Preprint of Michael K. Buckland. Lodewyk Bendikson and photographic techniques in documentation, 1910-1943. In: *International Perspectives on the History of Information Science and Technology : Proceedings of the ASIS&T 2012 Pre-conference on the History of ASIS&T and Information Science and Technology*. Ed. by Toni Carbo and Trudi Bellardo Hahn. Medford, NJ: Published for the American Society for Information Science and Technology by Information Today, Inc., [2012]. Pages 99-106. Published version may differ slightly.

Lodewyk Bendikson and Photographic Techniques in Documentation, 1910 – 1943.

Michael K. Buckland
School of Information, University of California, Berkeley.
buckland@ischool.berkeley.edu

Abstract.. Photographic techniques were central in research and development in documentation during the first half of the twentieth century, much as digital computing was later. One pioneer of photographic documentary methods was Lodewyk Bendikson (1875-1953) of the Huntington Library, San Marino, California. His work illustrates the development of techniques for the reproduction, preservation, and analysis of documents: (photostats, microcards, microfilm, readers), the use of infrared, ultraviolet, and fluorescent rays for the analysis of damaged and altered documents; and policy issues relating to preservation and dissemination. Easy, inexpensive, reliable document copying became available during Bendikson's library career and has had very extensive consequences.

Photographic technology matured greatly during the first half of the twentieth century. Here we are concerned with the application of photographic techniques to the reproduction, dissemination, and physical analysis of documents. Leading figures in this development in United States included Lodewyk Bendikson, Robert C. Binkley, Watson Davis, Eugene B. Power, M. Llewellyn Raney, and Vernon D. Tate. Of these, Lodewyk Bendikson is now the least remembered even though his work attracted widespread attention at the time, having been widely publicized in, for example, *Popular Mechanics Magazine*, *The Readers Digest*, *The Illustrated London News*, and several newspapers. What follows is a brief introduction to Bendikson and his work on photographic documentary techniques and, thereby, an overview of the development of the field.

Bendikson's Early Life

Lodewyk Bendikson was born in Amsterdam in the Netherlands in 1875. Destined for a military career, he was sent to a military academy primary school in The Hague. However, his inability to pass eye tests at age 12 resulted in transfer to an elite academic secondary school in Amsterdam. He studied medicine at the University of Amsterdam and become an orthopedic surgeon, first in Amsterdam, then, from 1902 in New York city. In 1904, he married Estella Martha van der Zijl and in 1906 he returned to Amsterdam.

His forename was *Louis*, but he used the Dutch form, *Lodewijk*, and, following a nineteenth-century practice, used the letter *y* to represent the *ij* diphthong, hence *Lodewyk.*

A Librarian

Bendikson returned to New York in 1909, became a permanent resident, and, in 1923, a US citizen. In New York Bendikson had come into contact with John Shaw Billings at the New York

Academy of Medicine. Billings was an army surgeon who had been frustrated when a student by difficulties searching the medical literature. Eventually he become responsible for the Army Surgeon-General's library and started the *Index Medicus*. This library and this bibliography became the National Library of Medicine and *Medline*, respectively (Dain, 1978).

In 1896 Billings was put in charge of forming the newly established New York Public Library out of the Astor, Lennox and Tilden foundations. In 1910 Dr Billings induced Dr. Bendikson to start a new career as a cataloger in the research collections of the New York Public Library. Subsequently, in 1916, Bendikson became a bibliographer in the private library of the railroad tycoon Henry E. Huntington, also in New York city. In 1920 Huntington moved his library to new quarters on his San Marino ranch, near Pasadena, California, and Bendikson went with it.

After years of aggressive purchasing Huntington had assembled an astonishingly rich library, with far more copies of pre-1501 printing than any other U.S. library. His collection of early English printing was third only to the British Library and Oxford's Bodleian Library. Huntington did more than open his collections to scholars. He created a research center supported by his library, art gallery, and gardens (Dickinson, 1995; Pomfret, 1969).

Bendikson's library work brought contact with older materials and he sent short notes about rare and interesting Dutch items to Combertus Pieter Burger, Jr. Burger was the editor of *Het Boek*, the scholarly Dutch bibliographical journal, and published six of Bendikson's reports from 1918 to 1929.

