

Historical Studies of Technical Communication in the United States and England: A Fifteen-Year Retrospection and Guide to Resources

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Abstract—Not only have historical studies of technical communication increased in quantity and quality over the last 15 years, but they have also entered the mainstream of technical communication research. These studies have focused on practitioners, artifacts, genres, movements, techniques, events, and the profession, as well as relevant methodology and pedagogy. There are still many opportunities for historical research in our discipline, particularly in the areas of chirographic, oral, and nonverbal communication as well as technical communication activities such as illustrating, translating, and editing and the business of technical communication. Researchers now have many online indexes, databases, and archives to assist them in locating and studying primary sources. There is a need, however, for greater coordination among scholars and a better awareness of the areas that have already been studied. Historical studies can serve teachers and practitioners by suggesting ideas, supplying precedents, creating critical distance, and establishing context.

Index Terms—Bibliography, historical studies, literature review, primary sources, retrospection, technical communication.

In its first 50 years, IEEE TRANSACTIONS ON PROFESSIONAL COMMUNICATION (T-PC) has published only a few historical studies of technical communication, but one of those was particularly useful: Jennifer J. Connor's "History and the Study of Technical Communication in Canada and the United States," published in March 1991 [1]. At a relatively pivotal point in time, when historical research was about to come of age in our discipline, Connor's article offered a retrospection of and a guide to historical research in technical communication. In the same year, 1991, Rutter published his well-known article on "History, Rhetoric, and Humanism" in the *Journal of Technical Writing and Communication* (JTWG) [2]. In the following year, 1992, Tebeaux and Killingsworth published their article on historical methodology in *Technical Communication Quarterly* (TCQ) [3], and Neeley published an article on the "Woman as Mediatrix" in T-PC [4]. These last three articles are among the most frequently cited sources in technical communication scholarship [5]. In 1994, Rivers published the first edition of his important bibliography of historical studies in the *Journal of Business and Technical Communication* (JBTC), and in his preface he describes Connor's article as "significant" because it identifies tools that make a

"rich array of primary materials easily accessible to researchers" [6, p. 9].

After summarizing three literature reviews of her subject, Connor identifies "both untapped resources and recently developed tools to mine them" [1, p. 5], then presents two illustrations of how these resources and tools might be used in historical research. She concludes her article with a discussion of the role of history in technical communication teaching and research. After a "decade . . . of both historical studies and research guides to them" [1, p. 3], Connor was attempting to connect the past, present, and future of historical research in technical communication, arguing that North America is a particularly fertile ground for this type of research. It is not clear whether her article directly influenced scholars in the field, but it is clear that since then historical research has entered the mainstream of technical communication research. Since 1992, the National Conference of Teachers of English has been offering an annual award for "Best Article Reporting Historical Research in Technical or Scientific Communication." Book-length studies of historical subjects in technical communication have been appearing with regularity since 1995. Universities such as mine are offering upper-level courses in the history of technical communication as part of their technical communication programs, and foundational textbooks such as *Central Works in Technical Communication* have sections devoted to historical studies [7]. There has even been a special issue of TCQ on the historical contributions of women to technical communication [8].

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In this paper, I will try to pick up where Connor left off and offer a retrospection of the past 15 years of historical research in technical communication and a guide to recent tools for accessing primary materials. Not only is my paper an updating of Connor's—though I shift the focus from Canada and the United States to the US and England to reflect the trend in recent scholarship—but it is also a supplement to Rivers's 1999 revision of his bibliography [9]. The list of references at the end of this article is a fairly complete bibliography of historical studies in technical communication from the beginning of 1992 to the end of 2006. Although 20 different periodicals are represented in my bibliography, I privilege the top five technical communication journals in my selection: *T-PC*, *JBTC*, *TCQ*, *JTWC*, and *Technical Communication* (TC). I do not attempt to distinguish technical communication from scientific communication, but I omit most studies of business writing history (e.g., [10], [11]) unless they are also relevant or instructive to the history of technical communication. Any such compilation, of course, involves “considerable judgment on the part of the compiler” [12, p. 1]. As Connor did in her article, I offer examples and suggestions for future historical studies and identify some of the uses of historical studies in technical communication.

REVIEW OF LITERATURE, 1992–2006

Connor identifies two general types of historical studies in technical communication: (1) those that focus on “literary and philosophical authors and their technical discourse,” and (2) those that focus on “the documents themselves” and “technical writing features” [1, p. 3]. These categories, while still valid, are no longer sufficient to encompass the diversity of historical studies being done in technical communication. Consequently, later scholars have added categories to Connor's. Kynell and Moran, for example, identify the following seven categories of historical studies: (1) Historical Models for the Classroom (“pieces of technical writing” for emulation); (2) Studies of Individual Technical Communicators (mainly “celebrated authors and scientists”); (3) Curricular Histories (of textbooks, courses, and/or instructional practices); (4) Histories of Rhetorical Strategies (i.e., the rhetorical practices or theories of particular periods); (5) Corporate and Government Communication Histories (both synchronic and diachronic); (6) Case Studies of Specific Events (e.g., Three Mile Island and the Shuttle disaster[s]); and (7) Genre Studies (i.e., studies of “types of technical and scientific

discourse”) [13, pp. 2–10]. The 14 categories that Rivers uses in the preface to his bibliography suggest how difficult it is to classify historical studies [9]. In my literature review, I use seven categories (some borrowed from the above writers), with the disclaimer that the categories are seldom mutually exclusive and ultimately not adequate to contain the abundance, diversity, and complexity of recent historical studies.

