

## THE CONSERVATION OF WRITINGS ON PAPER IN CANADA

by

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An earlier version of this paper was used by a formal committee of McGill University librarians, museologists and archivists charged with developing a plan for the conservation of McGill's holdings of reference and research materials. Records administration materials were also involved. Its publication now, in the Canadian Archivist, is designed more as an "alert" than as any definitive answer to the problems that librarians, records administrators, archivists, public officials and others face, involving the "life expectancy" of the papers used for the writings which we create or have in our custody.

### I. The Conservation of Writings Already on Paper

Years ago, we learned that good as it is, the manual repair of deteriorating papers simply meant that the job would have to be done over again within anything from 18 to 30 years. The conservation of writings on paper requires something more than the "silkaline approach". The two men most responsible for pointing up the problems and for suggesting some of the solutions have been Verner W. Clapp, President Emeritus of the Council on Library Resources, Inc., of Washington, D. C., and the late William J. Barrow of the W. J. Barrow Research Laboratory of Richmond, Virginia. Mr. Clapp enunciated the basic problems.<sup>1</sup> Mr. Barrow, with grants from the Council, provided some logical and tested facts on which solutions can be based. It should be pointed out that the research and development work done was directed primarily at 1) the conservation of book papers and 2) the provision of permanent-durable book papers. The relationship to the unique writings on paper with which the archivist, historical records custodian and museologist is concerned is, however, direct and clear. Mr. Barrow found that several factors were responsible for the deterioration of papers:

- 1) The major cause was identified as the "acid catalyzed hydrolysis of the cellulose in fiber papers". Responsible estimates are that "90 percent of the books published between 1900 and 1945 will be unsuitable for general library use within 35 years if protective measures to reduce the rate of hydrolysis are not taken".
- 2) The general assumption that rag papers of the 19th century were permanent was found to be erroneous in subsequent

studies of papers used between 1800-1899. Mr. Barrow found that "the major blame for the deterioration of book paper after the mid-point of the 19th century...should be assigned to the use of alum-rosin size, with which papers of both kinds (rag fiber and wood pulp) were sized to prevent 'feathering' of ink". He found that while only 5% of the 1800-1849 group of papers were in the restoration category, 10% of the 1850-1869 group were in need of restoration, and 37% of the 1870-1899 group were in that category.

- 3) Other chemical reactions are also involved. These it is well known vary according to temperature. Further research has now determined that this general rule affects paper deterioration. "The evidence indicates that the longevity of any particular papers (except newsprint) will be increased about seven and a half times for each decrease of 36°F." (I might add that for some time, archivists, museologists and librarians have considered that a good temperature and humidity for people was also a pretty good temperature and humidity for papers, bindings, paintings and the like. In other words, most of us aimed at 70 degrees F. and 50% humidity. These Barrow temperature findings seem to change this notion, but I have seen nothing as yet in the literature which does state what the correct humidity should be at any given temperature ranging down to -2 degrees F.)

As long ago as September 1960, Robert E. Kingery of the New York Public Library listed steps which then could be taken to 1) conserve original materials and 2) reproduce such materials. Research has, of course, been continuing, but I've taken his general outline and added to it, in the light of the literature on the subject which has issued since that time.

#### Conservation of original materials

1. Store books and archives in atmosphere free of sulphur dioxide and other acids. Among other things this calls for an air-conditioning plant equipped with an alkaline wash device to maintain acid-free air rather than air-conditioning which increases and extends the flow of acids in the air.
2. Provide humidity controls, and temperatures ranging downward as low as may be practicable depending on the nature of the writings stored. (Research on the appropriate % of humidity is especially urgent.)
3. Store books and other writings which have had excessive exposure to light, in the dark in nitrogen or helium, to arrest

post-irradiation effect.

4. Treat books or other papers to bring the pH factor above 7, by washing, spraying, vapor deacidification, or otherwise, with an alkaline mixture.
5. Laminate, after deacidification, selected books and papers using tissue for added strength and cellulose acetate sheets (cellulose acetate film is of course only a purer form of paper without the built-in means of destruction) of archival quality to protect against further deacidification when the books or papers are in use. (Canada's first lamination machine was installed in the Public Archives of Canada in 1968.)

#### Reproduction of original materials

1. Miniaturize by copying in one or another of the microforms.<sup>2</sup>
2. Reproduce in book format by the production of electrostatic stencils from roll microfilm with offset reproduction in relatively small editions.
3. Where books are concerned, the original publisher can sometimes be prevailed upon to reprint a deteriorated volume. There are a growing number of reprint publishers who made a business of this sort of thing.

