2003

Zvládání krizí a jejich následků
Crisis Management and Recovery

CASLIN 2003:
Crisis Management and Recovery

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Drazí přátelé,

mnoho se posunulo za posledních deset let českých a slovenských knihoven. Z přepravek na police, od lístkových katalogů přes elektronické až po souborné katalogy a digitální média k virtuálním a knihovnám bez zdí. A zatímco se knihovníci prošlapávali bludištěm vlastních dějin, mnohem cynická společnost se proměnila v převážně spokojené uživatele. A my se dál scházíme tváří v tvář na krásných místech, na chvilku ukradeného času, na seminář CASLIN. Na výměnu zkušeností a k utvrzení nových vzniklých přátelství. Ať bylo na co vzpomínat. Na dalších deset let.

Dear friends,

From crates to shelves, from card catalogues through electronic ones on to union catalogs and digital media, from new libraries to libraries without walls, many things have moved in the Czech and Slovak libraries during the past 10 years. And while librarians hiked through the thorny labyrinth of their own history, the lethargically cynical society has been transformed into predominantly satisfied users. And we continue to meet face-to-face, in beautiful places and for a bit of stolen time, at the CASLIN seminar, to exchange experiences and to confirm new friendships. In order to remember. For another 10 years.

Andrew Lass

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Introduction

Františka Vrbenská

Questions relating to the protection of national cultural patrimony attracted considerable attention at that time as a consequence of devastating floods in Moravia (1997). The whole issue, however, suddenly shifted from the realm of theory to very practical concerns under what were almost war-like conditions. This drew light to the weaknesses of the gradually built system, but it also showed what can be managed with the existing expertise and equipment, what solutions there are in emergencies, and what steps should be made in preventive measures.

Work to save and restore damaged books and archival holdings started as soon as the most critical period of the flood was over and before the water subsided. Human solidarity, be it volunteers from among the general public or specialists in conservation and preservation (and assistance was coming in also from abroad) had a very positive effect. To prove the truth of the old saying that every cloud has a silver lining, the period that followed August 2000 provided a wealth of experience, influenced new technologies, restored old but effective techniques, and quite a few damaged libraries moved to a better location.

The money provided by the Czech government for disaster recovery purposes made it possible to buy new equipment and set up facilities that not only are used today but will be available also in the future if and when a new natural or man-made disaster strikes again. The work to repair damage was very intensive; reports of events during the flood and subsequent rescue and restorative operations make an interesting and informative reading. It was still necessary to analyze the shortcomings in disaster prevention and disaster mitigation, and to correct them. Experience and expertise of foreign specialists would have been very welcomed ...

All the above factors led the CASLIN organisers to reconsider the planned focus of their seminar in 2003, and to choose a more topical theme for their discussion there, namely crisis management and disaster recovery. Papers presented at the 10th international CASLIN seminar mapped various approaches to issues related to floods and natural disasters in a broad sense, represented various schools of technical thought, proposed alternative ways to save damaged documents, and sometimes their points of departure were different – it was logically all also reflected in, and had a very stimulating effect on, the final discussion.

CASLIN 2003 brought together some of the best international specialists in the protection of cultural heritage and administrators of collections that suffered the most in the August flooding. That is also reflected in the structure of the proceedings where their papers on crisis management and disaster recovery have been published. In their presentations, specialists from abroad expounded on the theory and the practice of crisis management, from the development of basic structures for organisation and cooperation to the honing of the system of prevention and natural disaster recovery measures.

Almost all the presentations of domestic participants described the tasks set to them by the 2002 flooding and were all very concrete in their focus. Much less space was devoted in them to the issue of improving institutional, organisational and technological tools of prevention to a much smaller extent, but a comprehensive overview of those aspects was presented by CASLIN's foreign guests.

The first group, which included librarians, archivists and museum workers, presented their experience from the autumn flooding. The main focus of their presentations was early salvage operations and the restoration of normal operation of their institutions, and they were a valuable source of information and examples of human tenacity and ingenuity.

In the second part of presentations, the methods for the repair of damage, both the proposed and the already implemented ones, were discussed in detail. The papers thus cover all the stages of the rescue process: preparatory work for the imminent disaster, evacuation, salvage work, recovery activities (from the freezing of wet documents and their subsequent drying by available technologies research in this area, conservation and restoration work to the revitalization of damaged collections by reformatting the damaged or destroyed objects by creating microfilm or electronic copies.

Although modern technologies at our disposal may facilitate the return of damaged documents to study rooms and they make virtual presentations of objects of cultural heritage possible, they cannot fully

compensate for the losses incurred in natural or man-made disasters. A review of losses, evaluation of costs and the extraordinary efforts in the rehabilitation of library and archival collections shows conclusively that prevention must be the starting point in any crisis management. The recent case of the Indiana Holocaust Museum from November 2003 that was completely destroyed by a deliberately set fire brought home the importance of paying the maximum attention to security measures and preventive strategies.

Although the CASLIN 2003 international seminar was considered as a successful and very informative event, it left some contentious issues unanswered, also because a number of revitalization procedures on damaged documents were still underway, and specialists have not made their final evaluation of the operations. It might be worth while to return to documents presented at CASLIN 2003 after some time to check how much of the projects proposed was successfully implemented, weather the hard won experience was put to some useful purposes, and to watch, full of nostalgia combined with enthusiasm, cultural memory-preserving institutions damaged by flooding being restored to their original purpose.

Františka Vrbenská

I

View from Abroad

Prevent To Better Respond

Marie-Thérèse Varlamoff

Abstract

The floods of August 2002 that affected Central Europe had such tragic consequences that it led many cultural institutions to draw lessons from the situation and envisage the implementation of more preventing measures in the event of further disasters.

Pointing out possible risks and measures to be taken in order to prevent them and better respond we shall explain how to draw a disaster plan. Then we shall study what happens when disaster strikes: how to assess damages and what is to be done in priority, what kind of response strategy is best, together with advice concerning rescue operations. Finally we shall try and draw some lessons from what has happened, pointing out the most frequent difficulties that rescuers usually encounter, even when a disaster plan exists.

A brief survey of the measures taken in case of a foreseen major flood in Paris will illustrate the paper. Lastly a presentation of the International Committee of the Blue Shield and its long-term objectives will hopefully advocate the importance of co-operative actions in the future.

Introduction

The flood disaster that the Czech Republic experienced last Summer counts among the most important catastrophes endured by the cultural community. Needless to say that the situation was unpredictable. Two waves of heavy rainfalls soaked the soil and afflicted the Vltava River and its tributaries. The geographical situation of Prague and the inconvenient system of dams built in the 50's added to an already preoccupying situation. On Monday August 12 there was no doubt that a major disaster was occurring. The situation was not the same in the various cultural institutions. The National Library whose collections were preserved in three different buildings, had to face a different situation, depending on the premises. For instance, in the Klementinum near the Vltava river in Staré Město, the most serious damage was caused to its technical equipment and not to the collections that had been removed from the basements. Fortunately the National Library had approved a disaster plan the year before. But, unfortunately not all measures had been taken. Still it worked well enough and the commitment of the staff was examplary. In Neratovice depository most of the books remained on shelves, unsoiled, thousands of books were transported to a cooling plant 30 kms from Prague in Kladno in order to be frozen.

Among archives, the institutions that seemed worst affected were the Architecture Archives of the National Technical Museum, and the Military Historical Archives.

Apparently the situation which was really dramatic seemed well under control. All pictures taken during the flooding and right after it show that in many institutions they were prepared and had taken measures. But the disaster was so important that people felt powerless. Added to that, power failure and restricted access to damaged areas made communication difficult. Ten months later it's time to draw lessons from such a catastrophe. Many of my Czech colleagues will describe their experiment and the state of the art concerning damages and rescue operations. My purpose today is to insist on prevention in order to better respond and more efficiently rescue in the future. To my mind there are two major issues that should be considered: disaster planning and co-operation.

When a disaster strikes a number of decisions are to be taken rapidly and a response strategy implemented. According to the efficiency of the response team, rescue operations can be facilitated or worsened.

We have learned a lot from last year flood. For instance it has helped the French to draw a disaster plan for all buildings concerned by a foreseen major flood in Paris. But the best lesson that we have learnt is that co-operation is essential, that's why I'd like to tell you more about the final objectives of the ICBS to protect cultural heritage in the event of natural disaster but also of armed conflicts.

I Prevent

1. The first step to take in order to prevent disasters is to assess the risks. You all know the different risks that may represent a threat: fire, water, chemical attacks, power failures, time damages are frequent and due either to the intention to destroy (such as war, terrorism, vandalism), to carelessness

(building deficiencies, maintenance deficiencies, poor storage conditions, poor environmental control) or more simply to nature. We call them, in that case natural disasters among which we can list earthquakes (Algeria, Turkey), landslides, floods, hurricanes, storm, lightning volcanic eruptions, tsunamis etc...

It is not enough to know that such or such a risk constitutes a threat. It is important to evaluate the risk. This you can do by having documented previous catastrophes, and calculated how often they have occurred. It is also essential to establish a priority within the risks and the catastrophes they generate. A hole in the roof, even if it leaks each time it is raining will represent a different threat that the flooding of a building located near a river whose level dangerously increases after heavy raining: the hole in the roof can easily be repaired, but the building cannot be moved or the river level lowered.

2. This leads us to envisage the kind of measures that should be taken according to the risks considered. There are three different types of measures:

- measures concerning the geographical or topological location of the building
- measures concerning the building itself
- measures concerning the equipment

Most of you work in a building that was built a long time ago and you are not responsible for the choice of the location. Any preventive measure that you can take derives from a previous situation to which you have to adapt yourself. But for the lucky ones who have a building project and can have some influence on the choice of the location of the building the situation is much better. They should naturally avoid any location that present a risk of flooding or landslide. They should avoid as much as possible to locate the building in a seismic or hurricane area and should rather settle it in a temperate climate than in a subtropical or polar zone. But let us not dream, we never have such a choice. We can try and select what seems best, which is not always "the" best, in order to avoid the worst. For instance, when the City of Paris offered "for free" the land where to build the BnF, it was not the ideal location for a library, near the river, with a permanent risk of being flooded. That is why all measures were taken to make the building entirely waterproof, even in the event of a major flood.

Measures number 2 concern the building itself. There are two types of measures whether you work in an old building or whether you intend to build a new building. In the first case you have to check the building entirely from top to toe: the roof, the doors, the windows, but also the immediate surroundings (are there trees, insects, pools, roads nearby that could influence the environment, for instance, or that could accelerate the development of a fire?) and repair all that goes wrong like gutters and drain pipes, heating devices, electric appliances and plumbing. But this is not sufficient. You must also check the equipment of the building. Are the shelves in the stacks adapted, what are they made of? Are there pipes running over the stacks? You must be particularly careful in case of sprinklers. Are they checked regularly?

Of course in the case of a new building it is easier. You just have to be careful to avoid future disasters in applying a number of precautionary measures.

3. The most important preventive measure remains the disaster plan. I have been asked lots of time: "do you have a 'model', how do we draw a disaster plan, what is essential?" All disaster plans are different, because each one must take into consideration the specificity of the institution, of the building, of the country. There are lots of disaster plan models available, many of them accessible on the web. Most of them have been done by English speaking colleagues, either British, American or Australian.

So when you start thinking of doing your own disaster plan the best way is to study attentively three or four of them before setting to work. Then you must calculate what your resources are: staff, financial, equipment, etc. ... and finally it is capital that you establish priorities in your collections because you must be aware and fully conscious that in the event of a sudden and major disaster you won't be able to save the whole collection. Knowing this, I'll try to give you some important points to include in your disaster plan.

A disaster plan is a written document (this point is very important) which points out the measures to take in case of disaster and the emergency procedures to adhere to when the disaster strikes. It includes the list of emergency procedures and recommendations, as well as updated lists of resource people to contact when the crisis arises, of suppliers and service providers. The disaster plan must also point out the collections for priority rescue and contain the building floor-plans mentioning the location of these collections and technical strategic sensitive points (electrical, cut-off and water supply points, fire extinguishers...).

The disaster plan is intended for the entire staff of the institution; but it will not be efficient unless it is accepted by directors. Different members of the staff will be provided with specific responsibilities; this shall be done according to their abilities, not to their status. That is why a storage area employee who has been working at the library for twenty years is more qualified than a recently appointed deputy director to select water-damaged items to be evacuated from the shelves. It would be useless as well for this director himself to proceed to the rescue of the documents. His job is to coordinate operations with the emergency services (firemen for example) and to keep in touch with the local (mayor), district (prefect) or national (minister) services.

If the managerial team is not involved from the very beginning in the working-out and implementation of the disaster plan, we run the risk of losing the necessary funding:

- to buy emergency equipment supplies,
- to change certain elements of the structure and provide the buildings with appropriate equipment,

and we will not have the possibility to achieve:

- staff training (response, handling of damaged collections...);
- compilation of the list of documents for priority rescue;
- contacts with local authorities and emergency services;
- essential daily updating of the disaster plan.

The disaster plan will include the list of:

- phone numbers of emergency units;
- people in the library who might be able to help in case of disaster and the extent of their intervention. The list will also mention what kind of responsibility they will be given, namely the composition of the various teams and how people can be contacted rapidly (name / address, home, office / phone-numbers: home, office, mobile);
- external staff capable of providing help;
  - staff working in other neighbouring cultural institutions,
  - consultants,
  - volunteers,
- suppliers (cardboards, blotting papers, gloves, towels...);
- service providers (transporters, freezer-companies, decontamination centers...).

The plan also includes budgetary and administrative measures to take and to adhere to in case of emergency as well as copies of insurance contracts. Finally, it gives a range of details about rescue procedures and staff instructions:

- location of collections,
- rescue priorities,
- handling of damaged collections according to the various types of disasters and documents.

Moreover, the disaster plan includes plans of the premises, the technical areas (water, electric power, extinguishers, emergency exits).

While the disaster plan is being drafted, it is essential to provide oneself with the material means which will allow the institution to cope efficiently and as soon as possible with a disaster, even (and most of all) a minor disaster. Placing rescue kits or carts with essential response equipment in strategic sensitive points of the building, will help to avoid loosing precious time later on.

In case of major disaster, fire, explosion, or bombing for example, the collections and their inventories or catalogues might be partly or totally destroyed. According to the budget available and the value of the items, it is wiser to make copies of the most important documents, and to store them off-site. This is particularly recommended for catalogues; actually, making copies facilitates a precise and detailed idea of what has been lost, and consequently makes it possible to reorganize the collection some day, either by acquiring documents still available on the market or by duplicating them (microforms or digital copies) thanks to collections stored in other libraries.

There is no perfect disaster plan, and it is only by drawing up a list of a disaster consequences that its efficiency may be appreciated and its shortcomings revealed. However, using common sense prevents making mistakes. We've seen that the disaster plan is a written document, but there is a long way from theory to practice. So we'll need to:

- train the staff. Time dedicated to theoretical training and the way to face potential risks will be complemented by disaster workshops and technical sessions. Topics may include for example the handling of damaged documents. This is an important operation which needs time and money; nonetheless, that is the only way to be sure that the emergency units are efficient when the disaster strikes.

When the plan has been written, the work is far from being done yet. It is necessary:

- to make it known, namely to deliver it to the whole staff by:
  - placing it in strategic sensitive areas;
  - distributing technical rescue cards to the services involved (conservation, storing areas...);
- to update it regularly, paying particular attention to lists, addresses and phone numbers. This job requires attention to detail and may take a long time in large institutions. There will be one leader designated for this job;
- to test it if possible and re-conduct the tests regularly;
- to set up organized teams: volunteers, whether they be part of the staff or not, will have to follow orders given by team leaders who will follow orders given by the person in charge of rescue operations;
- to make a list of both human resources, equipment and services off-site and update it. The leader in charge of these lists might also be appointed to this task.

The disaster plan is partly confidential (cf. personal addresses, phone numbers, location of valuable documents) which means that it must not be distributed to the whole staff.

There must be constant surveillance. A disaster plan will not keep a disaster from striking, whether

it be a natural or a man-made disaster. So we must get and keep in touch with the prevention services namely those in charge of natural disasters (meteorology, seismic movements, floods...). Concerning minor or human inflicted damages, we must pay particular attention, after hours, when the building is closed, or when renovations are underway; actually, week-ends and holidays are the most favorable time for disasters to spread.

4. Once you have written your disaster plan, do not think that you are safe. A disaster can still strike and you must be prepared to face it. In order to put all the chances on your side, you must have organised your network and planned the co-operation with other cultural institutions, but not only. It is of the highest importance that you contact the rescue teams that will be the first to intervene in case of a disaster. I am talking of firemen, police, the army if the catastrophe is huge. It might also be useful to count on some volunteers among the civil society. It is not in the confusion and stress of an incoming disaster that you will be able to find and meet such people. You have to contact them when you have time to explain who you are, what you preserve, what you can expect from them, how they can help you, how to handle wet books for instance.

You must be aware that in case of a major disaster you probably won't be allowed to enter the premises and that the firemen will be the only ones to deal with, first, the disaster, second, your collections. So you'd better explain them exactly what are the dangers threatening paper materials for instance when they get soaked. They might be using something else than water to extinguish a fire if it is possible. Also a first contact with the firemen could be precious when starting building the library. Where to place the extinguishers, the alarms, what kind of alarms or extinguishers should be best, etc...

Contacts with the police department are also very important. In case of a disaster there is a need to secure the surroundings and to protect the collections from looting. Co-operating with the army is important when you live in a region where there are risks of armed conflicts. Soldiers should be aware that cultural property is to be respected and protected in all situations. That was not the case in Iraq recently and we all deplore it.

Every workshop dedicated to library specific problems, from discussing equipment and response measures to the handling of documents, is a positive experience for non library professionals. Eventually, it is advised to get in touch with people heading neighbouring cultural institutions: museums, archives... in order to make a list of available resources, to organize joint trainings and to help one another in case of major disaster.

II When Disaster Strikes

In spite of all those excellent preventive measures that you have taken, in spite of the excellent disaster plan you have elaborated, a disaster occurs. Most of the time the extent of the damage will be larger if it is difficult to communicate and give the appropriate information. Lack of information, disinformation or misinformation whatever you call it is always an hindrance to rescue operations. And also it may handicap future solidarity movements. A good communication is essential. First to give alert. Messages to be sent through telephones or loudspeakers should have been recorded in advance in order to send clear messages concerning the type of disaster and give the appropriate information to evacuate the building. When the disaster is important the whole community feels concerned and wants to know what has really happened, the extent of the catastrophe, what measures have already been taken, what are the damages, etc... Most of the time people want to help and spontaneously organizing volunteer or ask what they can do. A crisis cell is a good means to pass the information to journalists and to the public in general. It is sometimes recommended to have a special phone number regularly updated with recorder messages to inform both the staff and the public of the situation. How long will the library be closed, when will the staff be allowed to re-enter the premises, etc... It is also a good way to handle the situation to send thank you messages through e-mail list-serve, which is less time consuming than answering each particular e-mail.

It is important that there should be one person to give orders. The same person must distribute its role to each person of the rescue team. There should be as less improvisation as possible, although flexibility must be the rule according to the evolution of the situation, which makes things difficult to handle. It is not necessary that the director be that person. Respecting the hierarchy is not the priority; what matters is competence, knowledge and experience. When constituting a response team these three points must be considered. A staff who has been working for 25 years in the stacks and knows perfectly the collection will be much more efficient in sorting the damaged books than the director of the collection department who has been nominated two months earlier.

Everybody knows that, particularly in case of flood, it is necessary to respond immediately because two or three days might be enough to ruin water-damaged documents. This is why we must carry out the emergency response as soon as possible. However, and I would like to focus on this point, saving time is important, but it is better to spend a few minutes to decide on the best emergency strategy than hurrying around erratically, which would only lead to chaos and handling mistakes. So it is better to think before doing, to calmly define a strategy for action and then

to follow the different steps, remaining open-minded to changes in case new parameters arise.

One important thing to remember is to assess damages as fast as possible. Taking pictures of the damaged area and collections will bring precious information when discussing with the Insurance Company or even to the conservators who will be in charge of restoration later on.

III Response

When an important disaster strikes, the evacuation of people is often made immediately and the staff is sometimes not allowed to re-enter the site before hours, if not days when the building has been secured. The situation is of course entirely different when it is a small disaster. Response operations vary according to the importance of the disaster but also according to the resources of the institution damaged: resources in staff but also in equipment or financial resources. Small institutions will find difficult to cope with a fire or a flood of some importance and will need the help of external colleagues, conservators or even volunteers. But in all cases we must be attentive to the security and comfort of the staff taking part in the rescue. To achieve this, we must:

- be sure that, in case of major natural disaster, people appointed to take part in the rescue have been reassured about the situation of their family and property;
- increase the number of teams and make them work in short rotations; actually, working in a hurry, in difficult environmental and climatic conditions is often much more tiring;
- plan to provide (if necessary) rescuers with good equipment (boots, raincoats, pullovers, blankets, glasses, gloves...);
- plan to provide refreshments.

In the days following the disaster, it will probably be necessary to plan psychological support sessions for employees who witnessed their life's work fade away.

If there are principles or good practices for adequate handling of damaged materials, particularly wet documents, there are situations when they must be privileged. During training sessions the staff has learnt how to sort damaged documents: dry, wet, soaked, how to handle them, and place them in different boxes according to their degree of wetness, they have been trained to draw lists of documents removed and to label boxes and envelopes in order to find them again when needed. Nevertheless when a great quantity of documents is damaged, it becomes necessary to take drastic decisions. We have all seen images of books that were passed from hands to hands, whether it be in Florence in 1966 or in Leningrad after the fire of the Academy of Sciences Library. In both cases it was urgent to remove the greatest number of documents before another disaster occurred and even if books were not handled adequately and suffered some mishandling, at least they were saved. As the proverb says "it's sometimes better to let well alone".

The disaster must be documented which will help better prevent and respond to future disasters. Having taken pictures will help but written reports on the circumstances of the disaster and details about damaged materials, response and rescue operations are necessary.

It's obvious that not all documents need to be treated the same way. For those books or newspapers that are too much damaged to be restored, it is useless to freeze them. Just the same, for books still on sale or paperbacks freezing is not the unique solution and it might even prove to be more costly than buying such documents anew.

It is wise to accept that no disaster plan is perfect, that they should always be improved, taking into account what went wrong when applied, or why they were not applied correctly.

It is wiser still to admit that major disasters cannot be avoided but the consequences can be mitigated if adapted preventive measures are taken.

The message I have tried to pass during this presentation is that "Prevention is the key".

IV Major Flood Foreseen In Paris

Now let me give you an example of how the City of Paris has handled the threat of a major flood last winter. Fortunately the disaster has not come yet. But experts fear that it could still happen during the fall or early next year.

To set up the landscape, the Seine River divides Paris horizontally on the banks, on both sides stand.

Major cultural institutions such as the Louvre, Orsay Museum, the BnF, as well as a number of less known institutions which nevertheless preserve treasures are located along the Seine River.

In 1910, a major flood inundated the banks of the Seine River and all the streets alongside the banks. Besides, in the centre of Paris most cellars were flooded. Floods of that importance usually happen every 100 years. This is why since last August the City of Paris and the Region have set up a very detailed disaster plan, including not only the cultural institutions near the Seine but also the Metro and railway network, the electricity plants and distribution, as well as the telephone. Measures have also been taken for schools and hospitals. If the flood is equal to that of 1910 it is expected that the economic activity of Paris will be stopped or disturbed for at least 6 months with no public transportation available, power failures, telephone connections damaged, even through mobile phone, no T.V. etc...

Recovering and repairing will be slow because of the importance and multiplication of dams. We hope this nightmare will never come true because the floods in Prague and in other Central European cities last summer really scared the Parisians and made them conscious that prevention was indispensable to mitigate the damages. Several meetings were organised by the Police Prefect, with civil servants from the Town Hall and from the Floods Service, together with the different Ministries involved (Culture, Health, Equipment, Police, Transport, etc...) to decide on:

- when to alert people;
- where to install temporary schools and where to accommodate children;
- when to evacuate people from endangered buildings or areas;
- what preventive measures to take.

Each institution, company or transporter that had a role to play in the life of the city had to take specific measures.

The Ministry of Culture for instance decided to allocate 5.2 M. € to transfer more than 100,000 artifacts which were stored in the basements of the various museums along the Seine to a warehouse (10,000 m^2) rented especially for two years. The museums of the City of Paris had already started to move but some of them had room enough in their own building, so that they could move the artifacts to a higher floor, which was less costly. As for the artifacts that were left in place they could be moved rapidly with a 24 to 72 hour notice. Staff was trained to learn how to handle fragile material.

Of course the Louvre and Orsay are huge museums and their collections are so important that extra staff will be needed in case of emergency. 700 persons are volunteers and were taught where to go and how not to hurt themselves when camping heavy items.

A similar evacuation plan was drawn for the Research and Restoration Centre of French Museums. Items that were waiting to be restored were sent back to their museum. Others will be moved just if there is a flood. Scientific and technical equipment which cannot be moved will be covered by a waterproof packaging. As to the documentation, it is currently digitized in order to be easily accessible from a distance.

Last but not least, the Minister has asked that studies be launched to equip new premises near Paris so as to store, under adequate preservation and security conditions, national collections.

As for the BnF, it was built less than 10 years ago and the architect was asked to make the basement entirely waterproof. Although it is located very near the River, technicians have assured that it could not be threatened. Nonetheless a disaster plan was drawn last year and is in the process of being implemented. Rescue teams are being formed and a number of training sessions on how to handle wet books have been taught so that many staff know now how to react.

I would like to end with a brief presentation of the Blue Shield. Many of you have heard of it but do not know it really although there is a Czech Blue Shield. Let me explain why it was created and what it can currently achieve.

V Blue Shield

During the war in Iraq, the dramatic events which caused the destruction and looting of an important part of Iraqui heritage was a shock for the entire cultural community. Each year dramatic and unexpected events erase part of our memory by destroying the cultural heritage that has been accumulated in our libraries, archives or museums. The recent and dramatic events in Afghanistan, Kosovo, East Timor or Sierra Leone, to quote just a few, testify the dangers threatening cultural heritage in the event of armed conflicts. Natural disasters like floods, fires, hurricanes or landslides do not unfortunately lack behind. My concern today is to explain how institutions like libraries, archives and museums have decided to join to mitigate the consequences when a disaster strikes. This is why they created the "International Committee of the Blue Shield" (ICBS).

1. The International Committee of the Blue Shield (ICBS)

The Blue Shield is the emblem of the "Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict" which is used to mark cultural heritage sites so that they will receive the protection offered by the Convention. The "International Committee of the Blue Shield" is an international, independent, co-operative venture which gathers four professional NGOs. It was created in 1996 by the International Council on Archives (ICA), the International Council of Museums (ICOM), the International Council of Monuments and Sites (ICOMOS) and the International Federation of Library Associations and Institutions (IFLA). These represent an unrivalled body of experts that can provide authorities and professionals with expertise and networks in case of armed conflict or natural disasters that could affect cultural heritage throughout the world. The four organisations are also working together to organise risk preparedness at an international level and to encourage it at a local level.

2. The Hague Convention

The Convention for the Protection of Cultural Property in the Event of Armed Conflict adopted at The Hague (The Netherlands) in 1954, in the wake of massive destruction of the cultural heritage in the Second World War, is the first international agree-

ment accepted world-wide and focusing exclusively on the protection of cultural heritage. It covers immovables and movables, including monuments of architecture, art or history, archaeological sites, works of art, manuscripts, books and other objects of artistic, historical or archaeological interest, as well as scientific collections of all kinds.

The States which are party to the Convention are obliged to lessen the consequences for cultural heritage of an armed conflict and to:

- take preventive measures for such protection not only in time of hostilities (when it is usually too late), but also in time of peace;
- safeguard and respect cultural property during armed conflict (this obligation also applies in conflicts of a non-international character);
- mark certain important buildings and monuments with the emblem of the Blue Shield.

The Convention was adopted together with a Protocol which prohibits the export of cultural property from occupied territory and requires return of such property to the State from which it was removed. The Protocol also expressly forbids the appropriation of cultural property as war reparation.

As of 26 March 2003, 105 States are Parties to this Convention, 87 of which are also Parties to the Protocol.

3. Second Protocol to The Hague Convention

Following barbaric acts committed against cultural property in the course of the 1980s and the beginning of the 1990s, a review of the Convention was initiated in 1991 to draw up a new agreement to improve the Convention. A Second Protocol to The Hague Convention was adopted at a diplomatic conference at The Hague in March 1999. This Second Protocol provides greater protection than before and creates a new category of enhanced protection for cultural heritage that is particularly important for humankind, enjoys proper legal protection at national level and is not used for military purposes. It also specifies the sanctions to be imposed for serious violations of cultural property and defines the conditions in which individual criminal responsibility shall apply. Finally, it establishes a twelve-member Intergovernmental Committee to oversee the implementation of the Convention and the Second Protocol. This Protocol officially recognises ICBS as one of the organisations authorised to contribute, in a consultative role, to the work of the Committee.

4. ICBS goals and principles

The main objectives of ICBS are:

- to facilitate international response to threats or emergencies through co-operation between ICBS and national organisations;
- to propose its services in terms of expertise;
- to encourage safeguarding and respect for cultural property and particularly to promote standards for risk preparedness;
- to train experts at a national or regional level to prevent, control and recover from disasters.

The vision of the ICBS is that in time the Blue Shield will become for cultural heritage what the Red Cross is for humanitarian protection. ICBS has elaborated its Charter in Strasbourg, April 2000, and decided to respect the following principles:

- joint actions
- independence
- neutrality
- professionalism
- respect of cultural identity
- work on non profit basis

5. Stages of intervention

The action of ICBS is threefold and takes place before, during and after a conflict or a disaster. So far the preventive phase has been the best developed within ICBS action plan and implies:

- to assess the risks and raise awareness of threats among governments, professionals and the public;
- to improve risk preparedness;
- to train professional staffs to intervene during and after disasters and to organise workshops;
- to promote the elaboration of disaster plans, especially in national institutions.

ICBS intends to emphasise the fact that preventive measures are useful not only in the event of a disaster but also in the daily management of an institution and that they contribute to the good care of collections.

Hopefully ICBS will prove to be able in the future to respond to disastrous situations by:

- providing a pool of experts through its international, cross-sectoral network of professionals;
- raising core funds to provide means of immediate response;
- disseminating information and sharing resources.

6. Iraq

A few weeks before the war started in Iraq, ICBS President, Ross Shimmon, who is also IFLA Secretary General, sent letters of protest to George Bush, José María Aznar and Tony Blair requesting them to respect cultural heritage and to take all measures possible in order to protect it. An official call from heritage professionals for emergency protection to save Iraq's treasures was also published by ICBS and sent worldwide to professional organisations, associations and institutions as well as to press and information agencies and newspapers.

It seems that the message did not reach the persons concerned, except some of the media: the

Canadian newspaper "Le Devoir" and the UK "The Guardian" published articles on the subject and advocated ICBS position. But most demonstrations of protest remained unheard and consequently unanswered, although many of our colleagues, in the US or in UK, who were against G. Bush's strategy, were so shocked by the attitude of the coalition armed forces that they even resigned from their managerial position when unfortunately the National Museum in Baghdad was looted, the National Library was set to fire and the archives burnt. Nevertheless we had some better news when we heard that many items had been previously removed and transferred to a safer place.

An expert meeting was organised at UNESCO HQ in Paris on April 17th and the founder members of ICBS were all represented. The experts discussed the damage to Iraqi cultural heritage caused by the war.

The official communiqué issued at the end of the meeting quoted:

"The meeting deplores and is deeply shocked by the extensive damage to, and looting of, the cultural heritage or Iraq caused by the recent conflict. It calls on the coalition forces to observe the principles of the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict and its two Protocols."

The meeting agreed on the following recommendations to those responsible for civil order in Iraq:

- That all museums, libraries, archives, monuments and sites in Iraq be guarded and secured immediately by the forces in placed.
- That an immediate prohibition be place on the export of all antiques, antiquities, works or art, books and archives from Iraq.
- That an immediate ban be placed on the international trade in objects of Iraqi cultural heritage.
- That a call be made for the voluntary and immediate return of cultural objects stolen or illicitly exported from Iraq;
- That there be an immediate fact finding mission under UNESCO co-ordination to assess the extent of damage and loss to cultural property in Iraq.
- That there be the facilitation of international efforts in assisting cultural institutions in Iraq.

Following this meeting, ICA and IFLA had agreed to appoint one unique representative to this fact-finding mission. Jean-Marie Arnoult was well qualified to participate as library expert: he had already been in Baghdad on a UNESCO mission in 1999, has had direct recent experience of conditions there. He has extensive experience in missions in Africa and Middle East. His professional background was in preservation and conservation. Unfortunately the US Authority in Iraq refused that a French national took part in the mission. This is why the mission only dealt with the situation in museums.

Hopefully this attitude will evolve, due to a strong protest from the cultural community world-wide. But the task of ICBS remains immense and we do need the support of all and yours in particular.

7. Past or ongoing activities

Despite the lack of resources, human or financial, ICBS has achieved a number of actions concerning specific endangered areas such as Kosovo and Afghanistan. It has participated in various meetings convened by UNESCO concerning the new Hague Protocol and organised in November 1998 an international seminar in Slovenia to train professional staffs to intervene following disasters. Participants from 12 countries, drawn from museums, archives, libraries and historic buildings, spent a week discussing strategies and tactics for dealing with disasters. Case studies on war damage in Bosnia and Croatia, flood damage in Poland, earthquake damage in Italy, together with the experiences of Dutch and Swedish military personnel, including a former UN commander in Bosnia, provided the raw material for the seminar, which was targeted at personnel in eastern and southern Europe.

