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Preserving the Church and Bernays typescripts: A Case Study

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In the "Personal Opinion" column of the August 1993 issue of the Mathematics Association of America's newsletter *Focus* (pp. 11–12) and in *The American Mathematical Society Notices* **40** (1993) (pp. 847–849), Albert C. Lewis asked the question: "Why Archive?" As historians of logic, most of us need little convincing of the value of archives; most of us have needed on many occasions to utilize archival materials, and all of us appreciate the value of archives for the work they do in making their materials available for our research. In his short piece, Lewis pointed out why we would wish to preserve more than publications. From lecture notes, manuscripts of papers, correspondence, and other types of unpublished materials, he noted (p. 11; p. 847), we can gain insight into "why and how mathematical discoveries are made, received, and taught." Those of us who have frequently used archival materials as part of our research are aware that we are not ordinarily given access to the originals, but to photocopies or microfilms of the documents which we require. We may not have given much thought to the originals themselves, and, if we have, we may well have assumed that while *preservation* of these documents is the purview of the archivist, ours, as historians, is with their *use*. This raises the question of whether historians need to concern themselves with preservation as distinct from use. Rather than answer that question, let us ask two others: Did Leibniz's work as chief librarian for the Duke of Braunschweig contribute in any way to his work in logic or the calculus? Did Styazhkin's work as archivist and bibliographer contribute in any way to his own work in history of logic? Without knowing the answer to these specific questions or the extent to which librarianship enhanced research in these or any other specific cases, one might nevertheless conclude that knowledge about this kind of work, even without direct experience in it, can enhance a historian's appreciation for the work of preservation. Christian Thiel has already written eloquently about the consequences for history of logic of lost archives in his paper "Some Difficulties in the Historiography of Modern Logic" (in M. Abrusci, E. Casari and M. Mugnai (editors), *Atti del Convegno Internazionale di Storia della Logica, San Gimignano, 4–8 dicembre 1982* (Bologna, CLUEB, 1983) pp. 174–191). There, as Dr. Thiel has said (p. 182), bibliographic concerns are an issue that ought to directly concern anyone who cares about the history of logic.

For the benefit of others who may find cause in the future to work on preservation and of those who may wish simply to gain some insight into what is involved in preservation, I

shall therefore describe in some detail the procedures taken by Modern Logic Publishing towards preservation of Church's 1940–41 "Elementary Topics in Elementary Logic" Galois Institute lectures "III. Set Theory" and "IV. Set Theory (continued)," and Bernays' 1935–36 Institute of Advanced Study course on "Logical Calculus."

I want first to thank everyone who responded to my query on document preservation, especially Kenneth Blackwell and Nathan Houser. From them I learned that several preservation options are available. The more complicated and costly of the alternatives is a several-stage process that includes backing pages with Japanese tissues, washing and resizing them, and encapsulating them in plastic. An effective and more immediate solution is to separate the pages and photocopy them, then interleave the originals with acid-free paper and store them in acid-free library folders. At some point, the originals could also be microfilmed and copies made available to other users from the microfilm. For those who wish to consider or undertake a more professional approach to repair and preservation of archival materials and antique books, Arthur W. Johnson's *The Practical Guide to Book Repair and Conservation* (London, Thames and Hudson, Ltd., 1988; first paperback edition, 1992) offers step-by-step guidance, along with suggestions for preventative protection of antique books in library storage (including such considerations as handling, shelving and storage methods, and temperature, humidity, and lighting controls).

As we all realize today, many of the papers used in the nineteenth and much of the twentieth century ordinarily have a high acidic content and are thus particularly susceptible to damage, especially when handled. My first recommendation, therefore, is that, if extensive handling of papers of this nature is anticipated, rubber surgical gloves be worn. Johnson warns (p. 39) that "acidic paper, poor materials and cheaper methods of joining sheets together have lowered standards and many books produced between 1900 and 1960 will be unusable in forty years," adding (pp. 39–40) that "it is unfortunate that much enduring literature is bound in a transitory fashion." We can easily extend this warning and concern to manuscript documents of this same period and slightly earlier. Among the precautions taken at the Bertrand Russell Archives for these reasons, for example, is that handling of original documents is carefully and strictly limited to the archive staff, and that users are provided xerographic copies for carrying out research, and photocopies are used where ever and when ever possible for the bulk of the work carried out both at the Bertrand Russell Editorial Project and at the Peirce Edition Project. Similar precautions indubitably prevail at other research archives and editorial projects.