TYPES OF STUDIES

Practitioners During the past 15 years, technical communication scholars have continued to show interest in the technical discourse of famous individuals, such as Geoffrey Chaucer [14], Herbert Hoover [15], Albert Einstein [16], [18], and Thomas Edison [17], but they have also begun to show interest, appropriately, in the works of lesser-known figures whose primary legacy is their technical discourse. For example, Brockmann discusses the techniques and strategies employed by an early 20th-century technical writer in books on aviation and automotive technologies [19]; Lippincott examines a 19th-century chemist's communication about the domestic arts and food sciences [20]–[23]; Shirk examines rhetorical techniques in the botanical writings of two 19th-century scientists [24]; and Tolbert analyzes the persuasive strategies in the correspondence of an early 17th-century observational astronomer [25]. Overall, there has been a shift from studies of well-known to lesser-known figures and an increased interest in women as technical communicators. Even when they focus on famous men, however, the studies are different from their counterparts in the 1980s, offering more sophisticated insights into the ideological underpinnings of the communicator's discourse. For example, Sauer analyzes Hoover's *Principles of Mining* in light of his earlier translation of Agricola's 16th-century treatise on mining and shows “how technical documents reflect the political ideologies of their writers” and the effects those ideologies have on technology use [15, p. 269]. (For additional studies of individuals, see [26]–[41].)

Technical communication scholars have also shown interest in the communication of groups, such as families, corporations, agencies, and other discourse communities. These kinds of studies were not uncommon before the 1990s (e.g., the many articles about the discourse of the Royal Society), but they seem to have become more common. For example, Haller explores the role that report

writing played in the valuation of work by early 20th-century American canning clubs [42]; Madaus critiques the technical writings of the women who helped to found the field of health and safety communication in the early 20th century [43]; and Adkins analyzes the wilderness metaphors of Harrington Expedition members in light of changing public attitudes toward the wilderness [44]. Interest in the discourse of the Royal Society remains strong (e.g., [45]–[47]). Other studies have focused on the communication of glacial geologists [48], the Greater St. Louis Citizens' Committee for Nuclear Information [49], and three engineers employed by George Washington during the American Revolution [50].

Artifacts A study of an individual author may also be a study of an individual work (e.g., [14]), but the artifact study is usually concerned with a work (not always a text in the strictest sense) as a model of effective communication employing time-honored strategies and principles (e.g., [51]) or as a theoretical influence on future technical communication (e.g., [52]). The artifact might also be proffered as a negative example (e.g., [53], [54]). In two studies of famous works, Longo examines the place and influence of Agricola's book on mining in the history of technical communication [55] and discusses Vitruvius's application of Ciceronian rhetoric in his book on architecture [56]. Also focusing on famous works, Moran critiques the rhetorical effectiveness of three 16th-century artifacts of the Virginia project: (1) the Harriot-White-de Bry map of Virginia [57], (2) Arthur Barlowe's 1584 report on Virginia [58], and (3) Ralph Lane's 1586 report on Virginia [59]. Longo's and Moran's studies are far more theoretical and academic than earlier studies of artifacts, such as those found in the "Models for Technical Communicators" section of TC in the early 1980s (e.g., [60]). Tebeaux comments on this putative evolution from "the pragmatic and the applied to the arcane and the academic" [61, p. 22]. Nevertheless, the quality of the work has been high even when not immediately applicable to the concerns of practitioners. In a book-length study, for example, Brockmann meticulously chronicles the ill fate of a technical report that became an unsuccessful piece of legislation in antebellum America [62]. (For additional artifact studies, see [63]–[65].)

Genres Genre studies are still a dominant concern of historical research in technical communication. These types of studies either look at the development of a genre, as Atkinson does

with medical writing in one journal [66], or at the characteristics of a genre in a particular period, as Moran does with 16th-century English commercial reports [58], [59], [67]. Responding to Rohan's article on sewing patterns and computers [68], Durack theorizes about the evolution of paper sewing patterns as a genre [69]. Williams presents a rhetorical and historical analysis of the Texas Black Codes to elucidate current audience responses to a genre of regulatory writing [70]. Zachry looks historically at one company's development of genres such as memoranda, manuals, and bulletins to communicate with employees at remote locations [71]. There have been historical studies of ornithological discourse [72], [73], scientific articles [74]–[76], EMS run reports [77], French medical discourse [78], ethnological papers [79], Canadian medical pamphlets [80], patents of invention [81], and popular media representations of nanoscience [82]. Most of Tebeaux's studies are surveys of writers and works for the purpose of probing genres, movements, and/or strategies in the history of technical communication, usually focusing on women writers of the early modern period in England [83]–[90].

Movements This category includes shifts, trends, and developments that may have exerted an influence on the history of technical communication. Kynell and Moran's collection of historical studies is organized around key individuals and movements, both American and European, from the 16th to the 20th centuries [13]. The essays in their collection examine such movements as advances in surveying instruments and technical illustration [57], the emergence of women as technical writers [86], the computer revolution [91], the Civil Rights movement, the perpetuation of humanism, and the rise of social constructionism [92]. In a more recent book chapter, Kynell-Hunt argues that we can better inform our effort "to create disciplinary status and legitimacy" by studying the late 19th-century movement to professionalize engineering education in the United States [93, p. 53]. Longo organizes her book-length study of technical writing history around five intellectual trends, from the quest for "maximum efficiency of production and operation" to the "redemptive urge to purify language and standardize practice" [94, p. xiv]. Other movements include the development of human factors as a discipline [95], the rise of the plain style in scientific and technical writing [85], [89], "the development of hypertext" under the influence of romanticism [96, p. 13], and the post-1960 shift in attitude away

from empirical research on writing [97]. (See also [98]–[101].)

