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Laura K. Dickinson

Sarah Wadsworth
Marquette University, sarah.wadsworth@marquette.edu


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The Making (and Remaking) of the Penny Magazine: An Electronic Edition of Charles Knight's "The Commercial History of a Penny Magazine" *

"The success of our undertaking will be the measure of its utility." 1

In the latter half of 1833 the Penny Magazine of the Society for the Diffusion of Useful Knowledge, a British illustrated weekly, published a series of four supplemental issues titled "The Commercial History of a Penny Magazine" (our emphasis). These issues, which appeared once a month for four months, present an interestingly self-reflexive and ideologically charged account of the history of printing and the development of printing technologies up to and including the time of the publication of the Penny Magazine itself. When we first encountered the series, it immediately became clear that it would be of potential interest to scholars of various fields, including those focusing on the technological, economic, and ideological history of nineteenth-century Britain as well as those looking more broadly at the History of the Book. Because of these multiple and intersecting communities of interest, we decided to undertake the project of making the articles more widely available through publication in electronic format on the World Wide Web.

There are a number of advantages to publishing on-line, which are worth mentioning briefly at the outset of the paper. One crucial advantage is the security of the completed edition: unlike the codex, an electronic publication is not susceptible to misshelving, theft, and loss. Preservation is another important consideration. While there are unquestionably times when it is necessary or desirable to use the physical volume, electronic editions can help preserve various types of documents by providing convenient alternatives to the original artifacts. In addition, there is the matter of access. While approximately 250 research libraries in the United States have holdings of the Penny Magazine (some scattered), this figure pales in comparison to the millions of users of the World Wide Web. Another benefit of publishing on-line is flexibility — for example, having the option to change the format of the document, to add material, and to correct errors at any time. But perhaps the most significant advantages of an on-line edition are its value-added features — those features that expand the possibilities provided by the print version. These include ease of navigation, the ability to access instantly supporting materials, such as introductory matter, annotations, and bibliography, and automatic links to related documents. The desirability of incorporating such elements as those guided the design of our electronic edition of "The Commercial History of a Penny Magazine". In this paper we will discuss the process through which this republication was accomplished.

In the pages which follow, we will begin by providing background information on the Penny Magazine, discussing in particular the historical and ideological significance of "The Commercial History". Next, we will document the processes of design and

*We would like to thank Michael Hancher for his assistance and encouragement with this project and the University of Minnesota Libraries for allowing us to reproduce materials in their collections.


4 WorldCat, a firstsearch database published by OCLC Online Computer Library Center, indicates that approximately 250 libraries in the United States have some numbers of the Penny Magazine. Estimates of the number of World Wide Web users range from nine million users in 1995 (Morgan Stanley) to 31.4 million as of October 1996 (International Data Corp.). These statistics are derived by I/PROM monitors at http://www.cyberAtlas.com/ market.html.
implementation through which we have endeavored to balance the competing claims of computer technology and the historical artifact by presenting a faithful yet enhanced version of this series in electronic form. Finally, we will conclude with some remarks on the adequacy of digital techniques in representing the material richness of the text and suggest possible correlations between the economic and political objectives embodied in the modes of production and dissemination of the Penny Magazine and those made possible in our own time through the medium of the World Wide Web.

Charles Knight, the Penny Magazine, and the Diffusion of Useful Knowledge

Published weekly by the Society for the Diffusion of Useful Knowledge (SDUK) from 1832 to 1845, the Penny Magazine was Britain’s first illustrated periodical with a mass circulation. In keeping with the mission of the SDUK, the magazine’s goal was to improve the conditions of the working class by providing an attractive and inexpensive means of self-education and cultural enrichment. Charles Knight, who acted as publisher for the SDUK, fervently believed that the condition of the lower classes could be materially as well as spiritually improved through the acquisition of cultural, geographic, and technical knowledge. Thus, to Knight and his sponsors, the Penny Magazine, as an inexpensive vehicle of informative and educational reading matter, was a political tool—an instrument of social change capable of promoting the economic health of Great Britain. As Knight explained in the preface to the first volume of the Penny Magazine, “ready and cheap communication breaks down the obstacles of time and space—and thus, bringing all ends of a great kingdom as it were together, greatly reduces the inequalities of fortune and situation, by equalizing the price of commodities, and to that extent making them accessible to all.”