The preservation process itself began with removing the staples from the two Church typescripts. This was a relatively straightforward procedure. Given the poor condition of these two typescripts, it was readily apparent that ordinary staple-removers were too crude and cumbersome for the delicate task. All of the staples were covered with rust and appeared to be approximately twice the thickness of the standard (1 mm. thick) staple. I therefore chose two small flat-head screwdrivers and a blunt-nosed letter opener; the smaller screwdriver, of the type used in eyeglass repair and the blunt nose of the letter opener were used to pry the prongs of the staples away from the paper. Next the blade of the letter opener and the slightly larger screwdriver's head were in turn slowly coaxed between the back of the staple and the page and the gentlest pressure I could manage was used to slowly lift the

staples, one-by-one, away from the paper. Although the greatest possible care was taken in the process of removing the staples, some minor damage occurred. Aside, of course, from the obvious damage of the small puncture holes (approximately 3 mm. diameter) in all of the pages that had been made by the staples themselves, two pages sustained minor damage when already weak edges around the worm-holes at the lower right-hand corner of those pages caused additional fragments of paper to tear off. The text itself, fortunately, was unaffected by the tears. Finally, the two small narrow strips of brown tape binding pages 75 and 76 at their left-hand margins were removed, causing some thinning to the paper which was lightly peeled away along with the tape, but the text remained wholly unaffected.

Although the Bernays typescript is in much better physical condition than the Church typescripts, the work on it was more difficult and time-consuming because of the tape binding and larger size of the staples (approximately 5 mm. diameter) used. The adhesive on the tape binding had over the years dried to the extent that with moderate pressure it peeled readily away from the "spine" of the paper without damaging any of the pages. Once the tape was completely removed from the spine, it was comparatively easy to remove most of the remainder from the outside of the cardboard covers. This revealed the that the three large, heavy staples holding the typescript itself together had rusted and that the tape used to bind the typescript between the covers was of some kind of cloth composition, and this may have contributed to the ease with which it could be peeled away in strips. The serrated edges of the letter opener were then used to scrape away most of the remainder of the tape, and in particular to help clean the tape away from the staples so that they could more readily be removed. The size of these staples made their removal particularly difficult and time-consuming in comparison with the removal of the staples from the Church typescripts. Once the prongs of the staples were straightened out, they were still difficult to remove due to their thickness and the rust coating on them; thus, rather than pull out the staples, the pages were lifted out, a small number at a time. Once all of the pages had been removed, it became clear that the adhesive from the tape binding had coated the gutter edge (side of the left-hand margin) of the paper itself where the tape had held the pages together. The brittleness of the dried adhesive made it easy to rub or scrape away much of the adhesive by hand without causing any apparent damage to the pages themselves. However, enough of the adhesive remained that it necessitated the separation of nearly every individual page by hand, one page at a time.

Completion of this entire process for all three typescripts combined took approximately $2^1/_2$ hours. Work on the two Church typescripts required approximately half an hour altogether; the remainder of the time was spent working on the Bernays typescript. No attempts were made at restoring — as opposed to preserving — the originals, as the former is far beyond the technical capacity of Modern Logic Publishing.

With all of the pages of the three typescripts separated, the next step in the preservation process was to photocopy each of the pages. Because of the age and poor condition of the paper, each page had to be photocopied individually rather than having them all batch-copied, hand-layed on the glass to prevent possible additional tearing by the photocopier machinery. Even so, I have seen pages from papers from turn-of-the-century journals begin to crumble apart, when lifted off of photocopy machines, due to their brittleness and age; a

specific case in point that I remember distinctly was Louis Couturat's review-essay "L'algèbre universelle de M. Whitehead" from the *Revue de Métaphysique et de Morale* **8** (1900), but I could find many other examples as well, if the issue were pressed. The job of photocopying the Church and Bernays typescripts was entrusted to Prints, Ltd., a photocopy shop in Ames. The Church and Bernays typescripts, not being quite so old, fortunately withstood the process without visible damage.[1]

For future use, only photocopies will be used for research and the originals set aside for preservation and protection. Of the options mentioned, we chose to interleave the originals with acid-free paper and store them in acid-free library folders in my office library rather than warehouse them with the MLP archives, so that it will be possible to control the temperature and humidity until such time as a suitable permanent archive can be established.

This kind of behind-the-scenes work of preservation is being carried out daily at such places as the Archives of American Mathematics (University of Texas), the Archives of Mathematics and Mathematicians (Brown University), the Bertrand Russell Archives (McMaster University), the Bertrand Russell Editorial Project (McMaster University), the Peirce Edition Project (Indiana University-Purdue University at Indianapolis), Erlangen's Interdisciplinary Institute for the Social History of Logic, and similar archives and editorial projects world-wide. It is neither particularly glamorous nor visible work and may not often even be very exciting, but it is important and essential for the history of logic and deserves the support and participation of all of us. The archivists' work in preservation is as crucial for historians of logic — or historians of any intellectual field — as the archæologists' excavations are for the general historian, and the archivists and archæologists are no less historians than those who use the materials that the archivists and archæologists have "dug" up and preserved. In fact, the rest of us could not do our jobs as well, if at all, without the preparatory endeavors of our archivist-bibliographer or archæologist colleagues.

[1] A special thanks is owed to Edward Knapp and his Prints, Ltd. employees, especially to Scot P., for the extra care they took with the papers.