

RECOVERY OF FLOOD DAMAGED DOCUMENTS BY THE QUEENSLAND STATE ARCHIVES

by Lee McGregor and Jim Bruce

On the Australia Day week-end, 1974, Brisbane experienced the most damaging floods ever to hit the city. Fortunately the Queensland State Archives, which is located on a hillside quite some distance from the river, was well out of the reach of the floodwaters. Some of the State Government departments, however, were not so lucky and several requested our advice and assistance in salvaging their records. This article is a record of our attempts to dry out and restore flood-damaged material. It is written in the hope that a record of our experiences may be of use to anyone faced with a similar situation.

Our previous experience in this field was virtually nil. Fortunately, however, we do have a document restorer on our staff, Mr. Jim Bruce, co-author of this article. He has recently returned from a four-month tour of Europe and America studying techniques of document restoration as part of a Churchill Fellowship. Regrettably lack of time prevented him from visiting Florence and seeing the restoration work being carried out there as a result of the disastrous flood of 1966.

Basically we relied on his expert knowledge combined with a common sense approach in dealing with the records. The urgency of the situation meant that there was little time for an exhaustive search of the literature for reports of methods used elsewhere. It also meant that we could not immediately acquire special equipment. It was therefore necessary to improvise using whatever equipment was available. We proceeded largely by trial and error, gradually improving our techniques as we went.

The floods occurred over the period 25 to 31 January. On 30 January we received an urgent request for help from the Children's Services Department. Their records which were housed in the basement of their building in Mary Street, were inundated by the floodwaters. The water reached a level of two metres and the files were submerged for about three days. Included among them were about 175 shelf metres of files dealing with adoptions. As these files are not duplicated elsewhere and because by law they must be produced in court when necessary, it was essential that they be saved.

The files consisted of correspondence, reports, etc., held together by metal pins and placed inside folders. About two-thirds were small files, no more than one centimetre thick, in ordinary manilla folders. The rest were very thick files, from five to fifteen centimetres through, with a cover made from two pieces of cardboard and a strip of material glued to one side.

The files were sent to us at a rate of two truckloads per day. We found that this was the maximum that we could satisfactorily process in a day. In the first loads the files were packed flat in large wooden crates. This meant that muddy water tended to drain through on to the bottom files so we asked the Department to stack the files side on to allow the excess moisture to drain out.

We found by a process of trial and error, that it was better to wash

the mud and slush off the files before drying them, rather than drying them first and then trying to remove the mud. This would presumably vary according to the kind of silt brought down by the flood, the degree of wetness of the paper, and the type of chemicals or other foreign substances adhering to the files. A further consideration was that because of the quantity of records involved and the very limited financial resources to be committed to this undertaking, the kind of page-by-page repair work undertaken in Florence would not be possible for us. This preliminary washing seemed the best way of cleaning the records in bulk.

We washed the files outside the building to allow the water to drain away freely. We used an ordinary soft brush connected to a hose (the type normally used to clean a car). The mud was mainly on the folders and edges of the paper with the correspondence inside being wet, but fairly clean. When the files had been washed they were placed in the sun for preliminary drying. Again we tried to stack the files on their side on a slope to allow excess moisture to drain off. As far as possible files were separated to allow the air to circulate freely to assist the drying process. It was necessary to improvise with planks, trolleys, spare shelving, and whatever else came to hand to create somewhere for the records to be washed, stacked and dried.

The files were left in the sun for a few hours by which time, although still wet, they were no longer dripping. They were then loaded onto trolleys and moved into the air-conditioned section of the building. The controlled humidity in this section (between 50% and 60%) slowed down the process of mould growth although it did not prevent it. It also helped to prevent any further rusting of the metal clips used



Showing the wet and dirty condition of the records when they arrived.



One of the authors of this article (not Ms McGregor) cleaning off the files with a motor-car washing attachment to a hose.

to hold the correspondence together. The ordinary metal pins and paper clips rusted very quickly. It was interesting to note that the few brass paper clips we came across were completely undamaged by water. This was also true of the few plastic paper clips we found.

There was very little empty shelf space available in the compactus in the air-conditioned area. Fortunately we had a large number of loose steel shelves and steel dividers and these were placed on the floor, on top of the map cabinets and anywhere else there was any space. All available fans were then used to circulate the air.