The seminar drafted a joint statement, to be known as the Radenci Declaration calling for:

- the protection, safeguard and respect of cultural property – in both normal and exceptional situation – to be included in national policies and programmes;
- strategies to assess and reduce risk and to improve response capacity in the event of threat to cultural property to be developed;
- institutions caring for the cultural heritage, to integrate risk preparedness and management within their activities.

8. Blue Shield network

The great strength of Blue Shield is that it is cross-sectoral, bringing together professions and institutions across the cultural spectrum. By pooling their expertise, and drawing in military authorities and emergency services, the Blue Shield is a potentially powerful model for managing disaster risks at a national level. Organisations such as the International Committee of the Red Cross (ICRC) and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) certainly stand as major partners in the implementation of ICBS activities. It is essential that the variety of persons concerned by risk preparedness and response to disasters may also be implied, not only when the disaster strikes but before.

9. National Committees of the Blue Shield

Since its creation it has been obvious that ICBS efficiency would be enhanced by the creation of national Blue Shield committees. It is vital that the

international initiative is taken up and supported by local initiatives. Blue Shield committees have been or are being formed in a number of countries. Belgium was the first to do so, later followed by The Netherlands, the United Kingdom, France, Italy, the Czech Republic, Macedonia, Poland, Benin and Norway. There are steps taken in Australia, Canada, Peru and Russia to create a national committee. Some other countries – Switzerland and the US – have similar organisations.

You all have an important role to play in the implementation and development of those national Blue Shield Committees.

To conclude I would like to insist upon the important role that you can play. As culture professionals you should encourage co-operation with other professions and bodies in order to improve emergency preparedness. At the local level, each of you can provide personal skills and help to raise public awareness of threats to cultural heritage and measures to combat them. The efficiency of Blue Shield relies more on professional expertise, good will and commitment than on financial abundance. Let us start first by creating the network and deciding of a strategy. A strong organisation at the beginning will guarantee the success of rescue operations which, because disasters occur unexpectedly, cannot be planned. Once we know where we are going, we shall try to get whatever resources we need and we will be in a position to implement fund raising campaigns to help disasters wherever they occur. The Blue Shield is a joint venture and we need you.

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The Next Time: Preparing for Crisis Management

Jane K. Hutchins

In the past year, cultural property managers have been deeply involved in emergency response and disaster recovery, particularly in the Czech Republic. One year later, it may be helpful to review other international experiences in crisis management and to compare your efforts and information. This paper will describe two international training programs developed to mitigate disasters affecting cultural property, beginning with two observations about conservation availability and cost.

First, there aren't enough conservators or time or money to treat all the objects and books that already need attention, and the institution that depends solely upon the conservation staff to preserve a collection will lose ground. If we're serious about preserving cultural patrimony, we need to think seriously about how to prevent additional damage. The most efficient way to do this is to find ways to share the skills and the responsibility of preservation with the entire staff, and with the civil authorities.

Few who have experienced a disaster can doubt the importance of training the people who have daily contact with collections-asking them to protect their collections from damage rather than asking specialists to repair damage. Within the institution there is preservation work to be done by everyone, from the Director to the cafeteria staff, from the curators to the janitor. Outside the institution, the course of a disaster can be profoundly influenced by an informed journalist, an involved trustee or knowledgeable civil authorities. Organizations that preserve their collections successfully are organizations that involve a broad segment of the community. It's not always easy: establishing and maintaining relationships takes time and effort, and is one of many, many tasks required to operate an organization.

The second observation to be made is that effectively preserving cultural patrimony necessitates identifying and addressing the most serious threats. Many in museums are researchers, more interested in specialists' inquiries than preparing for disaster. Contemplating the latter is difficult and unpleasant. However, it is possible to lose an entire collection overnight in a fire or in a flood, and years of study and analysis can be lost in minutes. It is only practical to try to make that loss less likely, or at least less severe, which is why museum professionals have begun to attempt to assess and stabilize whole collections-improving handling, storage, and documentation. It has also led to increasing attention to emergency planning and response.

Our profession does not use the words mitigation, preparedness, response, and recovery consistently, so the terms should be defined briefly here, with notes on their temporal relationship to one and other.

The first of the three stages of an emergency is preparedness and mitigation. Preparedness is understood to include those activities that prepare a framework for organized and immediate response to disaster situations that cannot be mitigated. The purposes of preparedness are to save lives, to minimize disaster damage and effects, and to facilitate recovery. Thorough training and exercises enhance preparedness capabilities and provide a review process for identifying changes and necessary updates in plans.

Disaster mitigation consists of the preparedness planning and activities that are directed toward eliminating or reducing the probability of occurrence of a disaster-producing event, or reducing the effects of those events that are unavoidable. Preparedness and mitigation should take place before a disaster.

Should a disaster occur, the next step is response. Disaster response includes the process of planning for the initial forty-eight to seventy-two hours after an emergency or disaster has taken place, and the actual implementation of the response plan. The time frame is flexible, with some response activities continuing into the third stage, and some third stage activities beginning during the response period.

The third stage of an emergency is recovery, or the actions taken to restore normal operations. The length of the recovery will vary with the effectiveness of the first two stages, and according to the severity of the disaster. Recovery may take days or it may take years.

The CASLIN organizations are well into the recovery from the disaster, and it is a substantial undertaking. The planning, mitigation, and response that occurred have shaped nature and size of the recovery, and for that reason, this is an ideal time to review its lessons in order to develop disaster planning and response that will make future recovery easier.

Following are descriptions of two international training efforts in planning and response that, coupled with the Czech experience of the August 2002 flood, may generate tactics for managing, or maybe even preventing, the next crisis.

One example of crisis mitigation is the Getty-sponsored program in Santiago, Chile entitled "Future Instructors of Emergency Planning". This was an international workshop that took place in the spring of 2000. Most countries in South America were represented by two people whom their country considered "decision makers" in cultural affairs. The workshop participants included academics, librarians, conservators, artists, administrators, directors, and a fire safety engineer. The instructors, who were from Chile and North America, included administrators, engineers, professors, government officials, conservators, and a security director. The course, which lasted 4.5 days, concerned both teaching methodology and emergency planning.

The purpose of this international workshop was to identify a group of senior professionals from a range of specialties, because there is a wide range of skills required for effective planning. The course enabled these professionals to meet, to discuss teaching and emergency planning, and to work together. As the course ended, they turned their attention to the question of how they would advance emergency preparedness in their institution or agency, in their region, and in their country.

The format of the course included some lecture, but as much discussion and practical exercise as we could organize. The practical exercises included a scenario where everyone was assigned a role in an imaginary disaster at an imaginary museum. People were given staff assignments different from their normal job. Some of the circumstances of this imaginary disaster were described and participants asked to react as they might if they had the job they'd been assigned. For some, it was the first time they'd ever tried to imagine what their colleagues' jobs might include, and it made a morning of anxiety and energy as well as understanding.

There was training in the use of fire extinguishers, and a session about finding the resources on the internet. The most dramatic exercise was a training session put on by the fire brigade of a local corporation. In a small house, the class went through a mock earthquake, complete with smoke, noise, breaking glass, and an evacuation by the brigade. This drill was a first for all of the participants, and all became more confident of their abilities to respond in the next drill, or in a real disaster.

At a local museum, participants were divided into teams of four to assess the museum's emergency preparedness. Each team member was randomly assigned to act as an architect, a security officer, a director, or a conservator, and, speaking from this professional perspective, contributed to the identification of the museum's three emergency planning priorities. They did this and reported the team's findings to the group, comparing the lists of priorities and discussing the differences and similarities. The teams were then reconfigured, and all the "architects" became one team, the "security officers" another, the "directors" another, and the "conservators", the last. This time, they came back with three priorities based on their professional role. In this part of the exercise, they concentrated on collaborating with their professional peers, discussing fundamentally similar concerns. The whole exercise was designed to accomplish three goals.

First, workshop participants were directed to look at the institution from the perspective of a staff member whose job they might not have considered. The chance to see a situation from someone else's perspective broadened their own. Most often, the conservators and administrators commented that they had a new respect for the security officers.

Next, workshop participants formed teams and, in the unfamiliar professional roles, negotiated priorities with colleagues who had different perspectives. Moving out of their real professional role and imagining another made it easier for some participants to hear the concerns of their co-workers.

Finally, discussing lists of priorities set by the architects alone or the directors alone provided an instructive contrast with the priorities set by teams.

The best measure of the effects of that course on emergency planning workshop is what the participants did in the six months afterwards. Some of the activities might have been predicted, and some were surprising.

The participants scheduled a session to discuss opportunities collaborate with the National Emergency Response Committee of the government of Chile.

They drafted a letter to the Directors of all of the organizations represented at the training session, proposing lateral and vertical contacts to promote planning.

The priorities that we'd discussed in the exercise at the museum were taken by the participant from that museum. Using them, he drafted a model emergency preparedness and mitigation plan for his museum, and he made it available for review and adaptation by everyone in the workshop.

Another participant wrote up his experience of establishing and training a Security staff and distributed it to his colleagues in the course.

The exercise at the museum was the first time many of the participants had had the opportunity to consider the preservation needs of an entire institution. Following the workshop, they explored the idea of assessing a whole institution as a means of setting preservation priorities.

They established an email list to share news.

They became personally involved with the importance of emergency response as a way of preserving cultural patrimony. This aspect was a coincidence, and the instructors didn't (and would not have been able to) plan it. It is one example of the unexpected directions that a course may take.

The exercise at the museum occurred early one morning, before the museum opened. As the session ended, a large school group entered and lined up in the courtyard we had been assessing. The members of the course had spent the previous hour and a half discussing ways to make the building safer for people and for collections, but seeing the courtyard full of children suddenly made our theoretical discussions real. There was no discussion of this at the time, and it was only when the course resumed back at the classroom that it became clear that the encounter with the school children had transformed the exercise.

This initiative to train "Future Instructors of Emergency Planning", then, introduced international specialists to each other, and to ideas and techniques they might use for emergency planning and mitigation.

A course on Emergency Response for Cultural Institutions has taken place in the United States, in response to the United Nations' declaration of the 1990's as the International Decade of Natural Hazard Reduction. As part of the United States' effort, all the organizations dedicated to preserving cultural property began a national initiative to reduce the hazards to cultural patrimony. There were about thirty groups involved in the project, and they included federal agencies, national professional organizations, and private institutions. They had two goals, which were, first, to safeguard America's cultural heritage from the damaging effects of natural disasters and other emergencies; and second, to use the members' expertise to help the general public recover from disasters.

Members of this consortium identified five areas of concern and created a Working Group to coordinate projects in each area. The Working Groups were: Health and Safety, Liaison with Civil Authorities, Public Information, and Training for Cultural Organizations. The Working Group for Public Information was responsible for creating the Emergency Response and Salvage wheel, which you have seen at the CASLIN meeting.

The Working Group on Training for Cultural Institutions has been chaired by the American Institute for Conservation, the national conservators' organization. The members of the committee began the project by addressing the question, "What kind of 'Training for Cultural Institutions' would meet the goal of safeguarding 'America's cultural heritage from the damaging effects of natural disasters and other emergencies'?" Members of the task force represented a wealth of expertise, offering access to wonderful information and experience. The discussions included architects, archaeologists, archivists, engineers, conservators, the military, and various agencies of the municipal, state, and federal government. These professionals were familiar with existing training and literature and enabled the Working Group both to avoid duplicating other efforts and also to identify training needs.

There was already some information and training in emergency planning. Librarians had generated much of the information in English, publishing such works as, "Steal this Handbook". Betty Walsh of Canada published "Salvage at a Glance", which initially concerned only archival information but was amended to include other media. This is available on line, at http://www.neirls.org/flood_recovery/salvage_chart.html

The Working Group members agreed that prevention and mitigation were the most successful ways to reduce losses from disaster, but knew that disasters were happening and that there was very little information on emergency response for cultural patrimony. They knew that it is normal not to be able to enter a disaster site for hours or days or even weeks, and decided to try to summarize the planning that might, if necessary, be undertaken outside the building without firsthand knowledge of the actual condition of the building or the material within. The Working Group saw response as the organizing and planning needed to muster and allocate resources, and to lay the foundation for resuming the functions of the organization. The success of the response would determine the success of the next stage, salvage and recovery.

Conservators had been asked to develop the training, but it was clear that conservation was one component of an institutional response. Preservation of the organization and its holdings was the objective, but doing so entailed planning for administration, team building, documentation, and financial issues as well as conservation. The Working Group sought to prepare a curriculum that could be used nationally, in any organization that preserves cultural property (except for zoos and botanical gardens).

Once the members of the Task Force had answered the question of what training was needed, it was necessary to identify the audience. Was it most effective to train directors? Volunteers? Registrars? Where would training be most useful? The consensus was that the most effective thing to do was to develop a curriculum for trainers, hoping for a multiplier effect as they were trained and then went out and taught others.

Questions of content, format, and course length were the subject of more discussion. Somewhat surprisingly, the most contentious question turned out to be course length. The committee finally set it at 2.5 days simply because they weren't sure their colleagues

would attend longer meetings. In practice, the length varies with the instructors. Often the course is longer, and parts of it are used in one day sessions. The committee began the project hoping to generate pertinent information but aware that if the curriculum didn't succeed, people would have a body of information to build on or modify.

Answering these questions took about a year and a half. The authors of the curriculum included conservators, archivists, registrars, archaeologists, directors, state historic preservation officers, curators, librarians, military Civil Affairs officers, insurance agents, management consultants, historic preservation architects, and professional emergency responders. The material they generated or included covered all the topics that the various specialists thought should be addressed in the course of a response. The amount of material in the course is enormous, and it's a small fraction of what the contributors thought was essential. Some sections are still incomplete, but the Working Group anticipated that the content would evolve and that the emphasis would change as we became more experienced.

In the course, the preservation components include documentation, immediate response, security, establishing salvage priorities, stabilizing the environment, and post-disaster clean up. The administrative issues include risk management, budgets, insurance, documentation, and team building. There are sections on international law, health and safety, and terminology.

The training program was drafted, reviewed, and revised. It was presented first to the Army, revised again, and submitted to the National Committee that had originally proposed the development of "Training for Cultural Institutions". In order to give the curriculum a life of its own, and to see if others were prepared to use it and to make it a nationally accepted curriculum in practice, the National Committee and the Working Group agreed to help disseminate the program. They set up a project with the following goals.

1. To train a group of senior professionals to teach emergency response techniques.
2. To increase the number of instructors familiar with the training program.
3. To enable those instructors to train responders and form a network of disaster response specialists.
4. To forge links among the professionals of the National Committee and the civil and military authorities.
5. To create clusters of professionals confident in a disaster and aware of current practice.
6. To increase the number of trained responders.

They sought and received funding to do six courses. The first course, 4.5 days long, saw two instructors teaching ten trainers, with the instructors discussing and demonstrating both the curriculum and the teaching of it. Six months later, the ten trainers divided into pairs and began preparing to offer the workshop. One of the two instructors attended that workshop, to assist the trainers. Each workshop was available to 15 people, and each was offered in a different location and a different type of organization. The locations were in areas with different types of hazards: earthquakes in the Northwest, tornados in the South, floods in the Midwest, hurricanes in the Northeast, and man-made disasters in the Southeast. The institutions that hosted the workshops included an art museum, a library reference center, a presidential library, a regional conservation laboratory, and a military base. The workshops lasted three and a half days. At the end of the project, there were eighty--seven people across the country who had met and reviewed emergency response practices together.

The purpose of the course was to give people the experience and confidence to offer the training on their own, and many are. To suggest the range of activity that has resulted from the course, here are a few examples of what the participants have done to improve emergency response.

The trainers maintain contact, individually and as a group. We've shared news about world events and about new products. We've helped each other find resources. We've shared advice and experience. Often we've just listened to colleagues try out ideas. Those colleagues have become friends.

All ten of the trainers have offered the course at least once for other organizations in the US and abroad. Prior to the 2003 CASLIN meeting, an email query was sent to find out who had taught courses and how many people had attended. The first three trainers who responded indicated that they've taught about 260 people directly, and that some of their students have gone on to teach the course themselves.

Two of the trainers have worked with state authorities to include cultural property in official state disaster response plans.

Several trainers have worked with people in the insurance industry. Organizations with trained staff can diminish losses and reduce risks. For those who are insured, this can result in lower costs for the insurer and also lower insurance prices for the organization. Demonstrating that this training will save not only collections but also money should increase interest in training.

The instructors and trainers regularly review training material prepared by other organizations in the United States and Canada.

Three of the people who attended the workshops came from abroad. They have taken the information back to their countries. One of them is planning emergency response with both the military authorities of her country and with the Blue Shield Program.

One of the responders has started efforts to establish a "sister city" response program. His idea is that cities of similar size who face similar disaster threats might pair up and exchange expertise and, if need be, responders.

Some of the participants have joined the activities of the civil authorities, taking training, offering advice, or writing articles. We've written articles for the Federal Emergency newsletter, and we've taped short programs for the emergency radio network that comes onto the air after a disaster.

Others continue to work with national and international government authorities, trying to ensure that cultural patrimony is identified and respected everywhere.

This is just a sample, but it does give an indication of the variety of networks that are being created.

In these courses, the instructors surely learned as much as the students. The content and the feel of each course always vary, but some things almost always occur. As you consider crisis management, perhaps it would help to hear some characteristics that seem to be shared by each group.

It's first necessary to state explicitly an assumption that underlies all of the foregoing comment. This is that life safety is of paramount concern. While this discussion concerns cultural property, the preservation is of collections is secondary to the protection of staff and visitors. All civil authorities act upon this principle, but it bears mentioning to members of the cultural community, professionals who care deeply about inanimate objects. Within the profession are colleagues who argue strenuously that it is their job to protect the collection, not the people. In discussions of collections care, it is necessary to recall the social context, and to remember why we have collections in the first place.

Another point that bears repeating is that planning and response are not equivalent. Good planning is a fundamental responsibility of organizations holding collections, and it is more effective than good response.

What generalizations might be made about groups of people looking at crisis management from the perspective of planning or of response?

The essence of the effort is the extent to which people can be persuaded that success lies in team work. All come with different experience, different concerns, different objectives, and different reflexes, and learning to coordinate strengths and move towards a goal together is particularly difficult under the stress of a disaster. People are said to exhibit the three classic responses to stress, which are to freeze, flee, or fight; and a response effort needs to be able to build on or direct all three.

Response efforts need to build upon changing information, the example of freeze, flee, and fight being a good example. Recent research has observed that this freeze, flee, or fight paradigm is based on studies of men only. Researchers suggest that women react differently, tending to try to establish contacts with others when they're under stress. A profession in which so many women work must incorporate this observation in its planning and training.

Technical information is obviously helpful, but a successful response depends upon the accurate identification of the skills held by respondents, and upon their organization. Whether listening to people in a course or assessing the help available in a disaster, identifying the strengths of the group and channeling it towards the task is fundamental.

The importance of variety in a group comes out repeatedly. Skills such as different means of expression or different abilities to manage details can promote original and flexible responses. Such variety should be deployed thoughtfully in drawing lines of authority during the response and recovery. There may be personal habits that cause difficulty-some people will insist on overseeing too much work; others will decline responsibility. Administrative elements will also come into play. One of the areas that causes the most difficulty can be the discussion of who has the authority to do what in an emergency. The lines of authority are different in an emergency, and they need to be worked out in advance. It's not easy to discuss functions instead of the individuals fulfilling functions, and planning lines of command and communication need to be done thoughtfully. Typical questions are whether the archivist and the conservator have equal status in the response; or whether the security guard, who often knows the building better than anyone, can select and direct members of the staff to help. It might not be desirable to have the Director be the chief of emergency planning and response, for instance. When there is an emergency, a Director may be more effective talking to the press or to donors or to Ministers, not organizing the work flow. Good planning requires exploration of what might happen when people under stress are working with altered authority.

Once the plan is written, practical exercises will determine if the analyses were correct. The plan should always evolve with the institution, but it begins its life not after it's drafted, but after it's drafted, practiced, and revised.

The other significant aspect of teamwork is inclusiveness. More than one museum has sent a technician to a disaster planning course and thought that that technician could come home and address emergency planning for the institution. This never works, because it's essential for everyone on the staff to be involved in disaster preparedness. This doesn't happen quickly, and sometimes it doesn't happen easily. One of the interesting aspects of a training course is that the people in the course typically become a network themselves. It may well be *that*

network that supports each person as he or she returns home and begins to attempt institution-wide change.

When participants do return home, the ones who are able to work most effectively are the ones who have the support of the administration. Successful planning and training require administrative determination as well as staff participation. Staff members will require time to do the work, and only the administration can make it an institutional priority.

Practical exercises are important components of training. People often discover unexpected strengths or unpredictable discomfort. In an exercise, people learn to accommodate different experience, different views, different personalities, different skills and, just as important, different styles of addressing problems. It's striking how often personal style can determine the outcome of a situation. In a disaster, stressed and worried people quite naturally look to someone who sounds knowledgeable, and whose confidence can carry the day.

One often sees the converse in these courses: someone very quiet who suddenly comes to the fore and solves the problems while others are indecisive. Practical exercises increase confidence, offering people opportunities to acquire or discover skills, or to make mistakes in a situation where it doesn't matter. One of the drawbacks of the training curriculum is that some people prefer to read the book instead of attending the course.

One of the ways that we resist thinking about unthinkable disasters is by imagining that our circumstances are unique. People do come to courses thinking that their problems are too unusual to be solved, or that solutions they hear won't work in their special case. The fact is, many, many challenges are shared, and a group of people working to solve them is much more effective than one desperate person, alone. The idea of a unique situation making planning uniquely difficult or even impossible hasn't held up under scrutiny. Progress through the course is often marked by students who say at the beginning, "we can't because we don't have information," and conclude by saying, "we can find the information". As they let go of the idea that information doesn't exist, they look farther afield for help. Once they begin doing that, they become less likely to claim ignorance of risks or of resources as a reason not to act. They move from waiting passively for direction or assistance to active involvement with the realization that there are effective, comparatively inexpensive ways to diminish risk and damage.

Participants sometimes come to a disaster course wanting to learn salvage techniques. They tend to want to rinse things in water and sort them. They may want the address of someone who will bring technology to solve a problem, or of a supplier of products that remove soot. Those who have experienced a disaster understand that this is only a small part of the effort, but participants sometimes have fairly specific expectations. When the expectations are not met, and when parts of the class look chaotic, some may become uncomfortable. The first time a group does a drill, for instance, it always is chaotic, and for library and museum staff who spend their careers fighting chaos, it's disconcerting. The next drill is always better, but this requires a leap of faith on the part of the students. It is the job of the instructors to challenge and stretch participants, and guide them through an experience that can be overwhelming. In some people, anxiety may show as anger or resentment, and this is an uncomfortable surprise the first time it happens. Balancing students' expectations and instructors' experience requires effort from both parties.

It is normal to see differences in teaching and learning skills. Different instructors are skilled or more at ease using different teaching techniques. Different students are more comfortable with different instructors. Different students are more comfortable with different types of exercises. Some participants dislike role playing in imaginary scenarios, for instance, but most of them will admit afterwards that they learned from it.

Courses must provide support for the instructors, too. Teaching emergency preparedness and emergency response is stressful and tiring for everyone, and it can be emotional. Small class sizes (fifteen or fewer) are desirable, and the best learning occurs when instructors work in teams, with one instructor for five students. When there are language differences among the participants, having a team of instructors is necessary, and the pace of the course must be slowed to enable all to follow the discussions.

Finally, a course never goes quite as planned. As in an emergency, it's important to listen to participants and to use their skills while maintaining progress towards the goal. The most difficult aspect of training may consist of maintaining an environment where participants feel comfortable sharing their views and experience, while simultaneously keeping an underlying order in stressful conditions. But then, this is the goal of a response in an emergency.

Twenty years ago, emergency response for cultural property was based on work done by librarians, who were and are still in the forefront of these efforts. Many conservators didn't consider the location of the river or the state of the roof to be their affair. After a disaster, they said that they didn't have any idea there might be a problem. Finally, that has changed.

There are measures that can be taken before, during, and after a disaster to diminish its effects. The very best kind of crisis management is prevention, and our South American colleagues offer an example of the power of international cooperation.

Nevertheless, catastrophes happen and continue to happen. Humans share deep resistance to

confronting this prospect, and as a result many cultural organizations remain unprepared. Even among the prepared there are surprises, and saying "you ought to have prepared better," fails to solve the problem. For this reason, the North Americans have tried to analyze the components of a crisis to produce a training course that outlines the choices to be made in managing the crisis. We don't really "manage" it, of course, because losses from disasters are fast and catastrophic. We use our personal experience and our shared experience to do our best in changing and unfamiliar circumstances, hoping that those who come after us will benefit.

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Coping with Disaster: Contingency Planning at the British Library

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Abstract

Nearly half a century separates the 1966 Florence flood from the massive flooding last year in Central Europe. What have we learned in the interval about practical approaches to saving our cultural heritage?

This paper will focus on three areas; firstly, contingency planning at the British Library, then the National picture in the UK – looking at a case study of a disastrous fire at a UK library, and finally what's happening on the international scene. Common elements link all of these. Whether a disaster is played out on an international stage or is a small local minor incident there is one common theme to coping – planning.

There are four phases of disaster contingency planning: risk assessment, prevention, preparedness, and response/recovery. I intend to use the British Library as a model to explore these elements in greater detail.

Risk assessment

The British Library took up residency in its new building at St.Pancras in 1997. Its design and construction took over twenty years in the making. Precisely because it was a new build there was control over the building specifications, for example, the construction and fire resistance of the internal and external fabric of the building.

The Library has all of the features one would expect of a national repository: smoke and fire detection, automatic fire extinguishing system and a controlled environment.

Interestingly, the storage is almost all below ground level. There are four basement levels, divided into fire compartments. The shelving throughout the building is at least 100mm above floor level and almost all is mobile shelving. The Library is located in central London, approximately 3 kilometres north of the River Thames. There were many debates at the time to the wisdom of the design, where the majority of the collections would be below ground level. Considerable in-depth analysis and risk assessment were therefore carried out in making that decision.

Risks vary from each institution. Disasters (other than natural or man-made, for example floods or acts of war and terrorism) are seldom caused by a single incident. Catastrophes happen when risks haven't been quantified in advance.

To distinguish between "hazard" and "risk", a **hazard** has the **potential** to cause harm, whereas the **risk** is the balance of that potential being actually realised.

It's important to identify all external threats: fire, flood, theft, vandalism, biological or pest infestation, and civil unrest. Risk assessments, to be effective, need to be repeated regularly.

It is vital that any contingency plan does not work in isolation. Salvage planning must be an integrated part of any institution's business continuity strategy. When we were planning for Date 2000, Collection Care worked closely with other Library departments (particularly Estates and Information Technology), as well as external government agencies, to minimise any potential interruption to the Library's business. As it turned out there was negligible disruption, to the Library in general and to the UK as a whole. But as an example of our contingency planning, all key salvage personnel were issued with both mobile phones and pagers – the latter in case the telephone system failed.

Our location is an important factor – for several reasons. Firstly, since September 11th and the recent war in Iraq there is heightened security and although the Library in itself is not considered a prime target, it is situated close to three main railway termini and therefore its location does present a potential risk. Secondly, there is a huge development and regeneration project centred around St.Pancras, where a new terminal for the Channel tunnel is under construction. Last year when the site was being excavated there was a serious alert when an unexploded World War 2 bomb was discovered! Major and immediate evacuation of staff and the public followed. And last year the Library found itself on the main route of a huge political demonstration – and emergency procedures were immediately put into action.

Prevention

Once the risks have been assessed the next step is prevention – how can any risks be minimised? There are the obvious precautions – fire detection,

fire suppression systems (manual and automatic), routine maintenance. There also needs to be as much consultation with the emergency services as is practical. In addition some basic but often overlooked principles need to be established – is there a **written** salvage plan? So often there isn't one, or there is a plan so old that it ceases to be effective. As an example of the most basic of issues – Does the institution have a smoking policy?

Preparedness

I want to focus on the British Library salvage plan and list the key features which I believe makes it as comprehensive as possible. When writing a plan make it as complete as you can. And remember it is by its very nature almost always theoretical.

Good communication is absolutely vital – staff involved in salvage activities need to know their roles and what is expected of them.

We have four levels of emergency response personnel.

1) The **ECO** – the emergency co-ordination officer whose main responsibility is for the fabric of the building, **not** the collections. The Library is split site – as well as the flagship St Pancras site, there are the Newspaper Library at Colindale, Document Supply at Boston Spa and several smaller storage locations in London. All of these sites are incorporated into the single plan – and the first point of contact in any incident, with the exception of Boston Spa, which is 650 kilometres from London, **is always** the ECO.

   An incident earlier in the year revealed a weakness in our communication channels. At the de-brief session after the event, we found that procedures had not been followed and that newly recruited members of staff who were involved in the incident had referred decision making to the most senior Library member immediately to hand, instead of contacting the ECO. We had not followed our own plan! Sometimes things do not go as planned – but, we learn from our weaknesses and mistakes. It proves how essential it is that all new members of staff are well informed and trained on a regular basis.
2) The **SCO** – the salvage control officer whose main responsibility is the collections and the management of the salvage operation.
3) The **STL** – the salvage team leader whose main responsibility is to organise the salvage recovery.
4) The salvage volunteers.

The SCO and STL rota is managed by the Preservation department. We are on call 24/7 – twenty-four hours, seven days a week – working on a two-week cycle. There are twelve SCO's and twelve STL's on the roster, which means on average we are on-call four times a year. The rota is published a year in advance – and, if duty officers require changes, the onus is on them to make the changes. Our contact sheet including work, home and mobile phone numbers is issued weekly – on a need-to-know basis. We have invested considerable resource in making our communication channels as effective as possible – and have issued each SCO and STL with their own mobile phone, supplied with additional batteries to cover the two-week duty. In addition, we've tried to keep our salvage plan both simple and concise. Each SCO and STL has a small 'Filofax' organiser; detailing list of duties, routes, basic procedures, maps, contact details (internal and external) plus other useful information. This serves as an aide-memoire, and it's portable enough to be carried at all times by salvage personnel when on duty. I haven't seen this used by other organisations for salvage planning, but would recommend it as a very useful and effective low technology tool. It is updated and revised twice a year.

Training is carried out on a regular basis – once a year we hold a scenario where everyone involved in the emergency planning is included. We work closely with the emergency services on this. At the very first annual exercise we were able to identify some very obvious points that had been overlooked.

For example, we all, in the Library, knew what part we played in our salvage operation – we worked together, we had rehearsed together, we recognised each other – but, when we carried out some worst-case scenario training with the local fire service they couldn't identify our chain of command and consequently events deteriorated very quickly. This was something that we could easily remedy. We introduced colour coding of salvage officers' jackets to identify individuals and responsibilities, and increased signage to our salvage kit.

We also realised very quickly how vitally important it is, after a disaster and especially at the beginning of recovery, to carry out handling training with the emergency services – in the UK they are the first people to salvage material in any disaster. So, if for example, the Treasures Exhibition Gallery was in immediate and catastrophic danger, the emergency services, not British Library staff, would be the first in to attempt any salvage and/or recovery.

To this end we have listed our priorities for salvage. We have included material that is on exhibition, together with items spread throughout the Library, listed under different department headings and/or locations. In my experience, gathering this information is 'like pulling teeth' – something curators and librarians feel very uncomfortable about. Crudely, it's a 'snatch-list' of what you would grab in a worse case scenario. It needs to take into account the value (historic and monetary), rarity, and the fragility of the item, i.e. would the item be difficult or impossible to recover.

We have extensive supplies on-site to deal with small to medium scale incidents – a store at St.Pancras which holds all the necessary but sometimes bulky material used in recovery: blotting paper, de-humidifiers, polythene sheeting, crates, wet/dry vacuum cleaners, etc.

In addition, we have salvage trolleys located at strategic points throughout all of the Library buildings as a stopgap measure. These carry basis supplies and can be accessed immediately the alarm has gone out.

On-site facilities include a cold store, freezers, freeze-drier and 2 vacuum pack machines. We've identified several areas within the building where wind tunnels can be erected to deal with partially wet material. These are in the basements and the tables are constructed to fold flat against the wall so they do not take up precious space. As part of our contingency plan we do hold several contracts with companies that specialise in handling large quantities of waterlogged and/or frozen material.

I think it's important not to overlook the human element in any disaster plan, and to make sure there are adequate supplies of refreshments to energise and comfort. Such provision will hopefully maintain morale when the recovery is taking place.

Response and recovery

In our written plan we have established procedures that must be followed. One of the first things to do once the cause of the problem has been identified is to correct the environment – call in the service engineers and contractors and stabilise the area as soon as possible. Take photographs – particularly important for claiming compensation or restitution through insurance. At the British Library the Salvage Control Officer and Salvage Team Leader will jointly assess the scale of the incident and will decide how to respond. Appropriate responses might be to air dry, freeze, and/or contact external contractors and decide how many volunteers to call in.

There are a number of options when deciding on the recovery treatment – but speed of response is essential. In most cases mould will start to grow 48 hours after a disaster where material has been water damaged – it could even be sooner depending on the surroundings, location, climate and time of year.

The type of salvage recovery will depend on the type of material that's damaged. As well as the easily portable Filofax, we have a much more comprehensive salvage manual to consult, which lists suitability of treatment by type of material. Examples of treatment are air drying, freezing, freeze drying, solvent drying, vacuum drying. It's also noted in the manual whether we have tested the method.

As an illustration –

- *General binding* after 1765 – options: to air-dry (yes), freeze (yes) or freeze dry (yes). Tested (yes)
- *35mm silver halide microfilm* – options: to air-dry (no), freeze (no) or freeze dry (no). Tested (yes)

Unfortunately, it is not until a massive disaster strikes with monumental consequences, that research into drying/salvage techniques moves up the agenda of most institutions. Consequently, much of what is written down in most salvage plans is the tried and trusted methods that we familiar with and have used for many years.

