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Technologies of Medical Information: The Rise of the Medical Trade Catalog in Britain, 1750-1914

Abstract

Recent interest in our current information age has provided scholars in a wide range of disciplines with increasing impetus to study the origins and development of a variety of forms of printed and non-printed media. This article addresses the rise of a largely neglected but significant non-literary form of print within the medical trade between 1750 and 1914: the mail-order catalog. It focuses on the development of the physical form of the publication – from attractive book of display to commercial mail-order catalog – to highlight economic, technological and professional changes within and beyond the field of medicine. As a result of such changes, catalogs became an increasingly important technology of medical information used by medical and surgical instrument makers to access and control markets of late-eighteenth, nineteenth and early-twentieth century medical practitioners on a local, national and international scale.

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Biography

Dr Claire L. Jones is Director of the Museum of the History of Science, Technology and Medicine at the University of Leeds, UK (email: C.L.Jones@leeds.ac.uk). She was Research Fellow at the Centre for the History of Medicine at the University of Warwick in 2010-2011 and earned her PhD in the history of medicine at the University of Leeds in 2010. Her first monograph, *The Medical Trade Catalogue in Britain, 1870-1914*, will be published by Pickering & Chatto in late 2013.

In 2012, John Weiss International, a world-leading medical and surgical instrument manufacturer, celebrated its 225th birthday. The company attributes its long standing success to its high quality manufactures and invites customers to view them within its printed and online catalog.¹ The catalog's eye-catching display of a wide assortment of products is characteristic of this type of publication circulating in all industries; as quintessentially modern tools of business, such catalogs now form an instantly recognizable part of advertising media. Yet, their emergence and wide scale use was far from predetermined. With the publication of its first edition in 1814, Weiss recognized the potential of the catalog to convey detailed technical and commercial product information to geographically dispersed markets of consumers, but its more general rise and incorporation into the field of medicine—its medicalization—were a result of social, economic and technological developments, both within and beyond disciplinary or trade boundaries.² This article focuses on the long term development of the catalog within British medicine between 1750 and 1914 and its role as an information technology in shaping the market for medical instruments and appliances.³

Recent interest in our own “information age” has aligned historians of media, of the book and of technology in the study of the origins and significance of all manner of information technologies.⁴ Indeed, increasing historical focus on an array of eighteenth and nineteenth century non-literary forms of print, such as almanacs, index cards, scientific expedition reports, railway timetables and cab information, as well as on non-printed forms

¹ See <http://www.johnweiss.com/news/john-weiss-son-ltd-celebrate-their-225th-anniversary> and <http://www.johnweiss.com/instruments-catalogue> (accessed on 20th October 2012.)

² The term ‘Medicalization’ became popular in the 1970s to describe the boundaries of the field of medicine. N. D. Jewson used ‘medical cosmologies’ to ‘define systematically the essential nature of the universe of medical discourse as a whole.’ “The Disappearance of the Sick Man,” 225.

³ Manufacturers of medical tools explicitly stated that their catalogs were aimed at “the medical profession only” and regularly checked medical registers when supplying a new customer for evidence of medical qualification. For example, see Mappin & Co., *Illustrated Catalogue*, preface; W. E. Schall, *Dosage of X Rays*; S. Maw, Son & Sons, *Illustrated Catalogue*, preface.

⁴ Interest is thought to have been stimulated through the rise of the internet. See for example Steve Woolgar (ed.), *Virtual Society*. Jon Agar has recently questioned the relationship between media history and the history of technology, although his focus does not expand beyond literary forms of media, “Medium Meets Message.”

of communication, such as the telegraph and telephone, have served to demonstrate that “information societies” and associated functional technologies aimed at guiding audiences through everyday life are by no means new.⁵ According to this literature, retail catalogs of household goods, the most commonly studied type of catalog, first emerged in late nineteenth century America as an unintended consequence of modern industrialization.⁶ The rapid late nineteenth century increase in all manner of new machines and techniques led to an expansive transportation infrastructure but also resulted in a widespread need among businesses for market control via expanding books of commercial information. More specifically, catalogs seemingly formed part of the increasing commercialization of society and were the marketing innovations of booming American retail giants, such as Aaron Montgomery Ward, and Sears and Roebuck.⁷

Yet, while there is consensus over the rapid increase in catalog numbers during the late nineteenth century, historians who have studied the significance of catalogs within more specialist trades have shown that disseminating commercial information through the catalog pre-dates modern industrialization.⁸ Such studies therefore suggest that a longer term assessment of the significance of catalogs in other trades, their relation to alternate forms of print and their function as information technologies is required. This study is the first to evaluate the significance of all known existing editions of medical instrument catalogs

⁵ For recent examples, see Noah Arcenaux, “Wanamaker’s Department Store”; Ann Blair, *Too Much to Know*; Robert Darnton, “An Early Information Society”; Paul Dobraszczyk, “Useful Reading?”; Mike Esbester, “Nineteenth-Century Timetables”; John J. McCusker, “The Demise of Distance;” Staffan Müller-Wille and Sara Scharf, “Indexing Nature;” Lynn K. Nyhart, “Voyaging.”

⁶ James R. Beniger, *The Control Revolution*. Toni Weller and David Bawden conducted a subsequent study of the origins of information societies in the English context almost twenty years after Beniger, “The Social and Technological Origins.”

⁷ Boris Emmett and John E. Jeuck, *Catalogues and Counters*; Gordon Lee Weil, *Sears, Roebuck USA*. For the origins of British retail catalogs, see Richard Coopey, Sean O’Connell, and Dilwyn Porter, *Mail Order Retailing in Britain*.

⁸ For catalogs within architecture, photography and science, see Daniel D. Reiff, *Houses from Books*; Paolo Brenni, “Nineteenth Century Scientific Instrument Advertising;” Michael Pritchard, “The Photographic Trade Catalogue.” Here, scientific instruments refer to all manner of tools within the physical sciences, including microscopes and optical, navigational and astronomical tools, as well as measurement devices suited to a physics or chemical laboratory, such as galvanometers.

produced between the eighteenth and twentieth centuries, a long period of industrialization and of wider technological change, a total of 305 (figure 1)⁹ The extant catalogs studied here are, of course, a likely subset of those produced at the time resulting from the preferences of collectors for particular editions.¹⁰ Nonetheless, this analysis of catalogs themselves, presented alongside underutilized hospital and medical company archives, not only extends existing studies of the modern development of information control, but also further aligns the history of information with the history of medicine and of technology.

Like those in other trades, the medical catalog rose to prominence in the late nineteenth century. Until 1875, less than one new catalog edition per year circulated in the trade but by 1914, catalogs were a dominant form of medical advertising with over one hundred medical companies publishing up to 30,000 thick, hard-bound catalogs of more than one hundred pages every two to five years (figure 2). Certainly, the publication aimed to extend medical instrument makers' capacity to sell tools and clients to buy them; as medical instruments multiplied, the publication became increasingly useful in transforming a tool from technology to commodity in the "medical marketplace."¹¹ Yet, instrument-makers' small-scale use of the catalog before 1800 belies attempts to view late nineteenth century industrialization, or indeed the trade of the stethoscope, the popular icon of modern

⁹ For medical catalog bibliographies, see Michael Jones and Jean Taylor, *A Handlist of Trade Catalogues*; Audrey B. Davis and Mark S. Dreyfuss, *The Finest Instruments Ever Made*.

¹⁰ This study is largely based on the collection of British medical trade catalogs held at the Thackray Museum, Leeds, UK. The Museum actively collects trade literature, while many others only acquire outstanding examples in order to identify specific tools. Nonetheless, museum collecting policies, along with the ephemeral nature of the publication, mean it is difficult to estimate how representative this sample is. It seems likely that many more editions were produced that we have knowledge of or access to. Yet, while it is not possible to identify how frequently many of the smaller companies in the trade produced catalogs, particularly prior to 1875, catalog prefaces of the largest companies often state publication frequency and therefore suggest that the sample includes one of each catalog edition produced by Britain's twelve largest medical instrument makers between 1875 and 1914. The catalogs produced by these companies account for 60 per cent of the total number in this sample.

