Chambers brothers cite this as a business reason to open their own firm in London.

> [We] *assure you that nothing could have induced us to take the present step, with all its inconveniences, but consciousness that, unless we vigorously interposed, the circulation of the Journal would inevitably dwindle into insignificance...with its many new competitors – some of them issued from your own establishment, and to which the poor Journal has been made a vehicle of publicity; one of them indeed,* The Leisure Hour *which we see in your invoices, being a publication which has been avowedly put forward by the Tract Society as an engine to destroy and rout out such papers as ours, while another, the* Home Companion, *belongs to a class*

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[11]Cooney (2006), p.144 quoted Chambers firm to W.S. Orr, 12 July (1853).

which, from comparative size and price, is by your own acknowledgement the most formidable that we have to contend with. [12]

Orr continued to run his own business while the Chambers set up their own London office, but in 1857 Orr's business became insolvent. At some point after, Orr became employed by the firm for at least the early part of the 1860s.[13] More complete chronicles by other historians exist which document the problematic dealings with Orr, and should be consulted to gain a complete picture of the Chambers firm's early history.[15] Orr is significant to the history of *Chambers' Encyclopaedia*, because through him and correspondence about him, we are able to gauge approximately when the Chambers firm was trying to translate the *Conversations-Lexikon* into English; because of his debts to the Chambers firm, we know that as partial payment, Chambers took back its stock that Orr had on hand, and additionally acquired stereotype plates valued at £5000 in total, including the *Penny Cyclopaedia*, which Orr had intended to publish; and it was Orr, as an employee of the firm, that commissioned several artists to make illustrations that were used in the First Edition, as well as other Chambers publications.[16]

5.1.2 From reprinting to creating a new work

In a letter sent from Robert Chambers to Orr, dated May 1853, Chambers expresses concern that Orr is announcing a new edition of *Penny Cyclopaedia* without first informing them. Robert writes:

> *We attach particular consequence to the new* [Penny Cyclopaedia], *as coming into direct competition with our intended translation of the German Conversation Lexicon – a very large venture about which we are extremely anxious.*[17]

In 1853, work was being done by the firm at the time to to translate and abridge the German language version. The German version was 15 volumes. Chambers had in mind that the work should be 8 volumes, completed in 8 years, which, coincided with what Knight originally proposed as the length and time of the *Penny Cyclopaedia* before intervention from the SDUK committee changed it. See Chapter 3. Knight recalled in his autobiography:

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[12]Chambers firm to W.S. Orr, 12 July (1853).

[13]Cooney (2006) p.146 Orr was working on the *The Gallery of Geography* in 1864,[14] but by the time of his death in 1873 was employed at Chapman and Hall.

[15]Cooney (2006) Fyfe (2012)

[16]Both the *The Gallery of Geography* and the *The Gallery of Nature* written by Rev. Thomas Milner and published by Chambers contain illustrations that were used in First Edition. The artists for both wood-engravings and metal plates are all named in the front part of these books. See Appendix G for a sampling of illustrations used.

[17]Chambers firm to W.S. Orr, 12 July (1853).

...eight good compact volumes were to contain the substantial food for which the working mind was pining. Before one volume could be completed, the Committee thought it expedient to hint that it must 'be observed that the plan of the Cyclopaedia *had been rather enlarged.' After a year the plan had enlarged so much that the rate of issue was doubled. It was no longer a penny a week, but twopence. After three years it was quadrupled–fourpence a week instead of twopence. Had the orginal plan of a penny weekly issue been preserved, it would have taken exactly thirty-seven years to complete the business. The extension of the quality of the Cyclopaedia was no doubt unavoidable under the superintendence, but it destroyed its commercial value...* [18]

Knight went on to say that what should have been 'the literary triumph of the publication' was marred by 'the paper duty upon all works of large circulation and low price.' He wrote that he felt 'melancholy' during the years he worked with the project, and often felt like 'throwing up the Cyclopaedia in despair.' [19]

Several advertisements for reprinted editions of the *Pictorial Bible*, the *Pictorial History of England*, and the *Penny Cyclopaedia* were made in the early part of 1854, showing that the Chambers firm was seriously committed to its reprinting endeavour of issuing all three works originally produced by Knight. All three publications could be ordered by subscription from December, 1854.[20] The main portion of the *Penny Cyclopaedia* ad reads:

W. & R. Chambers New and Revised Editions of Standard Works
Re-Issue, commencing on the 2nd December 1854
No. 1 price 6d; also Part I, price 2 s
The Penny Cyclopaedia.
Originally Edited by George Long, AM
Illustrated with many thousands of wood-engravings
REVISED UNDER THE CARE OF MESSRS. CHAMBERS
Presented under a modest name and form, the Penny Cyclopaedia of the SDUK—or rather Mr. Charles Knight—attained a reputation second to that of no book of its class. Even now, ten years after its completion, it is by many persons of the highest intelligence preferred to all similar productions. The Proprietors of the Work in its original, and as they trust, most advantageous form of a continuous ALPHABETICAL CYCLOPAEDIA, have to announce their intention of commencing a Re-Issue, embracing a complete Revision, with all the Corrections and Additions called for by the progress of knowledge, and the emergence of new facts and events.

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[18] Knight (1864), pp. 203-205.
[19] Knight (1864), pp. 203-205.
[20] *The Pictorial Shakespere* was also reprinted by Chambers, but not relevant to this discussion.
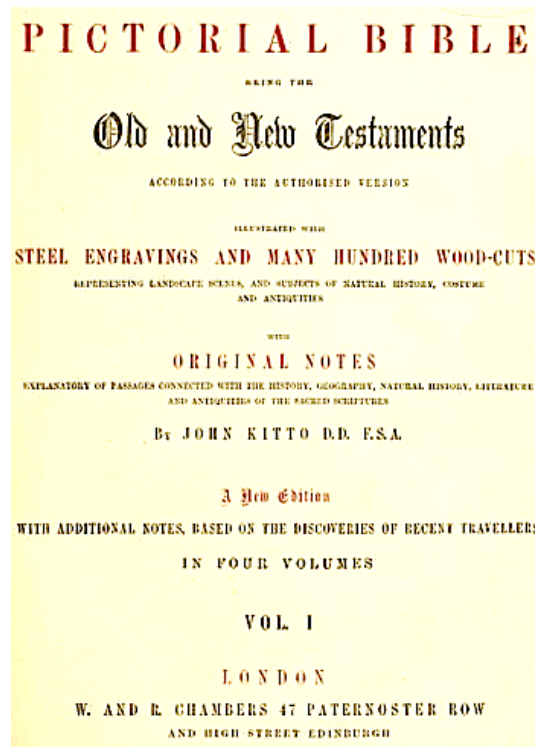
Figure 5.2: Title page of the *Pictorial Bible*, reissued by Chambers in 1855.

> *They trust that they give sufficient guarantee for the satisfactory character of this Revision, when they state that it is executed under the care of Messrs. Chambers, of Edinburgh. Being in possession of the stereotype plates, originally produced at an enormous cost, the Proprietors are enabled to offer this Revised Edition, which will be in many respects equal to a New Work on such terms as will bring it within the reach of large classes of persons who are usually precluded from possessing Encyclopaedias in consequence of their expensiveness...*
>
> *Printed in a superior style, the Work, comprising upwards of 14,200 pages exclusive of a Supplementary Volume, will be presented at a price not exceeding 8£16s.*
>
> *From the smallness of the cost, and the method of publication, in Numbers and Parts, this New Issue of the* Penny Cyclopaedia *will be eminently suitable for Country and Parish Libraries, Mechanics' Institutes, Literary Institutions, etc. requiring a standard work for consultation.*[21]

There is a similar announcement on the other side of the page for the *Pictorial Bible* and the *Pictorial History of England*, both of which the firm did publish in 1855. See Figure 5.2. However, the archival folder [22] at the National Library of Scotland that houses the

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[21]Advertising for reprinted versions of Knight's works (1854), Item 2.

[22]Advertising for reprinted versions of Knight's works (1854)

W. & R. Chambers Collection also contains some correspondence by people who identify themselves as being ardent readers of Chambers works. In several of these letters the writers point out various deficiencies of the *Penny Cyclopaedia*. In one of them, Mr. George Baggatt of Manchester writes:

> *Messrs Chambers,*
> *Gentlemen*
> *Understanding you are about to issue a new edition of the 'Penny Cyclopaedia',*
> *allow me, humbly, to suggest the propriety of guarding against the following defects*
> *of Mr Knight's edition of that Publication...*[23]

The letter states that the *Penny Cyclopaedia* contained many of pages with information that he doesn't find complete or useful. It also criticises the writing, finding the style and content of the 8th edition of Britannica much better. He also interpreted some passages of the *Penny Cyclopaedia* to be anti-religion.

Another letter from Robert Scott Burn of Stockport, dated September 20th 1854 reads:

> *Gentlemen,*
> *As I understand you are preparing a new issue of the* Penny Cyclopaedia*; I take the*
> *liberty to suggest that considerable improvement might be effected in the article on*
> *'Textile Manufacture'... since the original articles were written vast improvements*
> *have been made in the various processes which demand more notice; moreover, a*
> *clearer and fuller explanation of these branches, than is given in the original issue,*
> *& I think desirable?* [sic.]
> *I may state that I am well acquainted with the mechanism and processes of the var-*
> *ious branches, and shall be glad if my notes and drawing can be made available for*
> *your purposes.*
> *I would also suggest that in the articles on the Constructive arts as Building, Car-*
> *pentry...Steam Engine some notice of the numerous improvements recently brought*
> *out, might be given with advantage.*
> *I shall remain here for a few days longer, before returning to Stockport; if you wish*
> *me to do so I shall be glad to call upon you & afford further information an the points*
> *I have made.*[24]

These letters providing constructive criticism indicate what editors of the firm realised when going through all the content of the *Penny Cyclopaedia*—that too much time and

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[23]Chambers firm with G. Baggatt (1854).
[24]Chambers firm with R.S. Burn (1854).

effort would be required for the firm to update the material, more so than translating another encyclopaedia from the German. In fact, Chambers came to the same conclusion as Knight, and to the decision *not* to reprint the *Penny Cyclopaedia*. After serious consideration, the *Penny Cyclopaedia* was never republished by Chambers, because they discovered that Knight had not actually given Orr the right to revise the work, merely to reprint and correct errors.[25]

As mentioned in Chapter 3, at the same point in time, Charles Knight was working on the *English Cyclopaedia*. Knight, himself, recognised major flaws in his publishing model when he produced the *Penny Cyclopaedia* in the 1830s, which made the work too large and unsustainable from a commercial point of view. [26]

The intended distributors of the *Penny Cyclopaedia*, and Knight's other works like *Pictorial Bible* were listed in the advertisement[27] above as:

- W &R Chambers, Bride's Passage, Fleet Street, London and High Street, Edinburgh

- H. Campbell, Glasgow

- J. M'Glashan, Dublin

- Hew Ramsay, Montreal

- C.S. Francis and Co. New York

- Lippincott, Grambo and Co. Philadelphia:

This advertising shows that the firm had an international network that included Ireland, Canada, and the US. On 28 November, 1854, Chambers sent a letter to J.B. Lippincott in Philadelphia:

> *...You will have heard that we have abandoned the intention of bringing out a re-issue of the* Penny Cyclopaedia*; our reason for this step being the timely discovery that its proprietors were financially unable to keep up the publication. We have bought from them the* Pictorial Bible *and the* Pictorial History of England*, which we now print on our own account. Your very best endeavours are asked on behalf of these works, as it would be a matter of first importance to us to reckon in a certain sale in America...*

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[25] Cooney (2006), p.145

[26] Cooney also points out that the other Knight works Chambers did publish were not very profitable. The *Pictorial Bible*, whose stereotype plates were valued at £1500, only made £889 in profit by 1868. The other works printed from stereotypes were a financial loss for the firm. After everything was balanced out Orr still owed the Chambers firm £3930 17s 2d. Cooney (2006), p.145

[27] Advertising for reprinted versions of Knight's works (1854).

The taking up of so many American Steamers for [Crimean War] *purposes by our government, will partly retard regular conveyance of goods for a little time But we shall do all in our power to keep you supplied...*

We may mention that that portion of Pictorial History of England *which refers to the American Revolution will be considerably improved. This work should be in every state and public library.*

We are Gentlemen, Yours very Truly, W. & R. Chambers per Mr Robertson.[28]

Presumably, similar letters would have been sent to H. Campbell, J. M'Glashan, Hew Ramsay, and C.S. Francis informing them that Chambers had changed their mind regarding reissuing the *Penny Cyclopaedia*. As the Chambers firm could not use the plates for the *Penny Cyclopaedia*, the plates were shipped to Tyler and Manning, in London. [29]

5.2   First Edition source material for images

When Chambers produced their First Edition, they used a combination of different sources, including some of their previous publications, and features partially inspired by Knight such as illustrations. In addition, new sources of information such as current stories in newspapers, and emerging scientific and medical information were adapted. The following sections provide some details on what is known of their influence.

5.2.1   The *Penny Cyclopaedia*

When Chambers took possession of Charles Knight's stereotype plates, as part payment of Orr's debt, but then decided to not reissue it, it seems logical that the *Penny Cyclopaedia* caused the firm's editors to reconsider what they were trying to accomplish with their own encyclopaedia. They wanted to have a product that was as appealing as Knight's work, but was more practical to produce and which would come out in a timely fashion. In many ways, *Penny Cyclopaedia* could have been a reminder of what the firm had achieved with *Information for the People*[30] released initially at the same time as the *Penny Cyclopaedia*. Knight was also known to have offered his wood-engravers generous compensation [31] and was rewarded by gaining the service of wood-engravers like William Harvey, and having beautiful illustrations that helped educate 'the people' — which was an overall goal that Chambers shared with Knight. While the *Penny Cyclopaedia* had shortcomings as shown in Chapter 3, Knight's work took great care to promote visual forms that resonated with his readers. I argue here that while looking to Brockhaus to provide a good model for

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[28]Chambers firm with Lippincott (1854)
[29]Cooney (2006), p.145
[30]See Chapters 2 and 3 for examples of *Information for the People* compared with *Penny Cyclopaedia*.
[31]Gray (2006)

structuring content into a well-organised text, Chambers also took inspiration from *Penny Cyclopaedia*'s illustrations. [32]

In Chambers's first edition, there were 4066 wood-engraved illustrations, within its 10-volume set. In the *Penny Cyclopaedia* there were 4942 wood-engraved illustrations within its 27-volume set. This shows that Chambers has a very high number of illustrations for such a small number of volumes. The 8th edition of *Encyclopaedia Britannica* also had 4511 illustrations, but like *Penny Cyclopaedia*, it was contained in 21 volumes, making it a larger ratio of text to illustration. Also, as noted in Chapter 3, one volume of the 8th edition of Britannica contained introductory dissertations that were dropped by the 9th edition.

To test if there were further links between illustrations in Chambers and the *Penny Cyclopaedia*, a sampling of four volumes of *Penny Cyclopaedia*: Volume 1, Volume 9, Volume 17, and Volume 25 was conducted. [33] The volumes sampled contained just over 700 illustrations. Of those 700 illustrations, 78 specific illustrations were found to be directly linked to illustrations in *Chambers's Encyclopaedia*. The 78 images were listed by subject, by volume and page number. A comparison was also made with how similar subjects were illustrated (if they were illustrated) in the 8th edition of *Encyclopaedia Britannica*, which as noted in Chamber 3 was published after the *Penny Cyclopaedia* but prior to the publication of *Chambers's Encyclopaedia*, first edition. Therefore, in theory, the Britannica, as another Scottish encyclopaedia, could also have visually influenced the first edition of Chambers.

This sampling provided an 11% image match rate. While that may not seem like much, a number of them were very similar, which suggests that Chambers used the illustrations in the *Penny Cyclopaedia's* as a source for some of their own illustrations in the First Edition. One must also consider that Chambers intended to *not* have as much content as the *Penny Cyclopaedia's*, so editorial decisions were made about excluding material. In terms of subject category influence, less than 10 of the vertebrates mentioned in both *Penny Cyclopaedia* and the first *Chambers's Encyclopaedia* edition appear in the 8th edition of *Encyclopaedia Britannica*, so seems more than likely that Chambers took ideas of what to illustrate from Penny. Yet, as indicated in the last Chapter, in terms of overall illustrations, Chambers favoured botanical specimens as the second largest category over invertebrates, which in the *Penny Cycloapedia* was statistically the same as the number its vertebrate illustrations. In this sample of *Penny Cyclopaedia's*, there was an of average of 20 illustrations per volume that have strong visual similarities, strong image compositional similarity, or indicate decisions to illustrate exact subjects when compared with the first

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[32]Brockhaus did eventually produce an illustrated encyclopaedia—its 11th edition, which unfortunately does not do well financially. Collison (1966). Collison says that Brockhaus returned to unillustrated encyclopaedia for the 12th edition but this was not the edition the Chambers firm had been working with to translate.

[33]See Introduction, Research Methods, Section 1.3.3.

edition of Chambers. However, more correlations could have been made if the entire *Penny Cyclopaedia* were studied. [34]

Images between Chambers and Penny were linked by two main characteristics or a combination of these two characteristics. The characteristics labeled as C – noted a correlation between image composition or layout. The links made in this correlation totalled 25 images. The characteristics labeled as S – noted a correlation by subject, for example, the same caption. The number of subjects that overlapped in this sample were 48. Additionally, 5 illustrations seemed to be nearly identical in subject and in image composition or layout noted by E. The strongest subject correlations in the volumes sampled, appeared in the category of vertebrates, corresponding with the visual content analysis from the previous chapter.

Figure 5.3 provides examples of an image that looks nearly identical between the Penny and Chambers, such as the 'Transit instrument' or which have an identical subject and similar visual composition, such as the 'Aye-aye.' Figure 5.5 provides an example of a subject correlations between the entry for tattoos.

The 'Transit instrument' entry (see Figure 5.3) describes a telescope used for precise observation of heavenly bodies and is two columns long in the first edition of *Chambers's Encyclopaedia*. It is 21 columns long in *Penny Cyclopaedia*. While the the illustration takes up nearly half a column in Chambers, the illustration takes up nearly one page of *Penny Cyclopaedia's* entry. The article in the *Penny Cyclopaedia* is also ambitious, stating that its aim is for its readers, upon reading this entry on 'Transit instrument' will for the reader to gain knowledge and 'be able to use it with tolerable success.'[35] The Chambers entry makes no such claims, simply describing the instrument and providing a very abridged history of its use. While the transit instrument is mentioned in the eighth edition of Britannica, its illustration in not with the entry, but is part of a fold-out plate with very detailed metal engravings of its components. See Figure 5.4.

This example shows how *Penny Cyclopaedia* provided a specific model for illustrations in the first edition of Chambers. The diagrams used for 'Transit' in the Penny and in Chambers nearly identical. Britannica had a very different approach to illustrations; its 8th edition still used metal engraving to produce 273 illustrations in the plates provided at the end of each volume, in addition to the wood-engravings within the text. The use of the intaglio method of printing, the illustrated plates produced by metal engraving, made ownership of their encyclopaedia more expensive.

The aye-aye is a lemur native to Madagascar, and the illustration in Chambers and

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[34]'This was not done because it was beyond the scope of this research which is primarily focused on comparing the first two editions of Chambers with each other. It is doubtful that *Penny Cyclopaedia* heavily influenced the Second Edition.

[35]Knight, C., ed (1833*b*), p.122

Penny Cyclopaedia, Vol 25, p 123   *Chambers Encyclopaedia*, Vol 9, p 512

Aye-Aye, Ed 1 Vol 24 p 276   Aye-Aye, Ed 1 Vol 1 p 587
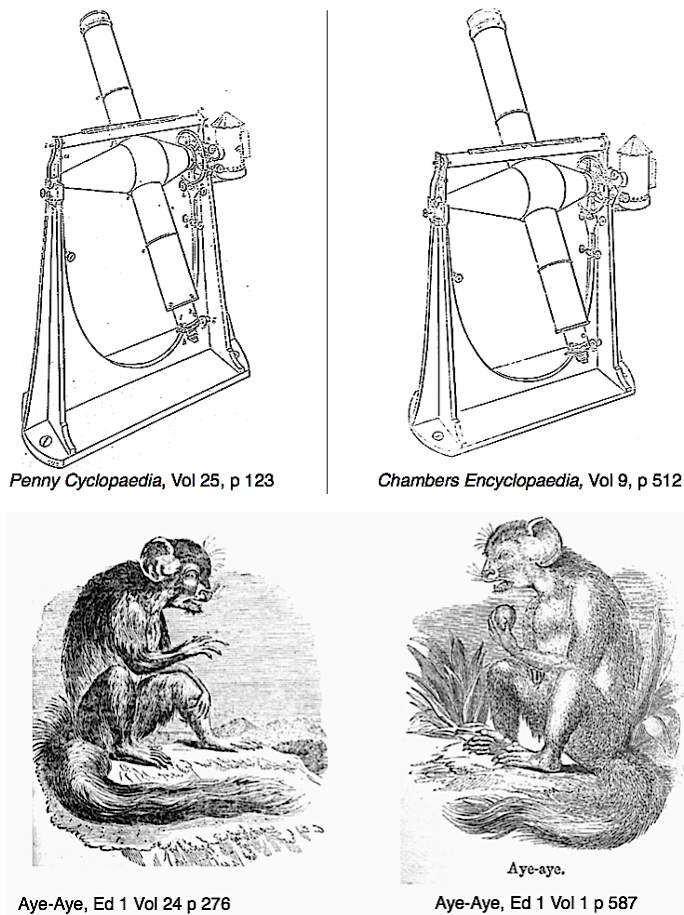
Figure 5.3: An example of (top) 'transit' and (below) 'aye-aye' in *Penny Cyclopaedia* and *Chambers's Encyclopaedia*, first edition. Transit shows Visual, Subject and Composition correlations; Aye-aye shows Subject and Composition correlations. Images are not to scale.

Penny is shown in Figure 5.3. The entry for 'Aye-aye' is illustrated with an aye-aye sitting in both the *Penny Cyclopaedia* and in the first edition of *Chamber's Encyclopaedia*. While these representations of nocturnal primates may not look exactly alike, both illustrations have a similar style of a profile of the animal specimen in a seated posture, with slightly open mouths. In the case of the Chambers illustration, it looks like the aye-aye is about to eat the fruit held in its hand. Of the 78 images that had a correlation between Chambers and *Penny Cyclopaedia*, the top 5 categories were: Vertebrates (28), Botanical specimens (19), invertebrates (9), medical / anatomical (5), and architecture (4). While many vertebrate and botanical specimens do not look exactly alike in Chambers and Penny, it is worth noting that the same exact species (Latin binomial nomenclature) of animal or plant was chosen to be illustrated as a subject in Chambers if that same species was represented for
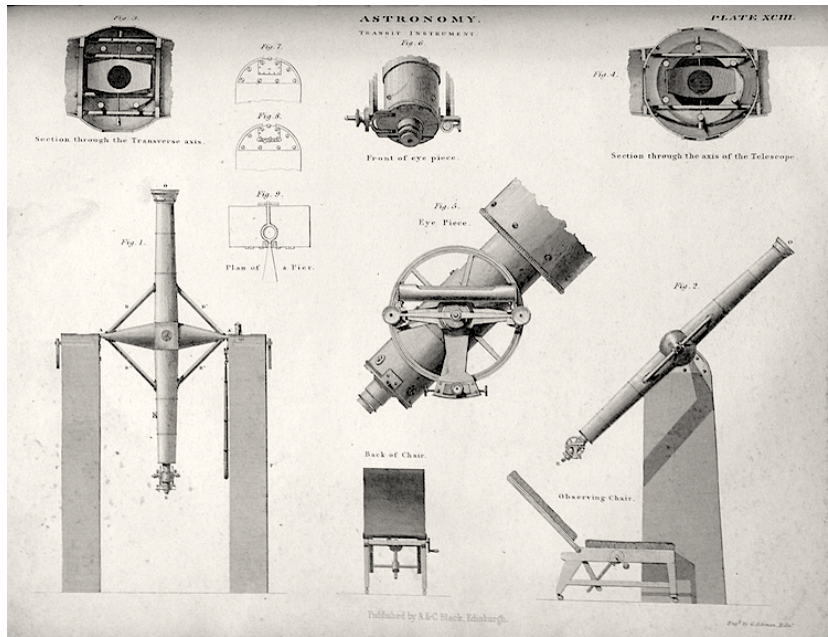
Figure 5.4: Plate showing detailed illustration engraved on metal. From *Encyclopaedia Britiannica*, 8th edition

the subject in Penny. For example, the entry on 'Woodpecker', both Penny and Chambers choose to illustrate *Picus viridis*. For the 9th edition of Britannica, the editors chose to illustrate *Dryobates nuttallii*.

The illustration 'Tattoo', as mentioned in Chapter 2, is a case study which demonstrates two aspects of illustration. First, the caption simply says '(from a photograph)', so it demonstrates the presence of 'facsimile' illustration in the first edition. Second the inclusion of this entry and its illustration shows the influence of the *Penny Cylopaedia*, which includes two illustrations of a tattooed face. See Figure 5.5. Not only do the illustrations in both encyclopaedias seem similar in their respective entries, certain main points are covered in both of the accompanying texts. This shared information on tattoos also appears in the same order. Both encyclopaedia articles state that tattoos are a practice of 'uncivilized' societies, that the English word 'tattoo' can be traced from the Polynesian word 'ta' which means 'to strike', and that New Zealanders tattoo their faces as a sign that they are adults. Both articles also state that tattooing was practiced in Ancient Rome and in pre-Roman Britain, and that there is a Biblical passage in Leviticus prohibiting it. Both Penny and Chambers books list the ethnic groups that currently use tattoos, speculating that the practice can be seen as a form of initiation within these respective groups. The *Penny Cyclopaedia* article is slightly longer than the Chambers entry, so there is additional information in Penny, but again, this seems to indicate *Penny Cyclopaedia*, influenced the Chambers work. The Chambers editors made choices about what to include in their own

Tattoo, *Penny Cyclopaedia* Vol 24 p100   Tattoo, *Penny Cyclopaedia* Vol 24 p100

Tattoo woodblock and print in *Chambers's Encyclopaedia, First Edition* Vol 9 p313
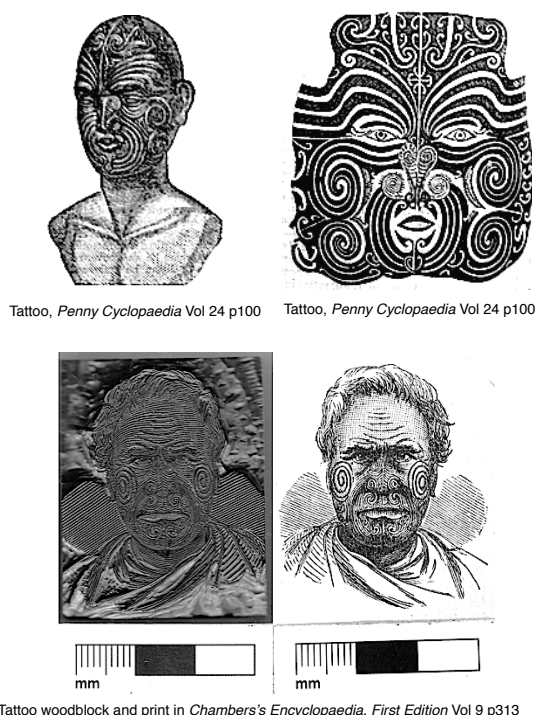
Figure 5.5: Illustrations used for 'Tattoo' entry in *Penny Cyclopaedia*, 1832 (Sheffield University, Western Bank Library RBR 030 (S), top) and First Edition, 1867 (bottom right). Woodblock (T.2011.56.304, bottom left) used for 'Tattoo' illustration in First Edition, National Museums Collections Centre, Edinburgh.

version of this entry, as well as sourcing a more recent photographic-style illustration to include in *Chambers's Encyclopaedia*, first edition. The tattoo illustration is reused in Chambers's, second edition in Volume 10, page 78. Of note, the 8th edition of Britannica does not have an entry for 'Tattoo'. which again, indicates the *Penny Cyclopaedia* had more of an influence on Chambers than Britannica did.

5.2.2   Correlations in encyclopaedia illustration styles

Chapter 4 provides examples of the illustrations styles noted here, and longer descriptions. Briefly as a reminder, a 'pictorial' illustration style denotes an aesthetic style derived from the concepts of the beautiful, the sublime, and the picturesque in art or literature, and gives the impression that the illustration might be drawn from an artist's imagination or a romanticised vision of a scene, although the image may actually be based on real objects or settings. A 'facsimile' illustration style attempts to depicting objects in as realistic a way as possible.

In a 'schematic' style illustration, details inessential to understanding an object or a
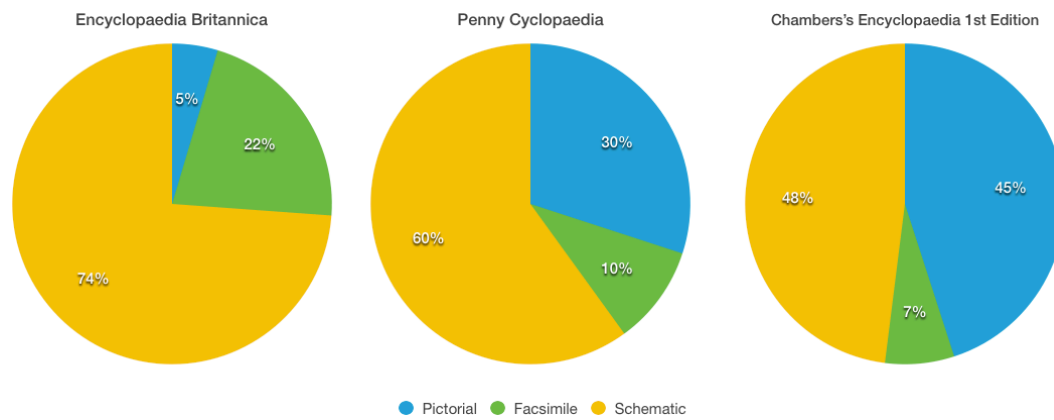
Figure 5.6: Chart comparing *Chambers Encyclopaedia*, First edition, the *Penny Cyclopaedia*, and *Encyclopaedia Britannica* overall illustration styles produced by wood-engravings. The *Penny Cyclopaedia* and *Chambers's Encyclopaedia* are more closely aligned.

subject are omitted. A schematic illustration can range from a simplified scale drawing to a symbolic representation, such as a map or a diagram.

As mentioned in the last section, the First Edition of Chambers had a higher proportion of wood-engraved images to text, compared with both the *Penny Cyclopaedia* and *Encyclopaedia Britannica*. Figure 5.6 shows how those illustrations were being used within each encyclopaedia's volumes. It seems that because both the *Penny Cyclopaedia*, and *Chambers's Encyclopaedia* are the works that are meant to appeal to 'the people', what they have in common is that approximately 50% of their illustrations are appealing pictures or illustrations that appear in either 'pictorial' style or 'facsimile' style. The use of wood-engravings for schematic style illustrations is high in both *Penny Cyclopaedia* (60%) and *Chambers's Encyclopaedia* uses (48%) but neither of them use it as much as the eighth edition of *Encyclopaedia Britannica* (74%).

Britannica's low use of pictorial style (5%) and facsimile style (22%) wood-engravings for illustrations does not mean the Britannica did not use these styles of illustrations at all. The eighth edition of Britannica utilised metal engraved plates at the back of each volume, and many illustrations on these plates such as these examples shown in Figure 5.7 depict various mammals. Other plates show styles of architecture, or machines or other vertebrates. Since most of the illustrations in this edition of Britannica were of mathematics and maps, this indicates that the editors of Britannica used wood-engraving to add smaller illustrations next to entries that were integrated with their text. As noted earlier, Britannica was a more expensive encyclopaedia to own than either Chambers or the *Penny Cyclopaedia* was meant to be. So, it seems that for the eighth edition, the Britannica editors believed that special, detailed illustrations should be saved for metal engraved plates.
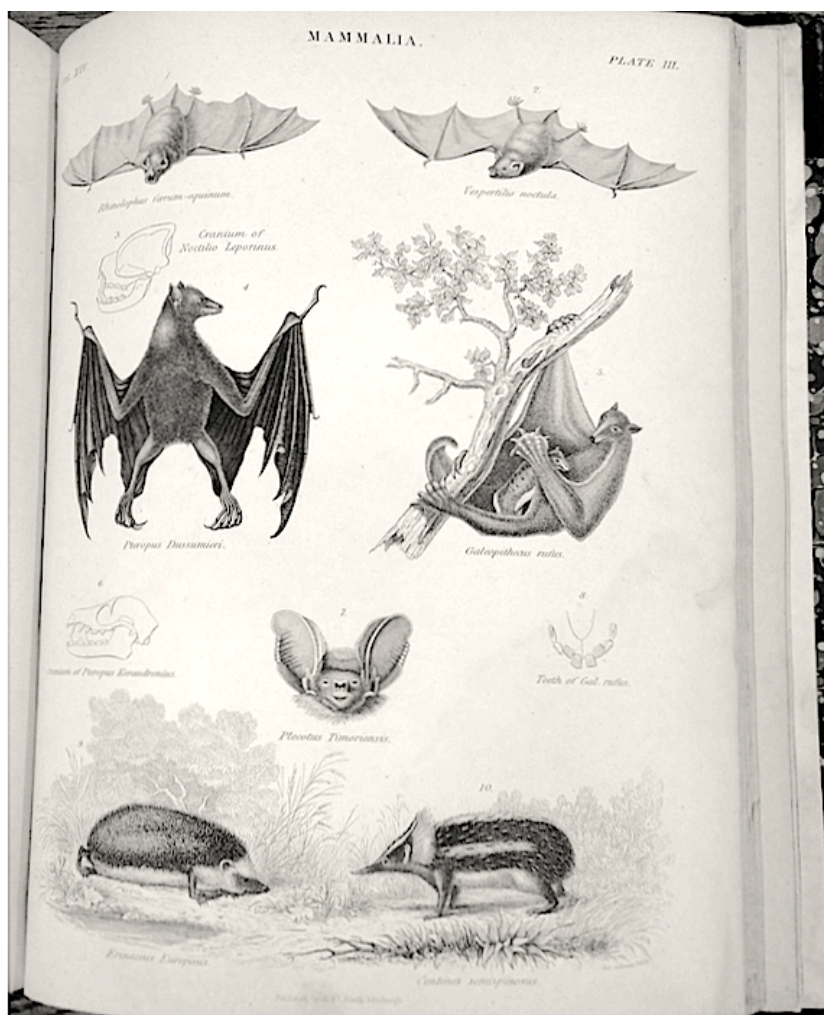
Figure 5.7: Detail of a 'Mammals' plate, produced by metal engraving in *Encyclopaedia Britannica*, 8th edition, 1856. Volume held at Central Library Store (032. Q) Sheffield Library and Archives, Sheffield City Council, Sheffield.

5.2.3   Artists commissioned to illustrate *Chambers's Encyclopaedia*

Another source for illustrations in the First Edition, were from artists outside the firm who were commissioned to draw material for wood-engravers, along with illustrations produced by artists employed as staff at Chambers. Receipts, dated and signed in Edinburgh, by a James Stewart, indicate that he was commissioned to illustrate various images in the G section of the encyclopaedia ranging from birds, such as 'Godwit', to fish, such as 'Goby', to insects such as 'Glass crab.'[36] A particular invoice dated 12 May 1862, shows he was commissioned and paid for drawing 13 items. However, 4 of the 13 items were not actually used in the first edition of *Chambers's Encyclopaedia*. One of the illustrations

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[36]Receipts to James Stewart for illustrations (1862).

commissioned and paid for, the 'Golden Fleece', has an entry in the encyclopaedia, but no illustration. While the three other items on the list, 'Golden calf', 'Gosling', and 'Gromed' do not have entries at all. See invoice in Appendix F. This could indicate two possibilities: there were no contributors to write the entries, or that the editorial staff decided to cut these items completely either for space reasons or because they were not satisfied with the entries, the illustrations, or both.

Walter Crane (1845-1915) mentions in his autobiography that very early in his career, as soon as he finished his apprenticeship learning to draw on wood with W. J. Linton (mentioned in Chapter 2), he was commissioned to make drawings by William Somerville Orr. Orr was then employed at Chambers office in London. He writes:

> *I was engaged...by a Mr. Orr to make some drawings for an Encyclopaedia—I think Chambers's and in order to get at the proper authorities* [sic.] *it was necessary to obtain a ticket for the British Museum Reading Room—planned and directed by the great Anthony Panizzi. As I was under age, an exception to the rules had to be made in my favour, and my ticket was endorsed in red ink.*[37]

Crane, who would later become well-known for illustrating children's books, writes in his autobiography that his task for this contract with Orr involved drawing historical objects for use in *Chambers's Encyclopaedia*[38] and possibly reused in their other publications.[39] Unfortunately at this time no records have been found to indicate which drawings in *Chambers's Encyclopaedia* were actually made by Crane because the records in the Walter Crane Archives at Manchester University do not extend earlier than 1864. Crane's commission for Orr would have taken place in late 1861 or 1862. Crane recalled that museum specimens, animals in zoos, and books from the British Museum's reading room were the basis for many illustrations.:

> *...I drew a variety of subjects from various authorities for the* [Chambers's] *Cyclopaedia, ranging from the bust of Shakespeare to the scenery of Honolulu.*[40]

Like Stewart's work, not all illustrations that Crane specifically remembers appear in the First Edition. There is no illustration for 'Hawaii' or 'island' in the first edition. Nor does a bust of Shakespeare appear.[41]

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[37] Crane (1907), p. 57

[38] Crane (1907), p. 57

[39] Stalker (2009)

[40] Crane (1907), p. 57

[41] Findlater, A., ed (1868) Volume 1, p. 776. A possible Crane illustration may be the bust of Aristotle in Volume 2, page 454. The caption of an illustration from Egypt also specifically mentions being based on a drawing from the British Museum, London. Perhaps this was one of many works of art that Crane initially sketched that a woodblock was based on. *The Gallery of Nature* (1864) attributes some illustrations

Moon entry, *Chambers's Encyclopaedia* First Edition, Volume 6, p 556
A Course in Astronomy, 1848 p. 63
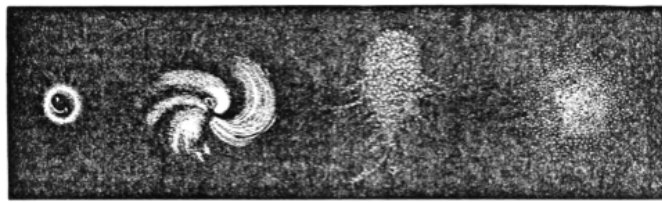
Galaxies in Stars entry, *Chambers's Encyclopaedia* First Edition, Volume 9, p 91
A Course in Astronomy, 1875 edition shown here, (originally published 1848) p. 52

Figure 5.8: Re-used images in 'Moon' and 'Star' entries in *Chambers's Encyclopaedia*, 1864 originally used in 1848.

