

# Experience of the liquidation of the consequences of the 2002 floods

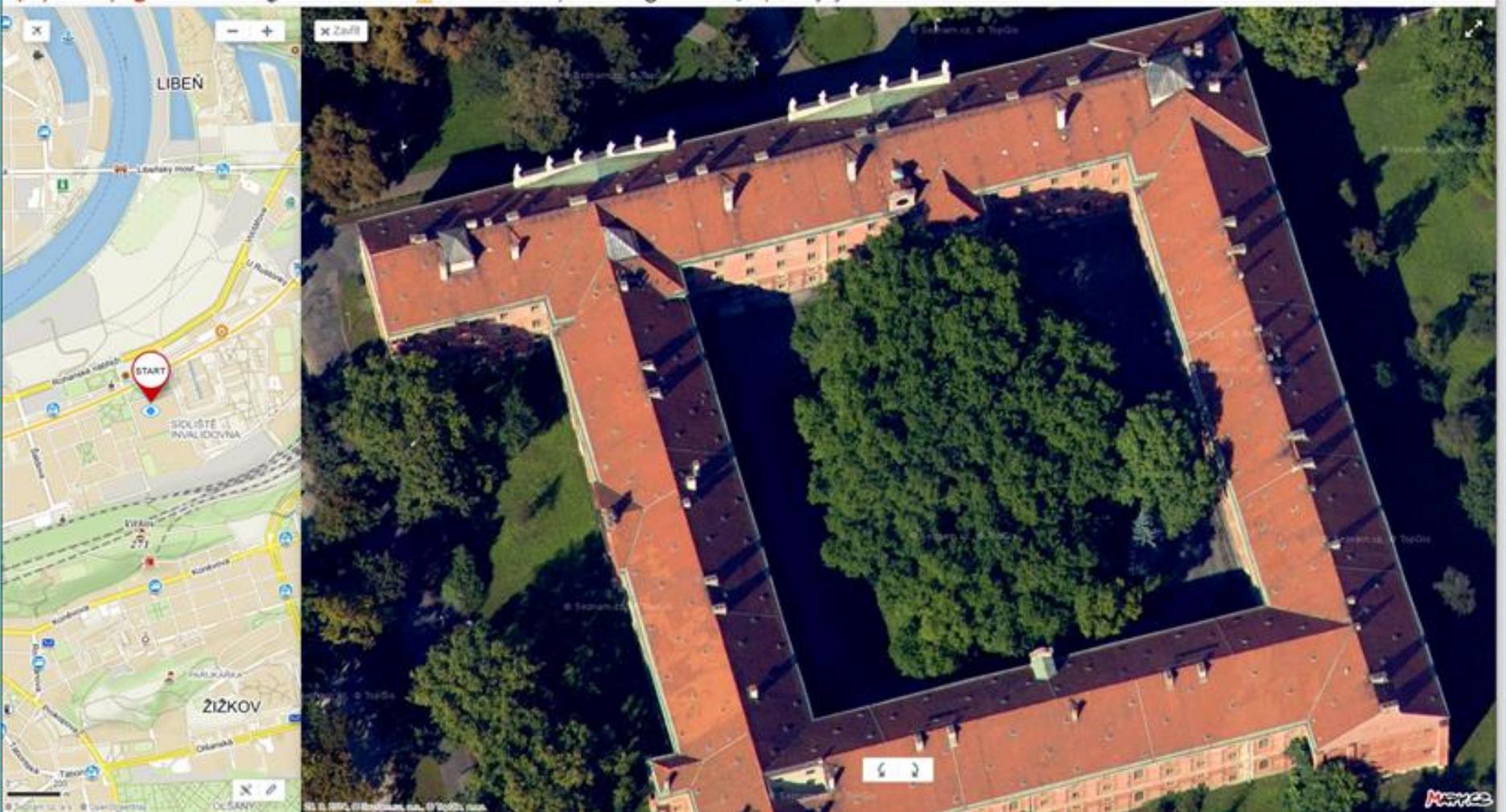
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