SOME OBSERVATIONS ON THE FLATTENING OF FOLDED RECORDS[1]

THE modern archivist's real problems in the use and handling of loose paper records are not primarily concerned with the relatively few documents of early periods that have survived the vicissitudes of war, fire, or wanton destruction. These papers, for the most part, have considerable intrinsic or sentimental value as individual items and have accordingly been carefully stored and cherished through the years. The flattening of this type of material, if it presents a problem at all, is comparatively unimportant and is usually closely associated with the problem of rehabilitation. The archivist's chief concern in the physical handling of loose paper records, therefore, is more properly directed towards the vast accumulations created in the nineteenth century.

Prior to and during the early years of that century, all writing or record papers commonly used in America and Europe were expensive hand-made sheets of one hundred per cent rag fiber. The rags, after a minimum of washing and cooking, were converted into a reasonably pure and stable form of cellulose fiber that did not require excessive chemical bleaching, mineral filling, or rosin sizing to produce acceptable paper; and, although the qualities of papers were not well standardized but varied considerably from time to time and with different mills in different localities, the product was generally good. The productivity of the labor engaged in the paper industry was extremely low, however, as gauged by modern standards, and as a result paper was a relatively expensive luxury. When the Fourdrinier paper-making machine was introduced into America in 1827, the potential output of the labor engaged in paper manufacture was enormously increased, and in a very short time the market was flooded with quantities of low-priced paper. The public avidly sought the cheaper product and quickly became aware of the many conveniences of its everyday use in the business world. As a result, the demand for paper soon exceeded the quantity that could be made with the supply of rags available, and the manufacturers were forced to substitute other fibers, usually inferior in strength and purity, in

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order to stabilize prices and to stretch the rag supply to meet the demands of an ever-expanding paper market.

Straw, wood pulps, and other fibers of no commercial value today were frequently used as adulerants in the rag papers or were used alone in the very cheap papers. The need for and the means of purifying these fibers for paper-making were not well understood and the papers were made with most of the naturally occurring acids and lignins intact. The presence of these foreign substances has been largely responsible for the obviously poor quality and the accelerated deterioration of some of the papers dating from the latter half of the nineteenth century.

The results of this evolution or industrialization of the paper-making industry can be made apparent in a cursory sampling of almost any archival series extending throughout the century. Papers of the early period will be relatively few, and, although they may exhibit signs of weakness at the folds and some discoloration, they will be fairly substantial in general and will be strong enough for safe and easy handling. Papers of the later period, especially after 1869 when ground woodpulp was introduced, will be found proportionately more numerous than those of the early period and will be not only weak or broken at the folds but, in many cases, will be brittle throughout. Many papers of this later period particularly have been considered of relatively little value and have often been improperly housed and carelessly used so that their natural deterioration has been accelerated rather than minimized by the storage conditions.

It is, therefore, the nineteenth century records worthy of preservation that now require the major portion of the archivist's thought insofar as physical handling is concerned. During the earlier period when files were less bulky and labor was less expensive, it was frequently customary to assemble periodically groups of related papers and have them bound into volumes of uniform size. In some instances, the individual documents were mounted on the pages of blank books, and such material that was currently bound in some way is generally found in good condition although the bindings may be in need of repair. As time went on, it was found that the bulk of accumulating files was increasing at a tremendous rate, and the adoption of some quicker, less expensive method of filing loose papers became of the utmost importance. The scheme of folding

records individually or in bundles, labeling them on the outside, and filing them on edge in Woodruff files or similar containers offered many apparent advantages and was widely accepted, especially by the larger record-creating agencies, both private and public.