I am in the process of putting together and identifying levels and responses to disaster, at the same time as looking at what options and new initiatives are on the horizon – and also looking at the advantages and disadvantages of the proposed methods. One positive move is that the British Library has just appointed its first Head of Conservation Research – and I for one am looking forward to collaborating with him on this neglected area.

Salvage techniques at present cover:

Air drying, controlled drying, freezer/freeze drying, vacuum-freeze drying, cryogenic drying and/or a combination of those techniques.

Air-drying

Advantages: Suitable for small-scale disasters. Little or no expensive equipment is required, e.g. electric fan, wind tunnels. Volunteer staff, with no prior experience in conservation, can be trained quite easily.

Disadvantages: Labour intensive. May require large space to set-up wind tunnels. Will distort bindings and paper.

Controlled drying (in situ)

Advantages: Effective for the drying of the fabric of buildings. Can be used to treat coated papers.

Disadvantages: Dependent on expertise and equipment.

Freezing/freezer drying

Advantages: Buys indefinite time. Used for large-scale disasters. Can be contracted out to specialist firms.

Disadvantages: Not suitable for all material types. Experts will need to sort material carefully for suitability.

Vacuum freeze-drying

Advantages: Reduced distortion. Reduced drying time.

Disadvantages: Specialist equipment and expertise required.

Cryogenic drying

'Cryo-drying' + 'thermaline' (patent) and is a new technique being developed in the United States. Its intended use is for rare book and manuscript

collections. I quote from Consdist list (Walter Henry): 'The process seems to be in essence vacuum freeze--drying, but with the temperature kept very close to the triple point so there is (possibly) a very brief liquid phase, and drying under restraint to a higher moisture content than the bone-dry endpoint of ordinary vacuum freeze-drying) to reduce planar distortion, and as a result significantly reduce the amount of rebinding needed. The cost appears to be high, but when you factor in reduced rebinding costs it can be quite competitive.'

Further information *www.documentreprocessors.com*

Combination techniques

e.g.vacuum packing + vacuum freeze-drying.

Before moving on I thought it might be interesting to touch upon a very early vacuum packing trial that I carried out with Stuart Welch from Conservation-by-design when this technology was in its infancy in the conservation world.

Here is a wet newspaper that was encapsulated in 1992. It is still wet, no evident mould growth, and it's yellowed – probably through lignin in solution. I think what's remarkable is that this has not been frozen, nor been kept in a controlled environment. I feel certain that this newspaper would be able to be conserved without great difficulty. In fact, Stuart was saying that a similar exercise was carried out with a wet newspaper vac-packed in 1996 and removed from its packing five years later. Apart from having an extremely noxious smell it was able to be conserved and consulted. I find this intriguing – and it could prove invaluable in the developing world where freezers might not be an option, particularly if this method was used in conjunction with an oxygen scavenger – it just might buy enough time.

While preparing for this seminar I took the opportunity to look back over the last five years to see what emergencies we had been asked to deal with:

1998–2003

Most of the incidents centred round fluctuations in temperature and relative humidity in the Exhibition Galleries and on most occasions phone contact between the Emergency Co-ordination Officer and the Salvage Control Officer was sufficient to organise resolution of the problems.

Other problems included minor water leaks in the basement. One was a result of continued heavy rain over the weekend where water penetrated the substructure via a blocked duct in the Piazza.

There were reports of leaks at the Woolwich and Micawber Street sites – much older buildings. In all instances the Salvage team carried out follow-up reviews after each report to ensure that collection items were not affected.

Most of the incidents since 1998 have been in connection with the environmental conditions and rarely resulted in any evacuation of the collections from the shelves or the Exhibition cases. The number of such incidents has decreased aided by better monitoring and a dedicated conservator.

The national picture

I am going to describe the case of a disastrous fire in 1994, which destroyed 100,000 books and was the worst fire ever in a UK library – **Norwich Central Library**.

The building was damaged so badly that it had to be demolished.

I want to explore the timetable of events; the opportunities that were created by such a catastrophic disaster, and the response of the local community – a community in a city left without a library.

In addition to the 100,000 books completely destroyed, two million documents were stored in fire-proof vaults in the basements. These became drenched as fire-fighters attempted to extinguish the flames and this material posed the greatest conservation dilemma. The problem was the sheer quantity of manuscript material that needed to be saved and treated.

I think it's an accepted fact that if material is not completely destroyed in a fire (and curiously enough tightly packed books in shelves rarely are), most of the damage occurs from water used to douse the fire.

In the immediate aftermath of the blaze the local community rallied around. Food companies donated refrigerated lorries to freeze-dry waterlogged manuscripts and literally thousands of people donated old books and pictures to replace the lost items. Temporary facilities were set up and the city elders turned their attention to funding and building a replacement – a decision that was taken within six months of the destruction of the old library. Funding organisations were approached and eventually an agreement was reached in 1997 (3 years after the fire) that support of £30 million from the Millennium commission would be awarded, with a package of matching funding from the County and City Councils. Norwich Millennium Library was opened in 2001 (7 years after the fire) and provides state-of-the art facilities, with a multi-media auditorium, a business & learning centre, tourist information centre, cafes, open spaces and below-ground parking. There was also the opportunity to design an energy-efficient building, using thermal mass to naturally moderate temperature fluctuations, and a heat recovery plant to minimise energy loss. Needless, to say a new fire suppression system was installed – Inergen (identical to

the system used in the British Library strongrooms), a mixture of nitrogen, argon and carbon dioxide. The conservation was contracted out to specialist firms and took approximately 5 years to complete. The material, which had been frozen initially, would be delivered in a dry state and was conserved using traditional conservation techniques.

I have read a number of the newspaper articles that relate to this event and an important factor to emerge is the management of the press and public relations. I think consideration of the media is paramount when dealing with any significant event – especially the management of the blame factor. To cite another incident before business continuity planning really came to the fore, the biggest problem – and one that had not been predicted – was when media attention became more damaging than the actual fire itself. In this case far too much effort had to be diverted in propagating the message 'business as usual'.

Another consideration worth mentioning: When there is wholesale loss of unique material, is any of that material on loan or deposit? Serious local floods in autumn 2000 led one institution to immediately change its collection development policy on what it would and would not accept.

UKIRB – United Kingdom and Ireland Blue Shield

www.bl.uk/services/preservation/blueshield/missionuk.html

The UKIRB was launched in March 2001 and its remit is as follows:

It is cross-sectoral, covering archives, libraries, museums, galleries and the built heritage.

It acts as a focal point for local, regional, national and international initiatives promoting risks to cultural heritage objects.

It acts as a unifying voice for lobbying governments and funders in respect to their responsibilities for protecting long term access to our cultural heritage. Through a five year work programme it will seek to establish a framework, within which institutions and authorities can be encouraged and enabled to meet those responsibilities in respect to implementable polices, training programmes, and adequate funding.

It will also establish a pool of expertise to assist with disasters both in the UK and Ireland and overseas.

Relevant to this meeting is that last summer the British Council asked the UKIRB to co-ordinate cultural heritage aid to the Czech Republic following the disastrous Central European floods.

There are other regional initiatives that sit alongside UKIRB.

M25disaster management group

www.m25lib.ac.uk/m25sec/business/disaster/disasterwghome.html

This was set up by the M25 Consortium of Higher Education Libraries to:

Promote awareness and best practice in disaster control management including disasters affecting IT-based services.

Assisting in the dissemination of information on disaster control

Undertaking co-operative initiatives, including purchasing opportunities and ways of carrying them through.

REDS is another initiative – regional emergency disaster strategy.

International perspective

ICBS –Marie-Theresa Varlamoff spoke about the International Committee Blue Shield yesterday.

The British Library has been involved in consultation with the relevant agencies about the war in Iraq and a very useful mailing list for those interested in following developments can be contacted via: *Iraqcrisis@listhost.uchicago.edu*

I think it's worth mentioning in this context – consequence management. This is predominately an emergency management function, which includes measures to protect public health and safety, to restore essential government, services and provide emergency relief to governments, businesses and individuals affected by acts of war and/or terrorism. Most emergencies in the UK are handled at a local level by the emergency services but central government will become involved when the incident is of such a scale or complexity that central co-ordination or support is required. One of the important and in the past overlooked considerations is the psychological impact of disaster – from the distress of the librarian who had worked in Norwich Library for thirty years and seen the entire collection burnt to the ground, to the deep traumas of war. Counselling may need to be available – and may need to be available whatever the scale.

So in closing, let me finish by summarising has been learned these past forty years since the shallow muddy waters of the river Arno inundated and destroyed over a million items.

We have far greater co-operation, both national and international, when faced with disasters. The advances in communication channels and the world-wide web have enabled faster responses. There is a wealth of good disaster plans readily available. There is far more choice in the commercial sector from

firms offering specialist facilities – helping us cope with large-scale incidents. Most libraries possess electronic versions of their catalogues and may be able to offer replacements, either in hard-copy or as a surrogate, to the afflicted institution or country. We have new technology adapted to suit the need of the conservation and recovery phase – and surely there is more to come.

Only last week I was discussing and exploring the possibilities of fire suppression in historic houses and the need to investigate the use of a barrier gel to retard fire. The opportunity of using fire-resistant curtains and blinds on wooden fixed bookcases – can something be adapted, modified that would suit our purpose?

I think we have leaned that the best way to preserve is to prevent.

Nearly forty years on the conservation is not complete in Italy and although the Florence flood paved the way for a renaissance in book and paper conservation a recent search on the internet revealed and I quote: 'the international community responded, and largely due to the British response, an assembly line solution was developed which accomplished a great deal of restoration work. (However) once the international funding faded away the assembly line gave way to tradition; one man – one book; and worked slowed down.'

Once large scale damage is done, it is hard to maintain the initial investment and momentum. Prevention is more effective and more achievable than cure, though we must be prepared for all contingencies.

"Hope for the best, expect the worst."

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The Day the University Changed

Randy Silverman

Introduction – The Flood at Colorado State University

The largest water-related library disaster in U.S. history occurred at Colorado State University's (CSU) Morgan Library in Fort Collins, Colorado on July 28, 1997. This flood was caused by a series of summer rainstorms that began the day earlier, July 27–and lasted off and on for about 31 hours, culminating in a five-hour torrent that saturated the foothills surrounding Fort Collins with 10 to 14.5 inches of rainfall.[1] The arid soil in the surrounding hills quickly became saturated; the resultant rapid runoff flowed into low areas of the town and caused a river to swell its banks which led to five deaths in a mobile home trailer park near the University. The storm was characterized as a "100 year event."

CSU was not unscathed. Runoff combined with detritus began to fill the below-grade floors of approximately one third of its campus buildings.[2] On the football field adjacent to the Morgan Library, pooled rainwater collected until a natural earthen berm gave way under the water's increasing weight and sent a wave of water and debris racing toward the library's newly-completed, below-ground addition. The water forced its way into the building through a basement window that exploded as a portion of the wall collapsed. The water filled the room to a depth of eight feet (more than two meters), completely submerging the stacks. Approximately 425,000 books consisting primarily of twentieth-century science books and journals were saturated by rushing water mixed with ceiling tiles and grime. The swirling water washed books from their shelves and knocked down some of the free-standing, baked enamel shelving. The force of the moving water actually forced several volumes up through the duct work of the building's air handling system and deposited them on the ground outside the building where they were discovered several days later lodged in the mud.

The Response

CSU responded to the crisis immediately by hiring a consultant to coordinate the simultaneous restoration of its 30+ damaged buildings, and President Albert C. Yates and his Administrative Council determined that the campus (which was between semesters when the disaster struck) would seamlessly resume operations without interruption. He planned to reopen the campus the following week and welcome students back for summer quarter to ensure the institution's fiscal as well as academic continuity. The University also hired a professional disaster recovery firm specializing in library recovery

to address the problem of the Morgan Library's books. The campus-wide consultant, having no expertise in the recovery of library material, then invited me to consult with him on library conservation issues, an offer readily accepted.

My first reaction upon reaching the disaster site two days after the water had been pumped from the basement was one of surprise at how little damage

had occurred to the town of Fort Collins proper, and then disbelief at the amount of devastation that had occurred specifically inside Morgan Library. Within 24 hours, flood waters were removed from Morgan Library's basement with the use of portable electrical pumps. As the sodden collection sat exposed to air awaiting the next stages of recovery, the library's new, steel compact shelving was slowly destroyed by expansion of the swelling books. In places, swollen sets of journals performed gymnastic feats, arching away from their shelves a full 10 inches like silent, buckram-covered accordions. All electricity within the library was incapacitated by the sudden intrusion of water into the building, and the damaged central heating, ventilation, and air conditioning (HVAC) system remained inoperable for nearly a week.

The flood prompted Colorado Governor Roy Romer to expeditiously request Federal assistance. Within days President Bill Clinton declared Fort Collins a Federal Emergency area and initiated the

involvement of the Federal Emergency Management Agency (FEMA). Aid was immediately administered to the residents of the damaged trailer park near the University, but a question arose concerning FEMA's fiscal responsibility to CSU. In Federal parlance, the formal definition of a "flood" is water overflowing the banks of a river. Since the CSU campus was affected only by rainwater running off the surrounding foothills, it appeared the University would not qualify for Federal assistance. Fortunately for all concerned, the University was adequately insured under State policies and this issue became, while intellectually challenging, a mute point.

The Packout

The packout was initiated by the disaster recovery firm specializing in library recovery. Arriving on-site, I observed the firm's temporary employees (temps) loading books into unlined, paperboard "banker's boxes" (15"×12"×10") that were subsequently moved to a conveyor belt assembled on the stairway connecting the basement with the library's ground floor. The boxes were tossed down onto this conveyor belt with a loud "thud" as though they contained frozen turkeys, and moved upstairs to the first floor where they were transferred onto two-wheeled dollies. The boxes were then rolled outside, loaded onto pallets, and subsequently hoisted into refrigerated tractor trailers for transport to a commercial cold storage facility in Laramie, Wyoming (approximately one hour north of Fort Collins). Empty bookshelves were being dismantled and piled around the perimeter of the basement. While conducting an initial assessment, I ran into one person who didn't seem to be employed by the disaster recovery firm, but inquired whether I had seen a copy of one of his favorite books. I believe he was looking for a volume of Kierkegaard! Large areas of this floor remained unlit, and numerous, water-logged volumes scattered randomly about the floor were being gradually ground into pulp under the boot heels of the untrained the temps.

The recovery was moving slowly and without sufficient care, but the situation came to a head the following morning at 7:00 AM during the daily orientation meeting when the University's consultant asked the library recovery firm to estimate its recovery costs for the library. The response was that the "packout" alone (e.g., removing the books from the library to a commercial freezing plant), would cost $1.5 million; approximately $3.50 per book. As this figure did not address cleaning or drying of the collection (which might have totaled $20 million), the University's consultant called a meeting with President Yates and his Council to discuss the appropriateness of requesting a competitive bid.

The meeting with President Yates occurred later that afternoon lasted 25 minutes. After listening to the concerns of the consultant followed by my assessment of the situation, President Yates terminated the contract with the first library recovery firm and replaced them with a second firm from Fort Worth, Texas that estimated the total recovery cost for the library (including packout, transportation, freezing, and drying) was $2.3 million ($5.45 per

book). In the throes of a natural disaster which, by its very nature elicits knee-jerk reactions, this particular meeting evoked the most dynamic decision-making strategy I have ever witnessed. Unfortunately, lost in the process of contract termination was some critical information, such as the whereabouts of a missing semi-truck full of student records.

Bright and early on the fourth day after the draining of the basement, the second recovery company took control of the library's recovery operation. Small groups of temps (six to eight people) were assigned to individual supervisors who had complete authority to fire at will, immediately eliminating issues of temp accountability. The library's perimeter was secured and future access by well-meaning interlopers denied. Randomly strewn books were picked up from the floor; disassembled bookshelves were passed out of the building, via a human chain, and deposited in nearby construction dumpsters; and the carpeting was pulled up and removed to reduce the moisture content inside the building. Extension cords and task lighting were hung from the ceiling and darkened areas of the floor became illuminated. Paperboard boxes were assembled en masse in the basement, and lined with black plastic garbage bags to prevent the cardboard from becoming soggy. The boxes were filled with waterlogged books, marked on the sides with tracking and retrieval codes, and moved via two-wheeled dollies through the hole in the wall where the flood waters had originally entered the basement. An intermittent summer rain required a waterproof tarpaulin be placed over the conveyor belt that moved the boxes up to ground level where they were stacked 24-boxes-per-pallet in a 3×3×3 configuration. Each filled pallet was rotated on an industrial-sized Lazy-Susan and wrapped in clear plastic wrap to stabilize the boxes in transit. A propane-powered forklift was used to load the pallets into the refrigerated trailers of waiting semi-trucks. Each pallet was packed only one-high to avoid crushing the paperboard boxes, and a small aisle down the center of the tractor trailer was left clear.

At the suggestion of Dr. Robert McComb (Research Chemist, Library of Congress, now retired), a 20-ton tanker-trailer of liquid nitrogen was brought on site, and each of the fully loaded refrigerated tractor trailers ("reefers" in the parlance of the trucking industry) containing the wet collection was blast-cooled to radically reduce the temperature of the books. The liquid nitrogen was transferred to the reefers through a one-inch diameter plumbing pipe (with holes drilled about every 12 inches) slid under the back door of the trailer and down the small aisle between the pallets. To prevent liquid nitrogen from leaking through drain holes in the floor boards and freezing the truck's tires, plywood boards were placed between the rear tires and the bed of the reefer. This methodology proved effective for rapidly reducing the summer temperatures inside the reefers to allow the trailer's cooling system to operate more effectively on the short trip to the closest commercial cold storage facility in Laramie, Wyoming, and at $500 per tanker-trailer, the cost proved quite reasonable: only two tanker-trailers were needed to complete the entire packout. The collection remained at this cold storage facility in Wyoming until the packout was completed, and was then transferred to a second cold storage facility in Fort Worth, Texas to be near the library recovery firm for further treatment.

A visit to the Wyoming facility about a week into the recovery revealed that the unlined, paperboard boxes removed by the first recovery firm during the first two days of the packout had become saturated and were now collapsing under their own weight, limiting to three high the height the now-crated pallets could be stacked. The boxes lined with black plastic retained their physical integrity, allowing each of these crated pallets to be stacked four high inside

the commercial freezer and later facilitating further handling of the boxes without risk of doing harm to their contents. The "lost" reefer containing student records was discovered on a dirt siding near the freezer plant, its refrigeration unit shut off and the sweltering records reeking of deteriorating biological matter. The packout took a total of 14 days to complete.

Building Cleaning

Once the collection was removed from the Morgan Library basement, all damaged, detachable building components (carpet, wall board, ceiling tiles, etc.) were stripped from the space down to the concrete floor and the wall studs. Concrete surfaces and duct work contaminated by mold were disinfected with "Simple Green" and "Zep-O-Mint," two commercially-available products each containing 5% o-Benzyl-p-chlorophenol. The duct work was then coated with "Foster's," an antibacterial agent containing barium metaborite, to prevent future regeneration of mold in those tight spaces.

Mold

Visible signs of mold appeared in the damp Morgan Library basement approximately three days after the water was pumped from the building. Efforts were initiated immediately to control the temperature and relative humidity within the basement which was isolated from the building's first floor by taping black plastic sheeting over all doorways. Dehumidifiers, powered by portable diesel generators, were used to pump desiccated air throughout the building in an attempt to dry the basement and prevent mold from spontaneously spreading to the remaining four floors of the building. This tactic proved successful above ground, but little could be done to counteract the huge amount of moisture trapped within the wallboard, books, and other porous material in the basement. Portable air conditioning units were set up in the basement, but their cooling capacity was inadequate leaving temperatures to hover at approximately 65 degrees Fahrenheit, not nearly cold enough to retard mold growth.

By the fourth day of the recovery, mold could be seen growing profusely on all flood-damaged surfaces, further damaging the already battered book collection and considerably complicating the recovery process. Mycologist Dr. Douglas A. Rice (Environmental Health and Safety, CSU) identified at least thirteen strains of mold growing in the basement,[3] approximately half of which were feeding on the paper-based collection. Additionally, human safety concerns led to the use of particle masks to reduce the health risk to all workers during the day,[4] and a desire to fumigate the library's basement at night. Disagreement about which sterilant to apply delayed its use for two days. The debate hinged on the need to identify a sterilant that could be adequately dispelled from the closed space by morning to allow workers to safely breathe the ambient air and continue salvaging the collection. Finally, Ortho--phenylphenol (OPP) was settled upon and applications were sprayed on with bug sprayers during three successive nights after the work crew was released.[5] This helped reduce, but by no means eliminate, the growth of mold in the Morgan Library basement.

The visible effects of mold on the collection increased with each day the books remained wet in the library basement. Active conidia became more and more noticeable on bookbindings and text edges, and, as time passed, staining became evident on the endpapers. This discoloration continued to progress into the leaves of the text until the books were finally frozen and the mold became dormant. Books recovered during the first few days of the packout exhibited little or no text staining, while books recovered in the last few days of the recovery frequently had damage extending 20 or more pages into the volume from either cover. Additionally, the first examples of dried books returned to CSU from freeze drying chambers in Texas (about 30 days into the recovery) contained a foul odor of decomposing organic matter not dissimilar to rotting sea life. It became abundantly clear that drying alone would not adequately address the mold problem.

In an attempt to respond to the growing concern about biological damage to the collection, conservators, chemists, and mold experts throughout North America were contacted to try to identify the most appropriate mass-sterilization technique for treating these books. During the course of this investigation I learned that the success with which conidia survive in nature is based on a number of variables, including the species' specific "resistance to deleterious agents, temperature extremes, chemicals, radiations, desiccation, competitive saprophytic ability, and mutational capacity."[6] It also became clear that mold can be extremely hearty: in a test situation, cultures of Aspergillus were shown to survive for 22 years, while Penicillium survived for 10 years.[7] Both of these molds commonly occur in library material and were present in the CSU disaster. It was also discovered that mold cultures can be preserved for long-term biological study by freeze drying[8] or flash freezing with nitrogen, both of which occurred to the Morgan Library's books during the recovery process, and neither of which was responsible for killing more than a small percentage of the mold.[9]

Toxicological Issues

The degree to which people are affected by mold depends upon the species involved, level of exposure, and a person's sensitivity to it. The most

common epidemiological reaction is allergenic which, from person to person, varies in severity. A second mold reaction is intoxication which can occur as the result of ingesting or inhaling toxic mold metabolite. The third type of reaction is infection colonization of human tissue resulting in the growth of the organism within (or on) the body. People at the greatest risk of contracting mold infections are those with suppressed immune systems (e.g., people suffering from AIDS, undergoing chemotherapy, or recovering from an organ transplant), or weakened heart or lung conditions, including asthma.

Trying to define how much mold is acceptable on library books turned out to be a key to understanding the long-term public health risks faced by CSU in the aftermath of the flood. Dr. Harriet Burge (Associate Professor, Environmental Microbiology, Harvard School of Public Health), a preeminent expert on mold and human health issues in the U.S., suggested, "Visible, living mold is certainly not acceptable, nor [is it acceptable if] there is sufficient active mold growth so that moldy odors are evident," as mold odors can result from the presence of dormant spores. In terms of being able to quantify these observations, however, Dr. Burge explained, "There is no data on which to base surface measurements. I usually consider surfaces that are not visibly moldy and produce one or two colonies of mixed types per square inch [when incubated] to [be] normal. This is predicated on sampling considerably more than one square inch surface, of course. On the other hand, if a surface produces an essentially pure culture of one fungus with more than twenty colonies from the test area sampled, then I would judge that active growth is still occurring."[10]

Mold, whether living or dead, can cause human health problems. Dr. Burge continued, "The reason for sterilization is to prevent continued [mold] growth, not to reduce [human health] risk. Dead fungi contain allergens and toxins as well as live ones. The health effects from lung colonization can be ruled out as a result of sterilization, but hypersensitive reactions will not be eliminated."[11] An equally significant concern is whether the sterilant used has the potential for causing toxicological problems of its own, and the duration of this secondary but equally important risk. This issue is at the heart of the current trend in U.S. conservation to avoid sterilization, a point summarized by John Haines and Stuart Kohler, who stated: "If a spore is an allergen when it is viable it is still an allergen when it is nonviable, but if it was treated with a toxin [e.g., a fumigant] it now has a coating of toxin in addition to its allergenicity.[12]

And finally, a key question relating to CSU's long-term liability was, "How long does dead mold on books remain a health risk?" Again, Dr. Burge explained, "Mold spores are designed to be resistant, so they last a long time. Allergens, however, are

proteins and probably degrade with some rapidity, although no one has the slightest idea (as far as I know) what the time course might be for a dry spore. It is known that mold allergen extracts can lose potency within weeks."[13] To safeguard staff and patrons from ingesting mold as a result of handling infected library materials, a standard protocol for removing dry, inactive mold from a limited number of books is to vacuum the friable material into a high efficiency particle (HEPA) filter, sweeping it towards the vacuum cleaner nozzle with a soft brush (working in a well ventilated area or fume hood and wearing disposable gloves and a particulate respirator). The quantity of spores contained collectively in CSU's 425,000 damaged volumes made this approach impossible, and an expeditious alternative was simply to wipe off the majority of visible, friable material after the mold was sterilized (workers wore protective clothing and used disposable rags).

Current Treatment Options for Mold

There are two diametrically opposed schools of thought governing the recovery of mold-damaged library material. The first advocates maintaining reduced RH levels inside the building to force mold spores into a non-active state and prevent further mold growth. The second champions the use of sterilants to kill mold spores. The reality is that both approaches have merits, but that once an outbreak occurs and people start expressing grave concern about human health risks, an optimal method for addressing mold on library material does not really exist yet. Further, precious little testing has been conducted to date to determine the long-term effects of sterilants on the permanence of library material.

Environmental Control

Maintaining stringent environmental controls (e.g., 40% RH +/- 5 % and 68–72 °F., with constant air movement[14]) within the storage facility will prevent mold from growing. Within this type of constantly controlled environment, nearly all types of germinating mold spores will also stop growing, and new spores will not germinate. However, many collecting institutions worldwide lack optimal (or any!) environmental controls, which can lead to circumstances that naturally promote mold growth. And, as in the case of CSU, even a facility that normally operates an HVAC system capable of maintaining optimal temperature and humidity ranges can have that norm tragically interrupted.

Sterilization

As noted in a study by Haines and Kohler on fumigation of archival material, "To rid books and paper of mold problems by non-destructive chemical application with a minimum of human contact would appear to be an attractive course of action. The problem with this approach is that most fungicides are either hazardous gasses that pose a health risk to the user or solutions that may damage cellulosic material."[15] Given the fragility of book paper, a monumental obstacle to sterilizing books after a mold outbreak is the difficulty of killing every spore, including thoroughly penetrating the interior of the book's pages. Even in an experimental setting where better than 99 % of the conidia were killed by fumigation, Haines and Kohler acknowledge this to be "an almost insignificant loss to a fungus which can produce hundreds of thousands of spores in a small colony started from a single spore."[16] Further, as mold spores are ubiquitous in the Earth's atmosphere,[17] and that any sterilized surface provides an optimal medium on which new spores can germinate given the right conditions. Florian observed, "Parchments have been reported to be more prone to fungal infestation after ethylene oxide fumigation treatment."[18] Again, environmental controls remain a key to preventing ongoing outbreaks.

What follows is a brief review of some of the most common options.

Thymol

Thymol has been reported to provide effective sterilization of mold in books,[19] but this treatment is known to deposit a very long-lived and unpleasant odor in paper that never seems to completely dissipate. Additionally, relatively recent testing draws into question thymol's efficacy,[20] although this finding has been a topic of some debate.[21]

Ethylene oxide

Historically, ethylene oxide (EtO) was often recommended as the most effective sterilant for library materials,[22] but even in a laboratory setting it has been shown to provide less than perfect results.[23] Dr. McComb noted that multiple applications of EtO improved its efficacy.[24]

EtO has been registered as an antimicrobial pesticide since 1948 and is commonly used as a sterilant in health care facilities because of its potency to destroy pathogens through an alkalization reaction. It is also flammable and explosive, a known carcinogen, and a toxic air contaminant.[25] Protocols for using EtO in a commercial setting include: sealing and evacuating air from a chamber (typically large enough to drive in pallets of material), adjusting the temperature and pressure (e.g., slightly below atmospheric for pure EtO), soaking the contents of the chamber in the sterilant for 4 to 24 hours, evacuating the sterilant, and bathing the contents in a series of fresh air washes to remove residual EtO. Further aeration follows (three-to-five days) after the gas has been evacuated from the chamber to allow for the complete dissipation of the gas.[26] In the U.S., use of EtO

is regulated by the Environmental Protection Agency. This material has fallen out use in North American library conservation,[27] and is avoided by commercial recovery companies due to concerns about future off gassing of EtO in confined spaces.[28]

Ortho-phenylphenol

Ortho-phenylphenol (OPP) was successfully used by Dr. McComb in a library disaster recovery situation in 1976 at Temple University in Philadelphia, PA following the Klein Law Library fire, and remains his preferred sterilization option for library material.[29] OPP, a salt requiring application by hand as an aqueous spray, is a common, commercial sterilant frequently used as an antiseptic for hospital floors, on fresh fruit prior to shipping, and for many years as the active ingredient in Lysol® Brand Disinfectant Spray.[30] Human safety issues are well understood with OPP which readily dissipates in air and which the Environmental Protection Agency classifies in a low-risk group of possible carcinogens (Group 2B).[31] Opp's long-term effects on books and paper are less well understood. Robert Weinberg (Graphic Conservation Company, Chicago), expressed concern that over a period of 10 years he had observed OPP yellowing the paper backings on framed works of art.[32]

Gaseous ammonia

Gaseous ammonia was recommended as a treatment option by Weinberg.[33] A material that holds some promise as it is inexpensive, gaseous ammonia poses few long-term toxicity problems, and may even improve the pH of paper as a bi-product of treatment. However, controlled studies have yet to be conducted to determine this material's efficacy as a sterilant or its long-term effects on paper.

Ozone

Ozone is commonly used in the disaster recovery industry to eliminate odors resulting from smoke. More recently, ozone has come under investigation by the Los Alamos National Laboratory for treatment of biological pathogens and seems to offer promising results,[34] but efficacy data related to a wide range of molds commonly associated with disaster situations is not available. On the CSU campus, Dr. Rice expressed interest in investigating its potential as a fumigant after ozone was successfully used to reduce the percentage of viable conidia in post-flood damaged buildings (other than the library). Ozone however, is one of the constituents of photochemical smog and well documented as a degrader of cellulose (e.g., cloth and paper) and dyes,[35] and as of this writing nothing is known about the long-term risks to books at the concentrations and duration of exposure necessary to kill mold.

Radiation

Both gamma and electron-beam radiation have been applied to commercial sterilization since the 1950s and bring to the problem the advantage of producing no harmful emissions. Gamma radiation is currently produced by cobalt-60, while electron-beam is ionizing radiation produced by accelerators ranging in energies from 3 MeV to 12 MeV (million electron volts); both kill mold by damaging the DNA molecule.[36]

Only rudimentary research on gamma radiation as a sterilant for mold-damaged books had been done at the time of the CSU flood,[37] but subsequent investigations by Adamo et. al. (1998 and 2001) suggest that low-level radiation offers an effective option for sterilizing mold-contaminated, library material without causing significant damage to cellulose or posing long-term health risks.[38]

Electron-beam (e-baem) radiation also holds promise for treating mold-damaged books as the dose rate used is significantly less than with gamma radiation, but no testing has been done in this area to date.[39] In test situations, some healthcare products have proven to degrade less when exposed to electron-beam radiation than to gamma radiation, but the penetration is not as thorough. Observations from the commercial disaster recovery field suggest electron-beam radiation is not as effective as gamma radiation in practice due to the density of boxed books.[40]

CSU Treatment Specifications

A number of factors affected the treatment specifications designed for CSU's book collection. Being a research library, it was known that the damaged material was intended for long-term (permanent) retention. However, the collection was made up predominantly of scientific journals and monographs 100 years old or less, indicating that some material would be relatively easy to replace as opposed to treat.

While mold affected the collection to differing degrees, it is fair to characterize all of the books as having been thoroughly wet and affected by mold. Due to the number of items impacted (425,000 volumes), any technique adopted needed to be efficient and adaptable to a mass-production approach. And, the institution determined that sterilization was an important step for all material before returning the collection to active use to minimize the long-term health risks to its patrons from recurrent mold growth.

Replacement Program

Over a period of months, a list of all collection material damaged by the flood was extracted from the library's online catalog. This list was electronically distributed to research libraries throughout the U.S. with a plea that duplicate copies of the identified

journals and monographs be sent to CSU as gifts to help Morgan Library expedite its recovery process. A generous response resulted and CSU received over 400,000 gift items. These books and journals were systematically sorted and compared with the shelf list, but despite the specificity of the items requested, only about one fourth of the gifts books received matched the flood-damaged items. As these 100,000 desirable items were identified, the material was accessioned and instructions sent to the library recovery firm in Texas to discard the damaged, duplicate copy.

Additionally, a photocopy page-replacement program was established through interlibrary loans. Pages badly stained by mold were excised from the text and replaced with photocopy replacements prior to rebinding, reducing the visual disfigurement caused in the most egregious examples of mold damage.

Washing and Drying

CSU's water-damaged books were shipped frozen using commercial overland trucking firms from the commercial cold storage facility in Wyoming to another commercial cold storage facility in Fort Worth, Texas. Books remained frozen until they could be treated by Belfor USA (2425 Blue Smoke Court South, Fort Worth, TX 76105, tel. 817-535-6793).

Before drying, the books were checked against the list of replacement gift items received by CSU and the damaged duplicates discarded. This searching to locate duplicates added significantly to the total time on the job, one of several steps added to the protocol that contributed to the final cost being higher than the initial estimate.