¹¹ On the "medical marketplace," see the introduction of this special issue; Roy Porter, "The Patient's View," 188; Irvine Loudon, "The Nature of Provincial Medical Practice," 2; Mark S. R. Jenner and P. Wallis, *Medicine and the Market*.

technological medicine, as critical turning points.¹² In order to better understand the medical trade catalog's development, it is necessary to view the publication as more than an adjunct to the medical tools and appliances it promoted but as an information technology in its own right.

The medical trade catalog was an information technology, but like other innovations discussed in this special edition, became medical as historical actors bestowed it with meaning. It is clearly not a diagnostic or therapeutic tool, but it functioned alongside hernia trusses, electrical machines, anatomical models and even systems of practices and organizations within the medical trade and profession; its study here thus represents a recent shift in the history of technology, which sees its purpose as understanding "how history works" in the broadest sense.¹³ Like other technologies discussed in the special issue, the catalog was designed, produced and distributed by a manufacturer and consumed by an end-user with a specific purpose in mind and its form and purpose – its two essential dimensions – were continually negotiated between the two; the form, embodying function, was reconfigured as the purpose changed.¹⁴ Indeed, by viewing the catalog as both medical and technological and shaped by both producers and end-consumers, this paper inevitably corresponds with current approaches in the history of print, which take the material features of a publication, its paratext and circulation as seriously as the text itself.¹⁵ Demand is

¹² Stanley Reiser presented the stethoscope as the tool that began medicine's reliance on technology and thus the beginning of a new medical economy in *Medicine and the Reign of Technology*. Preliminary investigations into the similarly specialized scientific instrument trade highlight that distinct changes to the physical sciences, such as their relocation to the laboratory, led to a growth in catalog numbers in the late nineteenth century, rather than a proliferation of tools. Robert Anderson first suggested this shift in "Were Scientific Instruments in the Nineteenth Century Different?" This is also discussed by Alison Morrison-Low in *Making Scientific Instruments*. She asserts that "there has been little response to [Anderson's] agenda," 9.

¹³ Older historiography defines technology as machinery. See Rosalind Williams, "All That Is Solid Melts into Air." Leo Marx reminds us that that "The essence of technology is by no means anything technological." "Technology, a Hazardous Concept." For systems of practice and organisations as technologies, see Jennifer Stanton (ed.), *Innovations in Health and Medicine*.

¹⁴ The central role of users in consuming and shaping technologies has received much attention in recent years. For example, see Trevor Pinch and Nelly Oudshoorn, (eds.) *How Users Matter*.

¹⁵ Literature on print culture is bibliographical approach is extensive. For a recent edited volume, see Rima D. Apple, Gregory J. Downey & Stephen L Vaughn, *Science in Print*. For early examples, see D. McKenzie,

therefore as critical to this story as others in this special issue: while many medical innovations analyzed thus far were shaped by patients, the catalog's changing form, from treatise to mail-order catalog, aimed to both suit and shape the requirements of the growing and changing audience of the medical profession.

Shaping the Trade for Medical Tools, Shaping the Catalog, 1750-1875

Predating the accepted chronology of American mail-order catalogs by a hundred years, late eighteenth-century European firms within all trades employed forms of print to disseminate commercial information to growing numbers of literate and affluent potential customers; advertisements for patent medicines and other proprietary drugs, often with wild claims of curing all ills, had become a prominent feature of weekly newspapers, and innovative companies manufacturing fashionable buttons, belts, and snuff boxes, such as Matthew Boulton's manufactory, invested in elaborate and decorative price lists and trade cards.¹⁶ Simultaneously, growing numbers of medical practitioners, particularly in towns and cities, converged with increasing numbers of specialist medical and surgical instrument makers: these makers produced the first form of medical trade catalogs.¹⁷ In 1775, Samuel Laundy, surgical instrument maker of London, published the first known list of surgical instruments consisting of ten pages.¹⁸ Lists, as one of the earliest forms of writing, encouraged readers to order information according to category and number but the correlation between the emergence of catalogs and the rise of medicine as an important eighteenth and nineteenth

Bibliography and the Sociology of Texts; Roger Chartier, *The Order of Books*; Robert Darnton, "First Steps Towards a History of Reading."

16. There is a wealth of literature on early modern medical print culture. For example, Hannah Barker, "Medical Advertising;" P. S. Brown, "The Vendors of Medicines;" Louise Curth, "The Commercialisation of Medicine;" Thomas A. Horrocks, *Popular Print*. For early modern advertising of general products, see John Styles, "Manufacturing, Consumption, Design,;" Liz McFall, *Advertising*, 31.

17. Few surgical instrument makers operated separately from cutlers in the early eighteenth century and cutlers and surgical instrument makers were rarely listed in trade directories as distinct categories before the 1840s. For example, John Schole, *Manchester & Salford Directory*; Sadler, *The Hampshire Directory*; Edward Baines, *Directory, General and Commercial*. For the beginnings of separately listed instrument makers, see J. Pigot and I. Slater, *General and Classified Directory*; Kelly, *The Post Office Directory*.

18. Samuel Laundy & Son, [*Catalogue of Surgical Instruments*].

century vocation suggests that medical instrument manufacturers were motivated to compile catalogs as a new form of information technology in order to reshape the way expanding viable markets received information.¹⁹ The importance of teaching hospitals for medical education in London and in major British cities from the 1740s, for example, made it easier for instrument makers to target practitioners at their place of work and learning. Hospital-based practitioners almost doubled between 1783 and 1830, and by the mid-nineteenth century medical practice became heavily centered on the hospital.²⁰ Although evidence is still wanting to understand the emergence of medical registers as information technologies distinct from general trade directories, one could argue that their publication, which also began at this time, helped instrument makers further in targeting the rising number of practitioners across the country; surgical instrument makers could correspond with the 3,120 practitioners listed in the 1783 Medical Register in regions all over Britain.²¹

While printed advertising was used in all trades at this time then, medical instrument makers aimed to bring their early catalogs more firmly into the field of medicine by shaping them into another rapidly growing genre of information technology: medical reference books. In fact, the earliest form of tool catalog consisted of a three or four page list of tools contained within a medical book, which separate catalogs of between ten and thirty pages began to replace.²² Instrument makers may well have been influenced by medical book publishers, who were among the first to compile catalogs separately from lists within books as markets of readers expanded.²³ It is unclear from current research how customers affected

¹⁹ Muller-Wille and Scharf, "Indexing Nature," 3.

²⁰ Susan C. Lawrence, *Charitable Knowledge*, 111. For the development of the medical profession, see Jeanne Peterson, *The Medical Profession*; Anne Digby, *Making a Medical Living*. For hospitals, see Brian Abel-Smith, *The Hospitals 1800-1948*.

²¹ Joseph Johnson, *The Medical Register*.

²² The earliest known printed promotional insert into a medical text was contained within Woodall's 1617 *Illustrated Manual with Equipment for the Sea Surgeon's Chest*, see, John Kirkup, *The Evolution of Surgical Instruments*, 66. For early scientific and mathematical instrument inserts in books, see, Brenni, "Nineteenth Century Scientific Instrument Advertising," 498; D. J. Bryden, "Evidence from Advertising."

²³ Booksellers stitched lists of books into their publications from at least 1650, see Raven, *The Business of Books*, 283. Catalogs of medical books were also among the first to be published. For example, Robert Bell,

the equally specialist scientific instrument catalog form and purpose, but by shaping their tool catalogs into hard, cloth-bound books aligned to medical reference books, medical instrument makers aimed to target expanding markets of practitioners in ways similar to medical publishers. Indeed, Laundry's publication, along with numerous other medical texts, was suitability shaped to fit into "the surgeon's coat pocket" and, like other information objects of the period such as medical almanacs, was purposely designed to be easy to transport.²⁴ The expansion of medical books allowed greater numbers of practitioners to share research and professional information, while the increasing numbers of catalogs shaped ranges of tools into commodities and disseminated a common body of commercial knowledge to both individual practitioners and to hospital staff.