Photostats

Bendikson started his library career as photography was just beginning to be widely used for document copying. There were isolated earlier examples of the use of photography to reproduce documents, e.g., for copying military instructions during operations. Dagron used homing pigeons to carry microfilms into besieged Paris in 1870 (Luther, 1950) and microfiche had been announced by Robert Goldschmidt and Paul Otlet in 1906 (Otlet, 1990, 87-95), but more important was the introduction of commercially available photostat copying cameras in 1910.

Photostat was both a trade name and also a generic name for using a camera to photograph documents directly on to sensitized paper instead of using glass plate or film. A large camera was loaded with sensitized photographic paper. An exposure was made, developed, and fixed. The immediate result was a negative print, usually life-size. Several European and American manufacturers sold 'photostat' cameras under different product names. (For background on photostats and other photocopying techniques see Greenwood (1943), Hawken (1960), Hawkins (1960), and Photostat (1936)).

An ordinary document with black text on white paper yields a negative copy on paper: white text on a black background, reversed left to right, and upside-down. A second photostat copy of the first, a negative of the negative, would yield a copy with the orientation and appearance of the original, with black text correctly positioned on a white background. It was convenient to mount the camera pointing horizontally and to add to the lens a 45 degree mirror reflecting downwards to copy an original laid horizontally, which would correct the left-to-right reversal.

Making photostats was relatively easy, accurate, inexpensive, and quick. Speeds up to 600 copies an hour were claimed (*Jahrbuch*, 1928, p. 156). However, the cameras were rather large and expensive and a copy of a book would be bulkier than the original because photostatic copies were usually one-sided on thick paper.

Economic and Legal Factors

The merits of photostat copying were quickly recognized. A federal efficiency study was promptly transmitted to Congress with President Taft's strong endorsement: "The attention of all departments has been called to this improved method of securing copies which heretofore have been made by hand at a cost many times greater than is incurred by the photographic process" (United States, 1912, pp. 3, 33-37). At that time, the federal government was paying people to visit foreign archives to transcribe important documents by hand or with a typewriter, so the advantages in both accuracy and efficiency of photostat copying were clear.

Photostats had significant advantages over film. Libraries avoided ownership of film because the nitrate stock then used was highly flammable and insurance companies imposed stringent storage requirements. Photostats, being made on photographic paper, were not particularly flammable. And, just as the acceptance by law courts of the evidentiary status of digital documents has been slow, so also with photographs. For a while photostats were accepted as evidence when conventional photographs were not, apparently on the grounds that a photostat was a direct copy but a photograph was two stages removed (via a negative) from the original (Jones, 1938, pp. 137-145).

Bendikson probably became familiar with photostat copying while employed at the New York Public Library, where a photostat camera was acquired in 1912 and one of his supervisors there, Wilberforce Eames, pioneered using photocopies for bibliographical work (Cole, 1921, p. 7; Robertson & Holley, 1978, p. 151).

Initially, few libraries invested in a photostat camera or had staff competent to operate one, but this changed as requests for photocopies increased. The Huntington acquired a photostat camera when it moved into its new building in San Marino in fall 1920. On November 1 Bendikson wrote to his supervisor, the bibliographer George Watson Cole:

> "I beg to inform you that the photostat machine and the dark room with all its appurtenances are now in working order, and a reasonable supply of papers and chemicals is on hand. All that is lacking at present is a photostat operator and there is a great deal of difficulty to fill the place in a satisfactory manner. The demands of professional photographers to come out for a certain number of days to do our work are prohibitive, and to engage a man on full time, is out of the question for the same reason.
> . . . I hereby offer to place my skill as a photographer (which I developped [sic] for this purpose in my spare time) at the disposal of the Library, in consideration of a remuneration of Thirty-five (35) dollars monthly; . ." (Quoted in Bendikson, 1921a).

After a reminder in May 1921, Cole agreed, Bendikson was assigned responsibility, and a Department of Photographic Reproduction evolved to serve the entire institution, which comprised an art gallery and gardens in addition to the library.

The Huntington had a strict policy of never lending its materials even to other research libraries. Located in earthquake-prone California, there was a serious concern about preservation, reflected in the construction of exceptionally strong stacks. The Huntington's mission was and is to promote research, and photostatic copying was seen as a major tool to advance that mission in several ways. As now, with digital texts, the creation of an archive of photographic negatives, whether photostatic or microfilm, allowed multiple copies for multiple purposes: Collaborative collection development, publication, conservation and restoration.