The books were thawed, washing in clean, running water to remove dirt and mold, squeezed to remove excess water, and then re-frozen. Three freeze drying chambers were used simultaneously, with 7,000 frozen books treated per load (21,000 volumes total). The frozen books were wheeled into the chambers on mobile racks that were internally heated to approximately 95 degrees Fahrenheit. Sublimation of the books occurred by maintaining the pressure inside each chamber below 4.57 mm Hg (typically, it was below 1 mm Hg), with the temperature ranging between 70 and 80 degrees Fahrenheit. The complete drying cycle, depending on the amount of water contained in the books, took between two and three weeks.

Sterilization

Following the drying process, the books were sent to SteriGenics, a commercial sterilization company (the Ft. Worth, TX office can be reached at 817-293-0999, with corporate offices at 8550 West Bryn Mawr Avenue, Suite 600, Chicago, IL 60631; tel. 800-472-4508) for gamma radiation treatment. Due to the variability of the density of each box of books, the radiation was guaranteed to range between 15 and 25 KiloGrays.

Wipe down and Shipping

Following sterilization, small amounts of mold not previously removed by washing were wiped from the book exteriors with natural rubber sponges, the volumes once again packed in boxes, placed on pallets, and shipped back to CSU by a commercial trucking firm.

Page Replacement and Rebinding

At CSU, the dried books were inspected and page replacements were ordered through interlibrary loan for badly mold-stained pages. Badly stained pages were removed, photocopy duplicates inserted in their place, and all other torn sheets repaired. The books were then sent for commercial library binding and the water-damaged covers replaced with new buckram bindings.

Total costs

The final cost for the treatment regimen performed by the library recovery firm (including packout; building cleaning; transport of wet books from Fort Collins, CO to Laramie, WY; freezing; transport of frozen books to Fort Worth, TX; washing; re-freezing; freeze drying; sterilization by gamma radiation; final wipe down; and transportation from Fort Worth, TX back to Fort Collins, CO) was approximately $9.00 per volume ($3,825,000).[41] The total cost to the Library to return the entire water-damaged collection to active service, including the above mentioned treatment regimen, their own in-house processing, photocopying, mending, and commercial library rebinding was approximate $30.00 per book ($12,750,000). The process took approximately two years to accomplish.

Lessons Learned

1 Buyer Beware:

Unfamiliarity with cost effective procedures and technical protocols, as well as severe disorientation and emotional shock that accompanies any disaster, puts the consumer at a terrible disadvantage when contracting for recovery services following an event. Unscrupulous recovery professionals can (and do) take advantage of this naiveté and may charge inflated rates, offer to provide unnecessary services, or perform work poorly. (The time for negotiating the price of a life preserver is not when the ship is sinking!).

2 Conservation Consultant:

A conservator experienced in disaster recovery should be identified as a key component of an institution's disaster plan and should be the first person hired following a disaster. Ideally, this person should report directly to the head of the institution to act as their advocate in negotiations with insurance

adjusters and establish recovery protocols to guide the work of a commercial disaster recovery firm.

3 Pre-Select the Commercial Disaster Recovery Firm:

Three days of organizational and recovery time were needlessly lost at CSU due to the initial selection of the wrong disaster recovery firm. This delay resulted in increased mold damage to the collection. Institutions are advised to pre-select a competent commercial disaster recovery firm in an informed way (scrutinizing prices, services offered, and previous customer satisfaction), and to pre-authorize this firm's services contractually to avoid delays or improprieties when awarding a recovery contract. The author would be pleased to discuss his experiences and offer recommendations on this point with anyone who is interested.

4 Recovery Capital:

Money is critical to effectively implementing a disaster recovery in a timely fashion. Determining an institution's current insurance coverage, including limits of liability and exclusionary clauses in the policy is critical to creating a viable disaster response plan. Determining who within an institution is able to initiate this type of expenditure in a crisis should also be a part of the plan.

5 Health and Safety:

Long-term health risks can arise from exposure to mold, infectious or hazardous agents, and unexpected workplace hazards (including electrocution). Disaster recovery can be physically exhausting, psychologically demanding work and should be conducted by people familiar with the attendant health and safety issues, and everyone involved in the recovery should take appropriate precautions.

6 Controlling Mold:

Reducing mold growth in situ in a recovery situation requires immediate use of significant amounts of cooling, which can include in-house HVAC (when operational), portable air conditioning units, and refrigerator freezer trucks (including the use of CO_2). Temperatures within the flooded facility should be maintained at approximately 45 degrees Fahrenheit to effectively retard mold growth. Additionally, in a large-scale recovery, mold formation may be able to be delayed and retarded by inundating wet spaces with ozone each evening when the work crew is released, and "washing" the area with fresh air in the morning before work commences.

7 Disaster Planning:

Each of the foregoing points are issues that can be addressed in an institution's disaster plan (which is only as strong as it is real). Post-disaster evaluation can also help prevent future problems; in the case of CSU, a retaining wall was constructed outside the Morgan Library designed to buffer the building from future flash floods.

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Assistance from the National Library in Warsaw (Biblioteki Narodowej) in Saving Library Collections in Poland Following the Floods in 1997

Ewa Potrzebnicka

The floods of June 1997 caused enormous damage to library collections. More than 90 libraries suffered, and in some cases the waters not only affected their collections, but also destroyed entire buildings, fittings, installations and technical facilities. The librarians, restorers and other people who spontaneously joined the efforts to save and dry out the wet books reacted to the tragedy with great self-sacrifice. Without their help the collections inundated with water, mud and dirt would in all probability have been completely destroyed.

A "flood team" was put together at the Ministry of Culture and Art during the first few days of the flooding, and entrusted the National Library in Warsaw with the role of co-ordinator of assistance for the libraries affected. All the affected libraries received the set of instructions "How to Proceed During Catastrophes", which contained guidelines relating to collections of books affected by flooding drawn up by the Book Conservation Department at the National Library in 1997 during the first days of the flooding in Silesia. The authors of these instructions aimed to provide the necessary advice as soon as possible to all libraries engaged in efforts to save their book collections. In addition to the damage caused directly by the flooding (soaking, soiling and deformation) paper documents are also at considerable microbiological risk. Infection can occur very quickly following flooding.

We should proceed as follows in order to restrict any damage to the minimum:

1. Select the most valuable items from among the flooded material to be saved first. These should include the kind of items most sensitive to water – manuscripts, illuminated prints, watercolours, pastel drawings, photographs, coloured maps, etc.
2. Clean the items as far as possible of dirt and then freeze without fail to the lowest possible temperature. Only in this way can the given items be protected against mould, and other damage caused by moisture limited. All the available freezing boxes and freezers should be used. The given items should be left frozen right up to the moment at which they are to be restored.
3. Before restoration the items should be dried, preferably in a freeze drier using the vacuum sublimation method. If this is not possible then they should be dried using the method described in point 5.
4. Any remaining items (black-and-white prints, graphic art, printed maps, etc.) should also be treated as above if possible. If not, they should be cleaned or gently soaked in clean water before being dried immediately.
5. First use absorbent paper or other hydroscopic materials, inserted between the pages of the book, to draw off excess water. The volumes should then be placed vertically, opened into a fan and dried in well-ventilated rooms. Fans should be used to ensure a current of air. Drying in warm air, of a temperature not exceeding 25 °C, is recommended. Oil heaters may be used to warm the air, though placed so as not to overheat the drying objects. Air blowers, which create an excessively strong current of air, should not be used.
6. Following drying the items should be disinfected with Rotanox in a vacuum chamber. A microbiologist should be consulted if mould appears.

At the end of July the National Library organised a trip by several people to the area affected by the floods. These people were able to assess the situation facing the libraries on the spot, give them advice, and assemble information on the needs for emergency action to be taken.

At least part of these collections was saved thanks to the enormously self-sacrificing efforts of a number of people. At first the books were dried using traditional methods, i.e. opened in ventilated rooms with absorbent filter paper inserted between the pages. Assistance in drying out wet books was offered by libraries in Warsaw, Gdansk, Cracow, Poznan and Torun.

The German company Ars-Assistance also joined the efforts to dry out the flooded library collections, and installed drying chambers with air at a temperature from 40 to 50 °C in Wroclaw and Opole. In spite of the enormous efforts and work of many people, mould began growing on both wet and dried books in ever-greater quantities after around two weeks.

The libraries in Wroclaw, Opole and Nysa suffered most of all. More than 3,000 volumes from the 17th

and 18th centuries were flooded in the Library of the Higher Ecclesiastic Seminary in Nysa, the University Library in Opole lost around 100,000 books and periodicals, the Regional (Voivode) Library in Opole lost around 43,000 books, and between ten and twenty thousand new volumes (i.e. from the 19th and 20th centuries) were soaked in the Wroclaw University Library. The losses in terms of real estate and furnishings of public (formerly people's) libraries alone have been calculated at more than two million dollars, and the damages to books at around a million dollars.

The Historical Collection (more than 3,000 items) from the Library of the Higher Ecclesiastical Seminary in Nysa and around 2,500 volumes from the 19th and 20th centuries from the libraries in Opole and Wroclaw were taken to freezing plants. Information obtained by the National Library indicates that more than 16,500 volumes, included the frozen volumes mentioned, have been saved.

The majority of the books in the historical collection from Nysa, which were not frozen until two weeks after the flooding, were in an extremely poor condition. The books had swollen as the result of the action of water, and leather and parchment bindings had become deformed and come away from the books either partially or completely. Most of the books had been cleaned of mud and other river impurities before freezing, although part of the collection had to be frozen without being cleaned in view of the rapidly spreading microbiological contamination.

On 10 October 1997 a one-day consultation meeting was held at the National Library to assess the consequences of the floods, which was attended by representatives of the libraries affected and representatives of other libraries and institutions assisting them. Representatives of the Ministry of Culture and Art, the Ministry of Education and the State Historical Monument Authority (the Office of the Conservator General) were also invited. Their discussions focused in particular on the realistic possibilities for saving flooded collections and other operations associated with their disinfection and conservation.

The conclusions reached were not as positive as they might have been. The disaster uncovered numerous flaws and areas of neglect in the system of protection for book collections in Poland. Practically none of the libraries had considered the possibility of a mass flooding of their collections. The importance of preventative measures had been underestimated, while plans of action in the case of a disaster were also lacking. Conservation units were unprepared for emergency action and lacked the necessary equipment and facilities – at least as far as disinfection chambers, freeze driers, freezing boxes and air driers were concerned. Further problems arose after the floods, about which decisions had to be taken by librarians, conservators and government functionaries managing financial means.

The meeting brought the libraries together and engendered a broader interest in the protection and conservation of book collections. It also resulted in many useful initiatives. The Nicolaus Copernicus University in Torun, the National Library and the Warsaw University Library signed an agreement regarding the formation of a National Council for Rescuing Book Collections from Flooding, which set itself the task of drawing up a programme for the conservation of the collections which had been saved and their protection against future disasters. The working group at the National Library also prepared a *Programme for the Conservation of Collections Saved from Flooding*, which contained proposals for further action to be taken on frozen materials and a number of conservation measures.

The following numbers of volumes have managed to be dried out using various methods and techniques:

- 700 volumes from the Wroclaw University Library – thanks to help from the Warsaw University Library, the Laboratory for Research into Heavy Ions in the Environment and the Central Archive for Old Documents;
- 2,000 volumes from the same library in Wroclaw – at the Central Library at the Nicolaus Copernicus University in Torun;
- 700 volumes from the same library in Wroclaw – at the Central Library at Gdansk Polytechnic;
- 700 volumes from the Wroclaw University Library and the Library of the Faculty of Law at Wroclaw University – with help from the Jagellon Library in Cracow.

Joint efforts have also resulted in the freezing of:

- 5,000 old books from the Higher Ecclesiastic Seminary in Nysa – 1,000 volumes at the National Library, the rest at the Central Library at the Adam Mickiewicz University in Poznan;
- 2,000 newer books from the Regional (Voivode) People's Library in Opole – with the assistance of the Central Library at the Nicolaus Copernicus University in Torun.

A total of more than 11,000 volumes.

On the whole the books dried by the various methods used have been assessed as being in poor condition. All the books required restoration or conservation, although books frozen and subsequently dried in a freeze drier were less deformed and mechanically damaged.

We decided to use state finances to buy freeze driers produced by AMSCO/FINN – Aqua – of a volume of around 1.2 m^3 for the National Library in Warsaw and around 2 m^3 for the Nicolaus Copernicus University Library in Torun.

Within the programme mentioned above justification was made for the necessity of effective

disinfection with a mixture of ethylene oxide and carbon dioxide in a suitable disinfection chamber (it should be noted that there wasn't a single near-hundred-percent effective chamber anywhere in Poland at that time). It was also emphatically stated that these books could be returned to their collections no sooner than six months following disinfection and that they should be subject to a microbiological examination beforehand.

The programme also stipulated the method for handling collections that had already been dried out and disinfected. A short post-flood record, representing the first authoritative diagnosis of the consequences of the floods, was also to be made out for each individual volume.

This record was to include the following information:

- the name of the library and the book number,
- the size of the object,
- a brief description of the construction of the book,
- a brief description of the state in which the book had been preserved,
- an estimate of the value of the item,
- a proposal for the conservation procedure and the anticipated working costs.

We have anticipated that some books will have to be completely restored, which will necessitate:

- the keeping of documentation,
- cleaning the item,
- use of an appropriate bath,
- deoxidisation,
- pasting,
- the replacement of missing material,
- the assembly of pages,
- reconstruction of book stitching,
- restoration of the binding.

Other books have had to be restored in part, which anticipated:

- cleaning pages without taking the entire book apart,
- or its being taken apart, followed by cleaning and pressing,
- restoration of the binding.

We have determined that the following will be required for restoration work and materials:

- around 15,000,000 PLN (i.e. 4,000,000 USD) for 5,000 old books
- 6,100,000 PLN (i.e. one million USD) for 6,100 books from the 19th and 20th centuries
- a total of 21,100,000 PLN (i.e. 5,000,000 USD)

The National Library in Warsaw had a work schedule, within the framework of which the Department of Book Conservation took on the drying and restoration of 1,000 items from the collections of the Library of the Higher Ecclesiastical Seminary in Nysa.

The Ministry of Culture and Art was accredited with the *Programme for the Conservation of Collections Saved from Flooding* and securing the financial means necessary for its implementation. Thanks to these efforts the ministry released money from the flood fund (i.e. the fund for repairing the damages caused by flooding) for further work with collections that have already been dried and frozen.

A disinfection chamber was also purchased for the National Library in Warsaw from these means. Prior to this, as has already been mentioned, the National Library had already received one freeze drier. Work on drying the frozen collection of the Library of the Higher Ecclesiastical Seminary in Nysa began in January 1999 following its installation. In addition to our own ideas, we also drew on the experience of all those who began drying collections during this time both in a similar freeze drier and using other methods.

The frozen collections delivered to the National Library contained around 180 old books and archive materials, a total of more than 1,000 items. Most of the books and papers were frozen to large lumps covered in layers of mould and mud. Before freeze drying even items which had not been defrosted were washed in running water and the outer surface of books and bindings coated with a solution of Aseps[t]in M in ethyl alcohol. The books were then put back into the freezing boxes.

Freeze drying is a slow process, taking several days, and sometimes even longer than ten days depending on how damp the items are and how many of them are placed in the dryer. The drying process was most effective when the frozen books were not placed too closely together in the freeze dryer. Every few days, and sometimes more often when it proved necessary, we opened the chamber and checked the extent of drying. We considered the objects dry when their humidity fell below 10 %. Thanks to this procedure we were able to avoid excessive drying.

We dried most of the books with leather bindings without removing the bindings. During the initial phase of drying, when the bindings (the first part of the books to dry) could be easily parted from the rest of the book, we wrapped the bindings in polyethylene foil, thereby insulating them from both the inside and outside and slowing the loss of humidity.

We weighed all the books both before placing them in the freeze dryer and after drying. We discovered that part of the dried collections was less wet and contained around a 40 % increase in water, while from the remaining part we removed as much as around 125 % of water in comparison with the weight of the books after drying. The two most heavily soaked books we came across weighed almost three times as much before drying as they did afterwards.

Another example was a set of small old books bound in parchment, which had not absorbed a

particularly great amount of water. As soon as we had wrapped their bindings in polyethylene foil we could dry the books without fear of damage. We removed only 12.6 % of water from these books in the freeze dryer, and this during a single day.

We wrapped all the dried objects in wrapping paper and placed them in a storeroom designated for this purpose. From samples taken we discovered that in spite of freezing and freeze-drying the collections showed extremely heavy microbiological contamination. Restoration work could begin only following repeated disinfection in a vacuum chamber using Rotanox gas (10 % ethylene oxide).

Disinfection took place in a chamber made by the Spanish company SUPHATEC. The disinfection line as a whole was comprised of:

- a double-door vacuum-pressure sterilisation chamber (model PJ 6.01) of a volume of around 1 m^3, a heating jacket, vacuum pump, compressor and steam generator for humidifying and heating the chamber,
- a ventilation chamber,
- an ETO Donaldson 100 for catalytic oxidation of ethylene oxide,
- a computer system running the entire process, including software ensuring its precise functioning and co-operation between the individual components.

In 1999 we began restoring old books. 10 restorers and renovation workers took part in this work outside working hours. In June 2002 we delivered the last batch of items following restoration – a total of 180 old books and 800 documents from the 19th and 20th centuries. The majority of these old books had to undergo complete restoration, i.e. they were dry-cleaned, washed in water with local use of preservative soaps, de-acidified, sealed with methyl cellulose, and their bindings restored or reconstructed. Brief descriptive and photographic documentation was produced for each item

We gained a great deal of new experience from the disaster that struck the southwest of Poland. Today we are better prepared to offer assistance to other libraries in the case of a disaster. Two large restoration centres in Warsaw and Torun have received equipment for drying books using the freeze-drying method, and the National Library now also has a disinfection chamber.

Our experiences have proven the rule that flooded collections must be frozen as soon as possible, preferably with 48 hours. Collections that remain wet for longer than this are liable to microbiological contamination. Returning them to their original state and appearance can happen only after lengthy disinfection and restoration, and this is extremely costly.

Considering the enormous effort and cost associated with dealing with the consequences of such a disaster, we can only conclude that it is better to avoid such disasters in the first place and to give our collections the commensurate protection, rather than to clear up the damage afterwards.

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II

When the Floods Came

The National Library, Prague and the Dangerous World

Michal Hora

"The current scene seems unusually dangerous.
It often does. Don't panic..."
Financial Times, 26 April 2003

The National Library: Initial security situation

- National Library resides in Klementinum – one of the largest complexes in Prague
- National Library (NL) is visited by 500 thousand to a million people a year (movement of visitors in buildings)
- the complex is technically and functionally obsolete

How are these aspects of the world at large reflected nowadays

- in Central Europe
- in the centre of Prague
- in the centre of the Baroque complex of Klementinum?

In this paper, crisis management is defined as a kind of managerial activity that must deal with serious threats to life and property, including threats that endanger the basic activities and functions of the institution in question, i.e. in the broadest possible meaning of the term.

1 The National Library five years ago and today

1998 – new statues and regulations governing procedures the NL's internal and external environments, new people (outsourcing used sporadically), inadequately staffed and funded

2003 – a number of people inside and outside the NL actively involved in crisis management, security and fire safety gained experience in managing emergency response teams during the worst flooding in Prague in the last 500 years

The budget for the protection of life and property has increased by 20 per cent (in constant prices) since 2000.

2 From a totalitarian regime to the jungle in brief

The second half of the 20th century ... – the zoo

- the Czech and Moravian communities – in cages of the totalitarian state, no freedom of movement, no freedom of expression, behind the wall and under the nuclear umbrella, no free press, living in the atmosphere of latent and often unspecific fear – live severed from the mainstream of civilisation

1989 to 1998 – The zoo disbanded

- period of transition, basic principles and everyday practice in an open society are being established, re-instalment of full freedoms, private property, the life of society, rules and customs are being redefined, specific and immediate threats of an open world are returning

All these things also affect the area under consideration.

What we have to deal with:

- more extensive individual freedoms, particularly with regard to movement and human rights
- migration of people living in different parts of the world
- and a related clash between cultural traditions in the broadest meaning of the word (politics, religion, life styles, etc.)
- information explosion (separation of relevant data from irrelevant ones)
- the necessity to set the extent of one's own responsibilities (observance of rules and regulations set in the democratic state)
- the necessity to set a certain level of empathy (how and when can and should I use my courage to help the society?)
- etc.

3 Recent history of the National Library and Klementinum in brief

1990 to 1992: internal and external crisis

reality of life: some of the books and documents are lying in heaps, the library resembles a haunted castle, untreated books confiscated in the previous period lie in cellars and are covered with mould, critical situation in communication with the Ministry of Culture and the public

response: The NL strived to deal with those issues while grappling with the problem of staff turnover and professional transformation following the fall of communism

1993 to 1996

REALITY OF LIFE: construction, completion and opening of the Central Depository, improvement in the situation of library holdings, further modernisation of the library both in technologies (automatic system) and personnel

RESPONSE: 1996 and early 1997 seem to be the relatively "happiest" period in the past 13 years

1997 to 1999

REALITY OF LIFE: economic crisis, slashes in budgets, the state of repairs of the library building is getting worse, the first suspension of preparatory work for the reconstruction of Klementinum, disastrous floods in Moravia (the most extensive in the country since 1890 – a reminder that such threats exist after a long period of no problems

RESPONSE: The plan of the main tasks includes conceptual tasks from the area of crisis management for the first time

REALITY OF LIFE: criminals will steal our cars even from the Klementinum courtyard, activities of mentally disturbed individuals grow in scope

RESPONSE: Klementinum now has gates and a checkpoint as if we were a military unit

2000

REALITY OF LIFE: a pyromaniac sets fire to a cabinet with documents in a remote corridor of Klementinum

RESPONSE: reorganisation of fire protection measures and library security arrangements – outsourcing

REALITY OF LIFE: the International Monetary Fund meets in Prague: fighting in the street of Prague for the first time since 1968–69, many aggressive people from all over the world, inhabitants of Prague are in a state of shock, beginning of real worries about security in the city as a whole

RESPONSE: a camera system is put in place in the compound, new protective measures for the Baroque core of the Library thanks to the Praha 2000 project

2001

REALITY OF LIFE: 9-11: is it necessary to add anything?

RESPONSE: a new control room for the security service put in operation in summer 2001, new emergency evacuation plan, new escape routes, evacuation drills

PANIC?

- we cannot give an answer to the question whether there is a threat of terrorist attacks in Prague, whether Prague is a part of the globalized world in that respect
- we, too, watch international students with distrust
- we, too, give out rubber gloves to the staff in post offices and document acquisition departments

PLUS?

- it seems that security instructions are not received with smirks and remarks about "communist" practices, but in a completely matter-of-fact manner and with understanding

2002

REALITY OF LIFE: August flooding was the worst Prague experienced in the past 500 years

RESPONSE: from now on, preparations for crisis management will be on a continuous basis

REALITY OF LIFE: NATO meeting in Prague, never before in its history Prague played host to so many world politicians

RESPONSE: inhabitants of Prague, fearful of chaos and terrorist attacks, leave the city in droves; Prague resembles a conquered fortress, Klementinum closes in the afternoon, it is impossible to guess what the situation will be like

2003

REALITY OF LIFE: everything about the war in Iraq is too new, new unfortunately is also SARS, and new also is the suspension of the reconstruction of Klementinum and of the National Library development, the Vltava River bed on the outskirts of Prague looks like it did centuries ago, it is not a river in the middle of peaceful Europe, it now looks exactly like the dry riverbeds in the Dolomites before torrential rains and floods

4 The situation in the NL before, during and after the flooding

Before the flooding

- team of reliable people built in the two years before the flooding
- department of protection of library collections had dealt with the issue of flooding for a number of years
- disaster-response personnel trained and stabilized in the central office
- basic directive for disaster response procedures in holdings issued
- other rules and regulations revised completely in 2000 and 2001 (evacuation procedures, fire protection, labour safety, etc.)

During the flooding

(for more details, see, e.g. *From the diary ... August 2002, in Bulletin NK plus, 3/2002*)

- in line with the library directive, emergency response team was set up in time and ad hoc extended to include several other specialists

- preliminary measures – until the evening on 12. 08. 2002 emergency response team leaders had to overcome criticism that the NL management was overreacting
- 12 – 13. 08. 2002: valuable documents and objects were moved to higher floors
- dozens of security measures taken
- the staff ordered to evacuate the building, based on the appeal of the Director and at one's own risk the core of the emergency response team was permanently in session in Klementinum

AFTER THE FLOODING

- disaster recovery – first things: telephone communication was restored a few days after the flooding, and a temporary substation was put into operation at the end of August 2002, 14 days after the water level reached its maximum
- crisis management board strived to improve internal Library guidelines: steps to be taken in the Library in an emergency declared by the Director), organisational and technical issues

THE MOST SERIOUS PROBLEMS

- at the level one step above ours – forecasts and instructions showed that the scope of the flooding was underestimated
- insufficient communication with our governing institutions, problems in communication between the Klementinum team and "the rest of the Library"
- legal problems at the very basic level, necessary makeshift arrangements (authorisations to enter the off-limits zone)

5 Conclusions

IN THE NATIONAL LIBRARY:

a we, too, often deal with problems from this area only in response to painful experience

b the reason is not only that the measures are expensive, but also because we wish to avoid being in constant conflict with people around us over the implementation of unpopular rules and their supervision

c in view of the fact that 1996 and a part of 1997 were the only "peaceful" years for the NL, we may speak, with a pinch of salt, of a permanent crisis management in the National Library since 1990

d issues of preservation and security have moved from the list of exceptional tasks (security, fire safety, etc.) to that of everyday management issues in the Library at both top executive and the administrative staff levels

GENERAL CONCLUSIONS:

a there are more threats around us:
- mental imbalance of individual people, aggressiveness (even among patrons)
- irresponsibility and risk-taking
- threats of terrorist attacks (not only political, but also terror and harassment of fellow citizens, e.g., bomb threats)
- "common" crimes
- risk of extensive natural disasters
- etc.

b we perceive dangers differently, the influence of the media is also evident
- between panic and cynicism
- people in the Czech Republic perceived threats differently under the communism than they do today, as if they only now have begun to freely perceive the true life and true threats

c we have a tradition of cleaver improvisation, now we have to catch up with the world in the area of development and observance of rules of the game and in technologies

d a banal incident in the security area may signal bigger threats, moreover it is a demonstration of our vulnerability

e psychologically demanding – we must be ready to face threats seven days a week

HOW TO SUCCESSFULLY DEAL WITH DISASTER SITUATIONS

FOUR NECESSARY PREREQUISITES:

1 carefully thought out rules of crisis management and thorough disaster response drills

2 ability to improvise within the framework given by the rules

3 basic equipment (particularly in monitoring and communication)

4 a team of competent and complementing personalities that can handle stress

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The Crisis Centre for Libraries Affected by Flooding

Františka Vrbenská

Introduction

Libraries in the Czech Republic were affected by flooding in 1997 and 1999. During these crises the staff of the Department for the Protection of Library Collections at the National Library of the Czech Republic systematically endeavoured to obtain information about the cultural institutions affected by the floods, to find assistance for them, and to themselves make an active contribution towards resolving the situation. In their efforts to help the libraries affected they were able to make use of foreign know-how and experience obtained from similar catastrophes in the past, and to offer the services and know-how of the restoration and conservation facilities at the National Library's Central Depository in Hostivař. In spite of their tragic consequences there was paradoxically also a beneficial aspect to these natural disasters, since invaluable information could be drawn from them (even if at an extremely high cost).

Involvement in the project Blue Shield represented an enormous advantage for the Central Depository programme that collected and processed information on the prevention of natural disasters, action taken at the height of such catastrophes and the subsequent repairing of the damages. The National Library of the Czech Republic has prepared a set of instructions aimed at preventing and resolving disasters caused by natural and human factors, with a particular view to collections affected by water. It has tried to distribute this material and has placed an extract from the text in the SKIP section on its webpages. All the previous experiences and accepted methods unexpectedly had, however, to be reconsidered and examined during the floods of August 2002.

Time and place

As was the case during previous floods, the Department for the Protection of Library Collections at the National Library of the Czech Republic again decided to form a crisis station to map out the extent of the damage and attempt to contribute to the situation by providing both consultation and direct aid, which it would organise, co-ordinate and implement.

The ideal situation would represent a group of experts in the resolution of crisis situations specialising in conservation and restoration, which would work in suitable office premises and have at its disposal a motorised courier, a removal firm, a freezing truck, internet connection (not to say telephones/ /GSM), a large stock of the necessary materials and premises for storing rescued documents, and a lease agreed in advance on areas in freezing plants. This group should spring into action as soon as the flooding began.

Previous floods have, however, shown that roads become impassable, telephone and internet connections are lost, electricity supplies interrupted so that mobile phones cannot be recharged, removal firms themselves are either affected by the floods or overworked, only extremely preliminary and rather vague agreements can be made with freezing plants (even assuming that they are operating properly and not affected by power cuts), and spare storage premises are unavailable.

During the August floods the situation facing the National Library was further complicated by the fact that the Klementinum was evacuated and the building then itself flooded, which led to telephone lines and the internet being knocked out. The internet also ceased to function at the Central Depository in Hostivař. The Reserve Collection Depository in Neratovice was also flooded. A number of employees were either cut off from their places of work by the lack of transport (the stoppage to the Prague Metro, damage to roads outside Prague) or evacuated. More than one of our employees either lost their home or had friends or relatives affected by the floods.

Nevertheless on Thursday 15 August, while the floods were slowly receding, a co-ordination centre began operating at the Central Depository in Hostivař with the aim of assisting libraries in particular and perhaps additional cultural institutions as well. A crisis team for archives also began operating at the State Central Archives in Chodovec. Although the two groups worked independently of each other, they did co-operate on a number of problems and provided each other with expert advice, operational information and supplies of the required materials.

Conditions and goals

With the benefit of hindsight the work of the Crisis Centre can be divided into three phases – the initial "start-up", when the group was put together and its working methods defined (15–19 August), the critical "emergency" period (most of the next fortnight) and a final "consolidation" phase from the beginning of September to around the middle of the same month. The priorities of the Crisis Centre and the scope of the individual parts of its work changed according to the way in which the situation developed and in the context of how the given problems were gradually dealt with.

The tasks facing the Crisis Centre from the beginning had to be divided into a number of basic sections:

- determination of the location and the extent of the damage;
- consultation relating to primary emergency measures;
- determination of freezing capacity;
- procuring the material necessary for emergency action and for the transportation and subsequent treatment of damaged documents;
- recruiting volunteers for emergency work;
- making contact with specialists from the Czech Republic and abroad and holding talks with interested parties (institutions) in the Czech Republic (e.g. People in Need);
- procuring dehumidifiers and preliminary research into the possibilities for drying;
- seeking expert, material and financial help in this country and abroad for the subsequent process of restoring the library collections affected;
- communication with foreign cultural/state organisations, with the Czech media (first and foremost radio) and the general public.

In addition to this the staff of the Crisis Centre were faced with the necessity of caring for the volumes in the reserve collections affected by the flooding of the National Library depository in Neratovice – periodicals from the period from the middle of the nineteenth century to the nineteen fifties. Although this was, in terms of the collections of the National Library of the Czech Republic as a whole, only a category four collection, the cultural value of these titles is far from negligible and, what's more, they could now be purposefully used in connection with the reparation of the flood damage.

People and staffing

The staffing of the Crisis Centre varied from four to ten persons according to the available possibilities, since it was necessary, particularly during the first fourteen days, to cover the period from six thirty in the morning until late into the night, even at weekends. The team was comprised first and foremost of members of staff from the Department for the Protection of Library Collections, although it also included employees from the Department of Librarianship and the Public Relations Department, whose assistance was extremely important in dealings with libraries and cultural institutions in the Czech Republic and abroad.

We had landline and (mostly private) mobile telephones, while the absolutely essential internet connection was provided through a modem, though this unfortunately proved slow and unreliable, since a number of internet portals were offering current news reports on the flood and the emergency action taken, from which the staff of the Crisis Centre could draw valuable information. Greatest use was, however, made of traditional and highly flexible writing implements and notepads. Records, notes, messages, reports and instructions were, if possible (which it generally wasn't – particularly during the first two extraordinarily demanding weeks, when the telephone lines were almost white-hot), recorded separately according to the individual categories of problems outlined above, or were sorted subsequently. They were then transferred into databases on computer, and those that might prove useful for other institutions affected – contacts and specific procedures – were put onto the web in co-operation with the Department of Librarianship.

The situation placed great demands on the staff of the Crisis Centre. It tested their teamwork, their communication and organisation skills, and even their improvisational skills, inventiveness and strong nerves. Literally dozens of talks were held from early in the morning to well into the night, many of which certainly did not lack an emotional dimension. Although the focus of the work was damaged and destroyed documents, the activity of the Crisis Centre was dominated by inter-personal relations. Much depended on the self-sacrifice and willingness of the kind of people often referred to as "ordinary", and on the obliging approach taken by a number of business entities, whether this entailed providing freezing space free-of-charge or materials for wrapping wet books.

The group of people on the other end of the telephone was made up of administrators of library collections and cultural institutions, determined to rescue at least part of their flooded collections, desperate individuals who had lost a library they had been building up all their lives, the groundwork of their scientific work, company documentation or a valuable collection of family photographs. It is difficult to distil purely objective information or any essential core from these days (and nights). Each call was a small drama or personal story, which ended, for example, in a solution for some historical documentary films damaged by water.

User's guide

The initial task facing the Crisis Centre was to determine or predict as best as possible which institutions had been affected and to offer them help. Some institutions contacted us themselves, while we checked ourselves that others had been missed by the floods (sometimes by a combination of curious coincidences), while others in contrast found themselves underwater (not infrequently due to a set of coincidences no less ironic). The essence of the problem lay in the fact that the telephone lines were usually down, which meant either that the institutions in question were not in contact with the damaged collections or that the flooding had reached the given location and cut off communications, but had missed the library. In both cases it was hard to find the persons responsible.

