Saving Raised Dots: A Feel for Braille Materials and Preservation

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Introduction

Braille books are, in essence, no different than the printed books from which they are transcribed. They contain the same words and convey the same meaning. The only difference between a Braille book and its printed counterpart is textual three-dimensionality. This may seem like a small difference, but it is vital to its blind readers, for whom three-dimensionality is necessary for comprehension. For the field of library professionals, however, three-dimensional text creates concerns not seen in ordinary, flat-printed books. These problems begin with materials and manufacture and continue through housing, shelving, handling, damage and repair.

This paper will explore the issues regarding the preservation of Braille documents. In addition to a review of the electronic and print resources on the subject, a survey was conducted to determine the actual issues faced by librarians in the housing and maintenance of Braille documents. A link to the survey is listed in the bibliography, and a printed summary of the survey results can be provided upon request.

The paper is divided into six parts, the first two being a history of Braille and an overview of the methods and materials used in the manufacture of Braille books. There is a section on potential issues in Braille preservation, followed by the survey results which give testimony to some of the actual problems currently seen in libraries housing Braille documents. The final section discusses the current practices for preservation of Braille books, and the conclusion suggests topics for further research in the area of Braille preservation.

I. History of Braille

Braille was invented by Louis Braille, a blind fifteen-year-old, in 1824. Prior to this invention, books for the blind were made by embossing regular letters on paper, which was time-consuming to make and read. The Braille system, which is composed of raised dots in cells of two dots high by three dots wide (see Figure 1), was not adopted as a standard until 1854, when France made it the "official communications system for blind people" (Paula Kimbrough, "How Braille Began").

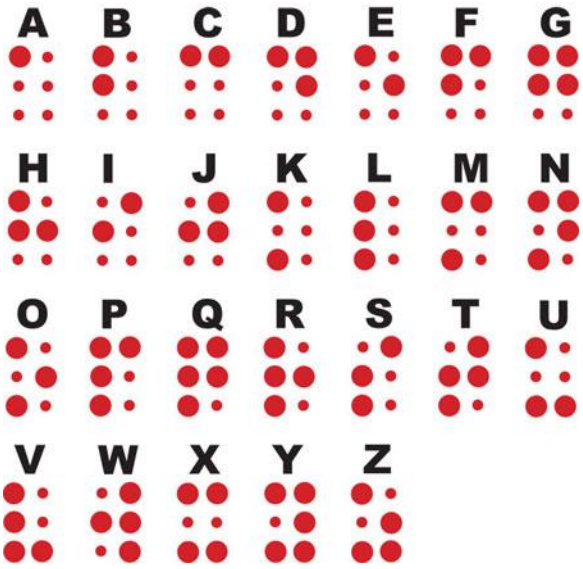

Figure 1 (Source: http://www.braillecards.co.uk/whats_braille/)

A form of modified Braille, developed by Joel W. Smith in the 1870's, was used by students at the Perkins School for the Blind. This system eventually became known as American Braille. However, Braille was not the only system used for reading and writing by the blind. The New York Point system was invented by William Bell Wait in the 1860's. This system consisted of dots arranged in cells two dots high and of variable width depending on the character. The idea behind this system was to save space with the variable width of the cells.

These two systems, New York Point and American Braille, were both used in the United States for decades. Certain institutions preferred one over the other, and typewriters and printing processes were developed for each system. Many individuals had strong feelings regarding which system was preferable and should be used in schools and institutions.

In 1909, two hearings were held by the New York Board of Education to determine which type of writing would be taught in its public school classes for the blind. American Braille was ultimately selected because it had a better system of capitalization and punctuation than New York Point. In 1910, the American Printing House for the Blind in Louisville, Kentucky, which is the largest printing house in the world for raised-type books, and which had previously printed only in New York Point, decided to also print in American Braille.

Ironically, after all the disagreements between factions who supported one of these systems over the other, a third system ultimately won out. The American Commission on Uniform Type decided in 1916 that schools and printing presses for the blind should use Revised Braille, which is a form of Braille based on the British Braille system. In 1918, the American Association of Instructors of the Blind adopted Revised Braille grade 1 ½ as the official writing system to be used in America, which is still in use today.