Collection development. One of the first projects was a collaboration with a New York collector, whereby each party supplied the other with photostatic copies of choice books that the other lacked. When the Depression weakened the Huntington's buying power, there was a systematic program of requesting photostat copies from other libraries of desired titles when originals were unavailable or unaffordable. The research staff carefully nominated titles important for research and an effort was made to obtain all of the works of selected authors for which the Huntington had strong holdings.

Publication. From the start the Huntington engaged in a policy of making and selling photostatic reprints of its rarest and most important items. A file of photostat negatives was used to produce positive photostat copies as needed. The titles were listed in a series of topical catalogs which eventually listed some 3,600 titles. It was a service to scholarship, but it was also a deliberate preservation strategy, ensuring that if anything happened to the Huntington's most precious volumes, photocopies would survive in other locations.

Conservation. In order to protect its more valuable and fragile books, the Huntington systematically made photostat copies for the open shelves, which increased access to the texts while protecting the originals from wear and tear.

Restoration. Old books are often damaged or incomplete and obtaining a photostat copy of missing pages could mitigate the problem. The treatment of the 1603 quarto edition of Shakespeare's *Hamlet* was a well-publicized example. Only two copies were known to exist, both incomplete: The Huntington's copy had lost the last page of the text and the one in the British Library lacked its title-page. Since the missing pages were different, each library supplied the other with a photostat copy of their missing page. The Huntington then published a complete facsimile edition so that copies would become available in many more than two libraries (Shakespeare, 1931). Photographic copying was recognized as far more reliable than the earlier practice of facsimile reprints using newly-set type that resembled the original (Willoughby, 1932). Microfilm copies could be made from photostat negatives or, where demand justified the investment, a photolithographic edition could be printed. The 1948 reprint of John Weever's *Faunus and Melliflora* (1600) was made entirely from Huntington photostats of the sole surviving copy in the Huntington Library (Weever, 1948).

Wave Length In Photography

In 1932 Bendikson published his longest and most important paper on documentary photographic techniques, "Phototechnical problems: Some results obtained at the Huntington Library," which summarized his experience (Bendikson, 1932b). What attracted widespread attention were the results obtained by manipulating the wavelengths of the light used.

Any visible image depends on there being a visible difference (contrast) between adjacent areas, often generated by differences in the *amount of light* radiated from the surface being viewed. White paper reflects more light than black ink marks on it do. There are also *differences in the wavelengths of light*, different colors. Human vision uses a limited range of frequencies from violet through red and so the human eye cannot see objects that radiate only infra-red or ultra-violet light.

Photography uses light-sensitive surfaces that darken when exposed to light and ordinary films are designed to be sensitive to all of the humanly-visible colors (panchromatic). However, photosensitive surfaces (and some animals) can respond to wavelengths that are invisible to humans, both longer than the visible spectrum (infra-red) or shorter (ultra-violet). In consequence photography can sometimes be used to record an image that is invisible to human eyes and, when processed, provide an image that has been made humanly visible. A special case is *fluorescence* whereby damage or chemical changes on a surface can cause a change in the wavelength of light, especially ultra-violet light, reflected back from the surface. Photography may be able to render this difference when it is not humanly visible in the original.

The challenge in photographic imaging, therefore, is to manipulate the amount of light and the range of wavelengths to record the optimal amount of contrast for the purpose at hand. The options available include the choice of light-sensitive material, the amount of light supplied (lighting, aperture, and exposure time), filters to selectively block some wavelengths, and the post-exposure processing of the images. Bendikson's skilful manipulation of these variables produced his most striking results.

Filtered Visible Light: Benjamin Franklin's Ink Blot

Benjamin Franklin knocked over his inkpot and spilled blue ink on a page of his handwritten autobiography, rendering text illegible. Max Farrand, who was trying to prepare an edition of the text, asked for help. Bendikson determined that by using an orange filter to reduce the amount of blue light admitted into the lens and then over-exposing the image to compensate, he was able to amplify the difference between where the blue ink of the spill covered lines of the ink of Franklin's writing and where the inkblot stained only white paper. This enhancement enabled Farrand to determine what Franklin had written (Bendikson, 1932b, pp. 789-90). See Figure 1.