The Crisis Centre worked to a great extent as mediator and co-ordinator. We sought freezing facilities, crates, volunteers, plastic sheeting, respirators, protective gloves, disinfectants, dehumidifiers and expert help from at home and abroad. We passed on information, contacts and materials to those who needed them. The situation was, however, further complicated by the collapse of transport in Prague and by the large area that was impassable at that time (Karlín, etc.). We were helped enormously by enthusiastic volunteers who offered to transport the necessary consignments to their destinations without charge.

An important part of the direction and co-ordination performed by the Crisis Centre was methodical and expert support during "first aid" for flooded collections. The way in which wet books were handled and the time which elapsed between them being removed from the water and mud and being put into the freezers had a significant impact on the success of their rescue. The State Central Archives put guides to the treatment of documents of the most varied kinds out onto its pages, which helped many people and saved innumerable documents. The National Library of the Czech Republic placed a similar guide (though in rather more populist form and designed for private individuals and small businessmen) on the pages of Neviditelný Pes. It was interesting to see that many readers also contributed practical tips relating to modern media carriers.

In spite of the fact that the Crisis Centre operated first and foremost for cultural institutions, it also answered questions from and provided consultation to members of the general public (two-hundred-year-old parish chronicles also surely deserve to be saved...). We ourselves also obtained valuable knowledge from the public. A scientific worker offered a small freeze drying unit, a retired professor offered an effective disinfectant, a businessman offered a deep-freeze, others offered computer repairs, including HDD data retrieval. This was also the source of the idea of using a timber drier to save books soaked with water.

And next time?

Although we tried to advertise the activities of the Crisis Centre in many and varied ways (the same ways, in fact, as the National Library of the Czech Republic itself cried out for help, both for itself and for all the other institutions affected) and ourselves addressed institutions whose book collections had been affected by flooding, we still found out about collections destroyed by the floods and about continuing problems with repairing the damage long after the waters had receded and life got back to normal.

If such a natural catastrophe should occur again in the future and it should prove necessary to reform the Crisis Centre we would, on the basis of our past experiences, we able to better organise its activities and more easily perform the tasks this work entails. The ideal situation would, however, be for the services of the Crisis Centre to never even be needed in the future thanks to an adequate level of prevention and the preparedness of cultural entities for crisis situations excluding the possibility of significant losses to book collections.

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Holdings of the Municipal Library in Prague and Flood

Zuzana Kopencová

Annotation:
Holdings of the Municipal Library in Prague – location, structure a composition. Evacuation operation before water reached the highest point. Flooding of the holdings – damage and consequences. Rescue work – progress and organisation. Post-flooding activities – fundraising. Library holdings: current situation and future prospects for drying the library holdings.

Last year with the devastating flood was a fateful year for many institutions and individuals. The Municipal Library in Prague, which celebrated its 111 anniversary that year, was no exception: the flood inundated its Central Library at Mariánské náměstí Square, district libraries in Karlín and Holešovice suburbs, and the holdings of the Municipal Library in Prague.

The holdings of the Municipal Library in Prague (MLP) were located in the depository at Ortenovo náměstí Square in Holešovice, where about 20 thousand rare and historic prints and more recent documents (luxury editions, graphics, maps, theatrical materials, documents about Prague, etc., were stored. The depository also included workshops of conservators with instruments and materials, and a cataloguing department.

After a meeting at the crisis management headquarters in the MLP on the Mon 12 August 2002, the first most valuable documents were moved to the elevated ground floor of the depository. The evacuation continued the second day from the early morning. The most valuable documents were moved either to rooms on the elevated ground floor, or to upper shelves in depositories. We were convinced that we had done the maximum to ensure the proper safety of the holdings. The Emergency Response Headquarters for Praha 7 and the city police, with which we were in permanent contact, did not expect any threat to the building by the rising water. Unfortunately, water at its highest reached the 1.5 m mark in the elevated ground floor. All the holdings were in murky, muddy water.

The period between 13 and 15 August, when the entire area was off limits and we were not allowed in the depository, was full of anguish and seemed endless. We used that time to search for information on options for salvaging wet books, and repeatedly requested the permission to enter the depository premises. The permission was granted in the morning of 16 August, and the rescue operation was started immediately. Water was pumped and dozens of volunteers began to help with the books. Each book was rinsed, carefully put in a plastic bag, which was then put to a transport crate. A frozen food producer (Mochovské mrazírny, a. s.) obligingly provided trucks and shipped the crates to their plants. Freezing was the only possibility how to prevent the formation of mould, conserve and store the documents until they can be dried and restored. Librarians, students, scouts and other volunteers donned rubber boots, masks and gloves and the rescue operation continued

for three days, 24 hours a day. Our worst enemies were the time, fatigue and the hot weather. Finally, late in the afternoon on 19 August, the last batch of books was shipped for freezing. That marked the end of the first leg of our journey to unknown territories, and the question was what to do next.

With our books and documents stored in a freezing plant, and other collections, and the conservation and cataloguing departments destroyed, we knew much too well that we won't be able to do anything at all without significant funding. We thus focused all our activities to win sponsors, donors and grants. By the end of the year we collected a total of 1,300,000 Kč for drying, for the building of a workshop for restorers, and air-conditioned depositories. We were very grateful to the National Library in Prague for letting us use its Central Depository in Hostivař for some time.

The drying started there in November 2002 with rented vacuum packing machines.[1] Vacuum packaging is a very friendly method, its only disadvantage is that it takes much time. If we proceeded at that pace, the drying of our collections would take more than seven years. For that reason, we looked for some other method that would be suitable for our holdings and, at the same time, would help us do the job much faster. We found it in the timber-drying plant at Kralupy nad Vltavou run by the National Library in Prague. In the Kladno cooling plant, documents in leather, combined and parchment bindings, for which vacuum packaging was to be used, were separated from paper documents, which were subsequently dried in the timber-drying plant. The sorting of documents was completed in mid-May, and the last batch of paper books was shipped to the Kralupy chambers in early June. Of the total of 41 pallets with 386 boxes of frozen documents, only 65 boxes have not been dried yet. Documents in these remaining boxes will gradually be dried using vacuum packaging lines.

Most of the holdings has been saved, but there is still a lot of work to be done. The drying must be completed, documents sorted, stored in a proper way and then restored. The reconstruction of the new building where the depository, restoration and cataloguing departments will also be located will be a difficult task.

We went through a very difficult period, full of hard work, minor failures and successes, groping and resolutions. But now we also know that we are not alone in our endeavours, that there are many enthusiasts among librarians, conservators, volunteers and institutions that we can turn to in crisis. We owe them our thanks and gratitude.

[1] The drying operation in the Central Depository of the National Library in Hostivař was terminated at the end of September 2003, and drying of valuable documents from the historical collections will continue in the National Library in Prague.

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The Library at the Museum of the Co-operative Movement Following the Floods of 2002

Vladimíra Vávrová

The library at the Museum of the Co-operative Movement, run by the Co-operative Association of the Czech Republic, is a small library which, at the time before the floods in 2002, held around 12,000 volumes of literature on the co-operative movement and the history of the movement in the Czech Republic and the former Czechoslovakia. Specifically it covered the establishment and development of housing, consumer, production, agricultural, credit and non-credit and other co-operatives, co-operative legislation, and so on. The oldest publications dated back to the 1870s and 1880s. Around 2,000 of the titles in the library were foreign co-operative literature, kept as a separate department of the library. Another 2,000 or so volumes were copies of volumes already contained in the library. The library also contained archive documents, such as correspondence from the estates of a number of important figures in the co-operative movement during the period up to 1945, hand-written records from meetings of the first co-operatives, and such items as posters, promotional leaflets and so on. The collection of co-operative literature held in the library at the Museum of the Co-operative Movement in August 2002 was unique in the Czech Republic.

Emergency work following the floods

The exhibits at the Museum of the Co-operative Movement, its depository and library were located in the basement of the building of the Co-operative Association of the Czech Republic on Těšnov Street in Prague. This meant that these rooms were flooded to the ceiling when the waters rose. For the sake of completeness I might add that the water on the ground floor of the building rose to a level of around a metre and a half. Although it did prove possible to remove the most valuable documents before the flood, this amounted to a negligible proportion of the collection as a whole. The library was underwater for about five days. Unimaginable devastation was left when the waters finally receded. Wrecked shelves and piles of books swept by the water into a single heap, all covered with a layer of mud, fallen plaster and other dirt. The situation was further complicated by the fact that it wasn't at first possible even to get into the museum and library, since the areas in front of the exhibitions and the library had to be cleared first. Work on rescuing the books could only begin after another two days. The books were then gradually moved to the yard behind the buildings, where salvageable items were picked out. These were then rinsed with water, packed into plastic foil and frozen. Sadly more than half the books and a large part of the archive documents had been completely destroyed and could not be saved.

Help from the National Library of the Czech Republic

At the beginning of this year the frozen items from the library's collection were dried in the National Library's specially modified timber drier in Kralupy nad Vltavou. After drying, the books and documents were put through a disinfection process at the State Central Archives.

Thanks to methodical and specialist help from the National Library of the Czech Republic, both during our emergency work and during restoration of the frozen items, we were able to bring the part of the collection of the library of the Museum of the Co-operative Movement which we had managed to save back to "life" in an extremely short period of time – something less than six months.

The library and the Museum of the Co-operative Movement now

The Museum of the Co-operative Movement and its library, as an important source of information on the history of the Czech co-operative movement and its standing in the present day, represent part of the educational activities of the Co-operative Association of the Czech Republic. The library is used mainly by university students and lecturers and scientific workers. For these reasons the board of the Co-operative Association of the Czech Republic has decided to reopen the Museum of the Co-operative Movement in new areas which, for precautionary reasons, are located on the 1st floor of the building. It has also provided the necessary material and technical assistance for the creation of a new permanent

exhibition, which opened in March of this year. Work on opening the library collection is also in progress. With the exception of the necessary "cosmetic" work on bindings and covers, and further cleaning work on a number of volumes, it will again be possible to make full use of the books, since the majority of the publications rescued are in an extremely good condition.

The library has also obtained new additions to its collection from private donors and from the Centre of Information and Library Services at the University of Economics in Prague. The members of the Co-operative Association of the Czech Republic have also been asked to turn to their various co-operatives and former members with a request for help in supplementing the collection.

Conclusion

I would, in conclusion, like to thank the staff of the National Library's Central Depository in Hostivař in Prague for their willingness and for the expert, methodical and practical help provided to the library at the Museum of the Co-operative Movement during the period directly following the floods and onwards until the final drying-out of the books rescued. I have to say that without their help it would hardly have been possible to save as much as we did. I would also like to take this opportunity to express my admiration for the work performed by the team of experts from the National Library's Central Depository who, in an extremely short period of time, modified a timber drier in Kralupy nad Vltavou and operated a system for drying frozen books which was technically perfect, effective, and gentle on the books and other archive material. Following this drying process these documents are in an extremely good condition. This work certainly saved extremely valuable items for all the institutions that used the system. I am sure that the experience gained during the course of the work and in evaluating the results of various methods for drying and restoring frozen items will be used in further research to perfect the methods to be used in similar disasters in the future, and will also prove inspirational in taking effective preventive measures.

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August 2002 Floods and Library of the Institute of Philosophy of the Academy of Sciences of the Czech Republic

František Pospíšil

Abstract:
During the floods in August 2002, the depository of the Library of the Institute of Philosophy of the Academy of Sciences of the Czech Republic and the Institute of Sociology of the Academy of Sciences of the Czech Republic was flooded by the groundwater that seriously damaged and partially even destroyed a substantial part of the greatest collection of the books on philosophy a sociology in the Czech Republic. Circumstances of this crisis, approach to its solution and selected methods of reconstruction of the library (content, spaces and registration) are a source of experience which can be of more general significance and importance. The author tries to summarize and assess the experience gained.

The philosophic and sociologic library of the Institute of Philosophy of the Academy of Sciences of the Czech Republic was damaged seriously during the last year's flooding, certain other libraries of the Academy of Sciences of the Czech Republic alike. This basic specialized library, which provided library and information services for the Institute of Philosophy of the Academy of Sciences of the Czech Republic and the Institute of Sociology of the Academy of Sciences of the Czech Republic, was collecting and gathering step by step since the time of their establishment (philosophic library in 1955 and the sociologic library in 1966) nearly the complete Czech and Slovak production of philosophic and sociologic publications and high-quality selection of specialized foreign literature. Certain other rare specialized collections, e.g. the collection of literature concerning the issues of science, philosophic issues of the environment (the so-called Rockefeller Foundation), the collection of literature focused on education of adults, etc. were also available in the library. We can quote from the press that "it was the library, unique in the Czech Republic from the point of completeness, richness and variety of book and magazine collections"; the library was utilized by nearly the whole community of philosophers and sociologist.

The reading room with the reference library, the loan protocol and other operating rooms of the library were (and are) located on the ground floor of the building of the Institute of Philosophy in Jilská Street 3. The depositary of the total area of about 400 m^2 was situated in the basement of the company; as many as 85,000 volumes were stored here in the compact racks, i.e. the prevailing part of the collection numbering over one hundred thousand volumes. The literature was processed as the name and subject catalogue in the card form and in the computer form since 1993. The library catalogues were available in the scanned form till 1998 and after 1993 at the same time as the integral part of Linca database on the Internet.

The planned inspection and audit of the library collections was running during summer months in 2002; the inspection confirmed good condition of registration, organization and storage of the collections. Before the floods, the library represented a well equipped, organized and frequently visited workplace which was also evaluated positively by management of both Institutes.

The damage was caused particularly by the groundwater, most probably from the sewer (although the water was relatively clean), which flooded the majority of the underground depository between 13 and 15 August; the water reached the level of up to 2.75 meters in certain rooms, i.e. the level of the top rack edge. Loss of the major part of the books (about 55,000 damaged or destroyed volumes) is the main flood damage of the library. Cancellation of the existing depositories and the necessity to use the reading room and other rooms of the library and the Institute (conference room) as temporary depositories is a real catastrophe for normal operation of the library. Catalogues, library database and complete records/ /files of the library and the whole ground floor with the reference books and equipment remained unaffected (though the threat of flooding of the Old Town quarter was imminent), but due to arisen nonconformity between the data and the real situation they are no more applicable. The library thus fell into the temporary regime, though since January 2003 we are again able to provide complex services for our Institute staff.

Location of library depositories in the basement for the period of reconstruction and conversion of the building for the library (as well as for certain

technical installations) was quite common in Praha in 1960s due to lack of storage spaces in the center of the city and due to statics of the buildings; such installations normally passed the approval procedure. According to the expert opinion from the 1980s, our depository located on the far edge of the inundation area, should in principle be safe even in case of a "centenary" flooding. Materially reduced risk of large flooding thanks to the system of constructed dams was anticipated.

The recent experience has revealed with open severity and cruelty that the risks of possible future flooding (considered controllable officially) have to be taken into account and the workplaces have to be reconstructed correspondingly, i.e. to safeguard the depositories or to relocate them to the safe place. This requirement is for our library, the majority of affected libraries alike, a great problem due to lack of adequate rooms and due to the fact that the basic literature must be available within the bounds of the workplace. The libraries usually consider refurbishment of the existing depository or one part of it, but safeguarded and protected fully from water leak, the primary possibility. From the psychological point of view this idea is rather daring, but we can find positive examples in this field.

The situation is often resolved by creation of separate (detached) or even common remote stores – with reference to the experience of large multidisciplinary libraries. For medium-size and minor specialized libraries such solutions represent reduced level of services. Certain opinions even call necessity of depositories in question. I think for instance that in connection with depositories we cannot argument by the awaited change of information carriers. Books and magazines are still the main carriers of information, more and more specialized books are published; prevalence of electronic publications is awaited only in the mid-century. The libraries for natural and technical sciences also accommodate large depositories in the new buildings. Moreover, philosophy and other humanities consider the long "half-life period" of philosophic information, i.e. the necessity to store the publication in different editions.

The Institute of Philosophy wants to solve a new depository by extension, by partial utilization of the least affected rooms of the former depository and by the anticipated common depository of the academy of Sciences of the Czech Republic in Jenštejn. It is evident that implementation of these plans would change the existing layout of the library quite materially.

What could be done in the crisis situation on the workplace more for rescue of the collections? I think that the flood revealed fully that possibilities for personal decisions are largely limited in the situation of natural disasters and that decisions as such are hierarchized to a high degree. The library is the integral part of the territorial unit, the staff members are submitted to instructions of the centers which determine priorities on the basis of available powers, means, funds and information. Personal decisions are adopted under pressure of time and cannot not be corrected any more.

On the basis of the information granted by the Police of the Czech Republic which concerned the imminent risk of break of the protective barrier on the bank and subsequent flooding of the Old Town quarter we stopped evacuation of the depository (13 August) in the library of the Institute of Philosophy and cleared the ground floor of the library for certain hours. We were forced to evacuate the building on the same day, though the depositories of the library were flooded by groundwater only one day later. We can regret the time which could be utilized for organization of complex evacuation of the collections from the basement, but the then decision was most probably correct – nobody could take the risk of presence of tens of people in basement of the building, which they could never come out from.

The center is even today criticized frequently for certain decisions that affected the possibility of relocation of a higher number of volumes in due time. The floods drew attention to the need to better safeguard libraries and their holdings.

Though we suspected, we were unable to anticipate fully the hard and long-term work connected with renewal of the library after the flooding. Rescue works were started immediately after the water was drained out of the flooded depository (16 August). By exerting every effort and under assistance of volunteers we succeeded to relocate about 25,000 volumes within the requested term (48 hours) into the refrigeration plant of the company Rovner in Brno, where they were heat treated. The company Rovner stored our publications till the end of the year free of charge and since January 2003 for the price of about CZK 4,000 per month. We were unable to rescue some 30,000 volumes. Today we are acquainted well (other affected libraries alike) with the procedure of rescue actions, but in August we were in urgent need of quick specialized assistance which was granted by the staff of the National Library by the personal visits, particularly by Mr. J. Vnouček. Other possibilities to obtain the necessary information were limited, workplaces of the Institute had no power, computers and telephones were therefore useless. Mobile telephones represented the single source of communication. These facts have to be considered when speaking about readiness to possible future crisis situations – a simple procedure (written document) how to rescue endangered and already damaged collections is of the top importance and must become the integral part of the crisis plan.

Taking in view complexity and price of the future drying, the publications rescued by us represent selection of the more valuable part of the collections (in the sequence of the foreign specialized literature and then the older Czech and Slovak specialized literature) as it could be done in difficult conditions – thanks to extraordinary selflessness and devotion of specialists and scientists of the Institute.

The purpose of drying is to minimize the damages caused by the flooding, but it is only the "complementary" method of library stock renewal, i.e. where the books cannot be replaced by another method. Drying and related processes are very popular, but the technical quality of this way rescued books differs materially. The process of drying is organized in the Academy of Sciences by the "humid heat" method which is satisfactory, because our objective is to put the necessary books at the users' disposal as soon as possible – old books were fortunately stored on the ground floor of the library. Nowadays about one half of the frozen publications has already been dried and disinfected – the Central State Archives assisted materially with disinfection. Condition of one third of these books, particularly the unbound ones, can be considered good from the technical point of view. The majority of the remaining two thirds of dried books need to be re-bound step by step or put into protective containers, certain books will be rejected additionally. To renew the stock – particularly the magazines – we work towards participation in the digitization programs. All dried and disinfected books have to be stored out of the remaining library stock for several months in order to check efficiency of carried out disinfection. We hope that this way stored and treated books will be "accepted" by the readers and used normally.

The old philosophers usually have books on their portraits, attributes of their science. Photographs of modern philosophers accommodate books as well. Books and magazines are also of material importance for temporary philosophical knowledge. Damage and loss of the library stock therefore became the matter for all Institute staff members as well as for the major part of the philosophical community. Flooding of the library met with a lively response in the mass media; it turned out that the library was well known and evaluated even among the wider public – the articles concerning flood damages in the philosophical and sociologic library appeared in the dailies (Lidové noviny, Právo, Mladá fronta) and magazines (Literární noviny, Akademický bulletin), etc.

Immediately after the scope of the catastrophe was determined preliminarily, the Director of the Institute turned to the Czech and international philosophic public and institutions with the declaration and request for help on behalf of all staff members. The action met with a good response from the very beginning. The workplace was prepared for the whole action. The call, placed incl. other information materials on the web site of the Institute, was accompanied by the calls send by individual working groups and individuals to their foreign partners with information of the arisen situation and with the request for help, because the call itself is the basis only, but its success must be supported by complex negotiations and personal engagement. The initiative was very effective, because the whole width of the international cooperation and contacts in the field could thus be revealed.

Our approach to renewal of our library stock was selective from the very beginning in order to improve its quality. Our efforts were focused not only to map our losses, but also to create an interim "virtual" concept of the new library, i.e. the computer files of what books will be necessary (naturally linked with the losses incurred). This approach, applied consistently by the Institute, could be considered the basic feature of the reconstruction of the library holdings. The new holdings will not be simple a "copy" of the destroyed collection, because the topics, approaches and language orientation have shifted significantly even in philosophy. The English language will be represented by the major share in the holdings, though in 1990s, foreign philosophic literature in our library was represented mostly by works in German (22.5 % – German, 13.5 % – English, 7–8 % – French, 4 % – Latin). It also reflects the fact that the greatest response tp our call for help came from the USA and Great Britain – the most comprehensive collection was organized and gathered in the USA. The French literature is obtained from the events organized by the CERFES Institute – only and exclusively on the basis of our lists.

Today we can estimate that thanks to the donors from abroad we will obtain at least 15,000 volumes of book and magazine literature; the publications are mostly of high professional value (the donation of about 10,000 volumes is anticipated from the USA).

The collection of Czech and Slovak literature, organized by the library itself, also runs with very good results. The library has obtained about 1,500 volumes of book and magazine specialized literature from tens of donors and institutions. The main assistance and help is represented by financial donations. I would like to point out personal financial donations of staff members of the Institute and other philosophers; important financial subsidies were granted by the Ministry of Culture of the Czech Republic, by the Huss Foundation, Vize Foundation, SKIP and other institutions. These contributions all in total represent nearly one half of our annual budget for purchase of books/magazines.

We assume that book and magazine donations will contribute materially to renewal of the library stock both from the point of content and quality; thanks to the donors we can eliminate the replaced books from the process of drying. We are unfortunately sure

that many titles (e.g. the older Czech philosophical literature) will not be obtained in this way. Therefore drying of publications is still of material importance, despite great success of collections.

To point out that the staff members of the Institute appreciate all donated books and magazines highly, the usual letter of thanks will be supported by the list of donors glued into each publication as a special, the so called "Flood List".

Renewed operation of the libraries affected by the flooding and renewal of the library stock by collections and drying are resolved in most cases in a wider context of institutions, librarians and users, whilst processing of the newly obtained literature and reconstruction of catalogues is often understood the matter of librarians and its time consumption and complexity is often underestimated. The annual acquisitions of our library amounted to 2000 books and can be considered one of the highest acquisitions in the Academy of Sciences. It can be calculated easily that without extraordinary extension of the library staff the library processing of donations will become the main and long-time problem, taking in view the current acquisitions.

Creation of current valid records and book discarding will not be less demanding and time consuming. In our library this activity is linked with automation of the whole library stock, thus converting it into the matter of principal significance.

The disaster has also influenced the affected workplaces in other important aspects. In our case it was decision of the Institute of Sociology to create a separate library of the Institute of sociology since 1 January 2003.

The floods of 2002 brought about a substantial change in nearly all aspects of operation of the Library of the Institute of Philosophy and Sociology, more complex changes compared with other libraries, although some of them might have been damaged more seriously than our library. The hard-won experience from the crisis and its consequences will hopefully be reflected in more consistent attention paid in the future to risks and hazards, and more comprehensive efforts to protect the library stock and another property of the library. In any case it will be the work and practice of the "successor" libraries which will most probably differ substantially from the library visited by its patrons before August last year.

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The Institute of Archaeology of the Academy of Science of the Czech Republic and the Floods in the Year 2002

Martin Tomášek

Prague's Lesser Quarter has been home to what is now the Institute of Archaeology of the Academy of Science of the Czech Republic for a number of decades. The baroque palaces have served as storage for documentation on archaeological finds in Czechoslovakia since the first half of the 20th century. Specialist studies and books on primeval times and the Middle Ages in the Czech Republic and elsewhere in Europe have been produced here for decades. It also houses reports on archaeological investigations conducted all over the Czech Republic, photographs of localities and objects and, not least, a systematically assembled archaeological library. This "in-house" library and archives have long been sought out by experts, students and members of the general public alike, who found much to enlighten them here. The institute's collection of hundreds of thousands of items weighed heavily on the floors of the buildings at Letenská 4 and 6, where they were found by the swollen waters of the River Vltava on 14 August 2002. The waters rose to a height of 2.8 metres in the vaulted rooms with their invaluable archive materials. 70,000 books, hundreds of thousands of pages of plans and photographs, restoration laboratories, the laboratories of the Department of the Natural Sciences and other premises felt the encroaching wet darkness...

When the staff of the Institute of Archaeology of the Academy of Science of the Czech Republic in Prague remember the rainy morning of 12 August 2002, when neither the sky nor the weather report augured anything good, they can't help thinking that something went wrong. The soothing reports from the media about the situation and the unanswered and engaged telephones of the Prague 1 crisis team engendered a feeling almost of safety. A cursory comparison with the level reached by the last massive flooding in the area around our buildings, on the contrary, indicated the necessity for an evacuation order and the institute preparing for significant flooding, while all the talk was still of something far less serious. Some of the archaeologists, technicians and other members of staff present spent the whole day carrying heavy map cases, books produced by the institute and pieces of equipment up to the first floor. Others moved all delicate material, such as negatives and photographs, up to a height of more than one metre. The same was done in the library which, due to the building's statics and repair work, was unfortunately housed temporarily on the ground floor of the institute. In the morning of 13 August the mere dozen or so people who had managed to get into the building carried hundreds more books up to the first floor. The police evacuation order brought their efforts to a halt perhaps a little too soon...

The next few days were a time of hope, followed by despair, and finally a time when only mobile phones made it possible to prepare to save what it was still possible to save, and then all that could be done was to think about future restoration. Thanks to help from Deputy Prime Minister Petr Mareš, the first employees and volunteers crossed the police barricades into the buildings in the morning of Friday 16 August. The devastation caused by almost three metres of water gave little reason for optimism. A plan for saving part of the collections, or at least putting off their final destruction, had, however, already been prepared. Books were sorted and some of them destroyed on the spot. The rest were washed in running water, wrapped in foil in groups of five and taken to the freezing plants in Mochov for freezing. Plans were washed and dried, before being disinfected and put into temporary storage. They are now awaiting digitalisation. Photographic negatives and positives were treated in a similar way. In spite of considerable losses (amounting to tens of percent) the first fortnight after the floods can be said to have been a successful effort by hundreds of people. More than half of the irreplaceable items in the collections had been saved, or at least enough time had been gained for them to be reproduced in digital form before their irreversible destruction.

Word of the catastrophe that had befallen European and global archaeology in Prague spread around the world by e-mail during the first few days of the tragedy. Financial help and (most importantly for us) gifts of books for the devastated library soon began to arrive. In October 2002 two freezing trucks filled with 35 tons of frozen books left the Czech Republic. This unusual load was headed for Denmark, where the Association of Conservators for the Ribe and

Ringkøbing Regions (Konserveringstjenesten for museerne i Ribe og Ringkøbing amter) had organised the transportation and is now handling the drying of the books at the association's headquarters in the town of Ølgod. It has also taken on all the costs of the work. In drying the books they are using a method known by our Danish colleagues as *arctic freezing*. The principle of this process consists of driving cold air into a closed container, followed by subsequent moisture separation. Drying of the first third of the frozen collections is currently being completed, and the original 35 tons of Vltava river water have already been reduced by 9.

Similarly generous help was also organised by the Provincial Museum and Provincial Monument Authority in Dresden in Saxony. Help from a city that had itself suffered considerably from the waters of the Elbe was unexpected. An office was established here in which Czech and German colleagues working together scanned the transparencies saved from the flooding.

In 2003 the Institute of Archaeology premises on Letenská Street are in the middle of busy building work. There is, unfortunately, always the chance of another similar catastrophe happening here in the future. It would, then, be criminal to return the items saved from the floods to their original places. We must now count on the possibility of evacuation within 24 hours. For this reason some of our office work will be moved into the reconstructed attic areas in the autumn. Offices and laboratories with less technical equipment will return to the renovated ground floor. The library will again be housed on the first floor, where our archive collections will also be located. The building work involved in renovation is not, however, the only aspect which must be resolved.

10 % at the most of the original 70,000 volumes will return from Denmark. Even with the few thousand books evacuated or out on loan at the time of the disaster, however, this will not comprise any kind of basis for a library collection. In September 2002 a network of co-ordinators was formed throughout Europe and outside its borders, comprised largely of people who are organising collections of gifts for the library. They are collecting gifts within their given countries, and these donations are finding their way to the Czech Republic and Prague. A full 5,000 volumes of specialist publications have arrived at the library from France, with thousands more books coming from Poland, Germany, Switzerland, Slovakia and other countries. Important donations from a number of Czech organisations and individuals will, alongside these foreign gifts, contribute to the renewal of the collection of Czech publications. The reading room at the library has been filled the bursting point with crates of books, which are being recorded in the T SERIES (formerly Tinlib) automatic library cataloguing system. The collection assembled will gradually be made accessible over the internet and connected with other libraries in this country and abroad. The first phase of the project to digitalise the library's oldest publications and the publications issued by the institute both in the past and in modern times has also been implemented. The initial stage of the project is the digitalisation of the magazine "Památky archeologické" (Archaeological Relics), first published in 1854. The more than 180 donors who have so far donated books to the reviving library should get the chance of seeing the results of their generosity and the efforts of the staff of the library at the Institute of Archaeology some time next year. In 2004 the building work will be completed, books will return from Denmark and the cataloguing of gifts will be completed. The life of the library will return to normal and the first students will again walk between the shelves...

The archive collections rescued from the flooding have now been scanned. The scanning of transparencies in Dresden is also practically complete. A project has also been initiated for a digital database of preserved text documents, drawings and photographs (reports, plans, negatives). This project is planned to cover a period of 5 years and is being implemented in co-operation with the company MINOLTA. The basic equipment, such as a book scanner (FUJITSU M4097D) and the necessary software (a document management system, Application Xtender and Scan Xtender) have been acquired, and archiving capacity increased (JUKEBOX PLASMON M 104-910-X with 104 magneto-optical disks each of 9.1 GB). Transfer to this medium is necessary for a number of reasons. The main reason is simply that we do not know for just how long the material rescued from the flooding has been saved. Another reason is, understandable, precautionary. We see the third aspect as lying in the future, when these documents can be made available for effective expert work. They will also be available to members of the general public, building contractors and civil servants.

The price paid for this experience has been, and will continue to be, high. It cannot be measured in purely financial terms, since the documentation on long-gone archaeological situations and findings cannot be replaced. It will cost millions of crowns to preserve the collection, which even after the disaster consists of 200,000 photographs and plans and around 1,000,000 pages of reports, and to make it accessible. There is never enough money invested in reconstruction, equipment and digitalisation. Subsidies, grants and donations from sponsors will, perhaps, enable rapid progress to be made on the given projects. If the programme is implemented as planned the renovated baroque palaces in Prague will become one of the most modern archaeological information

centres anywhere in central Europe. The digital database has, from the beginning, been conceived as being accessible to the public, albeit with certain restrictions in view of the possible abuse of data and in view of copyright law.

The events of last year cannot be seen in purely black-and-white terms. Our archaeologists will gratefully remember the assistance given by dozens of volunteers and hundreds of our colleagues from around the world. They will think back to the generosity of various individuals and organisations. They will try to learn from the mistakes that were made and to pass on their experience in crisis situations (which, of course, they wouldn't wish on anyone) to others. To summarise our advice the most important point would be: *If a disaster occurs, then it is certain to be far greater than you can even imagine.* If we had had this in mind on 12 and 13 August, then we wouldn't have tried to move our books to shelves a metre or more from the ground, but would have taken everything straight to the next floor up. We wouldn't have wasted such valuable time and effort, and would have managed to save more than we did (if not everything).

Another important factor is to place the greatest possible emphasis on *the provision of information*, if possible in real time. Information for employees, volunteers and, first and foremost, related organisations and the media both in this country and abroad. It was the rapid and relatively enormous media campaign started on 14 August, and systematically directed towards our colleagues, international professional organisations and universities, which led to the generous support given by our Danish and German colleagues and the massive donations of books. The public media certainly played a positive role, though, from the viewpoint of renewing the basic functions of the institute, a secondary one. Co-operation with crisis teams and the authorities in the Czech Republic did not result in the expected rapid flow of information and subsequent rapid assistance, with the exception of the crisis team of our mother organisation the Academy of Science of the Czech Republic.

The important thing for us now is for the Institute of Archaeology of the Academy of Science of the Czech Republic to demonstrate to all those who generously provided their help in many and various ways that it can reciprocate this help in the foreseeable future in the form of well-organised and, most importantly, accessible study collections. Meeting this goal will be the best possible thanks we can give to the individuals and organisations that helped us...

Information on the floods and the action taken to clear up afterwards, including a picture gallery and list of donors, is available at www.arup.cas.cz.

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Archives and Registries after the 2002 Flooding: Disaster Recovery

Lenka Linhartová

The devastating flooding that hit large parts of the Czech Republic brought havoc also to many institutions, including archives and registries.

From the very beginning, the Archives Administration Department of the Ministry of the Interior and the State Central Archives in Prague evaluated the extent of damage to archival material and documents, organized consultations and material assistance to institutions affected, and took preventive measures in institutions still unaffected by the flooding.