Techniques Technical communication scholars have long been interested in the historical use of rhetorical and grammatical techniques, particularly in scientific discourse. This scholarly interest can be seen in Ding, who argues that “the adoption of passive voice and the impersonal active subjects in scientific discourse” was a product of the same historical forces that caused journals to replace books as “the major means for scientific publication” [102, p. 127]. Writing on a similar topic, Little analyzes the suppression of human agency in 12 articles published in the *Journal of Experimental Education* between 1932 and 1944 and concludes that the authors achieved the “Peter Effect” mainly by using passive voice, nominalization, and personification [103]. Ben-Chaim offers another historical study of the rhetorical construction of objectivity [104]. It is not always easy to distinguish historical studies of movements from historical studies of stylistic techniques or strategies. Shirk, for example, traces the evolution of metaphors used to describe depression from classical times to the present [105]. Kynell and Moran treat her article as a study of a movement [13], but it is also a study of a rhetorical technique. Similarly, Connor’s article about the use of plain language in 19th-century Canadian medical works might be treated as a study of a rhetorical strategy or a movement [106].

Events An event might be a protracted legal dispute over allegedly libelous technical prose [107] or a political debate about the sale of a landfill [108]. More often, though, it is a tragedy resulting from a technological failure or natural disaster, such as the two space shuttle accidents, in which communication played a key role. The Challenger disaster was a topic of interest to technical communication scholars before 1992 (cf. [13, p. 289]) and continues to be a topic of interest [109]–[112]. In a recent article, Dombrowski compares reports of the 1986 Challenger disaster with reports of the 2003 Columbia disaster and concludes that “technical communication scholars, teachers, and practitioners are having a broad, humanizing impact throughout the technological world” [113, p. 250]. (See also Dombrowski’s paper in this issue of T-PC.) Along the same lines, scholars have already begun to explore the communication implications of 9/11 [114], [115] and are poised to do the same with the Asian tsunami and Hurricane Katrina. Writing about the tsunami, Romano reminds us of “the importance of technical communication in saving lives and avoiding

disasters” [116, p. 1], while Hayhoe, writing about Katrina, notes that “we technical communicators have a social responsibility to help ensure the safety and security of our neighbors” [117, p. 415].

The Profession Scholars have used textbooks to try to understand our pedagogical past. Warren, for example, investigates the early teaching of technical writing by surveying 46 technical writing textbooks published between 1908 and 1970 [118], while Hagge attempts to explain the ideas about language use in 20 early engineering writing textbooks [119]. Kynell evaluates five editions of John M. Lannon’s *Technical Writing*—“a fine mirror with which to reflect our recent history as a field” [120, p. 49]. Longo’s cultural history of technical writing is partly based on her analysis of old textbooks [94]. Other scholars have turned to the histories of university programs and curricula for insights. In their book-length curricular histories, Adams discusses the emergence of creative writing, journalism, and “professional” writing as specialized topics within English programs [121, see esp. ch. 7], while Kynell traces the evolution of technical writing in American engineering programs over a 100-year period, relying heavily on information from the proceedings of the Society for the Promotion of Engineering Education [122]. The latter book’s epilogue—a reprint of an article by Staples [123]—presents an overview of changes in technical communication education after 1950. Other studies have discussed the teaching of “engineering publicity” at MIT in the 1920s [124] and analyzed the historical debates surrounding certification in technical communication [125].

Scholars have continued to document the histories of our organizations and journals: JBTC on its 16th anniversary and the occasion of a change in editors [126]; SIGDOC on its 20th anniversary [127]; JTWG on its 25th anniversary and the occasion of a change in editors [128]; ATTW and its journal TCQ on their 13th anniversary and a change in editors [129], [130]; the Society for Technical Communication (STC) and its journal TC on their 50th anniversary [131]–[133]; and T-PC on its 50th anniversary (the present issue). The obituaries of pioneer educators and scholars such as Frank R. Smith [134] and Herman Estrin [135] offer additional information about the histories of these organizations and journals. Pearsall and Warren provide a 20-year retrospection of the Council of Programs in Technical and Scientific Communication (CPTSC) [136]. There has even been some interest in the histories of awards—for example, the CCCC Outstanding Dissertation

Award in Technical Communication [137], the Frank R. Smith Outstanding Article Award [138], and the Joseph T. Rigo Award [139]—and the founding of an electronic discussion list, TECHWR-L [140]. A group in the United Kingdom is reportedly working on a comprehensive history of that country's Institute of Scientific and Technical Communicators [141]. Teachers and practitioners alike might benefit from a book-length history of technical communication organizations, including STC and the IEEE Professional Communication Society (PCS), which began as the IRE Professional Group on Engineering Writing and Speech (PGEWS).

Several recent historical studies have focused on the relevant technologies and technology use in technical communication. Durack, for example, traces the evolution of text-producing tools, noting that “[t]he tools we use are intimately connected with our roles as technical communication professionals and as teachers of technical communication” [142, p. 571]. Her study includes a helpful timeline as an appendix. Writing for technical communicators, Goldfarb gives a first-hand account of the history of generalized markup language, especially SGML [143], while Brockmann examines the history of anthropomorphic technology, such as Microsoft’s *Bob* [144]. In his review of the early history of photography, Wickliff discusses the development and dispersion of various photographic technologies, from the heliograph to the daguerreotype, suggesting that this information can elucidate recent technologies, such as digital image formats, high-definition television, and MRIs [145]. Other scholars have focused on technology use and its implications. Selfe and Hawisher, for example, examine technical communicators’ acquisition of computer literacy during the last quarter of the 20th century [146], while Johnson-Eilola, Selber, and Selfe explore the intersection of technical communication and computer technologies from four different perspectives: pedagogical, rhetorical, spatial dynamic, and critical [91].

