

Potpourri

Operation Paper Lift

by PETER BOWER and CHARLES BRANDT*

Fire gutted a building on Main Street, Winnipeg, during the early hours of 22 January 1981. The blaze, still under investigation, caused about \$315,000 damage to the three storey building which housed an appliance centre on the first floor, and on upper floors a regional office of Income Security Services (Provincial Government Department of Community Services and Corrections) as well as the Jewish Child and Family Service, a private organization. The building housed upward of 600 feet of paper records of the two social service agencies. Approximately 80 file storage units were involved, some of which plunged through the floors as firemen battled to arrest the fire.

The largest proportion of the records of the Income Security office are composed of client or case files, both active and closed records. These highly sensitive and confidential records provide the necessary control mechanisms for social assistance to the needy. The active files are defined as those relating to clients still receiving help; the closed concern past, suspended, or terminated transactions. As soon as the staff of the Provincial Archives of Manitoba became involved, we were struck by the significance of the records for the litany of reasons usually invoked to justify archives and records management: legislative, legal, fiscal, operational, administrative, and operational. Historical and cultural factors also came to mind, but our efforts were quickly suffused by the obvious humanitarian reasons for salvaging the records, especially when we learned that within a week, the Income Security office would have to issue benefits to the less fortunate individuals of our society. This emotional sense was dramatically heightened as we dealt with staff of the Jewish Child and Family Service, which, in their own words "are concerned with the entire spectrum of human need."

* Because of the number of individuals involved in the operation from the agencies whose records were effected, the Canadian Armed Forces, Government Services, and the Provincial Archives, we have deliberately mentioned very few. It would not seem proper to identify some and not others of all those who contributed in a major way to "Operation Paper Lift".



The offending fire, 22 January 1981. (*The Winnipeg Free Press*).

Some particularly compelling details emerged as we learned that the fire and water damaged materials include records of the now-defunct Jewish orphanage going back at least to the early 1920s. The Service also houses adoption records, whose significance and sensitivity need hardly be defined. Apart from the fact that such materials have considerable historical importance, their uses range from a very personal impulse to know oneself and one's origins to medical factors where an orphan or adopted child might develop a serious illness in later life. In these records could be the background information providing the key to the cause and cure of the illness. While these points hardly do justice to all the other activities of the agency, one more detail should be mentioned: support comes not only from the Provincial government channels, but also very substantially from the United Way and the community directly served. In the cases of both agencies, the financial implications alone of loss of records were very substantial indeed. In addition to the more obvious reasons of financial control relating to active materials, there was the less apparent factor of potentially recoverable monies documented in the closed files.



The file drawers of active documents arrive in the basement of an associated office. (Charles Brandt, Provincial Archives of Manitoba).

Not surprisingly, the first contact during the shock phase made between the Archives and Income Security was characterized by a misunderstanding of the Archives' interests and capabilities. However, a brief explanation at once disabused Income Security officials of their understandable belief that we were concerned only with "historical" documentation. This led to extensive mutual cooperation and confidence in the Archives' motives and expertise. During the shock phase, Income Security staff were almost overwhelmed by a sense of futility in trying to salvage the records, especially the closed files. This is not at all a criticism of the staff, but rather a recognition that they were burdened by the fact that they had to return almost immediately to an operational stance to issue social benefits. Obviously, any emergency operation or procedure should recognize such pressures on programme staff and that assistance is essential not only to provide direct technical support, but also to cushion the psychological and emotional impact on the staff of the affected agency whose attention is naturally directed at regenerating their services as rapidly as possible. Under such circumstances, there may well be a clear recognition of the importance of the documentation, but it might not be a dominant concern. This is an aspect which must be handled with great sensitivity, especially if the staff of the agency involved has already been pushed to the limit by long hours worked, by struggling with the early chaos entailed by an emergency, by the toll of heavy physical exertion, and by trying to cope with the pervasive filth and penetrating stench involved in handling fire and water-damaged materials.



The file drawers of active records laid out, and files turned on end to allow greater air circulation with assistance of fans. (Brandt, PAM)

Following the initial contact between the Archives and the agencies involved, the active files of Income Security were moved to the basement of another office and the salvage operation began in earnest. The documents were delivered in their original file drawers and inspection showed that some of the files were not only burned at exposed edges, but also scorched to the centre of some of the less tightly packed documents. Approximately 10 per cent of the total volume of active files were relatively unharmed, save for heat damage, and were dry. A large quantity of the records in file drawers had swelled from water absorption and had become jammed tightly in the containers. Removal was extremely difficult, but absolutely essential, forcing recourse to carefully applied crowbars or to overturning and banging the raised portion of the drawer fronts on the concrete floor.