This type of filing was completely satisfactory from several viewpoints. The documents pertinent to one subject were folded and kept together conveniently; an over-size sheet presented no special packing and indexing problem since it was folded to standard size and was filed in its proper sequence in the series; and, probably most attractive of all, servicing was easily and quickly accomplished without the need of extraneous and space-consuming materials such as folders and guide cards. What those who introduced the Woodruff files evidently did not foresee was the inevitable physical damage to the paper that would be incurred by the periodic unfolding and refolding of the records as they were used. Because of the natural aging of an initially poor paper, the exposure of the paper to relatively high concentrations of sulphur dioxide evolved by the gas burners and coal heaters of the day, and the lack of properly humidified air, the papers gradually dried out, deteriorated, and became brittle. Breakage along the fold lines became inevitable but was more commonly encountered among the sharply folded records containing few enclosures than among those with softly rounded folds. The general weakening and fracture among the folded files finally became obvious and this method of filing was gradually abandoned so that by the beginning of the twentieth century the flat-filing of loose papers had been almost universally adopted as standard practice. The older files, however, were kept for the most part in their original containers and those that were relatively early and inactive are still today in fairly good condition, but many of those that were on poor grades of paper and were also improperly housed and actively used have become so torn and broken that their effective servicing today is seriously hampered.

It consequently seems apparent that the eventual flattening of all folded records of permanent value that are frequently consulted must be accepted as a prerequisite to their proper preservation regardless of the inconveniences in the use and storage of the material. When storage conditions favorable to paper preservation (50 per cent relative humidity and 70 to 75 degrees Fahrenheit) can be maintained, however, the flattening of large volumes of relatively

inactive records may be safely postponed almost indefinitely. Priorities on flattening should certainly be given to those groups already exhibiting evidence of physical deterioration and to very active records that are receiving unreasonable wear from their day to day use.

The actual mechanical process of flattening the average records series is much simpler and less time-consuming than is the preparation of this same series for flattening, and the refiling, in whatever containers selected, after flattening. The rate of flattening a particular group of records should be tempered to the speed at which the finished material can be conveniently assimilated by those refiling the records. Whenever oversize material must be filed separately and cross-indexed, or papers kept together with enclosures either by stapling or filing in a suitably labeled envelop or folder, or individual documents removed, repaired, and reinserted, the speed of the whole flattening process will be considerably retarded. For the sake of over-all efficiency in the conversion of a series of records from a folded file to a flat file, it is advisable to limit strictly the facilities and labor employed for routine flattening and to spread the flattening program over a considerable period of time rather than to allow large quantities of material to be in process or to remain unfiled for any length of time.

A careful study of the physical condition and the degree of use of the various series of folded records should be the basis for determining flattening needs and priorities, although first consideration should generally be given to the most actively used materials. The older and perhaps more valuable or more fragile records may be handled little by little as time becomes available. Opportunity should be allowed for the careful repair of records whenever necessary and for refiling immediately after processing in their permanent containers with all the needed labels and cross-references.

Certain techniques have been developed at the National Archives during recent years for the expeditious flattening of the various types of records encountered in bodies of archives. The specific method selected in each case depends primarily upon the nature and condition of the material, but the great majority of records may be most effectively and inexpensively flattened by ironing. All papers must first be opened and smoothed out by hand. Rubber bands and any unnecessary pins and clips are removed in order to avoid stains on

the papers that may result from these fasteners as they deteriorate or rust. During this part of the processing, which may be quite time-consuming if the percentage of broken sheets or sheets of tissue weight is high, each document with its attachments or enclosures is kept separate from adjacent sheets in the file by the use of a strip of colored paper acting as a divider. When the unfolding of a group of records, such as the contents of one drawer or Woodruff file has been completed, the whole pile is placed on a tray in a room maintained at about ninety-five per cent relative humidity. The papers are fanned out somewhat to provide reasonable exposure of each sheet to the damp air and are left in this atmosphere for several hours. Any prolonged exposure to this high humidity must be avoided because of the danger of inducing mold-growth or blurring the water-soluble inks. Two or three hours of moisture absorption can do no harm, however, and are adequate for the purpose. At the end of this period the papers are gathered together to preserve the moisture absorbed, are removed from the damp air, are assembled in small piles, and are ironed immediately in these groups. This method of ironing dries and flattens most records effectively, but if the papers are very fragile or thin it will be necessary to iron each individually. Ordinary electrically-heated hand irons are the most easily handled and the most adaptable ironing equipment for this type of work. A firm but not hard ironing surface, such as a pile of blotters should be used. The hand iron is far less expensive in both first cost and maintenance than the mangle formerly used in the National Archives for the purpose, its use requires no special skill or instruction, and the sheets ironed are flat rather than curved. Mangles, however, are of definite value for flattening large maps, especially those on tracing cloth where even pressure over a wide surface is advantageous. After ironing, the material that does not need repair is ready for packing and shelving.