In addition to the various Braille writing systems, a separate system, called Moon Type, was invented by Dr. William Moon in 1845. This system is a modified form of the Roman alphabet which is embossed onto paper (see Figure 2). It tends to be more easily learned by people who go blind late in life than the small, raised dots of Braille.

However, like the early forms of embossed letters, this type is considerably more time-consuming to print than Braille. Because of its ease of use for older blind readers, this system of type is still in use as well.

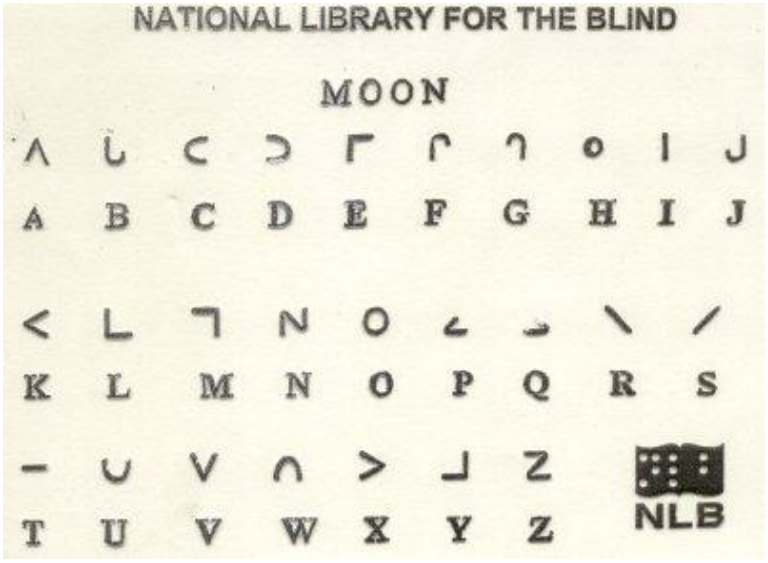

Figure 2 (Source: http://www.moonliteracy.org.uk/whatis.htm)

The contentious history of raised type makes it clear that the preservation of Braille documents is not limited to currently circulating books, many of which may in fact be replaceable (as many modern print books are replaceable). Outside of circulating collections, there are documents going back nearly two hundred years that provide primary evidence of the evolution of raised type. If any number of these documents has been saved, there is clearly a need to attend to the preservation of them for historical purposes.

II. Methods and Materials of Braille Manufacture

The initial method of manufacturing Braille type was with a slate and stylus. The slate is a template which allows the user to emboss paper with the stylus (see Figure 3).

Throughout the history of Braille, these have been made from metal, wood, plastic, and rubber. The slate and stylus method is still in use, although it is less favorable than other, more modern methods because it requires that the user write backwards so that when the paper is turned over the embossing will read left-to-right.

Figure 3 (Source: http://www.afb.org/braillebug/braille_technology.asp)

In addition to the slate and stylus, other personal Braille writings mechanisms were developed, including various types of Braille typewriters that have been produced since the 1880's. More recently, there have been electronic Braille writers and devices made to allow personal computers to output Braille type. One example of these is the Braille display, which functions as follows:

> Braille displays provide braille access to computers by converting the information on a computer screen into braille. In response to information from the computer, braille is produced on the display by pins that are raised and lowered (refreshed) in combinations to form braille characters.
>
> Braille notetakers are portable devices that allow a user to take notes by inputting standard braille characters using a braille-style or QWERTY keyboard. Some of these devices also allow users interaction with the text through synthesized speech, a braille display, or both. Some allow the text

to be edited and translated from the braille characters to their print equivalents.

(Freddie L Peaco, "Braille Literacy: Resources for Instruction, Writing Equipment, and Supplies").

In terms of published books, Braille materials were not standardized until 1966. For almost 150 years, published Braille was printed on and with materials at the discretion of the publisher. This includes materials printed from hand transcribing services offered by public libraries nationwide. It is possible that there were common understandings of the best types of paper and machinery to use, and of ways it should be stored, however it is likely that many of these historical documents have widely varying sizes and weights of paper and binding styles.

According to the 1971 Commission on Standards, the following are the requirements for production of Braille books, pamphlets, and magazines, which are also recommended for all personally transcribed Braille materials. The standards included are not all of the ones listed, but are the ones most relevant to the topic of preservation. (National Accreditation Council for Agencies Serving the Blind and Visually Handicapped, Standards for Production of Reading Materials for the Blind and Visually Handicapped, September 1970).