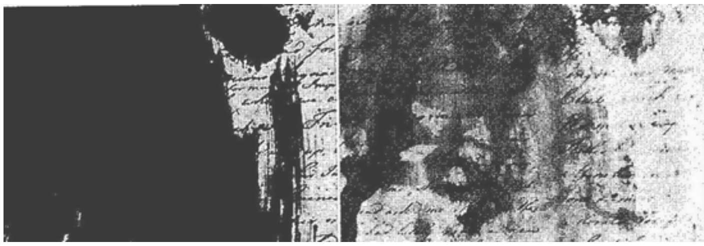

Figure 1. Benjamin Franklin's ink stain (left) and photographed with an orange filter (right). (Bendikson, 1932b, p. 789).

Infra-Red Light: The Spanish Inquisition Censor's Marks

The Spanish Inquisition sometimes prohibited books and at other times "expurgated" (redacted) them, retaining the document but rendering objectionable passages illegible by scribbling over the offending lines. The Huntington had a copy of Theodore de Bry's *Collectiones Peregrinationum* (1590-1634) with much of the text obliterated (redacted) by inky scribbles by a Spanish inquisitor to conform to the *Index Expurgatorius.* Bendikson found that the printer's ink was chemically different from the censor's. Both appeared equally black in visible light but they had different properties with respect to infra-red light. The printer's ink absorbed it and so appeared black, but the censor's ink transmitted it, becoming transparent, and allowing the printer's ink underneath to be visible. Use of a film sensitive to infra-red and a filter admitting only infra-red rays created an image in which the original printed text could be read through the (now transparent) censor's inked redaction (Bendikson, 1932b, pp. 790-91).

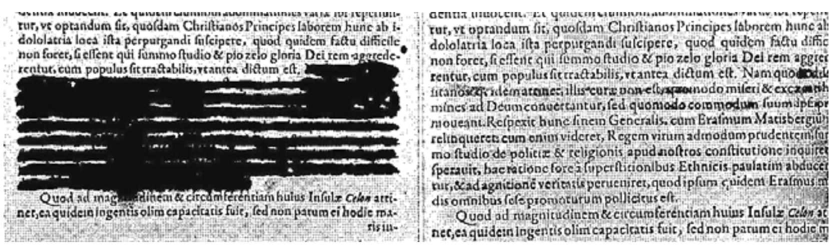

Figure 2. Censored document (left) photographed using infra-red light (right). (Bendikson, 1932b, p. 792).

Bendikson's de Bry photographs were picked up by the press and publicized internationally, especially after being exhibited by the Royal Photographic Society in London in 1932 (e.g., *Illustrated* (1932)). The next year Bendikson curated a traveling exhibit of some thirty photographs illustrating the various processes he had employed. This exhibit was shown at Stanford, in Santa Barbara, at the Huntington Founder's Day celebration, and elsewhere. Five prints were sent to the Fifth International Salon of Photography, held in connection with the California Pacific International Exposition in San Diego, and were awarded the gold medal in the division of scientific photography.

Ultra-Violet Light

Medieval scribes recycled valuable parchment by scraping off existing writing in order to re-use the same surface for a new text, a palimpsest. Modern scholars want to know what the erased text was and ultra-violet light can sometimes be used to read it. See figure 3.