The Archival Care Department of the State Central Archives, which plays the role of a national centre for restoration and conservation of archival materials, drew up procedures for the salvage of water-logged written documents and published them on its web pages on 14 August.

Of all **state archives**, only the Lovosice repository of the State District Archives at Litoměřice was flooded. The flood water drenched about 300 standard meters of Class III archival documents and 150 standard meters of books, including newspapers and journals. Another 650 standard meters of damp archival materials were temporarily stored at the Kadaň repository of the State District Archives at Chomutov. Damage was done not only to records, written documents, books and newspapers, but also to one of temporary buildings, which significantly reduced the space available at the archives. At present, project documentation is being drawn up at the Ministry of the Interior for the reconstruction and a construction of a new annex to the Lovosice repository of the Litoměřice State District Archives. None of the other state archives were damaged by the flooding, which is a positive result of generous and conceptual care for the construction and reconstruction of special-purpose archival structures. Only six years ago, availability of storage space was critical and records of the State Central Archives in Prague had to be stored below the flood level at Těšnov and Malá Strana repositories where they would have certainly been damaged or even destroyed.

In the last ten years, state district archives had been moved to new and safer premises in the districts of Prachatice, Český Krumlov, České Budějovice, Strakonice, Písek, Beroun, Praha-west, Mělník and Děčín, and that saved the archives from damage during the flooding that hit those regions.

Of the five **municipal archives**, only two were flooded. They were the Archives of the City of Prague at Varhulíkové and Jankovcova streets in Holešovice, where the administrative archives of the Prague Metropolitan Authority were stored. Three hundred and fifty standard meters of water-logged documents were frozen, and another 300 standard meters of undamaged documents were shipped to the Chodovec central repository of the archives. The remaining 660 standard meters of completely water-logged and mouldy documents were disposed of.

In the Archives of the City of Ústí nad Labem, the basement and the ground floor to about 1 m height were flooded. Most of archive records had been moved away in time, and a few sections of archive documents of minor importance only were damaged. When the water subsided, it was found that a small Gothic-style cellar under the front of the building had been damaged, and structural properties of that part of the building were thus negatively affected. Further damage to structural properties was caused when water was pumped from cellars of the surrounding houses. For that reason, all documents, including valuable collections of the Archives of the City of Ústí nad Labem, were moved out immediately. The archives were closed for the public until mid-March of this year.

Four of the most seriously damaged important **special-purpose archives** were:

The *Military Central Archives* at Invalidovna was flooded up to its first floor (based on information of 16 August). On the ground floor of the building, 33,000 boxes of documents were stored. The sorting and salvaging of the documents started on Monday, 19 August. Eight thousand boxes placed on the so-called galleries were not flooded at all, and were therefore moved to the higher floors of the building. About 15,500 boxes were frozen, 650 boxes were air dried on the upper floors of the Invalidovna premises, and about 8,000 boxes containing Class III materials were disposed of.

In the *Archives of the Academy of Sciences of the Czech Republic*, the worst damaged were

photographs and some collections stored on the ground floor at the V Zámcích street. Wet documents (183 standard meters and 400 boxes) were frozen, partially wet documents were gradually dried in the Prometheus repository. Work on gradual defrosting and drying of documents is nearing completion. There are still some outstanding issues regarding the drying and restoring of the still frozen documents.

In the *Archives of the National Museum* in Terezín, the first floor housing a collection of seals was flooded. Salvage work commenced as soon as it was possible to enter the building. About 13,800 seals were irreparably destroyed, and efforts to save another approximately 37,200 seals and impressions are currently underway.

The Invalidovna also housed the Archives of the National Technical Museum. Its depositories were flooded up to about 4 meters above ground level. The water flooded the archives of architecture, history of technology and industry, the collection of negatives and prints, parts of personal holdings, archives of cuttings, etc. A total of 340 standard meters of archive documents, 25 cabinets with drawings and 22,500 negatives and prints were flooded, of which 55 standard meters of copies of Austrian and Czechoslovak patents, 50 standard meters of cuttings and 17,200 negatives and positive prints were destroyed completely. The documents were partly cleaned and then shipped to a freezing plant. Not flooded archive records were taken to the main building of the National Technical Museum at Letná. At present, the defrosting and drying of documents is underway but because the documents are severely damaged and need to be treated one by one, the work progresses very slowly.

Registries of several ministries were also located in buildings situated in inundation areas. Specialists from the State Central Archives, which is responsible for pre-archival care at ministries, began to offer assistance with rescue work in individual institutions even before the water subsided.

In the building of the *Ministry of Transport and Communication*, the 2nd underground floor was flooded completely, and in the 1st underground floor water reached to the first shelves. Fifteen meters of documents were completely destroyed, and 17 pallets of documents were frozen. According to the most recent information, hot-air drying of documents is nearing completion.

The registry at the *Ministry of Industry and Trade* was completely under water. About 12 pallets of documents were frozen and 300 standard meters of damp documents were taken to the State Central Archives at Chodovec, where they were air dried in empty quarantine rooms. Salvage of the documents from the Ministry will be implemented in accordance with the Government Resolution 216.

The situation at the *Ministry of Agriculture* was also very serious. The 3rd underground floor was completely flooded, compact book shelves located there were torn out of the rails, and the accounting department on the 2nd underground floor was partly flooded, also. Dry documents from the basement were transported to Chodovec, and another 20 pallets of the wet ones were frozen. The Ministry of Agriculture, too, was included into the disaster recovery project set up by the above-mentioned government resolution.

According to information from the Ministry of Finance, water in its building at Letenská Street rose about 1 m high. The administrative archives and the registry, however, were unscathed. Only about 70 standard meters of documents from the property and foreign currency administration department on property losses of civilians expelled from the Sudetenland were flooded and, unfortunately, completely destroyed.

At the *Ministry of Regional Development*, two storage areas were flooded to the height of 1 meter, and about 250 standard meters of documents were soaked with water. The water-logged documents were destroyed on the premises on 23 August, and dry documents were transferred to the State Central Archive.

The *Ministry of Justice* suffered exceptionally high losses. The registry of the Prague Municipal Courthouse at Troja stored about 2 million files from all Prague courts and several state courts. About half of them, including file directories, were flooded. A total of 346 pallets of files with documents were frozen, including file directories. The Ministry of Justice was also included in the disaster-recovery project based on Government Resolution 216.

The *Czech Statistical Office* reported the flooding of 20,000 volumes of valuable books and about 800 standard meters of documents, of which 500 m were frozen and the rest disposed of. The Czech Statistical Office also participates in the government project of mitigation measures.

No other ministries reported any damage to written documents, which can mainly be attributed to the fact that their registries and administrative archives were not situated in basements.

The flooding, however, damaged numerous registries of other state institutions, local authorities, boroughs, companies, associations and other juristic and natural persons. A survey of damage was done by individual state archives at appropriate levels. Thanks to their active cooperation, many documents were saved, and the documents that could not be saved were disposed of in a proper manner.

All the institutions affected were, contrary to legal regulations, located in inundation zones. In Section 6 on the care of documents before they are stored in archives, the Archives Act 97/1974 Sb. as amended, specifies the role of registries and stipulates quite unambiguously that those who produce the documents must make sure that they are archived

efficiently and safely. Section 1, Par. 1 c) of the Protection and Classification of Archive Documents Decree 2/1975 says that the premises where archive documents are stored must be above the water table. Section 1, Par. 2 says that the location and construction of buildings that are at least partly used for the storage, processing or use of archive documents must provide all-round protection to the documents, the building's loading capacity must not be exceeded, and the buildings must not be situated in areas where there is a risk of flooding.

Principles for the construction and reconstruction of archives and premises of corporate archives, which reflect not only legislation but also domestic and international experience and data from the construction of archives, were published by the archives administration of the Ministry of the Interior in 1981. The basic requirements for the location of newly built public record offices and corporate archives include: New archives must be built in areas with a stabilized water table and outside the reach of inundation waves.

Last November, an inter-ministerial commission headed by the Deputy Prime Minister Petr Mareš was set up to help disaster recovery in state organisations and institutions managing cultural heritage after the floods. Besides the commission, a team of experts composed of the representatives of the State Central Archives, Czech National Library, National Technical Museum, Technical Museum in Brno, Masaryk University in Brno and the Ministry of Culture was also set up. The team drafted technical documents to assist the commission in its work, and it also prepared the Study of the effect of drying techniques on physical, chemical and microbiological characteristics of various types of paper, which was one of the basic documents for the drafting of the Governmental Resolution 216.

The commission drafted a governmental resolution on further measures to salvage water-logged documents from state institutions and organisations managing cultural heritage. The government adopted the draft as its Resolution 216 of 3 March 2003. In the resolution, the government decided to use a two-pronged approach to the document salvage operation. One course of action will be used for documents from institutions whose majority are managed by the Ministry of Culture, and a different course of action supervised by the Deputy Prime Minister will be used for documents from other ministries. The basis for the first strategy was the establishment of the Methodological Centre of Conservation at the Technical Museum in Brno, which will not only allow for the drying and restoration of documents damaged during the 2002 flooding, but will be used for the purpose also in the future. The second (and undoubtedly the bigger) part of the damaged documents from central offices of state authorities and special-purpose archives will be treated differently. Pursuant to the Public Procurement Act 199/1994 Sb., a tender will be announced for the defrosting, drying and transport for disinfection of the documents. The disinfection of defrosted and dried documents will be performed by the State Central Archives, while the restoration and conservation of the documents will be the responsibility of state archives. The ministry responsible for this operation will therefore be the Ministry of the Interior.

According to recent information, the commission is working on amendments to the government resolution because it was necessary to change the funding methods in the tender for defrosting and drying of the second batch of documents, as well as in the funding of disinfection, conservation and restoration in state archives. It was originally anticipated that the funds necessary for the operations will come from the budget of the Ministry of the Interior, while the funds from the tender will come from the budget of the Czech Government Office. If the changes proposed are adopted, the necessary funds will be included in budgets of individual ministries, which will then transfer them to the Government Office or the Ministry of the Interior. Another, and very important, change compared with the original document is that the announcement of the public tender is moved from 3 May to 30 of June 2003. This will cause a delay in the entire disaster recovery process at central offices of state administration and special-purpose archives. At present (June 2003) a draft of the amendments to the Government Resolution 216 is being circulated at ministries for comments.

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The Czech Committee of the Blue Shield

Jana Součková

Almost a year after the floods of August 2002, cultural institutions are still busy repairing the damage that the worst natural disaster in living memory did to their collections. The disaster recovery operation will certainly take many more weeks. In spite of that, the institutions should not limit themselves to doing those jobs only, imperative as they may be, but, from the perspective of their recent experience, they should also think of preventive future-oriented steps.

That also is the aim of the Czech Committee of the Blue Shield. Let me briefly introduce this organisation because it is relatively new and may not be generally known. It is a Czech office of the international NGO created in 1996 by executive bodies of associations of archives, libraries, museums and cultural heritage institutions, when attacks targeted at cultural heritage sites showed the urgent need of an all-round international cooperation.

The basic documents for the organisation are the Hague Convention for the Protection of Cultural Property of 1954 (and the 1954 and 1999 protocols to the Convention), the UNESCO Convention on the Protection of World Cultural Heritage (1972) and several other international documents at a similar level. The logo and the name derive from the emblem used to mark buildings that meet the Hague Convention criteria for cultural heritage sites and thus receive protection offered by the Convention.

Although the International Committee of the Blue Shield was created to respond to armed conflicts, it strive not only to save cultural heritage threatened by war but also those those monuments and sites threatened by natural disasters and human blunders, vandalism and terrorism; but first and foremost it is concerned with preventive measures.

The first national committees of the Blue Shield were created in 1998. The Czech Committee of the Blue Shield was founded in 1999 on the initiative of the Czech Committee of the ICOM, and its members at present are the Archives Administration of the Czech Ministry of the Interior (the Czech representative in the ICA), Czech Archival Association, Czech Information Society at the State Central Archives, the Czech Committee of the ICOMOS, Association of Librarians and Information Workers (with the well-known acronym SKIP – the Czech representative in the IFLA), Association of Czech Museums and Galleries, Council of Czech Galleries and the Czech Committee of the ICOM.

The first event organized by the Czech Committee of the Blue Shield was a round table discussion at the Local Museum in Olomouc, where librarians, museum workers and national heritage workers evaluated their experience from the 1997 floods in Moravia, and expressed their support to the mission of the nascent organisation. In response to that meeting, a conference was held in May 2001 at the Wallachian Museum at Rožnov devoted to the drawing up the "Plan for the Prevention of Risks and Repair of Damage caused by Accidents or Natural Disasters". In November 2001, the Czech Committee of the Blue Shield organized a seminar on crisis management, Cooperation between archives, libraries, museums and national heritage institutions within the framework of the integrated rescue services system, on 8 November in the Museum of the Arts in Olomouc; and another seminar in June 2002 in the East Bohemian Museum in Pardubice on the "Preparation of evacuation plans for archives, libraries, museums and heritage buildings and sites". After the August disaster, a seminar on "The Floods and After" was held in the National Museum on 18 November focusing on the evaluation of damage, an overview of the current situation, and most importantly, on options for the saving of paper documents at that time deep-frozen in Mochov. The same topics were also discussed at the international working meeting "August 2002 Floods" organized by the Academy of Graphic Arts, Faculty of Architecture of the Czech University of Technology, the Institute of Restoration and Conservation Techniques Litomyšl, the Architecture Archives, Czech National Library, National Heritage Institute, National Museum, National technical Museum, State Central Archives and the Czech Committee of the Blue Shield at the Subcommittee for Cultural Heritage of the Senate of the Parliament of the Czech Republic in the Wallenstein palace in February 2003.

In order to support preventive and rescue measures adopted, the Czech Committee of the Blue Shield drew up an overview of the fire protection and crisis management legislation (and documents for

downloading) and published it all on its web pages. With the permission from the Ministry of Culture, it also published the Catalogue of Restorers including their specialization on it web pages. For this year, it has prepared a project for the identification and assessment of natural disaster risks in libraries, museums and national heritage institutions in the Czech Republic.

In 2000, the Czech Committee of the Blue Shield began to cooperate with the Fire Brigades' Association, and, at the end of 2001, made a contract with the Association as the technical sponsor of the Integrated Rescue System of the State on the sharing on information, and conditions for providing assistance and cooperation in rescue operations. Since then, the Czech Committee of the Blue Shield has been building a system of contact places in archives, libraries, museums and national heritage monuments and sites pro the requesting and providing assistance, and it has published the list of the places and contact points of the Integrated Rescue System complete with all the necessary data on its web pages. Because helping hands are always welcome, the Czech Committee of the Blue Shield invites to cooperation everybody who is willing to share his or her expertise and experience.

Probably all of us learned a lesson of August 2002 and realized that accurate and timely information during natural disasters or some other catastrophe is extremely valuable, in fact it is one of the basic pre-requisites for rescue. Quite a few of us could have probably been able to do more for the evacuation of our collections if we had had an immediate access to such information.

Cooperation with the Integrated Rescue System gives us an opportunity to protect the cultural heritage entrusted to us more effectively. That cooperation, however, is voluntary for both parties, and that sets certain limits to the implementation.

We are lucky in the respect that we have only indirectly experienced the fact that cultural heritage monuments and sites are prominent targets, targets that are singled out purposefully and deliberately. We also know that their damage and destruction is a severe loss for the entire society, a cultural and economic loss, which has serious and long-term effects on the society.

We believe that the protection of cultural heritage should also be supported by legislation, where it currently enjoys the same level of protection as any other property.

In order that administrators of this special kind of property can fulfil their obligations, that their acts of unselfishness and those of their employees are not spoiled by trivial problems caused by a lack of information, we recommend that at least one of the cultural heritage sector representatives listed among the contact addresses be members of crisis management teams at individual administrative levels. That kind of help to our heritage monuments and sites, museums, libraries and archives would be quite inexpensive but extremely effective.

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III

Ways to Reducing of Damages and Loss

Remedy of Flood Damage to Library Collections: Activities of the National Library of the Czech Republic

Jiří Polišenský

The last-year's August flood caused enormous damage to library collections. Over 40 libraries and about 800,000 books were affected. A minor part of them was dried immediately after the flooding, about 140,000 volumes were deep frozen, the other ones were liquidated and disposed. The majority of books, records and other paper documents affected by water (about 2000 m^3 in total) were collected during September and October in the branch of the company Mochov Cooling Plant in Kladno. The calculated costs for deep freezing of the affected documents amounted to CZK 60 thousand per day.

Taking in view high financial costs for freezing, large quantities of frozen documents of the most different types and absence of experience of their drying, it was quite evident that rectification and remedy of flood damages would be a very complex process which a number of tests verifying different methods of drying and facilitating to determine how to proceed would have to be preceded to. The tests were carried out by the end of the year by the staff of the Central State Archives and the National Library of the Czech Republic in cooperation with the specialist in paper issues, Ing. Neuvirt, as the integral part of the running research project. Their results are available at the address: http://www.nkp.cz/fondy/suseni.htm Results of testing showed what methods were suitable for specific kinds of paper documents and served as the basis for decisions taken by the interdepartmental commission headed by the Deputy Prime Minister Petr Mareš.

From the experience gathered abroad it follows that the vacuum technologies of drying, namely the vacuum freeze-drying (lyophilization) – where the books are dried by water sublimation from the solid state – and vacuum drying – where the ice is dissolved in the course of drying, but water evaporation takes place under low temperatures friendly to the paper – are considered the most suitable ones. The former method should be used particularly for the documents containing inks, seals and color layers. This fact was confirmed by the tests carried out by the National Library of the Czech Republic and by the Central State Archives in the leased freeze-drying units and/or on other workplaces. The test have showed, inter alia, certain difficulties, particularly the fact that the books must be under pressure when dried to prevent further deformation.

The first vacuum technology, available very soon for drying of rare documents thanks to the donation of the British Council, was the technology utilizing the vacuum-packing units for drying. The book wrapped by the non-woven textile, filtering paper and newspaper absorption layers is subject to repeated vacuuming; the absorption layers and other wrapping materials are replaced for each repeated vacuuming. We are speaking about a quite new technology developed by the British specialists. Because the book is under relatively high pressure in the vacuum container, the vacuum packing must be carried out by experienced staff. In November 2002 the Central depository of the National Library of the Czech Republic in Hostivař launched the workplace of drying the rare documents, utilizing the technology above, which is also uses by the City Library in Praha for drying of old books. Labor-intensive and time-consuming features of the technology are considered its disadvantages.

The old rare books represented only a minor part (about 6,000 volumes) among the deep frozen documents, all other books were represented by the publications of the 19th and 20th century which suitable industrial methods of drying could have been applied for. Staff members of the National Library of the Czech Republic have checked different technologies offered by institutions and companies (hop kilns, equipment of the Military Air Research Institute, etc.). Wood driers in Kralupy nad Vltavou were selected as the most suitable ones. Upon agreement with the company Dřevo a dýhy (Wood and Veneers) the test run of drying was started; the drying process control system and the overall control system was modified and adopted during the trial run. Thanks to the company Stahl that had leased suitable trucks both drying chambers were adapted for book drying. The method of book fixing during drying, utilizing unglazed ceramic panels donated by the RAKO company in Rakovník, was designed and tested. After completion of the trial run, in the course of which the reserve stock of the National Library were dried, the working team consisting of the representatives of affected organizations, organizing and coordinating

the process of drying, was created. Transport of documents and their loading onto the trucks is provided by the company Stahl whose staff members were trained and carry out all the works under supervision of the representatives of relevant libraries. The process of drying is supervised continuously by Ing. Neuvirt and specialists of the National Library of the Czech Republic. The collections and stock of the Museum of Cooperative Movement, Central Bohemia Museum in Roztoky, library of the Zoological Garden and the major part of the stock of the City Library were dried till now (June 2003). The tests of drying of the drawing documentation of the Archeological Institute of the Academy of Sciences have revealed that the drying chambers can also be used for quick drying of these documents. Drying of the documents of the remaining institutions (library of the Institute for Nuclear Research, selected stock of the National Technical Museum, library of the Grand Lodge of the Czech republic) will continue during the third quarter when operation of the wood drier for the institutions cooperating with the National Library of the Czech Republic should be completed and ended.

Besides drying of the deep frozen documents the issue of book disinfection had to be resolved as well. The Central State Archives, that have put its two ethylene oxide chambers at the disposal of the affected institutions, contributed to a great deal. The dried and disinfected books must be under strict supervision and control (experience of foreign companies) for six months to prevent possible occurrence of mildew.

The process of book rescue is not completed by their drying. Many books are damaged permanently and cannot be used without further treatment. A high percentage of books has damaged binding, some books have both the cover and the paper block damaged, the books contain visible residues of dirt (sludge, glues, size, etc). If the books are printed on high-quality paper having no signs of progressive degradation, the books can be re-bound. Re-binding is unfortunately impossible for the majority of newspapers and journals of the 19th and first half of the 20th century due to worsened physical paper features. The books should be stored in protective containers preventing their further damage and enabling their use. Historical and rare documents, subject to restoration in the future, should also be stored in protective containers. The experience of flooding confirms that the books in protective containers have survived in a much better condition and, when dried, show nearly zero signs of damage.

Manufacture of protective containers is a complex process, because it has to fulfill two demanding conditions. To be operable and efficient fully, the containers must be made to measure of the document precisely and the materials stable to chemicals must be used for their manufacture. Both conditions are met by the workplace of the National Library of the Czech Republic built within the bounds of the research project; the manufacture is provided here by the sampling cutting plotter. A special archive cardboard – also developed within the framework of the research project above and made of pure pulp guaranteeing stable environment inside the container – is used for manufacture of the protective boxes. The workplace is able to make 8,000 to 10,000 boxes annually. One part of the capacity is devoted by the National Library of the Czech Republic for rescue of the flooded documents. The possibility to create another workplace (in cooperation with a private company), thanks to which sufficient quantities of protective containers could be made for the affected institutions, is under negotiations. The trial production for the dried documents of the library of the Institute of Philosophy of the Academy of Sciences of the Czech Republic, in the course of which the procedures applicable also for other institutions shall be determined, was running in June at the workplace of the National Library of the Czech Republic. Organization and coordination of this activity will be also provided by the working team controlling and managing the process of drying for the time being.

The newspapers and magazines printed on the acid wood paper, the mechanical qualities of which were very bad even before the flooding due to progressive degradation, belong to the most massively damaged documents. Properties of the dried paper got even worse and material reduction of the service life of these documents can be awaited. The situation is very serious, taking in view that we are often speaking about the key periodicals, utilization of which represents the very basis of operation and normal life of relevant institutions and possible other copies, if any in other institution, are also in a very bad condition. Quick re-formatting through microfilm or hybrid technology, guaranteeing long-term substitute of partially or fully damaged documents, is the sole method of rescuing.

Microfilm processing of the documents damaged by flooding will also be organized through the National Library of the Czech Republic. Microfilming will be carried out by external companies, microfilm digitization – by the National Library of the Czech Republic at its own workplace. Within the bounds of resolution of the damaged library stock caused by flooding the micrographic laboratory of the National Library of the Czech Republic will be extended by a special camera enabling to scan the bound documents open to 90° only. The camera enables to scan without any risk of damage of the books with rare or historical binding. Limited capacity of the workplace of microfilm digitizing and inadequate equipment of relevant institutions for microfilm reading and making of blow-ups is the problem in the field of re-formatting. The activities connected with re-formatting of the damaged documents will be managed

and coordinated by the working group consisting of the representatives of affected institutions (engaged in drying and manufacture of protective containers for the time being).

The National Library of the Czech Republic can provide storage of archive and matrix microfilm copies in the special store in the Central Depository in Hostivař and also backup of digitized documents on its own hardware for a limited time period. For this purpose the Library has been granted the funds for extension of the robotic magnetic-tape library to manage archiving of huge data volumes.

Re-formatting is based on international norms and standards and coordinated within the bounds of European cooperation activities. Records of the re-formatted documents are granted to the European database EROMM (European Register of Microform Masters); the lists of documents microfilmed and digitized within the framework of the national program Kramerius are available on the web site of National Library of the Czech Republic (http://www.nkp.cz/start/knihcin/ookf/noviny.htm). This year the metadata of digitized periodicals are adapted – within the framework of transfer to the XML format – to the structure declared by the European consortium DIEPER.

Accessibility of the digitized documents should be resolved by a new application which will be obtained by the National Library of the Czech Republic by the end of this year; the application will provide accessibility of complete metadata and differentiated accessibility of graphic files. The application will also satisfy requirements of the copyright act in the part of accessibility of the protected documents.

Restoration of damaged old books and other documents will become the integral part of activities of the National Library of the Czech Republic in the field of remedy of flood damages of the library stock. Due to limited space external workplaces for less complex interventions will have to be provided. The existing restoration workplace in the Central Depository in Hostivař will be utilized for demanding and complex interventions and for rare documents.

Assistance of a private American foundation – the A. W. Mellon Foundation – funding further research and development in the field of document drying, restoration and re-formatting – is a great contribution for rescue of water damaged documents. Thanks to the Foundation the National Library of the Czech Republic develops – in cooperation with Ing. Neuvirt and specialists of the Czech Technical University and the Central State Archives – a special multipurpose vacuum chamber which will serve for drying of books both by vacuum technologies and in the protected atmosphere under normal pressure. The chamber can also be used for disinfection.

Protective re-formatting of the drawing project documentation is another key project which will also be funded partially by the Foundation. The project should reveal the possibility of rescue of water damaged documents and/or check the protective re-formatting as the preventive action. Testing of technologies of protective microfilming by the roll film 35mm and micro-labels, digitization and hybrid technologies, utilizing both the microfilm and digital format, will be dome within the framework of the project.

Standardization of descriptive data for the museum collections and selection of suitable picture formats is a great problem in case of digitization – unlike the field of library documents. It is also necessary to develop the program tools for creation of metadata in the XML format and for their editing. The issue of digitization of the project documentation will be resolved by the group of specialists of the National Library of the Czech Republic and the National Technical Museum. The output will be available also for other museums and archives storing this kind of documents.

The issues of disinfection of the contaminated documents, elimination of deformation of the paper documents caused by flooding, using the vacuum units, development and manufacture of special protective containers for the water damaged documents should also be resolved within the bounds of assistance granted by the Mellon Foundation.

Last but not least, the National Library of the Czech Republic helps with renewal of the library stock to those libraries that had lost the majority of its collections during the high water. The Committee distributing the funds allocated by the Ministry of Culture of the Czech Republic and coordinating these activities has been created. The assistance is focused particularly on minor city and municipality libraries, but one part of the funds will also be utilized by specialized libraries of universities and scientific institutes.

The damages caused by the high water were also a great lesson. The long period passed since the last disaster of similar character has caused that, despite warning of the specialists, the danger seemed to be less probable. Hard financial situation and limited spaces of different institutions led to utilization of inadequate rooms and areas for storage of paper documents, e.g. in basements, and absence of corporate crisis plans accompanied by missing equipment and devices made the rescue very difficult. Hardly any institution had categorization of its collections available which would facilitate classification of the rescued documents or taking qualified decision regarding their further destiny. The Mochov Cooling Plant thus stores the documents, the rescue of which is problematic.

Lack of devices and equipment used for rescue actions is the proof of general unpreparedness. Particularly the vacuum chambers, enabling drying of

the frozen documents by freeze-drying (lyophilization) or by vacuum drying – quite common in other countries on similar occasions, are missing. Standby power sources, pumps, different transport and communication devices and specific materials were unavailable as well.

On the other side, it is necessary to consider the conditions under which the rescue teams had to work. The majority of buildings/structures was inaccessible for a longer time period and rescue actions could be organized only after the mildew began to rise and it was quite evident that the time for rescue was nearly over. The group of rescuers, often consisting of employees, volunteers and servicemen worked during the night, without any water and with hand mechanization only. The highest number of documents which the persons above managed to treat, pack and transport to the cooling plan, ranged between 20 to 25 thousand volumes. The quantities above can be considered the maximum figures for planning the rescue actions in case of possible future events.

Remedy of the damages caused by the high water will be the long-time process requesting high funds. On the other side, certain positive features are also worth mentioning. After removal of high water consequences certain institutions will keep the devices and equipment which can be utilized in the field of protection of library stock and collections. The flood has also turned attention of the specialists and politicians to the issue of protection of the national cultural heritage and corrected certain overoptimistic views of storage of library and archive funds in the risk spaces. It has revealed legitimacy and justification of crisis planning, incl. investment into the necessary material and equipment and into training of certain activities. Let us hope that possible future natural disasters or events will not result in such a huge damage of our cultural wealth thanks to our better preparedness and readiness to them.

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Large-scale Drying of Frozen Books and Documents

Jiří Neuvirt

Introduction

What kinds of water are there in wet books?

There are three different kinds of water in a wet book. Some water, which we shall call free water, is in the space between fibres. Its amount depends on the paper's porosity and sizing, and also on the time for which the paper was in water. Free water loosens up bonds between fibres, and paper with larger quantities of free water looses its strength and may be difficult to handle.

Another type of water is bound water, i.e. water absorbed in the structure of fibres. This type of water in balance with the relative humidity of the ambient air, and it causes the swelling of fibres, and hence also changes in the dimensions of the paper sheet. Its volume is determined by the structure of fibres, which depends on its origin and technological process used in the manufacture of pulp. For that reason it is practically independent of sizing or other treatments during paper manufacture.

Finally, there is an unspecified amount of *free water between sheets of the paper block*.

All that water is now in the form of ice crystals.

Methods of drying

There are a number of techniques that enhance the removal of water by increasing temperature and/ /or reducing the pressure:

Hot-air drying

Performed in a chamber by a current of air whose temperature may be adjusted. To minimize the length of drying (to about a day), the usual temperature is around 115 °C. Paper blocks are laid on racks and separated from each other by aluminium plates to accelerate heat distribution. The relative ambient humidity is practically zero.

Lyophylization – vacuum sublimation

The drying takes place in a vacuum chamber at temperatures below the freezing point. During lyophylization, ice is removed by sublimation and the vapour resolidifies in a cooler at temperatures below -50 °C. The complete drying cycle is several days long.

Drying by humid hot air (timber drying plants)

The drying takes usually place in a chamber with intensive forced circulation of air whose temperature and humidity may be adjusted as needed (usually 60 °C and 35 % relative humidity). The drying cycle is about two weeks.

Air-drying

Air-drying is performed in well-ventilated premises at a room temperature. Blotting paper is put in books to accelerate the removal of free water, and as soon as possible, books are placed in an upright position and opened up in a fan-like fashion.

Vacuum drying

Takes place in a vacuum chamber with heated shelves holding the material to be dried. The shelves are heated to 25 or 30 °C, and the pressure in the chamber is 5 to 10 mbar. The water evaporated is removed via an oil valve, where the oil is heated to 150 °C. The drying cycle takes about a week.

Vacuum packaging

Books are wrapped in an unwoven fabric, place between layers of blotting paper (filtration paper, newspaper) and put to a polyethylene bag. When the air is evacuated, the bag is sealed. The water passes to the blotting paper until a balance is reached. After some time (1 or 2 days), the bag is cut open, and the entire cycle is repeated until the book is dry. Usually, 10 cycles are necessary. The drying period is about 10 to 20 days. This method is labour-intensive, which is its main disadvantage. Its advantage, however, is that the process is very gentle and causes no warping of dry books.

Microwave drying

Based on the fact that liquid water intensively absorbs short electromagnetic waves. The heat generated at the point of absorption accelerates the evaporation of water. It is, however, necessary to prevent local overheating due to non-homogeneity of materials, and the varying local intensity of the electromagnetic waves.

Tests of drying methods

In cooperation with the State Central Archives and the CHEMTECH association, the National Library made standard assessments of the above drying methods and their influence on physical and chemical characteristics of three basic types of paper, and on the survival of microorganisms. The results are available on the Internet at the web pages of the National Library and the State Central Archives. The following types of paper were used in the tests:

Whatman No 1, newsprint paper from the late 1930s, and bleached cellulose office paper for copiers used today.

The sensitivity of individual types of paper to drying methods was markedly different. I would now like to briefly describe individual methods and discuss how they generally influenced the strength in double bends in different types of paper (Fig. 1).

It follows from Fig. 1 that hot-air and microwave drying at temperatures exceeding 100 °C had a significantly negative impact on the strength characteristics.

The relatively little success of lyophylization may be explained by pointing out that this is not the optimum method for high-absorption materials with a high water content. An irreversible destruction of the fibre structure takes place because the structure contains no liquid water that might restore bonds between fibres disrupted by ice crystals.

Fig. 2 shows the impact on the survival rates of microorganisms. It is obvious that the material is sterilized at higher temperatures. The reason for better results with humid air heated to 60 °C may either be the fact that the hot-air drying and microwave drying were performed elsewhere and that the material may have been contaminated during transport to the testing laboratory, or that a certain level of air humidity is conducive to the germination of spores, which are then more sensitive to heat and may be destroyed at 60 °C.

The tests will be continued with other types of paper and various modifications of the existing drying methods.

Paper deterioration

We should bear in mind that drying at higher temperatures is in fact accelerated aging. Paper deterioration in time depends on temperature and relative humidity. That is the reason why we have to take these effects into account when drying at higher temperatures is used. For a relatively long period of time, some places in the book are at a 100% relative humidity. It is a well-known fact that increasing relative humidity will accelerate the process of deterioration. That is why deterioration in the inside sections of the book with the longest exposure to water will be most severely affected. The bigger the book is, the greater the risk of deterioration.

Let us now consider the possible extent of deterioration. Fig. 2 shows results of a study into offset paper aging under different light and relative humidity conditions made by the US Library of Congress. It follows from the data that drying at temperatures around 60 °C is acceptable from the point of view of deterioration rates, and that the risk of mould growth is minimum provided that that temperature is reached sufficiently soon throught the entire volume dried.

Drying facilities

In the following text, hot-air drying will no longer be considered because it causes significant paper deterioration, and drying of books in the open air will not be considered because it requires a lot of space and complicated sanitation measures.