While Knight and the SDUK targeted a working class readership, the Penny Magazine may actually have appealed more to members of the middle-class who were interested in self-improvement. No doubt it was by hitting a combination of these audiences that the Penny Magazine managed to achieve a record sales of 200,000 copies per week. As high as the sales were, however, the circulation of the magazine was even higher. Knight estimated that each issue was read by a million people. This number may well have been inflated, but even allowing for this possibility, the figure is an impressive approximation considering that, while the population of England, Scotland, and Wales in the 1830s was slightly over 16 million, the literate population was considerably less. The unprecedented success of the Penny Magazine helped bring about the explosion of cheap periodicals in nineteenth-century Britain, including, ironically, magazines with less refined subject matter that would ultimately entice away working-class consumers and erode the readership base that the Penny Magazine was instrumental in cultivating.  

In format, the Penny Magazine consisted of eight single-color pages, of 20 by 29 centimeters. Each issue contained an abundance of high-quality wood engravings, which Knight considered an important selling point for an audience unused to reading. Reproductions of well-known works of art were especially prominent, although illustrations of cathedrals, cities, scenes from other countries, flora, fauna, and other subjects, including technical matter, also appeared in the Penny Magazine. The content of the magazine was secular—unlike the competing Saturday Magazine of the Society for the Propagation of Christian Knowledge—and the journalistic quality was high. The chief articles were commissioned pieces authored by professional writers. The emphasis throughout the periodical was on “practical” knowledge, although the SDUK seemed to have had a rather flexible definition of “practical.” for the Penny Magazine carried articles on such topics as fine art, architecture, natural history, geology, and even astronomy. Fiction was proscribed, since it was not considered “useful” or improving (a fact that has been linked with the magazine’s eventual decline) and by omitting coverage of news, the

10. See Altick (see note 7), pp. 332–333.
publisher of the *Penny Magazine* was able to avoid paying the stamp tax, a factor that helped him keep prices low and profits up. Due to concern about the possibility of worker unrest and potential threats to social stability, political topics were studiously avoided. As Patricia Anderson notes in *The Printed Image and the Transformation of Popular Culture, 1790—1860*, “the values it promoted unquestionably served the interests of those in positions of social, economic, and political authority.” These values—paradoxical in a periodical ostensibly devoted to the betterment of the working class—are very much in evidence in Charles Knight’s *The Commercial History of a Penny Magazine*.

The introduction to republish *The Commercial History of a Penny Magazine* arises from a recognition of the importance of the series both within the context of the *Penny Magazine* itself and in the broader context of reading and publishing history, nineteenth-century periodicals, and Victorian studies. Within the context of the *Penny Magazine*, the series is thematically linked to others on industry and manufacturing, providing a counterpart to the fine art which is its most renowned feature. The series also provides detailed information about the magazine’s production, including the processes of paper-making, type-founding, composing, printing, and binding. The series is a prime example of Knight’s rhetoric, which emphasizes the social, cultural, and industrial superiority of Great Britain, the improvement of society through technological innovation, and the necessity of a morally responsible workforce. In addition, the series articulates Knight’s economic argument, which relies on the still fundamental principle of economy of scale, whereby large print runs result in a low unit cost which makes it possible to sell cheaply to a mass audience.

In the broader context, the series contains a concise history of the development of the book arts and printing technologies, including a glimpse into the 1830s “state of the art” of the manufacturing side of the publishing industry. To provide a few examples, the paper mill described is that of John Dickinson, who patented an innovative cylinder machine for making paper, and the printing office featured is that of William Clowes, a progressive printer who was the first to employ the steam press in printing books. Additional evidence of the technologically advanced point of view presented in the series is found in its discussion of stereotyping. In this section, Knight provides a carefully reasoned economic argument in favor of stereotyping—a process in which molds were used to produce metal plates from making pages of moveable type. Stereotyping thus freed up the type for use in other projects. (Knight describes this in terms of the “economy of capital” and made it possible to print subsequent editions without reinvesting in the labor of composition. The process was one of the major breakthroughs in printing technology and one upon which the mass production of the *Penny Magazine* depended.