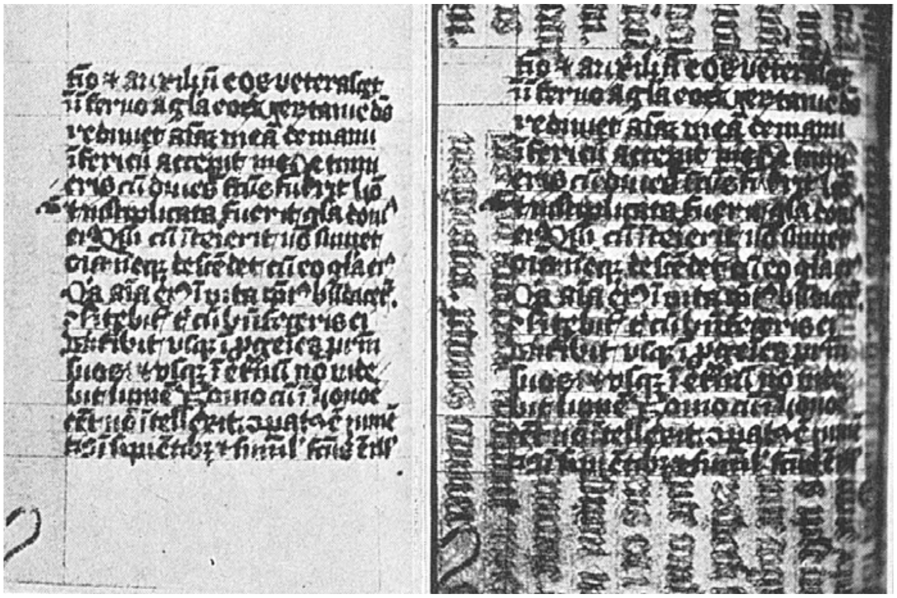

Figure 3. Medieval palimpsest breviary (left) photographed with ultra-violet light (right). (Bendikson, 1936a, p. 17).

Because commercially available ultraviolet lamps were hot, heavy, expensive and unsuitable for documentary photography, Bendikson adapted available medical equipment to provide a light-weight, portable ultra-violet lamp. It was a kind of long thin fluorescent lamp made with hard, quartz glass and bent into a spiral that circled the camera lens in order to give well-diffused, shadowless lighting. See figure 4. This spiral light could also be combined with a magnifying glass for visual examination of palimpsests, a hand-held “palimpscope” (Bendikson, 1934; 1936a, c).

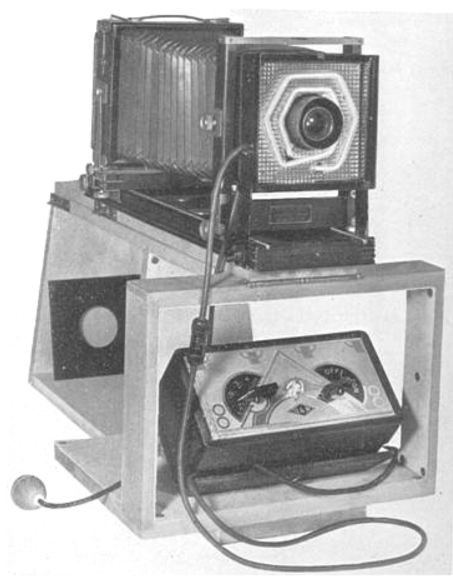

Figure 4. Ultraviolet lamp attached to camera (Bendikson, 1934, p. 690).

Fluorescence

Fluorescence is a phenomenon whereby the wavelength of reflected light is altered. A surface that has been altered through physical damage or chemically modified may fluoresce differently from the surrounding unaltered area. A modern application is the use of lamps that shine ultraviolet light on carpets to detect traces of pet urine which show up brightly. Bendikson used this technique to detect writing that was no longer visible in ordinary light. An example that received wide attention was his revealing of secret diplomatic writing written with "invisible ink" (Bendikson, 1937b).

Opaque Microprints and Microcards

A disadvantage of photostats is their bulk. They were usually one-sided copies the same size as the copied original and on relatively thick photographic paper. Bendikson saw an opportunity to reduce costs by first making negative copies, then, when making photostat positive prints from them, reproducing several pages at a time. For originals on small pages, if the negative copies were arranged correctly the second, positive print could be folded and bound like a gathering of the original. This reduced the number of positive exposures needed (Bendikson, 1921b).

Bendikson also explored the options for reduced-scale photostat reprints and developed a preference for microprint copies bearing around 50 pages on sheets 5 by 8 inches to be read using low magnification, wide-angle binoculars on a stand, which, he said, caused less eyestrain than a monocular magnifying glass (Bendikson, 1933).

Fremont Rider is famous for his proposal that libraries could solve their storage problems by microprinting the text of a book on the back of its 3 x 5 inch catalog card. That way no book collections or bookstacks would be needed! (Rider, 1944; Jamison, 1988). The foolishness of having readers remove cards from the catalog in order to read the reverse was quickly apparent and, instead, cards were filed separately from the catalog, with a concise bibliographical record along the top of the front of the card.