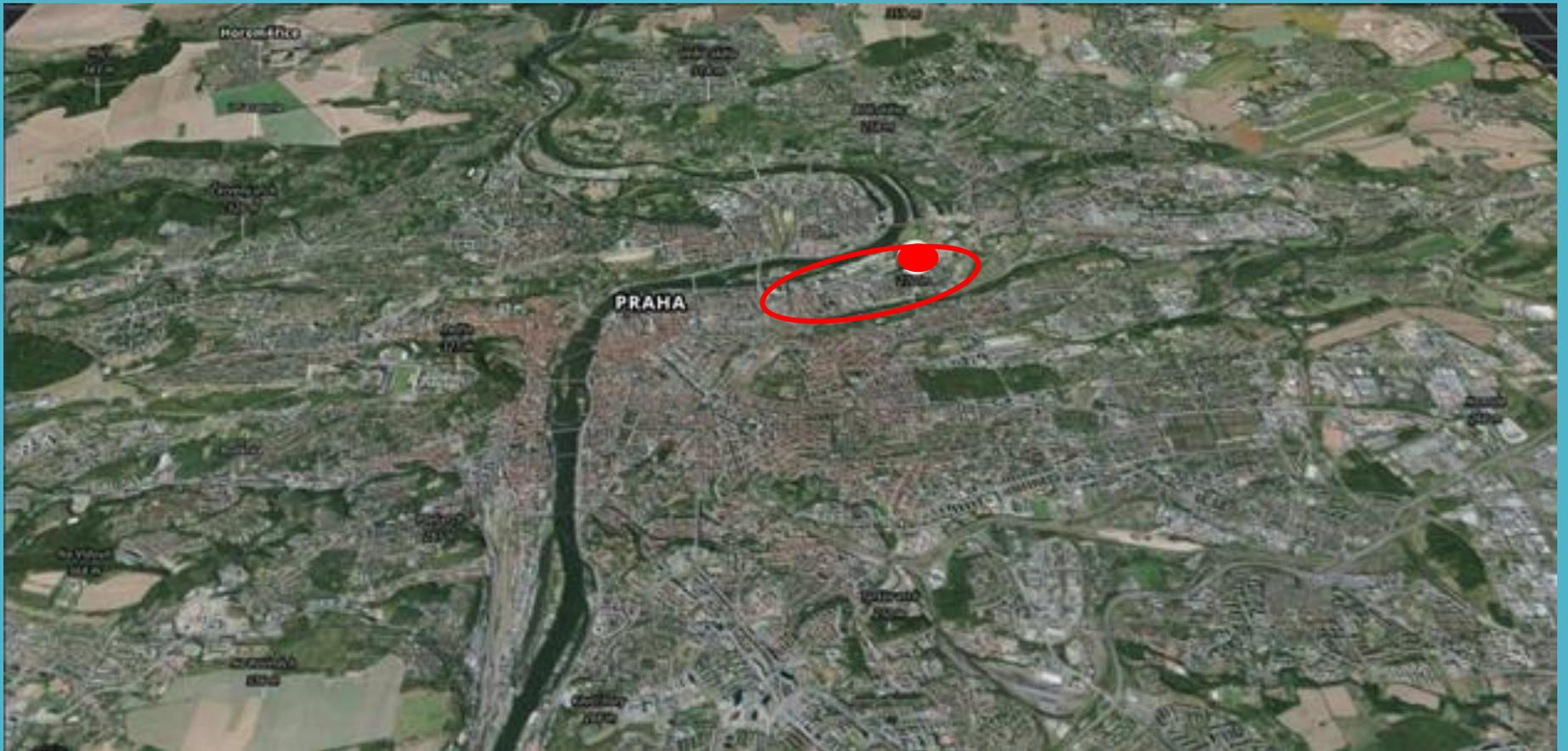
National Technical Museum,  
Dept. for Drying and Restoration of Flooded Archive  
Materials