One of the topics of the Association of Research Libraries at its Montreal meeting on 18 June, 1960 was the problem of paper deterioration. As a result, a Committee on the Preservation of Research Library Materials was established. The revised report of that Committee was published in the Library Journal, January 1 and January 15, 1966. Part II of the Report entitled "The Preservation of Deteriorating Books" recommends: "Establish a central library that will accept from other libraries and physically preserve, by deacidification and storage at the lowest practicable temperature (or by improved techniques if such be discovered by future research) an example of an original written record that...meets listed qualifications. Meanwhile, it has been reported that the New York Public Library has microfilmed some 500,000 of its estimated 3,500,000 brittle books, and that the Library of Congress has been spending approximately \$50,000 annually to microfilm brittle materials in its collections "and have barely scratched the surface". For 1970, the Library of Congress has requested \$100,000 with which to preserve 'brittle books' through microfilming". "The Microfilming Activities" of the National Library of Medicine are described in N.L.M. News, February 1969 pp. 4-5.

A report on the "Brittle Books" project at the Library of

Congress appeared in the January 1969 issue of College and Research Libraries. Frazer G. Poole, Assistant Director for Preservation, Administrative Department, Preservation Office, Library of Congress has commented on it: "However, the Project investigated only a minor facet of the total deterioration problem. Establishment of a national preservation collection, the problem of indemnifying libraries for relinquishing copies to a national preservation collection, the initial microfilming, and the preservation of suitable negative and positive copies for libraries which may need them, the storage conditions under which such collection should be maintained, and a number of other related problems are under investigation presently by the Association of Research Libraries".<sup>3</sup>

In any report on the state of the art, Mr. Poole's statement which follows, summarizes my own conclusions:

"The truth is, of course, that this is an exceedingly complex problem for which no one has good answers. At the same time we do have information and techniques suitable for preserving those materials in sheet form. The problem of preserving books and other bound materials has never been satisfactorily resolved, primarily because of the cost factors involved". (Underlining, supplied)

Put in other terms, the librarian dealing with printed books doesn't yet have a clear pattern to follow. The archivist, the map, the broadsides, broadsheets and historical manuscripts custodian does. This pattern calls for the use of a combination of such techniques as microfilm, deacidification, lamination and cold storage. There is one note which must be added. The flood disaster in Florence in 1966 resulted in worldwide attempts to aid in the rescue and conservation of the damaged books, manuscripts and works of art. The restoration work highlighted a number of problems calling for research. Announcement was made late in February 1969 that the Council on Library Resources had made some \$75,000 available as a grant to the Imperial College of Science and Technology, London, U. K., for three years of such research. An attempt will be made to close the present gap between traditional restorers of books and paper and the scientists and it is expected that booklets on working techniques and standards will result. The program is designed, among other things, to extend the work pioneered by the late William J. Barrow,<sup>4</sup>

## II. The Conservation of Writings Not Yet on Paper

So much for the problems involved in the conservation of writings already on paper. Do we have to go on writing and printing papers that have their suicidal acid within them? If the generally

stated percentage estimate that only 5% of writings on paper are worth keeping, then shouldn't we continue with this "planned obsolescence" kind of operation? It would automatically eliminate what was useless and we'd have, say a generation to select what should be retained. Fire, flood, war, heat, sunlight, moves, acid within and without and human indifference would solve the problems growing out of the paper avalanche of the last 30 years. For the time being, that's pretty much a description of the situation. However, the archivist does have to take an interest in this matter of paper birth control. The Federal Government, probably the largest user of record papers in Canada, still appears to follow the lowest bid procedure, without reference to permanence or durability.

We all know, of course, that as a result of the Barrow experiments, an acid free and durable paper has been produced and advertised in many pages and issues of The American Archivist. We know that for some years, the issues of that journal have been published on permanent/durable paper.<sup>5</sup> During the summer of 1968, McGraw-Hill Book Company announced that all books intended for library, reference and scholarly use would be printed on the modern permanent paper, presumably with a pH factor of 7 or above. Other publishers may have adopted the same policy and practice.