Rider acknowledged that his proposal built on Bendikson's work: ". . . some of us felt that Dr. Bendikson, of the Huntington Library, had been on the right track in his work, a decade or more before, with paper photo-microprints, and thought that these pioneer studies of his had hardly received the attention they deserved" (Rider, 1944, p. 96).

Bendikson used 5 by 8 inch cards which he described as filing cards (Bendikson, 1933). This size (large post octavo) is half of the "letter size" used in Britain (8 by 10 inches, quarto) before the adoption of metric paper sizes. Although 3 x 5 inches was already the dominant international format for catalog cards, some research libraries used other formats well into the twentieth century and the Huntington Library catalog used 5 by 8 inch catalog cards until photostat technology was used to convert its catalog to 3 by 5 inch format around 1930. See figures 5 and 6.

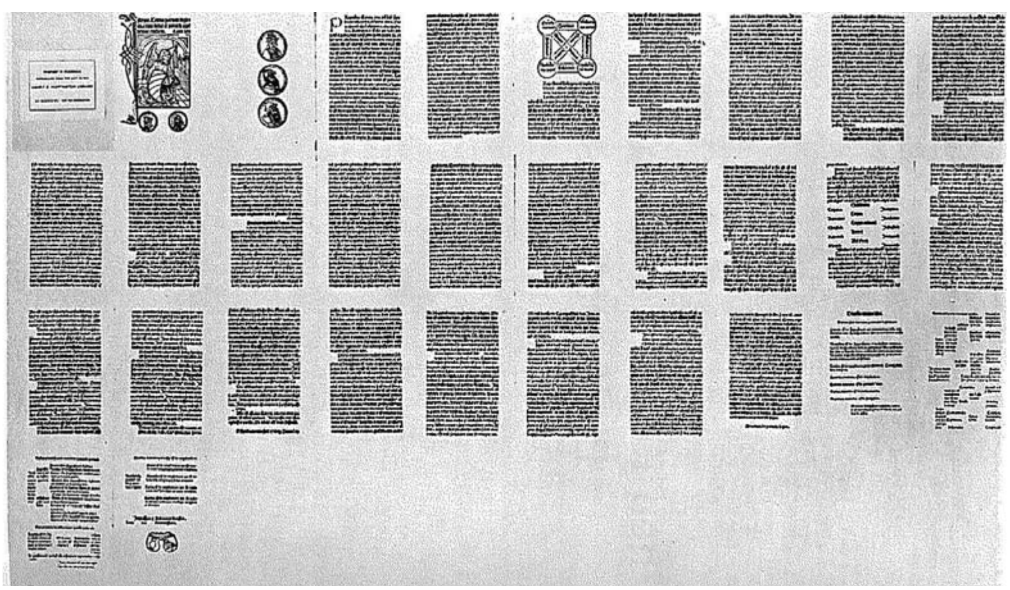

Figure 5. Microprint on a 5 x 8 inch card (Bendikson, 1933, p.912).

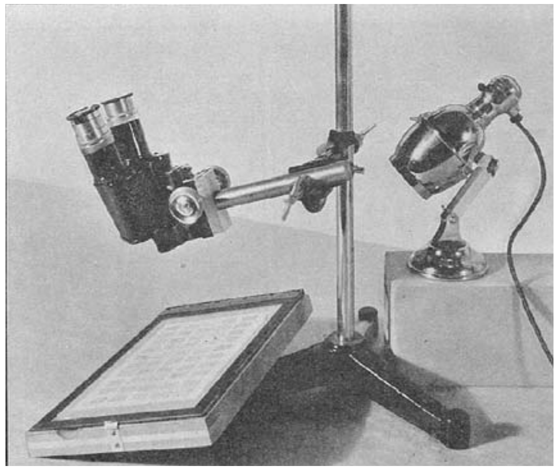

Figure 6. Binocular microcard reader (Bendikson, 1937a, p. 269).

Other Technical Work

Microfilming did not displace photostats in libraries until late in the 1930s when precision 35 mm still cameras, continuous flow copying, and safety film were used, making microfilm more acceptable (Metcalf, 1936). For publication, rather than one-off copies, Bendikson favored the production of microprint cards from 35 mm microfilm.

Bendikson worked on and/or reported a variety of technical advances including “engravers’ negatives” for improved fidelity in photolithography, the reduction of sulphur dioxide in library air, the permanence of microfilm and phototstats, and the eradication of insect book worms. For the most part he was deploying and advancing techniques already suggested or tested by others.