Medical instrument catalogs thus aimed to embody information about all that a practitioner could require: tools for amputation, trepanning, lithotomy, dissection, midwifery, and instruments for small surgical procedures such as lancets, needles and pocket knives. Instrument makers extended their catalogs as product ranges expanded in line with the changing conceptions of diseases. Indeed, while tools for amputation, the incision of abscesses and phlebotomy had long been an important part of a surgeon's work, new tools for diagnosis in the nineteenth century also increasingly appealed to physicians too.²⁵ Accordingly, throughout the nineteenth century, catalogs expanded from a few pages to over a hundred, which were more frequently updated with increasing numbers of new medical tools. For example, Maw followed its first six page catalog of 1822 in 1830, 1832, 1866 and 1869 with extended editions promoting ever-increasing tool designs.²⁶ By the 1860s, several instrument makers had also developed new forms of catalog specializing in only one type of medical tool, as an attempt to rationalize the increasing volume of commercial information

Catalog old physical and surgical authors to be sold at prices marked therein, 1770 in Romaine, *A Guide to American Trade Catalogs*, 69-73.

²⁴ Kirkup, *The Evolution of Surgical Instruments*, 30; Horrocks, *Popular Print*, 6.

²⁵ Christopher Lawrence, "Incommunicable Knowledge."

²⁶ George Maw, *A Catalogue*, 1822; Maw, *A Catalogue*, 1830; J. and S. Maw, *Priced Catalogue*.

that helped to shape new tools into commodities. Claudius Ash & Sons of London published its first catalog of forty pages specializing in dental instruments in 1858 and compiled subsequent expanded editions in 1865 (88 pages), 1871 (201 pages), 1873 (261 pages) and 1875 (302 pages).²⁷

Medical practitioners' acceptance of the illustrations that formed an increasingly important part of both medical books and catalogs, and indeed other features subsequently, was also central in shaping this method in disseminating medical information. Indeed, growing numbers of studies focused on the visual culture of medicine, particularly within medical reference books, have argued that illustrations became crucial to medical theory, practice and pedagogy from at least the eighteenth century.²⁸ John Savigny, an eighteenth century surgical instrument maker renowned among practitioners for manufacturing high quality and innovative medical devices, included illustrative plates of tools designed accurately to scale to reconfigure his catalogs of 1798 and 1800 from product lists to attractive books of display; a continuing catalog feature that aided the effective dissemination of commercial information to growing numbers of practitioners while simultaneously further distinguishing the publication from other forms of printed advertising (figure 3).²⁹ Within medical reference books, illustrations produced by similar techniques aimed to convey the detailed inner workings of the body, while catalog illustrations conveyed the minute detail of

27. Claudius Ash & Sons Ltd, *Catalogue of Artificial Teeth*, (1858, 1865, 1871, 1875); Ash, *Appendix to C.*, 1873.

²⁸ For example, Martin Kemp and Marina Wallace, *Spectacular Bodies*; Carin Berkowitz, "The Beauty of Anatomy," Lorraine Daston and Peter Galison, *Objectivity*. For visual culture more broadly, see Margaret Dikovitskaya, *Visual Culture*; Marita Sturken and Lisa Cartwright, *Practices of Looking*.

29. John Savigny, *A Collection of Engravings; A Catalogue of Chirurgical Instruments*. A similar catalog production trend occurred in North America and Europe. See Kirkup, *Surgical Instruments*, 66; Giovanni Alessandro Brambilla, *Instrumentarium Chirurgicum Militare*. Raven argues that engravings offered new levels of technical accomplishment adding to the distinction between types of publication, *The Business of Books*, 252.

tools, which were crucial for practitioners to gauge the dimensions of these tools for use in the performance of delicate surgical procedures.³⁰

Catalogue producers thus included engravings to enhance the credibility of their publications among medical men, an important part in making innovations medical, as this special issue argues. Indeed, the undoubtedly high cost of illustrative plates before the mechanization of print, for use in both catalogs and in medical books of the time, signified that instrument makers and book publishers considered them a worthwhile investment.³¹ Savigny envisaged that his catalogs, shaped into attractive books of display, would entice hospital-based practitioners to purchase tools via his shop and boasted that the surgical instruments promoted within his 1800 catalog edition were in use at “the most eminent hospitals in London.”³² Innovative instrument maker, John Weiss developed his one page price list of 1814 into a catalog with illustrations, or an “account of inventions,” by 1831, which consisted of 27 illustrative plates and 100 pages of explanatory text. Weiss presented a copy of this catalog “to the Medical Gentleman of Manchester Royal Infirmary”, which the Infirmary valued as much as its other reference books by housing the edition in its library.³³

By the 1860s, medical instrument makers followed the lead of general book publishers and replaced their large illustrative plates with individual product illustrations

30 Surgical procedures conducted with tools made from inferior steel or by imperfect workmanship could result in dire consequences for the surgeon; damage to the health of the patient could permanently ruin his reputation. John Kirkup, *Surgical Instruments*, 439; James M. Edmonson, *American Surgical Instruments*, 272.

³¹ Costs were particularly high if skilled artists with an eye for detail were employed. For example, Dutch artist Jan van Rymdyk produced 31 of the 37 illustrations contained within William Hunter’s 1774 *The Anatomy of the Human Gravid Uterus* to depict the detail of the foetus in the womb. Hunter, *Anatomia uteri humani gravidi tabulis illustrate*. See also, Harry Mount, “Van Rymdyk and the Nature-Menders.” Solomon Maw, London based instrument maker, employed J. M. W. Turner, the British artist famed for his landscape paintings, to create numerous plates of engravings of tools within his catalogs of the 1830s. Evelyn Joll, Martin Butlin, and Luke Herrmann, (eds.), *The Oxford companion to J.M.W. Turner*, 185.

³² Savigny, *A Collection*, 5, 6. Producers of mathematics instruments sought to distribute their catalogs in similar ways, see Bryden, “Evidence from Advertising,” 330.

³³ John Weiss, *Printed Price List*. The Thackray Museum’s copy of Weiss’ 1831 catalog is inscribed by John Weiss and stamped “The Manchester Royal Infirmary library”.

integrated into the main catalog text, thus blending illustrations and text on one page.³⁴ Historians of print have long argued that new machinery of the 1830s aided the publishing trade and led to the replacement of plates with wood engravings in order to make books, periodicals and other non-literary forms of print more appealing to audiences in a format and on a scale which would not have been technically and financial viable previously.³⁵ Yet, the adoption of separate engravings within the medical trade some thirty years later than other forms of print also serves to highlight the importance of readers in shaping publications; medical companies did not adopt new printing techniques as soon as they were available but instead were steered by demand. Practitioners' increasing requirement to view representations of the growing number of tools and appliances, often associated with new developments in anesthesia and related invasive surgery provides one explanation for the adoption of new engravings; it was presumably more convenient to view illustrations of unfamiliar products alongside their accompanying description. Moreover, the display of integrated text and illustrations in other medical publications earlier in the period may well have encouraged practitioners to request for this feature to appear within catalogs; Evans & Wormull, surgical instrument maker of London, began to include high-quality illustrations in its catalogs from 1876 following "the repeatedly expressed wishes" of practitioners.³⁶ Practitioners' ongoing need for clear illustrations of every product was emphasized by the American surgical instrument firm, Tiemann & Co, in 1872: "a drawing of an instrument imparts a more accurate conception of its construction and consequently a clearer idea of its

34. Maw's catalog of 1866, for example, contained nearly 1,000 product illustrations, which were integrated into the text. Solomon Maw, *A Catalogue*. Weiss incorporated text and illustrations into its catalogs for the first time in 1863, but also continued to include illustrative plates. John Weiss, *A Catalogue*.

35. For excellent examples of studies of scientific print, see Geoffrey Cantor, Gowan Dawson, Graeme Gooday, Richard Noakes, Sally Shuttleworth and Jonathan R. Topham, *Science in the Nineteenth Century Periodical*; James A. Secord, *Victorian Sensation*, 32, 119. For more general print, see Michael Twyman, *Printing*, 51, 52.