5.2.4 Influence of other Chambers works and outside sources

Throughout the First Edition, other sources of illustrations were mentioned and cited. Chambers used images from books by other publishers, as well as from their own publications. The illustrations from their own publications were re-used, ones from other publications and photographs were models for new wood-engravings.

It is no surprise that other Chambers works provided source material found for illustrations in *Chambers's Encyclopaedias*. Over 100 instances have been linked with illustrations in previous works. For instance, four images that are in the first edition of *Chambers's Encyclopaedias* showing stars and galaxies were originally published in an 1848 publication, *Astronomy*, which was part of the *Chambers Educational Course* series. This series was also

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to an artist named 'I. Crane.' The 'I' may be a mistake. This could be a future area of investigation, outside this thesis, to uncover illustrations that the young Walter Crane made for the Chambers firm.

edited by Andrew Findlater. Interestingly, the encyclopaedia image for stars and moon shown in Figure 5.8 appears inverted, being printed upside down compared to the same image in *Astronomy*. However, both prints illustrate the same concept and are identical upon close examination. A non-exhaustive list of instances when Chambers images were reused is in Appendix G.

Other sources of illustration for the First Edition included scientific illustrations from journals or from books, such as in Volume 5 page 96, where there are two illustrations of microscopic organisms for the entry *Gregarinidae*. Both illustrations have captions that state '(copied from Greene's *Manual of Protozoa*)'. In the same volume on page 16, is 'Goshawk' with a caption that states '(copied from *Falconry in the British Isles*)'.

The First Edition shows that newspapers were also used as a source for Chambers illustrations. In the entry for 'Japan' there is an illustration depicting three Japanese ambassadors in Volume 5, page 684. The illustration was based on photographs taken by photographer Robert Vernon Heath (1819-1895) for *The Times*. [42] [43]

Both *The Times* and the French paper, *Le Siècle*, reported that a diplomatic mission from Japan visited Europe between January 1862 and January 1863. During their year-long visit, they stopped in London, Paris, Berlin and St Petersburg, as well as making shorter visits to the Netherlands and Portugal. [44] There were 40 members of the diplomatic mission, led by Takenouchi Yasunori, governor of Shimotsuke Province, on the far left of the other men in Figure 5.9. The aim of their mission was to request the delay of five years for opening Japanese port cities to European trade, which was successfully negotiated.[45] Their trip was also a research mission, to enable the Japanese to learn about different European nations and was influential on Japanese foreign policy as Edo Japan transitioned into the Meiji Empire.[46]

The Japanese ambassadors were frequently photographed by the media during their visit, making them popularly known, among people who read the periodical press. Vernon's image was turned into a *carte-de-visite* and was a popular image for people who collected *cartes-de-visite*, especially of famous 19th century people.[47] It is likely that both the *Times* article and the Chambers entry were based on this photograph, given the iden-

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[42]Findlater, A., ed (1864), p. 684

[43]Heath first learned of photography in 1839 while attending Michael Faraday's lectures at the Royal Institution in London. On the evening of January 25, Henry Fox Talbot displayed photogenic drawing. Heath obtained a licence from Talbot, though he switched processes later on. From 1857 to 1865, Heath had his own photographic studio and contributed regularly to various photographic exhibitions and newspapers. Taylor & Schaaf (2007)

[44]*The Times* (1862)

[45]Shimamoto (2015), p. 79

[46]Cobbing (2013), p. 173

[47]Many popular 19th century albumen prints are on: http://www.19thcenturyphotos.com/?nav=about

tical spelling of the ambassadors names.[48] In order to fit into the space allocated for the Chambers entry, and the woodblock that would have made the printed illustration, the image was altered from portrait to landscape format for *Chambers's Encyclopaedia*. See Figure 5.9 The volume that this illustration appeared in was in 1863, and the photograph was taken shortly before the ambassadors left for the French leg of their journey in April 1862. This suggests that images could be sourced for an upcoming volume about one year in advance. This also means that Chambers were including illustrations of popular and relatively current people and events within their pages.

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[48]Takenochi's name is spelled differently in historical scholarship. Shimamoto (2015), p. 79

Figure 5.9: Print of 1862 Japanese Delegation to Europe in First Edition, Volume 5, 1863 (top left) with woodblock (T.2011.56.318, top right), National Museums Collections Centre, Edinburgh. Print of 1862 Japanese Delegation to Europe in First Edition (bottom left) with *Carte-de-visite* of Japanese delegation.

5.3 Workflow in Chambers for the first edition

5.3.1 General working conditions at the firm

Much can be deduced about the working conditions of the firm from the 'Rules and Regulations W. & R. Chambers's printing-office' 1851.[49] Employees worked 6 days per week in a hierarchical structure that employed men, women and children. Men and women were kept strictly apart, and women actually worked an extra two hours per week, as a result the enforcement of Rule 7, requiring them to arrive 10 minutes earlier and leave 10 minutes later than men. Other types of proper decorum were enforced, regarding language, manners, and punctuality, strictly enforced by the shutting of doors at the beginning of the work day, and the docking of pay for non-arrival at work. Employees also lost pay due to illness.

However, in comparison to other trades in Scotland at the time, conditions at the firm do not seem too harsh.[50] The overall work environment also provided a clear structure of management, the establishment of a relatively safe working environment for the time, (free of sexual harassment by fellow employees or exposure to pipe and cigarette smoke). In line with the firm's philosophy of encouraging self-improvement and providing opportunities for their employees to take the initiative in raising 'their condition in life', one benefit the firm provided was an on-site library. In an account given by a former employee, George Manson (1850-1876), the firm provided a good education and emotional support for his learning as a young man.

5.3.2 Chambers's art department

What is known about how the Art Department operated on a macro-level, is known from two individuals that worked for the Chambers firm—artist George Manson, and J.R. Pairman, who worked his way up from wood-engraver to Art Editor. See Figure 5.10 [51]

A commemoration of George Manson's life written in 1879 tells us he was a Scottish artist, born in Edinburgh in December 1850 and apprenticed to the Chambers firm as a wood-engraver. He had a short and successful career as a painter before his untimely death in 1876. The account of his life documents his apprenticeship beginning in 1866, when he was given the task of engraving illustrations for dictionaries (Chambers had several), encyclopaedias, and tail pieces for *Chambers's Miscellany*.[52]

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[49]1855 Notice (1855).

[50]Macdonald (1904), p. 53. Women were commonly separated from men, and paid less than men for longer hours. In many trades, Scottish wages were low compared to England. See Chapter 2.

[51]Manson portrait from Gray (1879) Pairman from a photograph of contributors to *Chambers's Encyclopaedia* second edition, presented to its editor, David Patrick, c 1892. NLS Deposit 341, Item 409a.

[52]Gray (1879), p.3. It is likely that Manson worked on both *Chambers's Encyclopaedia* and *Chambers's*

Figure 5.10: Photographs and signatures of George Manson and J. R. Pairman who provided artwork and engraved woodblocks for *Chambers's Encyclopaedia*. Manson photo from Gray (1879). Pairman image from 'Chambers Photographic album featuring Second Edition contributors' (circa. 1892).

J. R. Pairman, then head of the art department writes warmly about his former pupil:

> *George had very strong ideas as to the proper province of the art of wood-engraving. He held that it had advantages in the way of simplicity in the production of effect of light and shade, which were wilfully thrown away when any attempt was made to imitate the execution of steel engraving, as was often the case. He made no effort to show meretricious skill in mere mechanical dexterity, but followed Bewick, whom he greatly admired, in producing the required effect by the simplest possible means, and in taking full advantage of the power of black, which the surface of a wood block gives, by working from the solid black into the white, instead of from the white into grey by means of a multiplicity of lines.*[53]

In 1870, Manson competed for a prize of the Edinburgh Society of Engravers on Wood. He didn't win the prize, because the aim of the competition was to show one's skill at copying, thereby proving 'artisanal prowess'.[54] Manson submitted an original piece

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Cyclopaedia of English Literature, given his dates at the firm.

[53]Gray (1879), p. 4. Gray interviewed Pairman for a memorial tribute to George Manson. Upon the young artist's death friends and family commemorated him by a special publication with illustrations of his artistic work.

[54]Adamson (2013), pp. 142-143. Adamson observes a paradoxical aspect of becoming a master at any particular craft, especially in the 19th century. 'In its purest technical form, it is the opposite of creativ-

of work so was not eligible to win. However, his original piece of work did impress a judge, and Manson instead received a special prize.[55] This likely changed the trajectory of Manson's life. It encouraged him to continue to be original with his work, and Pairman also encouraged him to visit the National Gallery of Scotland to practice drawing, and take evening classes at the Mound.[56] 'The Mound' is a hill in central Edinburgh where the Royal Scottish Academy of Art and Architecture (RSA), provided (and still provides) lessons for aspiring artists, among other activities.[57] Gray writes that Manson made use of his years at the RSA to study Ruskin, to study nature, and to have the deepest reverence for depicting things with the greatest care.[58] Manson benefited from a good education at the Chambers firm, the apprentices would often take turns reading books out loud in order to improve their minds while their hands were busy. In many ways, he embodied the work ethic of the Chambers firm. According to Gray, Manson rose at 3:00 am every day and would go on walks in order to find views to sketch, sometimes walking a couple of miles into the countryside. He would then walk to the Chambers firm, where he worked from 9:00 am until 6:00 pm on Monday through Saturday. Gray speculates that this schedule of long hours over many years, contributed to his poor health.

Upon his death, Manson had been away from the Chambers firm for five years, and had only completed 5 of the 7 years apprenticeship. However, he seems to have been on very good terms with Pairman. Gray writes:

> *Through the courtesy of Messrs. Chambers, we are enabled to give several specimens of the wood engravings* [sic] *by Manson while in their establishment. Mr. J. R. Pairman has been so kind as to engrave, expressly for the work, a design drawn upon wood by the Artist* [Manson] *and has also furnished us with valuable biographical particulars...* [59]

In contrast to George Manson, who was at the firm for only 5 years, John (sometimes James) Ramsay Pairman, was at the firm for decades. Pairman signed some of his work 'J.R. Pairman'. He engraved many of the images that appeared in Chambers publications, noting that the encyclopaedias were among them.[60]

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ity...design reformers put copying at the heart of didactic regiments of training.' To win the prize it is likely that Manson was meant to engage in a type of facsimile engraving.

[55] Gray (1879), p. 4

[56] Gray (1879), p. 6

[57] Founded in 1826, the RSA moved to 'The Mound' in 1855, sharing its premises with the National Gallery of Scotland.

[58] Gray (1879), p. 7

[59] Gray (1879), 'Preface.' The work had a print run of 400 hundred copies, and was paid for by subscribers interested in Manson's artworks and life.

[60] *Athenaeum, The* (1908), pp. 826-827

Born in 1837, Pairman began working for W. & R. Chambers in 1858. He remained there until 1908. During his 50-year tenure, he moved from wood-engraver, to Superintendent of the Illustrating Department, to the firm's Art Editor.[61] He also trained many people, such as Manson, in the wood-engraving trade. It is also known that he was responsible for all the scenic vistas and objects in a William Chambers book, *A History of Peebleshire*.[62]

In an 1908 interview Pairman gave to mark his 50-year anniversary, and in his obituary[63], we learn about changes in publishing trade and the profession of wood-engravers, and how they were reflected in the Chambers firm. Combined with other accounts of the trade, such as that of W. J. Linton, discussed later in the chapter, we know in which decades there were many opportunities for young wood engravers to become skilled and then work their way up to the top in either a publishing house or their own firm in the mid century, and in which decades that career path became closed. (See Chapter 2) Pairmain seems to typify the earlier career trajectory and by 1866 he was the running the art department at the Chambers firm. In the 1871 census, Pairman gave his occupation as 'Artist and Engraver on wood.' In his interview, Pairman states that for some decades the Chambers firm had about 10 people working under his supervision, but the number decreased over the years.

Several expenses ledgers from the Chambers firm list wood-engraving as a major expense in the 1860s, but by the 1870s, stereotyping and electrotyping were added to this line item, and woodcuts become a smaller expense. While the records of the firm at the NLS are scarce on the details of employees who were wood engravers, were know there were specific blocks that were commissioned for the Second Edition, based on the Pairman acknowledgement in the Second Edition and the presence of blocks in the Chambers collection by the Dalziel Brothers. One can speculate that the need to outsource wood engravers and not just artists might indicate that the number of people being employed to undertake full-time wood-engraving at the firm was stablising at this point, if not dropping off.

In Chapter 2, a study is mentioned of 19th-century independent wood engravers in Edinburgh by Houston. Her study documents the growing number of independent wood-engraving offices in Edinburgh between the 1860s and 1880, and their decline at the end of the 1890s. The data from her study could be correlated with the publications Chambers firm produced during the 1870s and 1880s. Presumably, during busy periods, or to meet the demands of a large project when the in-house staff did not have sufficient capacity, Chambers could hire freelancers as the work was required, and there were over 20 inde-

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[61] *Athenaeum, The* (1908), pp. 826-827

[62] *Athenaeum, The* (1908), pp. 826-827

[63] Pariman died in December later that year

Figure 5.11: Woodblock (T.2011.56.319, left), National Museums Collections, Edinburgh, and print (right) of 'Life-belt?' entry from Second Edition, Volume 6, p. 619, 1890.

pendent wood engraving businesses to select from during the production of the Second Edition.[64]

In the individual case of Pairman, by the time of the Second Edition, his job seems to have expanded to both writing and research. Pairman began writing in his areas of expertise. He contributed to both editions of *Chambers's Encyclopaedia*, writing the 'Wood-engraving', entry, revised from an earlier Chambers article in *Information for the People*. For the Second Edition, he also wrote other articles on 'Illustration of books',[65] 'Lithography', 'Bowls', the 'Bayeux Tapestry' and 'Knightly orders'. 'Knightly orders' is the only one of these entries not illustrated. He was also responsible for the commissioning of images from other sources besides the Chambers firm, and for his efforts is thanked in the Second Edition's introduction, specifically for sourcing images that reproduced the photographs of Francis Frith and Gambier Bolton. See Chapter 4. Other evidence shows that some blocks were made elsewhere, and Pairman became responsible for seeking permission for their use.

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[64]Houston (2000), p. 11. An interesting question outside the scope if this research would be to discover which local Edinburgh freelancers were used regularly by the Chambers firm, and to tie them to specific publications.

[65]Index page of Volume 7, Second Edition, simply lists this article as 'Illustration'

An example of a block from London is housed in the NMS's store, in the drawers for Second Edition encyclopaedia material. The wood engraving was used to illustrate the Second Edition entry, 'Life-Saving apparatus',[66] and shows a bearded man wearing a life-jacket, captioned as a 'Life-belt.' See Figure 5.11. It is known to be from London because a print of this block was found in one of the specimen books in the Dalziel Brothers Archive at the British Museum. The Royal National Lifeboat Institution commissioned the Dalziel Brothers to create a booklet and this block was one of the illustrations used in that booklet. [67] However, in the W. & R. Chambers collection at the NMS, there is a block that matches the print. So it seems that staff at the Chambers firm either purchased the block, or received permission to re-use it or to make a copy of it.

Although no woodblocks used in the production of *Chambers's Encyclopaedia* have been found with the 'Dalziel Brothers' signature, there are three signed Dalziel blocks used in the production of the *Book of Days* which do have them. As mentioned in Chapter 2, 'Robert Chambers himself complied the famous *Book of Days*.' [68] Figure 5.12 provides an example of one of them.

From the presence of these other blocks in the NMS collection, we can infer that Chambers bought existing blocks (or copies of them) from external firms for the Second Edition, but not the First Edition. While it is possible that some blocks may have been purchased from other sources for the First Edition, there is no evidence for this so far, aside from the fold-out maps commissioned from the firm J.G. Bartholomew.

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[66]Patrick, D., ed (1890*a*), Volume 6, p. 619
[67]*India-Proofs of Wood-Engravings* by The Brothers Dalziel, British Museum number 1913,0415.183
[68]Collison (1966), p. 188
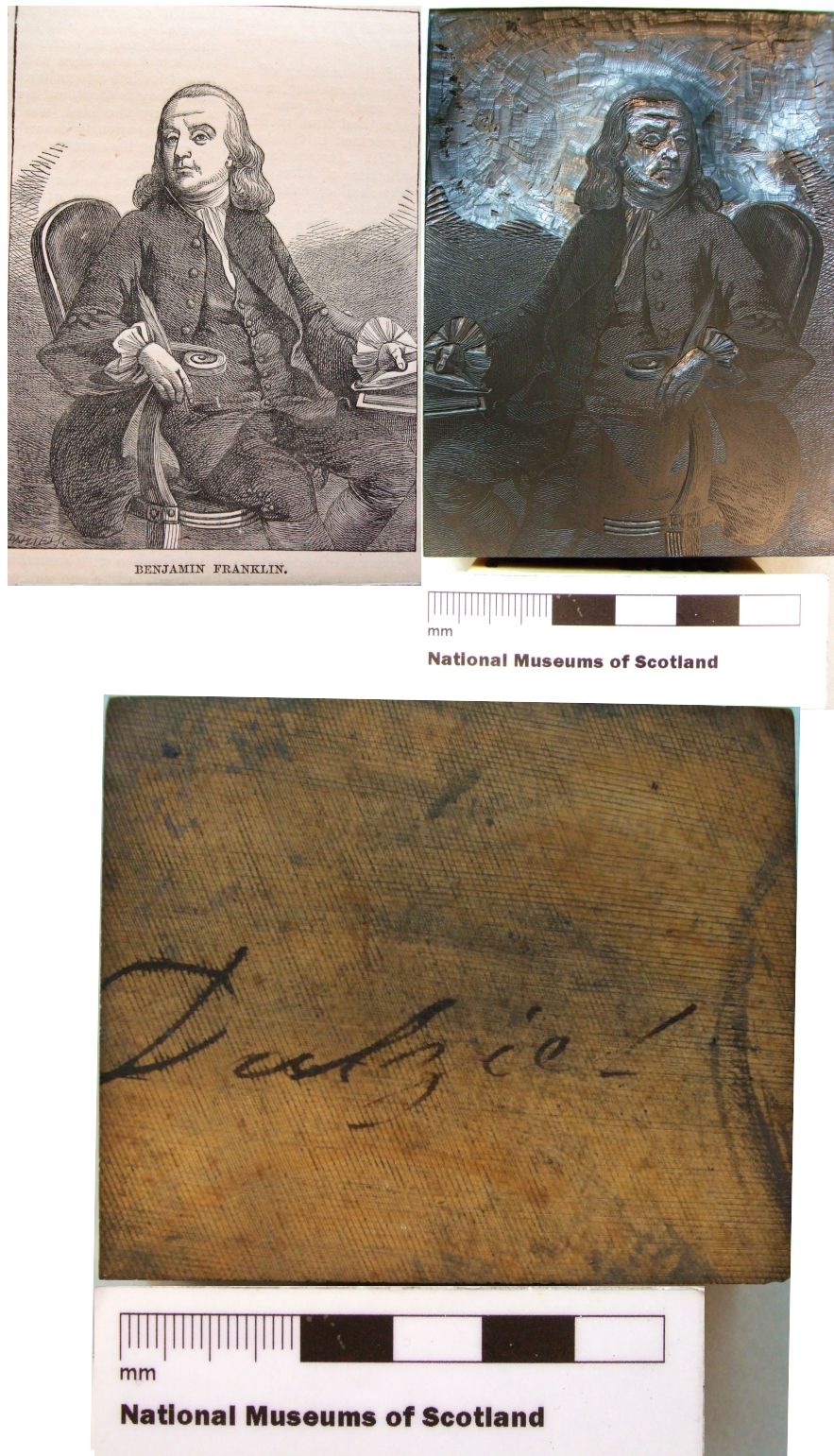
Figure 5.12: Benjamin Franklin print (top left) from *The Book of Days*, 1869, Volume 1. Underside of woodblock (T.2011.56), enlarged to show Dalziel signature (bottom). National Museums Collections Centre, Edinburgh.
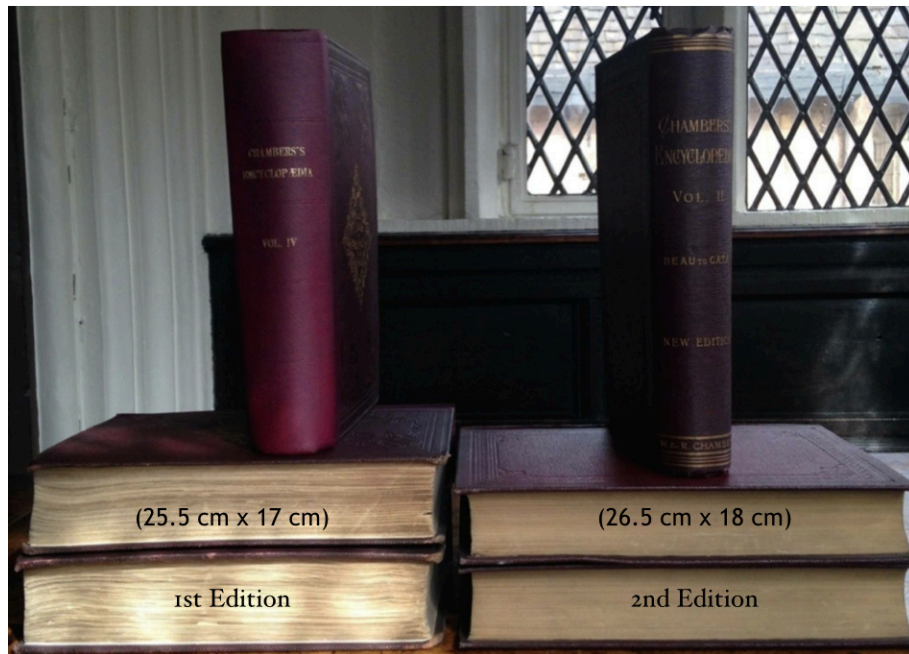
Figure 5.13: *Chambers's Encyclopaedia*, First Edition (left) Second Edition (right)

5.4 Changing production in *Chambers's Encyclopaedia*

5.4.1 Physical description of both editions

The first edition of *Chambers's Encyclopeadia* is 25.5 cm high and 17 cm wide. It is smaller than the Second Edition, which is 26.5 cm high and 18 cm wide. See Figure 5.13. The second edition is longer and slimmer, and was printed on calendared paper, so its pages have a smoother finish, when compared with the First Edition. Page numbers in volumes of the First Edition are variable, as well. The amount of numbered pages in volumes of the First Edition are: Volume 1 – 824 pages; Volume 2– 828 pages; Volume 3 – 827 pages; Volume 4 – 828 pages; Volume 5 – 827 pages; Volume 6 – 826 pages; Volumes 7 and 8 – 828 pages; Volume 9 – 882 pages; and Volume 10 – 821 pages. The volumes of the Second Edition are much more consistent, with all volumes except the first and last containing 828 pages. Volume 1, which contains the introduction, has 824 pages. Volume 10, which contains an index for all volumes, has 832 pages. These total page counts seem to indicate that the Second Edition was more precisely produced than the First Edition.

Figure 5.14: Illustrations relative to layout in *Chambers's Encyclopaedia*. First Edition (top). Second Edition (bottom).

Figure 5.14 shows how illustrations were laid out on a page in both editions, and the organisation of a page's content. Both examples are used from the First and Second Edition's entry for 'Wood-engraving'. The First Edition has no border around its two columns of text. The page's header, which contains the first and last entry titles, is centred relative to the entire page.

In the Second Edition, there is a frame around the entire block of text. The header, which contains the first entry title of the page, is usually centred relative to the left column. The last entry title on the page, is usually centred relative to the right column. However, if a Second Edition entry takes up whole page and fills both columns, as shown in Figure 5.14, title of the entry is centred relative to the middle of the page, and looks similar to the First Edition.

The red arrows in Figure 5.14 indicate either the main area within the column space allotted for an illustration, or how far from the column divider an image extends. Larger Illustrations in the First Edition tend to extend further into the adjacent column's space than in the Second Edition. One would think this is because the First Edition had a smaller paper size and narrower columns. However, while the Second Edition did have a larger page area with wider columns, the blocks used to make illustrations were wider generally, too, as can be seen in Figure 5.15. I believe that the actual reason that blocks in the Second Edition tended to not extend too far into the adjacent column space, is because the pages were printed from electrotypes of woodblocks. In terms of production, it would be easier and more efficient when laying out a page for electrotyping, to use a standard range of illustration sizes that can be easily locked into a matrix with text. An electrotype plate is then made from the matrix. For both editions, image sizes would have to take into account the column width and height, but as pointed out previously, the First Edition seems to have re-used older blocks that had varying sizes. For the second edition, if illustrations were being especially commissioned for purposes of this encyclopaedia as stated in the Second Edition 'Preface', then it would make sense for the newly created or commissioned blocks to either fit neatly into a single column, or to not extend too far beyond the column's width. More about Figure 5.14 will be discussed in connection with blocks and the size of the blocks after the case study in the next section.

5.4.2   One case study of a block from the First and Second Editions

In order to provide an example of the changes in standard size blocks between the First and Second Editions, Figure 5.15 shows two blocks and their illustrations. These blocks were used to illustrate the entries for 'Apollo Belvedere' in both First and Second Editions. The significance of this Vatican statue, was discussed in Chapter 2., but the blocks themselves, in terms of the printing process, are discussed below.

Figure 5.15: Illustrations and blocks for the entry 'Apollo Belvedere' from the First Edition (T.2011.56.214, left) and the Second Edition (T.2011.56.213, right). National Museums Collections Centre, Edinburgh.

A close physical examination of the Figure 5.15 blocks provide clues to how they were used. The block on the left, from the First Edition, was made to be printed from directly, as indicated by the fact the background area of the block (the unprinted surface surrounding image) has been cleared away, and that it is covered with printer's ink. The block on the right is from the Second Edition, and the back part of it is not cleared away. This woodblock, and other ones used for the Second Edition, are also covered with graphite, which means that they were used to make a derivative image through the electrotyping process. A general description of electrotyping was provided in Chapter 2, but there were alternative ways for making electrotypes. In the 19th century, graphite was called 'black-lead' and John Southward, who also contributed to the Second Edition, explains the process that must have been used by the Chambers firm based on the evidence of the woodblocks:

> *The process of electrotyping as carried on in a large establishment involves a good deal of machinery. A moulding case is warmed and placed on a level iron table, and when melted, beeswax is poured into it from a ladle. After the wax has flowed quite level it is rubbed over with black-lead and polished by means of a soft brush, after which it is ready for taking an impression of the block or page to be reproduced. To make this impression, great and steady pressure is needed, and this is obtained with a moulding press – a steady iron frame having a planed bed, over which is a fixed head. There is a projecting table on which the case of wax and the form of type, which is also black-leaded and brushed, are arranged before sliding them in the press to received the pressure, which is put on them by raising the bed against the head-piece...* [69]

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[69] Southward (1897), p. 71

Figure 5.16: Underside of a block with scraps of paper from *Information for the People*, 1845, used as make ready. 135 x 123 mm. W. & R. Chambers Collection. (T.2011.56). National Museums Collections Centre., Edinburgh. Photo by Rob Banham.

Other evidence gained from studying the woodblocks in the Chambers collection at the NMS, which shows that First Edition blocks were printed from directly can be seen on the underside of many blocks in the form of scraps of paper or make ready. In the process of making illustrations, printers might need to raise the whole block or *parts* of it, to ensure that the image is printed properly. Usually, this was accomplished by using scraps of paper, that were glued or affixed to the underside of the block in different layers. See Figure 5.16. In some cases the whole block might be a little low, but in other cases the printer attempted to raise specific portions of the block so that particular areas would print lighter or darker. This could either have been to achieve an even impression, or so that background areas, or the edges of a vignette, appeared fainter. Based on examining not just W. & R. Chambers blocks, but a dozen blocks from the Dalziel collection in the British Museum and nearly 100 blocks formerly owned by the (American) Religious Tract Society now housed in the Library Company of Philadelphia (made in the early to mid 19th century, so contemporary to the First Edition blocks), I have observed more blocks that printers have affixed scraps of paper in patches to the underside of, than blocks with uniformly applied paper, suggesting that adjustments usually were made to a part of an image, rather than the whole.

Judging how pressure would be applied to the block could be a time consuming process. Examples of prints made from a block engraved by the author can be found in Figure 5.17. The print on the left is lighter because no make ready was placed under it. After several scraps of paper were fitted on the back of the block, the print became darker.

Figure 5.17: Examples of prints made from a block engraved in 2015, by author under Chris Daunt's guidance. Woodblock in personal collection of Rose Roberto. Note, the left-side print with no make ready is lighter.

5.4.3 Woodblock trends in both First and Second Editions

There was a shift in the size of blocks from the first edition to the second, the Second Edition using a more uniform-sized range of blocks. Figure 5.18 shows data collected from a general sampling of blocks in first volumes of both editions. The numbers on the vertical axis indicate the number of blocks available to be sampled in the collection. (See the break-down in Chapter 1). The numbers across the bottom of the horizontal axis indicate the size of the blocks in mm. Measurements here will also be given in picas.

The pica is a typographic unit of measure corresponding to approximately one-sixth of an inch and is the largest ordinary size of book type, and the standard measurement for leads, furniture, rules and the width and length of pages.[70] While the smallest blocks found in the First Edition, measure 1 pica (4.23mm), for example the letter 'a' in Figure 5.14, in the Second Edition the smallest measure 5.9 picas (25mm). In the First Edition, the width across the block of text is 45 picas, and across each column is 22 picas. In the second edition, the width across the block of text is 47 picas, and a column is 23 picas wide. The Second Edition allowed a slightly deeper text block at 54.37 picas (230 mm), compared with 52 picas (220 mm) in the First Edition. In addition to increasing the number of words per page, the decision to use wider and deeper pages with a larger text block size allowed more space for images, and allowed more images to fit within a single column. Since the majority of the blocks in the Second Edition's general sample, average 15.36 picas (65 mm), they were designed to fit just inside one column width. The second and third most frequently used block sizes were, respectively, just 3.54 picas (15mm) outside to column, and just 3.54 picas (15mm) within it. See Figure 5.14.

The First Edition blocks indicate that the highest frequency of block-size used were meant to fit into the single-column width. While the same can be said about Second Edition illustrations, two specific block widths were used a lot more than others, whereas

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[70]Pasko (1894)
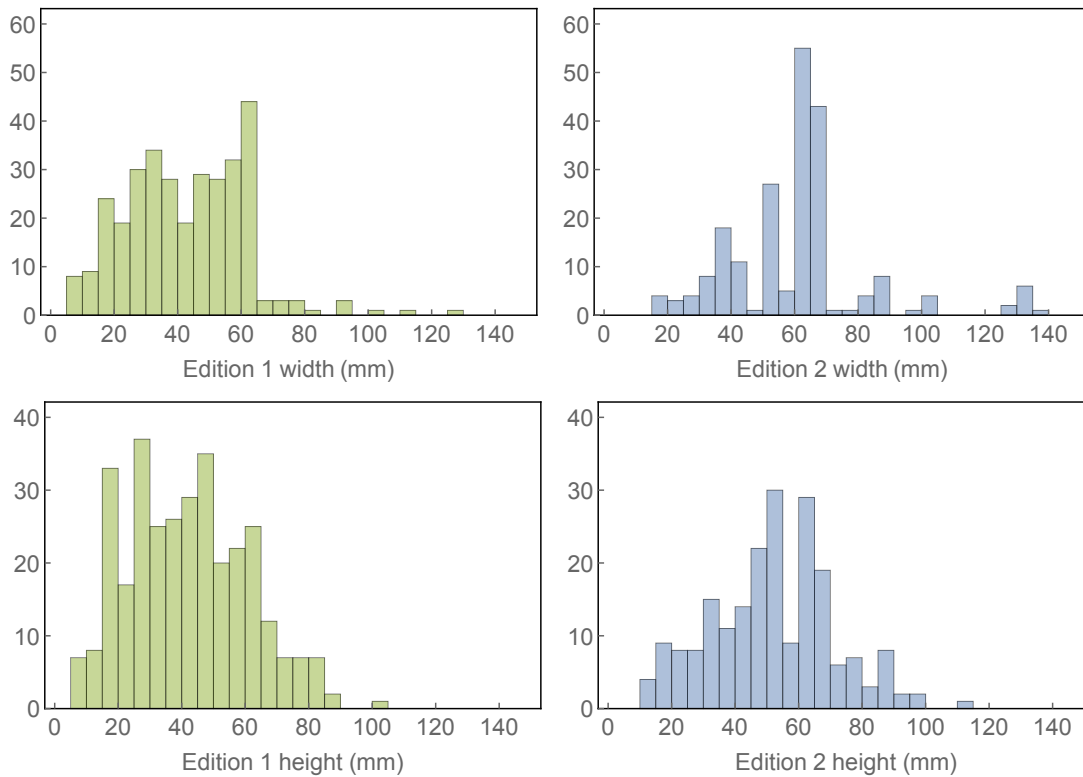
Figure 5.18: General sampling of blocks in first volumes of both editions

the First Edition varied in the number of block sizes that were used. This suggests an attempt to have at greater consistency in the Second Edition.

Besides a general comparative survey of the images in the first volumes of Chambers, noted in Figure 5.18 other blocks were sampled by categories previously mentioned in Chapter 4. The tables presented in Figures 5.19 - 5.22 reflect research on blocks in these categories.