ESSAYS ON METHODOLOGY AND PEDAGOGY

The last 15 years have also produced several articles on methodology and pedagogy—that is, methods for conducting historical research and approaches to teaching the history of technical communication. For example, Tebeaux and

Killingsworth suggest a historiography of technical writing that consists of the following steps:

- (1) Look for technical writing as it exists in particular periods.
- (2) Examine technical writing as it reflects the period in which it was written.
- (3) Examine as many forms of technical writing as practicable.
- (4) Determine how technical writing differed from other forms of writing of the period. [3, p. 27]

Tebeaux employed this historiography to good effect in the writing of her 1997 book about Renaissance technical manuals [83]. Connor offers a five-step method for approaching historical medical texts:

- (1) Establish originality for historical textual analysis.
- (2) Adopt an authoritative text for analysis.
- (3) Understand the genre or form of a historical text.
- (4) Understand the intellectual or social context for a historical text.
- (5) Understand the publishing and readership context of a historical text. [147, p. 212]

This historiography arose out of a fascinating scholarly debate with Jo Allen about historical methodology [148]–[150]. Dillon advocates applying New Historical methodology to the history of business and technical writing “to enable [students] to frame more usefully the writing they produce and receive in terms of power, authority, culture, and economic necessity” [151, p. 72].

In the current century, scholars concerned with research methodology have emphasized the practical as well as the theoretical value of historical research. Battalio, for example, offers a ten-step method for studying published articles in scientific and technical journals of the 19th and 20th centuries, but he points out that his approach is valid for “other forms of discourse and other time periods” [152, p. 21]. The chapter by Kynell and Seely in *Research in Technical Communication* explains the value of historical research for practitioners and gives a step-by-step illustration of how it might be done [153]. Noting the lack of pedagogical applications of historical research, Todd prescribes four guidelines for using historical materials in the American technical communication classroom:

- (1) Maintain a continued research interest in teaching history.

- (2) Limit to technical rather than scientific discourse.
- (3) Focus on English-language texts.
- (4) Focus on American texts, authors, and practice. [154, pp. 69–72]

Finally, in a published version of an earlier conference paper, Shirk gives information and advice to practitioners (and teachers of future practitioners) for accessing and using materials in corporate archives. She explains that corporate histories can help practitioners diagnose flaws in current communication products, solve communication problems by analogy with older companies' problems, and understand the traditions that underlie current practices [155]. (See [156]–[158] for additional theoretical discussions.)

PRIMARY SOURCES FOR HISTORICAL RESEARCH

Writing just a year after Connor [1], Tebeaux and Killingsworth noted the difficulty of locating and accessing technical documents from earlier periods: "Many documents are not readily accessible. Indexes ... are limited" [3, p. 7]. The situation has improved a great deal since then, and no doubt it will continue to improve over the next decade. Not only are many texts now available as page images and accessible directly from your office or home computer, but many of them are also fully searchable. The collections described below are some of the most important ones. The documents fall into two categories: published and unpublished. The published documents include printed books, pamphlets, and broadsides that in many cases have been converted from microform to digital formats. The collections of unpublished documents are being digitized directly from the originals and made available to remote users for the first time. Even when a collection is accessible only through an index at this time, copies of the documents can usually be ordered online and received via the internet in a matter of hours or days. Although you may have to pay a steep price for access and service, particularly if you are not affiliated with an academic institution that has a large library, you do not have to travel to archives or struggle with reels of microfilm as often.

Tebeaux did not have the benefit of Early English Books Online (EEBO) when she was doing the research for her 1997 book [83]; she had to rely on microfilm copies and printed facsimiles in Da Capo Press's English Experience series. EEBO offers page images of approximately 100,000 volumes, including multiple editions of some

works, all printed between 1475 and 1700 [159]. If you are interested in the history of technical marketing communication, for example, you can download Joseph Moxon's instructional manuals for instruments such as the Copernican sphere and the mathematical jewel. These publications (e.g., STC M3027bA) were designed to promote the products that were on sale at his shop in late 17th-century London. See Bryden for the research possibilities in this area [160]. You can download and compare medical almanacs (e.g., STC A1844), math textbooks (e.g., STC 10560), books on beekeeping (e.g., STC 4192) or fireworks (e.g., STC W1792), technical proposals (e.g., STC 1801), or books copiously illustrated with technical drawings (e.g., STC 17572). The ready availability of printed texts from early modern England may account for the fact that there are more historical studies of the technical communication of this period than of any other period [151]. Although you cannot search the EEBO page images, you can search text versions of some titles. The Text Creation Partnership is in the process of converting 25,000 EEBO titles to fully searchable files. EEBO's counterpart for the next century, Eighteenth-Century Collections Online, offers full-text access to approximately 150,000 volumes, every page of which is searchable [161].

When Connor wrote her article in the early 1990s, *Early American Imprints, 1639–1800* (also known as the Evans collection) was still a microprint collection [1]; now, of course, it is available online. Its vendor, Readex, touts it as a collection that contains "virtually every book, pamphlet and broadside published in America over a 160-year period" [162, p. 1]. The approximately 36,000 digitized volumes include many works that were not previously available on microform. Although it includes many literary works, such as novels, plays, and poems, it also includes volumes of interest to technical communication scholars, such as medical works, cookbooks, textbooks, manuals, scientific treatises, catalogues, and ephemera of various kinds. If you are a teacher interested in technical marketing communication, you can download a PDF version of Benjamin Franklin's 1744 pamphlet on Pennsylvanian fireplaces and examine it as a precursor of the modern white paper (see [163]). In his *Autobiography*, Franklin states that he wrote the pamphlet to "promote that Demand" for the product [164, p. 191]. For a different view of this artifact, see Todd [154], who also recommends it for classroom use. Series I of *Early American Imprints* is complemented by Series II: *Early American Imprints, 1801–1819*, also known

as the Shaw-Shoemaker collection. Both resources allow searching by author, genre, subject, printing history, place of publication, and language [165].