36. Evans & Wormull, *Illustrated Catalogue*, preface.

suitableness for the end proposed; or, the description, however precise, is at times imperfectly comprehended.”³⁷

Practitioners’ apparent demand for such illustrations became more obvious when medical book publishers began to borrow instrument makers’ blocks to represent the dimensions of increasing numbers of tools to the same audience of practitioner readers. Instrument makers embossed their names on their blocks, usually across the tool itself to indicate their craftsmanship, but the appearance of illustrations produced from these blocks in medical reference books provided instrument makers with another, and broader way, of promoting their wares to practitioners. For example, J & A Churchill, publishers of Henry Thompson’s *Clinical Lectures on Diseases of the Urinary Organs* of 1868 borrowed engravings blocks of lithotomy instruments from Weiss & Son, which displayed the company name and went into eight editions (figure 4).³⁸ This feature further sets apart the medical catalog from those common to general trades; companies in other trades omitted their name from illustrations allowing them to share blocks in order to reduce costs and to enable agents to sell from the publication without the risk of customers circumventing them by ordering direct from the producer.³⁹ In the medical trade, sharing blocks between companies was often undesirable because it advertised the wares of a rival.

Instrument makers also seemingly increasingly employed printers of medical reference books, with adequate machinery, to produce their catalogs. Weiss employed Longman, the well-known book publisher responsible for a number of medical books including the reissue of *Gray’s Anatomy* throughout the nineteenth century, which shaped his catalog of 1831 into book form, both inside and out.⁴⁰ Indeed, mechanized printing enhanced the appearance of the catalog as a hard-bound book of display specifically designed to appeal

37. James M. Edmonson and Terry F. T. Hambredt. *American Armamentarium Chirurgicum*, 33.

³⁸ Henry Thompson, *Clinical Lectures*. See also Christopher Hoolihan, “Wood Engravings.”

³⁹ Romaine, *A Guide*, vii.

⁴⁰ Ruth Richardson, *The Making of Mr Gray’s Anatomy*.

to medical practitioners. Moreover, the sustained absence of product reference numbers, prices and trade names of the type typically associated with catalogs suggests that medical tool catalogs of this period were considered as useful information technologies for fulfilling practitioners' requirement for tool precision, high quality manufacturing and availability. For Maw, Savigny, Weiss and increasing numbers of other surgical instrument makers then, innovation in medical tools and catalogs went hand in hand; while the tools crafted by instrument makers had to be perfectly manufactured, in order to meet a surgeon's requirements in terms of design and finish, high quality catalogs became incorporated into the world of professional medicine through the inclusion of illustrations and their book-like appearance.

Commodifying the Catalog

Medical book and catalog manufacturing were then tailored to suit the requirements of the practitioner market and, as historians have already demonstrated for other information technologies, corresponded to the size of the "information society" in which they circulated. Yet, the level of late eighteenth and early nineteenth century catalog output reached nowhere near the scale of more general printed material, or other specialist periodicals aimed at practitioners, such as the *Lancet* published from 1823 or the *British Medical Journal* from 1853. The importance of trade conducted with hospital-based practitioners and suppliers at a local level, during a period business historians have called the era of personal capitalism, seemed to limit catalog production numbers and networks of distribution at this point.⁴¹ The "high-trust culture," characteristic of Britain's first phase of industrialization in the late eighteenth and early nineteenth centuries, resulted in strong relationships between makers and hospital-based practitioners within the medical trade. All over Britain, small and informal

⁴¹ John F. Wilson, *British Business History*, 21. See also, S. D. Chapman, "Financial restraints"; Mark Casson, "Entrepreneurship."

business networks operated around the vicinity of most of the major hospitals, including those in London (the London, the Middlesex, University College, St. Bartholomew's, St. Thomas' and Guy's), and those in other important medical centers, such as Edinburgh, Leeds and Newcastle.⁴² Clearly, high quality precision instruments were a must for all practitioners but by cultivating relationships with renowned practitioners from major hospitals instrument makers aimed to ensure the continual favor of their supplies and enhance their reputation through patronage. Samuel Laundry of St Thomas' Street, London, for example, developed close relationships with consultants at nearby St Thomas' and Guy's Hospitals.⁴³ The informal way in which instruments were often supplied to hospital consultants meant that purchasing decisions could be based on personal relationships; catalogs widely distributed without these personal connections were therefore less likely to influence such decisions. Indeed, the catalog's form as medical reference book was seemingly unpersuasive as a marketing tool.

Acknowledging the success of these relationships, some suppliers also established a relationship with a hospital by ensuring at least one of their employees undertook some form of medical training at the institution. Training employees in the art of medicine proved to be another vital way of providing companies with the necessary credentials to be seen as equal to medical men, as the introduction to the special issue has highlighted. Cornelius Hanbury, a late nineteenth century partner in the instrument and pharmaceutical firm Allen & Hanburys, established a successful relationship with St Bartholomew's physician George Burrows (1801-1887) following his appointment as hospital clinical clerk in 1849.⁴⁴ John Hornby Maw, son of Solomon Maw, surgical instrument maker of London, completed his surgical training in 1826 under St Bartholomew's surgeon John Abernethy (1764-1831); he returned

42. Data was gathered and analyzed using regional trade directories and maps. For example, E. R. Kelly, *Directory*, (1881, 1882).

43. Peterson, *The Medical Profession*, 137. For more on Laundry and St Thomas' and Guy's, see "Court of King's Bench; Samuel Wilks and G. T. Bettany, *A Biographical History*, 174.

44. Desmond Chapman-Huston and Ernest C. Cripps, *Through a City Archway*, 155.

to the business to craft tools specifically for the institution.⁴⁵ The acquirement of medical qualifications amongst the employees of medical companies continued into the twentieth century.⁴⁶

The success of these relationships notwithstanding, instrument makers with excellent reputations for crafting high quality precision instruments were able to supply practitioners located outside the vicinity of their shop with tools. For example, Weiss' reputation for superior lithotomy instruments led Sir Astley Cooper (1768-1841), surgeon at St. Thomas', to change supplier from Samuel Laundry, his local instrument maker.⁴⁷ Yet, enhancing their reputation for crafting tools also allowed instrument makers to broaden the reach and creditability of their catalogs in the field of medicine.⁴⁸ We have already seen Weiss' personal presentation of his 1831 catalog to the medical staff at Manchester Royal Infirmary, but he also distributed editions of this catalog through more established commercial medical networks: sellers in the book trade and regional agents. The catalog was available for purchase for 15 shillings alongside medical reference books at well-known book shops frequented by medical practitioners in both Dublin and Edinburgh, while an amended version was available to practitioners frequenting the shop of Robert Kay, chemist and druggist of Birmingham and Weiss' sole commission agent in the English Midlands. One such edition was distributed to a J. W. Somerville, presumably a Birmingham based practitioner.⁴⁹ By the production of his 1863 edition, Weiss had built sufficiently on the good will of the medical

45 Lesley Richmond, Julie Stevenson, and A. Turton, *The Pharmaceutical Industry*, 246.

46 Henry Maw graduated from the University of Cambridge around 1913 in medicine. Indeed, the relationship between the Maw family and St Bartholomew's hospital was so strong that the hospital committee saw no conflict of interest when they unanimously elected Charles Trentham Maw as a governor in February 1881 and 1887, and as auditor of the hospital accounts in 1892. St. Bartholomew's Hospital, *Letter book*, HA10/5, 1886–1889, St. Bartholomew's Hospital Archive, London (henceforth St. Barts), 106; St. Barts, *Letter book*, HA10/6, 1890-1892, 695.

47. Edmonson, *American Surgical Instruments* 41.

48 Sometimes these practitioners were located outside of Britain. Indeed, many American surgeons preferred to import high quality instruments from British manufacturers due to their excellent workmanship. However, exports usually constituted a smaller part of business operations than domestic trade until later in the nineteenth century. Geoffrey Tweedale, *At the Sign of the Plough*, 115; Edmonson, *American Surgical Instruments*, 15.