It frequently happens that a series of records being flattened will be of apparently uniform size and in good condition when folded, but that documents of miscellaneous sizes and in varying states of preservation will be found when the series is unfolded. It must then be determined, for each records series, whether it is better to cut and hinge the larger sheets to fit the container proposed for housing the material, to refold the documents to some extent, or to cross-index and to file them in a larger container away from the general

series. The policy adopted will depend upon the physical condition of the oversize pieces, their numerical proportion to the whole collection, and the manner in which the records are used. If the paper is in good condition there should be little harm in refolding some sheets for convenience, although it is never advisable to fold papers in more than one direction, as folded corners are extremely vulnerable to wear. If the papers are weak or already broken along the original folds, it is better to repair them at the time of flattening either by hinging along the original breaks or cutting and hinging otherwise as the document or the container indicates. From a records preservation standpoint only, it is of course advisable to pack all such oversize material flat in large containers without folding or hinging, but the convenience in having all pertinent documents together in one container certainly deserves some concessions, and it is not believed that intelligent folding or hinging will cause real injury to the papers so treated.

Documents of average size that are broken or fragile are repaired in the manner best suited to each case and reinserted in the file so that each paper in the collection will be in good usable condition and in its proper place after flattening and repacking.

The amount of repair required in each series naturally varies widely; each sheet in some series must be repaired, whereas in other groups but one sheet in a hundred may need special treatment. The time required to flatten and refile any particular collection is almost wholly dependent upon the condition of the paper and the amount of repair undertaken. The actual humidifying and ironing processes with which flattening is primarily associated are relatively simple and by far the least time-consuming of the whole series of operations required in converting records from a folded file to a flat file. It is therefore impossible to determine flattening rates in advance or to estimate costs or man-hour production on such a process if the flattening of records is to be construed in this larger sense. It may be said, however, that one man working continuously with one iron on an average group of records in good condition can flatten what five are required to unfold and put away, and as a group they should average about ten thousand sheets a day.

There are several methods of flattening papers other than ironing that may be advantageously adopted in certain cases. Extremely fragile items such as brittle tracing papers, documents that have been washed or bleached to remove stains, fragments of mildewed, water-

soaked, or burned documents, and parchments, which do not tolerate ironing, may be more safely handled by spreading out each dampened sheet between blotters and pressing, without heat, until dry. The method is of course very expensive in labor and time and is used only as a last resort in those special cases where ironing would be difficult or injurious to the records.

At the other extreme of flattening costs, large groups of material in good condition may oftentimes be flattened sufficiently for satisfactory storage merely by opening the sheets and packing them flat under the natural pressure maintained in records containers without either humidification or ironing. This method can hardly be effectively carried out, however, unless the air in the records-storage areas and the work rooms is reasonably moist. The fifty per cent relative humidity maintained in the National Archives for the sake of the prevention of the embrittlement of the papers has been found adequate for this type of flattening, and good papers conditioned from long storage in this atmosphere may be opened and pressed out without danger of breakage.

It should be apparent that the mechanical aspects of flattening are fundamentally very simple and its execution requires little equipment or technical training to produce satisfactory results. The real problem of flattening records, then, lies not in the process itself but in the preparation of the material for processing and the repacking of the records afterwards for most convenient use. These parts of the operation require considerable time, intelligence, and skill, and any design for the eventual flattening of all records in an institution should be modest enough to provide ample opportunity for the refiling, in the most useful and acceptable manner, of all records to be treated. Fortunately for the success of such a program, modern records are not being folded and the quantity of documents to be flattened is not increasing but gradually declining as folded material can be treated. The eventual flattening of all permanent records is eminently desirable as a factor in their preservation, but it is not a work that should be hastily undertaken. The flattening program for any establishment housing large quantities of folded records should be carefully planned on a priority basis and then carried out in such a manner that at no time will any sizable quantity of records be out of records containers and unavailable for use.

ADELAIDE E. MINOGUE

The National Archives