- The height, base diameter, and spacing of dots is specified (Section 4.3).
- For hand transcribing, the paper is specified to be not less than 80 pound weight and no larger than 11 by 11.5 inches. (Section 4.15.2.2)
- "The maximum number of pages for a one-side, hand transcribed volume is 90 pages" (Section 4.21)

- The binding should have “sturdy covers” that “adequately protect the Braille embossing and keep the pages intact while allowing them to lie flat for reading” (Section 4.22).
- For press-produced Braille materials, the paper weight is specified at 80 pound or more for general-use books, at least 90 pound (but preferably 100 pound) for manuals in the instruction of Braille, and at least 70 pound for magazines (Section 4.24)
- The books should be “durably bound in cloth covered board bindings, using a .90-point Davey board…(Linear polyethylene plastic material offers acceptable quality). (Section 4.26.1.1)
- Pamphlet and magazine bindings can be plastic comb or saddle stitch, with heavy paper or plastic covers (Section 4.26.3)
- Interpoint (two-sided) books are limited to a maximum of 300 pages for large works such as dictionaries, 250 pages in general, and 100 pages for magazines. (Section 4.27)

Specifications are also given for the quality of mailing containers for Braille materials:

- “Magazines consisting of a single volume of 100 pages or less are mailed in strong Kraft envelopes.” (Section 4.28.2)
- “Magazines consisting of two or more volumes are packaged in strong corrugated boxes of suitable size, or in suitable padded bags in which the Braille materials do not shift about” (Section 4.28.3)

- For books, it says only that "Mailing containers are of a quality to protect Braille materials through the mails without damage". (Section 4.28)

These standards are now almost 40 years old and have apparently not been updated since this publication. Current standards, published by the Braille Authority of North America, focus on the specifics of the Braille format rather than on the materials used.

In addition to paper, Thermoform plastic is now also used as a support for Braille printing. The National Braille Press prints its books with zinc plates, onto Thermoform plastic sheets which are melted around the templates. However, Thermoform has not become the new standard, but only one option used by Braille presses. For example, Seedlings, a company that prints Braille books for children, embosses "heavy" paper (weight unspecified) rather than using thermoform. Most individual Braille transcribing services also print on paper of varying sizes, and the paper weight used is generally not specified.

Bindings currently used for Braille books include plastic comb bindings (see picture), spiral bindings, and regular sewn, case bindings. According to the *Etherington and Roberts Dictionary* on Conservation Online, "Braille books are bound much like other books except that they are generally liberally stubbed and they are not pressed after casing-in, as the pressure would flatten the raised characters." However, the bindings offered online by various Braille presses are generally plastic comb or spiral bindings. No one type of binding is listed in any publication as being preferable to the others, and

no standard has been set for the circumstances for use of each, so publishing houses bind in whatever format they choose.

III. Potential Issues in Braille Preservation

Braille books are subject to the same issues of preservation as any other book. These include wear and damage to bindings, deterioration of paper and binding materials, deterioration due to environmental changes such as temperature and humidity, insect damage, mold, and so on. However, Braille books are also susceptible to unique forms of damage due to the nature of the type, and so special concern must be given to each part of their care.

The biggest problem one might expect to encounter in the preservation and deterioration of Braille documents would be flattening of the raised print from use and storage. This is, in fact, a common problem as evidenced by the survey results. According to a post on the online Conservation Distribution List, "Storing Braille books flat can cause the Braille to flatten on the outer sheets, both front and back," (Dorothy Blunt, Re: Braille documents).

Unfortunately, according to the same post, "Storing Braille books upright causes the signatures to rip through the binding straps from the weight of the pages." Much like art books or other large books printed on heavy paper, Braille bindings must be very strong to be able to hold up the weight of the textblock, and so the case-to-textblock connections are inherently at a greater risk for damage.

Another potential source of concern is the deterioration of the paper used in older Braille materials. As shown in the survey results below, all respondents have

experienced brittle paper in their collections. This is of serious concern, because any books containing acidic paper that could benefit from deacidification will not be able to receive such treatment until further research is done. The current methods for deacidification require the introduction of humidity, pressing the book, or both. Either of these would potentially have a detrimental effect on embossed Braille type. However, research has not been performed on some of the gaseous-phase deacidification processes in regards to Braille books, so it is possible that these methods could be used on certain types of books without causing damage.