Another database, Thomson-Gale's *Sabin Americana, 1500–1926*, is a digital collection of nearly 30,000 works about America, based on the work of Joseph Sabin, a 19th-century bibliographer [166]. This database is a particularly rich source of American scientific and technical documents. Here you will find PDF copies of books such as *The American Silk Grower and Farmer's Manual* (c. 1838; Sabin 81013) and *The Gold-Seeker's Manual* (1849; Sabin 1647), as well as reports of 19th-century mining companies, railroads, and municipal committees, including quite a few feasibility studies. You can download a civil engineer's 138-page *Report Made to the Water Committee of the Common Council of the City of Brooklyn, April 15th, 1852, on Supplying the City with Water* (Sabin 42933). Likewise, Thomson Gale's *The Making of the Modern World, 1450–1850*, based on the Goldsmiths-Kress Library of Economic Literature, contains many works of a technical nature, including manuals, reports, and proposals [167]. Among the 61,000 works in this database are 168 works on engineering, 206 works on accounting, 309 works on agriculture, 96 works on medicine, and 63 works on navigation—everything from the first edition of Georg Agricola's *De re metallica libri xii* (1556; Goldsmiths-Kress 63.0-1 suppl.) to a 19th-century engineer's report on Indian river navigation (1849; Goldsmiths-Kress 36280).

Formerly called PROCAT, the Catalogue of the British National Archives offers information about millions of public records dating from Medieval times to the present [168]. When you locate a record you want, you can visit the archives in southwest London to inspect it, or you can purchase photocopies or digital scans via the internet. The benefit of receiving digital scans in PDF is that you can enlarge the page images to decipher the text of handwritten documents. The British National Archives is a largely untapped source of chirographic technical communication, especially technical proposals and reports. For example, there is a 17-page proposal c. 1576 for a fortification on the Anglo-Scots border (SP 59/42) along with a drawing that presents a bird's eye view of a small fort (MPF 1/146). There are 17th-century proposals for coining tin farthings (PRO 30/24/34/23), draining and cleaning a dock (ADM 106/485/128), and rebuilding the Royal Mews in Westminster (WORK 30/6465/5-7), as

well as technical reports by Sir Anthony Deane on tests done to determine the strength of ropehouse cordage (ADM 106/298) and by John Shish on the detonation of an underwater chest to destroy a ship (ADM 106/305). Tebeaux illustrates the value of studying these kinds of documents by analyzing Elizabeth Cellier's *A Scheme for the Foundation of a Royal Hospital*, presented to King James II in 1687. Cellier's proposal, purportedly the first of its kind written by a woman, was not published in its own day, though it has been published several times since the 18th century [86, pp. 115–116]. Unpublished documents may tell us more about the technical communication of previous ages than published documents.

As a complement to PROCAT, the National Register of Archives provides information about the content and locations of documents in collections around the British Isles [169]. You may search or browse the register by personal name, family name, place name, and, most importantly, corporate name. If you do a personal-name search for the 19th-century electrical engineer Charles Vincent Walker, the earliest of three people explicitly identified as technical editors in the *Oxford Dictionary of National Biography* [170], you will discover that some of Walker's letters are located in the Royal Astronomical Society Library (GB/NAF/P29529). If you do a corporate-name search for the East India Company, you will find that the British Library has the company's correspondence from 1611 to 1644 (MSS 2086, 2122-23). Oxford's Bodleian Library has company papers from the 18th century, and the Tower Hamlets Local History Library and Archives has company records, such as account books, from the period 1817–1870 (TH/8367). The London Metropolitan Archives not only has the business records of an 18th-century surveyor named George Peper (Q/STB), but also has the books and papers of the New River Company, a public utility founded in 1619 and dissolved in 1902 (ACC/1953). The Hackney Archives Department in London has the papers of the distilling business of J. & W. Nicholson from the 1730s onward (D/B/NIC/1). Scholars of the history of professional communication have already begun to take advantage of such collections. Richardson, for example, offers a study of the Gawdy Papers over two and a half centuries. Although he is more concerned with business writing than technical writing, his article illustrates the kind of study that can be done from family or corporate papers in archives [171].

Similar online databases are available for archival materials in the US. An important one is the Archival Research Catalog (ARC) of the US National Archives and Records Administration (NARA) [172]. Using a search engine that permits searching by keyword, location, date, and type of material, you will find digital images of reports that were part of the federal response to the 1906 San Francisco earthquake (ARC 296616 et seq.), drawings from the 1940s of an electrical door locking and operating device for Alcatraz prison (e.g., ARC 296683) and plans for modernizing the prison (e.g., ARC 596298), and a 1948 comic book titled *Adventures Inside the Atom* (ARC 281568), created by the Atomic Energy Commission in cooperation with General Electric to educate children about atomic energy. NARA's main office is in Washington DC, but it has many branch offices. For example in Missouri, in addition to the Harry S. Truman Library in Independence, NARA has offices in Kansas City and St. Louis. Only a small fraction of NARA's archival holdings have been digitized for online access, but the process is ongoing. There are many other government archives that are not specifically affiliated with NARA, and many of these have online collections, such as the Library of Congress's American Memory, which includes the papers of Samuel F. B. Morse and Alexander Graham Bell, and the Online Digital Special Collection of the US Department of Transportation (DOT), which includes aircraft accident reports, 1934–1965, and railroad investigation reports, 1911–1966. Making use of the latter collection, Brockmann examines the evolution of a discourse community of coroners, investigators, and experts whose relationships influenced the development of a genre of investigation reports [173].

The USPTO Patent Full-Text and Full-Page Image Database offers three search options for pre-1975 US patents: issue date, patent number, and classification [174]. You can view images of the patents for famous inventions such as Eli Whitney's cotton gin (No. X0000072, hand-written, 14 Mar. 1794), Thomas Edison's electric lamp (No. 223,898, 27 Jan. 1880), and the Wright Brothers' flying machine (No. 821,393, 22 May 1906)—which have been available in print and online for several years—but you can also access the patents of less famous inventions such as A. McCormick's automatic toaster (No. 1,329,421, 3 Feb. 1920) and M. Cusick's electric knife (No. 1,658,884, 14 Feb. 1928). Other documents, such as ex-parte and inter-parte records related to successful patents, may be obtained from the USPTO or NARA.