However, it did seem strange to me that there was no reference to such papers of a permanent/durable character manufactured here in Canada when I started work on this account, since paper making is one of Canada's major industries. On 19 November 1968, I wrote the Secretary of the Pulp and Paper Research Institute, Ken Vroom, at the laboratories of the Institute in Pointe Claire, Quebec, as follows:

"Hasn't the time come to give consideration to the production of paper products in this country which can be used for the publication of the scientific and professional journals, the library books, the cardboards and the corrugated box papers which are needed to store permanent records? And probably most important, can't we soon have a permanent archival paper for the unique writings of lawyers, notaries, corporate secretaries and the like? A good layman's description of the book paper is to be found in the Colophon, p. 79 of Barrow's Permanence/Durability of the Book - II Test Data of Naturally Aged Papers, Richmond, 1964."

My friend Vroom passed the letter on to the Canadian Pulp and Paper Association and Mr. A. E. Rickards wrote me on 10 December 1968, and referred me to six Canadian manufacturers of book, writing and other fine papers. On the following day I wrote these six manufacturers outlining the problems to which research had been directed:

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"What causes the deterioration of writings already on paper? What can be done to conserve such writings already on paper? And what should be done to provide a permanent base for writings in future? Research is, of course, still underway".

I then called attention to representative advertisements in a recent issue of The American Archivist which offered such things as "acid-free envelopes and file folders, text, bond, ledger, cover, bristol papers, library catalog card stock, letterheads, records storage boxes, document boxes, lined manuscript boxes and the like, and of course, the U. S. manufacturers and vendors". And then I asked, "does your firm manufacture any of such papers? Or, do you know of any Canadian source for such papers?" The response had many interesting factors. One of them was that two firms did not respond at all. The first response was a telephone call on 18 December 1968. "Yes, we do make a permanent paper and we will make others to order, but there are some problems such as the need for different inks. However, we will put one of our technical people in touch with you to discuss the technical problems involved and the possible market".

A second company wrote on 16 December 1968 - "We do manufacture a few high grade bond papers treated for permanency and can manufacture other grades. I am making some inquiries with our Technical staff after which I will be in touch with you and would hope that we may meet with you to discuss your interesting letter in more detail".

A third company representative telephoned on 19 December 1968. He said that, like other firms, they had been working on an alkaline system of sizing papers. He stated that if there was a demand of consequence they could supply acid free papers. He stated, however, that it was impossible to conduct alkaline and acid paper making systems in the same plant. I asked why, if a market survey were conducted, the various manufacturers couldn't agree on a single plant for the purpose? Such an arrangement, he thought, was forbidden under law. He added another interesting statement to the effect that fine papers were largely produced in the country where used, and that there was little export market for such papers. He, too, offered to make available his technical people for further discussion during the Montreal Paper Manufacturers' conference in Montreal starting 27 January 1969.

A fourth company replied on 19 December 1968 "Unfortunately we do not manufacture these grades at present" and suggested several manufacturers who might do so.

Arrangements were then made to discuss the possibilities with technical representatives of the three firms. The first of these

discussions took place on 13 January 1969. I was informed that M. Antoine Roy, l'Archiviste de la Province de Québec had asked for such permanent papers in 1949; that they had offered a bond paper with a pH factor of 7 in 1964 and that they were now producing or offering on demand some 10 grades of paper "neutral sized for permanency" in a variety of weights, including library card stock. Subsequently, a listing of these papers was supplied in writing. I was also informed that the Canadian Government Specifications Board had met on the matter of specifications for an acid free library card stock in December 1968.<sup>6</sup> I was a bit surprised to learn from them that acid-free paper was not materially higher in cost than the acid papers generally offered. Subsequently, this manufacturer offered to make samples of the paper available for display, and a technician to answer questions at the June 1968 meeting of the Archives Section of the Canadian Historical Association at York University.

The meeting with the technical representative of the second manufacturer took place on 29 January 1969. I was presented with a sample of that firm's "Durable-Book" paper which had been manufactured for the past four years for one Toronto law book publisher and the statement that they expected to have 4 other grades of permanent paper by the end of 1969. Apparently the Barrow tests for permanence and durability had been applied and the tests to that date showed 40% strength after 75 years of accelerated ageing. Again I was informed that the cost was not much higher than acid papers.

Canadian winter weather grounded the representative of the third manufacturer, and the planned meeting did not come off. After reading a draft of this paper he did write me on 31 March 1969 as follows: "We, as the third manufacturer, do not produce a line of 'Permanent Papers'. However, the capability is there and is strictly a matter of economics. We have made acid-free papers and are continuing with various trials. There are certain advantages to the producer but to date we have found the acid size to have a distinct cost advantage".