IV. Braille Preservation Survey

The survey was sent to eighteen institutions, including libraries and museums housing Braille documents. Of those eighteen institutions, there were six respondents, all of whom were libraries. Their Braille collections ranged in size from 300 to 500,000 books. Only one institution housed solely Braille documents. Three of the six respondents maintained a permanent, non-circulating collection of Braille books. Three respondents also stated that the majority of their Braille collection would not be replaceable if damaged beyond repair.

The number of circulations expected for an average Braille book ranged from one to 25. The fact that 3 institutions expected a possibility of 1-4 circulations for Braille books before needing replacement or repair indicates that use can be severely damaging to these documents.

The most common style of binding for Braille books was a comb binding, followed by a PVC strap binding (see illustration). One institution indicated that some of

its books are cloth-bound, but that these are not replaceable. Braille periodicals are also bound mostly in comb bindings, although one institution stated that its periodicals are stapled paperbacks.

All respondents have dealt with brittle paper, damaged paper, and damaged bindings. The most common problem was damage to the bindings, which was indicated for all types of bindings. It was also stated by two institutions that the raised type is flattened over time, both from use and storage.

Four of the respondents perform in-house repairs on their Braille books. These repairs mostly involve binding repairs and re-binding, however one institution indicated that it performs re-embossing as well. Five of the respondents print Braille documents within the institution, and four of these bind Braille documents as well.

From these survey results, it seems that deterioration and damage to bindings is the most common problem faced by institutions that house Braille books. Of course, this is a common problem in all libraries. However, the styles of binding used in Braille books are generally different from the majority of bindings used in regular print books, and the issue of flattening of the raised type is also a unique problem faced by libraries housing Braille books.

V. Current Preservation Practices

Very little information is available regarding the preservation of Braille documents. According to the 2004 National Library Service for the Blind and Physically Handicapped Conference Notes, there is a Braille and Audio Conservation Project underway by the NLS. From this project, the NLS published a circular entitled, "Braille

Preservation and Salvage Guidelines". This gives guidelines for disaster planning, basic preservation including temperature, humidity, light, and air pollutant control and periodic cleaning instructions, emergency salvage of wet Braille volumes, and emergency salvage of moldy Braille volumes. In general, these guidelines are no different from those used for ordinary library collections.

The only notable difference is in the salvage of wet Braille books, which are nearly immediately distorted and rendered unusable upon becoming wet. A test was performed by Belfor Fire and Water Damage Restoration Services of Ft. Worth, Texas to determine what method of drying would be most suitable for wet Braille documents. They tested three drying methods: dehumidification, air drying, and freeze drying, on magazines and both metal and plastic-bound books. They found that none of the methods resulted in readable type for the magazines and plastic-bound books, but that metal-bound books were mostly readable after both dehumidification and freeze-drying. Based on these results, the NLS recommends that Braille books that have gotten wet be replaced, or air-dried if they are only slightly damp. Interestingly, the NLS does not make any recommendation or suggestion that future library-printed Braille books be bound in metal.

There is one interesting preservation method being advertised by APH, which offers an "Electronic Preservation of Braille Service". APH offers to scan paper Braille or metal plates and convert them into electronic documents which can then be edited with Braille transcribing software and sent to a Braille embosser. Because much of the current Braille transcribing is done using computer software, this makes it easier and faster to

reprint old Braille materials. At $2.50 per page, however, the cost of this service is probably prohibitive for much use beyond personal documents.

Conclusions

The amount of information regarding the preservation of Braille documents is woefully small. Given that all of the survey respondents indicated problems in the preservation of Braille books, it is evident that there is a need for further research in this area. Important questions that could be investigated include the deterioration of thermoform plastics, the quality and permanence of papers used for Braille printing, possibilities for new and better binding materials and processes for Braille books, and how Braille books stand up to various types of deacidification. It would also be useful to perform an in-depth survey of the current state of Braille documents in libraries worldwide. The richness of Braille's history and its continued value for use by the blind warrants careful and deliberate planning of its preservation for future generations.

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