Technical communication scholars have long recognized the value of patents as artifacts and have been doing research in this area during the past 10 years. For example, Brockmann presents a stylistic analysis of patents from 1795 to 1980 [81] and has written about patents in other contexts. Likewise, Durack analyzes the persuasive strategies used in 19th-century washing-machine patents [175]. In a later article, she discusses the opportunities for research in patent repositories and offers a guide to this kind of research [176]. Most recently, she has examined the litigation surrounding the patent of Hannah Millard's 1919 sewing pattern for Butterick and considers the implications of this litigation for technical communicators [177]. For additional studies by Durack, see [178] and [179].

Shirk's article about conducting research in corporate archives has already been mentioned [155]. For those interested in this kind of research, a good starting point is the *Directory of Corporate Archives in the United States and Canada*, now online in a fifth edition [180]. It identifies companies that maintain their own archives as well as those that contract the work out, including trade associations such as the Texas and Southwestern Cattle Raisers Association. Each listing provides contact information, terms of access, and a brief description of the holdings. The material in Daimler Chrysler's product history archives, for example, includes "brochures, price lists, owner's manuals and operating instructions, replacement part catalogues, workshop literature, technical drawings, documentation material and test reports" [181]. Researchers may access the archives for specific projects as long as they follow reasonable guidelines [182]. Some corporations, such as Intel, are making their historical records available online [183]; those records that are not immediately available can be requested [184]. IBM has made similar resources available to the public and invites visits and requests from researchers [185]. You might also consult one of the many guides to archival research in specific industries (e.g., [186]).

The studies by Atkinson [46], Battalio [73], Harmon [74], and others [75] illustrate the kinds of historical studies that can be done with journals. Complete runs of many journals are available online. For example, PubMed Central (PMC) offers free access to scores of journals in biomedicine and life sciences [187]. Researchers can explore 19th-century issues of the *Transactions of the American Ophthalmological Society* (1865–2005), *Journal of Physiology* (1878–2006), and *Annals of Surgery* (1885–2006), as well as early 20th-century issues

of *California State Journal of Medicine* (1917–1924) and *Genetics* (1916–2006)—to name just a few. Other journals are accessible through subscription services, such as the non-profit organization Journal Storage (JSTOR), which offers access to journals in many disciplines, such as biology (e.g., *American Naturalist*, 1867–2000), mathematics (*American Mathematical Monthly*, 1894–2002), geography (*Journal of the Royal Geographical Society of London*, 1831–1880), and psychology (*American Journal of Psychology*, 1887–2002) [188]. The JSTOR database also includes an almost complete run of the London Royal Society's *Philosophical Transactions* (1665–1995). A valuable tool for locating historical scientific and technical literature is *Inspec Archive*, a fully searchable digital collection of abstracts published in science abstract journals, such as *Physics Abstracts* and *Control Abstracts*, from 1898 to 1968. Here you will find abstracts of journal articles written by Albert Einstein, Guglielmo Marconi, Max Planck, Marie Curie, and many other scientists [189].

Finally, there is a great deal of work to be done on the history of professional organizations and journals in technical communication. In recent years, several relevant collections and archives have been established. In 1998, for example, William C. Stolgitis, long-time executive director of STC, donated a collection of STC records to the University of North Carolina [190]. MIT has a similar, though much smaller, collection of records related to the Boston chapter of STC [191]. In the 1950s, the Boston chapter was created out of the remains of Boston's Society of Technical Writers (STW), one of STC's founding organizations. STW's journal, *Technical Writing Review* (1954–1957), is available on microfilm in more than 20 libraries in the US. Columbia University has a complete run of the rare *TWE Journal* (1955–1957), published by the Association of Technical Writers and Editors (ATWE), another STC founding organization which merged with the Boston group in 1957. Columbia University also has several issues (March–November 1955) of the newsletter of the Society of Technical Writers and Editors, which in 1955 became ATWE's first chapter, now the New York City chapter of STC. The Library of Congress is the only library that has some issues (1957–1958) of *Technical Communications*, the journal of the Technical Publishing Society, which is another founding organization of STC. Archived materials of the CPTSC are located in the Elmer Andersen Library at the University of Minnesota, where one of its founders, Thomas Pearsall, taught for many years

[192]. Texas Tech University is reportedly collecting papers for an ATTW archive. Those interested in the history of IRE-PGEWS/IEEE-PCS should contact the IEEE History Center at Rutgers University.

THE FUTURE OF HISTORICAL STUDIES IN TECHNICAL COMMUNICATION

Todd notes the growth in quantity and maturity of historical studies since Rivers's bibliography in 1999 [154]. Casting a wide net, Rivers managed to locate about 260 studies (journal articles, book chapters, papers in proceedings, and monographs) published between 1930 and 1997 [9]. Since 1998, there have been at least 50 historical studies published in the five major technical communication journals alone. JTWC and TCQ have been the most hospitable to historical studies. While studies of individual writers and works continue to be prevalent, scholars are beginning to explore new terrains in technical communication history. For example, calling for more studies of non-print communication, Lippincott discusses Ellen Swallow Richards's multimedia exhibit, the Rumford Kitchen, at the 1893 World's Fair. Lippincott reminds us that technical communication is more inclusive than technical writing and that other forms of communication are worthy of historical study [22]. The following paragraphs offer a few examples of non-print forms of communication that might be studied—and in fact have been studied in a few cases—by technical communication scholars. These examples are not meant to deflect attention from printed technical writing. The history of technical writing should remain central to the historical study of technical communication.