When examining the blocks in the vertebrate categories, they seem pretty consistent with the findings of the general survey. The size of blocks, especially in terms of height, seem to show a standardised size that is slightly larger for the Second Edition, when comparing it with the First Edition. For the blocks size in terms of width, it seems for this category that the average image would just fit inside a two column space in the Second Edition, meaning larger and wider images seem to have been selected. Standardising the block sizes, and in particular having more blocks made to fit the exact width of one column, or more that are narrower than one column, would have made typesetting easier and therefore quicker.
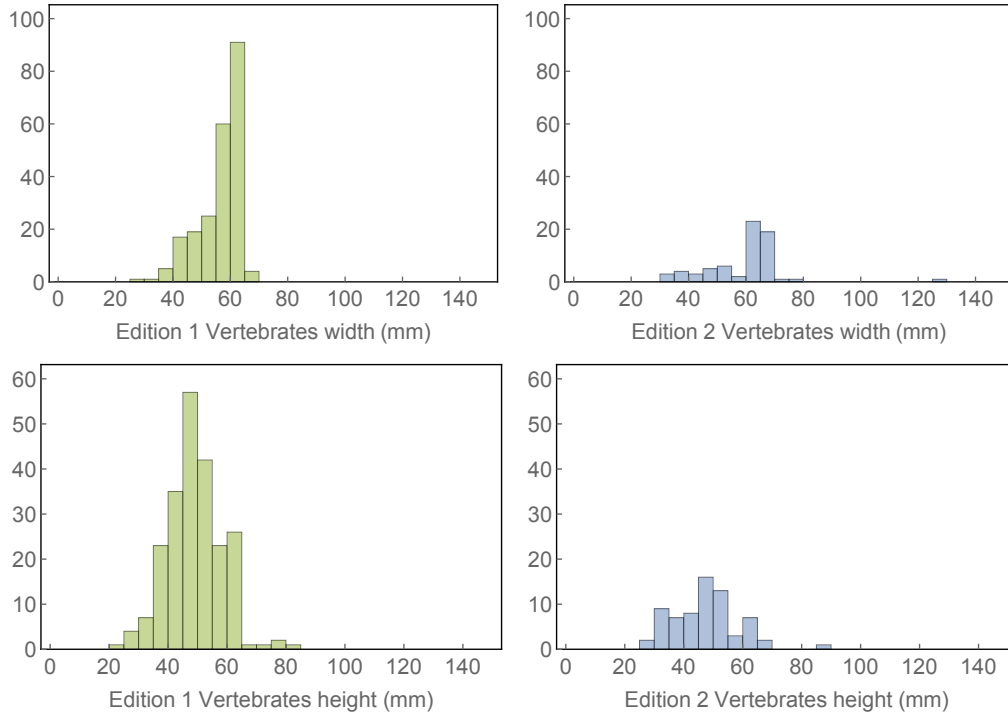
Figure 5.19: Sampling of blocks showing vertebrates in both editions
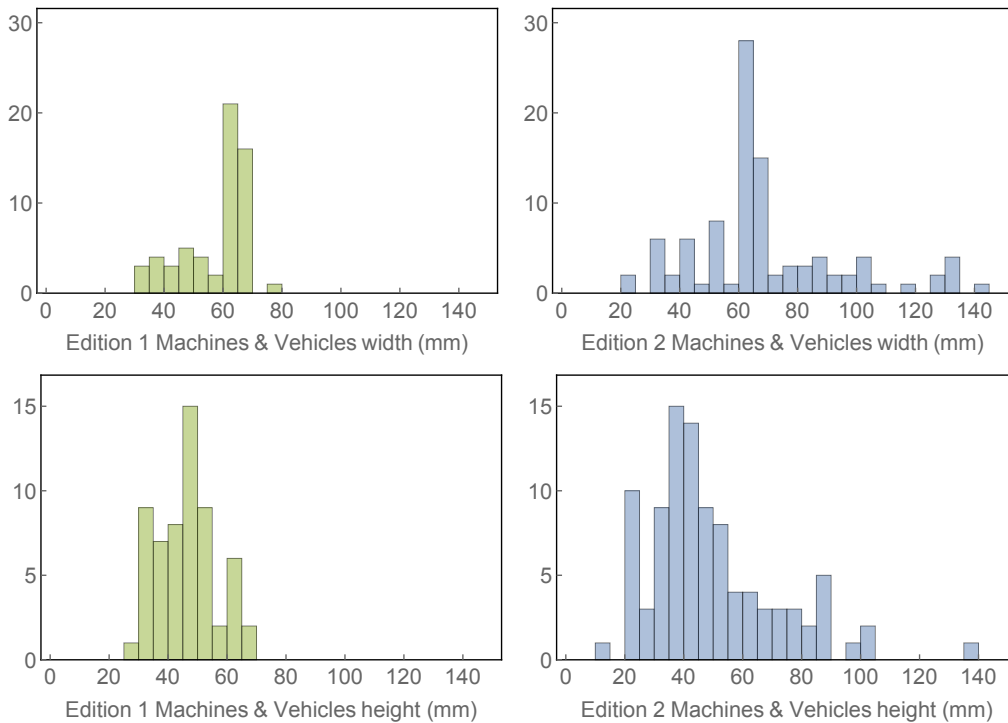
Figure 5.20: Sampling of blocks showing machines and vehicles in both editions
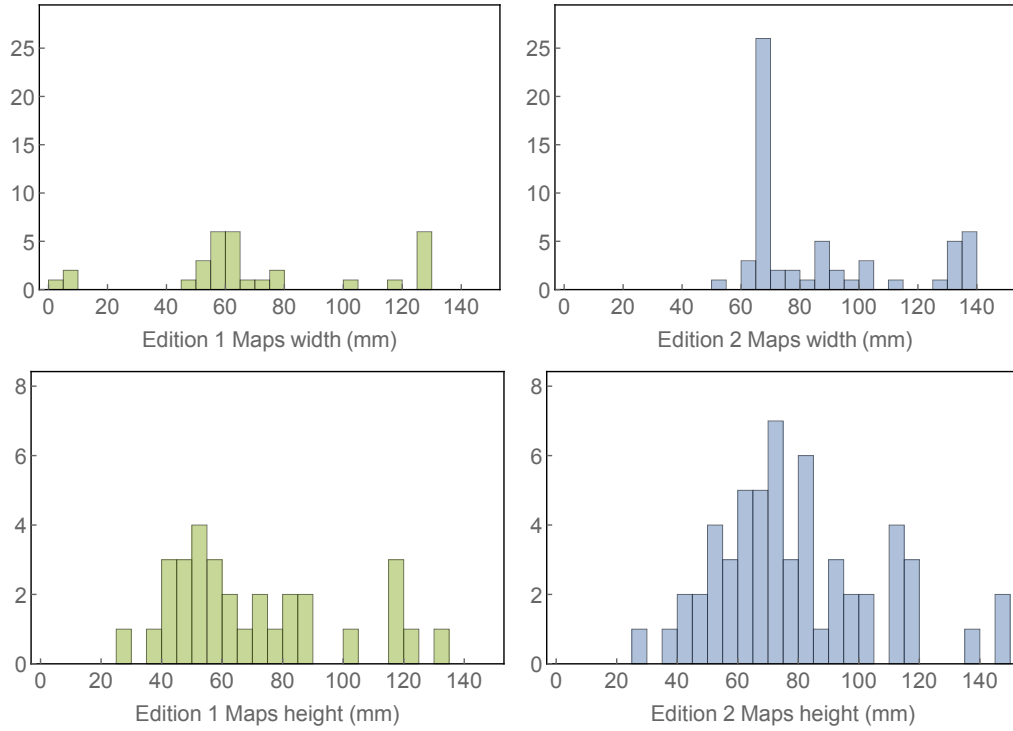
Figure 5.21: Sampling of blocks showing maps in both editions
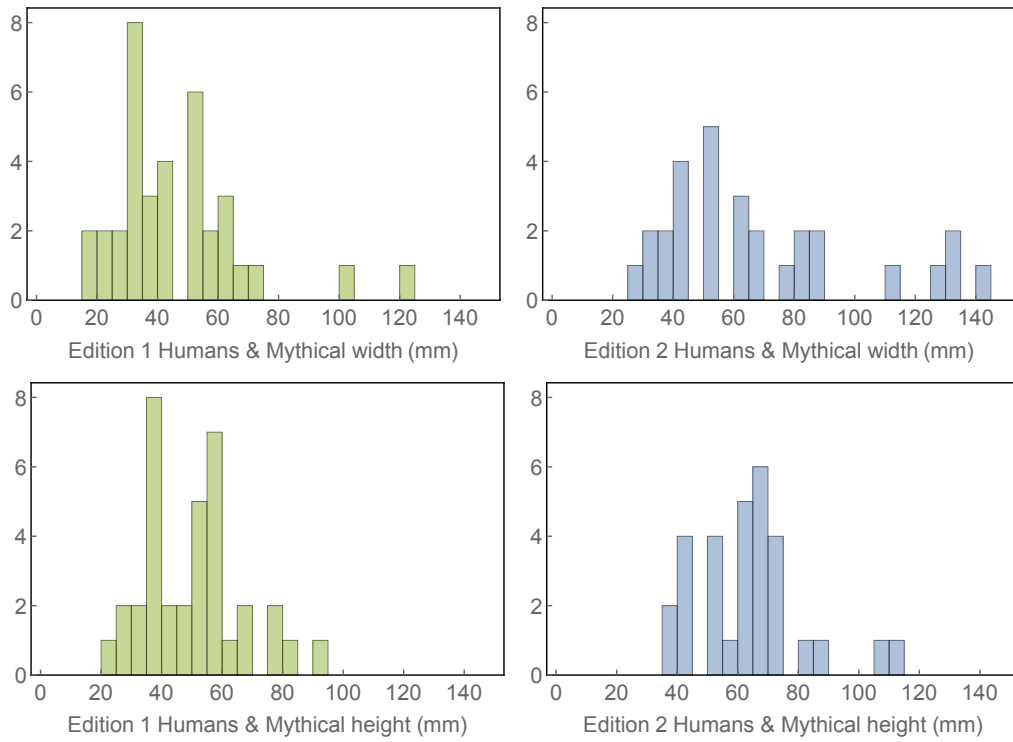
Figure 5.22: Sampling of blocks showing human or mythic figures in both editions

When looking at the data from the blocks representing machines and vehicles, one notices that blocks illustrating this category have a wider range of sizes in the Second Edition. This is because the illustrations of machines and vehicles tended to be tall to showcase subjects shown that were more variable. What can also be observed is that there are many blocks in the collection which depict this category in comparison to the category for vertebrates. This discovery, that there were fewer blocks depicting vertebrates, when I expected to see more blocks based on the frequency of prints, led me to believe that vertebrate blocks were reused in other publications, and indeed they were. Second Edition illustrations were used in three known publications: two by Lippincott, and another one by Chambers. See Chapter 6. While illustrations of machines and vehicles and illustrations of birds both broadly depict science, blocks or electrotypes of birds can be used again while the technology for printing them remains. However, woodblocks depicting machines become outdated, so were less likely to be reused as the years passed.

Maps also show significant standardisation in terms of image distribution by size. This could be due to the fact that map illustrations used in Chambers were outsourced by the Second Edition. John Bartholomew, well known for engraving and mapmaking, supplied all map illustrations for the second edition — not only with fold-out map plates, but also electrotype maps used within the text.[71] Maps are also more likely to be standardised by their nature, as publishers decided their size and scale and a map was made accordingly. Its possible that Chambers specified a preferred or maximum size (either in general, or for each map) and also possible that a list of maps were grouped by required size.

5.4.4 Printing artefacts used for First and Second Editions

The W. &. R. Chambers Collection in the NMS contains five types of objects used in the printing process of the first editions of *Chamber's Encyclopaedia* An example of each one is shown in Figure 5.23. First, there are engraved wood blocks which have been created for printing from directly as described above, such as the Labrador.[72] This kind of block was locked up in the forme and printed together with the metal type. Illustrations made from these engraved blocks were printed directly from them. Although they vary in size, these blocks are fairly uniform in appearance, and they typify the majority of blocks used to print images in the First Edition of the *Chambers's Encyclopaedia*. Since many prints used in the first edition of *Chambers's Encyclopaedia* follow a pictorial aesthetic as described in Chapter 4, and look very similar to other, older Chambers publications like *Information for the People* many of them were previously in other Chambers publications.

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[71]Three sources support this: 1) Cooney (2005). 2) The NMS collection for the second edition only contains electrotypes or in some cases duplicate stereotypes. Some have the name J. Bartholomew inscribed on them. 3) Correspondence in Lippincott Company to Chambers, 26 April (1888), 4.10, p. 99

[72]First Edition, Volume 6, p. 746.

Figure 5.23: Blocks and plates used in production of *Chambers's Encyclopaedia*. First and Second Editions. 1-'Labrador', wood-engraving, 1860s; 2- 'Bloodhound,' wood-engraving, 1888-1892; 3-'Moon', wood-engraving, 1888-1892; 4- 'Wood-engraving' [of people from the Middle Ages], stereotype, 1888-1892; 5- 'Egyptian wall painting', electrotype, 1888-1892. Items in W. & R. Chambers collection (T.2011.56), National Museums Collection Centre, Edinburgh.

The second type of block in Figure 5.23 is the example provided by the Bloodhound[73] is also made from boxwood. This particular block looks like it was based on a photograph, and it was also covered in graphite, indicating it served as as templates for the creation of electrotype blocks in the manner described by John Southward earlier. A layer of graphite was brushed onto wax and then was pressed against the block to make an impression, graphite was also applied to the block itself. Therefore there is graphite residue was left on the block.

The third block, a Moon[74] shows the effect of a wood block that had a photograph exposed on it, as a way to guide the engraver. This type of block produced the facsimile style illustration discussed in Chapter 4, and the process described in Chapter 2, with the robin block used in *Chambers's Expressive Reader* series.

The fourth object, from the Second Edition's entry 'Wood-engraving'[75] is a stereotype plate fixed on a block. Chapter 2 describes the general process of making stereotypes. The

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[73]Patrick, D., ed (1888*b*), Volume 2, p. 237
[74]Patrick (1889), Volume 4, p. 237
[75]Patrick, D., ed (1892), Volume 10, p. 711

fifth object from the Second Edition, is an electrotype of and 'Egyptian wall painting' [76] It is made to be fixed on a block. However, some of electrotypes, like this one, are finished and mounted on wood, others are in different stages of being processed. The final type of object, of which there are less than a handful of examples, are half-tone plates. None were used for the first two editions. Chambers used both stereotyping and electrotyping process, and based on some account books, I believe that there was a transition from mostly using stereotype plates to mostly using of electrotype plates in the 1870s. [77]

In addition to the blocks and the block derivatives mentioned above, there are items that look like various experiments in printing or drafts of illustrations for other works. Figure 5.24 is an illustration that was used in the Second Edition entry 'China' and shows what is in the Chambers collection – a woodblock that matches the illustration, but also a stereotype plate with a copper finish. The illustration is also slightly larger and includes details that were cut from the final print, such as a table and a vase. These objects seem to indicates that the image was taken from somewhere, possibly another Chambers publication, and then re-used for the Second Edition, after it had been edited. However, it is also possible that this stereotype was copied from the woodblock and then extended to fill a larger space in a subsequent publication.

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[76]Patrick (1889), Volume 4, p. 237

[77]Pub Led. (1859) and Pub Led. (1891*a*)
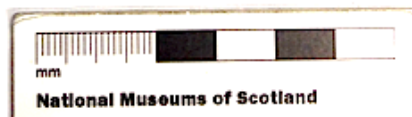
Figure 5.24: Print (top) of a Chinese school painting in 'China' entry, Second Edition, Volume 3, 1889. Woodblock (T.2011.56.241, middle) used in the production of this illustration. Stereotype plate with copper finish (T.2011.56.242, bottom). Both woodblock and plate from W. & R. Chambers collection, National Museums Collections Centre, Edinburgh.

5.4.5   Printing machines used for First and Second Editions

In contrast to many critics of Victorian era design, such as John Ruskin (1819-1900), John Southward (1840-1902) wrote positively about changes to printing in the late 1800s, not only for his entry in the second edition *Chambers's Encyclopaedia*, and his entry on the same topic in the ninth edition of *Encyclopaedia Britannica*, but also in several other books he wrote on the history of printing.

> *Printing is by no means in decadence. On the contrary... very good printing is being done... in fact far better printing is being done during the last sixty years in each of the three principle branches of business – job, news, and book printing– than was ever done before* [78]

Southward's knowledge, optimism, and attitude towards new types of printing presses, were compatible with the values of the Chambers firm, a representative voice of the Chambers philosophy who explained the fundamental principles of how machines worked.

While advances in printing technology were driven by the business practicalities of daily press deadlines, the innovations developed from the newspaper industry spread beyond that sector. As noted in Chapter 1, since the W. & R. Chambers firm were producers of periodicals through the *Edinburgh Journal*, the trends in newspaper practices and technology did directly effect it.

In the First Edition, under the entry for 'Printing' in Volume 7, there is a description of how printing machines worked.

> *Applegath and Cowper's book-machine as just mentioned, remains the best of its kind. The machine, moved by steam power, from which the annexed engraving is taken, is one of this description. It is about 15 feet long by 5 broad, and consists of a very strong cast-iron frame-work, secured together by two ends and several cross-bars. To this frame, all parts of the machine are fixed. In external figure, as seen in the cut [illustration], it is a large apparatus, of imposing appearance. On approaching it when at work, we perceive two cylinders, as large as hogsheads, revolving in upright supports; two smaller cylinders or drums revolving above them; and beneath, within the framework a table, on which lie the types at both ends, going constantly backward and forward. A belt from a steam-engine, acting upon a shaft in the frame, gives motion to the whole apparatus. It will further be observed that a boy, marked by a in the cut, is standing on top of some steps feeding in sheets of paper, each of which, on being delivered, is swept round the first cylinder b (being held by tapes), gets its impression below from the types, is carried over and betwixt the drums above, and then brought round on the second cylinder c; now it gets it*

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[78] Southward (1897), p. 5

second side printed, and issuing into the space between the cylinders, is seized by the
boy d, who lays it on a table completely printed.[79]

The machine was steam powered and the cylinders provided strong uniform pressure
upon the forme holding type and woodblocks, so that even impressions could be made
upon the printed pages. Unlike many other firms, Chambers had adopted cylinder print-
ing before the 1840s.[80]

The Chambers firm acquired their first steam press in 1833. By the 1850s, they had
10 working steam presses installed by professional engineers in their expanded premises[81]
They described the advantages and disadvantages of using cylinder presses in *Information*
for the People, 1845. The advantages are that the machine produces material quickly, that
with the help of steam power can apply a heavy force of between 40-50 tons, much stronger
than several strong men. It also had this safety feature on it:

> *The machine may be stopped at any instant, by turning the handle of a leaver,* [sic]
> *which shifts the belt from the fast to the loose pulley, without stopping the engine.*

However, cylinder machines did have some disadvantages.

> *We have now described the advantages of cylinder printing, and it is but proper*
> *that we should mention certain drawbacks to its universal use. The pressure by a*
> *round or cylindrical surface is less perfect than that given by an even surface. The*
> *cylinder has the effect of pressing partly on the edge of the type, both in coming up*
> *to the impression and in leaving it, therefore the impression... is not clean, it has*
> *a slight blurring or wants that degree of sharpness and fairness than is required*
> *in fine bookwork. Cylinder printing, from the same case, wears down types much*
> *more quickly than flat presses. A fully more important defect is the time required*
> *to prepare a sheet of types or forms, for the machine. A sheet such as this present,*
> *requires no less than three hours to make ready, and a sheet of stereotype plates an*
> *hour longer.*[82]

The time it took to compose type and woodblocks with make ready was 3 hours. Cre-
ating a stereotype plate of the page would make this process 4 hours. But it was advan-
tageous to have stereotypes so that multiple copies could be made on different printing
presses, which meant that production could be faster, and that printing could be done in
multiple locations at the same time. In the case of the encyclopaedia, they also ensured

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[79] Findlater, A., ed (1868), Volume 7, p. 766
[80] Fyfe (2012)
[81] Fyfe (2012), p. 198
[82] Chambers & Chambers (1842*a*), 'Printing issue', p. 637

that J. B. Lippincott, who it seems, initially operated as American distributors[83] for the Chambers firm would be able to print the First Edition in the United States only one year after the encyclopaedia had been released in the UK. By 1863, Americans could purchase the same encyclopaedia parts and volumes in Philadelphia during the same year that were released earlier in Edinburgh, since Chambers had sent Lippincott stereotype plates. Examination of the American version published in the United States during the 1860s reveals that the page layouts, the illustrations, and the page numbers were identical to the British version published in the 1860s.[84]

The First Edition was edited and produced solely by the Chambers firm. Initially it was printed, sold in parts, packaged and marketed alongside other Chambers serials, like *Information for the People*. The two column layout, with a header at the beginning of a section is also very similar in style and page size, *Chambers's Encyclopaedia's* bound with cover measures 25.5 cm x 17 cm; IFP, 1840s version, bound with cover measures 25 cm x 17 cm), which makes sense, given that in the 1860s Chambers had at least 10 similar printing machines.[85] It seems logical that the format was driven by the size of Chambers presses.

Chambers completed the First Edition in eight years. Using a cylinder steam press described above, allowed the quick printing and publication of the work once each part had been typeset. The First Edition of the encyclopaedia was printed in 520 parts and sold by subscription and in shops, using what I believe was the standard publishing model for Chambers serials, the parts were made as orders came in, and the profit from initial sales could be reinvested back into the project. According to archival records, orders of the *Chambers's Encyclopaedia* were steady, but initially slow. For instance, four separate Edinburgh booksellers, that regularly stocked Chambers's products quarterly, only ordered an average of three copies of *Chambers's Encyclopaedia* parts in 1859. Only in November of 1859 does the bookshop of Messrs Waterston & Johnstone order 13 copies. [86] The Chambers firm did not make any profit on the sale of the encyclopaedias until the First Edition was completed in 1868. By 1880, they had sold 80,000 sets.[87]

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[83]Copyright issues seemed to compel a more formal partnership, as will be discussed in later sections

[84]A sample comparison was made of pages 1- 50 and pages 500-550 in all 10 volumes of both British and American versions, that had illustrations, as well as the 'United States of America' entry. Only minor textual changes were detected in the entry for 'United States of America' which listed a different number of official States and territories. These changes could have been made to stereotype plates by physically cutting the metal parts with the relevant lines of text, and replacing those lines with other lines of text, composited from other type metal. The new text could then be easily soldered into the space left behind by the cut lines.

[85]Fyfe (2012), p. 198

[86]Pub Led. (1852)

[87]Pub Led. (1891*b*)
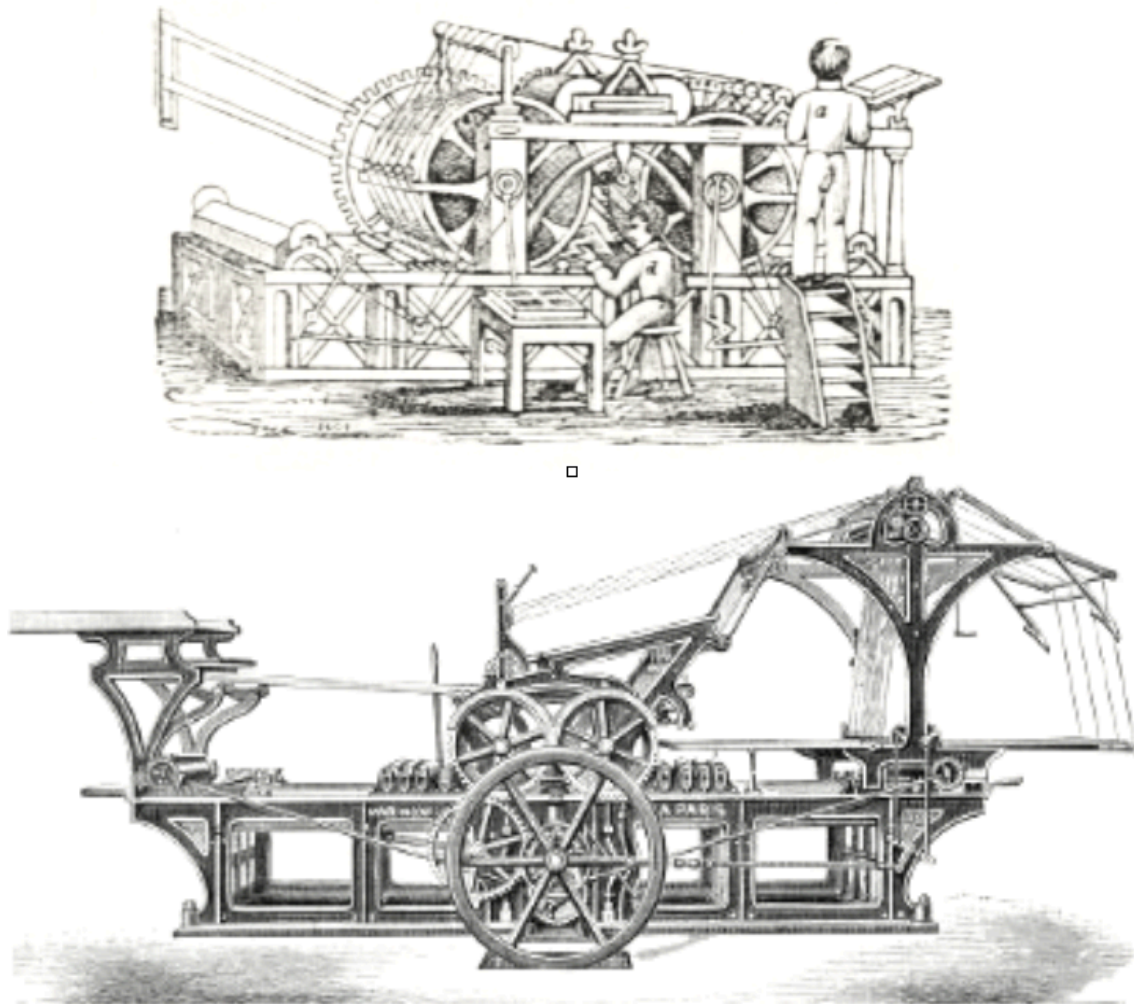
Figure 5.25: Printing presses used for *Chamber's Encyclopaedia*. The first edition was printed on an Applegath and Cowper book machine, shown on the top. The second edition was printed on a Marinoni Perfecting Machine, shown on the bottom.

Towards the later part of the century, many types of printing press made the move to using calendared paper. Southward explains that historically it was believed by many members of the book trade, especially ones that aimed at the high end of the market, that the only way to achieve fine illustrations was by using platen presses with wetted paper, in order to ensure finer details of illustration and type were printed. Of course this older process added an extra step of work to the overall process, not only to wet the paper, but for other tasks such as changing impression blankets in printing machines that the wetted paper process required. The number of bodies necessary to run a machine led to extra labour costs for publishers. When explaining how that process had worked, Southward writes in his entry on page 414 of Volume 8 in the second edition, how the shift to calendared paper preserved the advantages of wetted paper from flat bed presses.

It is not long since that it was a firm article of belief among printers that fine work could not be done except on a press provided with a platen. And up to quite recently all paper was first thoroughly wetted, then printed, then dried, and then pressed to restore the surface, of which the dampening deprived it, and to give it a certain gloss. Between the form and the platen of the press or the cylinder of the machine a thick, soft, yielding blanket was placed, which was supposed to produce a better impression from the inequalities of engravings and type. There has been a radical change in opinion and practice on these important points. It has been found, since machines have been brought to their present degree of perfection, that they give far superior results to those from presses—their impression is stronger, more solid, and more uniform, and the sheets can be laid on them with a precision unattainable with hand presses. Paper is now not made spongy and stretchable by being wetted, and the result of working it dry is that type is brought up with greater brightness, and the delicate lines of engravings are printed finer, clearer, and cleaner. Improvements in ink-making have much conduced to this desirable result. Paper had been produced for book-printing with a specially prepared surface, which admits of a far more excellent impression than was formerly procurable. The soft blanket has been discarded, and the packing or covering of the cylinder is now generally as hard as it can be got. The aggregate results of these alterations may be seen by a comparison of the issues of an illustrated newspaper with those of fifty years ago. Up to about 1840 there was actually no press strong enough to properly print a woodcut of 48 square inches in superficies; now woodcuts of 2000 square inches, or 50 inches by 40 are printed in the most perfect manner. The coloured supplements of the pictorial journals are often admirable reproductions of works of high art; it is within the memory of persons of middle age that the first crude attempts were made with such pictures.[88]

Southward goes on to praise the innovative quality of machines that do not require people to do menial tasks like feeding paper into the machine, pulling the paper out, refeeding the pages back into the machine to print on the second side, then cutting the printed paper and folding it. Some perfecting machines could cut and fold the paper, like the Marinoni press acquired by Chambers, and it made printing much faster. The most one person could feed into a printing machine in one hour was about 1500 sheets. [89] Machine makers, including Apple and Cowper, started building presses with more feeding stations for paper, but this became more and more unwieldy, given the increasing number of operators required.

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[88]Patrick, D., ed (1891*b*), Volume 8, p. 413

[89]Twyman (1970)

The second edition of *Chambers's Encyclopaedia* was printed in the UK on a Marinoni Perfecting Machine, and printed on dry paper that had been calendared; a step at the end of the paper-making process when a series of hard pressure rollers gives the paper a smooth and glossy finish. By the 1880s, use of calendared paper was widespread in the printing industry on both sides of the Atlantic. The Second Edition that was printed in the United States by Lippincott who refer to their cylinder presses, but the exact make and model has not be discovered.

John Southward, the author of the entry on printing in *Chambers's Encyclopaedia*, writes enthusiastically about these innovative machines:

> *Fig 9 shows the Marinoni, a well-known type* [of perfecting machine] *used in the printing of the British editions of the present work. These machines can print in the very finest manner from 1000 to 1500 perfected sheets per hour, according as they may be complicated with illustrations or not.*

The Marinoni Perfecting Machine was also a cylinder press machine, but it was much faster than the Applegath and Cowper machine. It was developed by Hippolyte Auguste Marinoni (1823-1904).[90]

This may be a key reason that influenced the editorial decision to have about 800 fewer illustrations in the second edition of the encyclopaedia, when compared with the first edition.

> *When the types are to be printed from direct, as already mentioned, the chase containing the pages is put on the bed of the machine. When stereotype or electrotype plates are used they are carefully dressed to an exact size and thickness, the latter about 3/10ths of an inch. The requisite number of wooden blocks are then put on the machine-bed and locked in a chase. These blocks are of the proper thickness to make up the plates to type-height (about 1 inch). The plates are fastened to the blocks by brass catches at the sides and ends, and when locked up are as solid as type....Before printing, however, a laborious process called making ready has to be gone through. When many wood-engravings are in the pages, several days may be taken up making ready a single sheet. This process is for the purpose of making the impression equal all over and properly printing the wood-engravings, and can be judged by comparing a carefully printed book with a daily newspaper, which is printed just as it comes without any making ready.*[91]

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[90]Marinoni was mostly associated with establishing *Le Petit Journal*, which circulated between 1863 - 1944 in France. Marinoni actively experimented on different components of printing machines throughout his career, taking out numerous patents, and building on the ideas circulating on improving the speed of printing machines. LeRay (2009)

[91]Patrick, D., ed (1891*b*)

Although stereotype plates were in use at the time of the First Edition as noted earlier, by the time of the Second Edition, electrotype technology was becoming more established as a means of image and text reproduction.

5.5 The First Edition in America

5.5.1 The Edinburgh-Philadelphia Connection

In 1853, the Chambers firm not only established a London office, run by David Chambers, they also set up a partnership with a publisher in the US. In December, William Chambers traveled to meet in-person with Joshua B. Lippincott (1813-1886). William Chambers writes of his visit:

> *I left Philadelphia with more regret than I had experienced in departing from any other city in America. As regards to good organisation, refinement and prosperity, the only Eastern city fit to be named with it is Boston...[they] offer the attractions usually sought for by a class of emigrants whose aim goes beyond mere money-making or the ordinary necessities of existence. Philadelphia, though not picturesque, is invested with charms to invite the settlement of the enterprising, the tasteful, and the moderately opulent.*[92]

Chambers was impressed that in Philadelphia there could be a dozen daily papers and forty weekly magazines produced in a single city,[93] and unlike Boston or New York, Philadelphia had trade connections with the American South and the expanding West. Fyfe also notes that this in-person meeting, and the days in Philadelphia hosted by Joshua Lippincott seemed to prove that both men were kindred spirits.[94] Joshua Lippincott was described as:

> *... skilful in argument, and held decided opinions which he did not hesitate to express, though always with courtesy. His presence was genial, and his manners were frank and simple, inspiring the stranger with confidence and winning for him many friends...* [95]

Chambers writes several paragraphs about how he was impressed with the Lippincott's firm, especially its book trade and distribution network:

> *I was told by the principals of the firm, that it had dealings in every seat of population of any importance from New Orleans to Toronto, and from the Atlantic to*

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[92]William Chambers also mentions an affinity for the city of Toronto. Chambers (1854), p. 321
[93]Chambers (1854), p. 318
[94]Fyfe (2012), p. 231
[95]Philadelphia's *Evening Bulletin* 'Obituary of Joshua B. Lippincott,1886' cited in Freeman (1992), p. 15

W.& R. Chambers	Year Released	Lippincott	Year Released
Volume 1	1860	Volume 1	1861
Volume 2	1861	Volume 2	1861
Volume 3	1862	Volume 3	1862
Volume 4	1862	Volume 4	1862
Volume 5	1863	Volume 5	1863
Volume 6	1864	Volume 6	1864
Volume 7	1865	Volume 7	1865
Volume 8	1866	Volume 8	1866
Volume 9	1867	Volume 9	1867
Volume 10	1868	Volume 10	1868

Table 5.1: Chambers's Encyclopaedia, first edition, and years that it was published in Edinburgh and Philadelphia

beyond St Louis. Think of commercial travellers being despatched on a journey of 2000 miles–as far as from London to Cairo or Jerusalem!

In 1849, Lippincott purchased the firm of Grigg & Elliot, one of the largest medical publishers in the United States, and from 1850-1855 the firm was named Lippincott, Grambo & Co. Upon the retirement of Henry Grambo, a former partner of Grigg & Elliot, the firm was renamed J.B. Lippincott & Company. (See company profile in Introduction). Following discussions between William and Joshua, Lippincott & Grambo placed 'an obliging order' for *Chambers's Edinburgh Journal* and several thousand copies of Chambers's instructive works.[96] Upon William's return to Edinburgh in the following January, he assured Lippincott that 'my brother feels satisfied with me that our various productions will suit your trade, and our wish is to give you every facility for making the very most of them.'[97]

Fyfe notes the rise of business between Lippincott and Chambers in the 1850s, as Chambers came to do more business with Lippincott than with any other American firm, and in fact, moved previous business to Lippincott from other American partners.[98] By 1855, Lippincott was importing the Miscellany (and its successor the *Repository*) the *Papers for the People* and a new edition of *Information for the People* in addition to *The Cyclopaedia of English Literature*. Published in 1860, *The Cyclopaedia of English Literature* became a standard work of reference associated with Lippincott in the United States when it was

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[96]The order was probably for *Papers for the People*, but it is not specified.
[97]Chambers to Lippincott, January 17, 1854 and Fyfe (2012), p. 232
[98]Other firms cited are Bangs, Brother & Co. and Gould & Lincoln; both were based in New York City.
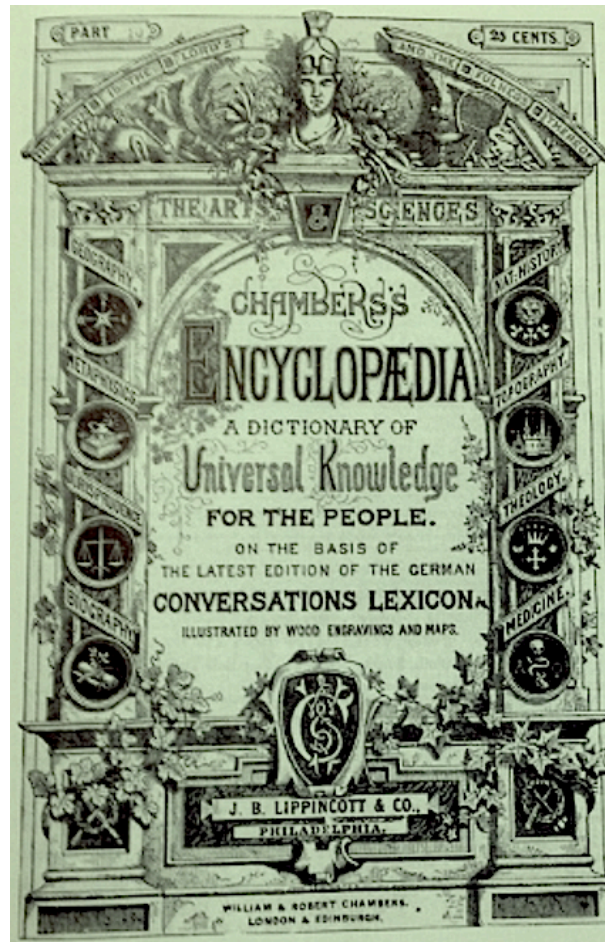
Figure 5.26: Part-issue first edition of *Chambers's Encyclopaedia* printed in the United States. See Figure 2.6 in Chapter 2 for Woodblock of this print

revised in 1888, 1893, and 1901. [99] At the end of the 1850s, Chambers sought Lippincott's advice about the American market for what would be the first edition of *Chambers's Encyclopaedia*, and Lippincott organised some contributions from American authors to enhance the work's American coverage. Furthermore by actually printing copies of the First Edition, Lippincott was on firm ground to argue to Appleton, not to proceed with a *Chambers's Encyclopaedia* reprinting project, although, Appleton did later publish its own *Johnson's Universal Cyclopedia*. However, at least one other firm did print unauthorised copies of Chambers. *The People's Cyclopaedia of Universal Knowledge*, copies much text from the first edition of *Chambers's Encyclopaedia*. This will be discussed further in the Reception chapter on piracy.

Table 5.1 shows the release dates of *Chambers's Encyclopaedia* in the United States compared with their release in Britain. Based on the dates, there seems to be an initial delay

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[99]Freeman (1992), p. 23

in the first years of release, but by the end of 1861, the volumes had caught up.

In addition to *Chambers's Encyclopaedia* being released as volumes in the United States, Lippincott also provided customers with the option of purchasing the encycleadia in parts as shown in Figure 5.26 [100] Stereotype plates of the First Edition were sent to Philadelphia to produce this work. As can be seen in this print of the part-issue cover, everything is identical except for two things. In the top right corner, the block of text features the price in US cents, rather than British pence. In the centre of the lower half of the document near the bottom, one can see a block of text noting that the printer of the work is J. B. Lippincott, rather than W. & R. Chambers and that it was printed in Philadelphia rather than Edinburgh.

Based on the First Edition volumes published in America, and studied in the Historical Society of Pennsylvania, as well as evidence noted in Figure 5.26, it appears that the stereotype plates sent to Lippincott contained covers for both volumes and parts, as well as the internal contents of the encyclopaedia. This provides evidence that Chambers were stereotyping at the time of the First Edition, but still printing directly from the woodblocks in their own printing establishment. In a way this makes sense, given that the firm had multiple Applegath and Cowper printing presses in Edinburgh, alone. They also had more than one main office in the UK, and as with the Journal, it made sense to send plates down to London, rather than large amounts of book or periodical stock. It is not known how long after the initial print run Chambers would wait before making a stereotype of the matrix with blocks and type, or how Chambers determined how many stereotypes plates they would make.

5.5.2   The origins of another edition

The first edition of *Chambers's Encyclopaedia* was successful enough in the US, that a reprinting of the first edition commenced in 1870.

Lippincott was a useful business associate for Chambers. Not only did Lippincott serve as a distributor of their work, but the personal friendship that seemed to have grown between the Chambers brothers and Joshua Lippincott helped them understand each other and the American publishing market. In 1871, Robert Chambers passed away which affected the relationship with Lippincott, with regard to the encyclopaedias.

After Lippincott began reprinting the first edition in the 1870s, several letters were sent by Chambers to Lippincott, expressing alarm at what were considered major modifications to the Chambers work. In response to letters from Chambers, on 17 August, 1874, Lippincott replied with a letter that starts:

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[100]The illustration of this cover is from a black and white image found in Freeman (1992), p. 23, but appears here as it would have been printed and available to customers.

We cannot but express our regret at the tenor of your communication–but presume that it is owning partially to the fact that, by reason of changes in your firm since the commencement of the publication of the Encyclopaedia, certain important circumstances pertaining to our connection with the enterprise may have passed out of the knowledge of your house.[101]

The 17 August letter described the four issues related to publication and reissue of First Edition in the US that Chambers was very unhappy about, and that Lippincott would like to either address or remedy. The Chambers concerns were as follows: First, Lippincott made changes to the text related to the entry 'United States' and others, not specifically named in the letter, but ones that both parties knew about. Second, compensation for sales, which Lippincott stated was related to a third issue, that Lippincott negotiated with the American firm of Appleton to have them drop *Universal Cyclopaedia*, which was basically a pirated version of Chambers's text. Forth, they offer to purchase interest in their share of the American editions, making Lippincott responsible for the content contained within it. A full transcript of the letter can be read in Appendix G.

In defence of their actions to the first point, that Lippincott made changes to the encyclopaedia without first consulting W. & R. Chambers editors, they argued:

you..claim that our privilege only extended to...taking of impressions from the stereotype plates as we received them from you. We have no hesitation in saying that had we confined ourselves to such a course it would have been absolutely fatal to the enterprise. Your editions... issued during the [American Civil War have] articles relating to our country were in their tone decidedly favorable to the 'secessionists'– offensively so to the Northern peoples! and we are sure that had we offered the work to issue unrevised as to these articles, it would have fallen, still-born from the press...

Other American articles– more or less– contained errors which so far as discovered were carefully eliminated. We do not think that in all this we exceeded the limits of our privileges in the matter... thereby added much to the currency of the work in this country...