Since its appearance in monthly supplements from August to December 1834, *The Commercial History of a Penny Magazine* has had a lively publication history. Unlike the vast majority of articles written for the periodical press, *The Commercial History* was revived and republished in book form—not only once, in fact, but on a number of occasions and for a variety of purposes and audiences. Recognizing the value of the articles, Knight resurrected the series, or parts of it, himself several times. In 1854, he published an abridged and otherwise modified version under the title *The Printer* (London: Charles Knight and Co.). This volume, published as part of the “Guide to Trade” series, addresses itself to youths who might be considering a career in the printing industry. The text follows the work of a newly hired printer’s apprentice over the course of a week in order to give readers a sense of what the job entails. In 1843, George Dodd, an industrial journalist hired by Knight, incorporated

11 ALICK (see note 9), pp. 333—334. FABER/BORNATT (see note 6), p. 55.
12 ANDERSON (see note 6), 78.
13 Although these articles are unsigned, there is no doubt that they were authored by Knight himself. Portions of the series appear verbatim in works that do bear Knight’s name as author, including *The Old Printer and the Modern Press* (London 1852).
14 Perhaps the best examples of articles on manufacturing and industry are George Dodd’s “Days at the Factories,” a series of 45 articles based on factory tours, published in the *Penny Magazine* between 1844 and 1846. Several of the articles were collected and published by Charles Knight in 1849 in book form, *Days at the Factories, or the Manufacturing Industry of Great Britain Described, and Illustrated by Numerous Engravings of Machines and Processes*. The book includes an additional article, “A Day at the Printing-office,” which incorporates text and woodcuts which originally appeared in “The Commercial History of a Penny Magazine.”
16 KNIGHT: Commercial History, pp. 470—474.
Fig. 1 Extended Hyperlinking of Annotations: (a) Sources for annotations are listed in a shorthand format in parentheses at the end of the annotation itself. By clicking on this shorthand code, the user can (b) view the full bibliographic reference for that source in the Sources For Annotations list. In addition, sources that provide important background information on the "Commercial History" are further linked (c) to the annotated bibliography.
portions of "The Commercial History" into his article, "A Day at a Printing-office" (see note 14). A decade later, in 1854, Knight recycled passages of the series in another book *The Old Printer and the Modern Press*. More recently, the Librarianship Department at Birmingham Polytechnic published an extract from one of the supplements, and other modern editions followed in 1980 and 1982?. While this publication history attests to the continuing interest and usefulness of the material to a wide range of audiences, none of these reprints has been capable of reaching as large a readership as the original version of the series. Now, however, through the means of newly available technology and an economic scenario radically altered by the possibility of publishing electronically on the World Wide Web, "The Commercial History of a Penny Magazine" is accessible once again to a mass readership.\^18

**Republising the Penny Magazine Electronically**

**Design**

The challenge in translating the four issues of the "Commercial History of a Penny Magazine" into electronic form on the World Wide Web lay in maximizing the advantages of the new medium while simultaneously minimizing the potential disadvantages. We began by making the decision to place the articles themselves at the focal point of the site, with a constellation of secondary resources – such as annotations and an annotated bibliography available to but not overwhelming this primary text.

The "Commercial History" menu is the gateway through which most users enter the site. It contains links to a brief introduction which sketches out the aims of the project, an annotated bibliography of textual resources published from the early 1850s to the present which provide useful background information on the "Commercial History"; and a list of reference works we consulted in compiling the annotations which appear alongside the electronic text. Primarily, however, the Commercial History Menu provides access to the supplemental issues themselves. Through a set of four sub-menus the user can gain access to the four articles either by issue or by page, and view them in two distinct formats: as annotated electronic text and as digital facsimile.

We provide two alternative views to the magazine because of what we consider to be the relative strengths and weaknesses of each method. The annotated electronic text format presents the "Commercial History" as ASCII text with pictures inserted as distinct objects and annotations appearing along the right-hand side of the page. The most immediate benefit of this design is that the text is both searchable and manipulable. Users can quickly find items of interest by using the basic text search function provided in most (if not all) World Wide Web browsers. Also, the text can be resized, copied, and easily edited. The annotations, likewise searchable, provide the reader with glosses on unfamiliar names and terms that appear in the text. Because the annotations appear immediately adjacent to that portion of the text to which they pertain, readers do not have to significant disrupt their reading as they would if the annotations had been placed at the bottom of the page or on a separate page entirely.