Bendikson the Bibliographer

Bendikson’s early publications reporting early Dutch materials have already been noted. In the early 1930s he published papers in English showcasing, with illustrations, Huntington’s treasures. In 1932 Los Angeles hosted the Olympics and he prepared three illustrated, sports-themed papers which appeared among advertisements for Duesenberg automobiles and other fine objects in an upscale Los Angeles society magazine *Game & Gossip* (Bendikson, 1931; 1932a, c). Later he published an article on a fine Dutch seventeenth bindery (Bendikson, 1936b).

Bendikson’s final writings included a series of impassioned warnings, as the Second World War developed, of the terrible destruction that aerial bombing would inflict on library collections and the desperate need to make and to disperse microfilm copies to mitigate the entirely predictable destruction of irreplaceable cultural resources (e.g., Bendikson, 1940).

He worked at the Huntington Library until he retired in 1943. See Figure 7. He died in 1953.

A portrait of Lodewyk Bendikson with a camera for microphotography is available at http://hdl.huntington.org/cdm/singleitem/collection/p15150coll8/id/98/rec/8

Conclusion

During Lodewyk Bendikson’s library career, from 1910 to 1943, there was a fundamental change in document technology. For the first time, copies of documents could be made easily, accurately, and inexpensively whenever needed. This change radically transformed constraints on scholars, administrators, professionals, and daily life (Jameson, 1939), but appears to have received relatively little attention from historians. Lodewyk Bendikson contributed actively to this change. He was a careful, professional, and successful exponent of a range of innovations in the technology of documentation, which he publicized through clear, concise articles, conference presentations, and exhibits, drawing attention to the valuable role of photographic techniques in documentation.

Resources

The primary resources for Bendikson are his published papers, mainly in the *Library Journal* and the *Journal of Documentary Reproduction*. For a checklist see Buckland (2012). The Huntington's *Annual Reports* contain a section on the work of his department until his retirement. A few professional papers, photographs, and biographical details are in the Huntington Institutional Archives, including Bendikson (1921a) and Notes (1943). I am grateful to the Huntington for permission to see them. So far, little else has been found, except for a few brief popular pieces (Invisible, 1936; also Ainsworth (1948, pp. 77-86; Zeitlin & Dunning, 1935).

Acknowledgment I thank Charles van den Heuvel for his assistance.

References

Ainsworth, E. (1948). *California jubilee: Nuggets from many hidden veins.* Culver City, CA: Murray & Gee. Chapter "The drunken bookworm," pp. 77-86.

Bendikson, L. (1921a). L. Bendikson to G. W. Cole, May 2, 1921. Huntington Institutional Archives.

Bendikson, L. (1921b). Photographic copying and reproducing. *Papers of the Bibliographical Society of America, 15*(1), 24-34.

Bendikson, L. (1931). When knighthood was in flower: A century of sporting books, 1545-1639, in the Huntington Library. *Game & Gossip* (Los Angeles), *9*(12), 16-18.

Bendikson, L. (1932a). Forgotten Olympics of King James' reign: How Captain Dover encouraged English sports. *Game & Gossip* (Los Angeles), *10*(5), 6-8.

Bendikson, L. (1932b). Phototechnical problems: Some results obtained at the Huntington library. *Library Journal, 57*, 789-94.

Bendikson, L. (1932c). Sports and pastimes of the middle ages, represented through illuminated manuscripts. *Game and Gossip* (Los Angeles), *10*(12), 14-15 & 44.

Bendikson, L. (1933). When filing cards take the place of books. *Library Journal, 58*, 911-13.

Bendikson, L. (1934). New type of an ultra-violet light source for documentary photography. *Library Journal, 59*, 690-92.

Bendikson, L. (1936a). A cycle of ultra-violet light sources for various uses. *Library Journal, 61*, 16-17.

Bendikson, L. (1936b). House of Magnus at Amsterdam, famous bookbinders of the seventeenth century. *Pacific Bindery Talk, 8*, Front cover, 94-100.

Bendikson, L. 1936c). The photography of ultra-violet fluorescence. *Journal of the Photographic Society of America 1*, 5, 6, 10 & 11.