Initially, after the files had been placed in the sun to let the excess water run off we tried the method of vacuum drying in our vacuum type fumigator. After a full 24 hours under vacuum, there was no appreciable extraction of water at all, so this idea was abandoned. The idea had been gained from results obtained in Florence with similar

equipment after the 1966 flood. The fumigant ethylene oxide, which is normally used in our machine, was not used in this operation.

Having reached a stage where all the files were safely stacked in the air-conditioned area, it became obvious that the records would take weeks, if not months, to dry out completely. By this time the odour was rather overpowering and there was barely room to turn round without falling over wet files. The only effective method therefore was to dry each file separately. Where the files were stacked back to back, the covers tended to stick together, mould developed and not enough air penetrated to allow the correspondence inside to dry out. We experimented with the shelving so as to maximize the air flow. For the thin files we used steel shelves laid crossways with three or five files to the shelf. The stacks could be built up in this way to about six feet. We found that by stacking the shelves in this way, the files dried quite quickly, i.e., about three days for each load. The thin files also dried quite quickly simply by spreading them out singly on the floor. For the thick files a different approach was needed. It was necessary to separate the pages in each file otherwise the paper simply did not dry out. This had to be done very carefully as the paper tore very easily.

Mr. David Jones, the conservator with the Australian Archives, who had been sent to Brisbane to advise Commonwealth Departments about salvaging flood-damaged material, suggested to us that we use silica gel to absorb moisture. Three kilograms is sufficient for an area of 25 cubic metres. This seemed to help although the records still dried slowly. We also tried sprinkling wet records with talc, a fine white powder used by printers to absorb moisture. This was quite effective on a small scale but, of course, difficult to apply to a very large quantity of material.

About a fortnight after the records were put into the air-conditioned area we began to notice mould growing on those records which were still wet. The fumigant we normally use is ethylene oxide, but as this is water soluble we could not use it for wet records. Thymol was the most obvious alternative, but it requires special equipment and expert handling which were not available to us.

The difficulty was that given our limitations of space and numbers of available staff, it was impossible to dry such a large quantity of material all at once. We could only process approximately fifteen to twenty metres at a time. To cope with this situation, it was decided to freeze those records which could not immediately be dealt with. 5.48 metres of files which were badly affected by mildew were transferred to a local ice-works for freezing. These were stowed in wooden boxes with handles and the boxes were placed crossways on top of each other. This made them easier to separate for removal. The temperature was set at -12° to -18°C . A temperature of below -40°C is considered to be damaging to paper. The files remained in the ice-works for about three weeks. They were then removed one box at a time, thawed out and dried in the normal manner. The freezing process had certainly prevented the growth of any further mould. However, because mould growth and paper deterioration had occurred before freezing, the life expectancy of the paper would be greatly reduced. Even under ideal storage conditions with carefully controlled tempera-

ture, humidity, etc., the paper could not be expected to last for any great length of time. Where permanent preservation is required, it would be necessary either to laminate the documents or to microfilm them.

In addition to the 175 m of adoption records, we also undertook to dry out approximately 75 m of records from the Mines Department. These posed a far more serious problem for us as they had been allowed by the Mines Department to remain in the damp, ill-ventilated basement where they had been at the time of the flood. The first load of files came to us about a fortnight after the flood and the second about a month after the flood so that there was ample time for a rather spectacular growth of a wide variety of moulds. The files were held together with staples and metal clips and these had rusted very badly. The paper was completely sodden and had deteriorated very badly. There were a number of envelopes containing photographs which had stuck together. The stench from some of the files was appalling, which made working with these files very unpleasant for our staff. In all, the records were in a very bad condition. In a very practical way they showed us how essential it is to remove the records from the site as soon as possible after the flood and to dry them out quickly. Where it is not possible to dry all the records at once, those files which cannot be dealt with immediately must be frozen. Otherwise a delay of several weeks in drying the records will mean that much irreversible damage will be done. We cannot stress this point too strongly.

The Mines Department files were treated in much the same way as the adoption files, although because of the deterioration of the paper and the fact that the outside of the files were half dry, it was not possible to wash the mud off the files before drying. The Department had used red sign pens for marking the file numbers and details of previous and subsequent files on the front cover. These are felt pens but without an oil base. They are water soluble and most of the numbers were completely obliterated by the floodwater, which is going to make it very difficult to use these files in the future. We found that red ink generally fared badly. Ordinary black or blue ink, on the other hand, was surprisingly good. There was certainly some running or smudging of the ink, but where papers had been packed tightly enough on the shelf to prevent the floodwaters swirling across the pages, there was very little damage done. Most writing in ball point also withstood the flood very well.