The revision that was necessary in certain articles at the outset became more generally necessary as the contents of the volumes became out of date by the lapse of time and hence our general revision was undertaken; the result of which you are somewhat acquainted with. We dwell upon these matters because we desire you to realize–what we feel certain that while giving all due credit to the intrusive merit of the work, much of its success in this country has been owing to our action in its favor at the outset and fostering care since.

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[101]Lippincott Company with Chambers, 17 August (1874), Vol.1.9, pp. 71-76.

To explain their actions to the second and third points, that Lippincott states:

> It should...be known to you that when we arranged with your firm to take up work [on printing Chambers's Encyclopaedia] the Messrs Appleton, of New York had already commenced in the re-publication, and it is not too much perhaps to claim that but for our instrumentality in forcing them to abandon the field, and to sell out to us, you would hardly have realized the sum of £1800 from the circulation of the work in the American Market and although this may be a sum, as you say, quite inadequate, considering the outlay in preparing work it certainly is much better than nothing; moreover, the outlay in preparing the plates for the American edition has been returned to you in addition to the royalty.

As a way to smooth over the relationship between the two firms, Lippincott offers:

> It would indeed be a matter of very sincere regard to us that the pleasant relations which have existed between our houses for nearly twenty years should be disturbed, and we shall certainly submit to anything in reason to avoid such a result.
>
> It occurs to us that it might be more satisfactory to all if we were to purchase your interest in our editions at a fair valuation, and thus at once heal our present under-standing and obviate all possibility of a difference arising on the account in future. You many therefore if you please let us know what you will accept in full for your interest in the 'Encyclopaedia' and 'Book of Days' (the latter, by the way, we have been quite unable to make a success of) and we assure you we shall meet you on any equitable basis of adjustment.
>
> At the same time we think that you ought to realize..that whatever you have received or may received hereafter from the sales of the work, our efforts, first in getting the work out of the hands of the Messrs Appleton at the outset, and then by our man-agement in giving it an extended introduction, out of which latter fact we believe the market for the English editions had principally grown.   Enclosed we have the pleasure of sending a draft in your favor for £773.12.5, in full for the amount of your statement just received.
>
> Awaiting your reply we remain
>
> Faithfully yours, J.B. Lippincott & Co.

Four issues were raised here: Who should have the final editorial say in content when it came to publishing *Chambers Encyclopaedia*? How will profits be divided? Who will 'own' the final intellectual content of the published work? and how should copyright be claimed in different countries?

These issues and how to solve them, provided a template for the second edition of *Chambers Encyclopaedia*, and other publications that might be co-produced by both firms.[102]

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[102]The *Cyclopaedia of English Literature* was also a joint venture of the firm in the late 1890s.

5.5.3   Issues of international copyright

Copyright has always been a major issue in the publishing trade. It is a legal right, such as one has over other property, granting the owner control over their work and the ability to decide how income from that work can be generated. In 1710 the Statute of Queen Anne became the world's first copyright statute and granted publishers of a book legal protection of 14 years.[103] It also granted 21 years of protection for any book already in print. During the first few decades of the 19th century, authors for works began to seek legislation that granted greater protection of their works, and a longer period of copyright enforcement. In 1842, after intensive lobbying [104] The Copyright Act gave protection for the authors's lifetime and 40 years. It was embedded in the concept of authors' rights in the law and ultimately made it possible for the United Kingdom to become part of a network of international protection for intellectual property.[105]

In the 1800s, there were no treaties between the United States and Britain concerning copyright. Although Great Britain was keen to negotiate one, many American publishers were reprinters[106] and lobbied Congress against such a treaty on the ground that these types of agreements would allow Britain to virtually control an American industry.[107] In the United States, from the first copyright act in 1790, until the passage of the Chace Act in 1891, legal copyright protection was only granted to citizens of the United States and to permanent residents; the works of foreigners had no legal protection.[108] Likewise, the Act of 1842, protected the rights of British citizens in Great Britain and its possessions, but gave no protection for British authors abroad or for foreign works in Britain.[109]

However, there is a difference between *de jure* (or having complied with all the requirements imposed by law) and *de facto* (in fact) copyright. Although W. & R. Chambers was under no legal obligation to pay F.B. Brockhaus to translate their work, and J.B. Lippincott was under no legal obligation to work so closely with Chambers, in order to reissue their work, there was the practice of 'trade courtesy' between publishing houses. This often meant that Americans did pay British firms for use of their material (in order to maintain a

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[103]Deazley (2006), p. 13

[104]Member of Parliament, Thomas Noon Talford (1795-1854) and authors like William Wordsworth (1770-1850) proposed that copyright should subsist for the author's lifetime plus 60 years, because they argued the law should not deprive them of their creations. Printers and newspaper publishers opposed this. Feather (1988), p. 114

[105]Feather (1988), p. 114

[106]American publishers specialised in mid-priced or cheap textbooks. They were often practical manuals and children's books produced by taking British-authored texts and reprinting them on less-expensive paper with cheap binding, and selling them at a fraction of the cost of British originals. Fyfe (2012), p. 191

[107]McGill (2003)

[108]Winship (1999), p. 101

[109]Winship (1999), p. 102

good relationship with them) and British did recognise American authors. [110] It was also essentially in every firm's mutual interest to participate as good player in the transfer of information, merchandise, and credit, otherwise they would not have a good reputation.[111]

In 1875, J. B. Lippincott established a London Agency to facilitate communication with their British counterparts. It was run by Joseph Garmenson (n.d) until 1906.[112] In a letter dated 12 December 1896, Garmenson explains different copyright procedures in the UK as opposed to the US to his colleagues in Philadelphia:

> *...English Copyright law requires* nothing to be done *copyright exists per se for 42 year or for 7 years after the death of the author, whichever period is longer – and whether you print any copyright notice or whether you register at Stationer's Hall or whether you let everything slide makes no difference. This seems to be the point which the American brain is unable to grasp probably for the reason that in America you have to do something to secure copyright. With us copyright is a natural right, with you it is a created one – at least that is how I understand your position. You will see from this letter that it does not matter one straw as far as English Copyright Law is concerned what you put on the back of a title or what you omit from it, but the Merchandise Marks Act requires that when a book is sent into this country with an English imprint, there should be something upon it to show that it is not of English origin...* [113]

In this letter, Garmenson was referring to the British The Merchandise Marks Act of 1887 (50 & 51 Vict. c. 28), which made it illegal for foreign manufacturers (such as Americans) to falsely claim that their goods were British-made and selling them in Britain and Europe. The letter discusses some complicated and confusing issues related to books being shipped into Britain and vice versa.

International copyright questions frequently come up in Garmenson correspondence, not just related the Chambers firm, but with other British-based firms that Lippincott did business with as well. Letters between Chambers and Lippincott, regarding the Encyclopaedia often refer to a Mr. Hart, and Mr. Hart's opinions. Hart served as the Lippincott lawyer. [114]

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[110]Winship (1999), p. 103

[111]Winship (1999), p. 103

[112]Much correspondence on the Lippincott side of British operations went through Mr Garmenson.

[113]Garmenson to Lippincott Company, 2 January (1897), (no page no.)

[114]Unfortunately, no correspondence directly by him or directly to him was found.

5.6 The Second Edition

5.6.1 Second Edition contract between Chambers and Lippincott

As noted previously, W. & R. Chambers had a history of doing business with international companies ranging from Canada to Australia, to the United States.[115] Many of Chambers's American associates were based in different cities. A Boston firm by the name of Gould, Kendall & Lincoln worked with Chambers from 1845 to 1846 to publish an American version of the *Cyclopaedia of English Literature* [116]. In 1850, W. & R. Chambers worked with the Philadelphia-based firm Blanchard & Lea to produce an American version of *Chambers's Latin-English Dictionary*. Chambers also had a business relationship with D. Appleton & Company of New York which enabled the sale of *Chambers's Miscellany of Tracts* in American markets.[117] However, it was the long-term working relationship with Lippincott, Grambo & Co., later J.B. Lippincott & Co. that produced the American versions of *Chambers's Encyclopaedia*, second edition.

In 1887, W. & R. Chambers entered into a contract with J. B. Lippincott to produce an international encyclopaedia in 10 volumes consisting of 520 sheets of 16 pages each. The document was a testament to how precise their planning could be.[118] See Appendix E for full text transcription. The encyclopaedia was to be a new edition of *Chambers's Encyclopaedia*, and their terms of agreement fell into three areas: copyright, payments, and production schedule and is summarised as follows:

Copyright: Chambers claimed copyright of the encyclopaedia outside the United States, while Lippincott claimed copyright in the United States during the period of the contract, which was set to end in 1912.[119] At the end of the contract period, Lippincott agreed to transfer its intellectual property claim to the Chambers firm. Chambers also agreed to give the Lippincott firm exclusive right of publication and sale of *Chambers's Encyclopaedia* second edition in the United States. Lippincott retained the right to alter and update subsequent print-runs of this edition with Chambers's final approval.[120] Both firms agreed to

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[115] See Chapter 6 for Australian connection.

[116] Fyfe (2012), p. 83

[117] Chambers firm to Appleton, July (1855)

[118] Contract of New Encyclopaedia by W. & R. Chambers and J. B. Lippincott (1887) From this we can gather the number of pages printed on each sheets (8 on each side) and the approximate size of the sheets.

[119] Text from the contract reads; 'This agreement will continue for 20 years from the date of the issue of the last volume (1892) unless terminated by both parties, or if one party does not fulfil stipulations. In the event of disputes or differences regarding the meaning of agreement, parties will be arbitrated by the Lord advocate for Scotland or the Solicitor General for Scotland and they agree to accept his decision as final. Parties can apply to arbitrator in writing and have the right to appear in person for for legal representation. Legal fees for this will be paid equally by both parties.' This allowed both or either of them to terminate the contract or renegotiate it.

[120] An updated version of this work is printed in 1901.

protect and uphold copyright of each other in American and British territories respectively.

Payments: Chambers agreed to pay American authors for their contribution to the encyclopaedia and for the cost of procuring copyright and legal expenses. Lippincott agreed to pay for packing, shipping, freight insurance duties, related to shipment of the electrotype plates. Lippincott also agreed to pay Chambers a royalty of $1.50 in gold dollars for every 10 volumes or 15 cents for each volume sold, on a quarterly payment schedule. In order for both versions of the books to not compete with each other, Lippincott agreed to import no more than 2000 copies of each volume of the British version. However, for any volumes they did purchase, Chambers offered Lippincott a discount of 2 shillings per volume of the British unbound sheets. Lippincott agreed to pay for any importation fees to the United States.[121]

Production Schedule: Chambers agreed to supply Lippincott with electrotype plates (which included wood engraved illustrations and text) at a rate of £2.1.3 per 16 pages, in succeeding volumes, 1 shilling and 1/3 pence; while Lippincott agreed to publish the encyclopaedia according to the style set by Chambers. Lippincott was allowed to alter electrotype plates and maps on their premises to meet specifications of American printing machines. When the contract concluded, Lippincott agreed to return the electrotype plates to the Chambers firm in Edinburgh, and in exchange, Chambers agreed to pay Lippincott for the value of the metal. To prevent intellectual property theft, Chambers agreed to destroy the plates upon receipt.

Correspondence between Lippincott and Chambers indicates that there was some discussion going on between the two firms about a new edition, rather than a reissuing, from at least as early as August 1886.[122]

This contract seems to take into consideration previous problems that were voiced when Lippincott re-issued the first edition in the 1870s and the setting up of provisions to minimise arguments between both firms. After the terms of the contract were agreed, correspondence from 1887 then discusses concerns such as the title for the new work, when to notify the public that this edition would be going on sale[123], the occasional expression of

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[121]It is not known why Lippincott would want to import more than a few copies of the British version of the encyclopaedia when they were printing an American version, but it could be that they had customers interested in both versions and Lippincott wanted the potential to fulfil their orders. For example, a letter from the Lippincott Company to Chambers, 17 September (1893), (Volume 10.3) shows Lippincott conducting business with Mexican entities, who may have purchased both versions.

[122]Chambers firm with Craig Lippincott, 4 October (1886). A letter from October 1886 refers to another letter, I was not able to discover, from 7 August 1886 regarding steps to draw up a contract for an encyclopaedia project. It seems likely that discussion about this project began earlier, at least informally, given the number of details in the contract, but this is the earliest, so far, that this second edition project can be dated from.

[123]Chambers was concerned about continuing to sell stock of the First Edition.

Figure 5.27: Colour print (left) from Richard Owen's Monograph on the Aye-aye compared with Second Edition print (middle) and woodblock (T.2011.56.235, right) of an 'Aye-aye'. Woodblock from W. & R. Chambers collection, National Museums Collections Centre, Edinburgh.

frustration due to production delays, and the coordination of release dates on both sides of the Atlantic.

What these archival records demonstrate is that the two editions were operating under different circumstances. While the first edition of *Chambers's Encyclopaedia* was initially conceived as a sole publication by the Chambers firm the Second Edition was conceived as a business partnership that sought to maximize profit for both parties and provide protection from copyright infringement. Given that one third of the contract related to the production of illustrations and coordinating the overall look and feel of the volume, it would seem reasonable for Chambers to find ways to make this process much simpler.

5.7   Second Edition Image sources

In the second edition, some methods for sourcing images that were practiced in the First Edition were repeated. For example, other books, especially ones written by well-known specialists were used as models and copied, such as in the case of the 'Aye-aye' entry image, which can be traced to Richard Owen's *Monograph on the Aye-aye*. See Figure 5.27. Another source of image models for the second edition seems to be *An Illustrated Manual of Birds*, published in 1871. See Figures 5.28, 5.29 and 5.30, which show very close visual copies of woodpeckers, swifts, and pigeons.

After the Expert Survey, a follow-up interview was conducted with ornithologist, Tom Ryan. Ryan remarked that if Chambers illustrators were not copying the books, they must definitely be copying the same sources as *An Illustrated Manual of Birds*, given that the poses of these birds are not natural and are likely to be illustrations of stuffed specimens, meant
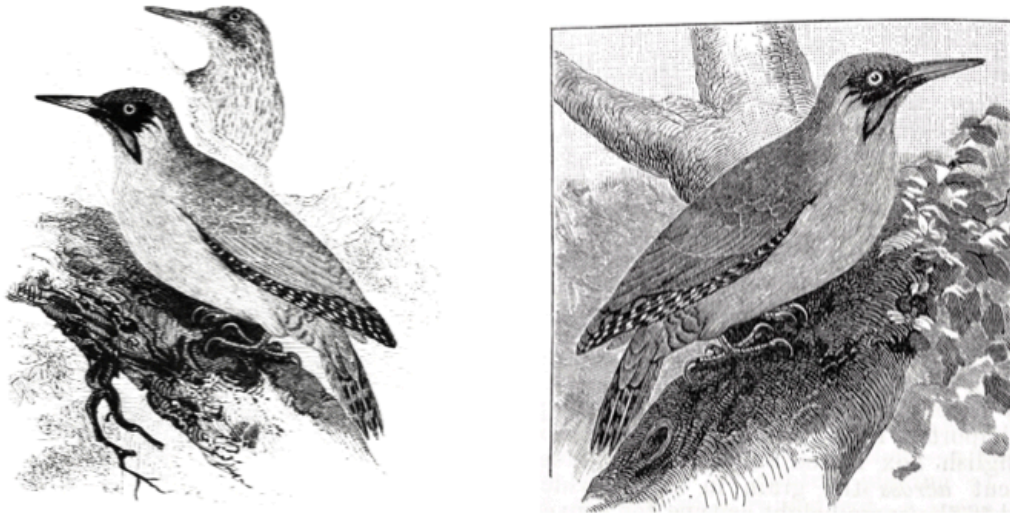
THE GREEN WOODPECKER.

Figure 5.28: Woodpecker from *An Illustrated Manual of Birds* (left) compared with the print of the same species (right), from Second Edition,

to highlight bird features, like the distinctive shape of the swift's wings.[124]

Feedback from bird experts surveyed as part of this research, see Chapter 6, show that illustrations in Chambers are accurate enough to enable identification to general level.

Many of the reviews for different subject areas in Chambers, that will be highlighted in the next chapter, show that experts were consulted in the initial stages of the encyclopaedia project development. James Legge (1815-1897), a well-known Scottish scholar of Chinese literature and Confusian philosophy, was commissioned to write the entry on *China* for the second edition of Chambers. Legge lived in China for many years as a missionary, and had photographs of the country. He also seems to have suggested one of the illustrations used to show Chinese architecture that appear in the 'China' entry. This same illustration, engraving from a photograph of Legge's also appears a 1871 edition of S. W. Williams's *The Middle Kingdom*.

Another entry that indicates a contributor to the second edition of *Chambers's Encyclopaedia* suggested the use of a certain image can be found in the entry for 'Anthropoid apes'. This entry was written by Patrick Geddes (1854–1932), who was Chair of Botany at University College Dundee. Geddes studied under Thomas Henry Huxley (1825–1895) at the Royal College of Mines, (now Imperial College). The illustration in the second edition of *Chambers's Encyclopaedia* comes from Huxley's *Evidence as to Man's Place in Nature*, published in 1863. Clearly Geddess was influenced by Huxley's interpretation of evolution

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[124]Follow-up interview to online survey November 2016. *An Illustrated Manual of Birds* is actually recommended in the second edition of *Chambers's Encyclopaedia* as further reading under the 'Grebe' entry.
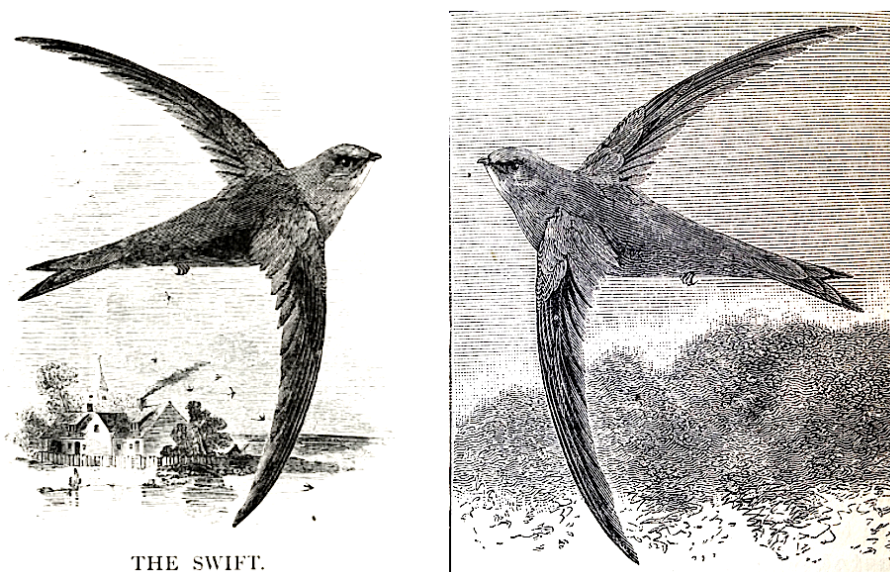
THE SWIFT.

Figure 5.29: On the left is a swift from *An Illustrated Manual of Birds* compared with a print of the same species on the right, in the Second Edition.

which was in opposition to Darwin's theory of natural selection. Geddes also authored two other entries in Chambers which are not illustrated, the entries for 'Evolution' and the one for 'Darwinian Theory' in which he writes:

> '...we must be careful to guard against the confusion, still widely popular, of 'Evolution' with 'Darwinism'... one particular interpretation of the mechanism and plot of this cosmic drama...'[125]

While experts, notably the encyclopaedia contributors, in various fields, seem to have had some input in the second edition at the initial stages of production, there seems to be no feedback loop at the end of the process when the entries were nearly done. For example, in the second edition of *Chambers's Encyclopaedia* is an illustration of a Grebe.

Experts taking the survey, looked at this illustration and pointed out problems with its accuracy. This will be expanded upon in Chapter 6. Presumably the errors in accuracy of the depiction of this bird could have also been pointed out by the bird experts who contributed textual entries to *Chambers's Encyclopaedia* when it was being produced. But this seems to show that once the production of a work began, the editors were likely considering the deadline and publicised date of release to the public, rather than making time to correct images from every entry.

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[125]Patrick (1889)

THE ROCK-DOVE.

THE STOCK-DOVE.

THE RING-DOVE OR WOOD-PIGEON.
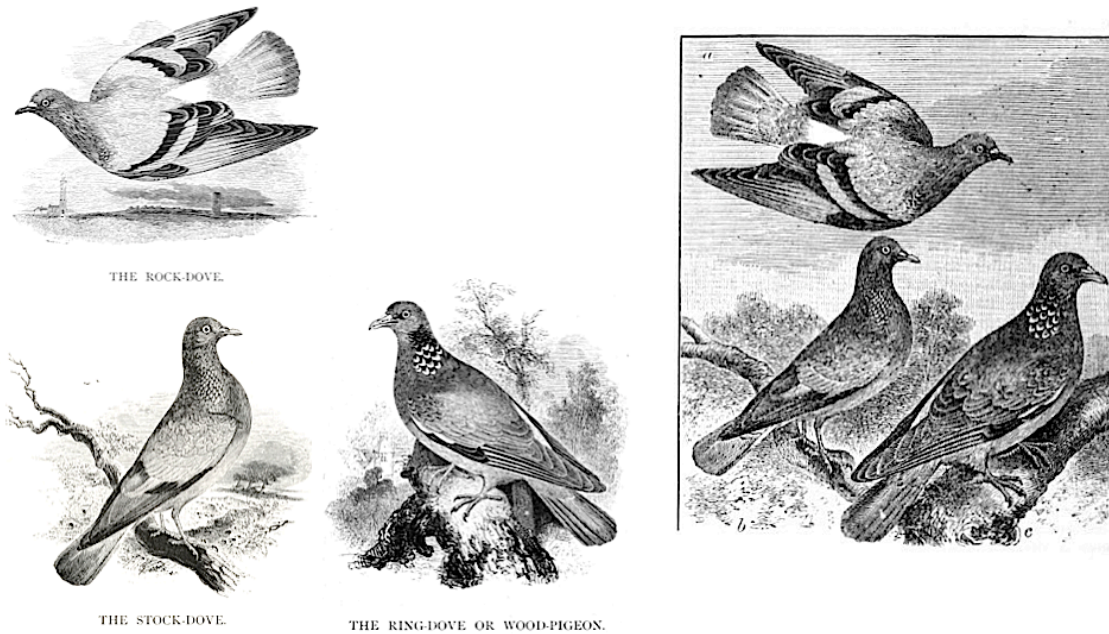
Figure 5.30: On the left are different species of pigeons from *An Illustrated Manual of Birds* compared with the print of all these species on the right, in the second edition of *Chambers's Encyclopaedia*

5.7.1   From a photograph

As stated previously, throughout the 1800s, different pictorial syntaxes were fashionable. While several syntaxes existed, image making was impacted by the spread of photography. This can be seen not only in *Chambers's Encyclopaedias*, and with other encyclopaedias in this study as well, see Figure 4.18, but also more widely in 19th-century print culture. In Chapter 2 Figure 2.12 showed different illustrations of women in *Punch Magazine* at twenty-year intervals, 1851, 1871, and 1891. Chapter 4, which discussed illustration styles also shows how both editions of *Chambers's Encyclopaedia* had images that reflected, interpreted and represented the tones of a photograph.

By the 1870s, photography, as a medium, became a means of capturing and communicating information between different academic communities and the public. Belknap argues that photography's key role in wider Victorian visual culture came from its use in periodicals, where it was used to convey objective scientific evidence. Circulation of photographs in periodicals allowed a greater number of people to participate in scientific discourse. I would also add that when scientific images circulate within popular culture, popular culture changes in response to new information. When periodicals designated an image as being 'from a photograph' the periodical in a sense, helped to endow the image

Durham Cathedral, 1883. Photo by Francis Frith

Durham Cathedral illustration, *Chambers's Encyclopaedia*, 1889
Second edition. Volume 4, p.131
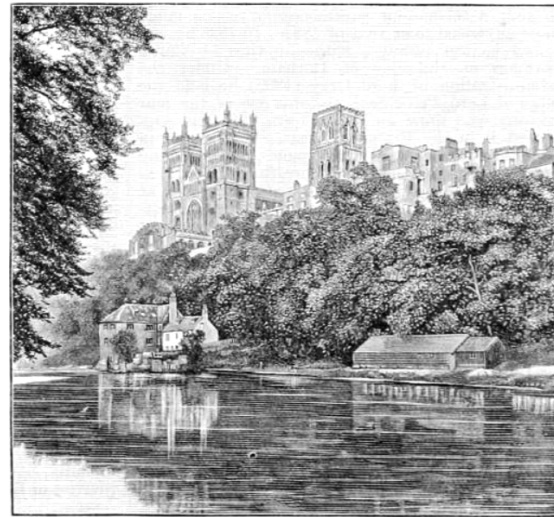
Durham Cathedral.

Figure 5.31: An example of an illustration by Francis Frith used as the basis for a Chambers illustration.

and the knowledge contained within it to have 'mechanical objectivity.' [126] This is arguably more true within the genre of the encyclopaedia, which had obtained, thanks in part to the business acumen of 19th-century publishers and businessmen, a high intellectual status as well as popular appeal. Belknap writes that photographs had an aura of being more authoritative, because many scientific disciplines were using photographs as data. So overall, the trend for images even if they are not from photographs is to be staged to look like them. This can be clearly seen in the examples of birds in Figures 5.28 - 5.30. While the swift, woodpecker and pigeon illustrations do look very similar to *An Illustrated Manual of Birds*, the Chambers images are designed to emulate photographic conventions.

Smith discusses how Darwin's use of photographs to study human subjects, gave photography both a scientific authority and linked it with the popular culture, especially manifested in the fashion of the exchange *cartes-de-viste* and portraits.[127] To provide a specific example of the popularity of Victorian photographs, and knowledge as well as entertainment value in them, Jay writes about the life and work of English photographer Francis Frith (1822-1898) who established Francis Frith & Co, the first firm dedicated to publishing and selling photographs not just of foreign places, but of cities and vistas around the United Kingdom. Frith's photographic postcards were on sale in 2,000 shops in England,

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[126]Belknap (2016), p. 212
[127]Smith (2006)
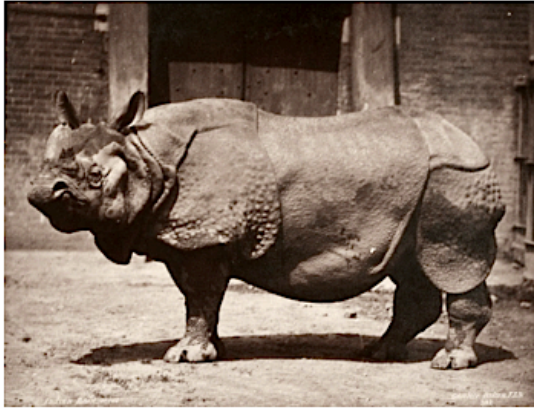
Bolton's original photograph from Breslau Zoo, Prussia.
Circa 1880s
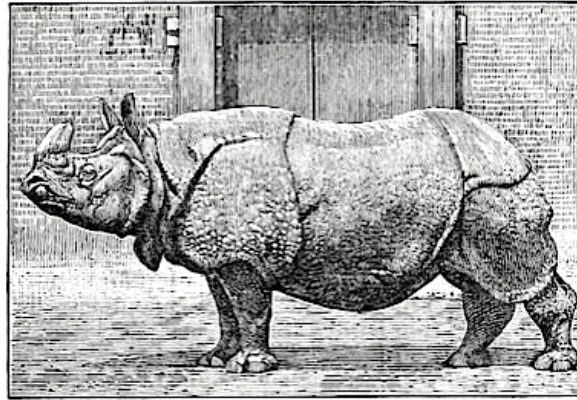
Rhinoceros unicornis.
(From a Photograph by Gambier Bolton, F.Z.S.)

Figure 5.32: Ten images in the second edition of *Chambers's Encyclopaedia* were labeled 'from a photograph by Gambier Bolton'.

by the mid century, and were used as the source for many wood-engraved illustrations in the Chambers second edition.[128] Ten illustrations in this edition are directly attributed to him. Some illustrations were not, although they do look very similar to Frith's widely-circulated work. See Figure 5.31.

As mentioned in the last Chapter, another source of popular photographs for Chambers publications was Gambier Bolton (1854-1928), known in the late Victorian era as a photographer of animals. [129] His animal photographs were sold by the publishers Erdmann & Schanz in London. [130] Bolton was a fellow of the Royal Geographical Society as well as a member of both the Zoological Society and the Royal Photographic Society. His work appeared in popular magazines of the time and he also published several books with his own photographs, including: *A book of Beasts and Birds*, *the Animals of the Bible*, and one on psychic forces. Like Frith, Bolton's photographs were used in the second edition of *Chambers's Encyclopaedia*, and an acknowledgement by editor David Patrick was made to J.R. Pairman, Art Director of the W. & R. Chambers firm for his work in sourcing appropriate images from both these photographers. [131] In Figure 5.32 one of Bolton's photographs taken during the late 1880s at the Breslau Zoo in Prussia compared with the illustration used in Chambers.[132]

As can be seen in Figures 5.31 and 5.32, some modifications were made by the wood-

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[128]Jay (1973)
[129]Bonhams (2014)
[130]Jacobson & Jacobson (1996), p. 171
[131]Patrick, D., ed (1888*a*), 'Introduction.'
[132]Patrick, D., ed (1888*a*), p. 691

Figure 5.33: Blocks in the W. & R. Chambers collection that show evidence of being engraved after a photograph was exposed onto them.

engraver to the original Frith and Bolton photographs. [133] Belknap also found several instances of periodical illustrations he writes have 'different notions of reproductive fidelity'. That means, not all illustrations necessarily provide faithful copies of the photographs that they were based on.[134] In a way, it is ironic that a general perception emerged that illustrations in facsimile style, based on photographs, were more objective to and free from interpretation. They could have just as much interpretation as pictorial style illustration.

5.7.2   Case study of facsimile style in Chambers works

In the Second edition entry for *photography*, which spans eight pages, there is a statement about photography and its use in wood-engraving:

> *Photography is now much employed as a means of reproducing drawings on wood*
> *blocks for the engraver. This process is of much importance, as the original drawing is*

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[133] A similar rhino photograph by Bolton was taken in 1898 and used in *Windsor Magazine*. That photo attributes the rhino to one in the London Zoo, but the date of this photo from the Breslau Zoo provides a better timeline match for the encyclopaedia.

[134] Belknap compares a photograph of an artist from Hong Kong sitting at his desk with the illustration produced in a periodical, and much of the 'clutter' in the room was removed in the illustration. Belknap (2016), pp. 36-37.

preserved, not only for comparison with the finished engraving, but it may be for its artistic value. The drawing also may be made of any convenient size, and reduced on the wood – a great consideration when minute objects are represented. The necessities of wood-engraving require that the drawing-on-wood should be reversed; hence the necessity of a reversed negative in the printing process. The negative may either be printed direct on to the wood or a modification of the carbon process employed. In the first case, one process is first to render the surface of the block waterproof, and then it is whitened with Chinese white. The block is then sensitised with chloride of silver, and printed under a reversed negative. It is then toned with gold and fixed with hyposulphite of soda, washed and dried, and is then ready for the engraver.[135]

The process described of exposing a photograph on wood, fixing the image, and then letting a wood engraver use that as the basis for an illustration is evidenced by a few blocks in the collection. One of the blocks in *Chambers's Encyclopaedia*, second edition, which used the method described here can be seen in the entry for *moon*. The illustration is labeled, 'The Moon, first quarter (inverted as seen through telescope). From a photograph through the Great Lick Telescope, by Professor S. W. Burnham'. While 'From a photograph' does not necessarily mean an image was created by exposing it to photochemical processes, in this case, the block provides evidence that is what happened. The other block in the collection, which demonstrates the Chambers firm was experimenting with this new process, was used to produce a *Chambers's Early Reader*, depicting a robin. See Figure 5.33.

Figure 5.34 shows a block from the Reeves Collection at the University of Reading, of larger image, being exposed on four separate blocks that have been joined. From this artefact, one can see that more of the photograph beneath that has not been cleared away. As explained in the *Chambers's Encyclopaedia* 'Photography' entry above, the negative seems to have been printed directly on to the wood, the surface has been prepared with different chemicals, making it ready for the engraver. Usually when a block like this was ready to print, the original photograph was destroyed in the process. However, in this case as the block never engraved the work of the photographer can be seen. It is likely that the next stage of this block would be to prepare it for stereotyping or electrotyping, as was the case with blocks from the Chambers collection. The artefacts in the Chambers collection and in the collection at the University of Reading provide evidence of these ephemeral and changing practices within the 19th century wood-engraving profession.

5.7.3   The relationship between wood-engraving and photography

An entry in the second edition of *Chambers's Encyclopaedia* lists an outspoken critic of facsimile style illustration.

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[135]Patrick, D., ed (1891*a*), p. 153

Figure 5.34: *Advance Elevator and Engine*, 1906, (70/258/6). Woodblock from the Reeves Collection, Museum of English Rural Life, University of Reading, Reading.

Linton, WILLIAM JAMES, wood-engraver and author, was born in London 1812. As a wood-engraver he may be said to be the most artistic who ever lived. Some of his finest work may be found in the pages of the Illustrated London News, to which he frequently contributed to until he finally went to the United States in 1867.[136]

In 1867, Linton arrived in New York and found employment as the instructor of wood-engraving at the Ladies School of Design attached to the Cooper Institute. After three years he was again engaged in illustrated magazine commissions, but also wrote and engraved the illustrations for several of his own books.[137] His reputation and illustrated work

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[136] *Chambers's Encyclopaedia*, Volume 6. p. 646, Patrick, D., ed (1890*a*).

[137] Schrock, N.C. ed (1976), p. 4. Linton wrote four books on wood engraving: *Practical Hints on Wood Engraving* (1879), *A History of Wood-Engraving in America* (1882), *Wood-Engraving, a Manual of Instruction*

led him to be elected to the American National Academy of Design. By 1878, writes Schrock, 'he seemed to be living a quiet but satisfactory life... Then he took up the cause of upholding the traditions of wood-engraving' against a younger group of artists.[138] They were trained in Paris and Barbizon, in a new painterly technique that they wanted to be transmitted in reproductions with the help of photographic technology.

In America, this reproductive style was called 'The New School', so called because it marked the appearance of a new wood engraving style with short white lines and dots in a stipple-effect, that combined with white line crosshatching was used whenever the engraver chose. It went against the traditional uses of pictorial syntax, and horrified Linton, who believed that only certain lines should be used to represent landscape, another should be used to represent foliage, another kind to represent sky, another to represent flesh. Linton's answer to the use of non-traditional pictorial syntax of The New School appeared in the June 1879 issue of *Atlantic Monthly* where he attacked the practices of wood-engravers' reliance on photography and facsimile work. He emphatically stated that wood engravers were artists, not copyists, and that this use of photographic technology promoted bad design, visually unpleasant aesthetics, and cheapened the wood engraving profession.[139] Linton was proved correct. By overly replicating the sensibilities of photographs artists and the periodicals made the interpretive skills of wood-engravers redundant. But it seems Linton was fighting a losing battle on both continents.

> *Photography has brought disruption to all that pertains to the art and craft of engraving. Disruption is hardly the word, considering the new wonder is doing away with engraving altogether.*[140]

Photography led artists like Bracquemound, quoted above, to adapt their work and their attitudes toward it. While the change was gradual and cumulative, several writers at the time who had been practicing wood engravers such as Wakeman, Linton, and Jackson conclude that widespread adaption to the tonal codes of photography by the profession signalled the end for wood-engraving as a commercial and ubiquitous method to produce books, journals, and newspaper graphic reproduction.

When comparing the illustration production process between both editions, the transition from one process to another is clear. J.R. Pairman said:

> [Wood-engraving] *as an art is now a thing of the past, its disappearance dating from the introduction of the process of half-tone blocks. That change meant that*

(1884), and *The Masters of Wood-Engraving* (1890). He also authored poetry, biographies, and books related to his advocacy work for the working classes.

[138] Schrock, N.C. ed (1976), p. 8

[139] Schrock, N.C. ed (1976), p. 8

[140] Newton (1979), p.12: quoted Felix Bracquemound (1833-1914) 19th century painter and etcher.

hundreds of wood engravers [sic] *were thrown on their own resources and many of the men had to take to touching up the process blocks.*[141]

5.8   Chapter 5 Conclusion

The figure labeled 'Simplified Production Cycle for Chambers's Encyclopaedia' compares differences between first and second editions of Chambers. It also shows that there were two major differences between both editions in terms of production workflow. First, is that planning of the First Edition encyclopaedia was done solely by the Chambers firm. Although they did consult Lippincott in regards to a few American contributors and the American market, planning was the sole prerogative of the editors in Edinburgh. Planning for the Second Edition, on the other hand, was carried out in conjunction with Lippincott to ensure simultaneous publishing dates. When the encyclopaedias were released on the same day, both companies could claim copyright in their respective countries. In the US, copyright was registered, in the UK, it was defacto by the date of release.

The second major difference in the production cycle is that different technologies were used. In the first edition, stereotypes were created by Chambers and then send to Lippincott. Although the first two volumes were produced after they were published and distributed in the UK, by 1862, Lippincott's production had caught up the the production of Chambers. In the case of the second edition, electrotypes were created by Chambers, and sent to Lippincott so that both firms could publish each volume at the same time.

In order to coordinate the transatlantic partnership for *Chambers's Encyclopaedia*, both firms had to work together in a way that allowed both parties to have their priorities met. Chambers editors wanted overall control of the look and feel of the content, and to be able to approve the final content of the work that had the name of W.& R. Chambers on the cover. J.B. Lippincott wanted to ensure that content covering the United States was depicted accurately and in way that could be profitable on the American market. By having Lippincott provide content for many entries by commissioning authors on their side of the Atlantic, they could approve the material before sending it on to Chambers to design and compose. It was an interesting partnership that proved profitable. The contract drawn-up between them addressed their mutual concerns.