The inhibition of mould growth and fusion of the wet documents were our immediate concerns, so we had the heat reduced as much as possible in the basement area. The file drawers were arranged on the floor in double rows, leaving aisles for access. Ten-foot long work tables were assembled in the remaining half of the basement, and we acquired six high-speed hair dryers, new file folders, labels, storage boxes, and other essential supplies. We loosened and turned the files end up in the drawers wherever possible, taking great care not to disrupt their working order. Three large fans were stationed to blow over the files constantly. Staff of Income Security then worked at manually drying the active records through Friday afternoon, Saturday and Sunday. Excluding archival staff, eight to ten individuals worked many overtime hours to salvage the documents. From Monday to Wednesday a crew of 25 Income Security employees concentrated on drying and refiling the material, then placing it in new filing cabinets. By Thursday, the office was able to issue payments to clients on a basis of control that would not have been possible had the documents been lost. This manual drying process was substantially facilitated by the dry air in the basement: ca.30 per cent relative humidity.

In the meantime, Archives staff were attempting to devise a process for salvaging the closed files. We decided that these files should be frozen while we searched for a means of drying them in bulk. With the assistance of Manitoba Government Services, we located an unheated building which offered adequate security, and, as good Winnipeggers, we luxuriated in the knowledge that our cold weather would do the job of freezing the documents. Otherwise we should have had to locate a large freezer unit or truck which would have entailed considerable expense, and in the absence of an emergency plan, perhaps have taken enough time to permit the growth of mould and the fusion of some of the wet paper. The temperature in the city ranged between about -7°C and -28°C at this time. Freezing does not kill mould spores, nor is it a drying method, but it does induce a dormant state giving time to plan the recovery of the documents.

To contain the documents from the 153 file drawers, the Archives contacted a local dairy for 418 milk carton crates. These crates each held about one cubic foot of loosely packed documents. Fortunately, by far the bulk of the documents involved were letter-size, not legal which would have been too large for the plastic cartons. Similar crates large enough for legal-size paper would have



Crates of documents being placed in the chamber. Note the method of stacking the crates so as to allow maximum air circulation. (The *Winnipeg Free Press*)

been difficult to locate in large numbers, and are much more expensive. The containers which were used proved to be ideal: they had perforations on all walls allowing good air circulation and could be stacked directly on top of each other thereby obviating the need for shelving to hold the material compactly. On 29 January the documents, which had been kept in a cool location, but not frozen, were transferred to the crates and placed in the unheated building. Care was taken to keep a careful record of what materials were in which containers. The window blinds of the temporary storage area were drawn to prevent Winnipeg's frequent winter sunlight from heating the rooms, and the cartons were piled in such a manner as to provide for access aisles in case any documents were urgently needed for operational purposes.

The Chief Conservator then took a different tack knowing that a vacuum chamber had been used in Downsview in the past to dry some water-damaged records of a commercial firm and also some theses held by a Toronto university. A call to John Barton, Conservator at the Archives of Ontario, provided the lead that there was a vacuum chamber at Canadian Forces Base Winnipeg. We immediately contacted the Base and were treated from the start with

The drying principle involved exploits rather elementary physics. The lowering of the air pressure accelerates the rate of evaporation of the material.

impressive courtesy, and an immediate and sympathetic grasp of the problem. We were soon dealing with the staff of the School of Aeromedical Training which includes several individuals with previous experience in drying documents in hypobaric chambers. "Military precision", with the best connotations, is the only apt phrase to describe all our contacts with the Base and School staff. After some telephone calls to Dr. Robert McComb, Research Scientist at the Library of Congress, for his expert advice on the drying technique we were contemplating using, the documents were moved to the decompression chamber site.

The Winnipeg hypobaric chamber, used by the School of Aeromedical Training to simulate high-altitude flight conditions, is about twenty-years old with interior measurements of about twenty-four feet in length, eight feet in width, and about six and a half feet in height. The age of the equipment restricted the simulated altitude which could be reached to about 85,000 feet, or sixteen miles. Modern chambers can "lift" contents to upward of 200,000 feet, or about 38 miles. The frozen documents in the milk crates were loaded into the chamber on 3 February with little room to spare. The crates were placed on each other in an alternating pattern so that no container's base fully covered the top of another. This was to allow maximum air circulation.



Using hair dryers on the active files. (Brandt, PAM)

The moisture is evacuated by the pumps used to reduce the air pressure. Before the process was begun, the principle was demonstrated to press and broadcast media by placing a large container of water in the chamber, then reducing the pressure. As the container was "lifted", the water began to boil off.