While the annotated electronic text version faithfully presents the entire text of each issue and all the illustrations, together with annotations, it immediately became clear that in the translation from the printed page to the screen something had been lost. That "something" was the materiality of the physical text itself. In order to represent what we could of that materiality on the computer screen we opted to provide digital facsimiles of each page in addition to the annotated text. The digital facsimile (Fig. 1) is an entirely graphical representation of the page – a snapshot, as it were, of the original printing. Since the representation is a graphic object, the digital facsimile pages are neither searchable nor (easily) manipulable, nor do they contain annotations. What they do provide the reader, however, is an accurate representation of the physical aspects of the text, including such attributes as page layout, typography, and, to a limited extent, size and texture of the paper, which would otherwise have been com-

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\^18 It should be pointed out that while the World Wide Web is, in theory, widely accessible and virtually free of charge, it is in fact only a privileged subset of the population that has the computer equipment necessary to gain access to the wide array of materials published there. In addition, while many people are able to access the World Wide Web for free, others must pay fees to an internet service provider. It seems clear that the "claim of free (at least in Knight's words, 'cheap') discrimination of educational materials is necessarily complicated by the direct and indirect vested interests involved in accessing such documents on the World Wide Web."
Preparing the text

The first step in the process of placing the text of the articles into the HTML template for display on the World Wide Web was to scan the text. We used a flatbed scanner to ensure as accurate a “reading” of the textual characters as possible. Once the scanning was completed, we had, in essence, a digital picture of each page of the series. It was then necessary to convert these “pictures” (which are, in fact, graphic objects) into ASCII text—that is, individual characters in a standard, machine-readable format. Only by thus translating the scanned page images from graphical objects into machine-readable code could we enable users of the electronic text to reuse the characters, change fonts, search for key words and phrases, copy, and otherwise manipulate the text.

To perform this conversion, we used OmniPage Pro, an optical character recognition (OCR) program that automates the translation process. Next we followed up with several rounds of proofreading, correcting, and general clean-up of the text. At the conclusion of this stage, we had effectively accomplished through electronic means the task of typesetting, or composing (as well as reading, correcting, and revising), a task which the original producers of the Penny Magazine laboriously performed by hand.

Preparing the images

The process of scanning the images of the “Commercial History” involved three steps. First, we scanned each page of the series using an Apple Color One Scanner with Ofoto software. Each page was scanned in 24-bit color at 300 dots per inch (dpi). At the conclusion of this process contained more digital information than can be displayed on a computer screen or reasonably downloaded through the Internet. These files were used therefore as work files from which the digital facsimiles and individual pictures could be created using Adobe Photoshop 3.0 image-processing software.

To generate the digital facsimiles, we reduced the resolution of the work images from 150 to 72 dpi. Thus users who are viewing these images on a moni-
itor with a 72-dpi resolution are seeing them at their actual size. Next we sharpened the images slightly and saved them using the JPEG compression algorithm to reduce file size. We opted not to edit the files heavily, in order to retain as much of the appearance of the original artifact as possible. Hence the slight yellowing of the paper is retained, if a bit exaggerated, in the scanned version. In addition, the bound magazine was warped and could not come into contact evenly with the scanning surface. This introduced an interesting electronic artifact: hands of darkness and lightness that do not appear in the physical magazine do show up in the scanned image. A more authentic, if equally serendipitous, effect reproduced through scanning is apparent upon close examination of the digital facsimile: the ghost of the type which was impressed onto the reverse side of the page is clearly visible. This effect, which is also evident upon examining the material object, tells us something of the conditions of its production, indicating that the pages were imprinted through the process of hot stereotype printing, a technique used for a short while in the early 1800s.