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[141] *Otago Witness* (1908)
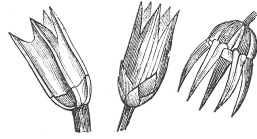
6 Reception and Influence

While the previous three chapters have dealt with content and production of the first two editions of *Chambers's Encyclopaedia*, this chapter will describe research related to its reception and intended audience. Based on these findings, I will speculate on the place of these works as products in the greater ecosystem of 19th-century print culture. This chapter will also answer these research questions: How broad a section of society were 'the People' who could understand and access a publication such as *Chambers's Encyclopaedia*, and did that change between editions? How did the public respond to the content, and the images in particular, for both editions of this encyclopaedia? From a user point of view, were significant improvements made to the content of the second edition, or was it the design (and production methods) of the material that changed? (These questions correspond with questions 9, 10, 11, and 12 in the introduction.)

To answer these questions, this chapter will cover several areas: First it will reexamine the Preface of both editions, that lay out the firm's goals and use primary source material produced by publishers or individuals not related to the Chambers firm gathered to determine if those goals were achieved. Second, in an effort to answer how broad a section of society *Chambers's Encyclopaedia* reached, and how this matched the stated aim of the work in the Preface, evidence from 19th-century library records, from wage estimates for certain professions, and circulation figures of newspapers which reviewed or advertised the encyclopaedia will be presented. The general and specialist reviews found in newspapers and periodicals will also be analysised. Furthermore, mentions of both editions in newspaper or periodical reviews as well as personal writings from the time will be presented. These different sources will allow us to gauge the reach of the encyclopaedia, and the extent to which it became part of popular literary culture. Third, building on the content analysis research found in Chapter 4, findings related to accuracy of the subjects illustrated most frequently in *Chambers's Encyclopaedia* will be reported here. As explained in the research methodologies section, because of gaps in the literature in regards to image assessment of reference works at the time, I have widened the scope of my research to include three Expert Surveys, designed to help determine whether *Chambers's Encyclopaedia* successfully communicated technical and scientific information to readers through their images.

One final note, many of the comments gathered about the First and Second Edition are presented together in order to highlight the comparative aspects of this study and the comparative nature of this chapter. This chapter draws on audience studies, which is a subfield of history of the book, and often reports an incomplete sketch of landmark works during a limited period of time. [1] However, there was enough information from different primary sources to merit a chapter which specifically places the reception of *Chambers's Encyclopaedia* into a greater 19th century context for this thesis. Research into audience studies can also be quite extensive and there is much scope for future areas of research beyond what is reported here, as will be noted throughout this chapter.

6.1   Encyclopaedia Audiences

6.1.1   An encyclopaedia encounter

In 1871, shortly after the first edition of *Chambers's Encyclopaedia* and the *Book of Days* were published, Robert Chambers passed away. As a tribute to his late brother, William printed Robert's biography, which also included William's memories of growing up with Robert. The biography states the brothers were born to a Scottish weaver and his wife at the turn of the 19th century and raised in Peebles. In the account of their childhoods, Peebles was described as 'a small, rural town on the Scottish Borders' that was mainly 'inhabited by weavers and labourers living in thatched cottages'. [2] Yet, due to a childhood operation, Robert Chambers was physically disabled by an injured foot and could not enjoy playing in the countryside with other children. Therefore, Robert recalled spending a great deal of time reading on his own and one day he happened upon the fourth edition of his father's *Encyclopaedia Britannica*.[3] Robert reported experiencing a 'profound sense of wonder' upon encountering the volumes.[4] He further writes:

> *...In a moment of intellectual curiosity, I lighted upon the stored book* [Encyclopaedia Britannica], *and from that time for weeks all my spare time was spent* [reading it]. *It was a new world to me. I felt such a profound thankfulness that such a convenient collection of human knowledge existed, and that here it was spread out like a well-plenished table before me. What the gift of a whole toy-shop would have been to most children, this book was to me. I plunged into it. I roamed through it like a bee. I hardly could be patient enough to read any one article, while so many others remained to be looked into... I pitied my companions who remained ignorant*

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[1] Rooney & Gasperini (2016)

[2] Chambers (1872)

[3] Robert notes that it was the fourth edition of Britannica. This was published between 1801 and 1810, in 20 volumes, and contained 581 plates with illustrations.

[4] Chambers (1872)

of what became to me familiar knowledge. Some articles were splendidly attractive to the imagination... The themes first presented to the young mind certainly sink into it the deepest. The sciences of which I obtained the first tracing through the encyclopaedia have all through life been endeared to me above the rest. [5]

Even late in life, after their firm had produced their own encyclopaedia, as well as other material like *Information for the People* and had a long catalogue of educational works, the memory of reading an encyclopaedia as a child was very strong with Robert, and it was a detail that William thought important to include. William Chambers writes in the Prefatory Notes that by including some of the 'poignant recollections' of Robert, he hoped to 'inspire youth with notions of self-reliance, along with a hopeful dependence on Providence when pressed by adverse circumstances...'. [6] Including this memory of Robert, published when sales of their own encyclopaedias were going strong, indicates two ideas relevant to the design of their own encyclopaedia for audiences. First, that both of them were well aware of the older publishing models for encyclopaedias discussed in Chapter 2. Second, *Chambers's Encyclopaedia* was meant to provide a similar childhood experience for a new generation. The aim of *Chambers's Encycloapedia*, one can conclude, was to convey the joy of discovery and learning to new readers through the many W. & R. Chambers publications, but especially through their encyclopaedia.

6.1.2   Designing an encyclopaedia encounter

A paragraph in both First and Second edition from the Preface explains:

> *The general character of the work is indicated by the title – A Dictionary of Universal Knowledge. The several topics are not handled with a view to the technical instruction of those who have made a special study of particular branches of knowledge or art. The information given may be characterised as non-professional, embracing those points of several subjects which every intelligent man or woman may have occasion to speak or think about. At the same time, every effort is made that the statements, so far as they go, shall be precise and scientifically accurate. One great aim in the arrangement of the work has been to render it easy of consultation.*[7]

The Second Edition additionally claims that audiences should expect to find some differences between editions. Namely, that in in the Second Edition:

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[5] Chambers (1872), p. 56

[6] Chambers (1872)

[7] 'Notice' Findlater, A., ed (1860) and 'Preface' Patrick, D., ed (1888*a*). Page numbers are not given in either edition, page numbers start after both sections.

The greater part of the work is entirely new; the majority of the important articles – by recognised authorities – being very much fuller than before. The others are virtually new. No old article has been retained without scrupulous verification by competent authorities.

A considerable addition has been made to the number of Maps, always an important feature in a work of reference; and amongst these are carefully executed Physical Maps. The Illustrations, a department superintended by Mr. J. R. Pairman, are mostly quite new, and will be found much in advance of the old, like in accuracy and in artistic character. A larger number are from photographs, many... especially having been engraved from photographs taken for this work. [8]

The first part of the Preface, which was consistent for both editions, states that this work intends to provide quality information in a way that engages the average person's intelligence, but one that allows busy people to refer to the publication for what they need. It is also structured in a way that aims to ease repeated use for accurate information. The second part of the Preface, provides some examples of the type of information in the encyclopaedia, and it is not limited to text. The Chambers idea of a complete reference package includes illustrations, maps, and tables alongside the text. See Chapter 4. According to the Preface, it is *not just the text* which will help readers of their product to improve themselves. Illustrations, especially ones based on photographs provide 'accurate' information in an accessible form. This implies that not only will the reader gain information, but the work is designed to make the process of learning easy and enjoyable by providing pleasing visual features.

The encyclopaedia eventually produced by Chambers was different from the Britannica that Robert Chambers read as a boy. As noted in Chapter 3, previous editions of Britannica, before its ninth edition, had long dissertations at the beginning of each work and entries, though organised in alphabetical order, took the form of long essays. They were also organised into systems of knowledge. Historian Jeff Loveland has demonstrated that editors of older encyclopaedic works intended these essays to democratise knowledge by providing contextual information for their audiences.[9] However, this was an approach Knight and Chambers disagreed with, as is evidenced by the layout of their publications. Knight and Chambers note that to them, the essays seem intimidating and do not take into account the realities of the daily lives of working people, who need to 'dip into the work' as appropriate. Based on their product outputs and statements, the W. & R. Chambers firm thought that to assist in the democratisation of knowledge, their audiences needed less information explained to them in the form of long essays, which would increase the

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[8] Patrick, D., ed (1888*a*)
[9] Loveland (2013), p. 168

overall cost due to paper expenses. Instead the text gave access at the customer's own convenience. Furthermore, Chambers and Knight relied on the appeal of illustrations to both attract their customers, and provide visual aids for learning. They also utilised a purely alphabetic sequence which enabled readers to easily find specific information, but which included cross references that allowed the possibility of expanded information and further discovery of knowledge. Knight was unable to fully implement his ideas, as discussed in previous chapters, so his intention of producing the *Penny Cyclopaedia* cheaply was severely constrained. Chambers, however, seems to have succeeded in providing cheap encyclopaedic material at a low cost.

The simplified design of the first edition of *Chambers's Encyclopaedia* was published in 1860s could have influenced *Encyclopaedia Britannica*. As noted in Chapter 3, Britannica removed the long treatises at the beginning of their volumes, in the 9th edition, produced between 1875 - 1889. The 9th edition also noticeably increased the use of illustrations by wood engravings that were interspersed with text, and reduced the number of fold out plates. Intaglio illustrations on those plates primarily became used for maps. One could argue that although older versions of *Encyclopaedia Britannica* inspired Robert Chambers, the design of *Chambers Encyclopaedia* and features of other lower priced reference books like the ones produced by Charles Knight, seem to have had an impact of later editions of Britannica. In the 9th edition, natural history subjects are the most frequently illustrated by integrated wood block illustrations, and entries become shortened with more use of cross-referencing. As discussed in further detail in Chapters 3, 4 and 5, this change in *Encyclopaedia Britannica's* design and arrangement, could have been influenced by the *Penny Cyclopaedia* and *Chambers's Encyclopaedia*. However, it could also be argued that the change was due to general public appreciation of these lower priced formats even by 19th century experts, as will be discussed in the next section.

As mentioned in Chapter 2, the first edition of the encyclopaedia was initially sold in parts. Users could become subscribers, but they could also purchase the encyclopaedia at certain bookshops[10] that were mentioned in advertisements listing shops which carried their products.[11] Subscribers were given the option of buying weekly parts in 520 instalments at 1 and 1/2 pence or purchasing the same sheets bundled monthly at 7d. The parts were printed and issued until the full run was complete. The price of *Chambers's Encyclopaedia* could be as low as 5 shillings 7 pence if no covers were purchased for this work.[12]

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[10]Pub Led. (1852)-'Notebook containing orders from Edinburgh booksellers 1852-1859' and Pub Led. (1887), 'Notebook containing orders from Edinburgh booksellers 1887-1898'

[11]Advertising for reprinted versions of Knight's works (1854). Advertisements mention local addresses of who to contact for distribution and the phrase 'and all Booksellers'.

[12]Trade catalogue (1868), 'List of books offered to the trade'.

As mentioned in Chapter 3, in the 1860s a footman earning under £30 per year could afford a purchase that amounted to £4 5s for the entire work, paid by instalment for the First Edition. While it is almost 13% of their annual salary, the cost was spread over 8 years, so it was affordable. In the late 1880s - 1890s, the Second Edition's price was raised to £5 in total. In 1888, the average annual wage for cabinet makers and carpenters was £32 8s, the average annual wage for blacksmiths was £28 6s and the average annual wage for a blacksmith's helper was £18 2s. [13] While the higher earning blacksmith would spend 15 % of his annual salary and the lower earning blacksmith helper would spend 20 % of his lower salary, the cost could be spread out over 4 years. Therefore, the Second Edition was also affordable. However, people in these trades might chose to access the encyclopaedia through the newly established public libraries. 'During the 1880s and 1890s private philanthropy saw the construction of a vast number of small and medium sized libraries throughout Britain.' [14] More about libraries will be covered in the next section.

6.2   General reviews of *Chambers's Encyclopaedia*

Based on articles at the time, it can be inferred that the publishing model the Chambers firm established resonated with their contemporaries in the printing trade. In 1860, a local Northern paper, *The Sheffield Independent* made the following comment after reviewing a part issue of *Chambers's Encyclopaedia*:

> *...the engraving, colouring, and accuracy of which are all that could be expected. They are brought up to the most recent geographical investigations and are produced in the first style. Their cost is excessively cheap. For ordinary purposes, nothing beyond them is required.*[15]

Another local paper, *The Blackburn Standard* in a more general statement on quality and access to *Chambers's Encyclopaedia* printed:

> *Part 20. The part before us of this excellent work extends from Brucine to Burns, and contains a large amount of valuable information at a very small cost. Such a work when completed will be a treasury of knowledge.*[16]

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[13]Wright & Weaver (1898). This report shows daily salary rates from the cities of London, Manchester and Glasgow during given years, and also presents the average for all three cities. These figures are from 1888, when the Second Edition was first released. These statistics were compiled in a report for the US Congress, so were reported in US dollars. The conversion at the time was $4.87 to £1. Calculation based on being paid 52 weeks per year, Bank Holidays Act of 1871 Workers in England and Wales had 4 days paid holidays per year, and in Scotland had 5 paid holidays days per year. Amulee (1938), p. 7; Atack & Bateman (1992)

[14]Many libraries were established with the assistance of the aforementioned Andrew Carnegie. 'By 1914, 62% of the England's population lived within a library authority area'. Taylor et al. (2016), p. 3

[15] *Sheffield Independent* (1860)

[16]Blackburn Standard (1860)

Furthermore, an excerpt from a much longer review in a third local paper, *The Liverpool Mercury* discussed the 2nd edition features of *Chambers's Encyclopaedia*, remarked that the look of the work was attractive and usefully structured its information.

> *By the skillful use of prominent black letter type the publisher have greatly added to the facility of reference throughout the whole book, while the typography itself is faultless...It will save the reader the necessity of wading through long treatises on special subjects, while it is remarkably easy of consultation*[17]

The three newspapers referenced above were based in Sheffield, Blackburn and Liverpool, major industrial centres with dense, urban populations, and this shows influence of *Chambers's Encyclopaedia* in the UK outside of Scotland. In the 19th century, Sheffield was associated with the steel industry, Blackburn associated with the textile industry, and Liverpool grew wealthy through international shipping. Knowing their readers, the news editors decided to review and recommend *Chambers's Encyclopaedia*, indicating they believed Chambers firm publications would resonate with them. The editors gauged that with a small approbation from them, the encyclopaedia would be popular. This is despite the fact that the papers had various political leanings. The *Sheffield Independent* and the *Liverpool Mercury* are characterised as a reformist and liberal papers, while the *Blackburn Standard* has been characterised as conservative. Nevertheless, the encyclopaedia and Chambers publications, in general, seem to be accepted across the political spectrum. [18] See Figure 6.1 for example of newspaper notices.

Between 1857 and 1882, the weekly circulation figures for the *Sheffield Independent* rose from 12,525 to 35,000.[19] The *Blackburn Standard's* weekly circulation by 1882 was 10,000 copies. [20] While the exact circulation figures for the *Liverpool Mercury* are not available, it can be estimated to be at least same as the *Sheffield Independent*. [21] The *Liverpool Mercury*, especially, was lauded for it coverage of Victorian social issues, especially topics affecting the lives of the urban poor, [22] who were, it may be argued, the very people Chambers publications targeted.

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[17]*Liverpool Mercury* (1888)

[18]See Chapter 2 for background of Chambers firm, where one aim of its publications is to eschew controversy.

[19]British Newspaper Archive (2018b)

[20]British Newspaper Archive (2018c)

[21]Exact figure are not recorded in the British Newspaper Archive, however, at the time, the newspaper was circulated not just in Liverpool and the surrounding rural areas of Lancashire and Cheshire, but also in Wales, the Isle of Man and London. In 1841, the newspaper moved from a weekly paper to a daily paper and became one of the largest and most heavily used by advertisers in the second half of the 19th century.

[22]British Newspaper Archive (2018a)

Chambers's Encyclopædia. A Dictionary of Universal Knowledge for the People. Illustrated with Maps and numerous Wood Engravings. Vol. X. London : W. & R. Chambers.

This volume completes what, beyond all question, is the most useful encyclopædia in the English language. The completeness with which its topics are brought together, the carefulness with which the articles are written, and the skill with which, without impairing their information, they are condensed, are beyond all praise. Its compendiousness and completeness mark it for the working hand-book of the desk and the home.

Half of this volume is occupied with the inevitable supplement; for, however rapid the production of such a work, the growth of knowledge is more rapid still, (and in ten years it grows a great deal) and however careful and competent editors may be, oversights are inevitable.

The proprietors claim just credit for the extent and fairness of their articles on religious beliefs and speculative opinions. In respect of these the information given is very complete. We have again and again found in this Encyclopædia information which we have in vain sought elsewhere, especially concerning the faiths and philosophies of the ancient world and of the modern nations of the East.

An index of subjects subordinately treated, greatly enhances the value of the work. An index of chief contributors is added.

Figure 6.1: A sample of a review for *Chambers's Encyclopaedia*, second edition that appeared in the *Saturday Review of Politics, Literature, Science and Art*, Volume 68, Issue 1176, November 9, 1889, pp. 535-536

Mentions of *Chambers's Encyclopaedia* in 19th century newspapers fall into three categories: advertisements, notices for sale or seeking to purchase, and reviews. [23]

A search through the British Newspaper Archive database during the period 1860-1869, reveals 1047 results that mention the First Edition. A search through the database during the period 1888-1892 reveals 1006 results for the Second Edition.[24] However upon further examination, not all of these results are articles.

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[23]'Substantial' means that the article focuses on the encyclopaedia. For example, several obituaries of Dr. Andrew Findlater mentioned the encyclopaedia as one of the books he edited. These mentions were not included unless the article turned to specifics of his work on *Chambers's Encyclopaedia*

[24]The search was last conducted on 1 September 2018. The database claims that new titles are being digitised and added. The search was limited to these years, in order to try to pick up reviews as the volumes were being published.

DECEMBER 16, 1889.] ST. JAMES'S GAZETTE. 3

Figure 6.2: A sample page of *St James's Gazette*, December 16, 1889, p. 3 featuring ad for *Chambers's Encyclopaedia* Image British Library Board. From British Newspaper Archive.

Of the initial search yielding 1047 results, 570 are advertisements or miscellaneous content. For example, on Saturday 11 May 1867, the *Illustrated London News*, has 5 lines of text stating that Volume 9 of *Chambers's Encyclopaedia* was ready for purchase, that it had '2355 Distinct Treatises' [encyclopaedia entries], '423 Wood Engravings' [sic], and it included '8 colour maps.' Of the 1006 results that mention the Second Edition, about 952 are classified by the database as articles, but a further 391 have been tagged as classifieds.[25] For example, the *St James's Gazette* appears to have the encyclopaedia as the main part of an article in its database, but on closer inspection one can see it is actually part of an advertising notice next to the main article. *Chambers's Encyclopaedia* is mentioned along with other titles: the *Book of Days*, the *Cyclopaedia of English Literature* and *St. Giles', Edinburgh*. See Figure 6.2.

Although I estimate that there are only a couple of dozen original reviews that examine Chambers in any amount of depth in these newspapers, there are two pieces of evidence that show its wider influence, besides the steady sales, which were 80,000 sets by 1880. [26] First, because reviewers in the papers state it as a fact, 'The original edition of this well-known and most popular Encyclopaedia was begun in 1859...' [27]. Secondly, because of the wide geographic scope where both editions are mentioned in newspapers throughout the country. Mentions of *Chambers's Encyclopaedia* appear in these domestic regions: Central Scotland; Dunfries and Galloway; East Midlands, England; East England; Fyfe, Scotland; Grampian Scotland; Guernsey; Highland Scotland; Isle of Man; Jersey; London; Lothian, Scotland; Mid Wales; North East England; North Wales; North West England; Northern Ireland; Orkney, Scotland; Republic of Ireland; Cardiff, Glamorgan and Wales; and Cornwall, England.[28] So, even if the local paper did not have an editor like the one from the *Blackburn Standard* who advocated for Chambers publications, the sheer volume of these casual mentions indicates popularity and a wide market.[29]

Despite the fact that the editors of these papers stressed the cheapness along with the high quality of the reference work, purchasing a new set of parts or volumes for oneself or for one's family was not the only way a person might read an encyclopaedia. Library records show that by the late 19th-century, Chambers's publications, including first and second editions of *Chambers's Encyclopaedia* were found in libraries in Cumbria, Devon,

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[25]The British Newspaper Archive is a partnership between the British Library and findmypast to digitise up to 40 million newspaper pages from the British Library's vast collection over the next 10 years.

[26]Pub Led. (1891*b*).

[27]'Chambers's Encyclopaedia' *Liverpool Mercury*, 14 Mar. 1888.

[28]Geographic regions are how the BNA database presents search returns. These results are from the BNA database.

[29]I believe that a future research direction outside the scope of this thesis would be a comparative examination of the reception of both editions generally, as the research focus on this thesis centred on encyclopaedia images.

Dumfriesshire, Devon, Exeter, Essex, Flintshire, Innerpeffray, London, Leeds, Manchester, Newcastle, Nottingham and Stirling. We can presume that the encyclopaedias were therefore available in many such libraries and other educational institutions catering for working or adult audiences, some on the premise of their places of employment.[30] More than 20 subscription libraries or institutions that operated in the UK during 19th century, are still in operation, though they were largely overtaken after the Public Libraries Act of 1850. [31] [32] The evidence that records from these older libraries provide, is that Chambers material did have an audience of beyond those who could afford a copy of their own – people who could afford to be members of these libraries, borrowed books and used library material. However, they were not able or willing to own these works themselves; or perhaps had no residential space to house them.

There was also the prospect for second-hand or donated reference works, and this seemed widespread in different parts of the British Empire. Classified ads placed in the local newspapers of Calcutta in 1872, and in both Aukland and Belfast in 1899, offered *Chambers's Encyclopaedia* for sale in *The Friend of India*, *The New Zealand Graphic and Ladies Journal* and *The Irish Presbyterian*, respectively. Rev. G. R. Bullock-Webster, a resident of Kiungani, Tanzania, placed an advertisement in *Empire*, in the 'Central Africa Wants' section. It solicited donations for the second edition of Chambers for his local missionary school.[33]

The British Empire and English speaking world, presented a wide education market for W. & R. Chambers. It is easy to speculate that any schools which had purchased books on languages, geography, history and science from the Chambers's Educational Course series,[34] redesigned for the education market especially after the 1870 and 1872 Education Acts were passed in the UK, [35] could also consider purchasing a set of the encyclopaedias and dictionaries for shared use by their students. Local distributors served as proxies

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[30]Banham (2013), p. 189. Banham notes that when the Oxford University Press Library opened, it took up a subscription to *Chambers's Edinburgh Journal*.

[31]Taylor et al. (2016), p. 3

[32]Many were former mechanics institutes, and most, in some form, continue their public education goals today. Research on older library holdings was conducted by looking at catalogue records and emailing staff from member institutions of the Independent Library Association (ILA). The ILA founding institutional members began life specifically as independently funded subscription libraries founded between 1768 and 1841 at a time when there were no public libraries and no university libraries outside Cambridge, Dublin, Edinburgh and Oxford. As more and more people were reading and books were very expensive to buy, groups of individuals combined together to form libraries which could be both of everyday use and of increasing value in the future. Many of the ILA members also provided other facilities for their members including museums, adult education and dining facilities.

[33]*Empire* (1893) circa late 1890s

[34]Trade catalogue (1861), Catalogue of Educational Works Published by W. & R. Chambers 1861.

[35]See Chapter 3, especially reference to editor James Donald's work with teachers

between their home countries and the Chambers firm in Scotland. The second edition of *Chambers's Encyclopaedia* was distributed in Australia by the Sydney-based Angus & Robertson, a major bookseller, publisher and printer founded in 1888. By 1923, when the third edition of *Chambers's Encyclopaedia* was published, Angus & Robertson developed a business plan, which involved selling the third edition of *Chambers Encyclopaedia* packaged with the its own *Australian Encyclopaedia*.

According to print historian Caroline Viera Jones, the W. & R. Chambers brand had a strong reputation because of the quality of the first two encyclopaedia editions. By the 1920s, Australian audiences had a strong incentive to purchase both sets together. Customers were told that the two-volume *Australian Encyclopaedia* focused on key national figures, regional geography, history significant to Australian citizens, and plants and animals native to Australia. Whereas the accompanying ten-volumes of *Chambers Encyclopaedia* provided their homes with an international perspective. Angus & Robertson customers were assured they were getting quality information that put the world at their fingertips. By selling the set of *Chambers's Encyclopaedia*, third edition (1923) with the set of the *Australian Enyclopaedia*, for only an additional 14 shillings and 6 pence, the national encyclopaedia sales were actually boosted. [36]

> *The name of the publishing firm W. & R. Chambers must be referred to with honour as having had a considerable share in fostering great intellectual awakening... The crowning effort of this firm to provide 'the people' with the means of obtaining useful and accurate information is no doubt to be seen in the 'Encyclopaedia' with* [sic] *which they have brought out under the editorial care of Dr Andrew Findlater. (Nature, 1871)*

As shown above, the reputation of *Chambers's Encyclopaedia* was substantial in an international context. Sales of the First Edition continued in Britain until 1887, a year before the Second Edition went on the market. In a letter to Lippincott, Chambers state that they would like to postpone announcing that there was going to be a revised version because there was still stock from the First Edition. Lippincott, on the other hand, was keen to get the American market ready for the New Edition or Second Edition, and wanted to begin advertising as soon as possible. They came to an agreement on a date of announcement in late 1887. [37]

On Saturday, April 9, 1859, *The Lady's Newspaper* in London carried the following review of *Chambers's Encyclopaedia*:

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[36]Jones (2006). The selling price for the 3rd edition was 20 shilling per volume if bound in cloth and 35 shillings per volume if bound with Morocco covers. *Dundee Courier* (1926, Thursday 18).

[37]Pub Led. (1881-96) and Pub Led. (1897-1923)

*The services that the Messrs. Chambers have rendered to education and to cheap literature have been long known and are widely appreciated. It is gratifying to find that these veterans in the cause of the diffusion of knowledge still hold their place in the van[*guard*], and are not likely to be distanced in the race for popular favour of competitors whom their own efforts have called into existence. In addition to their educational works, and as the crown and consummation of them all, they have now commenced an encyclopaedia – an immense undertaking, extending they estimate, to eighty monthly parts; but on such a scale of cheapness as to render it accessible to all classes. The plan of the work differs somewhat from other publications of a similar title…it undertakes to give, in the clearest and most succinct terms, all that the reader wants to know. The value of such a work must be immense…The numbers, so far as they have yet appeared, bear out this character, and promise to be of great utility.* [38]

The review states that the Chambers firm had earned a solid reputation in the eyes of a London periodical as a trustworthy source of information, and as a publisher that provided worthwhile material that brought joy to their readers. The review also expresses an appreciation into the time to work that an encyclopaedia would entail, but expresses confidence in this endeavour.

6.2.1   Subject experts review textual content of *Chambers's Encyclopeadia*

The previous section highlighted a handful of reviews from the two dozen newspapers and periodicals mentioning *Chambers's Encyclopaedia* in the late 19th century. The reviews featured in this section summarise overwhelmingly favourable reception as well as some critiques of *Chambers Encyclopaedia*. The leading scientific journals, *Nature* and *Science* reviewed *Chambers's Encyclopaedia* for their more specialist content.

Nature has been published in the UK since 1869. *Nature* was founded by English scientist, and astronomer Sir Joseph Norman Lockyer (1836–1920) to facilitate the transmission of ideas between scientific disciplines. Many of the early contributors were part of Thomas Henry Huxley's X Club, a group of scientists known for having liberal, progressive, and somewhat controversial scientific beliefs relative to the time period. [39] Incidentally, Robert Chambers had been a member of the X Club. [40] *Science* was published in the US by the American Association for the Advancement of Science and was started in 1880. [41] Their support of the scientific articles in *Chambers Encyclopaedia* testifies to the quality of this reference work and most likely helped solidify its reputation internationally early on. The following was part of a review in 1871 of the first edition *Chambers's Encyclopaedia*.

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[38] *The Lady's Newspaper* (1859), p. 230
[39] Browne (2002), p. 248
[40] Barton (1998), p. 443
[41] Reuters (2009). Both journals are regarded as highly prestigious in the sciences.

Previous to the publication of this Encyclopaedia...a large number of books of reference of this class had been published both in England and Scotland, but all were of a ponderous size and constructed pretty much after the plan of the Encyclopaedia Britannica, consisting mainly of long treatises on various departments of knowledge. The Messrs. Chambers, however...have the only satisfactory plan for a dictionary of universal information, which first of all, ought to be a handy reference book... Perhaps some might desire an encyclopaedia with more copious vocabulary, with a fuller list of subjects, more condensed information, and in every case where practicable a copious bibliography. But for the great bulk of the people, the encyclopaedia before us will be found to answer with singular completeness all the purposes of a book of reference. Between the body of the work and the copious index there is little that any ordinary man will want to inquire about which he will not find information upon here, and that speedily. In many cases to special authorities furnish the means of pursuing a subject further. As to the quality of the work we can speak with most unqualified approval... We have examined carefully a large number of the articles, and of course the scientific ones especially, and considering the purpose and plan of the work there is really very little room for criticism. All the scientific articles have been evidently written by men who have special knowledge of their subject (Nature, 1871)[42].

Interestingly, the reviewer for *Nature*, quoted above not only talk about subject knowledge, but also overall design by making a comparison between *Chambers's Encyclopaedia* with contemporary encyclopaedias on behalf of the general public. Although he states that Chambers may not contain as much detail as the other encyclopaedias, like the *Encyclopaedia Britannica* or perhaps even the *English Cyclopaedia*, which ran to 25 volumes and 24 volumes respectively, the reviewer thinks that 10 volumes is just the right amount of information, and that the wording is pitched at an appropriate level for ordinary, literate people, who, if they are curious to pursue further knowledge are given references to works to further their education on the topic. It is a very favourable review and one that also praises the editorial effort of Andrew Findlater directly. Since Findlater had a long association with Chambers, as he edited the revised, 1857 edition of *Information for the People* and various other dictionary projects, as well as non-Chambers related work such regularly contributing to the *Scotsman* newspaper, it is likely that Findlater was widely known in many circles. [43]

Here is another quote from a review in *Science*:

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[42] Nature Reviews (1875)

[43] Andrew Findlater has an entry in *Encyclopaedia Britannica* which shows he was a significant and well respected figure in the 19th century as a professional writer and scholar.

The original issue of this work was completed twenty years ago, and few works of the kind have enjoyed equal popularity, or rendered better service to the masses of read-ers...The progress of events, however, and the increase of knowledge in almost every branch, have necessitated a new edition... Many articles have been re-written, and others partially so, while all have been subjected to a careful scrutiny by competent hands; and the result, so far as we have examined the work, seems excellent. Con-siderable attention has been give to American subjects, the more important of which have been treated by American writers; and their articles have been copyrighted in the United States by the J.B. Lippincott Company of Philadelphia, who publish the encyclopaedia in this country. (Science, 1888)

Science, as an American journal, specifically points out that there were articles in *Chambers's Encyclopaedia* written by American authors on American subjects. The review praises the scientific articles they have examined, as well as articles with content relevant to peo-ple in the United States. Like the review in *Nature* for the first edition, this is a positive review. It appeared in 1888, the year the first volumes of the second edition were being simultaneously published in Philadelphia and Edinburgh. The feedback here is that the scientific content is up-to-date and excellent.

A third review, this time from a social science point of view:

A gratifying illustration of the widespread interest in everything pertaining to Folk-lore is to be found in the generous space allotted to this branch of study in the new edition of Chambers's Encyclopaedia...These articles are models of treatment at once scientific and popular, and may be consulted with profit by scholars as well as by the general reader. (American Folklore Society 1890)

The *Journal of American Folklore's* remarks on the approachability and authority of the text articles found in Second Edition volumes. Notice the praise of the *Chambers's Ency-clopaedia* for being pitched at the right level for the 'general reader.' This review stresses that the encyclopaedia is a good example of how subject coverage can be both 'scientific and popular,' and is a good indicator of how an expert in one particular field responded to the textual content and the publishing model that Chambers used. In fact the word 'model' is used in the review. Furthermore, the folk-lore expert comments on entry's international relevance to readers not only in the UK, in the US. This implies that *Chambers's Ency-clopaedia* is not only a good national publication, but that the content is much appreciated internationally, as well.

This bodes well for the intentions of the partnership between Lippincott and Chambers on this project, who organised the inclusion of information found in articles, for example, or regional maps for their respective versions, that audiences on both sides of the Atlantic

> *Chambers' Encyclopædia.* **Parts 15 and 16.**
>
> The letter of a correspondent, who exposed the inaccuracies in the account given in Part 16 of the town of Blackburn may have somewhat destroyed the faith of Blackburnians in the general reliableness of the information contained in this work. We see no reason, however, to condemn or distrust the general accuracy of the vast amount of information which is here supplied at so small a price; and the Blackburn article seems to have been one of those mistakes which in a work of this character and magnitude are almost inevitable. We see much reason to acknowledge the work to be trustworthy, and hope to see more as it progresses.

Figure 6.3: Editor's reply to a letter pointing out an error in *Chambers's Encyclopaedia*, June 20, 1860.

could generate a brand loyalty to Chambers or Lippincott, and not seek pirated versions. More about pirated versions will be discussed later in this chapter.

Not all testimonies in favour of the expertise found in *Chambers Encyclopaedia* have been published in public forums. Sometimes there was praise in personal correspondence, and in one case even a willingness to stake one's business on the quality of the Chambers information. On 14 March, 1872, Albert Megson of the law firm of A. Megson & Son in Manchester sent a letter to the offices of W. & R. Chambers based in Edinburgh. In the letter, Megson informs the Scottish publishers that his law firm was creating a standard form for potential clients on the importance of preparing a last will and testament, and Megson requests permission to extract a paragraph from the first edition of *Chambers's Encyclopaedia* on the subject of 'Wills', because he writes that parties in need of drafting a Will would find the *Chambers's Encyclopaedia* text 'most useful' and he 'naturally proposes' to credit Chambers. The letter implies that as an expert in the Law, Megson finds the entry for Wills accurate, written at the appropriate level for a lay person (his potential clients), and easy to understand. He further writes in the postscript of the letter:

> *I have much pleasure with [reading] your Encyclopaedia and think it is the greatest treasure I possess...* [44]

There were some criticisms of the textual content of both the first and second edition of *Chambers's Encyclopaedia* in the newspapers or periodicals. Most fell into two specific categories: errors by omission; and not enough coverage of a subject area that a particular reviewer thought should be covered. Errors by omission were acknowledged by reviewers as due to space constraints of the format. When reading critiques of not enough subject

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[44]Chambers firm with A. Megson (1872)

coverage, one has to wonder if this is the reviewer's way of promoting their own special interests or to make pointed remarks about some broader issue. For example, in one case, found in 1860, in the First Edition, there is an error of fact noted in the *Blackburn Standard* about a geographical aspect of the city of Blackburn. However, the editor of the *Blackburn Standard* acknowledged the error in the next issue, quickly defended the encyclopaedia as a whole, and pointed out that an entire work should not be judged by one article. See Figure 6.3. The newspaper editor further concluded, 'We see much reason to acknowledge the [encyclopaedia] work to be trustworthy and hope to see more as it progresses.'

The *Aberdeen Evening Express*, showcases a casual mention of *Chambers Encyclopaedia*. In another article in 1893, reporting on a Mr William Wallace, a distinguished former Aberdeen student, who had recently been the subject of a book, the article notes that among Wallace's many accomplishments, he contributed to the new [second] edition of *Chambers Encyclopaedia* and became the editor of the *Glasgow Herald*.[45]

The comments presented here from *Nature*, from *Science*, from the *Journal of American Folklore* and from A Megson & Son provide evidence of expert approval for the textual content of *Chambers's Encyclopaedia* that were written in the 19th century, as well as a positive response from the daily and weekly papers in three major industrial cities. The reader reponses reported here not only show a general belief in the accuracy of the book's content and in the textual appropriateness for people who are non-experts. It also shows that the encyclopaedia volumes themselves, were an enjoyable reading experience. They also benefited from an almost universal respect for the Chambers brand, which not only had customers, but ardent supporters.

6.3   Gauging the reception of images

As shown in the previous section, reviews of *Chambers's Encyclopaedias* appear in scattered periodicals of the time and in letters addressed to the firm. Yet, most of them discuss textual content specifically. The two main records readily available on the reception of images come from these sources: the firm of J.B. Lippincott, the American co-publisher and distributor of Chambers's other works, and a couple of reviews found in literature of the time.

The Philadelphia firm of J.B. Lippincott, who worked with the Chambers firm to produce American versions of the first and second editions, have also lauded the encyclopaedia illustrations for their 'scientific accuracy.' Lippincott's confidence in Chambers is clear – from the long-standing relationship with Chambers, to the fact that Lippincott sought permission to reuse hundreds of images in other subsequent Lippincott publications. Two of those publications, *A course in Zoology for Secondary Education* and *Home*

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[45] *Aberdeen Evening Express* 7 October, 1893.

Life in All Lands will be discussed later in the chapter. For now it suffices to say, that J. B. Lippincott's business relationship, while a good gauge of how other publishers might have seen the firm, may not be the best indicator of a general customer experience. One cannot ignore that their printed adverts and positive affirmations of the quality of Chambers products and images are part of Lippincott's own marketing strategy. The Lippincott business depended on further promoting the idea that Chambers publications were high quality, and that complicates public statements by them about their Scottish partners. It is important to look to other sources to critically assess whether Chambers achieved their stated aims.

One of the stated aims of the Second Edition, was to provide illustrations that were mostly new, more 'advanced' than the previous edition, as well as more accurate. Chambers also claims that a higher proportion of their illustrations are based on photographs. Based on the research presented in Chapter 4, that there were a higher number of images that were created in facsimile style, the last point is granted. It has also been demonstrated by journal review statements, such as the *Liverpool Mercury* above that there is a higher proportion of images that look like photographs and this was evident to 19th century readers of the publication. However, the claim that the illustrations in the second edition are more accurate than the first has not yet been examined, and the best indicator of content accuracy can be demonstrated by feedback from a subject expert.