49 Details of booksellers are in the preface, Weiss, *An Account*. Weiss & Son, *A Catalogue*, (1835). The edition given to Somerville is held at the Thackray Museum.

profession to enable the distribution of catalogs through the major commercial events they frequented, such as national and world fairs.⁵⁰

While historians have paid much attention to the mid-nineteenth century rise of trade exhibitions as a new medium of Victorian commodity culture, and on the role of agents in expanding commercial networks, less is known about companies' use of these methods for the distribution of printed information.⁵¹ Yet crucially, medical instrument makers' employment of such methods for catalog distribution accompanied changes to the form of the publication, as it became further embedded in the medical trade. Indeed, as the first catalog to contain prices for each product, the 1831 edition Weiss produced for Robert Kay left practitioners in no doubt that this publication aimed to encourage orders of tools and appliances. Similarly, newly enlarged catalogs for distribution at exhibitions incorporated large numbers of product illustrations along with prices, and thus, provided practitioners with a permanent embodiment of commercial information, which they could take away and consume at their convenience. During the International Exhibition of 1862, the *Lancet* praised "the elaborate, largely illustrated and valuable catalogue just published by M. Charrière on the occasion of the present display."⁵² Certainly, the widespread nature of catalog distribution through book sellers and agents among surgical instrument makers beyond Weiss is difficult to ascertain. British instrument makers seemed to lag behind their European counterparts in compiling catalog editions specifically for exhibitions, and attempts to sell catalogs alongside books became increasingly unusual as the publication became further shaped to facilitate mail-order from 1875. Nonetheless, the use of agents and exhibitions by the most innovative instrument makers suggest that more aggressive attempts

⁵⁰ "Weiss," 310; "Instruments at the International Exhibition," 577-578.

⁵¹ For example, Thomas Richards, *The Commodity Culture*; Rosalynd Williams, "Dream Worlds of Consumption." Williams points out that the 1851 exhibition at Crystal Palace had been innocent of commercial purpose, but by the 1900 Paris exhibition, events charged admission and each item displayed carried a price tag.

⁵² "Report on the International Exhibition," 495. Charrière's catalog contained more than 500 engravings, "The Great International Exhibition," 49.

at employing new forms of catalogs to expand the trade in medical tools beyond local established networks were beginning.

Between 1750 and 1875 then, instrument makers made concerted efforts to convince the growing numbers of medical practitioners of the credibility of their catalog publications. To do this, instrument makers shaped their catalogs into cloth-bound books, with detailed to scale illustrations, which expanded in line with new products. These catalogs bore close resemblance to the increasing number of medical reference books of this period so that by the mid-nineteenth century, medical publishers and instrument makers worked together to produce publications through sharing engraving blocks and production methods. Despite the limited size of the medical catalog “information society” resulting from the successful function of local supplier-practitioner trade relationships, catalogs could be distributed to practitioners widely through methods common to other medical commodities, such as booksellers, agents and trade exhibitions. Subsequent changes to catalog form, such as the incorporation of product prices, represented the beginnings of a change in purpose as instrument makers attempted to target a larger and more geographically dispersed market of practitioners with a more explicitly promotional publication.

Catalog Standardization, International Growth and Hospital Bureaucratization, 1875-

1914

The late nineteenth and early twentieth centuries witnessed further growth in literary and non-literary forms of print, both in professional medicine and beyond. Certainly, functional items, such as train timetables and advertising flyers, had never been so prevalent, and in medicine itself, practitioners increasingly valued information in the form of statistics, temperature charts, prescriptions and of course medical trade catalogs.⁵³ While general mail-

⁵³ See for example Reiser, *Medicine in the Reign of Technology*.

order houses began to rapidly increase their output of catalogs, the number of new medical trade catalog editions also grew exponentially: growth peaked in 1903, but levels of production never subsequently dropped below the number published in 1875 (figure 1).⁵⁴ Not all British manufacturers of medical tools published catalogs, but certainly the largest companies, and arguably the most successful, followed the lead of Maw and Weiss and compiled editions. Companies more regularly updated their catalogs with new editions than they had earlier in the century: many compiled new editions every two to five years. During this thirty-nine year period, Down Brothers, the surgical instrument maker of St Thomas' Street London published at least fifty-one catalog editions.⁵⁵ Maw, a firm who had compiled catalogs since 1822, published new editions in 1882, 1891, 1903, 1905 and 1913 and supplemented these editions with cheaper-to-produce quarterly price lists in 1882, 1891, 1897 and 1909.⁵⁶ Numerous other instrument makers, such as Mayer & Meltzer and the Dental Manufacturing Company, developed their first catalog edition after 1875, and published new editions every few years thereafter.⁵⁷

While their medical reference book-like appearance remained, medical catalogs also became increasingly standardized in form, and were further shaped into the mail-order information technologies identified by historians as crucial to controlling markets in this period of industrialization. Firms adopted advertising techniques from publishers of general

54 The apparent decline in catalog production between 1911 and 1914 is deceptive, because data analyzed is only for this four year period. Numbers of catalogs published between 1914 and 1918 most probably decreased due to disruption of the medical trade. Indeed, British medical companies, such as Maw, stopped producing catalogs during war, and instead invested heavily in the manufacturing of goods to contribute to the war effort. Maw, Sons & Sons, *Comparative Sales Ledger*, D/EMw B45, c. 1900-1950, Maw, Son & Sons, Hertfordshire Record Office, Hertford, UK.

55. Down Brothers, *A Catalogue*, (1906), preface. Down Brothers also included supplements dedicated to specific types of tool to rationalize the increasing amount of commercial information. For example, Down Brothers Ltd., *A Catalogue of Aseptic Furniture, Sterilizers; A Catalogue of Abdominal Belts; A Catalogue of Appliances for Incontinence of Urine; A Catalogue of Appliances for Hernia; A Catalogue of Air and Water Beds; A Catalogue of Artificial Limbs; A Catalogue of Acoustic Apparatus for the Deaf*.

56. S. Maw, Son, & Thompson, *Quarterly price current*, (1882a, 1891b, 1897); Maw, *Book of illustrations of surgical instruments*, (1882b, 1891a, 1903); *Illustrated Catalogue; Catalogue of Surgical Instruments*.

57. Mayer & Meltzer, *Catalogue of Surgical Instruments*, (1880, 1888); *An Illustrated Catalogue of Surgical Instruments*; The Dental Manufacturing Co. Ltd., *List of Specialties; Catalogue of Mineral Teeth; [Catalogue of] Lathes; Catalogue of Dental Furniture*.

catalogs, and replaced instrument makers' lengthy discussions of tools with practitioner testimonials, extracts from relevant texts and trade names (figure 5, figure 6). Crucially, catalogs produced after 1875 more explicitly encouraged practitioners to purchase supplies through the inclusion of product reference numbers, order forms and offers of free product delivery. As in previous years, the machinery employed by publishers shaped catalog form and changes were aided by medical instrument makers' increasing employment of well-established printing firms, with vast experience of book production and the most up-to-date machinery, to publish their catalog editions in batches of approximately 30,000 catalogs per edition.⁵⁸

Images of tools also continued to form a major part of medical catalogs, which served to further embed the publication into the growing visual culture of both medical consumerism and the medical field as a whole.⁵⁹ Almost every edition by this stage included individual illustrations and prices for each product. While general retailers adopted new machinery to produce four-color mail-order catalogs in the early 1900s to appeal to affluent markets of householders, medical instrument makers continued to invest in their own individual engraving blocks to shape increasing numbers of tools into commodities and appeal to a more discernable practitioner market, which grew to 40,483 by 1911.⁶⁰ If electro-plated, these blocks could be employed almost indefinitely to produce subsequent editions and continued to be used by printing firms to reproduce illustrations of tools in medical reference books.