As of now, that adds up to a willingness on the part of paper manufacturers in Canada to supply permanent-durable papers. What would seem to be needed is broader knowledge on the part of those who produce books and permanent records of the need for such papers ( and probably inks ). I don't pretend to know who should take up the leadership, but certainly all the major research libraries in Canada should be interested; all the federal and provincial and municipal archivists in Canada could be expected to assist. The producers and custodians of legal documents, vital statistical records, all permanently required governmental and business and church association records would seem to have a natural interest in this matter of permanent-durable writings on paper in future.

Certainly the directors of university presses, the registrars of schools, colleges and universities, and publishers generally would be involved. And, I would think, even the manufacturers of office copying equipment might well be involved. Specifically, I'd urge that the Archives Section of the Canadian Historical Association establish a Committee to work with all who would join them in the evolution of Canadian specifications for the various papers needed, and in urging the formal adoption of such specifications. The Dominion Archivist might well have the necessary authority to take on the leadership needed under The Public Records Order P.C. 1966-1749.

For a long time to come, the book, and other writings on paper will be with us, and we'll have to face up to problems of today and the solutions available to us now if what is presently recorded is to be passed on to the next few generations.

#### FOOTNOTES:

1. Verner W. Clapp after reading those lines modestly wrote me: "let me tell you what I think my position is in this matter. I had a long-time concern with the problem of deteriorating paper when it suddenly became possible for me to underwrite research on the problem. Luckily there was at hand exactly the man for the job - a man who had studied the problem and had excellent ideas as to its solution, but needed financial support - namely, W. J. Barrow. I was able to provide him the support he needed; I was also able to publicize his findings. But, I do not wish to be given more credit than I deserve. The accomplishment was solely his". 10 March 1969.
2. I might add, that in my own view since 1947, I have thought that books copied on microfiche, could provide an answer to 1) preservation of books; 2) solve the growing space problems of libraries, since such microfiche could be shelved in permanent/durable envelopes on existing library shelving in probably less than 5% of the space occupied by normal bound volumes; and 3) serve reprinting or republication needs. As a matter of fact, the Library of Congress acquired a step and repeat camera for producing microfiche in that year to experiment with this idea. The mechanical deficiencies of the camera at that time defeated us.
3. President Clifford Shipton reported on the work of the Society of American Archivists'. Ad Hoc Committee on Paper Research to an SAA Council Meeting in Ottawa on 29 September 1968 and announced a grant of \$2,500 to the Committee for expenses from the American Council of Learned Societies.
4. In Verner W. Clapp's view, the 1960 "Permanent/Durable" paper

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specifications prepared by W. J Barrow already need updating. There is a possibility that the Library of Congress Information Bulletin may carry supplements in future designed to serve as a clearing house for information in this area.

5. Verner W. Clapp makes the point that "permanent," papers and "permanent/durable" papers are not the same thing. " 'Permanent' paper is non acid or alkaline paper, but may be very weak - in fact is undoubtedly weak. 'Permanent/durable' paper is a paper which combines neutral or alkaline pH with good strength. The fact is that good strength is necessary for permanence, because the papers with less strength deteriorate to zero just that much faster than strong papers (see Permanence/Durability of the Book page 22 and Fig. 1)."

6. I have in my files a 2 page analysis of two Canadian and one U. S. produced catalog card stock produced at the Abbaye Saint Benoit, St.-Benoit-du-lac, Québec, entitled "Fichiprim Présente et Analyse Trois Cartes à Fiche".

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of specialization of their professional background. While an impressive number of Canadian archivists journeyed to Ottawa, they still only numbered 25 out of a total of 330 registered delegates.<sup>1</sup>

The Canadian archival community seems altogether more cohesive, familiar and homogenous than the American one. Canadian archivists, like the generality of Canadian academics until very recent years, are still few enough to know one another personally. This does not seem to be the case "south of the line".

From conversations with American delegates I concluded that there are very wide discrepancies between the archives of various states. The best may approach superlative standards, but those at the bottom of the scale are undernourished almost to the point of extinction. The archival scene perhaps again reflects aspects of the current poverty crisis in The Great Republic. By comparison, Canadian provincial archives today seem to be relatively closer to some median standards of policy, outlook and salary scales. These comments, I must emphasize, are conversational garnerings and nothing more.

No doubt delegates to every large conference which presents a varied program face the problem of selecting which papers or workshops they should attend. Certainly this proved to be a problem at the S.A.A. Meeting. At times, four workshops of almost equal interest

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<sup>1</sup>These figures are mine, and approximate. Ed.