Unlike the letter from Megson, shown in the previous section, which testifies to the accuracy in the textual content of 19th century law, no customer letter has been found in the W. & R. Chambers Archives giving a meaningful link between encyclopaedia's illustrations and assessment of the image content. Nothing like consumer feedback that directly ties the illustrations with aiding laypersons in understanding complex and technical content has been discovered in the archives on deposit at the National Library of Scotland. In a way, this is not too surprising, as the main function of any company archives is to provide institutional history and reflect the narrative of the company's administration, policies, and daily business activities, from the point of view of that institution. [46]

Furthermore, when most 19th century reviews found in the papers do mention the quality of illustrative content, often times they either quote direct language from *Chambers's Encyclopaedia's* Preface, or the illustrative content is discussed in a non-substantial way, compared with the review given of the textual content. One example in particular from a review in the *Liverpool Mercury* on Wednesday, 14 March 1888 demonstrates this, it contains a very positive and detailed review of the Second Edition. Figure 6.4 shows the *Liverpool Mercury* article in the context of its page layout. A legible copy of the review will be in Appendix H.

The review tells readers the history of the First Edition, notes the accomplishments

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[46] The National Archives (2009).
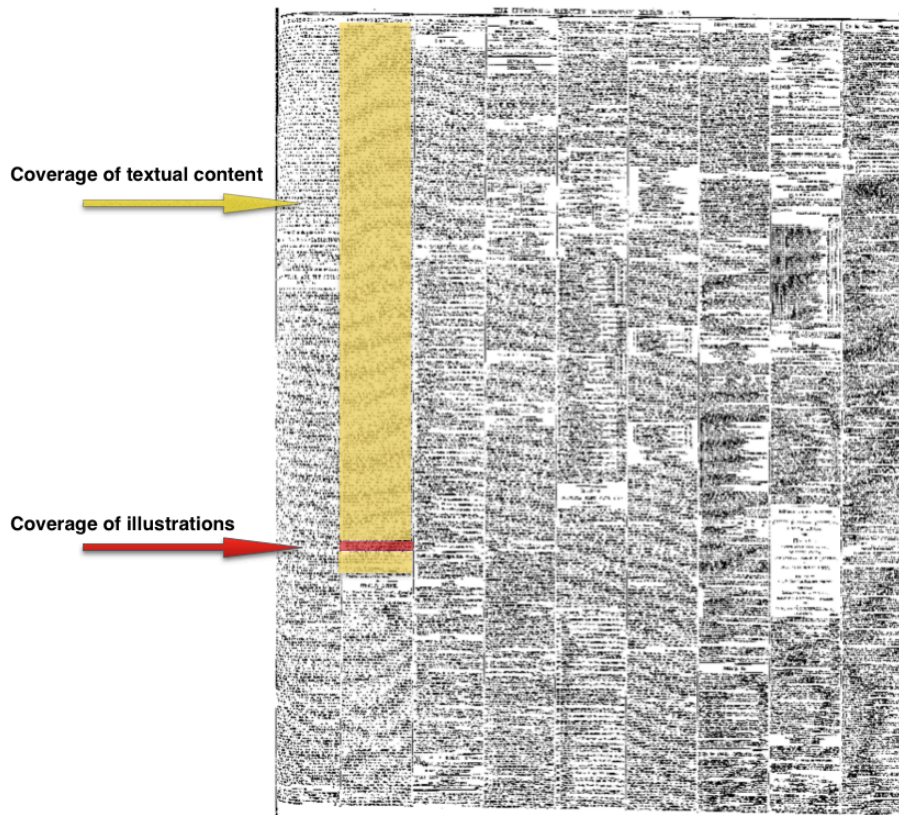
Figure 6.4: Page layout of *Liverpool Mercury*, 14 March 1889, showing proportion of content on *Chambers's Encyclopaedia*, second edition. The yellow highlight indicates the portion of the article dedicated to reviewing the textual content; the red highlight indicates the one sentence discussing Chambers's illustrations.

of Andrew Findlater and David Patrick, the editors of both editions, then proceeds to discuss the different contributors and their areas of expertise. Specific entries are named and briefly commented on. The review claims that a side-by-side comparison was made between the First Edition and the Second Edition and agrees with Patrick's overall assessment, that the Second Edition is a much better and more concise. The discussion of the Second Edition is conveyed in a very enthusiastic tone, and one gets the impression the author enjoyed reviewing the different entries.

In contrast, the portion of this review discussing illustrations is only one sentence long. It reads:

> *The pictorial illustrations have been superintended by Mr. J.R. Pairman, and in the case of plants especially, have been expressly engraved from photographs, and strike us very much in advance of those with which we used to be familiar* [sic.] *in the old edition, the place of which will now be taken by the edition before us.*

Now, compare this one sentence with the Preface of the Second Edition, as shown previously, in the second to the last paragraph of the Preface of *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge, New Edition*, Volume 1 which states:

> *The Illustrations, a department superintended by Mr. J.R. Pairman, are mostly quite new, and will be found in advance of the of the old, alike in accuracy and in artistic character. A large number are from photographs, many of the plants especially having been engraved from photographs taken from for this work.*

The review of the illustrative content of Chambers is virtually the same as the two sentences found in the Preface. It does not take much to imagine that the person writing this piece for the *Liverpool Mercury* was not very concerned with illustration, and other than noting they were pleasing to the eye, reiterated what was written by Patrick, so that more time and space could be dedicated to an area in which there was a genuine interest.

This example provides a case for why it was necessary to widen the scope for determining how audiences received visual information in these books by using a structured image analysis method. By asking people who are subject experts today about the images, some insights into how the images were constructed and ideas about what content was being communicated was captured. Notably, their feedback overall seems to confirm parts of what other research results presented here have determined, especially in the relationship of the production workflow of images in the Chambers's firm.

6.3.1   Expert Survey goals

Image analysis is the extraction of meaningful information from the content of the image itself. It attempts to understand what the image is communicating to a possible audience. The online study conducted between October 2016 and May 2017 asked experts in three subject areas to engage with images and to some extent, extracts of text associated with images from the encyclopaedia. Their reactions were then recorded. [47] The survey was designed to test an 'average' type of image a reader might encounter when picking up the encyclopaedia, therefore the categories chosen to be surveyed were sampled from the most frequently illustrated subjects: vertebrates, botanical specimens and medical images. These three categories were based on the visual content analysis exercise mentioned in Chapter 4: Visual Content and Form. Vertebrate and botanical specimens were the categories most frequently chosen to be illustrated by Chambers, indicating these categories were significant to the encyclopaedia editors.

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[47]Details of qualitative methods, participant selection and survey administration were explained in the Introduction, under the research methods section.

Bird survey illustrations - 65 people completed survey

grebe	puffin	pigeon	swift	tit
65 surveyed could identify it	54 surveyed could identify it	52 surveyed could identify it	45 surveyed could identify it	21 surveyed could identify it

Botanical survey illustrations - 23 people completed survey

almond	banyan tree	barley	flax	olive	vanilla
10 could identify it	9 could identify it	18 could identify it	10 could identify it	20 could identify it	8 could identify it
3 guessed correct genus	4 guessed correct genus	2 family / 1 genus	1 guessed correct genus	-	2 guessed correct clade

Medical survey illustrations - 21 people completed survey
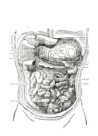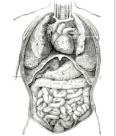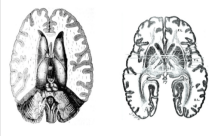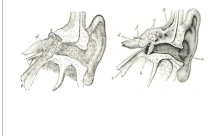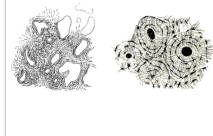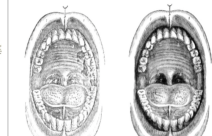
abdomen	brain	inner ear	compact bone	pallet
21 people could identify it	21 people could identify it	21 people could identify it	6 could identify it	21 people could identify it

Figure 6.5: Illustrations tested for subject accuracy from *Chambers's Encyclopaedia*

The survey asked whether the experts could identify an image, if the image looked accurate, and if they believed the image was useful in teaching technical details of their subject to someone who was not an expert. The goal of this exercise was to gain qualitative information that evaluated illustration content and to address these overall research questions: Did both editions carry images that were regarded as accurate by subject experts? Are the illustrations in the Second Edition more accurate than the First Edition? When processing their answers, I also checked to see if there was a correlation between their assessment of accuracy and illustration style.

An image was chosen for the survey if it had a corresponding image in the other edition. The illustrations chosen were fairly typical, but as mentioned in the Introduction, such a small sample might yield anomalous results. I chose not to survey entires where the first edition used an illustration, but the second edition used tabular information, as the goal of this survey was to have a like-to-like comparison. The general key findings will be summarised in the next section, followed by statements from experts regarding three specific survey examples.

6.3.2   Key findings

Figure 6.5 shows a table containing the various images that were used in the survey from both editions of the encyclopaedias. The table documents how many people took the survey, and records the number of images that were recognisable. The bird survey was taken by 65 people, the botanical illustration survey completed by 23 people, and the medical survey by another 21 people. The results of the survey yielded some mixed results, but generally showed the images sampled were accurate enough for subject experts to recognise the image content. Four out of five medical images were easy to identify, 4 out of 5 bird images were generally identifiable, and out of 6 plant images shown, 2 were easy to identify. However, the table also shows that for the botanical survey, after prompting from questions further in the survey, the sample of plant illustrations *could* be identified by experts as far as the family, clade or genus level, if not to the exact species.

In Chapter 4, it was shown that encyclopaedia publishers were moving towards more facsimile styles as the decades of the 19th century unfolded, because of a more general belief that facsimile styles referencing photographs were more scientific and authoritative. I expected experts to prefer second edition illustrations across the board, but what I found instead was that their answers were more complex and depended on the specific image being examined. When looking at a particular illustration, the primary focus of the experts was on subject content, the illustration style and the aesthetics of the image was secondary.[48] Also, from the more general comments on birds and plants, all images were regarded as stylised and old-fashioned in their depiction, and there was less awe surrounding illustrations that were in black and white, compared to, say, the feedback from 19th century periodical reviewers in the previous section.

This survey revealed that there were varying degrees of information embedded in each image and participants from different subject disciplines processed information of their discipline differently from each other. For instance, vertebrate illustrations tended to show a contextual scene, whereas the medical and plant illustrations found in Chambers tended to show mostly schematic illustrations. These visual conventions did not surprise the experts.

Survey participants discussing birds noted that poses (resting or moving) were unnatural and guessed that bird illustrations were based on dead specimens. [49] These comments were echoed in statements responding to the plant survey. A comment that came up frequently for plants especially in the first edition, was that some illustrations looked like artistic depictions of botanical specimens, rather than the sketch of a plant in the wild.

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[48]See Chapter 4 for more information about types of images that fall in to pictorial, facsimile, and schematic illustrations.

[49]As previously stated in Chapter 5: Production, this practice was confirmed by Walter Crane who reported he was sent to the British Museum to sketch specimens. Crane (1907).

| Bird survey | Edition | | | | |
Edition preference for teaching non-expert	1st	2nd	Either	Other	Total
Grebe	24	25	10	11	70
Pigeon	5	53	5	3	66
Puffin	9	32	22	5	68
Swift	25	23	16	4	43
Tit	20	36	3	8	67
Edition preference	83	169	56	31	n/a
Botanical survey	**Edition**				
Edition preference for teaching non-expert	1st	2nd	Either	Other	Total
Almond	13	4	2	5	24
Banyan	2	16	2	4	24
Flax	13	4	2	5	24
Olive	7	8	5	5	25
Vanilla	3	14	3	5	25
Edition preference	38	46	14	20	n/a
Medical survey	**Edition**				
Edition preference for teaching non-expert	1st	2nd	Either	Other	Total
Abdomen	1	19	0	2	22
Ear	1	19	0	2	22
Brain	13	3	5	1	22
Compact bone	2	9	9	2	22
Edition preference	17	50	14	7	n/a

Table 6.1: Summary of responses for first or second edition preference of images…* For Bird and Botanical surveys, some participants felt compelled to qualify their preferences for first or second edition, so in addition to preference they added comments in the 'Other' category.

Table 6.1 shows a compilation of responses regarding which image an expert might find useful to explain an aspect of their subject to a non-expert. For bird illustrations, there was a preference of 169 to 83 in favour of second edition images. For botanical illustrations, there was a preference of 46 to 38 in favour of second edition images. For medical illustrations there was a preference of 50 to 17 in favour of second edition images.

While there is an overall preference for illustrations in the second edition, there were some cases where first edition illustrations were considered more helpful. For instance, in the bird survey, the swift in the First Edition received more preferences than the swift illustrated in the second edition. The grebe illustrations, which will be discussed in the next section, were very close in terms of what the experts thought would be useful, with only a 24 to 25 split in preference for the second edition. In the botanical survey, the first edition illustrations for the almond and flax were preferred over the second edition illustration, and in the medical survey, the image of the brain from the first edition was preferred over the second edition. Why these preferences were stated in terms of teaching will be discussed through three pairs of examples, one pair from each survey are shown in Figure 6.6, Figure 6.7, and in Figure 6.9. They will be discussed in the next sections which will show in which aspects *Chambers's Encyclopaedia* 'advanced' and made 'more accurate' images in the Second Edition.

6.3.3 A summary of the bird survey

Bird illustrations chosen for the survey were a subset of the subject category, vertebrates. Figure 6.6 shows illustrations of birds labeled 'Great Crested Grebes' from *Chambers's Encyclopaedia*. The First Edition image shows the head of a grebe, and a lobed foot, which is a distinguishing feature, as opposed to a webbed or grasping foot. The second edition illustration shows two grebes, one of them perched near a nest of eggs. Both images seem to be in pictorial style, however, the illustrated scene depicted in the second edition with a nest and eggs seems to have facsimile elements, and utilises the closed frame of a photograph.

Like other vertebrates in these encyclopaedias, birds were often depicted in what we presume to be their habitat. Facsimile style illustrations in Chambers second edition are composed as a snapshot of a scene in nature at any given point in an organism's development. Interestingly, based on their comments, it seems that when trying to identify a specific bird, ornithologists tended to look at other details in the image besides just the bird itself. The bird expert responses indicate that they study the background, the number of eggs in a nest, or type of body of water a bird builds it habitat near as visual aids with identification. The experts expressed an awareness that certain physical characteristics changed between juvenile and adult stages, and these indicators helped them determine the age and gender of an individual within a particular species. This information alluded to layers of information present in a particular image, and their answers demonstrated the complexity of *Chambers's Encyclopaedia* illustrations. These next two examples are revealing. One expert wrote:

> *Grebe. European, probably a great crested, nicely done but details of crest are inac–*

Grebe
Chambers's Encylopaedia, 1860-1868

Grebe
Chambers Encyclopaedia, Edition 2, 1888-1892
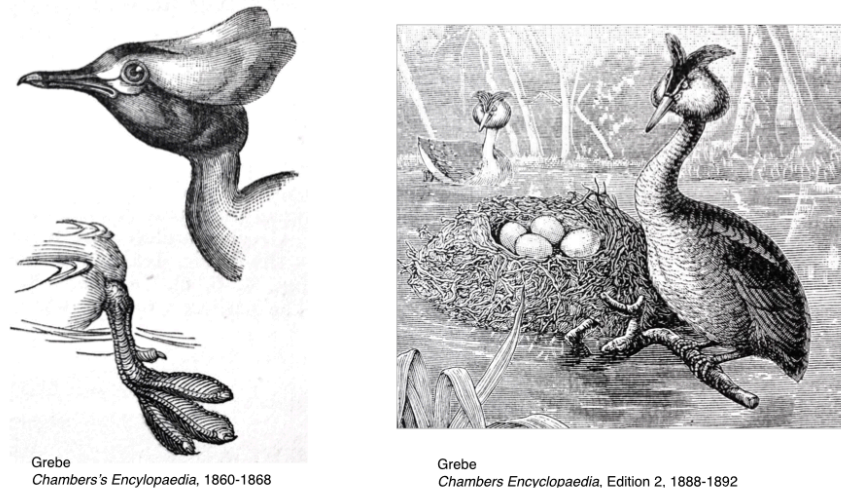
Figure 6.6: Grebe from first (left) and second (right) editions

curate. Also ability to perch on a stick next to nest is wrong. I also think that there are too many eggs [in the nest][50]

Another bird expert wrote:

Stylized: looks as if [it] *is drawn from mounted specimens rather than from life*[51]

This second bird expert further stated that the body proportions of the grebe were not exactly like one would encounter in nature, and that the grebe's posture was not correct, which is why the expert suggested it must be an illustration after a non-living specimen. In addition, the expert commented that the illustration should show a 'clutch of 2 not 4 eggs' and that the nest itself, was too big and too high.

Another expert noted that the image from the second edition showed different scenes in the life-cycle of these birds:

[The illustration] seems to be mixing up courtship positions with post-courtship breeding. Clearly this is showing the breeding mode of grebes, [but] I question whether grebes can perch as in the [Second Edition] *illustration*[52]

In this particular survey on birds, the grebe found in the second edition of *Chambers's Encyclopaedia* was directly criticised by 20 experts, and indirectly commented on by 10 others. Grebes are water birds with lobed feet, that have evolved for swimming. The first

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[50]Expert survey number: 149795-149789-21343168

[51]Expert survey number: 149795-149789-19014032

[52]Expert survey number: 149795-149789-21332189

edition illustration highlights this physiological feature. In the second edition, the bird has been depicted nesting on a low-lying tree branch. Bird experts pointed out this is 'inaccurate' and 'improbable', given that the grebe's feet do not allow it to perch. In nature the bird would be swimming or standing on the ground. Other portions of the illustration are accurate, however, according to the experts. The plumage for the white crested grebe is identifiable, as is the bird's habitat. The eggs look correct, but a few people, two were quoted above, noted that this species does not have four eggs in its nest.

In a way, there is parallel feedback between the visual critique here of one image, and a critique of the First Editions article on 'Blackburn', see 6.3. While most images seemed to be accurate, there were likely some images which had inaccuracies in them. This may be due to the inherent limitation of the production workflows that were followed in the 19th century, when it was impractical to send many artists to draw from nature. With very few exceptions, 19th century bird illustrators used dead specimens as their models.[53] As discussed in the previous chapter, many people were involved in the production of an illustration, from the artist who was commissioned to create the drawing to the person who drew it on wood, to the engraver who carved the final woodblock. With this many stages, an initial image may have been altered by someone, who was concerned with the aesthetics of the image, and was not aware they were altering and misrepresenting content. According to the experts surveyed, as this example shows, the illustrations in Chambers could be useful as a reference, but not as a guidebook. However, according to one survey participant, although there were some issues with a particular image, the birds in the survey were generally identifiable.

Commenting on a different pair of birds, the participant said:

> *The* [First Edition] *puffin is highly stylized.*[sic.] *That made it harder to identify. However, if I were at the shore and saw it, there would be enough in this picture to do so.*[54]

6.3.4   A summary of the botanical survey

Botanical specimens were the second largest category of images most frequently illustrated. Although most botanical specimens are plants, illustrations in this category could include fungi, such as mushrooms or yeast. For the survey, all of the images selected were of plants. Most of the *Chambers Encyclopaedia* illustrations do not show an the entire plant,

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[53]John James Audubon (1785–1851) was a rare exception, who studied birds in nature before he killed them in order illustrate them. He did this because he noted that parts of dead birds, such as beak and feet, often change colour as *rigor mortis* set in.

[54]Survey response from: 149795-149789-19832578

but tend to depict identifying details of a species, with a few exceptions such as the banyan trees in Figure 6.7.

Of these illustrations, 13 out of 23 people could identify the almond and the banyan by the Chambers images of these trees. Twenty out of 23 people could identify the olive and 21 out of 23 could identify barley illustrations. However, the results were mixed for vanilla and flax — only 10 out of 23 and 11 out of 23 could respectively identify those illustrations.

Overall this survey was very mixed when compared with the other survey categories of birds and medical illustrations, but like the vertebrates, the responses to the other questions showed that the illustrations generally provided enough information for the experts to extract some information, such as family, and clade, even if they could not narrow down the plant to a specific species. Two comments related to the question of identifying the banyan tree indicate this:

> *These drawings look like the habitat of the Banyan Tree (Ficus spp.) The [First Edition] doesn't seem to look like a true representation, rather, like an artist's impression.*[55]

> *This is more like an artistic depiction, the only thing that comes to my mind is some type of Ficus.*[56]

The comments above refer to the genus *Ficus*. In binomial nomenclature, when a living organism is identified, the two terms used to denote it are the genus and species. In the case of the 'banyan tree,' the binomial nomenclature would be 'Ficus benghalensis'. As with the bird survey illustrations, the answers tended to indicate how the survey participant is working through the process of identification.

A comment about the flax illustration also shows that some information was conveyed to the survey participant:

> *This looks like some type of flax, some idea of colour, habitat and scale would help to refine identification*[57]

The overwhelming preference of the plant survey participants was for Second Edition illustrations over First Edition illustrations. Two quotes about the banyan and almond illustration explain why they made their preferences.

> *The important feature here is the root systems, and the* [First Edition] *does not show much resolution in that regard. The* [Second Edition] *seems to do it better, but the rest of this plant seems to have little detail.*[58]

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[55] Survey response from: 149795-149789-23929051
[56] Survey response from: 149795-149789-23999585
[57] Survey response from: 149795-149789-23978312
[58] Survey response from: 149795-149789-23928418
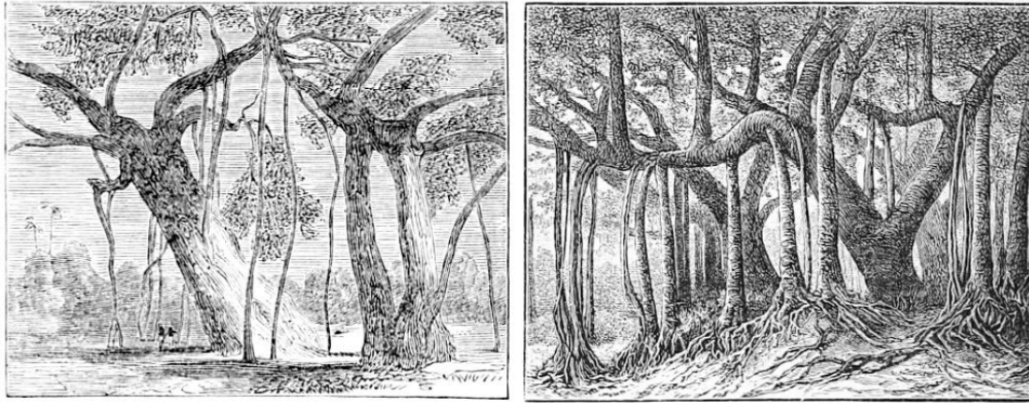
Figure 6.7: 'Banyan Tree' as shown from the First (left) and Second (right) Editions

Assuming that both of these represent almonds(?)(for sure the [Second Edition] *illustration reflects the forms and textures more faithfully than the* [First Edition] *schematic one.*[59]

What the plant and vertebrate feedback indicate, is that the models the artists based their illustrations on were probably correct, but that at some point in the translation process from sketchbook to woodblock, someone had taken artistic licence, perhaps to make the image more aesthetically pleasing. This survey reinforced other evidence of the production challenges in the 19th century, that Chambers and their contemporary publishers faced, when relying on the skill of artists, wood-engravers, and the technology available at the time. Namely, that the picture printed in 19th-century books or periodicals had gone through the hands of many people who were not necessarily subject specialists in the fields they were depicting. It is also a possibility that some artists used unnatural poses or invented backgrounds for other reasons, for instance to signal personal beliefs or to communicate through symbolism. Jonathan Smith suggests for some artist-illustrators like John Gould (1804-1881), staging birds within nests was related to the belief in natural theology, and artistic works made by artists who believed in natural theology often depicted God nurturing his creations.[60] It is unknown exactly why a grebe might be staged to perch on a branch next to a nest in the Second Edition, but we can speculate it is because someone considered it aesthetically pleasing, and because it was a common illustration convention in the study of birds to stage them in a pose that could highlight the morphology of the nest, the eggs, and the adult bird. [61]

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[59]Survey response from: 149795-149789-23954595

[60]Smith (2006), p. 119

[61]Farber (1997), p. 79
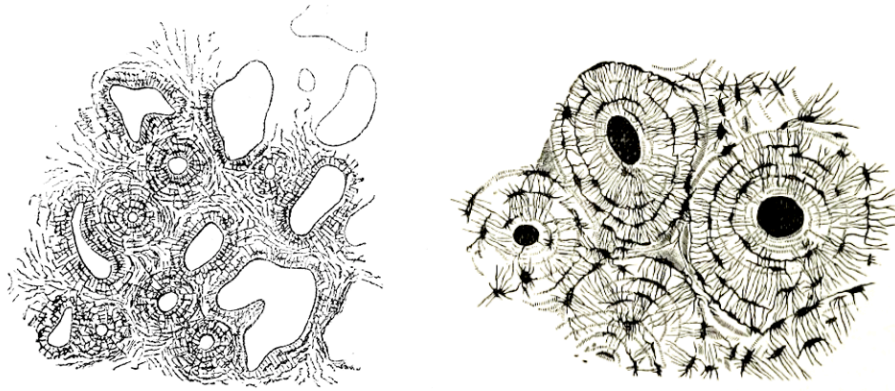
Figure 6.8: 'Compact bone' as shown from First (left) and Second (right) Editions

6.3.5   A summary of the medical survey

The medical / anatomical category was one of the top four categories illustrated in *Chambers's Encyclopaedia*. Of the five illustrations tested, only the image for compact bone was difficult for the majority of survey participants to identify. See Figure 6.8. Many of the medical experts expressed difficulty recognising the image because it is not a structure that is commonly encountered, and in fact this anatomical structure needs to be viewed through a microscope. Several comments about the image after the experts learned what it was, questioned its usefulness in terms of presenting information to general audiences. They implied that the image represented a high level of technical knowledge, and is not the type of information they would be communicating to their patients, unless there were special circumstances. The comments of the medical experts, most of whom either identified themselves as general practitioners or nurse practitioners, highlighted the differences between medical practice and medical research. The 'compact bone' images are illustrative of medical research, and perhaps may have been included as an indication of modernity that Chambers publications often referred to, and knowledge of this new material needed the technology of microscopes to observe and understand it. Therefore, it is reasonable to see that the inclusion of this illustration was partially about showing readers bone structure, and partially to illustrate medical advances.

Figure 6.9 shows two medical illustrations. For the survey I removed the schematic labels in order to see if the illustrations on their own could be identified. While the experts were able to identify the images, many expressed their belief that when schematic images are presented, labels were part of the visual convention that they *always* expected to see.

As in the other two surveys the medical experts generally preferred second edition illustrations. Here are the responses of one survey participant commenting on why the Second Edition illustration was preferred.
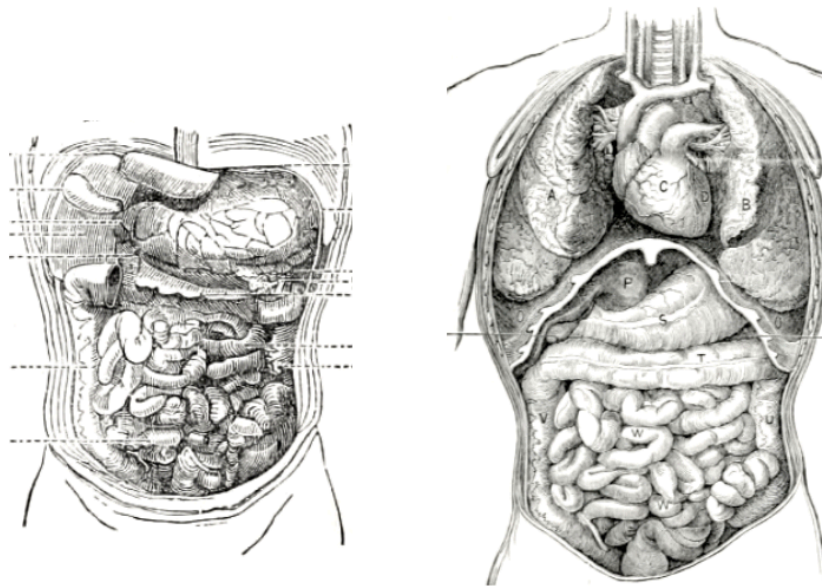
Figure 6.9: 'Abdomen' as shown from First (left) and Second (right) Editions

Not only is the image [from the Second Edition] *clearer than the* [First Edition]
image, but [it] *shows the diaphragmatic floor which separates and delineates the
abdominal cavity from the thoracic cavity.* [It] *seems more lifelike than the* [First
edition] *one as well* [62]

The results of these surveys indicated that in general, it could be argued that the editors
of the Second Edition did achieve an improvement over the First Edition. Of course, with
the exception of the editor from the *Liverpool Mercury* referred to earlier, who claimed he
looked at both editions side-by-side, it is unlikely that audiences in the 19th century would
be looking at the images together.

In Chapter 3, this thesis argued that Chambers changed the publishing model of ency-
clopaedias with the First Edition and one of the changes to the encyclopaedia publishing
model was the inclusion of thousands of cheaply produced wood-engravings. This was a
significant advance in access to illustrative material for general audiences. By the Second
Edition in the later decades of the 19th century, audiences were more used to seeing illus-
trations of all sorts, so I argued in Chapter 4 that the Publishers modified the illustration
styles of some images, and adjusted the subject content illustrated in other areas. Pub-
lishers did that to increase the impact of their illustrations, and as shown here, Chambers
highlighted the new aspects of this Second Edition in their marketing material and in the

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[62]Survey response from: 266527-266519-23731005

The illustrations form an important feature of such a work. We desire to extend our thanks to Messrs. W. and R. Chambers & Co. for permission to use cuts from the new Chambers's Encyclopædia, without which it would have been extremely difficult to give the book its present value in this respect.

Many of the cuts of animals are from photographs, and of special scientific value.

Figure 6.10: Inscription in *A Course on Zoology: for Secondary Schools*, 1893 acknowledging the Chambers firm for images from *Chambers Encyclopaedia*

new volumes themselves. Based on the evidence presented here, audiences *could see* the differences between editions, and they appreciated the changes.

6.4   W. & R. Chambers works in the wider Victorian world
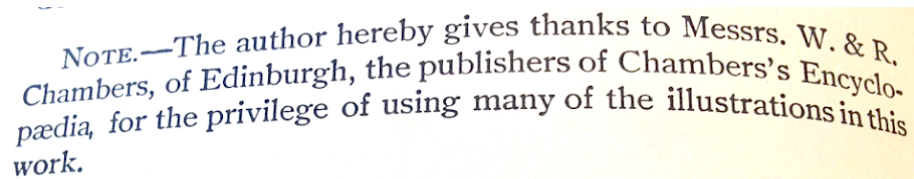
6.4.1   Circulation of images through Lippincott

During the period that J.B. Lippincott and Chambers were collaborating on the second edition, letters from Lippincott to Chambers reveal that Lippincott was working on two separate publications: *A Course on Zoology: for Secondary Schools*, published in 1893, and three volumes of *Home Life in all Lands*, that were reissued in 1907, 1909, and 1911 respectively. [63] However, in 1892, Lippincott requested and was granted permission to use Chambers images for these publications. Chambers agreed, and charged Lippincott $1 per image used.[64] Appendix G shows a sample listing of over 300 images from both works that have been traced to the second edition of *Chambers Encyclopaedia* and made their way into these two works. The dedication in both works acknowledges the Chambers firm and the Second Edition, as the source for their images. See Figure 6.10 and Figure 6.11.

The text for *A Course on Zoology: for Secondary Schools* was based on a French-language school book co-written by C. De Montmahou, Inspector-General of Primary Education in Paris and H. Beauregard, Assistant Naturalist at the Museum of Natural History in Paris. It was translated by Dr. William Henry Green (1824-1900), an American scholar of theology and languages (especially Hebrew), at the College of New Jersey (now Princeton

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[63]It is not clear when *Home Life in all Lands* was first published. The volumes that I have seen, indicate they are part of a fifth or sixth impression. It it could be that another edition of this book came out earlier. More extensive research on these books could be completed outside of this PhD.

[64]R. Morrison of Chambers to Lippincott, 22 February (1892); Lippincott Company to Chambers, 18 March (1892) confirming price to be paid.

NOTE.—The author hereby gives thanks to Messrs. W. & R. Chambers, of Edinburgh, the publishers of Chambers's Encyclopædia, for the privilege of using many of the illustrations in this work.

Figure 6.11: Inscription in the first volume of *Home Life in all Lands*, 1907-1911, acknowledging the Chambers firm for images from *Chambers Encyclopaedia*

University). It contains 368 pages and more than 300 illustrations in its 25 chapters.

The Preface states that it 'treats the subject of natural history in a manner adapted to the needs of secondary schools, using methods found by experience to excite the most interest on the part of the pupil.'[65] Each chapter provides basic biological and medical information about humans, other vertebrates, and invertebrates and their geographical distribution. It was sold and distributed to school districts and to teachers around the United States.

The text for *Home Life in all Lands* was written by American Charles Morris (1833-1922), who was a journalist, novelist and author of popular historical textbooks, eight of them published by J.B. Lippincott, including *A history of the US, its People and Institutions*, *Our Island Empire: a handbook to Cuba, Porto [sic] Rico, Hawaii, and the Philippine Islands*. Each of the three books has a different topical focus. The first volume is subtitled, 'How the world lives' and contains 17 illustrations that were reused from the second edition of Chambers. The second volume is subtitled, 'Manners and customs of uncivilized peoples' and six reused Chambers illustrations. The third volume is subtitled 'Animal friends and helpers' contains 16 illustrations that were reused from the second edition. The tone of parts of these books can be construed to modern readers at best as patronising to non-Americans and non-Europeans, and at worst prejudiced and jarring. Nevertheless, they reflect the way popular history and geography was narrated at the time. [66]

6.4.2   Pirated content

The *People's Cyclopaedia of Universal Knowledge* produced by Phillips & Hunt, 1879 essentially plagiarised text from Chambers's first edition and the illustrations from *An American Dictionary of the English Language*, 1865, by Noah Webster (1758-1843). Figure 6.12 pro-

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[65]DeMontmahou (1893), p.3

[66]As stated in Chapter 1, and as shown in the reviews earlier in this chapter, the Chambers firm, itself, was well-known as an educational publisher throughout the English speaking world. While this thesis is exploring the impact of Chambers's illustrations on others, there is much scope outside this thesis to compare the 4066 illustrations from the First Edition with those previously used in Chambers' works published from the 1830s to the 1860s.

Abacus in
Chambers's Encyclopaedia,
1st ed. Volume 1 p. 16

A'BACUS, an instrument seldom seen except in infant-schools, where it is used to make the elementary operations of arithmetic palpable. It consists of a frame with a number of parallel wires, on which beads or counters are strung. In ancient times, it was used in practical reckoning, and is said to be so still in China and elsewhere.—*Abacus Pythagoricus* meant the multiplication-table.—Abacus, in arch.,
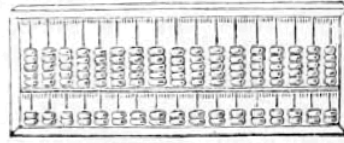
Chinese Abacus.

Abacus in
*People's Cyclopaedia of
Universal Knowledge,*
Volume 1 A-E, p. 15

Ab'acus, an instrument seldom seen except in infant-schools, where it is used to make the elementary operations of arithmetic palpable. In ancient times it was used in practical reckoning, and it is said to be so still in China and elsewhere.— *Ab'acus Pythagor'icus* meant the multiplication table.
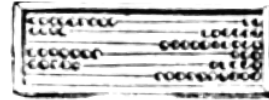
Abacus.

Figure 6.12: Comparison of 'abacus' *People's Cyclopaedia of Universal Knowledge* with *Chambers Encyclopaedia*, first edition

vides a comparison of the entry for 'abacus' between the *Cyclopaedia of Universal Knowledge* with *Chambers Encyclopaedia*, first edition. Note that the text is virtually the same. What makes the plagiarism apparent is the term 'infant school', which has been used historically in England and Wales, rather than in the United States which uses the term 'elementary school'. [67]

People's Cyclopedia of Universal Knowledge copied textual content from *Chambers's Encyclopaedia* in an abridged fashion. The pattern for a section of 'A' entries that I sampled usually amounts to the first 3 paragraphs verbatim from Chambers, then shortened in the last few sentences if the article ran longer. In this 'A' sample, out of 48 entries, 36 were copied from Chambers's text. That being said, it is clear that because *People's Cyclopaedia of Universal Knowledge* was a 3-volume work, while Chambers was a 10-volume work, some sort of abridgement would need to occur. While researching the copying of images from 19th-century works other than Chambers is outside the scope of this thesis, I will point out that it may be worthwhile for others to conduct a further investigation on the publishing and production history of *People's Cyclopaedia of Universal Knowledge*. In my own brief examination of the A and B sections of *People's Cyclopaedia*, I discovered that the illustrations accompanying the entries for 'Abacus', 'Antelope', 'Baboon,' 'Banyan' 'Banner', 'Bark' and 'Basilisk' seem to have been copied from *Webster's Dictionary*.

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[67]The definition and use of 'Infant School' as a British term is explained in the 'Infant School' entry, *American Heritage Dictionary of the English Language*, fifth edition.

The copying and marketing of Chambers First-Edition text by those other than the publishers did have economic consequences for J.B. Lippincott. Lippincott vented anger in correspondence to Chambers stating that although the Chambers's New Edition 'is superior to anything on the American market, third-rate publishers' are still selling pirated copies of the first edition of *Chambers Encyclopaedia*, and it affected Lippincott's market share.[68] While Lippincott did copyright articles written by Americans in the second edition and they made every precaution against future copyright infringement, it is not clear by the letters I found if they wanted or were able to take action for old text of the first edition of *Chambers's Encyclopaedia* that was repackaged in *People's Cyclopaedia of Universal Knowledge*.

6.4.3 *Chambers's Encyclopaedia* in popular culture

In Chapter 2, some cartoons featuring *Information for the People* being sold by Mr. Punch in *Punch* magazine show that the Chambers firm and their output were well-known. The following section reports specifically on the instances of *Chambers's Encyclopaedia*.