Instrument makers, however, faced new and strong economic pressures, which increased production numbers and affected the catalog's form, but also led to more

⁵⁸ Well-established printers, Hazel, Watson & Viney, for example, produced Allen & Hanburys, *Catalogue*, (1901). William Clowes printed Claudius Ash & Sons Ltd., *Catalogue* (1886), but also a huge variety of other books. William B. Clowes, *Family Business*.

⁵⁹ While largely beyond the scope of this paper, historians have paid increasing attention to the widespread appearance of medical images, both illustrative and photographic, in professional and public forms of print beyond the catalog during this period. For example, Burt Hansen, "New Images of a New Medicine"; David Serlin, (ed.), *Imagining Illness*; Lisa Cartwright, *Screening the Body*.

⁶⁰ "The "Medical Register,"" 643.

systematic attempts to gain custom from practitioners based far beyond the locality of their premises through wider catalog distribution. Crucially, such pressures meant that demand, a central issue throughout this special edition, became even more important in shaping catalog output. The catalog was no longer available for sale through book sellers but began to form part of a bureaucratized system of marketing with other forms of freely distributed printed and non-printed information technologies. Indeed, instrument makers increasingly invested in media common to more general trades, including the employment of qualified traveling salesmen (in addition to agents) and regular advertising in specialist periodicals.⁶¹ Aided by developments in the postal system and improved transport links, companies began to send catalogs free of charge, not just nationally but to all parts of the world.⁶² A number of instrument makers, such as Ash and De Trey, also translated catalog editions into various languages, such as French, German, Spanish, and Russian signifying their attempt to disseminate commercial information to non-British practitioners.⁶³ Along with companies in all trades, instrument makers considered catalogs as an ideal tool through which to expand because the publications were conveniently bound books displaying most of their product range.

These changes in catalog production and distribution represented company attempts to rationalize and shape increasing amounts of commercial information accompanying new products yet were also manifest in company structures and administration. Indeed, the

61. Companies who employed travelling salesmen include Allen & Hanburys, Maw and Reynolds & Branson: Allen & Hanburys, *Correspondence*, 1880-1914, AH103, Allen & Hanburys archive, Glaxo Plc, London; Maw, *Personal Ledger of Charles Maw [including trade expenses]*, D/Emw B2, 1878-1889; A Reynolds & Branson salesman's bag from the 1890s forms part of the Thackray Museum collection, object no. 1727. For medical instrument makers at exhibitions, see *Illustrated and Descriptive Report of Select Exhibits; Catalogue of the Annual Exhibition*. Of course, medical instrument makers did not spend anywhere near as much as drug companies. Thomas Holloway, the renowned patent medicine producer, spent more on advertising than producing the actual products. In 1887, Beecham's spent £70,000 on advertising alone. T. R. Nevett, *Advertising in Britain*, 71.

62. For discussions of how improvements in the postal service aided distribution of retail catalogs, see Coopey, O'Connell, Porter, *Mail-Order*, 15. For a discussion on the growth of railways see D. Alford, "The Railway Age."

63. For example, Ash, *Prix-Courant des Machines* ; De Trey & Co. Ltd., *Im Zeichen des Fortschritts*.

traditional personal capitalism business model run by family members was breaking down, as it was in other industries during this period; instrument and catalog production became managed separately, as innovation in mechanized and standardized catalog production was not matched in the production of medical tools. While some of the most popular types of medical tools could be produced en masse, handcrafting was still the only way to ensure that many instruments maintained the necessary precision.⁶⁴ Maw, for example, employed those from an emerging class of professional managers such as Joseph Banks to control marketing communication, whilst those with credentials gleaned from undertaking medical training, Charles Maw, his sons Henry Trentham Maw and Henry Solomon Maw, and John Thompson, oversaw instrument manufacturing.⁶⁵ By 1882, advertising was the second largest expenditure for the firm and accounted for 19.2 per cent of total costs, of which 2 per cent accounted for catalog production. By contrast, the company had spent considerably less on advertising during the 1870s, and advertising costs amounted to only 7.3 per cent of total expenditure.⁶⁶ Thus, while many medical tools continued to be manufactured to order, developments in printing meant that standardized catalogs could now be produced and distributed all over the world without customer request.⁶⁷ Indeed, Maw's wider distribution of a larger number of its catalogs from the late 1870s led to the need for the company to maintain extensive customer registers, evidence for which before this date is scarce; by 1885, Maw sent catalogs to and received orders from medical practitioners in Eastbourne,

⁶⁴ For the rise of professional managers and moves away from personal capitalism more generally, see Wilson, *British Business History*.

⁶⁵ Richmond, Stevenson and Turton, *Pharmaceutical Industry*, 246; Maw, *Personal Ledger of Charles Maw [including trade expenses]*, D/Emw B2, 1878-1889. Similarly, within the more aggressive pharmaceutical company Burroughs, Wellcome & Co. (BW&C hereafter), Silas Burroughs, who began his career as a travelling sales representative, took a more active role in the commercial side of the company whilst Henry Wellcome was keen to develop improved product lines. See Roy Church and E. M. Tansey, *Burroughs Wellcome & Co*, 47, 48. For more on BW&C's travelling representatives, see Roy Church, "The British Market for Medicine."

⁶⁶ Maw, *Personal Ledger of Charles Maw [including trade expenses]*, D/EMw B1, 1870-1882, 75.

⁶⁷ Weston-Davies, "The Surgical Instrument Maker."

Liverpool, Harrogate, Leeds, Oxford, Nottingham and Scarborough, as well as countries in the British Empire, Australasia and South America.⁶⁸

Increased production and distribution of non-literary forms of print such as catalogs also served British medical instrument makers as a way to defend, as well as expand, their market shares. After all, growth in international trade simultaneously led to intensified competition and increasing competition made it difficult for new British medical instrument makers to penetrate the market. For newly established instrument makers like Baird & Tatlock and Chas F. Thackray, the creation of company and brand awareness through their catalogs was a necessary but costly part of business strategy from the beginning. As a newly established pharmaceutical company, Burroughs, Wellcome & Co. was also affected by increased competition and in 1881, its advertising expenditure reached 10 percent of sales revenue increasing sharply from £9,820 in 1899 (ten times the amount spent by Maw in the same period) to nearly ten times that figure £95,918 in 1914.⁶⁹ As instrument makers began to publish catalogs in increasing numbers, others felt compelled to follow in order to compete. British instrument makers also faced more intense competition from those based in North America and Germany with ambitious plans to expand into Britain and the rest of Europe.⁷⁰

Medical instrument makers were particularly eager to maintain their often well-established relationships with a largely neglected but rapidly developing and increasingly bureaucratic form of customer: the hospital.⁷¹ The general reconfiguration of local trade relationships as a result of industrialization and expansion of trade has been well covered in the historical literature, but local relationships were undoubtedly still an important way in

68. Maw, *Register of customers in Britain*, D/Emw B35, 1885.

69. Church and Tansey, *Burroughs, Wellcome*, 55.

70. Jonathan Liebenau, "Marketing High Technologies," 85; Edmonson, *American Surgical Instruments*, 131; Ross J. S. Hoffman, *Great Britain and the German Trade Rivalry*.

⁷¹ While the development of the hospital in Britain has received a great deal of historical attention, its role as a large scale purchaser in this period has largely been neglected. See Granshaw, *St Mark's Hospital*.

which the medical trade functioned.⁷² By 1880, a whole medical industry operated around hospitals in British towns and cities. For example, around St Bartholomew's hospital was located Arnold & Sons, Ferguson & Son, Holborn Surgical Instrument Company, Dale & Crampton, Maw and J. Button & Co. This pattern of localized medical industries was mirrored in the North American cities of Boston, New York and Philadelphia.⁷³ Sustained relationships with hospital based practitioners also meant instrument makers could create and maintain relationships with practitioners with private practices located nearby. The number of private practices in Harley Street, a short distance from the Middlesex Hospital and University College Hospital, had increased from 12 in the 1860s to 214 by 1910.⁷⁴ Similarly, in Leeds the private practices of numerous renowned practitioners, such as Thomas Clifford Allbutt (1836-1925) and Berkeley Moynihan (1865–1936), were close to the General Infirmary, in the exclusive Park Square.⁷⁵

The importance of the catalog as a tool through which companies aimed to retain and obtain hospital relationships is suggested by the large number companies sent to these institutions. From a sample taken from Maw's customer register of 1895, over half the London-based customers to whom the company distributed catalogs were hospitals.⁷⁶ St Bartholomew's hospital received catalogs from local companies, Arnold & Sons and Maw, as these companies attempted to retain the custom of the hospital which with they had established relationships. The hospital also received catalogs from companies located outside the local area and with which it had had fewer dealings, such as Down Brothers, Coxeter & Sons, Krohne & Sesemann, F. Schutze, W. H. Bailey and Holborn Instrument Company, as

⁷² For the scientific instrument trade, see Alison D. Morrison-Low, "“Spirit of Place”"; *Making Scientific Instruments*. For a similar discussion on locally based trade in pottery, see Andrew Popp, "Trust in an Industrial District."