For the third step in the image digitizing process — that of creating graphics files for the illustrations that appear in the series — we again started with the work files, cropping out each illustration and saving it as a separate file. Because our priority here was to present a clear and faithful representation of the original wood engraving, we discarded the unnecessary color information, edited out the dark bands described above, and again reduced the resolution to 72 dpi. We saved these files as interlaced GIFs, a format developed by CompuServe to create smaller 8-bit graphic files for delivery online. The interlacing effect allows the images to display incrementally on the computer screen: the entire image appears blurry at first but then sharpens successively as more of the file downloads, so that the overall effect is rather like looking through the viewfinder of a camera while adjusting the focal distance of the lens. We used similar scanning and image-editing techniques to create the navigation buttons, masthead, and other graphic elements that appear on the "virtual" pages of "The Commercial History of a Penny Magazine".

Creating the Template

When it came to encoding the HTML to present this digitized information on the World Wide Web, we found it useful to create a set of two HTML templates which prescribe how the annotated electronic text and digital facsimile pages will display on the screen. Each template contains encoded information that determines the design elements that are to remain consistent from one page to the next. Information that is particular to a given page, such as the text and graphics that are to appear, can be inserted into the design framework that is defined by the template. In the annotated electronic text template, for example, the buttons are defined by the template itself, but it is necessary to encode them properly so that when the user clicks on them the appropriate actions occur. In addition, certain locations in the template are designed to contain the primary text while others contain the annotations. While the process of creating each page involved more than merely dropping the information into the correct place in the document, the templates made implementation of the design relatively straightforward and also helped to establish a consistency of interface from one page to another.

The End Result

This project is not yet completed, mainly because a project such as this one is always inherently unfinished. An electronic publication is necessarily an open endeavor which can always be expanded to make room for new information, new links, new technologies, and new contexts. In addition, it can be modified in response to the critical and informational feedback we receive from our virtual audience. What we have described on these pages, then, might appropriately be called Version 1.0 of "The Commercial History of a Penny Magazine".

Coda

Describing the process of paper-making in Part I of the "The Commercial History of a Penny Magazine", Charles Knight writes:

The material of which the sheet of paper which the reader now holds in his hand is formed, existed, a few months ago, perhaps in the shape of a tattered book, whose sheets, exposed for years to the sun and wind, covered the study room of the shepherd watching his sheep on the plains of Hungary; or it might have formed part of the coarse blue shirt of the Italian sailor, on board some little trading vessel of the Mediterranean; or it might have pertained to the once tidy cap of the neat straw-plater of Tuscany, who, on the eve of some festival, when her head was intent upon gay things, condemned the garment to the sturdy mendicant of Leghorn; or it might have constituted the coarse covering of the lock bed of the farmer of Saxony, or once looked bright in the raiment Adolphus of the burger of Ham-
burgh; or, lastly, it might have been swept new and unworn, out of the vast collection of the streets and patches, the hussian and buckstain, of a London tailor, — or might have accompanied every revolution of a fashionable coat in the shape of lining — having travelled from St. James's to St. Giles's — from Bond Street to Monmouth Street — from Rag Fair to the Dublin liberty — till man discovered the vesture, and the kennel-sweeper claimed its miserable remains. (our emphasis)

That "material" referred to in the first line of this passage, to which Knight could assume his readership had direct, tactile access, and which he so deftly uses to evoke the material conditions of its production, is something that is necessarily sacrificed in the translation to digital form. Though it is possible to represent the text visually, the feel — the smell — the sound of the leaves slipping through the fingers — these sensations are not digitally representable, at least not at the present time with current technologies. In a sense Knight's textual object, which is both the carrier of the fruits of knowledge and the product of the knowledge he "diffuses", can only be represented incompletely and imperfectly in the realm commonly known as "cyberspace". Yet, even when we take into account the very real issue of popular access to World Wide Web technologies, it is only within this realm that the broad and inexpensive diffusion of the "Commercial History" is even possible in the late twentieth century. As Knight stated,

"By a society which has undertaken the task of contributing, as far as lies in its power, to the diffusion of useful knowledge, no means should be neglected by which instructive amusement can be afforded... The channel, then, is open. Through its course must flow much of the information conveyed to the minds of a large and increasing class of readers. We are called upon to pour into it, as far as we are able, clear waters from the pure and healthy springs of knowledge. That duty we will not neglect, in the attempt to fulfil it we think that we ought not to fail."

9 Knight: Commercial History, p.379.
10 Knight (new note s), p.8.