Chirographic Communication Most historical technical writing is chirographic rather than typographic—that is, handwritten rather than printed with movable type. Even after the introduction of the printing press in Europe, “The vast majority of scribes...pursued their chosen career in the courts (both judicial and aristocratic), the chanceries, the archives, and in other offices of government and, so far as it then went, of commerce” [193, p. 24]. These scribes were employed to copy handwritten documents (and sometimes printed documents), and their very existence in post-Gutenberg societies suggests the continued importance of chirographic communication, much of it technical in nature. Such communication was more likely to be used by specific audiences to accomplish specific

goals than print documents were. Few technical communication scholars have worked with manuscripts, perhaps discouraged by the difficulty of accessing such documents and deciphering handwriting. New online indexes, services, and technologies have made the job easier.

Oral Communication One difficulty with researching this form of communication is that it is intangible and fleeting. Until we can find a way to recover the sounds of our ancestors, we will have to rely on secondary sources, such as scripts and transcripts, and perhaps the products created by oral technical communication. From these derivative artifacts, we are able to extrapolate practices of oral technical communication and the values of its practitioners. Some scholars have already done work in this area. Working from an extant script, Brockmann explains Joseph Crane's "Silver Dollar Demonstration" of a cash register in 19th-century America [81, pp. 99–116]. I have used the script and Brockmann's analysis in a technical marketing communication course to prepare students for writing and delivering a technical demonstration of a product [163]. Johnson gleans the "prediscursive" oral communication of early American ironworkers from personal accounts in correspondences [194]. Evidence of oral technical communication is extant from many periods and places. For example, a 16th-century medical student in Italy left an eyewitness account of Andreas Vesalius's public anatomy lectures, which involved audience participation—hands-on learning—in dissections and vivisections [195]. Throughout history, more technical and scientific information has been conveyed by word of mouth than by quill or pen or printing press.

Nonverbal Communication Mazzolini edited a collection of essays about nonverbal communication in the history of science that is a good starting point for researchers in technical communication [196]. The essays cover a variety of historical topics such as the following: astronomical instruments, drawings of machines, textbook illustrations, natural history museums, bird taxidermy and the habitat diorama, anatomical specimens, and medical photography. Overall, though, there is a dearth of historical studies on the use of gestures, props, and displays in technical communication. Nor is it known what roles the senses of touch, taste, and smell may have played historically in the communication of technical information; these senses will certainly play an important role in the future of technical communication. Most historical studies of nonverbal communication focus on visual

communication, such as illustrations in printed books. For example, Brasseur and Thompson look at illustrations in Renaissance medical books [197], while Wickliff considers photographs in 19th-century technical books [198]. (See also [199]–[202].) Historical studies of document design have usually focused on specific genres. Webb and Albers, for example, apply four design criteria in their analysis of a certain type of Medieval religious how-to book [203]. Having written about historical page design before, Tebeaux turns her attention to the formats of Medieval and Renaissance accounting books [88]. Schriver devotes almost 150 pages of her magnum opus to a history of document design [204].

Technical Communication Activities In addition to studies of non-print forms of technical communication, there is a need for historical studies of technical communication activities, such as translating, editing, and illustrating. Kelly has begun this effort by compiling a bibliography of early modern technical translations containing prefatory statements about translation theory [205]. I have written about the technical editing of learned correctors in the printing houses of early modern England [206]. A study of illustrating in early modern Europe might focus on industrial espionage and technology transfer—for example, the 24 extant technical drawings c. 1656 by industrial spy Jean Hindret of William Lee's stocking frame [207]. Certainly it would be valuable to have studies of how technical translators, editors, and illustrators performed their jobs in different periods, their relationships with employers and writers, and the ways in which they viewed their own work. To some extent, these studies would be histories of the business of technical communication, and they would complement the curricular and disciplinary histories that scholars have already written.

THE USES OF HISTORICAL STUDIES IN TECHNICAL COMMUNICATION

A reviewer of one of my manuscripts recently commented that "history is interesting in its own right (especially if it's a history of an unknown subject) without having to have a pragmatic application to the present." While this statement is true, it does not acknowledge the pragmatic nature of technical communication as a discipline. As Kynell and Seeley state, "historical writers are concerned with the past, whereas technical writers usually seek to explain contemporary events" [153, p. 68]. Likewise, paraphrasing earlier

scholars, Brockmann notes, “if the field of technical communication is instrumental communication, communication that gets things accomplished, so must its history” [81, p. 386]. Teachers and practitioners of technical communication may not always require explicit explanations of the applicability of a given historical study, but the applicability of the study should at least be implicit. The earliest justifications of such studies were that they help to legitimize the field by showing that it has a history and that they validate current practices. There will always be a place for these kinds of studies, especially as we venture into new areas, such as the history of previously unexplored forms of nonverbal technical communication.

Based on her survey of historical studies, Connor cites at least 11 applications or uses for historical research in technical communication. For teachers, it is a tool to “pique the interests of technical and nontechnical students alike” and “show technical students the important role that effective communication has always played in their fields”; for scholars, it is a means of developing “self-identity by delineating the contours of the field” and increasing “awareness of ‘what is enduring and what is ephemeral’”; for professionals, it is an opportunity to become “more humane and sensitive to change” [1, p. 5]. A number of scholars have observed that the history of technical communication gives us direction for and understanding about the future of our profession (e.g., [208], [209]). While all of these applications are valid, I see at least four major roles that historical studies can play in technical communication: (1) invention (helping one generate ideas), (2) precedent (offering authority for decisions and actions), (3) distance (enabling one to see objectively and clearly), and (4) context (providing a frame of reference for better understanding).

Invention Historical studies may suggest approaches, solutions, techniques, and even genres that technical communicators can adapt and use in current projects. In this respect, the study of history is potentially an invention strategy for practicing technical communicators. For example, there is a long tradition of using playing cards to communicate technical and scientific information, from fortification cards in 17th-century France to spotter cards during World War II to the recent bird flu cards in China. These cards invite us to consider (or reconsider) the role of games and leisure activities in technical communication, the implications of using a familiar inorganic structure (e.g., 4 suits of 13 cards each) to organize technical

information, and the practicality of unusual formats and distribution methods [210]. Shortly after reading Allen’s analysis of William Harvey’s *De motu cordis et sanguinis* (i.e., *On the motion of the heart and blood*) [148], I read an article about Aubrey De Grey, a biogerontologist at the University of Cambridge, who has come under attack for suggesting that we may soon be able to extend the human life span by a thousand years [211]. It occurred to me that De Grey’s efforts might benefit from his studying examples of how past scientists, such as Harvey, presented iconoclastic ideas to the public.