⁷³ Edmonson, *American Surgical Instruments*.

⁷⁴ Reginald Pound, *Harley Street*, 21; Tweedale, *At the Sign of the Plough*, 83.

⁷⁵ Penny Wainwright, *Opposite the Infirmary*.

⁷⁶ A 5 per cent sample was taken from 1,000 practitioner names listed. Two names from each letter of the alphabet, the first and the last, were included. *Register of customers in London*, 1895, D/EMw B33, Maw archives.

these companies attempted to expand.⁷⁷ St Thomas' Hospital received advertising literature from Krohne & Sesemann and Weiss, who attempted to subvert the hospital's longstanding relationship with local instrument maker Henry Bigg (previously Samuel Laundry) and their relatively new relationship with Down Brothers, established on St Thomas' Street in 1874. Outside of London, Maw sent catalogs to hospitals all over Britain, in order to expand their customer base. Among others, hospitals included East Sussex Infirmary, The Nottingham Hospital, Saffron Walden Infirmary, and the Royal Hants Hospital, Winchester.⁷⁸ Leeds General Infirmary received advertising literature from London based companies Allen & Hanburys, Down Brothers, and Mayer & Meltzer, who attempted to subvert the relationship local company Reynolds & Branson had with the Infirmary since their establishment in 1816.⁷⁹

While bureaucratic administration allowed medical companies to better tackle changes in the trade, the increasing bureaucracy of the hospital system meant that personal relationships of the kind common in the early nineteenth century could no longer easily be obtained or maintained. At St Bartholomew's, for example, the growth in the number of surgical procedures from 417 in 1863 to 2,446 in 1899 relied on increased monitoring and extensive record keeping.⁸⁰ As important centers in the acceptance of new medical specialties such as electrotherapy, laryngology and ophthalmology, many general hospitals established their own special departments and between 1855 and 1889, there was a 230 per cent increase in the number of staff within these departments, many of whom began to share tools and equipment purchased and owned by the hospital, rather than using sets of their own.⁸¹ This period also saw a huge growth in specialist hospitals: by 1900, specialist hospitals numbered

77. St. Barts, *Letter book*, HA10/3, 1881 – 1883, 574.

78. Maw, *Register of customers in Britain*, D/EMw B36, 1890s.

79. Leeds General Infirmary, *Weekly board minutes*, SC 3/15, 1877-1882; *House Committee Minutes*, SC 4/11, 1909-1911, Leeds Record Office, West Yorks.,

80. Harvey White, "Surgery in the eighteenth and nineteenth centuries," 219.

81. Peterson, *Medical Profession*, 277, appendix D.

128 in England and Wales.⁸² The expansion of such specialisms led existing companies to broaden their product ranges, and new specialist companies published catalogs, most notably, Karl Schall, an electro-medical instrument supplier of London established 1893, and The Cavendish Electrical Company of London established in 1902. Catalogs began to offer hospitals discounts on large orders as a retention and expansion strategy.⁸³

Attacks on nepotistic relationships between hospitals and suppliers, particularly from the health reformer, Sir Henry Burdett (1847-1920), also correlated with company difficulties in maintaining and obtaining regular orders. A former medical student at Guy's hospital, Burdett had witnessed first-hand how one of the largest hospitals functioned, and he criticized the lack of regulation in hospital systems. Through his collection, compilation and analysis of hospital statistics—another new form of functional writing—Burdett argued that hospitals wasted huge sums of money on drugs, tools and appliances, particularly those where bad routines had become entrenched over long periods of time.⁸⁴ He advocated a uniform system of hospital accounting across the UK, where price was considered the most important factor when purchasing medical goods.⁸⁵ Perhaps as a result of Burdett's campaigning, hospital administrative bodies—largely formed of men with business experience like Charles Maw—increasingly looked to the supplier who could supply instruments of the highest quality at the best price instead of automatically using those based locally. In purchasing decisions, economic considerations therefore were becoming more important than established relationships between companies and hospitals. Schedules and lists of prices were drawn up by board members and prices were negotiated with companies. In 1901, St Bartholomew's made new procedures clear to their local supplier Arnold & Sons in a letter stating: "no goods

82. Rosemary Stevens, *Medical Practice in Modern England*, 27.

83. For example, Arnold & Sons, *Catalogue of Surgical Instruments*, ([n.p.], 1885), preface

84. Henry Burdett, *The Uniform System of Accounts*, xxxvi.

85. Henry Burdett, *The Hospital and Charities Annual*; "Hospital Accounts," 189; "Hospital Accounts," 220.

are to be supplied without an official order signed by the clerk.”⁸⁶ As these regulations were increasingly enforced, relationships with medical practitioners within the hospital could be fraught. In 1881, the hospital administrative board at Leeds General Infirmary agreed to Dr Churton’s request to purchase of antiseptic inhalers providing the cost did not exceed 2s 6d each.⁸⁷ In 1892, St Bartholomew’s surgeon William Lewis Jones ordered two cystoscopes from Schall for use at the hospital, but as the decision over purchasing was not brought before the committee, the treasurer of the board refused to sanction payment.⁸⁸ The tendering system also became popular with hospital administrators as hospitals grew and supplies were needed on a more regular basis. Tenders, often shared between instrument makers, created a greater amount of competition among suppliers that had been able to work alongside each other early in the nineteenth century.⁸⁹ No longer able to rely on their local hospital for trade, companies used catalogs to expand beyond their locality.

Historians have identified the role of national and international competition in the breakdown of companies’ established networks of trade, but the extent of its effect within the more specialist medical trade, along with the effect of changes in hospital bureaucracy, is difficult to assess. Despite the rise of the mail-order catalog as a medical information technology, the importance of personal relationships between suppliers and hospitals never completely disappeared. Yet, the fear of competition was enough to motivate instrument makers into attempting to broaden their clientele through shaping their catalog into a more discernable tool of business. By the late nineteenth century, hospitals such as St. Bartholomew’s began to order from the catalogs of companies outside their locality, suggesting companies’ fears were justified. The medical trade, along with all other trades,

86. St. Barts, *Letter book*, HA10/10, 786.

87. LGI, *Weekly board minutes*, SC 3/15, 238.

88. St. Barts, *Letter book*, HA10/6, 953.

89. For example, for St Bart’s tender for 1906, Arnold & Sons supplied bougies, catheters and several types of knives, needles and lancets, whereas R. Beaucamp, another surgical instrument maker of London, supplied a number of scissors and forceps. St. Barts, *Drugs, Instruments and Appliances Committee Meeting Minutes*, HA6/3/1, 1905, 8.

had changed significantly since the early nineteenth century. By the turn of the twentieth century “in many industries the small firm clung tenaciously to life” but the struggle for survival in these new economic circumstances was too great for some, and many instrument makers, along with small firms in other trades, disappeared altogether or merged with others in order to strengthen their market position.⁹⁰ Indeed, John Wilson estimates that an average of sixty-seven firms disappeared in British mergers each year between 1888 and 1914.⁹¹ As in other trades, larger firms such as Allen & Hanburys and Maw certainly played a part in the decline of the number of companies within the trade because they started to manufacture some instruments en masse making them cheaper and easier to supply.⁹² Their large scale international advertising campaigns, of which catalogs formed an increasingly important part, also led to these significant changes in the trade. Published in unprecedented numbers, catalogs took on a format which more explicitly encouraged mail-order than those published one hundred years earlier.