On Friday, March 6, 1891, the *Pall Mall Gazette*, a London-based evening newspaper, ran a short work of fiction, entitled, 'My First Spelling Bee' about a man named David Bubkins, who spent mornings and evenings over several weeks memorising *Webster's Unabridged Dictionary*. Mr Bubkins does this in order to win the coveted prize of the new edition of *Chambers's Encyclopaedia*, 10-volume set. The story mostly revolves around the drama of the spelling bee, and when Mr Bubkins doesn't win the prize, he says resentfully of the winner who does walk away with the volumes, 'He did nothing to deserve them'. After he arrives home from the spelling bee, Bubkins tells his wife Emily,

> 'I have not won the prize. Our library will remain, at least for the present, unadorned by Chambers's Encyclopaedia. and if you laugh at me, I shall kick the back of your head.' She did not laugh at me. I went to bed and wept myself to sleep. [69]

In *The Child's Companion and Juvenile Instructor*, published in 1863, there is a short story entitled 'A Fact a Day'. The main character of this tale is a young Robert Chambers, working as an apprentice, who spent his evening writing down interesting facts. As the years passed, he recorded more and more interesting facts and worked hard in spare moments to persevere and obtain even more information and record that information. Many years later, according to this account, 'as one flake of snow builds upon another' and so 'changes the surface of the earth', Robert was able to give three thousand accumulated facts to the public with *Chambers's Encyclopaedia*.[70]

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[68] Lippincott Company to Chambers, 17 September (1893)

[69] *Pall Mall Gazette* (1891)

[70] Religious Tract Society (1863)

'A Fact a Day', is related to the story 'My First Spelling Bee', and both will be discussed together here. 'A Fact a Day' is a moralising tale about good behaviour, the Protestant work ethic, and how following this work ethic leads to material rewards. The Victorian champion of the concept of work ethic, Samuel Smiles, referred to in Chapter 2, produced a book called *Self-Help: with Illustrations of Character and Conduct* (1859). The tone of this particular the book makes it difficult for the modern readers, like myself, to absorb from cover-to-cover when compared to other works of the period, such as the short stories in Chambers publications.[71] Nevertheless, this book teaches lessons by providing stories of men who have in different ways improved their lot in life though hard work, and by seeking self education. 'A Fact a Day', included in *The Child's Companion and Juvenile Instructor*, was produced by the Religious Tract Society. It is part of the same genre of Samuel Smiles, though is written in a more heavy-handed style and produced for an evangelical agenda.

'My First Spelling Bee' is an example of Horatian Satire, a literary term for light-hearted, gentle satire that points out general human failings. In the story of David Bubkins, ownership of *Chambers's Encyclopaedia* represents to him a rising social status, earned through his own labour. Additionally, it provides a means for further self-education and the opportunity to gain more social and intellectual status. Unfortunately, Bubkins resentful character and rude behaviour seem to be areas where he actually needs to improve himself. He shows ill will towards his competitor who defeats him, and threatens violence against his wife if she dares to jeer at him. While disappointment is understandable, this character feels humiliation so copes by having a tantrum. Bubkins behaviour shows he is not the gentleman he seeks to be.

Nineteenth century literature is rife with examples of Horatian Satire. 'My First Spelling Bee' mildly pokes fun at Victorian progressive movements and the self-help philosophies fixated on improving the minds of the lower middle and working classes, pointing out that their work is not holistic in approach and not necessarily a sole means for improving society.

This short story, with *Chambers's Encyclopaedia* placed squarely in the middle of it, and indeed supplying the motivation for the main narrative to unfold, indicates that the Chambers firm and its Encyclopaedias were central enough to nineteenth century popular culture that satirical works could be made about them in a popular London paper and be widely understood. Both stories referred to above frame the publication of the first and second editions. 'A Fact a Day' came out while the first edition was being produced. 'My First Spelling Bee' was released in 1891 as the second edition neared completion.

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[71]To the modern sensibility, the work of Smiles can be jarring. Women in his stories only seem to serve some enabling purpose for men. Stories in Chambers, at least, show both women and men characters that can be foolish as well as sensible.

6.5   Chapter 6 Conclusion

Chambers's Encyclopaedia seeped into popular culture. References to the encyclopaedias were frequency mentioned in local and national newspapers, and in self-help books. *Chambers's Encyclopaedia* authors and editors are found in biographies of key figures in the 19th century, ironically in other encyclopaedias of the time like Britannica. There are also references to the encyclopaedia in moralising stories discussing the goodness in children's books; and even in a satirical short stories mentioning it in a London paper. Catalogue records of libraries established before the late 19th-century show that library subscribers had access to Chambers's publications, including first and second editions of *Chambers's Encyclopaedia*. As well as being read and sold locally around Great Britain, *Chambers Encyclopaedia* was sold globally. The Chambers firm had partnership and distribution arrangements with J.B. Lippincott in the United States and Angus & Robertson in Australia. While we don't have complete records of their sales internationally, through newspaper advertisements of the sales and acquisition by individuals, we can trace the encyclopaedia in Australia Ireland, India, New Zealand, and Tanzania. Archival records show sales of the British edition sold in Canada, and that Lippincott was trying to broker a deal to sell a Spanish language version of the second edition in Mexico. Therefore, we can conclude that it was a well-known product circulating in the British Empire, and not unheard of in places with geographical proximity to the English speaking world. The geographic locations that both first and second editions were found in and which were reported on in published sources of the time that show that the wider culture of Victorian Britain reacted to these works by stories told about them to children, and in earnest through testimonials from experts as well as in parody form to adults.

There is scope for further research in the area of reception, as noted, questions have been raised about action that Lippincott could have taken regarding the *People's Cyclopaedia of Universal Knowledge*. However, what is reported here is as much as could be unearthed while working on this PhD and focusing study on the areas of encyclopaedia content and production.

The stated purpose of both editions of *Chambers's Encyclopaedia* was to engage people's intelligence, provide them with useful information, and make that information repeatedly easy to access. The volumes were in fact aimed at 'the People' in the broadest sense: whoever could read, from children and their parents, to teachers, to autodidacts of any class. Anyone who was a non-specialist in any particular field and interested in learning was welcomed. The Chambers firm designed their encyclopaedia to convey information through text, but also through other elements like maps, tables and especially through their illustrations. As I have shown previously in the chapter on Content and Form, mid-century illustrations were more pictorial, later century illustrations attempted to replicate the per-

ceived authority and realism of photographs. The Preface in both editions states that the editors hope the audiences will find the information to be both 'accurate' and 'artistic' and that there was material both expert and non-expert could enjoy. Expert reviewers praised the text and the overall design in their professional journals, and in appreciative correspondence sent directly to the Chambers firm.

In the Expert Survey, which used a structured image analysis method to collect qualitative information on three categories of the types of subjects most frequently illustrated, I made a few key discoveries. First, that there are different layers of 'accuracy' images can contain. Second, overall the illustrations had elements in them that were at least partially recognisable to present-day experts, and the experts judged most of the images sampled to be useful or partially useful for teaching non-experts about their subjects. Third, that the illustration style of the image was of secondary concern to them, they were most interested in the content of the image, and quick to point out what was accurately depicted in it. It seems that despite the challenges of 19th-century production workflows, Chambers did attempt to use authoritative information, and their images were as accurate as others circulating in other reference works at the time.

From the feedback provided by the experts, I gathered that *Chambers's Encyclopaedia* could be a good source for 19th century audiences to consult, either before or after they visited a museum, ventured on a nature walk, or went to a zoo, activities which were popular pastimes in Britain.[72] However, this survey indicates that the encyclopaedia illustrations would not be completely useful in a field guide or in a practitioner's guide. The other discovery made was that the style of illustration did not matter to the experts as much as the actual content they were viewing.

When Robert Chambers was a boy, he came across the fourth edition of *Encyclopaedia Britannica* and spent many hours reading it, explaining later in life that this experience influenced him to learn as much as he could about the world, because the process of learning brought him pure joy. This early experience also seemed to have the effect of making him a prolific writer on numerous subjects.

Another writer, born three years after the death of Robert Chambers was GK Chesterton (1874-1936). Chesterton produced 80 books during his lifetime on different topics, along with countless articles while working as an art critic and as a contributor, himself, to later editions of both *Encyclopaedia Britannica* and *Chambers Encyclopaedias*. Many comparisons can be made between Chesterton and Chambers, in the sense that both men were intellectually curious about diverse topics and both wrote prolifically. Perhaps, a major difference between the two is that Chambers was more interested in science toward the end of his life, and Chesterton more interested in thinking about philosophical and religious questions.

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[72]See Fyfe & Lightman (2007) for different activities that engaged the interest of Victorian middle classes.

Reviews of specific encyclopaedias appear in scattered periodicals of the time and are referenced by name in stories and biographies,[73] but overwhelmingly these references are limited to portions of the encyclopaedia's textual entries as shown in the previous section. However, reviews that touch on the actual images in *Chambers's Encyclopaedia* are very few and only comment on the appearance of the images, rather than on their content.
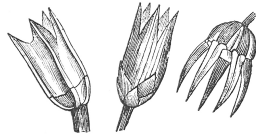
Nevertheless, when Chesterton was a boy he recalled to his biographer Maisie Ward, that he 'used to read whole volumes of [the Second Edition of] *Chambers's Encyclopaedia*'.

> *The thing was a mere brute pleasure of reading, a pleasure in leisurely and mechanical receptiveness. It was the sort of pleasure that a cow must have in grazing all day long.* [74]

Perhaps it is not surprising that *Chambers Encyclopaedia* would resonate with Chesterton. He was part of the receptive audience that embodied the the spirit of discovery and wonder Robert Chambers had experienced, himself, and tried to replicate in his own publications. That Chesterton had a similar experience to Robert Chambers indicates that *Chambers Encyclopaedia* passed on the joyous experience of reading, learning, and feeling wonder, to next generations.

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[73]G.K. Chesterton (1874-1936) would spend hours reading *Chambers's Encyclopaedia* because he was engrossed in the text. Ward (1952), p. 15

[74]Ward (1952)

7   Conclusion

This thesis presents new interdisciplinary research contributing to the fields of history of printing and publishing, and the history of the book, as well as visual and cultural studies, by examining the content, reception and production of illustrations in a transatlantic publication. It presents a comparative study conducted on different editions of well-known 19th century encyclopaedias, utilising the archival records of the W. & R. Chambers firm and the J. B. Lippincott Company. This is also the first time that a large study of thousands of artefacts in the National Museum Scotland's W. & R. Chambers collection has been conducted. It contains over 20,000 artefacts, spanning a period of over 100 years beginning in the 1830s and ending in the middle of the 20th century. As well as wood-engravings, the collection contains stereotype and electrotype plates, halftones and what appear to be copper-faced stereotypes. It is a remarkable collection of artefacts that physically reveal the way in which they were adapted and used in the Scottish printing trade, especially during a major period of transition between the mid- and late- Victorian era. Furthermore, this study gathered evidence of how publications by the Chambers firm inhabited the wider print ecology and the extent of the firm's international trading network. Democratising Knowledge studied research questions which will be discussed here in the three areas studied related to *Chambers's Encyclopaedia's* content, production and reception.

7.1   Content

My overarching research question in this study asked: What type of content the Chambers firm was interested in promoting, and how did that content reflect the firm's values? How were their values communicated to the public via their knowledge-based products through different decades of the 19th century, especially in the first two editions of their encyclopaedia?

From the 1830s and 1840s, the firm published in formats such as tracts, serialised books and periodicals. The best selling ones were *Chambers's Edinburgh Journal* and serials *Information for the People*, and *Chambers's Miscellany of Useful and Entertaining Tracts*. In the 1840s and 1850s, the firm produced a series of Early Readers that were the precursor of their classroom textbooks, in addition to continuing its Journal and reissuing another

edition of *Information for the People*. In the 1860s and 1870s, the firm produced a large encyclopaedic work: *Chambers's Encyclopaedia*, covered extensively in this thesis and in Cooney's study on the textual contributors [1] for the First Edition. Since the Chambers firm had two decades of experience in publishing before they undertook what could have been an overwhelming project, they found an appropriate publishing model based on the German-language *Conversations-Lexikon*. This model was suitable for what they wished to do — which was to take a genre that had previously been aimed at the elite classes, and bring information contained within it to more people, who could use it as a tool for learning about their world. Chambers and another publisher, Charles Knight both used different models of production compared to encyclopaedias that preceded them. Both also used illustrations that were produced inexpensively by the medium of wood-engraving. Just over two decades later, in collaboration with J.B. Lippincott, who were already a major part of their American business network, *Chambers's Encyclopaedia, A Dictionary of Universal Knowledge, New Edition* or the Second Edition, was published.

During this period, the firm also produced other reference works such as a high-end almanac, dictionaries, and a smaller, topically-focused encyclopaedia. Examples of those reference works respectively are the *Book of Days* (1864)[2] *Chambers's Etymological Dictionary of the English Language* (1871), and *Chambers's Cyclopaedia of English Literature*, in its third edition by 1876. Chambers took an active role in transforming genre aimed at higher- and lower- end markets and adapted them into a sustainable and profitable content machine. By the 1860s, Chambers had a system in place for producing beautifully illustrated works at a low cost.

What subjects were chosen to be illustrated in *Chambers's Encyclopaedia* and were there any visual trends in 19th-century encyclopaedias? How did the style of illustrations impact the look and feel of both editions?

There were image trends detected by visual content analysis, which was conducted not just on these two editions of Chambers, but also carried out on five other 19th-century encyclopaedias, in order to provide a comparative benchmark for *Chambers's Encyclopaedia*. This was a comparative study that examined other encyclopaedia illustrations through different decades, including two different editions of *Encyclopaedia Britannica* and two of Charles Knight's encyclopaedias. Subject trends were detected in illustrations, showing that images related to natural history were popular in 19th-century encyclopaedias, beginning with the *Penny Cyclopeadia* in the 1830s and 1840s continued with the *English Cyclclopaedia* in the 1850s, expanded with *Chambers's Encyclopaedia*, first edition in the 1860s and carried on with *Johnson's Universal Cyclopaedia*, with the Britannica, 9th edition and with Second Edition of Chambers. What varied between encyclopaedias were uses

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[1]Cooney (1999)

[2]The *Book of Days* cost £2 for a two-volumes set. Trade catalogue (1868)

of specific categories of illustrations to depict vertebrates, invertebrates, botanical specimens and in some cases the illustrations of different organism's skeletons. Vertebrates were the most frequently illustrated subjects in Chambers, and were closely aligned with other encyclopaedias generally (see Chapter 4.2 for details), followed by illustrations of botanical specimens, medical specimens, architecture, and depictions of machines and vehicles. Based on illustrations surveyed, Chambers favoured science and technology subjects. These illustrations correlated with other patterns of those studying textual content subject trends in British encyclopaedias.[3] The textual content and other features such as tables and fold-out maps, specifically found in *Chambers's Encyclopaedia*, conveyed the narrative of the progress of humankind. An analysis of these features shows that between editions, there was a growth of data and in graphical conventions that allowed presentation of information in Second Edition entries, as reflected in larger tables and maps with more variables that could be absorbed more quickly. There was also a rise in certain topics between editions, such as microbiology, that corresponded with the changing times, and reflecting that for the Chambers firm, science and technology are evidence of past progress, and indicators of continued advancement.

Self-improvement messages and the genuine belief in progressive philosophy meant a great deal to the Chambers firm and is reflected, not just in these encyclopaedia editions, but in their other works. This progressive view of the world can be linked directly with Robert Chambers's writing[4] and the Lamarkian view of evolution, that other historians of science have covered elsewhere.[5] Chapter 2 discusses the writings of the Chambers brothers, especially of the prolific Robert Chambers who was instrumental creating the three specific reference books named above, and shows that because the Chambers firm was established in the 1830s, the founders had characterises of publicists, rather than journalists. Among the attributes of a publicist's writing, is a clear, well-articulated perspective, which the publicist's writing reflects and directly communicates to its readers. The Chambers brothers used their position as publishers to promote their world-view, and the optimistic messages in these publications also had practical advice or useful information.

The *Penny Cyclopaedia* did have some influence on some of *Chambers's Encyclopaedia* organisation and aesthetics. According to the data I collected, the first edition of Chambers has a closer correlation in terms of illustration style with *Penny Cyclopaedia*, than with the 8th edition of *Encyclopaedia Britannica* which preceded Chambers. In terms of the subjects chosen to be illustrations, Chambers, Penny, the *English Cyclopaedia* and *Johnson's Universal Cyclopaedia* have a strong correlation in terms of proportionally illustrating nat-

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[3] Schmitt & Loveland (2017)

[4] Much scholarship has been done on *Vestiges of the Natural History of Creation* Secord (2001) and how this work reflects the Lamarkian view of evolution

[5] Secord (2001)

ural history subjects, specifically vertebrates. There is also some evidence here to suggest that first edition of Chambers influenced the organisation of Britannica. This is based on contrast between the 8th and 9th edition of Britannica. Appearing after the First Edition of Chambers, Britannica's 9th edition dropped its opening dissertations, and in terms of subjects to illustrate, seems to be favouring more natural-history related topics, although its depiction of animals shows them anatomically.

In line with notions of progress, the style of illustrations changed between editions as did certain formats for visually presenting information. This thesis found that there seemed to be trends in terms of style of illustration, as well. The decades nearer the early and mid-century tended to use images which the favoured pictorial of style illustration. While illustrations closer to the century's close tended to favour a more facsimile style that mimicked the characteristics of photographs. In fact, as shown in Chapter 5, some illustrations may have been based on images that were not, in fact, from photographs, but artists and wood engravers staged images to have photographic features, like frames around their edges, or by posing subjects like they were part of a photographic portrait.

Photography was often imbued with notions of scientific objectivity in the later part of the 19th century, because specific scientific disciplines used photography as part of the data-collection process to provide evidence.[6] Photography was also increasingly referred to with authority in the periodical press as well as in textbooks, so that editors and authors could claim their content was reliable with the phrase 'from a photograph,' often as part of the caption. Chambers adapted this wide-spread convention, and in Chapters 4 and 5, specific examples of historical photographs or their derivatives in books, have been presented as models which influenced Chambers illustrations. Visual content analysis shows that images in *Chambers's Encyclopaedias* that had been classified as 'facsimile-style illustrations' were more frequently used in the Second Edition, than images that were classified as 'pictorial-style illustration,' thus indicating an editorial preference for wood-engraving with facsimile style in the 1880s. Facsimile-style illustrations were either based on a specific photograph, or staged to look like photographs, as the aesthetics of photography gained popularity. As indicated by their use and by their statements, the editors believed that engravings based on photographs carried *more* information and presented more facts. Presenting more information was in line with Chambers's overall publication goals.

7.2 Production

This last point leads to two other questions this study addressed: How did the firm's approach to making illustrated encyclopaedias change between the first and second edition? How did the practicalities of production affect the design of the encyclopaedias? How

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[6]Belknap (2016)

did the practicalities of production affect the number of wood-engravings in the Second Edition?

The physical artefacts of the Chambers firm now housed in the NMS provided some enlightening answers. First, they show that the illustrations from the First Edition were printed directly from woodblocks and that were derivative stereotypes made from them. [7] Second, they show that the illustrations from the Second Edition were made from wood-block derivatives. The woodblocks housed in Second Edition drawers contain derivatives, woodblocks covered in graphite that provide physical evidence they were used in electrotyping process, as well as the specific electrotyping process described by Southward, and that Chambers conducted experiments with their blocks. They reused many illustrations from previous publications and used their blocks to draft illustrations and illustration layouts.

The Second Edition had approximately 800 fewer illustrations than the first edition, but the subject coverage was similar, vertebrates and botanical illustrations were among the highest proportionally, followed by medical images, illustrations of machines and vehicles and architectural structures. A key difference between the first two editions of Chambers was that there were a higher proportion of illustrations reflecting the influence of photography as noted earlier, and in general the woodblocks used to make derivative images have larger and more standard dimensions.

The printing technology used to make both editions also changed. Both editions of Chambers used cylinder steam-powered presses. The First Edition was made on an Applegath and Cowper press, the Second Edition, UK version, was made on a Marinoni Perfecting Machine. The Second Edition US version, was also made on a cylinder press, although the exact type of press is unknown at this time. The text of the Second Edition entry on 'Printing' states that the Marinoni Perfecting Machine was extremely fast, printing 'in the very finest manner between 1000 to 1500 perfected sheets per hour, according as they may be complicated with illustrations or not.' [8] It seems that too many illustrations printed with this machine, could slow production down. Although electrotype plates were used to print from, having fewer illustrations most likely assisted the editors in having a faster publication workflow.

The First Edition was released in parts and in bound volumes over the course of 8 years. The parts would have been released every 8 weeks or two months. For the production of the First Edition, Andrew Findlater's editorial team assigned visual content to artists to draw and textual content to authors to write, and with a few exceptions, contributors were based in the UK.[9] Both types of contributors were paid for each entry, at an

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[7]Based on evidence in archival correspondence and in the US editions of the encyclopaedias.

[8]Patrick, D., ed (1891*b*), p. 414

[9]Some writers were commissioned by Chambers upon the recommendation of J. B. Lippincott. These

agreed fixed-rate price in advance. While planning happened in advance there was room for the editorial team to cut articles or illustrations or both, as shown with the records of James Stewart, who was commissioned and paid for 13 drawings, when only 8 illustrations were used. Walter Crane notes in his autobiography that he was commissioned to make illustrations based on objects in the British Museum and from books in the British Museum's library in late 1861 or early 1862. We also know that an illustrated newspaper article in April 1862 about Japanese ambassadors on a diplomatic mission in Europe, was used as the basis for a Chambers illustrated entry 'Japan' that was published in 1863. Upon receiving illustrations, we know that the editorial staff at Chambers then needed to have the drawings 'translated' onto wood, and laid out with text. I speculate that content deadlines were less than one year before publication. [10]

In terms of production, we can see that the approach of the Chambers firm changed between the First Edition, which came out in volumes in the 1860s and in the Second Edition which came out between 1888-1892, because during the First Edition, the firm was looking for an appropriate publishing model to copy. For the Second Edition, an encyclopaedia publishing model was already in place, although this time, Chambers was cognisant of a working relationship with its American partner, J.B. Lippincott. Each of the firms had different priorities, Chambers wanted control of the overall design and to approve the final textual content, Lippincott wanted to ensure that American content was depicted accurately in order to ensure it was favourably received by the American market. Part of the contract facilitated the partnership by allocating American content to Lippincott that Chambers would then approve of before the article was typeset. This transatlantic partnership was beneficial, and overall Lippincott was useful to Chambers, not only as a distributor, but also in the earlier decades when William and Robert were friends of Joshua Lippincott, he helped them to understand the American markets as well as with other matters.

When Robert Chambers passed away in 1871, correspondence in the J. B. Lippincott Archives showed that Joshua Lippincott was appointed a trustee for investments that Robert had in the United States. With the Power of Attorney, Joshua was put in charge of selling those assets and entrusted with sending the funds back to Britain. In a post script to a letter in June 1871, Joshua also noted to Robert's son, that he mentioned his father in the July-November issue of a *Lippincott Magazine*, and that Lippincott held his father in high esteem. [11]

A formal contract was drawn between the J.B. Lippincott firm of Philadelphia and

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authors were suggested because they could write knowledgeably about American subjects

[10]The content would need to be ready in time for the part it appeared in; 520 parts were issued weekly.

[11]Joshua Lippincott to Robert Chambers, II, 1871. Lippincott Company to Chambers, 12 February (1889), Vol. 4.1, pp. 120-121

the Chambers firm in 1886 working out the details of formally co-publishing Chambers Encyclopaedia, the New Edition. I believe that was done to avoid some of the problems between the firm that were encountered when the First Edition was reissued in the United States in the 1870s. While William and Robert Chambers had enjoyed a close working relationship with Joshua B. Lippincott, whom it seems they had much in common with, both firms had founders that had established themselves fairly young,[12] and they were family-run businesses that shared similar values about providing educational publishing efficiently. The contract was set up so that the next generation could work together more smoothly. The Second Edition was released in bound volumes and it was released simultaneously in Philadelphia and Edinburgh. Illustrations and textual content had to be decided ahead of time because a quarter (estimate based on credited entries) of the articles were given to American authors so that J.B. Lippincott could claim copyright in the United States on the content. All text entries and suggestions for illustrations, for example the city maps of San Francisco and Chicago were suggested for inclusion as wood-engraving by Lippincott, were sent to Edinburgh. In Edinburgh illustrations were commissioned. In the case of the maps (both fold-out and electrotypes), they were commissioned from J. G. Barthlomews, and in the case of other blocks, examples provided in Chapter 5, from Dalziel in London. The pages were then laid out, typeset and then electrotyped. Prior to the release date, the electrotype plates were shipped to the US. On the scheduled release date, the finished pages were printed from in Edinburgh and Philadelphia.

7.3   Reception

Many of the visual changes between the First Edition and the Second Edition had to do with how Chambers believed their audiences would receive the information. The Preface of Chambers made it a point to highlight new material based on how much the world had progressed since the First Edition. New entries that reflected advances in science and technology, such as the image used for the 'Bacteria' entry which showcased both new knowledge gained from a new areas of study called germ theory that had developed in the 1870s, and the optical technology used to detect newly discovered microscopic organisms. The expansion of these areas can even be detected in related, but unillustrated articles, that showed how science was improving health. While 'Hospital' was an entry found in the First Edition that spanned about one and a half-pages, 'Hospital' in the Second Edition was expanded to two and a half pages, and discussed not only history, but administration, buildings, and nursing focusing very much on the modern and practical nature of it and

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[12]Both J. Lippincott and the Chambers brothers lived with the legacy of a failed business by a mentor or father figure. In the case of Lippincott, at 18 years old, he had to run a company on behalf of his mentor David Clark. In the case of Chambers, the brothers had set up a bookselling and printing business by the time they were both reached their early 20s.

how it was based on medical science and care for people. The entry was also written by none other than Florence Nightingale (1820-1910), the defacto expert on modern hospitals, who was also given her own entry and is mentioned in other entries such as 'Women's Rights'. This example highlights the changing role of women in the late 19th century, but also that there was an editorial decision to include a well-known person that a general member of the public would easily recognise, and to link her to other articles, of a less practical and more theoretical nature. The 'Hospitals' article explains how rooms needed to be kept clean and allow for the circulation of fresh air, allow patients to heal in peaceful conditions. There is an underlying message of progress in that modern facilities such as hospitals fight the spread of infections, now that our understanding of disease is based on science. The innovations between First and Second editions were noted in reviews by subject experts who wrote and published their favourable opinions in specialist journals, but also by general book editors in local and national newspapers. Significant authors and their contributions were made a feature of the Second Edition. They were listed by name with their articles at the beginning of each volume.

The research questions related to reception were: How broad a section of society were 'the people' who could both afford and understand a publication such as *Chambers's Encyclopaedia* and how global was the audience for these images?

The first part if this question was answered in Chapter 5 which examined at the cost of the encyclopaedia and who could afford to own it. The First Edition cost £4 5s and in the 1860s a footman earning under £30 per year could afford a purchase that amounted to £4 5s for the entire work. While it is almost 13% of their annual salary, the cost was spread over 8 years, so it was affordable. In the late 1880s - 1890s, the Second Edition's price was raised to £5 in total. In 1888, the average annual wage for cabinet makers and carpenters was £32 3s 8d, the average annual wage for blacksmiths was £28 2s 6d and the average annual wage for a blacksmith's helper was £18 2s. [13] While the higher earning blacksmith would spend 15 % of his annual salary and the lower earning blacksmith helper would spend 20 % of his lower salary, the cost could be spread out over 4 years. Although the ownership of the Second Edition was also affordable to some, 5% of a person's annual salary (20% over four years), would have been a substantial investment.

However, by the time the Second Edition was released, public libraries were being established in Britain, and much of Chambers advertising focused on the school and library

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[13]Wright & Weaver (1898). This report shows daily salary rates from the cities of London, Manchester and Glasgow during given years, and also presents the average for all three cities. These figures are from 1888, when the Second Edition was first released. These statistics were compiled in a report for the US Congress, so were reported in US dollars. The conversion at the time was $4.87 to £1. Calculation based on being paid 52 weeks per year, Bank Holidays Act of 1871 Workers in England and Wales had 4 days paid holidays per year, and in Scotland had 5 paid holidays days per year. Amulee (1938), p.7 Atack & Bateman (1992).

market. People in these trades might choose to access the encyclopaedia through the newly established public libraries which were starting to replace the need to buy membership in subscription libraries. There was also the market for second-hand editions, also mentioned in the previous Chapter and there were hundreds of advertisements that attempted to sell, purchase or received donations for either edition of Chambers.

These topics, the overall organisation, and the lower price did mean that Chambers aimed to accommodate more people and popular taste than encyclopaedias that had come before it. Archival records and ephemera produced in the later part of the Victorian era attest to their popularity, not just in Scotland, but in other parts of the UK. References to the encyclopaedias are spread in self-help books. *Chambers's Encyclopaedia* authors and editors are found in biographies of key figures in the 19th century, and ironically in other encyclopaedias of the time like Britannica. They are also spread around in moralising stories of its goodness in children's books; and even in a satirical short stories mentioning it in a London paper, and the firm is featured in the iconic *Punch* magazine.

7.4   Final remarks

The Chambers firm evolved and reinvented knowledge-based products as the decades of the 19th century unfolded. W. & R. Chambers adapted to different legislation, social and cultural events like widespread migration of the Scottish people around the globe, and the impact of technology on image-making profession. Chambers publications were influential on readers great and small. Their products were infused with messages of the possibility of personal progress; they encouraged individuals to take the initiative to improve ones situation in life, even if it meant moving to another city or another country; and above all they preached that education while useful and practical, could also be an end in itself. One of the tools for democratising knowledge were illustrations that simplified the world's complexity, and made information easier to absorb.

Scottish values such as self-reliance, rationality, and pragmatism have been around the Scottish publishing trade since the Scottish Enlightenment. Chapter 3 makes two comparisons between two types of Scottish Encyclopaedias that were produced at different times. In the 18th century, the Scottish founders for the *Encyclopaedia Britannica* envisioned an encyclopaedia that should be revised as knowledge grew; while their intellectual counterparts in France believed that all knowledge could be collected and finalised into a large body of volumes. While the *Encyclopédie, ou Dictionnarie Raisonné des Sciences, des Arts et des Métiers* has become a historical artefact to study, the Britannica is still current, though now produced in a digital form, over two-hundred years later because it was created to be adaptable to change. In the 19th century, *Penny Cyclopaedia* was a product that the Englishman Charles Knight sought to provide to his readers in an inexpensive way.

But he was hindered by a model that relied on the charity of a well-meaning committee that took his encyclopaedia in different directions and it was priced out of the market he was trying to reach. In contrast, the content machine set-up by the Chambers family-run business managed to restrict the First Edition to 10 volumes, which were still produced in the original 8 years planned.

Two entries in Volume 6 of *Chambers's Encyclopaedia*, second edition discuss two 19th-century wood engravers, William Linton and Frank Leslie. Both were trained as wood engravers in England, both worked for the ILN, and both emigrated to the US. Both have sometimes been called eccentric.[14] Linton is not only featured in Chambers, but he was responsible for training Walter Crane, who illustrated some entries for Chambers. Linton was also an advocate of the working people, later he became a teacher of traditional artisan skills, and wrote about the history of the wood-engraving trade. Leslie adapted to every circumstance he found himself in, and managed to become financially successful, and to build a publishing empire by engaging in activities that he felt passionate about. *Chambers's Encyclopaedia* has many things in common with them both — it was developed in Britain, it profited from the appeal of inexpensive, but beautifully made images, it was built on traditional skills, but it adapted knowledge in a new way. Both editions show the rapidly changing technologies in the 19th century and the diversity of a wider, global culture of print.

In the 21st century the image has become so ubiquitous that many of us overlook them. For the Chambers firm in the 19th century, the image was an important mode of communication. Illustrations communicated specific information to 19th century audiences, and Chambers valued greatly its illustrations. The stated purpose of both editions of *Chambers's Encyclopaedia* was to engage people's intelligence, provide them with useful information, and make that information repeatedly easy to access. The volumes were in fact aimed at 'the people' in the broadest sense: whoever could read, from children and their parents, to teachers, to autodidacts of any class. Anyone who was a non-specialist in any particular field and interested in learning was welcomed.

As stated in my introduction, encyclopaedias are a snapshot of a particular time, place and world view. Like museums, they have been heavily curated and the collections within both reflect evidence of particular narratives of history, science and culture. *Chambers's Encyclopaedia* provides a key to understanding how the flow of information in 19th century society was changing. Not just in Britain, but around the world, because the British Empire and the English speaking world was the market for Chambers illustrated publications.

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[14]Schrock, N.C. ed (1976)

List of Figures

Abbreviations and Glossary

BL British Library

BOS Bristol Online Survey tool, developed by Jisc for higher education and research institutions. The BOS system is used by over 300 organisations, approximately 130 UK universities plus other public bodies and companies, among them, the University of Reading.

CCO Cataloguing Cultural Objects in an internationally recognised data standard developed for museums, libraries, image collections, and archives.

HSP Historical Society of Pennsylvania

LCP Library Company of Philadelphia

NLS National Library of Scotland

NMS National Museums Scotland

Pub Led Publications Ledger

SDUK Society for the Diffusion of Useful Knowledge

VRA Visual Resources Association

WRA W. & R. Chambers Archives, NLS

WRC W. & R. Chambers Collections, NMS

Pictorial Syntax A set of tools used by artists, draughtsmen, or printmakers to create a representation of a three dimensional object or scene from real life in a two-dimensional space. [15]

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[15]Ivins (1996)

Styles, Illustration For the purposes of this research, three general styles of illustration have been defined as pictorial, facsimile, and schematic. Definitions and a full discussion of all three are given in Chapter 5.

electrotyping an electro-chemical method for forming metal parts that exactly reproduce a model invented by Moritz Hermann (Boris Semyonovich) von Jacobi (1801-1874) The electrotyping produces 'an exact facsimile of any object having an irregular surface, whether it be an engraved steel- or copper-plate, a wood-cut, or a form of set-up type, to be used for printing; or a medal, medallion, statue, bust, or even a natural object, for art purposes.'[16]

facsimile style illustration – illustrations depicting objects in as realistic a way as possible; or to show how it would be encountered in the real world. See Chapter 4 This term used[17]

pictorial - style illustration aesthetic illustration style when the concepts of the beautiful, the sublime, and the picturesque were tied to ideas of 'good taste' found in visual art, literature, and music. Wood-engraved illustrations produced earlier in the century had visual qualities giving an impression that they might be drawn from an artist's imagination or a romanticised vision of a scene, although the image may actually be based on real objects or settings. Chapter 4 [18]

pictorial syntax Pictorial syntaxes are marks used to represent objects or scenes in a two-dimensional space.[19]

publicist Jean Chalaby uses the term 'publicist' to describe 19th century individuals involved in the printing trade prior to 1855, whose strong personalities and value systems were deeply ingrained in the material they published in the first few decades of the 1800s. Chalaby contrasts a publicist with the emerging profession of journalist, who aimed to provide neutral and objective facts in their reporting. Chapter 2[20]

schematic illustration 'An illustration that represents the essential elements of a machine, experimental facility, industrial plant, system, process, etc. Details inessential to understanding are omitted and a schematic can range from a simplified scale drawing to a symbolic representation.[21] Examples of schematic diagrams in Chapter 4.