The equipment available to libraries at the end of the last year included several vacuum packaging machines, a vacuum chamber for testing with an option to rent, two unused timber drying chambers at Kralupy nad Vltavou; and discussions went on whether a lyophilization chamber should be built or rented. Furthermore, the Institute of Chemical Processes of the Czech Academy of Sciences published information about the use of microwave continuous drying.

With the estimated 20 thousand volumes of frozen books from the Czech National Library and the Prague Municipal Library, the timber drying plant seemed the optimum solution for the drying of large amounts of ordinary books from the point of view of immediate use, accessibility, operating costs, capacity and acceptable damage to the book material. The irony is that the drying plant had been also damaged in the August 2002 flooding. In spite of that, the drying of first books was tested there in December.

Process of drying

Underlying mechanism

It is clear that the amount of water in fibres will remain at its maximum corresponding to 100% relative humidity as long as there is free water in the paper. At the same time, the expansion of fibres is also at its maximum. As soon as free water around fibres disappears, bonds between fibres are restored and the amount of water in the fibre structure begins to decrease in relation with the relative humidity of air in that place. The gradual decrease in the amount of bound water causes the shrinking of fibres. The ideal situation would be if bound water was removed uniformly from the entire book volume because this would prevent any warping of the book block or the binding. In the real life situation, there is a wetness gradient from the centre of the book towards its edges, and hence the problems with warping. Along the edges where there is least water the most extensive shrinking will take place, i.e. the paper will no

longer be flat unless we prevent it by placing the book in between two flat plates. This is a method that may help provide protection against warping for small books and books printed on permeable paper with a low level of sizing. For big books, and particularly books printed on well sized paper with surface treatment, this measure will be only a partial remedy at realistic drying rates. Although a book may be squeezed in between two permeable plates, it will be thinner along the edges than it is in the centre, because the amount of bound water in the centre is higher. The thinner along the edges the book is, the more space for warping there is, because the plates will only grip the thickest central part of the book (see Fig. 4). In order to minimize warping, the difference between relative humidity inside outside a book must be as small as possible. In practical terms it means that relative humidity of the drying air will be about 30 per cent lower than relative humidity inside the book. The drying should be concluded in an ambient corresponding to conditions under which the book is to be stored.

Drying books in the timber-drying plant

In order to maximize the removal of dampness from books and to prevent any warping, each book was fixed in place by a unique system of permeable ceramic tiles. Books to be dried were placed on shelves in moveable racks to stacks about 90 cm high, and bricks or cement blocks were placed on top of them as needed. Each stack consisted of a series of "sandwiches" (their structure is shown in Fig. 5).

Filter papers or newspaper protect the pores of ceramic tiles against clogging by substances brought up from the books with the rising water. They may be either soluble substances or fine particles of dirt from flood-water. Glues and water-soluble sizings are a particularly difficult problem. Air may flow freely through the vent between ceramic tiles, which accelerates the transfer of heat and removal of humidity. The vents offset the very real risk that moulds would grow on book bindings inside stacks.

For common sizes of books, three different sizes of ceramic tiles are available: 45×25 cm, 33×25 cm and 20×25 cm. Also newspaper, filtration paper and unwoven textiles are cut to those sizes. It is very important that they are not bigger in size than ceramic tiles used because they would otherwise block the vent and hinder the free circulation of air. Tiles of only one size should be used in each stack to guarantee its stability. Books should be smaller than the tiles used, or the edges would protrude and might warp. One tile should be used for one book only. If it is used for more than one book, the stack will tilt as the books dry and shrink, the unequal pressure on the books will bring about their deformation, and the stack may fall and wedge into the neighbouring one. That would limit the vertical movement during drying and might bring about further deformation of books in stacks involved.

Each moveable rack will hold at least 6 stacks of the biggest size tiles. Each stack will have 12 books on average, and the chamber will hold 15 shelves. In one chamber batches of at least 1,000 books of up to 45×25 cm in size (or proportionally more books of smaller sizes) may be dried at one time.

Procedure used

The chamber is filled with frozen books in transport boxes, and they are left there overnight to defrost at 30 °C and 70% relative humidity. If books unsuitable for this type of drying are not sorted out before defrosting, they must be sorted out the next day after defrosting. Then the books are stacked on the moveable shelves as described above, and the shelves are loaded to the chamber.

Characteristics of the drying process and monitoring

At the beginning of the drying, the temperature is set at 60 °C and relative humidity at 70%, later it is gradually decreased to 30%. In two days, the temperature of drying is gradually reduced to a level about 10 °C above the outside temperature.

Special dual-purpose flat-shaped sensors were developed to monitor the temperature and humidity in the chamber. The sensors can be placed to a book, the book spine, etc. to provide continuous information on the drying process. Data from individual sensors were transmitted over the mobile phone to the Prague monitoring centre. It was therefore possible to immediately respond if the figures deviate from the values desired, and to phone instructions to the plant boiler room operator to find out the reasons for the deviation, or to make adjustment to the settings. The so-called monitoring book may also be used: this book with a cut-out section for a probe is soaked in water and then dried with other books. In this way the probe is not at risk of contamination by dirt from really flooded books.

Advantages

- controlled atmosphere provides for optimum speed of drying without any part of the book being dried excessively
- the course of drying may be adjusted to prevent any mould propagation during drying (60 °C).
- dry books are in balance with their future environment
- books are firmly held in place, which minimized any warping
- remote monitoring of process parameters

Fig. 1: Relative changes in strength in double bends (%)

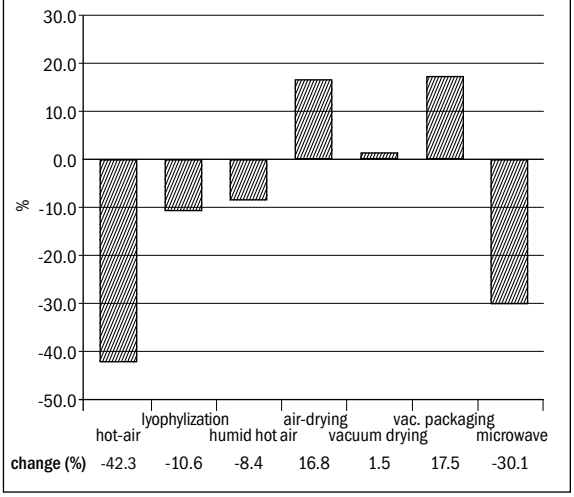


Fig. 2: Viable cultures after drying by various methods

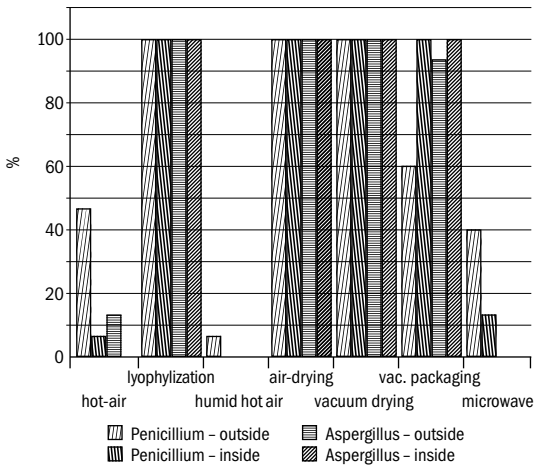


Fig. 3: Effects of temperature on half time of deterioration at 50% relative humidity

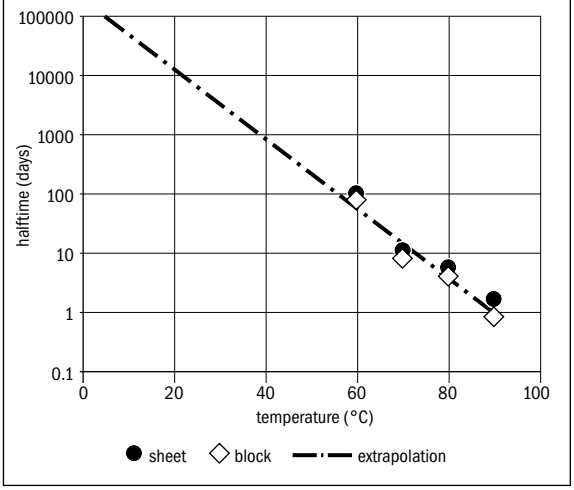


Fig. 4: Shrinking of book edges during process of drying

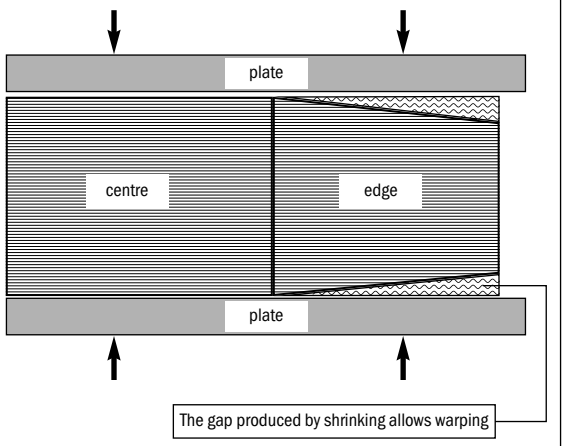
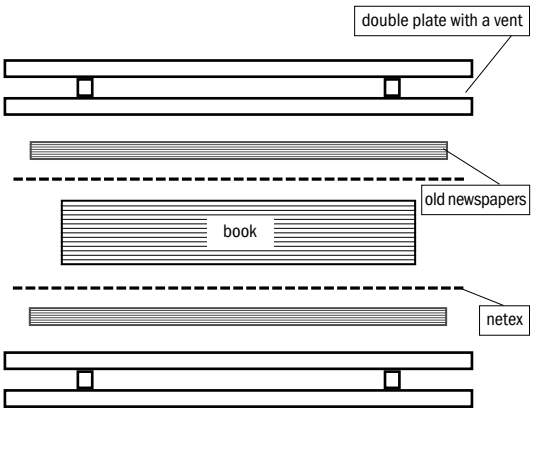


Fig. 5: Schematic diagram of a "sandwiched" book on shelf



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Use of Vacuum Packaging Machines for Drying

David Kleňha

The possibility of using vacuum food packaging machines for drying has been described relatively recently by Stuart Welch ad Nicolas Hadgraft from the UK. After the August floods, the British Council gave several such vacuum packaging machines to the National Library as part of its recovery aid. Pilot operation on the premises of the National Library was launched in autumn, and a standard drying operation started in November. Because flooded books may be contaminated by moulds, bacteria and viruses, it was necessary to consult experts what possible health risks there were and how they can be eliminated, and based on that, what measures should be taken to meet strict public health standards.

Because the National Library had only its reserve holdings flooded, it offered selflessly the use of its new drying workplace to the Municipal Library, whose holdings, including rare prints section, had been flooded.

The drying process consists of the following steps: wet, sometimes still frozen, books are wrapped in a separation cloth, put in between paper filters and thick layers of newspaper. The newspaper serves as an absorbent, and paper filters protect the book against the ink, dirt, etc., that might get to them from the newspaper. The separation cloth will prevent the sticking of newspaper and paper filters to books. The size of the approximately 1 cm thick layer of newspaper should be cut to the size of the book to prevent deformation of book binding edges.

The wrapped-up book is then placed into a polyethylene bag and the air is removed from the bag. This is repeated 8 or even 12 times. Periods between re-packing are about 14 days (might be even shorter at the beginning). Starting from the second of third re-packing, books may be opened carefully, and paper filters inserted in between their pages. This will partly reduce the risk of pages getting stuck together, and it also gives us information about the state of the book. The inserted filters may help to determine the end of drying. The drying is completed when no part of the book or any of the inserted paper filter feel cold to touch. At that time, paper also regains its strength and characteristic sound (tinkling, rustling sound). It is of course necessary to wear gloves when checking whether the drying process has been completed. In the course of drying, it is possible to straighten out creased leaves, and also to correct, partially or completely, the spine, cover boards, etc., twisted in the flood.

The physics underlying the process of drying is fairly straightforward. When a wrapped-up book is placed in vacuum in a bag, water and humidity begins to diffuse spontaneously to the dry newspaper. In this way, the humidity in the bag will gradually be equally distributed. After each re-packing, the resulting humidity will be between the humidity of the book being dried and the humidity of the dry newspaper, and the book can never get drier than the newspaper. Because humidity in the book is finally equalized by its partial absorption from the wrapping material (in the final stage lower values of relative humidity are in play), books can never get excessively dry, which is particularly advantageous when valuable, fragile or severely damaged materials are being treated.

When the air has been removed from the bag, the book is compressed by the atmospheric pressure, which poses certain risks. Before drying, the state of repair and the material of the binding should be considered.

Paper, cloth or buckram bindings can usually be vacuum-treated without any risk of the atmospheric pressure causing undesirable smoothing out of the surface of the binding and its compression. Leather and parchment bindings should be protected by some soft absorbable material, e.g. by paper towels or tissues, which should be placed on books wrapped up in the separation cloth instead of the paper filter, and then covered with a layer of newspaper.

During the flooding and subsequent freezing, the spine of many books may have swelled in volume and width. The lining was often separated from the binding when the books were flooded, and slipped from the boards to the spine to compensate for the growing size of the book. After the air has been evacuated, the lining cannot, however, return to its place, and it warps on the spine, because the spine gradually gets back to its normal size. Where the lining, e.g., partially slips off the boards, the compressive force causes undesirable deformation because the lining copies the shape of the board and gets bent again along the board's edges.

In such cases, it is advisable to remove the cover or the entire binding from the book and dry it separately. This usually is no problem because glue gets washed off in the flood. All the bags containing parts of one book are marked with the same serial number, so that dried books are easy to put together again. To make it very simple in practice, each worker is allocated a set of ten numbers (1–9, 10–19, 20–29, etc.) and when he has used them all up, he is unallocated the next available set of ten numbers.

Another problem is the deformation of board edges. When the size of the newspaper used exceeds that of the book dried, the newspaper leaves will be bent towards is book edge. The boards, softened up as they get soaked with water, will bend under the newspaper in a similar way. Such deformation may be completely or partially prevented if a layer of at least one centimetre of the newspaper is cut to match the size of the book boards.

In a few cases, folds along the edges of the leaves parallel with the upper, lower and front edges were observed. These deformations, just like some deformations of the spines and boards, could be prevented by a less aggressive air evacuation. Moulds remain a big problem because their growth gradually gets out of control. When books are packed for the first time and they are still quite damp, humidity moves from the book to the newspaper relatively fast, which is exactly not conducive to the grows of moulds. However, the drier the books, the slower the molecules of water move. In that environment, moulds thrive because the bags contain relatively large amounts of oxygen due to the moderate air evacuation. We abandoned this type of the air evacuation very soon.

Mr. Neuvirt from the Chemical and Paper Industries Association suggested that paper filters soaked in n-butanol be placed in the bags, which, however, is not 100 per cent effective. Another option would be to build in gassing equipment into the vacuum packaging line that would allow packaging of dried books in nitrogen protective atmosphere. The books would be disinfected after a suitably long period. The use of inert atmosphere would be ineffective before the books get dry. Moreover, in bags filled with nitrogen there would be no guarantee of a sufficient contact between the book and newspaper. Vacuum packing at full capacity of vacuum packaging machines is therefore unavoidable.

Another method used by the Municipal Library Prague is drying at a controlled temperature and humidity in wood-drying chambers at Kralupy nad Vltavou. The suggestion that our Library uses the chambers came from Mr. Neuvirt, who also acts as a consultant for the process. The National Library offered the use of the drying chambers to the Municipal Library free of charge.

Books are piled into stacks, interlaid with pairs of porous tiles with an air vent in between. Separation cloth and newspaper are placed between the books and the tiles. The stacks of books are loaded from above to prevent board warping. Inside the chambers, the circulating air temperature and humidity are constantly checked and regulated to achieve gradual drying of the books in 10 to 14 days.

A comparison between this method and the use of vacuum packaging machines shows that the major benefit of the former is the speed of drying. Other advantages include no deformation of spines and board edges. It is also less labour intensive. Tests made by the National Library in cooperation with the State Central Archives have shown that internal paper degradation was only marginally bigger than if vacuum packaging machines were used.

The disadvantage of the method is that books get excessively dry. Leather and parchment in particular are subject to severe damage by the temperatures used (about 60 °C). Glue is also overdried, and some books may crack slightly at the spine, etc. when they are opened. Compared with hot-air drying, vacuum packaging will also help remove some dirt from the books.

Our rescue operations have show that neither of the methods is perfect, or a panacea. It is always recommendable to carefully choose the best drying method with regard to the material dried. Confronted with the necessity to dry a large number of volumes, the necessary drying time should also be taken into account, and it should be kept within realistic limits.

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Development and Construction of a Multi-purpose Vacuum Drying Chamber for Water-damaged Documents

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Specification

The vacuum chamber is to be used mainly by "memory-preservation" institutions whenever rare or historical paper document stored there are damaged by water (natural disasters, accidents fires, etc.). To prevent paper deterioration and mould growth, wet documents are frozen. Because collections of these institutions contain documents with different types of paper, it is necessary to bear in mind that different types of drying technologies, and even different types of disinfectants, may have to be used. The main uses of the vacuum chamber could be:

1. Vacuum drying. Books or archival documents are being dried in a vacuum, but the amount of heat delivered to the chamber is only sufficient to convert water in the books from the solid to the liquid phase; water will then evaporate at lower temperatures that will not cause paper deterioration.
2. Vacuum freeze-drying. Books are being dried by sublimation, i.e. water does not pass through the liquid phase. This drying technique is used mainly for documents with coloured pigments, inks, stamp ink, etc., and there is a risk of bleeding.
3. Drying in a controlled atmosphere. Books are being dried under atmospheric pressure, while the air or some other gas or a mix of gases is forced to circulated in the chamber. The temperature and humidity of the gas are adjusted according to the requirements. The use of a gas should prevent the growth of moulds. This method is suitable for documents that cannot be dried in a vacuum, or whenever accelerated drying is required.
4. Disinfection. Books are exposed to an active agent (e.g. butanol vapor). The high vacuum will facilitate the penetration of the agent into the paper block.

The client also required that the chamber allowed for the books and other documents to be held there under a defined pressure that will prevent any warping during the drying process.

In view of the above requirements, the equipment must contain the following sections:

1. vacuum chamber
2. freeze-drying unit
3. structure for the clamping of books and ceramic tiles
4. air-conditioning unit
5. system for the regulation and control of the drying and disinfecting processes

Description of the drying process in the vacuum drying chamber

The drying will take place at 99.9 % vacuum (1 mbar of absolute pressure). Individual books will be wrapped in special paper and placed between two ceramic tiles, the so-called "smart tiles". The tiles are equipped with electric heating that will supply the book with the heat needed for the sublimation of the frozen water. The temperature control system of the tiles makes it possible to set the maximum tile temperature depending on the type of document to be dried, and thus to prevent its deterioration due to excessive heat. The tiles will be unglazed porous ceramic tiles with an aperture to allow air circulation and to maintain their evaporation surface equal to the entire surface of the book. Based on calculations, the freezing chamber will be fitted with a fan as part of a closed air circulation system to accelerate the process of drying, and a freezing unit on which the evaporated water will freeze. At the end of the drying process, air or some other gas (e.g. nitrogen) will be let into the drying chamber. Using air conditioning, the books will be brought to the temperature and humidity that exist in the room in which they are to be stored. The objective is to homogenize the humidity and temperature distributions in all books, and thus to prevent their further deterioration due to the re-absorption of humidity and equalization of their temperature with that of the environment. The use of a suitable gas will sterilize the books during or after the drying.

Throughout the operation, books will be in stacks and fixed in a special-purpose clamping system to prevent warping or any other deformations of the books. The clamping system will be designed to allow stack of books to be handled individually, and it will include a filling truck and a system for loading and unloading stacks of books that will be user-friendly and will allow loading according to some special requirements. It will be possible to keep the books clamped even when they have been taken out of the

chamber, which will facilitate balancing their parameters with those of the environment without any risk of warping, etc.

Data from the control and regulation system, temperature sensors in books, electronic vacuum-measuring system, air-conditioning unit, freeze-dry equipment and the oil vacuum pump will be stored in a computer.

The reason for this approach is to address the issue of book drying (freeze-drying, hot-air drying, vacuum drying) and sterilization (by butanol, nitrogen, etc.) in its entirety. In its design, the system also provides for the fact that the range of types of archival documents that might be damaged is enormous. That is the reason why the drying process programming can be adjusted to ideally suit the material in question.

The main priority in the design was to guarantee the best quality of the books dried, and everything else was geared towards that purpose.

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Enclosure

Approximate numbers of books that may be dried in one cycle, designed for the National Library of the Czech Republic.

Book thickness (cm)	4	6	8	10
tile size (mm)				
250×200	216	162	126	108
250×330	144	108	84	72
250×450	56	54	42	36

The number of books to be dried in one cycle depends entirely on the dimensions of the vacuum chamber, which may be designed to suit the client's requirements regarding both the numbers of items to be dried and specific requirements for the items.

In view of the complicated nature of the project and the very high safety requirements on the quality of drying, the project execution will be supervised by an expert team.

Saving Inscriptions of the Names of Holocaust Victims on the Walls of Pinkas Synagogue

Jan Červenák

Introduction

In 1492, J. Horowitz bought a Christian house "U Erbů" and set up a private prayer house there. One of his sons, A. M. Z. Horowitz, who belonged among the most prominent and wealthiest members of the Prague Jewish community, had a synagogue built between his house and the Old Jewish Cemetery. It was built in 1535 in the late Gothic style with renaissance elements and was called the Pinkas School.

Recent excavations have shown that it was built in two stages. The eastern section was built first, and when the older and continuously used prayer house was abolished, the western section was added.

Pinkas Synagogue also has a ritual bath, the so-called *mikve*, which is probably a part of remains of an older structure dating back to the 15th century, which would make it evidence of the oldest Jewish settlement in that area.

The synagogue was a part of the Horowitz family house until 1607 when, after the settlement with the heirs to the house, it was rebuilt in the late renaissance style (1607–1625), and extended to include a new wing with an antechamber on the ground floor, a meeting room and a women's section with a two-storey gallery opening up to the synagogue's interior through semicircular arcades.

Also, the present-day appearance of all the facades generally dates back to that time.

In its history, Pinkas Synagogue has been flooded several times. One of the floods hit in 1771, and repairs of water-damaged parts also included the bima. In 1775, several alterations were made that have survived until today. Several more were made in the following years.

The next heavy flood of 1860 caused very extensive damage to the synagogue. In subsequent repairs carried out by architect V. Holeček in 1862, the floor was raised by 1.5 meters, Baroque decoration was removed and the entire interior was modernized. The synagogue was also threatened by the 1892 flood.

In 1950, original fragments of decoration were used to restore the synagogue to its almost original appearance, and from 1954 to 1959 it served as a memorial to 77,297 Jewish victims of Nazi persecution in Bohemia and Moravia.

In 1968, the memorial to Jewish victims was closed down due to high dampness.

In the 1970s and 1980s, various reconstruction jobs were made.

In 1990, the synagogue was opened to the public following extensive reconstruction work.

Between 12 and 14 August 2002, Prague was hit by a flood that might be expected once in a thousand years.

On 16 August, measures to be taken after flood waters have subsided were drafted.

Immediately after flood waters did subside, a team was set up on the initiative of the client and non-aggressive measures were taken in order to prevent any damage to the valuable elements of the interior that might be caused by ill-conceived actions.

1 Consulting with the employer for the rehabilitation of damp masonry, plaster and floor layers

Because the synagogue was flooded and water penetrated to floor layers with absorbent insulation, it was necessary to remove the layers, also because electrical heating elements there were destroyed. During the dismantling and removal of the layers, about 300 to 500 litres of water were taken out of the synagogue.

2 Cooperation between the employer and the team of experts in saving the walls with names of holocaust victims

The team was set up by the Jewish Museum in Prague to include the following experts:

- Microbiologist and chemist
- Climatologist
- Civil engineer – architect
- Building structure analyst
- Hydrologist
- Project manager

3. Scope of activities

To regularly inspect names of holocaust victims on the walls of the synagogue with a particular attention to the changes in the dampness and temperature

of the masonry and in the synagogue, to take microbiological and chemical smears from the wall surfaces, and to evaluate them. Microclimatic measurements were made once a week in 45 places at a total of 135 measuring points, microbiological measurements were made biweekly or whenever necessary. Experts were also expected to summarize and evaluate the data obtained, and to make their results, conclusions and recommendations available to the rest of the team of experts and the employer, together with recommendations for further rescue work.

3.1 Microbiologist and chemist

Mould samples were taken by experts as part of their regular inspections. Because, however, the microclimate was controlled as much as the situation allowed and the surfaces affected by mould were immediately disinfected, mould incidence was minimized.

Very good cooperation was maintained with the research chemist, conservator and lettering conservator. Desalination and some other specialized jobs were performed as needed during inspection procedures. Detailed surveys and analyses of each section of the surfaces with inscriptions in individual fields made it possible to accurately define the scope of necessary conservation work.

3.2 Climatologist

A continuous sequence of measurements and subsequent assessments of the microclimate and dampness of the structure showed that the amount of water in the building was significantly reduced.

A detailed evaluation of individual measuring points shows the following:

- A radical reduction of dampness was observed in panels bearing the inscriptions.
- An even more significant reduction occurred when ventilation holes were made just above the floor of the synagogue nave.
- To reduce the effect of damp external walls, fans were set up to intensively ventilate the duct outside the external wall, and thus to eliminate the vapour pressure towards the interior of the synagogue nave.
- From October 2002, the synagogue was heated to a constant temperature between 8 and 15 °C.
- When the outside temperature was within, or very close to, the above range, outside air was used for ventilation.
- Particularly damp sites were air blasted, and dehumidifiers were used inside the synagogues when necessary.
- From the desiccation process point of view, the synagogue surfaces may be divided into areas of slow drying – pillars, area with measuring points 6, 7, 9, 10, 19, 24, and the rest of the areas where the drying proceeded as planned.

The desiccation process, generally speaking, followed an exponential curve, as demonstrated by plots recorded at individual measuring points. The rate of desiccation was not uniform over the entire surface, the situation on pillars was markedly better than in wall recesses. The non-homogeneity of the walls and possibly some pockets there were the cause of damp patches and unequal dampness over the surface of the walls. The exponential course of drying proved to be satisfactory, with no major step changes taking place.

About a week after the rehabilitation work on the floor, the removal of the upper layer and drilling holes near the floor, the dampness in the walls immediately along the floor was reduced. At the same time, it was possible to see that dampness was rising in the walls, and the dampness of surface layers was more and more serious in higher sections of the walls. It follows from positive reports on the occurrence of microscopic filamentous fungi, "moulds" that the effectiveness of measures to increase the air circulation in the synagogue was satisfactory. (Efforts to reduce dampness in places of growth, however, have had only minimum success to date.)

When ventilation is used extensively, relative humidity inside the synagogue depends on relative humidity outside it. In spite of that, a significant reduction in weighted average relative humidity values has been achieved.

Salt crystallization in the process of wall drying can hardly be influenced at all, and it will take some time before measures proposed to do that can be evaluated.

Although it may be too early to assess the contribution of all the measures and processes in view of the type of devastation of the structure, the situation has been developing favourably. In the next period, it will be essential to keep monitoring all critical parameters, and to continue with measures and processes applied so far.

3.3 Civil engineer – architect

Because it proved necessary to remove the more recent floor layers and disintegrating hollow brick were exposed, it was also necessary to repair infill walls. The work flow for the repair of infill walls of hollow bricks was made by Ing. Host.

3.4 Building structure analyst

Because cracks were found in the structure, it was necessary to monitor them and measure any dimensional changes in the cracks over extended periods of time. Although no major problems were ascertained over a five-month monitoring period, the monitoring will be renewed if new shifts are suspected.

3.5 Hydrogeologist

A very thorough survey of archival materials and investigations of underground structures of the synagogue were made. It follows from their results that the subsoil under the synagogue is stable, and it

is not even necessary to lower the water table by digging a well under the synagogue.

3.6 Project manager

The work of the team of specialists and conservators and that of the authors of project documentation had to be closely coordinated.

The parties cooperating in the project also included specialists who reported directly to the employer.

Basic steps in synagogue rehabilitation:

1. **Rehabilitation of walls with names of holocaust victims.**
2. **Removal of modern floor layers as the main source of humidity after the flood**
   The board of experts approved a two-stage removal of the floor. The first stage was to start immediately and depended only on the go-ahead from the employer. The second stage depended on a number of external factors, primarily the state of repair of the walls with inscriptions, and the decision about its implementation was made only after some test holes were made in which the situation in the subsoil is to be examined.
3 **Conservation work on the walls, aron, bima**
   The processes to be used had to be approved by the board of experts.

4 Conclusion

Individual reports were submitted as independent documents complete with other materials, audits, measurements, etc., at regular review days and also whenever it was necessary.

5. General evaluation of procedures used in reconstruction and rehabilitation work after the flooding and their comparison with procedures used elsewhere.

Comprehensive and continuous monitoring of surface temperatures, dampness and incidence of mould in the synagogue interior, on its walls and inscriptions together with direct measurements of salt depositions made it possible to take targeted measures to prevent serious breakdowns or damage. This approach was different from more radical approached used in some other structures, where the plaster was removed and still wet walls replastered soon afterwards. The situation in these structures, to which we were invited only after such remedial action (in some cases the procedure was repeated several times), is nowadays pretty dismal, and stabilisation may be delayed by up to a year.

In the approach adopted by us, which included comprehensive measures taken with individual treatments adjusted to exactly suit the state of the masonry and the surfaces and to directly link with the rest of the factors that have a bearing on the situation, no steps were taken that might have hindered or negatively influenced the gradual rehabilitation of the masonry, surfaces and inscriptions. The situation was significantly improved by ventilating the duct along the synagogue external wall, heating the synagogue in winter, and continual treatment by the chemist, the microbiologist and the lettering conservator.

Experts concluded that treatment procedures used were exemplary.

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A Centre for Restoring Book Collections Affected by Flooding

Jiří Vnouček

The restoration of books affected by flooding represents the second and, to a large extent, final stage in overcoming the consequences of the physical damage inflicted on book collections. The freezing of the books in reality merely delayed the problem of drying them, which represents the first stage in their rescue.

The aim of the centre being formed at the National Library's existing restoration facilities in Prague is to provide help to libraries and other cultural institutions affected by the floods of August 2003 that do not have their own restoration facilities, or whose facilities were themselves damaged. While the existing restoration facilities have only covered the requirements of the National Library itself, the new facilities, created with financial support from the Ministry of Culture of the Czech Republic, should also serve other cultural institutions, principally by performing restoration work on collections of books damaged by the flooding.

This new centre is designed to handle a relatively large number of books and other paper documents, and will been equipped with this purpose in mind. It should have a wide range of possibilities for protecting and restoring damaged collections at its disposal. Damaged materials received will be sorted, before being assessed by experts to determine what kind of condition they are in, to enable the best possible procedure to be taken. We anticipate that far from all the damaged items will need to be completely restored. Co-operation with the institutions concerned and the administrators of the damaged collections will be required after the damaged books are documented and prepared for restoration.

We anticipate three basic variants for restoration work:

1 inspection, minor treatment and storage in protective packaging (in essence maintaining the state following book drying)

2 restoration work without the book being taken apart (principally the correction of deformation to bindings and in-situ repairs to the bodies of books)

3 complete restoration (including the book being taken apart and returned to its original condition)

The typology of damage to book collections

The collection of books affected by the flooding, subsequently frozen and then dried in various ways, shows a wide range of types of damage. The level of damage is dependent on the way the book was treated before freezing and, first and foremost, on the type of drying method chosen. Various types of deformation are seen, both to the body of books and, first and foremost, to their bindings. Parts of bookbindings such as covers have often been lost or damaged to such an extent that their replacement must be considered. The materials used to cover bindings have, obviously, been preserved in various conditions during drying. It is necessary, in the case of parchment and leather in particular, to count on their have contracted and dried hard. In the case of handwritten sections and notes (hand painted initials can also be expected, particularly on the oldest books), stamps and signatures the ink or paint can be expected to have washed off, for which reason it will often be necessary to identify these markings. The collections are generally heavily soiled, and deposits of mud and various sediments, which will easily form clouds of fine dust after drying, must be removed. The unpleasant smell of the books and documents handled is a chapter unto itself.

The working process

1 preliminary work – keeping records of orders, documentation, drawing up a proposal for treatment following initial analyses

2 a initial treatment and production of a box on a sampling plotter

2 b renovation repairs using vacuum technology, in particular various forms of low-pressure vacuum benches

2 c taking books apart and treating their individual parts, washing away dirt in water baths, unsticking pages, possibly de-acidification, repairs to existing bindings or the production of new bindings

(all the given treatments anticipate prior thorough mechanical cleaning)

3 the assemblage of orders, documentation, the production of protective wrappers and dispatching

Basic facilities

- computer records of orders and digital documentation of the state before treatment (computer, notebook, digital camera, tripod, stereo microscope)
- analytic instruments (pH meter, photo-spectrometer, infra-red camera)
- mobile workbenches with washable surfaces, which can be combined to form a larger area
- water baths with temperature regulation and odour extraction
- various kinds of low-pressure vacuum benches (large benches for gluing and de-acidification, partial vacuum benches for mending damaged paper, vacuum wedges for in-situ repairs to books and bindings)
- drying equipment specially modified for drying documents cleaned in water baths
- a ventilation system and fume hood
- bookbinding workshop

Financial cost

Costs of around ten million crowns are anticipated for the construction and equipping of the centre.