A second physical fact of importance to us was that during evaporation, there is a heat loss which would slow down the rate of vapourization. In the Winnipeg chamber, the only heat sources were the overhead fluorescent lamps and whatever would penetrate the un-insulated walls of the unit. The latter source of heat exchange would be very inefficient as heat transfer would be substantially retarded by the loss of air. The point is that we believe the process of evaporation could have been considerably accelerated if there had been some low level heat sources in the chamber during the periods of vacuum.

After four days, the chamber was brought down to earth, as it were, and the documents were inspected. The drying process proved to be working, but many documents were still excessively damp. Consequently, another vacuum was pulled. Three days later, the documents were again inspected and we found that 238 crates were dry. The documents in 180 remaining crates were further loosened by distributing them amongst an additional 100 containers and sent back to 80,000 feet. On 12 February, this last batch of high-flying paper was brought down after a total of nine days in upper atmospheric reaches. About 35 of the original crates still held slightly damp documents which were finally dried by exposing them to fans. We estimate that the hypobaric chamber withdrew about 200 gallons of water, or nearly 2000 pounds.

During the drying process, members of the Aeromedical Training Team who manned the chamber 24-hours a day noted a fascinating phenomenon. As the documents lost moisture "they began to open up like spring flowers".

Apart from all the obvious benefits of salvaging these documents, we were impressed by the amount of press and broadcast coverage the Archives received. Furthermore, we have built up quite a store of good will with the government Department and the private agency involved. We concretely demonstrate a justification for maintaining well-rounded archival institutions. Many more people now appreciate the non-historical facets of the archival mission. The process also underlined the need for developing emergency plans, something the Archives of Manitoba was just about to begin. Despite the absence of such plans, we found the remarkable cooperation of the Armed Forces and Manitoba's Department of Government Services almost fully compensated. Consequently little time was lost — certainly not enough to increase the damage already done to the documents by fire and water.

While not all the costs have yet been tabulated, we estimate that they will not exceed \$12,000 in all aspects. Fortunately, the Armed Forces undertook their role as a public service, so the costs will be considerably less. Even at full expenses, the values of the material exceed such figures. In fact, potential recoveries well in excess of the costs of the operation were initiated from the closed files of Income Security within a week or so of the return of the salvaged records.



Charles Brandt, Chief Conservator, Provincial Archives of Manitoba, inspecting condition of documents after period in the vacuum chamber. (PAM)

We consider the operation a success and probably one of the least expensive techniques for drying large quantities of paper documents. We know of several other similar operations in the United States, one undertaken by the General Electric Company, Valley Forge Space Centre, Pennsylvania, and the other by the McDonnell Douglas Corporation, St. Louis, Missouri. There are certain dangers in both freeze-drying and vacuum-drying processes, but they are entirely safe under carefully controlled circumstances. For example, rare printed books and early manuscripts should not be mixed with deteriorated or brittle materials because of the possibility of acid migration from the former to the latter during the drying process.¹ Another detail which should be emphasized is that the records salvaged in Winnipeg were exposed to high temperatures during the fire. This will have “artificially” aged the paper by many years. Inasmuch as most modern paper has a functional lifespan of only

1 Peter Waters, *Procedures for Salvage of Water-Damaged Library Materials* (Washington, 1975) pp. 7-8. For a description of the salvage operation involving water-damaged books belonging to Stanford University, see Sol London, “‘Outer Space’ Saves 40,000 Water-Soaked Books”, *Records Management Quarterly* 13, No. 2 (April, 1979): 38-39. The last item was reprinted from *Lockheed Life*, an employee magazine of the Lockheed Corporation.

about eight decades or less under more or less normal conditions², it is fair to assume that much of the documentation will have to be microcopied if the information is to survive for an extended period. Obviously, some of the materials could be rehabilitated in a professionally-run and equipped laboratory, but the quantities and costs involved would prohibit anything approaching wholesale preservation of the original documentation.

Other hypobaric chambers in Canada include:

- * CFB, Edmonton, Alberta;
- * Defence and Civil Institute of Environmental Medicine, Downsview, Ontario;
- * CFB Trenton, 426 Squadron, Ontario;
- * CFB Bagotville, Quebec.

Some time later this year, we believe that the chamber in Winnipeg will be moved to CFB Greenwood, Nova Scotia. By that time, Manitoba Archives should have its own vacuum-fumigation chamber and will therefore be able to mount a similar operation when next needed. In fact, the new chamber will have the capability of actually freeze-drying as well as vacuum-drying. Needless to say, the Archives' chamber will have a much smaller capacity (about 250 cubic feet) than the hypobaric chamber at CFB Winnipeg, but with proper plans for a back-up freezing system to hold excess water-damaged materials, we will have another successful salvage project.

2 See W.J. Barrow, *Permanence/Durability of the Book — II and VII* (Richmond, Virginia, 1974).

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