In addition to the major tasks of salvaging the adoption files and the Mines Department records, we also undertook to assist with some smaller amounts of flood-damaged material. The Department of Irrigation and Water Supply sent over about 200 maps and plans which were very wet but, fortunately, not too muddy. These were carefully separated and a piece of blotting paper inserted between every two maps. Any mud on the maps was carefully sponged off. The blotting paper absorbed the moisture and the maps were dry within a few days. Heavy boards were used to weigh the maps down to prevent creasing or crinkling of the paper as it dried. A similar process was used to dry out a valuable typescript of several hundred pages which was sent to us by the Botany Branch of the Department of Primary Industries.

We tried the same method on some wet registers, but this time it was not successful. The pages were removed from the registers and the loose pages were then interleaved with blotting paper. After a couple of weeks the pages were still damp and mould had started to grow. We assume that the method was unsuccessful here because the paper was very thick and very wet.

With the Mines Department records were about 200 maps of the early goldfields at Gympie. An enterprising officer of the Mines Department had arranged for these to be frozen immediately after the flood. They were stored in a cedar cabinet which was transferred to an ice works where it remained for about twelve weeks under a temperature of from -12° to -18°C . The maps and charts (both paper and tracing linen) were rolled up at the time of the flood and they were left this way during the freezing process.

On removal to the Queensland State Archives, the maps were allowed to thaw out. They were not allowed to dry out completely as the silt adhering to the maps would have been difficult to remove from dry documents. While still damp, each map was placed in a trough of warm clean running water and the silt was carefully sponged off. The linen maps were then hung on string lines to dry while the paper maps were laid out flat on perspex. All inks proved stable except red, although even with red ink the outline generally was still discernible. After drying, the tracing linen was ironed flat. The paper maps and charts will be deacidified using a bath of calcium bicarbonate, and then mounted on calico and Japanese tissue. It is significant that apart from the silt marks on these maps and charts there was no evidence of mould or bacteria of any kind. This is a clear indication that immediate freezing is a very simple solution to the problem of preventing mould growth in wet documents. It has the added advantage of not being particularly expensive. It cost the department 50 cents per week to freeze a map cabinet 1.62 m x .57 m x .96 m high.

Our experience taught us several valuable lessons. The first one was the necessity for speed. The records must be removed from the site as soon as possible. Records which cannot be worked on immediately should be placed in cold storage. Those which can be dealt with should be moved into an air-conditioned area with a controlled humidity. This is particularly important in a humid climate such as Brisbane's. Records should be dried as quickly as possible using air circulation rather than excessive heating. Mould and rust are the two big dangers and these can be held at bay only by speedy handling or by freezing.

The second lesson was the necessity for improvisation and adaptability. In Australia, unlike history-conscious Europe or rich America, funds are likely to be very limited and special equipment and expertise difficult to obtain. We had to improvise with shelving, dividers, planks, blotting paper, hoses, a car brush, nylon clothesline and whatever else came to hand. Different kinds of files required different methods of drying. We experimented with hanging files on nylon lines, with fanning out the pages of a file in a circle around the metal clip the way one fans out a pack of cards, and with arranging the files in different ways on the shelves. Some kinds of paper dried faster than others. Some

large folded maps had to be unfolded and dried separately. Photographs had to be given different treatment. An inventive, trial and error approach was needed for each specific problem.

The most obvious lesson we learned, of course, was simply not to store records in flood prone areas. It is probably impossible to be totally protected from every natural disaster, but sites for record storage should be carefully selected. It is truly alarming the number of departments which store their files in basements in low-lying areas on or near the river. In a city with Brisbane's flood history, this is asking for trouble. While archivists doubtless appreciate the need for careful selection of record storage sites, unfortunately government departments frequently do not. Semi-current records, many of which will eventually become archives, are frequently housed under conditions which make them very vulnerable to flooding. Quite a few departments have lost the bulk of their records in this flood, a situation which is going to cause them considerable difficulties in the next few years. One would like to think that a few lessons have been learned from this experience, but we note with disappointment that several departments are simply cleaning out their record storage areas, moving the remnants of their records back in, and sitting back calmly to wait for the next flood.