The location of the centre

There is not enough space in the existing National Library buildings to house the planned centre (around 200–250 square metres), for which reason the leasing of premises near the restoration laboratories at the Central Depository in Hostivař in Prague is planned. A small production hall has already been targeted (a 5-year lease is anticipated). The optimal solution would, of course, be to build the necessary premises right in the Central Depository building. The transport service premises would seem particularly suitable for reconstruction. Unfortunately adequate finances are not available for the reconstruction of these premises, which could also be integrated with other restoration and conservation work such as the reformatting and digitalisation of collections following the floods, and the reconstruction of the building is not a priority of the National Library of the Czech Republic at the present time. Building a permanent centre in the buildings of the National Library or on its land would reduce costs over the long term, particularly considering the payment of a lease and the installation of the essential air conditioning.[1]

[1] At the time of preparation of the anthology the location of this centre has yet to be definitively resolved.

Staff

At the present time we are planning on three permanently employed restorers and one chemist/technician. The workplace is, however, planned for as many as ten additional members of staff, who should include students from colleges of restoration (including foreign colleges), trainees and volunteers. The recruitment of the necessary staff is already in progress on an international level.

Commencing operations

The time at which the centre begins work is dependent on the allocation of financial means into the account of the National Library, the purchasing of equipment (and the associated tender proceedings), the closure of contracts of lease, etc. October or November of this year is, however, anticipated. It should, however, be noted that work on restoring damaged items from library collections has already began to a limited extent and on cramped premises. The first trainee from a college of restoration in France has been working at our restoration laboratory since May. She is working on the conservation and restoration of the collection of books from the Municipal Library in Prague, and will be joined by another trainee in June.

Preconditions for the work of the centre and prospects for the future

One of the basic preconditions to the opening of the centre is a sufficient quantity of dried books and other documents. Books should be delivered following drying and subsequent disinfection. It will nevertheless be necessary to observe hygiene regulations. Even if the given items have been disinfected, this will still be heavily soiled and mechanically damaged material (in certain cases subject to chemical contamination as well), which can be expected to be characterised by an unpleasant smell and other problems which are not usual during work with ordinarily damaged items. All the equipment used should, therefore, be designed to ensure that the conservators working with this material are not exposed to any health risk and so that they can work under reasonable, or preferably even pleasant, conditions. A considerable psychological burden can also be expected. The centre should be thoroughly air-conditioned to ensure that any unpleasant smell is minimised. We also anticipate the development of special drying equipment designed for drying sheets of paper after cleaning in water. All the equipment should be relatively mobile, in order for the working layout to be easily varied and to allow for operative changes to working procedures.

The new centre for the restoration and conservation of library collections should work for at least five

years on rectifying the damage caused by the floods, although even now its use after that time is fairly obvious, since part of the equipment can be transferred to any new library restoration laboratories created. It is, in any case, certain that the centre will continue to serve to protect, conserve and restore the library collections of cultural institutions that do not have their own facilities for performing this work within the framework of the National Programme for the Conservation and Restoration of Book Collections now being drawn up. The existing restoration laboratories of the National Library were also originally conceived in this way (and operated in this way for a number of years). We believe that the creation of a new centre will be represent an appropriate continuation and development of our fifty-year tradition in the restoration of books and other written material and something of a celebration of Josef Vyskočil, the man who began it all.

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Methodological Centre of Conservation: Concept of Technology for Flood Recovery Efforts

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Abstract:
The Methodological Centre of Conservation (MCC) Project of the Technical Museum in Brno (TMB) draws on a large number of similar long-term projects in conservation and restoration in this country. The project was launched in response to the government document "Cultural Policy of the State" and Act 122/2000 Sb. The aim of the project is to build a centre for support and development of conservation and restoration in the Czech Republic. The flooding that hit the Czech Republic in August 2002 and the damage to library and archival holdings it caused prompted the drawing-up of technological processes to salvage them; in 2003, the Czech government set the salvage operation as the MCC priority.

The basic problems faced when dealing with frozen material are its volume, differences in material and different degrees of microbiological contamination hazards. The technology proposed for the MCC responds to the above challenges.

On the basis of the Czech government Resolution 216 of 3 March 2003 regarding the salvage of documents of public administration institutions and of institutions administering cultural heritage damaged by 2002 flooding, a decision was taken to build a Methodological Centre of Conservation (MCC)[1] in the Technical Museum in Brno, and, at the same time, with a high priority task for 2004–2008 consisting in providing for the thawing, drying and sterilization of damaged holdings, with a possibility of subsequent conservation of selected documents and collection items in flood-affected organisations.

Mission of MCC

The mission of the Methodological Centre of Conservation is to support and develop of best practices in the care and protection of national cultural heritage in the Czech Republic. The basic aim of the MCC is unify conservation and restoration activities in the areas of research, applications and education. The MCC will create and provide conditions for research into, and development of, conservation and restoration materials and technologies, their analysis and verification. The MCC shall be active in providing information on, and in counselling in, conservation and restoration. The Centre shall closely cooperate with museums, galleries and other institutions maintaining Czech national cultural heritage, and assists them in providing optimum protection of their collections. The Centre has been modelled after similar institutions in other countries, particularly the Canadian Conservation Institute and the Netherlands Institute for Cultural Heritage.

Basic activities

- Research into and development of new conservation technologies and materials.
- Testing of original technologies of manufacture and processing of material, conservation means, methods and technologies.
- Material diagnostics (analysis of level of damage, chemical composition, manufacturing methodology, etc.).
- Conservation of collection items in the form of preventive conservation or conservational remedy based on experience in traditional manufacturing procedures combined with knowledge of most up-to-date methodologies proven by research, tests and analyses.
- Counselling including evaluation of the state of repair of objects and recommendations for their treatment, storage and exhibition.
- Immediate assistance in emergencies, e.g. flooding, fire or vandalism.
- Education and lecturing
  - Professional training for staff in museums
  - To organize lectures on museology and conservation in cooperation with universities
  - To organize seminars, workshops and placements

Conservation and restoration

- Historic, scientific and ethnographic objects of various materials
- Industrial, technological items and militaria

[1] More information on the MCC is available at www.technicalmuseum.cz

- Archaeological material
- Furniture and ornamental objects
- Books and archival materials, drawings and prints
- Photographs, negatives and films

The MCC plans to gradually expand its conservation and restoration activities to include also other types of collection items and types of material.

Organisational structure

Founded and operated by:

- Ministry of Culture of the Czech Republic – Technical Museum of Brno

Cooperating organisations:

- Masaryk University in Brno:
  - Faculty of Natural Sciences
  - Faculty of Arts
- Brno University of Technology
  - Institute of Material Engineering of the Faculty of Mechanical Engineering
  - Faculty of Chemistry

Cooperation between the MCC and the rest of the organisations will be organized on a contractual basis, in compliance with the TMB's Articles of Establishment and Rules of Operation, and with regard to possibilities of individual institutions in the areas of equipment and human resources, and their specific possibilities for cooperation. The MCC will invite domestic as well as international research centres to cooperation and work on projects.

Structure of MCC departments

1 **Technological Line Operation Department**
(This department will subsequently be transformed to the Rescue Centre and will respond in the case of natural disasters and emergencies; it will consist of a technological line + depositories)
2 **Analytical Centre**
(material diagnostics)
3 **Conservation Research and Application Department**
(research, application and verification of conservation methods, materials and preparations)
4 **Material-Specific Divisions of Department for Conservation**
(application of conservation technologies to conservation of all kinds of collection items)
5 **Learning Centre**
Education and training (courses for students from the Faculty of Natural Sciences and the Faculty of Arts of Masaryk University and other schools, training courses, seminars and conferences)
6 **Depositories**

Situation of collection items and library and archival holdings after the flooding

During the August 2002 flooding in the Czech Republic, the quantities of paper documents deposited in state institutions and soaked with river and sewage water were enormous, and thus the drying of the documents in the open air was effectively ruled out. The waterlogged documents had to be frozen immediately when the water subsided because that was the only suitable method of conservation at that time. Before freezing, the documents were sorted (if possible) and rinsed with clean water on the outside (the inside of the documents remained contaminated). When for various reasons the rinsing was not possible, the still dirty documents were put together to make A4 format packages about 10 to 30 cm high on average. Architectural plans and drawings were in packages up to A0 size and they were 20 to 40 cm high. PE sheet was used as wrapping material, and the individual packs were labelled for identification purposes. It is estimated that the total volume of thus frozen paper documents from the Ministry of Culture alone is about 400 m^3, and the documents are stored in Mochovské mrazírny a.s. (a freezing plant) at Kladno.

Potential labour risks – microbial risks

The paper documents flooded may be divided into two groups:

- Paper documents flooded with contaminated surface water (e.g. the Terezín depository) – expected to be classified to **Group 2**[/2] biological agents
- Paper documents flooded with contaminated sewerage water (e.g. Praha depository, the majority of the documents flooded) – expected to be classified to **Group 3** biological agents

Because the flood was the largest in the last five hundred years, it flushed not only sewerage pipes and sludge sumps currently in use but also a number of blocked and for centuries unused sumps, sewerage pipes and other underground spaces. It may be assumed that apart from the numerous pathogens microorganisms, moulds, etc., usually living in such areas, there may be also other water-borne infectious agents, posing a hazard not only during floods. It should also be noted that thanks to their physical

[/2] Government decree 178/2001 Sb., which stipulates the level of health protection at workplaces (Section 22, Par. 2):

b) Biological agents of group 2: potentially causing human disease.... with low likeness of spreading outside the workplace. Effective prophylaxis and therapy are available.

c) Biological agents of group 3: potentially causing serious human diseases and representing serious risk for the staff and serious risk of spreading outside the workplace. Effective prophylaxis and therapy are available.

properties, paper documents placed in more or less flowing water acted as an effective filter for mechanical as well as biological particles carried by the floodwater. The paper documents, especially those stored in basements, may have been contaminated with microorganisms and moulds even before the flooding. Relatively high ambient August temperatures after the water subsided and the above-mentioned conditions made paper documents into an ideal environment for the growth and reproduction of microorganisms and moulds.

For these reasons, it was necessary to follow strictly defined technological and operational procedures to guarantee labour protection when handling unknown material that might contain biological agents of group 3. This procedure includes a number of sanitation and safety regulations harmonised with the EU regulation that lead to the sterilization of the material. The selection of a suitable technology of drying and sterilization of frozen material must be accommodated to those facts. Under these circumstances, the best methods of drying are those that keep the material constantly frozen (the so-called lyophilization). The comprehensive technology for salvaging frozen documents proposed for the MCC fully respects and complies with the above requirements.

Comprehensive technological solution for salvaging lyophilized documents

For the paper documents to continue to serve their original purpose, they must be dried, sterilised and conserved after lyophilization. These measures are performed in three independent technological sections that follow one immediately the other to make a single **technological line**:

Technological Section I – storage of frozen material, sorting of frozen material (I – Group A or B, metal – non-metal), drying, sterilisation and sorting of dry material (II – by content, contamination and level of preservation)

Technological Section II – removal of mechanical dirt from material structure (wet, dry), structure reinforcement, drying using methodologies adjusted to the material type in question, and further sorting (III – by content)

Technological Section III – stabilisation of treated material and its return to owners, or conservation on the premises

Core area – drying and sterilization methods

The most important and demanding part of the technological procedure (from the financial, instrumentation, personal and operational points of view) is the drying of frozen documents and their subsequent sterilisation (with ethylene oxide). In view of the high risk of the environment and the staff contamination with dangerous pathogenic microorganisms of groups 2 and 3, a special technology has been devised for the drying of frozen material of the types A and B:

1. The frozen material (types A and B) will be repacked and placed in double-layer sterilisation bags protecting the environment and the staff from contamination (gas permeable sterilisation bags).
2. The frozen material types A and B will be kept in the same sterilisation bags throughout the contaminated material processing, including the drying and sterilisation (only frozen or dry material, never wet material).
3. Only frozen material will be dried – the most gentle method of drying paper documents is lyophilization (vacuum freeze-drying).
   - Material B will only be dried in lyophilization devices combined with an ethylene oxide sterilizer (2 m^3 and 20 m^3 in volume), and the material will be sterilized with ethylene oxide at the end of the drying cycle.
   - Material A may be dried in a separate lyophilization apparatus (about 2 m^3 in volume) and sterilised with ethylene oxide after being transfer into the sterilisation apparatus.
4. Ethylene oxide sterilisation will take place in a closed system:
   - **a** A trial operation (Q4 of 2003 to the end of 2004) – instruments supplied from Switzerland as part of aid efforts (drying – lyophylization) will be used to treat part of material A, and before the entire technology is commissioned, material will be sterilised in a special small-volume (about 135 l) ethylen oxide sterilizer.
   - **b** When all the equipment is operational, sterilisation will take place in special combined appliances mentioned above using a mixture of ethylene oxide (10%) and CO2 (90%).
   - In both cases, the ethylene oxide will be catalytically burned in an abator with output concentrations at the outlet of the roof exhaust at < 3 mg/m^3.
   - Ethylene oxide evacuation will take place in several aeration cycles for a period for about 16 hours if the pressure is less than 10 kPa, or directly in the sterilisation apparatus if vacuum is used (about 0.1–1 Pa). In the latter case (use of vacuum), the material will stay for another 48 hours in a special ventilated room until biological test of sterilisation effectiveness have been evaluated (the guarantee of ethylene oxide residual concentration well below 1 mg/m^3 for long-term storage). In the former case (reduced pressure), a chemical test of sterilisation effectiveness will be made, and the material sterilised will be ventilated in storing

containers during its whole period of storage (until the technological line is put in operation); if requested by the owners, the dried and sterilised material will be returned to them.

To dry frozen material (I) of the A and B types, the following modification of lyophilization will be used:

- Lyophilization with standard heating (grids, chamber walls)
- Microwave lyophilization
- Microwave vacuum drying at a pressure slightly exceeding the triple point of water (the material remains dry and frozen – see below)

Before material (II) is dried, it will be rinsed to remove particles of dirt, and then the following methods will be used depending on the type and sensitivity of the material:

- Vacuum drying with standard heating (vacuum apparatus about 30 m^3)
- Microwave vacuum drying

Conclusions

The concept of the Methodological Centre of Conservation responds to the need of inter-disciplinary approach to the protection of cultural heritage. The combination of the scientific potential of a university with activities of museums and other institutions responsible for the care of cultural heritage opens the door for further qualitative development of conservation and restoration. Particular emphasis is placed on enhancing scientific, research and training activities, and a systematic processing and publishing of information. For the MCC priority task, i.e. to dry, sterilize and conserve documents and materials frozen after the 2002 flooding, a multi-purpose technological line will be used. The line has been set up on the basis of the above principles including the observance of strict public health and labour safety regulations, the use of optimum drying methods for the materials treated, tight control over the entire process and testing the validity of individual procedures.

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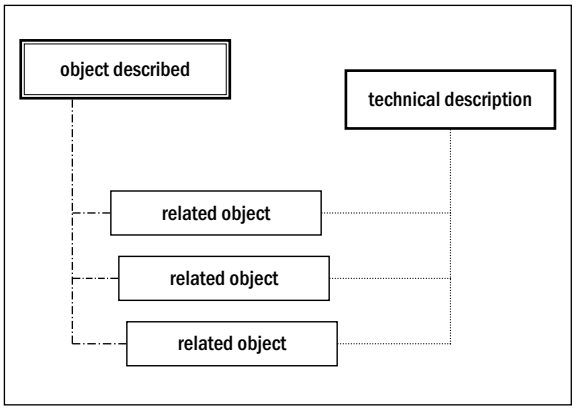
Basic Model of Museum Object Descriptions

Adolf Knoll

In August 2000, a large part of the archives of the National Museum of Technology storing material documenting the development of Czech aircraft manufacture and Czech architecture was flooded. Most of the documents were various types of drawings and sketches. It was decided that they would be dried, microfilmed and digitized. Thus a question of a suitable descriptive format for such objects was brought to our attention.

We decided to analyze approaches commonly used in other countries, and to test their applicability to objects that were in the centre of our attention. An analysis of description requirements showed that museum objects may be represented and documented in different ways, and that the same is also true about some of their constituent parts. Technical or architectural museum objects may be originals or mock-ups, and, at the same time, there may exist their drawings or sketches and a large number of other objects or documents that supplement the information background linked to them.

Almost anything may serve as the core description object, although in most cases it is the original object, is plan, mock-up or archival document. Core description objects may have a number of other related objects of different character attached to them, be it other identification descriptions of various parts of the core description object or web documents, pictures, texts, audio documents, videos, etc. The related object descriptions should preferably contain some technical descriptions that would more clearly identify their properties in a simple metadata format.



Objects described

The objects to be described need to be identified, and the basic administrative and location data need to be recorded. At the same time, it is important to allow for the objects to be linked to other related objects that participate in constituting the information environment.

In the selection of descriptive elements, standards currently used in the National Museum of Technology for the description of technological and architectural objects were taken into consideration. The foreign models considered included the existing evaluation[/1] of museum standards, with a particular attention on French standards for the description of movables and architectural objects[/2]. These standards are very similar, but they focus mainly on how the data should be stored and the terms definition. The system for the description of architecture is more detailed and highly specialized; a large number of descriptive data are administrative and location data, and it also gives detailed geographical information. The PALISSY and MÉRIMÉE databases, although their data lists are somewhat simplified, also included a number of descriptive elements that we were unable to use. For our purposes we needed a reasonable compromise because previous analyses showed quite clearly that there were too many descriptive (identification, cataloguing) standards for museum objects, and that they often had very little in common.

[/1] Knoll, Adolf: Přepodklady možného technického řešení virtuálního zpřístupnění kulturního dědictví. In: Národní knihovna. Knihovnická revue. Praha, Národní knihovna ČR, vol. 13. 2002, no. 2, p. 77–83. (ISSN 0862-7487)

Knoll, Adolf: Prepodklady možného technického riešenia virtuálneho sprístupnenia kultúrneho dedičstva. In: Knižnica. Revue pre knihovníctvo, bibliografiu, knižnú kultúru, informačné systémy a technológie, biografistiku, archív a múzeum knihy a literárnych pamiatok. Martin, Slovenská národná knižnica, vol. 3. 2002, no. 2, p. 57–64. (ISSN 1335-7026); or: http://www.snk.sk/kniznica/2_2002/elek_1.html

[/2] Système descriptif des objets mobiliers / Sous la direction de Hélène Verdier par Aline Magnien et Catherine Arminjon, ... Paris, Editions du patrimoine, 1999. 372 p. Documents et méthodes, 6; ISSN 1150-1383; ISBN 2-11-091636-2; ISBN 2-11-091765-2

Système descriptif de l'architecture / Sous la direction de Monique Chatenet et Hélène Verdier par Jeannette Ivain, Xaver de Massary avec la collaboration de Marie/ Hélène Bénetière, ... Paris, Editions du patrimoine, 1999. 304 p. Documents et méthodes, 5; ISSN 1150-1383; ISBN 2-11091636-2; ISBN 2-85-822-336-X

A number of descriptive standards was analyzed in the REACH project of the RLG (Research Libraries Group) in the USA. The authors came up with a list of twenty descriptive elements, the so-called REACH Element Set[3]. We analyzed the REACH element set and developed it into a structure in which, besides the standards currently applied in the National Museum of Technology, cataloguing rules developed for the description of digitized serials[4] in the DTD draft. These rules are based in existing standards and reflect the best cataloguing practice. This means that the basic identification description of museum objects is largely compatible with the identification description of digitized serials, while offering a necessary extensions and modifications dictated by specific museum needs.

The descriptions of museum objects use the XML as its platform, and the description is formally defined in the appropriate DTD (MuseumObject.dtd). Technical records are defined as independently loaded entities (the TechnicalRecord element in TechnicalRecord.dtd).

A museum object description (the **MuseumObject** element) consists of two basic parts:

1. the core description of the object (the **CoreDescriptionObject** element)
2. the identification of related objects (the **RelatedObject** element)

Both of the elements may appear more than once, and the **RelatedObject** element is not obligatory; it makes it possible to reference any other types of files (web documents, other xml files, data, image and audio files and full text files) as well as documents located either locally or on the Internet, and thus to create a relatively very rich research environment.

The current versions of DTD and related documents are available from the URL:
http://digit.nkp.cz/MaterialObjects/index.html

DTD is at the address:
http://digit.nkp.cz/MaterialObjects/1.0/DTD/MuseumObject.dtd

The web also offers examples of specific XML files and their transformation for web browsers, which demonstrates the characteristics of the model proposed.

DRAFT OF MUSEUMOBJECT.DTD

```
<?xml version="1.0" encoding="UTF-8"?>
<!- edited with XMLSPY v5 rel. 4 U (http://www.xmlspy.com) by Adolf Knoll (Narodni knihovna CR)
->
<!ELEMENT MuseumObject (CoreDescriptionObject, RelatedObject*)>
<!- PART A1 -- THIS IS THE IDENTIFICATION DESCRIPTION OF THE MUSEUM OBJECT ITSELF ->
<!ELEMENT CoreDescriptionObject (ID?, InventoryNumber*, ShelfNumber*, Location*, GMD, Title+,
Creator*, Publisher*, Printer*, PhysicalDescription?, Series*, Language?, Subject*, Keyword*,
Style*, Accessibility?, Notes?, Annotation?, DocumentationObject*)>
<!- Element AdmRecordData informs about persons who created descriptions or made their
revisions. Dates are written in the format YYYYMMDD. SourceOfDescData may use entities from
external lists. ->
<!ELEMENT AdmRecordData ((CreatorOfRecord, DateOfRecord, SourceOfDescData?),
(AuthorOfRevision, DateOfRevision, SourceOfRevisionData?)*)>
<!ELEMENT CreatorOfRecord (#PCDATA)>
<!ELEMENT DateOfRecord (#PCDATA)>
<!ELEMENT SourceOfDescData (#PCDATA)>
<!ELEMENT AuthorOfRevision (#PCDATA)>
<!ELEMENT DateOfRevision (#PCDATA)>
<!ELEMENT SourceOfRevisionData (#PCDATA)>
<!- Unique identification number of the object ->
<!ELEMENT ID (#PCDATA)>
<!ELEMENT InventoryNumber (#PCDATA)>
<!ELEMENT ShelfNumber (#PCDATA)>
<!- Information about provenance, ownership, and location of the object ->
<!ELEMENT Location (PreviousOwner*, CurrentOwner, Exhibition*)>
<!- Information about previous ownership, location, and dates ->
<!ELEMENT PreviousOwner (PreviousOwnerName?, PreviousRepository?)>
<!ELEMENT PreviousOwnerName (#PCDATA)>
<!ELEMENT PreviousRepository (PreviousRepositoryName?, PreviousRepositoryPlace?,
PreviousRepositoryDates?)>
<!ELEMENT PreviousRepositoryName (#PCDATA)>
<!ELEMENT PreviousRepositoryPlace (#PCDATA)>
<!ELEMENT PreviousRepositoryDates (#PCDATA)>
```

[3] RLG REACH Element Set for Shared Description of Museum Objects, URL http://www.rlg.org/reach.elements.html

[4] Knoll, Adolf: New DTD for Digitized Periodicals - Nové DTD pro digitalizovaná periodika. Version 1.0 - Verze 1.0, URL http://digit.nkp.cz/DigitizedPeriodicals/index_web.htm

```
<!- Information about current ownership, location, and date of acquisition ->
<!ELEMENT CurrentOwner (CurrentOwnerName, CurrentRepository?, DateOfAcquisition,
MethodOfAcquisition)>
<!ELEMENT CurrentOwnerName (#PCDATA)>
<!ELEMENT CurrentRepository (CurrentRepositoryName, CurrentRepositoryPlace)>
<!ELEMENT CurrentRepositoryName (#PCDATA)>
<!ELEMENT CurrentRepositoryPlace (#PCDATA)>
<!ELEMENT DateOfAcquisition (#PCDATA)>
<!ELEMENT MethodOfAcquisition (#PCDATA)>
<!ATTLIST MethodOfAcquisition
   Method (Purchase | Donation | Exchange | Other) "Donation"
>
<!- Information about where and when the object was shown at an exhibition ->
<!ELEMENT Exhibition (ExhibitionName?, ExhibitionPlace, ExhibitionDates)>
<!ELEMENT ExhibitionName (#PCDATA)>
<!ELEMENT ExhibitionPlace (#PCDATA)>
<!ELEMENT ExhibitionDates (#PCDATA)>
<!- Type of the object ->
<!ELEMENT GMD (#PCDATA)>
<!ATTLIST GMD
   TypeOfObject (Original | Plan | Model | PublishedDocument | ArchivalDocument) "Plan"
>
<!- Title, name, or denomination of the object ->
<!ELEMENT Title (MainTitle, SubTitle*, ParallelTitle*, KeyTitle?)>
<!ELEMENT MainTitle (#PCDATA)>
<!ELEMENT SubTitle (#PCDATA)>
<!ELEMENT ParallelTitle (#PCDATA)>
<!ELEMENT KeyTitle (#PCDATA)>
<!- Person who created the object ->
<!ELEMENT Creator (CreatorSurname, CreatorName*, PlaceOfCreation?, DateOfCreation?)>
<!ATTLIST Creator
   Role (Architector | Artist | Author | AuthorOfScreenplay | Cartographer | Commentator |
Compiler | Composer | Constructor | Designer | Draftsman | Editor | Engraver | Etcher |
FilmEditor | GraphicTechnician | Illustrator | Litographer | Manufacturer | MetalEngraver |
Other | Photographer | Scenarist | Translator | TypeDesigner | Typographer | WoodEngraver)
"Author"
>
<!ELEMENT CreatorSurname (#PCDATA)>
<!ELEMENT CreatorName (#PCDATA)>
<!ELEMENT PlaceOfCreation (#PCDATA)>
<!ELEMENT DateOfCreation (#PCDATA)>
<!- Person or body who published the object if applicable to its character ->
<!ELEMENT Publisher (PlaceOfPublication?, PublisherName?, DateOfPublication)>
<!ELEMENT PlaceOfPublication (#PCDATA)>
<!ELEMENT PublisherName (#PCDATA)>
<!ELEMENT DateOfPublication (#PCDATA)>
<!- Person or body who printed the object if applicable to its character ->
<!ELEMENT Printer (PlaceOfPrinting?, PrinterName?, DateOfPrinting?)>
<!ELEMENT PlaceOfPrinting (#PCDATA)>
<!ELEMENT PrinterName (#PCDATA)>
<!ELEMENT DateOfPrinting (#PCDATA)>
<!ELEMENT PhysicalDescription (Size?, Extent?, Scale?, Technique?, Material?,
PreservationStatus?)>
<!- Size indicates the size or dimensions of the object ->
<!ELEMENT Size (#PCDATA)>
<!ELEMENT Extent (#PCDATA)>
<!ELEMENT Scale (#PCDATA)>
<!ELEMENT Technique (#PCDATA)>
<!ELEMENT Material (#PCDATA)>
<!ELEMENT PreservationStatus (PreservationStateOfArt, PreservationTreatment?)>
<!ELEMENT PreservationStateOfArt (#PCDATA)>
<!ELEMENT PreservationTreatment (#PCDATA)>
<!ELEMENT Series (#PCDATA)>
<!- Two-character ISO 636 values for language are applied ->
<!ELEMENT Language (#PCDATA)>
<!ELEMENT Subject (UDC, DDC)>
<!ELEMENT UDC (#PCDATA)>
<!- 100 classes level for DDC could be used as listed in the DIEPER manual ->
<!ELEMENT DDC (#PCDATA)>
```

```
<!ELEMENT Keyword (#PCDATA)>
<!- Style indicates style, period, group, movement, or school identifying the object ->
<!ELEMENT Style (#PCDATA)>
<!ELEMENT Accessibility (#PCDATA)>
<!ELEMENT Notes (#PCDATA)>
<!ELEMENT Annotation (#PCDATA)>
<!- Documentation enables to cite various resources, such as printed publications or any other
documents related to the decsribed object /// some of these documents can have digital forms
and thus thez can be also pointed to as related objects within the lement RelatedObject ->
<!ELEMENT DocumentationObject (#PCDATA)>
<!- PART A2 -- THIS IS FOR DESCRIPTION OF RELATED OBJECTS AND LINKING TO THE DIGITAL DATA FILES
THAT REPRESENT THEM ->
<!ELEMENT RelatedObject (RelatedObjectName, (DigitalSource, TechnicalRecord?)*)>
<!ELEMENT RelatedObjectName (#PCDATA)>
<!ELEMENT DigitalSource EMPTY>
<!ATTLIST DigitalSource
   TypeOfDigitalSource (WebDocument | Image | Text | Sound | Video | IdentificationDescription
| Other) "Image"
   href CDATA #REQUIRED
>
<!ENTITY % TechnicalRecord SYSTEM "TechnicalRecord.dtd">
%TechnicalRecord;
```

Draft of TechnicalRecord.dtd

```
<?xml version="1.0" encoding="UTF-8"?>
<!ELEMENT TechnicalRecord (TypeOfFile, InputDevice, ImageFileParameters?, AVFileParameters?)>
<!ELEMENT TypeOfFile (Image | Text | Audio | Video)>
<!ELEMENT Image (#PCDATA)>
<!ELEMENT Text (#PCDATA)>
<!ELEMENT Audio (#PCDATA)>
<!ELEMENT Video (#PCDATA)>
<!- Information about the device that was used for digitizing ->
<!ELEMENT InputDevice (DeviceName, DeviceType, InputMedia, InputTechnique)>
<!ELEMENT DeviceName (#PCDATA)>
<!ELEMENT DeviceType (#PCDATA)>
<!ELEMENT InputMedia (#PCDATA)>
<!ELEMENT InputTechnique (#PCDATA)>
<!ELEMENT ImageFileParameters (SpatialResolution, BrightnessResolution, CompressionScheme,
FileFormat)>
<!- Spatial resolution is given in dpi ->
<!ELEMENT SpatialResolution (#PCDATA)>
<!- Brigthness resolution is colour depth and it is given in bits per pixel, e.g. 8 bpp ->
<!ELEMENT BrightnessResolution (#PCDATA)>
<!ELEMENT CompressionScheme (#PCDATA)>
<!ELEMENT FileFormat (#PCDATA)>
<!ELEMENT AVFileParameters (SpatialResolution?, FileFormat, SamplingFrequency?, BitRate)>
<!- Sampling frequency is given in kHz ->
<!ELEMENT SamplingFrequency (#PCDATA)>
<!- Bit rate is given in kilobits per second, e.g. 128 kbps ->
<!ELEMENT BitRate (#PCDATA)>
```

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Postscript

Martin Svoboda

Upon concluding the fifth CASLIN Seminar, organized with means originally calculated for just four seminars, it seemed to us that this activity of the CASLIN group is over. Some of those present thought however, that it would be a pity to bring the new born tradition of high quality and very intense seminars to a premature end. And so the series has been continuing for five years already on condition that the organizing institution has to raise the most of necessary means. In spite of perpetual warnings of Professor Andrew Lass in his role of "manager of the scraps of Mellon grant" that "this year it is definitely the very last contribution for inviting the foreign speakers" we have so far managed – with his remarkable personal involvement – to attract outstanding groups of both foreign and local speakers. The seminar structure ripened to a scheme of three, four foreign keynote speeches reflected in a number of local papers; some topics brought in by the key speakers are in-depth examined in smaller groups in workshops; the traditional seminar highlight is a controlled discussion, so called Aquarium, which usually aims at facilitating the understanding among advocates of rivalling opinions. It appears that this format, together with a usually intimate setting contribute to an atmosphere remarkably supportive to an intense communication and clarification of opinions and attitudes, which is profitable to all participants – at least this can be often heard from both local and foreign participants. Unfortunately, the atmosphere cannot be transferred to the printed proceedings; the seminar photo-gallery (www.stk.cz/CASLIN03/foto-e.htm) could only hint at that.

The shots prove the very working and agreeable ambience of the jubilee tenth seminar that found place in a former Schwarzenberg estate farm adapted to a boarding house. The professional programme was responsibility of the "flood team" of the National Library of Czechia represented first of all by PhDr. Františka Vrbenská and PhDr. Jiří Polišenský; the National Library also took care of all foreign guests under the expert control of Dana Stankiewicz. All the rest, from chasing sponsors and raising money through fine-tuning the menu, setting up and maintaining the web site, agreements with our expert interpreter Ota Brídl, down to print releases and publicity materials, extorting contributions from the authors for this proceedings you just finished reading and including its fine layout, rested on the shoulders of the Public Relations team of the State Technical Library. The seminar's main theme was the crisis management and it proverbially started with one: Jane Hutchins, the first speaker of the first day, as a Canadian was not allowed to enter the Czech Republic without visa and got stuck in Germany. "Viribus unitis" we managed to convince the consul in Munich already on Sunday so that on Monday morning we collected both the visa and Jane and drove her safely in time for Monday dinner. The crisis was over and the rest of the seminar ran smoothly thanks to the quiet care of Lenka Kocánová and Lukáš Mázl from the State Technical Library. I am glad to give my thanks to all those named and also to all the others, who contributed to the success of the tenth CASLIN Seminar.

See you at the next CASLIN 2004 in the Slovak Paradise

Martin Svoboda
State Technical Library

History of CASLIN Seminars

2002 Document Preservation and Access: New Trends
Podbanské (Slovakia) / Slovak National Library, CASLIN

2001 Document Description and Access: New Chalenge
Beroun (Czechia) / Library of Academy of Sciences of Czech Republic, National Library of Czech Republic, CASLIN

2000 Education for Libraries
Luhačovice (Czechia) / MOLIN, National Library of Czech Republic

1999 Union Catalogues: Their Organization and Service
Zadov na Šumavě (Czechia) / State Technical Library, National Library of Czech Republic, Masaryk University

1998 Libraries without Walls
Štrbské Pleso (Slovakia) / KOLIN

1997 Libraries of the Future
Dlouhé Stráně (Czechia) / MOLIN

1995 Library Consortia
Smolenice (Slovakia) / University Library

1994 Management Training
Liptovský Ján (Slovakia) / Matica slovenská, Slovak National Library

1993 Management Training
Rožnov pod Radhoštěm (Czechia) / Moravian Library

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