In an unusual article, Di Renzo offers Francis Bacon’s *Advancement of Learning*, with its concept of the Great Instauration, as a “curricular blueprint” for “creating and defending professional and technical writing programs within the humanities” at small liberal arts schools; Di Renzo describes his approach as a “Vicoan ricorso—a circling back to something old to create something new—a turnaround that is also a turnabout” [212, pp. 46–47]. Approached in this manner, history becomes a rich storehouse of ideas and potential models for technical communicators. Just as graphic artists keep clip files that they turn to for inspiration when their creativity runs dry, a technical communicator can file away anecdotes and artifacts, whether they have been formally studied or not, and use them as sources of inspiration. Past designs and approaches may suggest solutions to current problems and become the catalysts for better designs and innovations.

Precedent Not only does history inspire us to create, but it also arms us to defend. We can cite precedents to support decisions that involve rhetorical and financial risks. Britton once wrote that technical writing is more like a bugle call than a symphony [213]. Indeed, bugle calls might even be studied as a form of technical communication. Historically, armies and navies have used bugles, as well as drums and other instruments, to convey instructions in camp or on ships, on marches, and even in battle [214]. A 19th-century fire chief in London developed a series of bugle calls to communicate messages such as “Clear the road” and “Clear out of the [collapsing] building” [215]. These examples might be cited to support a proposed use of nonverbal signals to communicate instructions or warnings in a hazardous environment or some other setting. Academics have long recognized the persuasive force of such precedents. Harmon, for example, uses historical data to show that “poetic

metaphorical language can be used effectively and judiciously in scientific discourse" [216, p. 192]. Culled from 89 "citation classics" in the sciences, his evidence is an effective refutation of the bald assertion, sometimes made, that scientific writers should avoid figurative language in their writing. Loges offers the case of the US Lighthouse Board's decision c. 1852 to produce a manual for lighthouse keepers as evidence that value "is added to technical products and services through effectively written documentation" [217, p. 437]. Technical communicators sometimes have to make this kind of argument in a business setting and might turn to history for evidence or illustrations.

Distance Sometimes we are too close to a problem to see it. We have to stand back and view it from a distance. One way to achieve this distance is to study technical communication that is remote from us in time and/or culture. For example, in one of her articles about Ellen Swallow Richards, Lippincott notes that "historical study's greatest contribution is to offer a lens through which we can critique implicit and explicit biases and assumptions in pragmatic discourse"; since the audiences for such discourse have become increasingly "intercultural, multinational, and multigenerational," we need to be even more sensitive to class, gender, and age issues, which often resist critique at close range [20, p. 377]. In an article comparing two editions of a military manual, Bernhardt notes that, "For those immersed in the culture, sexism can simply be difficult or impossible to see" [218, p. 218]. Durack cites this passage to justify her own "historical focus" in an article about 19th-century sewing machine manuals [179, p. 181]. Historical studies such as Bernhardt's and Durack's may help to sensitize us to instances of exclusion, misrepresentation, etc. A 2002–2003 discussion about the representation of people of color on the covers of TC, for example, raised questions about our sensitivity to issues of race [219]–[221]. Several readers mocked the suggestion of political incorrectness even though the allegation had generated healthy analysis and reflection (e.g., [221]). By seeing what technical communicators in the past could not see, we may be better able to locate and understand our own blind spots and take corrective action.

Context Historical studies can also provide context for understanding practices, concepts, and relationships that would otherwise remain elusive. Schriver's explanation of typography is a good example: such concepts as point size and leading

are difficult to understand well without appropriate historical background. Schriver's explanation of the letterforms of early printers clarifies her definition of point size as "a measure of the face plus the frame" [204, p. 254]. She explains that early typesetters typically inserted two one-point lead strips between lines of type, and suddenly the notation "10/12" becomes clear. Oddly, it helps to know that serifs sprung from the chisels of Roman masons and that the Times typeface was designed to be compact for use in the *London Times*. We might have been able to use Aldus PageMaker (now Adobe PageMaker/InDesign) without knowing who Aldus Manutius was (although we would have recognized him on the street as the "PageMaker guy" if we had seen him), but the story of his role in the development and popularization of italic face may help us remember distinctions such as roman versus italic and italic versus oblique [204]. A study of the origin and development of proofreading symbols, which predate the discovery of movable type in Western Europe, might facilitate speedy learning of those symbols while pointing the direction to a universal system of markup for the digital age: the *dele* may or may not have a future.

During the last few years, technical communication scholars have expressed conflicting views about the state of historical research in technical communication. Blakeslee and Spilka, for example, note that most of the researchers they surveyed c. 2003 felt that we were covering the history of technical communication quite well and were advancing in our understanding of it [222]. As late as 2003, however, Kynell and Savage could claim that "we are as yet largely ignorant of our history" and that the "history of technical communication is in the very early stages of being written" [223, p. 4]. These two viewpoints are not necessarily contradictory. Technical communication scholars have produced many historical studies in the last 15 years, but the work has been rather idiosyncratic and diffuse. There is a need for greater coordination among scholars and a better awareness of the areas that have already been studied. There is also a need for more book-length studies, such as those by Brockmann [81], Tebeaux [83], Longo [94], Kynell [122], Schriver [204], and Moran [224]. Perhaps this paper—offering a retrospection and guide to historical research as well as a bibliography of the secondary literature—will help to facilitate greater coordination and awareness among those in technical communication who are interested in historical research.

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