The archive of National Technical Museum houses over 200 collections, consisting of drawings, plans, photographs, documents and models amounting to over half a million items.

The archive and depository of National Technical Museum has been stored in the historical building of Invalidovna, in Prague's Karlín district



On 15th August 2002 the whole Karlin was flooded



## Flooded area of Invalidovna



- The flooding was dynamic.
- The water in the building stood for a week during an extremely hot weather.
- No one had previously experienced a similar situation.
- A huge volume of documents was flooded.

It was inevitable to freeze the documents.

# The area after the water receded



# Depository - consequences of dynamic flooding



# The archive after the water subsided



# The archive after the water subsided



# A corridor after the water subsided



The affected funds (200 qm) were taken away to be stored frozen

For the next 10 years the archive remained closed for public.

Since 2003 the drying and conservation of all the 200 qm of affected funds has been carried out.

*The rescue of such a quantity of archival materials required the participation of many people and quantity of consumables.*

# The people

necessary prerequisites:

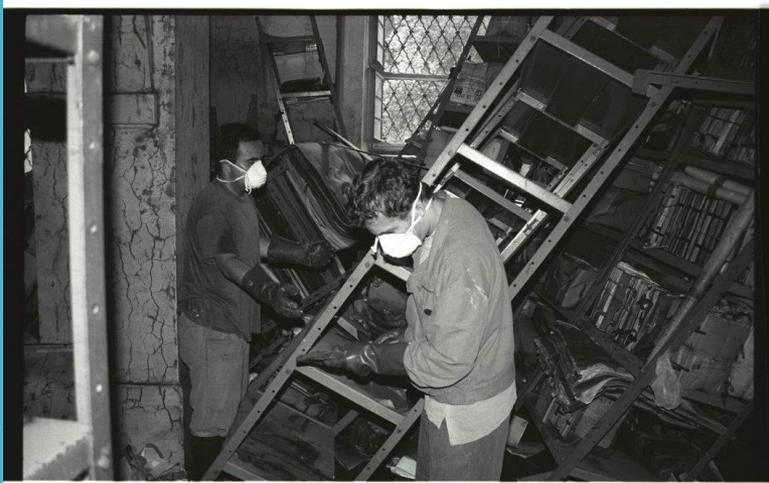
- physical ability
- vaccinations (tetanus, hepatitis)

sorting people into 3 groups:

1. people familiar with the archives were taking out the wet archival materials
2. group cleaning and packaging archival materials into foils
3. group for loading and transporting

# Necessary material:

- Rubber boots
- Gloves
- Respirators
- Clean water
- Pipes
- Sponges
- Writing tools
- PE (PPE) bags and foils
- Twines, straps
- Palettes



Cleaning...



## Experience of liquidation of flood consequences:

It is necessary to proceed very quickly!!!

- To freeze as much material as possible and as quickly as possible.  
*(To analyze, separate and dispose of (eg. duplicates) only after the defrost.)*
- To describe materials in the ordinary pencil.
- To form them into small packages (because of the light handling)
- To form the packages combining documents of similar character.

*Because of the warm weather after the flood, there was a threat of fungus that could attack the material after 48 hours.*

# Packaging procedure of wet archival materials

- Washing using clean water
- Basic sorting (according to types of materials - magazines, plans, photographs, books, ...)
- Packing (Pe bags, foil)
- Packages describing
- Loading packages on pallets

Especially in warm weather it is necessary to work very quickly!

# Freezing Plant, freezing container



## Errors, which we now could avoid

- Placing documents of different nature into one package.  
*This caused unnecessary delay - after defrosting it was necessary to sort them out before the drying process could start.*
- Some packages have been described by marker or ballpoint pen.  
*The writing infiltrated on documents.*
- Some packages were too large (per pallet).  
*During defrosting This caused a delay. It was necessary to wait until the whole pallet was thawed and the handling was difficult.*

# Dept. of Drying and Restoration of Flooded Archive Materials





## Defrosting – no reason to panic

- You can rescue almost everything, certainly more than you thought.
- There is no need to throw away the book covers.
- Graphics, photographs and plans on racing-paper can also be rescued.

# Technique of manual drying

*This method is rather laborious, but very effective.*

Its main advantages are:

- Large formats can be dried.
  - Before drying, sorting and shredding is carried out.
  - After they have been dried, you have clean archival documents that are ready to be stored in the archive – this eliminates the step of restoration.
- X
- From the drying chamber you take out dirty package which must be soaked and restored before further archivation.