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[16]George (1890)

[17]Beegan (2008); Beegan (1995); De Freitas (1986); and Jackson & Chatto (1861)

[18]Beegan (2008); Beegan (1995); De Freitas (1986); and Jackson & Chatto (1861)

[19]Ivins (1996)

[20]Chalaby (1998)

[21]OED online 'schematic'
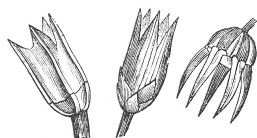
Historical people mentioned in the body of thesis

Babbage, Charles (1791-1871) mathematician, Chapter 4.1

Barnham, P.T. (1810-1891) businessman, Chapter 2.4.2

Beauregard, Henri. (1851-1900) naturalist, writer Chapter 6.4.1

Beeton, Samuel (1830-1877) publisher, Chapter 2.5

Bewick, Thomas (1753-1828) wood engraver, Chapter 2.3

Bolton, Thomas (n.d.) inventor of producing photos on woodblocks, Chapter 2.4.4

Branston, Allen Robert (1778-1827) wood engraver, Chapter 2.3

Brockhaus, Heinrick (1804-1874) German publisher, Chapter 5.1.1

Caldecott, Randolph (1846-1886) artist, Chapter 2.4.2

Carnegie, Andrew (1835-1919) industrialist, philanthropist Chapter 2, sections 1 and 4.4

Chambers, David Noble (1820-1871) London agent of Chambers firm, Chapter 5.1.1

Chambers, Ephraim (1680-1740) encyclopaedist and editor Chapter 3.1

Chambers, Robert (1802-1871) writer, publisher, Chapter 1; Chapter 2.1.1

Chambers, William (1800-1883) writer, publisher, Chapter 1; Chapter 2.1.1

Combe, George (1788-1858) author who founded Edinburgh Phrenology Society, Chapter 4.3

Cole, Henry (1808-1882) social reformer, Chapter 4.3

Crane, Walter (1845-1915) artist, book illustrator, Chapter 2.4.2

D'Alembert, Jean-Baptiste le Rond (1717-1783) encyclopaedist, philosopher, Chapter 3.1

Dalziel, George (1815-1902) wood engraver, businessman, Chapter 2.3

Diderot, Denis (1713-1784) encyclopaedist, editor, philosopher, Chapter 3.1

Donald, James (c.1839-1877) editor of *Chambers's Dictionary*, Chapter 2.6

DuMaurier, George (1834-1896) artist, Chapter 2.2.2

Evans, Edumund (1826-1905) wood engraver, publisher, Chapter 2.4

Eltze, Frederick (active 1864-1870) wood engraver, Chapter 2.3

Faraday, Michael (1791-1867) scientist, Chapter 5.2.3

Ferguson, Adam (1723-1816) Enlightenment philosopher, Chapter 3.2

Findlater, Andrew (1810-1885) editor of *Chambers's Encyclopaedia*, 1st edition, Chapter 5

Foulis, Andrew (1712-1775) co-inventor stereotyping with paper mâchè, Chapter 2.4.3

Ged, William (1699-1749) inventor of sterotyping with plaster, Chapter 2.4.3

Gosse, Philip (1810-1888) populariser of science, Chapter 4.2

Gostick, Joseph (1814-1887) writer, translator for Chambers firm, Chapter 5.1.1

Greene, William Henry (1824-1900) scholar, Chapter 5.2.4

Greenway, Kate (1846-1901) artist and author for children, Chapter 2.4.2

Gillray, James (1756-1815) visual satirist, Chapter 2.3

Harvey, William (1796-1866) wood engraver, Chapter 2.1.1

Heath, Robert Veronon (1819-1895), photographer, Chapter 5.1.1

Hetherington, Henry (1792-1849) publisher, advocate, Chapter 2.1

Hogarth, William (1697-1786) visual satirist, artist, Chapter 2.3

Hutcheson, Francis (1694-1746) Enlightenment philosopher, Chapter 3.2

Jackson, John (1801-1848) wood engraver, Chapter 2.1.1

Keene, Charles Samuel (1823-1891) artist, Chapter 2.3

Knight, Charles (1791-1873) publisher, Chapter 3
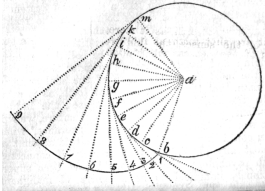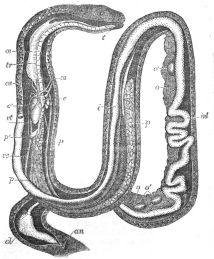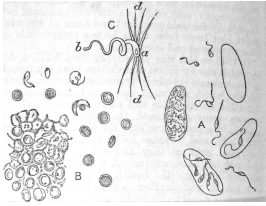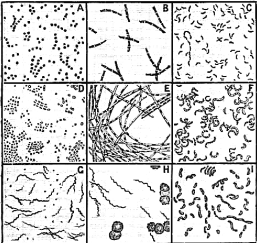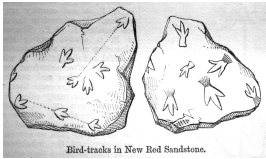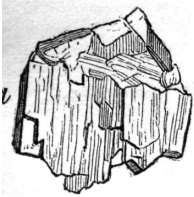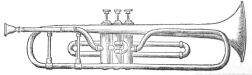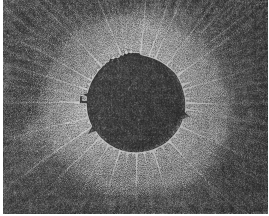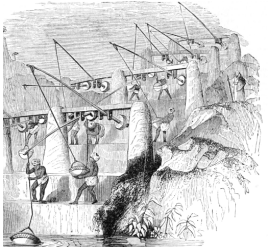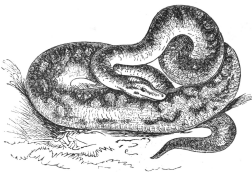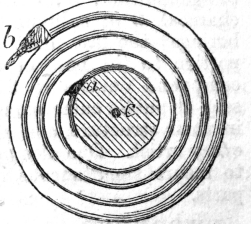
A   CCO Subject Category Exemplars

architecture / built environment	Category includes bridges, furnaces, monuments, and details of buildings. Structural and civil engineering.		
arms / armour / weapons / instruments of torture	Category includes siege weapons used in warfare, devices for criminal punishment or that inflict pain.		
botanical	Category includes plants, plant parts and fungi, such as trees, flowers, leaves, stems, seeds fruit and mushrooms.		
clothes / textiles	Category includes garments, shoes, accessories, head decorations.and close-up details of ropes, lace, cotton and wool.		

container	Category includes various vessels for eating, drinking and recreational activities.		
currency	Category includes coins and bank notes		
decorative	Category includes details of patterns or motifs presented in a close-up detailed way obscuring actual object		
diagram	Category includes illustrated abstractions meant to aid understanding of a concept discussed in an encyclopaedia entry's text.		
emblems / shields / symbols	Differs from the decorative category because the symbol transmits a specific meaning, unlike typography / alphabets which is a system of communication		
furniture / domestic objects	Illustrations in this category consist of furniture and common objects found in household settings. Free standing furniture or objects from places of worship or general communal gathering places are also included, such as pulpits and lamps.		
games / sports equipment	Illustrations showing items that provide physical or mental recreation are included in this category. Depending on how a field of play is signed, more abstract or with specific details from a field, a specific illustration may be found here or in the diagram or maps category.		

human / mythic figures	Illustrations in this category are drawn from art, such as paintings, sculpture, relief or from objects such as coins or vases and is the main subject or the dominant visual representation in the image.		
instruments, scientific / tools	In the broadest definition, a tool is a device or implement, used to carry out a particular function. Includes tools to measure, assist scientific research or perform experiments that are not necessarily mechanical in nature,		
invertebrates / insects / arthropods	Example of illustrations classified here, are what 19th century people referred to as "lower forms of life' or 'primitive.'		
jewellery / medals	Category include rings, amulets, necklaces, bracelets. Medals that can be worn on a person are also included.		
machines / vehicles	A machine is an apparatus with one or more moving parts that perform a definite function while applying mechanical power to perform a particular task. Nearly all vehicles illustrated fit in this the definition of a machine, so they are grouped together.		
maps	This category contains illustrations that provide way finding navigation within a two-dimensional space, real or imagined, organising elements within that space in relation to each other.		

mathematics / geometry	Category contains geometric figures used in mathematical calculations.		
medical / anatomical	Contains internal organs or structures of human or vertebrate bodies. This category was separated because of the sheer number of images, but also because this is a different specialisation from those categories that arguably requires different technical skills to engrave on wood.		
micro-organisms	This category contains living organisms that need to be viewed through a microorganisms		
minerals / geology	Examples of illustrations that would be classified under this category are presented here, showing this category relates to archeology, mining, geology, and chemistry and depicts a variety of images from fossils to gems to strata in the Earth's crust.	Bird-tracks in New Red Sandstone.	
music	All illustrations in this category signify musical notation. Sometimes chords are depicted as they would be seen on sheet music, sometimes individual notes.		
musical instruments	All illustrations in this category signify an actual instrument meant to be played. Sometimes, the instrument may have further symbolic, cultural or historic meaning.		

natural phenomena	Naturally occurring phenomena that are currently studied in disciplines of physics, chemistry, meteorology, and environmental science. These disciplines were developing at the time.		
scenic / vistas	All illustrations in this category are complex compositions with at least 3 different elements that on their own might fit into the categories previously mentioned. They often have the intent of highlighting an object or structure in a larger context.		
typography / alphabets	This category depicts systems of writing and symbols used to create a text, in the most general terms possible.		
vertebrates	This category includes depictions of any external features of whole animals, such as fish, amphibians, reptiles, birds and mammals. It is by far the most numerous of all illustrations in both editions of Chambers's Encyclopaedia.		
visual display	This category only includes fireworks. It is used in 4 instances in the first edition and in one instance in 2nd edition		

B   Map of the System of Human Knowledge

MAP of the SYSTEM of HUMAN KNOWLEDGE

UNDERSTANDING

MEMORY — **REASON** — **IMAGINATION**

HISTORY

SACRED (HISTORY OF PROPHETS)
ECCLESIASTICAL
CIVIL, ANCIENT & MODERN — CIVIL HISTORY, (*properly said*) — MEMORIES / ANTIQUITIES / COMPLETE HISTORIES
LITERARY HISTORY

CELESTIAL HISTORY

UNIFORMITY OF NATURE — HISTORY — OF METEORS / OF LAND AND SEA / OF MINERALS / OF PLANTS / OF ANIMALS / OF ELEMENTS

CELESTIAL WONDERS
LARGE METEORS
DEVIATIONS OF NATURE — WONDERS ON LAND AND SEA / MONSTROUS MINERALS / MONSTROUS PLANTS / MONSTROUS ANIMALS / WONDERS OF THE ELEMENTS

NATURAL

WORK AND USES OF GOLD AND SILVER — MINTING / GOLDSMITH / GOLD SPINNING / GOLDDRAWING / SILVERSMITH / PLANISHER *etc.*

WORK AND USES OF PRECIOUS STONES — LAPIDARY / DIAMOND CUTTING / JEWELLER, *etc.*

WORK AND USES OF IRON — LARGE FORGES / LOCKSMITH / TOOL MAKING / ARMORER / GUN-MAKING, *etc.*

PHILOSOPHY

SCIENCE OF MAN

SCIENCE OF GOD
GENERAL METAPHYSICS, *or* ONTOLOGY, *or* SCIENCE OF BEING IN GENERAL, OF POSSIBILITY, OF EXISTENCE, OF DURATION, *etc.*
NATURAL THEOLOGY — RELIGION *whereby, through abuse* / SUPERSTITION
REVEALED THEOLOGY
SCIENCE OF GOOD AND EVIL SPIRITS — DIVINATION / BLACK MAGIC
PNEUMATOLOGY OR SCIENCE OF THE SOUL — REASONABLE / SENSIBLE

LOGIC

ART OF THINKING — APPREHENSION — SCIENCE OF IDEAS
JUDGEMENT — SCIENCE OF PROPOSITIONS
REASONING — INDUCTION
METHOD — DEMONSTRATION / NATURAL — ANALYSIS / SYNTHESIS

ART OF REMEMBERING — MEMORY — ARTIFICIAL — PRENOTION / EMBLEM
SUPPLEMENT TO MEMORY — WRITING / PRINTING — ALPHABET / CIPHER — ARTS OF PRINTING, READING, DECIPHERING / GESTURE — ORTHOGRAPHY / PANTOMIME / DECLAMATION
SIGNS — CHARACTER — IDEOGRAMS / HIEROGLYPHICS / HERADRY / BLANSONRY

ART OF COMMUNICATING — SCIENCE OF THE INSTRUMENT OF DISCOURSE — GRAMMAR — PROSODY / CONSTRUCTION / SYNTAX / PHILOLOGY / CRITIQUE
PEDAGOGY — CHOICE OF STUDIES / MANNER OF TEACHING
SCIENCE OF THE QUALITIES OF DISCOURSE — RHETORICS / MECHANICS OF POETRY

ETHICS
GENERAL — GENERAL SCIENCE OF GOOD AND EVIL. OF DUTIES IN GENERAL. OF VIRTUE. OF THE NECESSITY OF BEING VIRTUOUS. *etc.*
PARTICULAR — SCIENCE OF LAWS OD JURISPRUDENCE — NATURAL / ECONOMIC / POLITICAL — INTERNAL AND EXTERNAL COMMERCE ON LAND AND SEA

METAPHYSICS OF BODIES *or*, GENERAL PHYSICS. OF EXTENT. OF

POETRY

PROFANE — NARRATIVE — EPIC POETRY / MADRIGAL / EPIGRAM / NOVEL, *etc.*
DRAMATIC — TRAGEDY / COMEDY / PASTORAL, *etc.*
SACRED — PARABLE — ALLEGORY

MUSIC — THEORY / PRACTICE / INSTRUMENTAL / VOCAL
PAINTING
SCULPTURE
CIVIL ARCHITECTURE
ENGRAVING

'Detail of English translation of *Système Figuré des Connaissances Humaines* translated by Benjamin Heller of the University of Michigan and designed by Marketa Kubackaova (above) Map from *The Encyclopaedia of Diderot & d'Alembert, Collaborative Translation Project* URL: https://quod.lib.umich.edu/d/did/tree.html

'Figurative System of organisation of human knowledge' from the *Encyclopédie* in original French, 1752 (next page). Note, the original French language used different diacritics on the document title.

*SYSTÊME FIGURÉ DES CONNOISSANCES HUMAINES.

ENTENDEMENT.

MEMOIRE.

HISTOIRE

SACRÉE. (Histoire des Propheties.
ECCLESIASTIQUE.
CIVILE, ANC. ET MODERNE. { Hist. Civile, *proprement dite.* { Mémoires. Antiquités. Histoire complète.
Histoire Litteraire.

NATURELLE.

Uniformité de la Nature. { Histoire Celeste. Histoire { Des Meteores. De la Terre et de la Mer. Des Mineraux. Des Vegetaux. Des Animaux. Des Elemens.

Ecarts de la Nature. { Prodiges Celestes. Meteores prodigieux. Prodiges sur la Terre et la Mer. Mineraux monstrueux. Vegetaux monstrueux. Animaux monstrueux. Prodiges des Elemens.

Usages de la Nature. { Arts. Metiers. Manufactures. }

Travail et Usages de l'Or et de l'Argent. { Monnoyeur. Batteur d'Or. Fileur d'Or. Tireur d'Or. Orfevre. Planeur. Metteur en œuvre, &c.

Travail et Usages des Pierres fines et précieuses. { Lapidaire. Diamanteur. Joaillier, &c.

Travail et Usages du Fer. { Serrurerie. Taillanderie. Armurerie. Arquebuserie, &c.

Travail et Usages du Verre. { Vereries. Glaces. Miroitier. Lunetier. Vitrier, &c.

Travail et Usages des Peaux. { Taneur. Chamoiseur. Peaussier. Gantier, &c.

Travail et Usages de la Pierre, du Platre, de l'Ardoise, &c. { Architecture pratique. Sculpture pratique. Masson. Couvreur, &c.

Travail et Usages de la Soie. { Tirage. Moulinage. Ouvrages, comme Velours, Droguets brochés, &c.

Travail et Usages de la Laine. { Draperie. Bonneterie, &c.

Travail et Usages, &c.

RAISON.

PHILOSOPHIE.

Métaphysique générale, *ou* Ontologie, *ou* Science de l'Etre en général, de la Possibilité, de l'Existence, de la Durée, &c.

Science de Dieu. { Théologie naturelle. Théologie révélée. { Religion, *D'où par abus,* Superstitions. Science des Esprits bien et mal faisans. { Divination. Magie noire.

Pneumatologie *ou* Science de l'Ame. { Raisonnable. Sensitive.

Science de l'Homme.

Logique.

Art de Penser. { Apprehension. Science des Idées. Jugement. Science des Propositions. Raisonnement. Induction. et Méthode. { Démonstration. { Analyse. Synthese.

Art de Retenir. { Mémoire. { Naturelle. Artificielle. { Prénotion. Emblême. Supplément de la Mémoire. { Ecriture. Imprimerie. { Alphabeth. Chiffres. { Arts d'écrire, d'imprimer, de lire, de déchiffrer. } Orthographe.

Art de Communiquer. { Science de l'Instrument du Discours. { Grammaire. { Signes. { Geste. { Pantomime. Declamation. Caractères. { Ideaux. Hieroglyphiques. Heraldiques ou Blazon. } Prosodie. Construction. Syntaxe. Philologie. Critique. Pedagogique. { Choix des Etudes. Maniere d'enseigner. Science des Qualités du Discours. { Rhétorique. Mechanique de la Poesie ou Versification.

Morale.

Générale. Science du bien et du mal en général. Des devoirs en général. De la Vertu. De la Nécessité d'estre vertueux, &c.

Particulière. Science des Loix, ou Jurisprudence. { Naturelle. Œconomique. Politique. { Commerce intérieur, extérieur, de Terre, de Mer.

Science de la Nature.

Mathématiques.

Métaphysique des Corps, *ou* Physique générale. De l'Étendue, de l'Impénétrabilité, du Mouvement, du Vuide, &c.

Pures. { Arithmétique. { Numérique. Algebre. { Elementaire. Infinitesimale. { Différentielle. Integrale. Geometrie. { Elementaire. (Architecture Militaire. Tactique. Transcendante. (Theorie des Courbes.

Mixtes. { Mechanique. { Statique. { Statique, *proprement dite.* Hydrostatique. Dynamique. { Dynamique, *proprement dite.* Ballistique. Hydrodynamique. { Hydraulique. Navigation, Archit. Navale. Astronomie geometrique. { Cosmographie. { Uranographie. Geographie. Hydrographie. Chronologie. Gnomonique. Optique. { Optique, *proprement dite.* Dioptrique. Perspective. Catoptrique. Acoustique. Pneumatique. Art de conjecturer. Analyse des Hazards.

Physicomathematiques.

Physique Particulière. { Zoologie. { Anatomie. { Simple. Comparée. Physiologie. Medecine. { Hygiene. { Hygiene, *proprement dite.* Cosmetique. (Orthopedie. Athletique. (Gymnastique. Pathologie. Semiotique. Therapeutique. { Diete. Chirurgie. Pharmacie. Vétérinaire. Manege. Chasse. Pesche. Fauconnerie. Astronomie physique. Astrologie. { Astrologie Judiciaire. Astrologie Physique. Meteorologie. Cosmologie. { Uranologie. Aërologie. Geologie. Hydrologie. Botanique. { Agriculture. Jardinage. Mineralogie. Chimie. { Chimie, *proprement dite.* (Pyrotechnie. Teinture, &c. Metallurgie. Alchimie. Magie naturelle.

IMAGINATION.

POESIE.

Sacrée. Profane.

Narrative. { Poeme Epique. Madrigal. Epigramme. Roman, &c. { Musique. { Theorique. Pratique. Instrumentale. Vocale. Peinture. Sculpture. Architecture civile. Gravure.

Dramatique. { Tragedie. Comedie. Opera. Pastorales, &c.

Parabolique. { Allegories.

C Prominent Chambers's book series & reference works between 1840-1900

1830-1850

- *Information for the People*
- *Miscellany of Useful & Entertaining Tracts*
- *A Biographical Dictionary of Eminent Scotsmen*
- *Chambers's Cyclopaedia of English Literature*
- *Peoples's Editions (of fiction & foreign)*
- *Chambers's Library for Young People*
- *Chambers's Educational Course* series

1850-1880

- *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge for the People*
- *Chambers's Elementary Science Manuals* series
- *The Life and Works of Robert Burns*
- *The Book of Days*
- *Chambers's Social Science Tracts*
- *Chambers's Etymological dictionary of the English language*
- *Traditions of Edinburgh*

1880-1914

- *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge, New Edition*
- *Lives & Labours of Leading Naturalists*
- *Chambers's Graduated Readers*
- *Chambers's Biographical Dictionary*
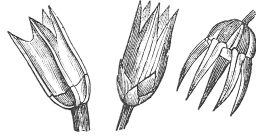
D Lippincott Letter to Chambers, August 17, 1874

Dear Sirs,

We were duly in receipt of yours of the 9th [ult. ?], but the absence of our Mr. Lippincott, Sr. has prevented a more prompt reply.

We cannot but express our regret at the tenor of your communication—but presume that it is owning partially to the fact that, by reason of changes in your firm since the commencement of the publication of the Encyclopaedia, certain important circumstances pertaining to our connection with the enterprise may have passed out of the knowledge of your house.

It should however be known to you that when we arranged with your firm to take up the work the Messrs Appleton, of New York had already commenced in the re-publication, and it is not too much perhaps to claim that but for our instrumentality in forcing them to abandon the field, and to sell out to us, you would hardly have realized [sic.] *the sum of £1800 from the circulation of the work in the American Market* [?] *and although this may be a sum, as you say, quite inadequate, considering the outlay in preparing work it certainly is much better than nothing; moreover, the outlay in preparing the plates for the American edition has been returned to you in addition to the royalty.*

Again, you complain of the changes which we have made in the work and claim that our privilege only extended to the more taking of impressions from the stereotype plates as we received them from you. We have no hesitation in saying that had we confined ourselves to such a course it would have been absolutely fatal to the enterprise. Your editions [you] will remember that in the portions of the work issued during the [American Civil] *war the articles relating to our country were in their tone decidedly favorable to the 'secessionists', offensively so to the Northern peoples— and we are sure that had we offered the work to issue unrevised as to these articles, it would have fallen* [?] *still-born from the press.*

Other American articles – more or less – contained errors which so far as discovered

were carefully eliminated. We do not think that in all this we exceeded the limits of our privileges in the matter, and we ensure that we thereby added much to the currency of the work in this country.

Touching [on] the changes in which you take exception on personal grounds only one of them so far as we are aware has been noticed adversely and this one criticism was so clearly in the interest of a rival work that its effect was lost. Furthermore, your firm was distinctly exhonerated from advocating the principles of the article as it now stands and the responsibility whatever that may be placed upon us.

This at hand is our impression touching the newspaper articles to which you allude; it was considered of little consequence and not presumed...and therefore we cannot speak from any recent reading of it.

The revision that was necessary in certain articles at the outset became more generally necessary as the contents of the volumes became out of date by the lapse of time and hence our general revision was undertaken; the result of which you are somewhat acquainted with. We dwell upon these matters because we desire you to realize—what we feel certain that while giving all due credit to the intrusive merit of the work, much of its success in this country has been owing to our action in its favor at the outset and fostering care since.

It would indeed be a matter of very sincere regard to us that the pleasant relations which have existed between our houses for nearly twenty years should be disturbed, and we shall certainly submit to anything in reason to avoid such a result.

It occurs to us that it might be more satisfactory to all if we were to purchase your interest in our editions at a fair valuation, and thus at once heal our present understanding and obviate all possibility of a difference arising on the account in future. You many therefore if you please let us know what you will accept in full for your interest in the 'Encyclopaedia' and 'Book of Days' (the later, by the way, we have been quite unable to make a success of) and we assure you we shall meet you on any equitable basis of adjustment.

At the same time we think that you ought to realize..that whatever you have received or may received hereafter from the sales of the work, our efforts, first in getting the work out of the hands of the Messrs Appleton at the outset, and then by our management in giving it an extended introduction, out of which latter fact we believe the market for the English editions had principally grown.

We presume that you are aware that the Messrs Appletons are now issuing a revised edition of their Cyclopedia (seven vols. of which have appeared) and it may also be known to you that two other Encyclopaedias are now in course of publication in this country, facts that should be taken into consideration as largely affecting the value of our work.

Enclosed we have the pleasure of sending a draft in your favor for £773.12.5, in full for the amount of your statement just received.

Awaiting your reply we remain

Faithfully yours, J.B. Lippincott & Co.
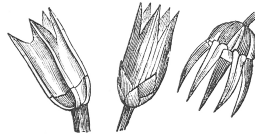
E   W. & R. Chambers and J. B. Lippincott Contract

Contract for Encyclopaedia by Lippincott and Chambers

1887

It is minuted and agreed upon between William and Robert Chambers Publisher, Edinburgh, Scotland hereinafter termed, the first party on the first part and J.B. Lippincott Company Publishers, Philadelphia, United States, hereinafter termed the Second Party on the Second Party in manner fall owning that is to say, the said parties, considering that they have entered into arrangements relative to the publication of Chambers International Encyclopaedia in (10) volumes consisting of five hundred and twenty (520) sheets of sixteen (16) pages each with maps and which the first party is the owner. And now seeing that in order to regulate their respective rights and interests and prevent disputes and differences the parties hereto have resolved to execute these pursuits. Therefore the said 'parties' have agreed and do heartily agree and bind and oblige themselves, and their respective presentations and successors as follows: [?]

   (First) The First party agrees to supply the Second party with Electrotype plates of the text and wood engravings of said work at the rate of two pounds thirteen shillings (£2.13.0) for each sixteen (16) pages [?] of and the said first party agrees to have the plates of the first volume completed if possible not later than October one thousand and eight-hundred and eighty seven (1887) The succeeding volumes to be furnished at such periods thereafter as may be found, practicable, and to supply impressions of the maps and other illustrations pertaining to the work as, from the wood engravings at the rate of one shilling and three pence (1 1/3), if the maps and other illustrations don't exceed fifty (50) any maps above fifty (50) in number to be charged at the same profitable rate. All expense of packing, shipping, freight, insurance duties etc. to be paid by the second party, the payments to be made quarterly as in clause three of this agreement. The first party further gives the sole and exclusive right of publication and of sale of the said ten in the United States of America to the Second Party during the continuance of this agreement. This right-shall be

limited to the United States of America. It is agreed that the expense of alteration on the American plates that may be made from time to time to keep the work up to date shall be paid by the Second party (Second). It is further agreed that the first part shall pay the cost of preparation of such American Articles as the parties hereto shall deem advisable, this cost of preparation shall include the following items: payment to authors; cost of procuring copyrights, and of any assignments of said rights and such legal expenses as are directly connected, with the procuring and assigning of the said copyrights; and it is further agreed that the copyright of the same in the British Empire shall be the property of the first party. The American copyright to be the property of the Second Party during the continuance of this agreement, the Second party agrees to transfer the American copyright to the First Party on termination of this agreement. It also agrees that these American articles shall be subject to Editorial Revision of the first party, before being incorporated.

[Second Page]

III Incorporated in the Work (Third) The Second _____ Party in consideration of the foregoing stipulations_____ agrees to manufacture the work in appropriate style_____ from the aformentioned electrotype plates and the maps and furnished and to use their facilities for its sale, and to pay the first party a royalty of one and half (1 1/2) gold dollars of present weight and fineness for every ten (10) volumes of the work sold by the said Second Party equal to fifteen (15) cents for each volume, containing fifty two (52) sheets of sixteen (16) pages with maps, sold during the continuances as in volumes the Royalty, at the same rate of fifteen (15) cents for every fifty two (52) sheets of sixteen (16) pages sold, the amount of sales to be certified annually by the Secretary of J.B. Lippincott Company verified by this affidavit before a notary public. Accounts to be rendered and payments to be made quarterly, by Bank Bill at the sixty (60) days sight in February, May, August and November of each year. (Fourth) it is further agreed between the two parties that each shall take the necessary action regarding the simultaneous of the other issue of the different volumes of the work to protect, the Second party in the copyright of the aforesaid American Articles (Fifth). It is agreed that i/i at any time it many be deemed advisable by the Second party to import the sheets of the British printed edition of the said work, the first party shall supply the same in terms– of not less than two thousand (2000) copies of any one volume at two (2) shillings per volume in sheets unfolded, subject to advance of price corresponding to any material advance, in the price of paper of All expense of packing, shipping, freight-insurance quarterly as in clause three (Sixth) On the termination of this agreement it is agreed that the Electrotype plates shall be returned to the first Party who shall pay for them to the Second party then value at the price of stereotype metal. The first party agreeing that the said plates shall be immediately destroyed. (Seventh) This agreement shall continue for the term of twenty (20) years from the date of the issue of the last volume of the

work unless terminated by mutual consent or unless either of the parties ceases to fulfil its stipulations. In the event of any disputes or differences arising as to the meaning of this agreement, or as to the rights and interests of the parties under if both parties agree to refer the source to the Lord advocate for Scotland when failing to the Solicitor General for Scotland for the time being? and they agree to accept his decision as final. This submission shall be made by written or printed briefs and neither party shall…

[Third Page]

have the right to appear before the arbiter either in person or for legal representative only attorney of any kind. The expenses of this arbitration to be paid equally by both parties (Lastly) the parties hereto agree and bind and oblige themselves, and their respective foresaid to implement this agreement in all its parts the one to the other. In Witness thereof these pursuits writt en upon this and the two preceding pages of stamped paper, William Frederick McAlpine apprentice to Lindsay McKeny, written to the Signet-Edinburgh.

Signatures
William & Robert Chambers
Robert P. Morton Secretary of J. B. Lippincott Company
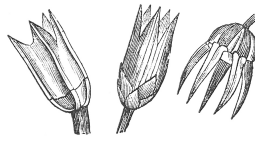
F   Receipt for James Stewart

£2 - 15 - 0

Edinburgh, 28 May 1862

Received from Messrs W. & R. Chambers
the sum of Two pounds 15/-
being payment in full for drawing

Subjects as on other

Side

for publication in Encyclopædia
and any other of Messrs Chambers's works.

James Stewart

Grosbeak — ✗ 5

Greyhound — ✗ 7

Gasteropoda (Buccinium) 6

Gaff 5

Gargoyle 6

Grebe — ✗ 4

Guara — ✗ 5

Grayling — ✗ 5

Gudgeon — ✗ 5

Guillemot — ✗ 5

Grenade — ✗ 2

2 15
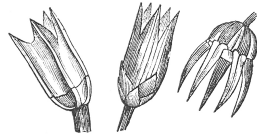
G	Sample of C.E. Images in Other Works

Images reused	*Secondary Course in Zoology,* 1893 300/300 total images	*Chambers's Encyclopaedia,* 2nd Ed 1888-1892
Otter	The Otter, page 57	Volume 7, page 661
Alpine Ibex	The Alpine Ibex, page 160	Volume 5, page 266
Goats	A Pair of Angora Goats, page 164	Volume 1, page 280
Swan	The Black Swan, page 201	Volume 9, page 828
Mocking Birds	The Mocking Birds, page 223	Volume 7, page 242
Parrot	The Gray Parrot on his perch, page 235	Volume 7, page 783
Starling	The Starling, page 242	Volume 9, page 687
Mongoose/ Egyptian Ichneumon	The Mongoose, page 298	Volume 6, page 64
Hedghog	The Common Hedgehog, page 303	Volume 5, page 618
Armadillo	Three-banded Armadillo, page 305	Volume 1, page 422
A Hooded Peregrine Falcon \ Hooded Peregrine on the block	Hooded Peregrine on the block, page 310	Volume 4, page 536
Leg and foot of hawk	Leg and Foot of Falcon showing the method of attaching the fastening, page 314	Volume 4, page 536
Harp Seal	The harp seal, page 324	Volume 9 page 279
Alligator \Pike headed Alligator	The savage Florida Alligator, page 326	Volume 1 page 172
Cormonant	Cormorant fishing bird of the sea, page 331	Volume 3, page 481
Albatross	The albatross sweeping over the ocean waves, page 333	Volume 1, page 224

Images reused	*Gallery of Nature,* Vol 2, 1864 11/ 231 total images	*Chambers's Encyclopaedia,* 1st Ed 1860-1868
Temple	Temple of Athens, p xii	Volume 1, page 517
Moon	Moon and Lunar phenomena	Volume 6, page 556
sky scene	Shower of shooting stars witnessed in N.A.	Volume, 7 page 57
granite	Disintegration of Granite	Volume 8, page 287

Images reused	Home Life from All Lands, Vol 3, 1911 16/104 total images	Chambers's Encyclopaedia, 2nd Ed 1888-1892
Otter	The Otter, page 57	Volume 7, page 661
Alpine Ibex	The Alpine Ibex, page 160	Volume 5, page 266
Goats	A Pair of Angora Goats, page 164	Volume 1, page 280
Swan	The Black Swan, page 201	Volume 9, page 828
Mocking Birds	The Mocking Birds, page 223	Volume 7, page 242
Parrot	The Gray Parrot on his perch, page 235	Volume 7, page 783
Starling	The Starling, page 242	Volume 9, page 687
Mongoose/ Egyptian Ichneumon	The Mongoose, page 298	Volume 6, page 64
Hedghog	The Common Hedgehog, page 303	Volume 5, page 618
Armadillo	Three-banded Armadillo, page 305	Volume 1, page 422
A Hooded Peregrine Falcon \ Hooded Peregrine on the block	Hooded Peregrine on the block, page 310	Volume 4, page 536
Leg and foot of hawk	Leg and Foot of Falcon showing the method of attaching the fastening, page 314	Volume 4, page 536
Harp Seal	The harp seal, page 324	Volume 9 page 279
Alligator \Pike headed Alligator	The savage Florida Alligator, page 326	Volume 1 page 172
Cormonant	Cormorant fishing bird of the sea, page 331	Volume 3, page 481
Albatross	The albatross sweeping over the ocean waves, page 333	Volume 1, page 224

Images reused	Home Life from All Lands, Vol 2, 1909 6/107 total images	Chambers's Encyclopaedia, 2nd Ed 1888-1892
Reindeer	A Lapland Reindeer, page 166	Volume 8, page 630
Canoe / Canadian Trapper's canoe	A trappers cannoe, page 173	Volume 2 , page 717
Spinning-wheel/ Two- handed spinning wheel	A Spinning-wheel, page 224	Volume 9, page 640
The god Nergal (BM)	The Assyrian God Nergal, page 291	Volume 1, page 519
Pagoda at Tanjore	Pagoda at Tanjore, page 309	Volume 7, page 694
Chinese Pagoda of Thirteen Stories	Chinese Pagoda of Thirteen Stories, page 310	Volume 7, page 694

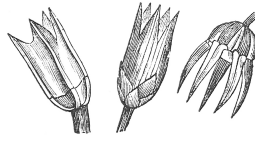# H   LIVERPOOL MERCURY ARTICLE, 14 MARCH 1889

CHAMBERS'S ENCYCLOPÆDIA.*

The original edition of this well-known and most popular Encyclopædia was begun in 1859 and completed in 1868. It has accordingly in its finished state been before the public for 20 years. It had scarcely been completed, however, when the accomplished editor, the late Dr. Andrew Findlater, of Edinburgh, subjected it to a thorough examination and revision. This led to a new edition, and the same process being carried on by him from year to year, successive editions have brought down the information to the latest possible date. Last year Dr. Findlater died, and in these circumstances, and considering that after an interval of 20 years many new subjects had emerged, and many others called for different treatment, the publishers resolved to issue an altogether new edition of the work. The original character of the Encyclopædia has been advisedly maintained, although it is practically a new book. In the volume before us, for instance, a large proportion of the articles have been entirely rewritten, while there are many new ones which found no place at all in the corresponding volume of the old edition. Among the writers or authorities personally consulted we notice the names of Professor Crum Brown, the eminent specialist in chemistry in the University of Edinburgh; Mr. Matthew Arnold, Mr. Andrew Lang, Professor Child, of Harvard, U.S.A.; Mr. Max Muller, Professor Lucien Bonaparte, and Mr. R. A. Lundie, M.B., a rising young medical man in Edinburgh, and the son of our well-known citizen Rev. R. H. Lundie, M.A., who contributes the papers on medical subjects (such as "Anthrax"), for which it may be remembered "Chambers" in its original form possessed a high reputation. There is also a profusion of maps and illustrations in this new edition, and both deserve much commendation for their accuracy and artistic character. We have compared the volume before us with its predecessor, and in fact have subjected it to a somewhat severe criticism, and are fairly astonished at the manner in which the new editor, Mr. David Patrick, and his literary staff have exercised their rigid economy of space and at the same time their fulness of information in all departments of human knowledge. It is quite impossible in a review of this kind to present even the shortest summary of the contents of this opening volume, but we may mention that Canon Isaac Taylor is the author of a very suggestive philological paper on the letter A, as well as another on the Alphabet. Dr. Thomas, who is either an American or one who is well acquainted with the country, is the writer of the biography of John Quincy Adams. Professor Mahaffy, the eminent classical scholar, is the author of the paper on "Æschylus;" Mr. Patrick Geddes, F.R.S.E., of the article on "Algæ," and other botanical papers; Mr. W. Senior, otherwise known as "Redspinner," and the editor wise known as "Redspinner," and the editor of The Field, of the pleasant paper on "Angling;" Dr. John Murray, of the Challenger, of the article on "The Antarctic Ocean;" Mr. Grant Allen on "Anthropology," the Rev. S. Baring Gould on "Apparitions," Senor Don V. G. Quesada, the Minister Plenipotentiary to the United States, on "Argentine Republic;" Major Dunlop, R.E., on "The Army" and other military articles; Mr. Thomas Raleigh, recently the Unionist candidate for West Edinburgh, a barrister of the Middle Temple, on "Arrest and other Law Articles;" Professor Conway, of the University College of this city, on "Art;" the Rev. J. G. Cazenove, of the Episcopal Church in Scotland, at Edinburgh, on "The 39 Articles;" Prince Peter Krapotkine on "Asia;" Mr. Edward Rigg, of the Royal Mint, on "Assaying;" Professor Bain, of Aberdeen, on "The Association of Ideas;" Professor Tait, the eminent natural philosopher, on "Atom;" Mr. J. O'Halloran, secretary of the Royal Colonial Institute, on the important subject of "Australia;" Dr. George Burnet, the Lyon King at Arms, on "Baron," "Baronet," and other articles in heraldry, and Messrs. D. and T. Stevenson, the lighthouse engineers, so well known in this country, on "Beacon." This list is a long one, but it by no means exhausts the list of first-class contributors and specialists to this opening volume. It is to be taken merely as a sample. The publishers have evidently spared no expense to secure the ablest writers on their different subjects, and their liberality has been amply rewarded. The new Encyclopædia will be a library in itself, and will be certain to be highly appreciated wherever the English language is spoken. As we have gone over the different papers contained in this volume, we have been reminded of the words of the biographer of the late Sir William Jackson, formerly the member for North Derbyshire—"When a mere lad he had made up his mind to get on in the world, and it was the information derived from a useful encyclopædia which moulded his character and qualified him in after life to achieve both wealth and position." It is easy to understand this, for a cyclopædia like this of Chambers' is the knowledge of the centuries focussed, the essence of all books and observations crystallised—in a word, giving in concise terms the result of other men's years of toilsome investigation. By the skilful use of prominent black letter type the publishers have greatly added to the facility of reference throughout the whole book, while the typography itself is faultless. Its title of "A Dictionary of Universal Knowledge" applies fully to this new edition. It will save the reader the necessity of wading

will save the reader the necessity of wading through long treatises on special subjects, while it is remarkably easy of consultation. We are particularly pleased to see the prominence given to American and colonial subjects. The more important matters connected with America have been written in the United States by American authors expressly for this edition. A long list of them is given and stated expressly to be copyrighted 1888 by the J. P. Lippincott Co., Philadelphia, for the United States. In the case of subjects where the American view or practice diverges from that of the United Kingdom, a special paragraph has been added from American sources, and in the law articles where the law of the United States differs from that of this country a paragraph is given on the American law. So many, indeed, are the articles written by American authors, that an authorised edition of the Encyclopædia is published by the Philadelphia firm already mentioned. The pictorial illustrations have been superintended by Mr. J. R. Pairman, and, in the case of plants especially, have been expressly engraved from photographs, and strike us as very much in advance of those with which we used to be familiar in the old edition, the place of which will now be taken by the edition before us. All accordingly who are interested with respect to persons and places, questions of art, and religion, politics and science, and who in these busy days are anxious to find the latest information on any subject lying ready to hand should possess themselves of these volumes as they are published, and it shows great enterprise on the part of Messrs. W. and R. Chambers to publish three volumes in a year. It will in no sense interfere with any other Encyclopædia, while for the millions who are unable to get together a large library, it is astonishingly cheap.

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