Conclusion

In its earliest form, the medical trade catalog disseminated commercial and professional information in a reference book format to suit the relatively small and geographically specific practitioner market. Its subsequent rise and transformation from an attractive book of display to a standardized mail-order catalog was certainly not inevitable but relied on several key developments. Like general mail-order catalogs, changes to the form of the mail-order catalog for medical instruments and its increased circulation were aided by printing developments and followed the rapid growth of the British economy during the late nineteenth century: makers within the medical trade aimed to steer demand and control

⁹⁰ Both J. J. Ferguson and Jean Evrard, surgical instrument makers of London established in the early nineteenth century, dissolved in 1893 and 1900 respectively. They were small firms consisting of only a few instrument makers, and rarely promoted their products.

⁹¹ For mergers in other trades, see Wilson, *British Business History*, 65, 102
⁹² Weston-Davies, “The Surgical Instrument Maker,” 42, 43.

markets with commercial information as a result of such growth. Simultaneously, its rise and incorporation into the world of the medical profession relied on changes specific to medicine: it accompanied the growth of the practitioner market and their increasing demand for print in forms which suited their requirements and circumstances. Innovation in early catalog form often accompanied the number of high quality therapeutic and diagnostic tools assimilated into medical practice as instrument makers attempted to disseminate new commercial knowledge reliably; the publication later developed into a more discernible marketing tool through the inclusion of individual product engravings, product prices, testimonials and reference numbers, with which companies aimed to penetrate increasingly bureaucratic hospital systems. Indeed, just as Robert Anderson has suggested that the rise of scientific instrument catalogs resulted from the reorganization of the physical sciences centered on the laboratory, here we have seen the rise of the medical catalog following the reorganization of medicine, which was increasingly centered on the hospital.⁹³ Through its use in both defending and expanding markets for medical tools, the catalog was therefore an increasingly important tool discernible from the medical instruments and appliances promoted within its pages; a purpose which only becomes clear once the catalog's long term changing material form is studied.

The catalog then played no minor role in mediating practitioner-supplier relations between 1750 and 1914: it aided the transformation of tools from technologies to commodities within the medical marketplace and between trade and profession as the consumption of tools shifted from individual relationships based on locality to the collective purchasing decisions of the hospital. Indeed, historians, very much like practitioners at the time, may well consider these catalogs as reference books for the medical trade. Although the catalog was once considered a late nineteenth century communication technology

⁹³ Anderson, "Were Scientific Instruments in the Nineteenth Century Different?"

manufactured to overtly facilitate mail-order, here we have seen that in its early form in the medical trade, it also represented instrument makers' desire to access and to control markets in an earlier information society. All medical catalogs aimed to disseminate commercial information to practitioners in the hope of encouraging custom, albeit those of the late nineteenth century did so on a larger scale and more explicitly; they encouraged mail-order as a more definite means of market control following full industrialization through the inclusion of features such as reference numbers and testimonials. Accordingly, nineteenth and early twentieth century catalogs represented a development in instrument makers' earlier use of print as an information technology.

By viewing the trade catalog as a medical information technology alongside the tools it promoted, this study, with others in this special edition, also broadens our conception and enhances our understanding of the relationship between medicine, technology, print and commerce. Indeed, historians interested in professional and technological development have only just begun to relate medicine to the development of an industry beyond the “quacks” first discussed by Roy Porter and to wider developments in print culture beyond literary publications.⁹⁴ Material medical technologies were not just diagnostic or therapeutic tools, but, as historians of information emphasize, could be printed in form and continually co-constructed by instrument makers and practitioners as a way of managing, disseminating and consuming increasing volumes of commercial and professional knowledge.⁹⁵ The focus on key catalog components, such as the replacement of illustrative plates with individual engraving blocks, throws light not only on producer motivations, but also on the ways in which producers responded to demand and to changes in medical practice. As an increasing number of scholars argue, practitioners, alongside other readers, were clearly, attracted to the growing visual culture of medicine and of consumerism. It is clear, however, that more work

⁹⁴ For example, Roy Porter, *Health for Sale*. A recent example of a synthesis of a medical industry and print is Takahiro Ueyama, *Health in the Marketplace*. See also Apple, Downey and Vaughn, *Science in Print*.

⁹⁵ Chartier, *The Order of Books*; Darnton, “First steps towards a history of reading.”

is required before we understand the full array of individual and collective practitioner responses to catalog development; such responses can be revealed to some degree by paying greater attention to the publication's physical features, such as practitioner annotations in catalog editions, and the significance of catalogs in hospital libraries.⁹⁶

Alongside forms of print, there certainly remains considerable scope to investigate other kinds of printed and non-printed medical innovation before, during and beyond British industrialization. Changing medical tools, the mechanization of manufacturing processes during the twentieth century, and the associated rise of more sophisticated systems of media in both printed and non-printed forms, such as pharmaceutical sales representatives and the electric telegraph, suggest the need for more thorough analyses before the full effect of information technologies and their diffusion among the medical profession, and indeed other audiences, are understood. Indeed, in the twenty-first century, the almost universal use of the internet by companies in all trades to target customers worldwide during what some have called the peak of information society has consequences yet to be fully fathomed. Such universal use may instinctively signal the demise of the catalog and its valuable role in expanding and retaining markets, although early research suggests that electronic communications have only served to enhance the production and distribution of printed advertising.⁹⁷ Indeed, the full range of tools and instruments from John Weiss International are fully displayed on both their website and in its latest printed catalog.⁹⁸

⁹⁶ Claire L. Jones, "(Re-)Reading Medical Trade Catalogs."

⁹⁷ James Raven, "Print for Free," 2. See also David Edgerton's critique of the idea that we have moved away from a material into a dematerialized, information age in *The Shock of the Old*, particularly chapter 3. For the effect of our information age on the pharmaceutical industry, see Nick Fox, Katie Ward and Alan O'Rourke, "A Sociology of Technology Governance for the Information Age."

⁹⁸ <http://www.johnweiss.com/news/john-weiss-son-ltd-celebrate-their-225th-anniversary> and <http://www.johnweiss.com/instruments-catalogue> (accessed on 20th October 2012.)

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Suggested figures:

Figure 1. Catalog editions published, 1750-1914. This graph is compiled using all the known existing catalog editions held in museums and libraries across the UK.

Figure 2. The exterior of John Weiss & Son Ltd, *Illustrated Catalogue of Surgical Instruments and Appliances*, 1901. Medical instrument makers had shaped their catalogs into well presented, hard-bound books since the late eighteenth century (image: Thackray Museum, Leeds).

Figure 3. Illustrative plate of surgical tools included in John Savigny’s guide of 1798, including scalpels, a cannula, and surgical needles. This is one of the catalogs first to include illustrations of tools drawn exactly to scale (image: Wellcome Library).

Figure 4. The appearance of Weiss’ lithotrite in Henry Thompson’s *Clinical Lecture on Diseases of the Urinary Organs*, (London, J & Churchill, 1868), complete with the company’s name embossed across the illustration (image: Thackray Museum, Leeds).

Figure 5. The content of Maw, Sons and Sons, *Illustrated Catalogue of Surgical Instruments*, 1905, demonstrating the promotion of a range of instruments for use in general surgery. By the late nineteenth century, each product promoted was accompanied by an illustration with a scale, a reference number, and a price (image: Thackray Museum, Leeds).

Figure 6. An extract from the *Lancet* (4th July 1903) written by practitioners Arthur Buck recommending a general operation bag and included in Maw’s 1905 catalog. Maw, and most other companies, incorporated this feature into their catalogs as a promotional technique; a written testimonial from a medical practitioner demonstrated to readers that the product referred to was reliable (image: Thackray Museum, Leeds).