Bendikson, L. (1937a). The miniature camera in library work. *Photographic Journal, 77*, 269-271.

Bendikson, L. (1937b). The restoration of obliterated passages and of secret writing in diplomatic missives. *Franco-American Review, 1*(3), 1-19.

Bendikson, L. (1940). The need for safety measures. *Library Journal, 65*, 774.

Buckland, M. (2012). *Lodewyk Bendikson – Checklist of publications.* http://people.ischool.berkeley.edu/~buckland/bendbibl.pdf Visited July 28, 2012

Cole, G. W. (1921). The photostat in bibliographical and historical work—A symposium. *Papers of the Bibliographical Society of America 15*(1), 1-16.

Dain, P. (1978). Billings, John Shaw (1838-1913). In B. S. Wynar (Ed.). *Dictionary of American library biography* (pp. 25-31). Littleton, CO: Libraries Unlimited.

Dickinson, D. C. (1995). *Henry E. Huntington's library of libraries.* San Marino, CA: Huntington Library.

Greenwood, H. W. (1943). *Document photography: Individual copying and mass recording*. London: Focal Press.

Hawken, W. R. (1960). *Full-size photocopying.* New Brunswick: Graduate Library School, Rutgers—the State University. (The state of the library art, 5, pt 3) Hathi: http://hdl.handle.net/2027/mdp.39015023479549

Hawkins, R. R. (1960). *Production of micro-forms.* New Brunswick: Graduate Library School, Rutgers—the State University. (The state of the library art, 5, pt 1). Hathi: http://hdl.handle.net/2027/uc1.b4194852

Illustrated London News, (Sept 17, 1932), 428.

Invisible rays solve ancient mysteries. *Popular Mechanics Magazine,* (May 1936), 717-19.

Jahrbuch für Photographie und Reproduktionsverfahren für die Jahre 1921-1927. (1928). *30*.

Jameson, R. D. (1939). The scholar and his library. *Saturday Review of Literature* 20 (Aug 26, 1939): 10-12.

Jamison, M. (1988). The microcard: Fremont Rider's precomputer revolution. *Libraries & Culture, 23*(1), 1-17.

Jones, L. L. (1938). *Valid or forged?* New York: Funk & Wagnalls.

Luther, F. (1950). Rene Dagron and the Siege of Paris. *American Documentation, 1,* 196-206.

Metcalf, K. D. (1936). Micro-copying on photographic film. *Library Journal,* 61, 10-15.

Mitchell, C. A. (1922). *Documents and their scientific examination*. London: Griffin.

Notes on the career of Dr. Bendikson. June 29, 1943. Typescript, 1 page. Huntington Institutional Archives.

Otlet, P. (1990). *International organization and dissemination of knowledge: Selected essays.* Amsterdam: Elsevier.

Photostat Corp. (1936?). *The Photostat and its operation*. Rochester, N.Y.: Photostat Corp. Hathi http://hdl.handle.net/2027/mdp.39015011240739

Pomfret, J. E. (1969). *The Henry E. Huntington Library and Art Gallery, from its beginnings to 1969.* San Marino, CA: Huntington Library.

Rider, F. (1944). *The scholar and the future of the research library.* New York: Hadham Press.

Robertson, W. D. & Holley, E. (1978). Eames Wilberforce (1855-1937). In Wynar, B. (Ed.), *Dictionary of American library biography* (pp. 148-153). Littleton, CO: Libraries Unlimited.

Shakespeare, W. (1931). *Hamlet: The first quarto 1603.* Cambridge, MA: Harvard UP.

United States Commission on Economy and Efficiency (1912). *Report of the commission on economy and efficiency*. 62nd Congress, 2nd sess., S. Doc. 293. Washington, DC: Govt. Print. Off.

Weever, J. (1948). *Faunus and Melliflora (1600)*. Ed. by A. Davenport. Liverpool: University Press of Liverpool.

Willoughby, E. E. (1932). [Review of Shakespeare's *Hamlet: The first quarto.*] *Library Quarterly 2*(1), 89-90.

Zeitlin, J. & Dunning, C. S. (1935). The camera finds new uses. *Review of reviews, 9, 1* (Oct 1935): 32-33, 56. Condensed in *Readers' Digest 27*(163), (Nov 1935), 93-94.