# Conditions of manual drying of flooded materials

It is necessary to follow strict hygiene measures:

- Work in gloves
- Use work clothes and shoes
- Make sure you have the required vaccination
- Use respirators
- Note that the cleaning has to be performed very rigorously and thoroughly.
- Overnight disinfection of rooms by germicidal lamps (archival documents must be covered )

# The method of vacuum packing - the treatment step by step

1. The material is left to defrost slowly at room temperature.
2. It is then dried in various ways according to the type of its paper support (*to avoid damage*).
3. Then material in form of „sandwich“ is press-dried in vacuo. *Photographic material is firstly documented (digitalized)*.
4. Plans, books and common paper up to the A3 format are “sandwiched” (interleaved with a special absorbent layer).
5. When the material is dry, it is disinfected in an ethylene oxide chamber.
6. Some items must be restored before they are put back in the archive.

- The above process is performed manually. *According to experts, this method for dried material is more gentle.*
- Given the fact that the archive was flooded by water potentially containing pathogenic microorganisms, strict hygienic rules must be observed during the entire drying process.
- About 200 qm of frozen material was thawed, dried, treated and stored in our museum.

The operating sequence starts  
at the small freezers



The frozen packets are taken out from the freezers one day before the start of the procedure and left to thaw at room temperature.



# After defrosting

The curator sorts the defrosted documents.

This is the moment to choose the best drying procedure (after consultation with a specialist).



# „The wet workplace“

This room with small freezers and bath tubes serves for slow defrosting of the documents and their basic cleaning.



From most of the documents the flood silt was rinsed away using slow flowing clean water.



Delicate documents are cleaned  
using distilled water



The photographs or glass negatives are cleaned by alcohol.  
The cleaned photographs are also dried by “sandwich” method.



After thawing out  
the photographs are digitalised immediately.



# Then the documents are vacuum-dried.



The “sandwich” is placed into a special plastic bag. After a week, the water is equalized between dried documents and primarily dry layers (newspapers). The packet is then undone and the work process is repeated until the documents are dry.



Plans, large documents, tracing-papers and art papers are dried by “sandwich” method (interleaved with a special absorbent layer).



The finished “sandwich” is weighted down for 24 hours.



Next day, the documents are interleaved again by new dry layers.  
This work flow is two times repeated.

The last procedure is free drying in the open air.



Dry documents are sorted, set up into logical units, supervised, packed and described.



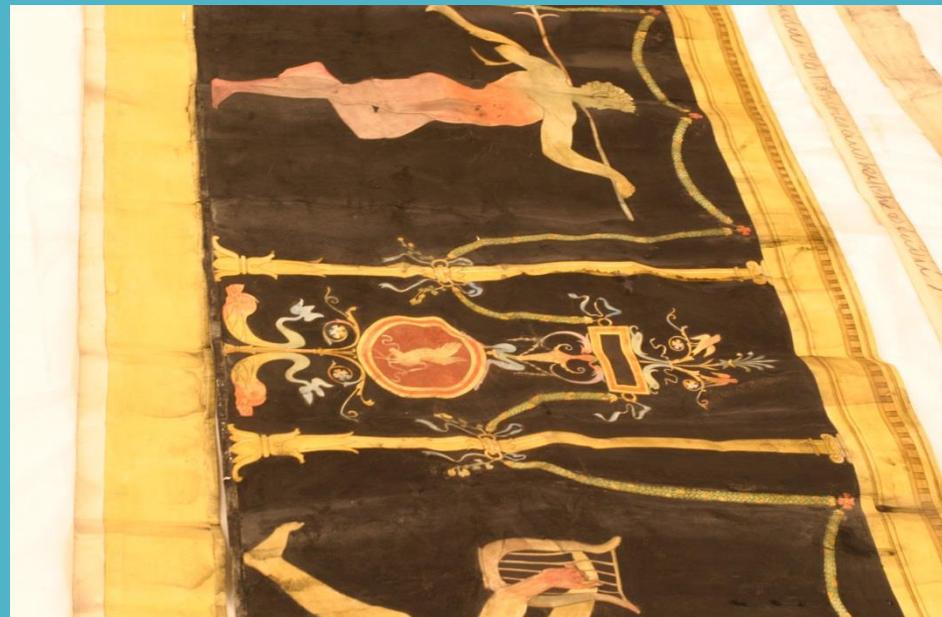
In the end all dried documents were disinfected by ethylene oxide in the National Archive of the Czech Republic

These methods have rescued many valuable historical documents and building plans

before...



...after



## *Brief resume:*

For rescue of collections it was important to have auxiliary material, reliable workers, contract with freezing plant and most important – to have good organization of work.

Thank you for your attention.