PREPARATION OF GLASS PLATE NEGATIVES AND FERROTYPES FOR DIGITIZATION – CHALLENGES AND BENEFITS.

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GLASS PLATE NEGATIVES

The Estonian Historical Archives (EHA) as the oldest archive of the National Archives of Estonia (NAE) has 1427 glass plate negatives in total. This collection includes mainly the silver gelatin dry plates from the end of 19th century until the first half of 2 0th century. The most valuable records of EHA collections were copied onto glass plate negatives in the 1930s. A part of the collection is stored in original boxes and envelopes.

Dust, dirt, fingerprints constitute the most common damage. During visual observation 37 seriously damaged (cracked or broken, flaking of emulsion layer, silver mirroring, etc.) glass plates were found. Preparation of glass plate negatives for digitization included some conservation treatments like cleaning, fixing of emulsion layer, backing and rehousing. Removal of the surface dust from the glass side of the negatives was done using a microfibre cloth and soft brush. In the presence of stains a mixture of ethanol and water (1:1) was used for cleaning (Fig 1). Dust removal from emulsion layer was carried out using a small manual air blower. Flaking emulsion layer was fixed by 2% gelatine B aqueous solution using a thin brush. For housing of unbroken negatives four-lap envelopes were used. This enables the glass plate to be put in and removed from the enclosure without scratching. Rehousing of 30 broken glass plates was more complicated. The negatives that were broken in two pieces received protective enclosures. The negatives were placed with the emulsion side up. Two pieces of cardboard were cut in the shape of both fragments and broken glass plates were separated also using cardboard. Then the fragments were securely placed in the four-lap envelope and inserted into an envelope or sleeve before boxing (Fig 2).

Fig 1. Cleaning of the opposite side of the emulsion layer.

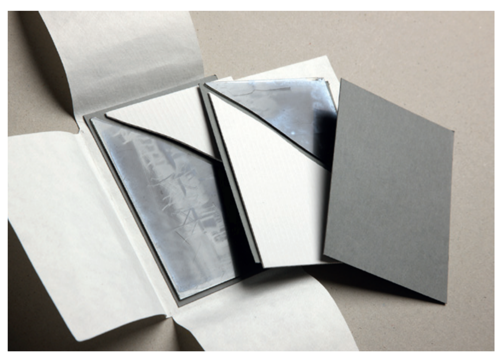

Fig 2. Protective enclosure for damaged glass plate broken into two fragments.

Some negatives that are in multiple pieces are best stored in sunken mats that hold the pieces in place[1].

Unbroken glass plates were placed in the box vertically and broken ones horizontally. Boxes containing broken plates were labelled on the outside to indicate that the contents are fragile.

All materials used for housing of glass plate negatives should be in accordance with the requirements and standards for archival storage (ISO 9706, 11798 and 14523). To prevent glass plates from moving inside the box ARTFOAM (polystyrene foam) padding was used[2] (Fig 3). After digitization glass plate negatives were finally placed back in the repository (Fig 4).

Fig 3. Boxing

Fig 4. Metal shelving of the glass plate negatives collection.

FERROTYPES

Ferrotypes (also known as *melainotype*, *tintype, lettertype*) obtained through the wet collodion process were widely used from the year 1856 in the United States. The popularity and wide-spread use of this photographic technique were attributable to the speed of the process, relatively cheap price and the fact that photographs could be taken on-site without having to go to the studio[3].

Preserved ferrotypes in Estonia are not exactly known. It is estimated that nearly a hundred ferrotypes have been preserved in Estonia and 12 of them belong to the collections of the National Archives[4]. There were two ferrotypes in the EHA collection that needed conservation before digitization.

The first ferrotype depicts engineer and factory director Otto von Krusenstern (13 June 1870, Hagudi – 23 July 1923, Tallinn) in a full figure portrait. The photo was taken in the period 1890–1900 in a Vienna photo studio (I. Wiener Schnellphotographie Lu[dwig] [P]retscher, [Prate]r No. 137, Kahleoberg, Praterspitz). The photo format is 52 x 78 mm.

The original case of the ferrotype was made of wood pulp fibres because the lignin test (Lignin Indicating Pen, University Products, Inc.) yielded a positive result. The mounting paper in some places was dirty, crumpled, torn and had partially stuck to the photographic emulsion. The overall condition of the photo was good. No separation or cracking of the emulsion layer was detected. The beautifully designed passe-partout was also preserved well (Fig 5). No signs of corrosion could be detected through careful observation of the metal plate support (Fig 6).

Fig 5. Front side of the ferrotype that stuck to the mounting paper (EAA 1414-2-243 p 22).

Fig 6. Reverse side of the ferrotype.

The mounting paper was carefully removed using a cotton swab and distilled water (Fig 7).

The mounting paper had stuck to the lacquer layer covering the surface of the photograph and its removal was time-consuming. When the paper was moistened, the year 1872 became visible, providing necessary additional information on the photo studio (Fig 8).

Fig 7. Removing the mounting paper with a cotton swab and distilled water.

Fig 8. The year 1872 appeared on the mounting paper stuck to the photo.

It was not possible to remove the mounting paper in a way that would have enabled its restoration later. Most of the paper was successfully removed from the surface of the photo, revealing the full figure portrait. Close observation indicated, however, that some paper fibres had nevertheless remained in the surface layer and could not be removed (Fig 9). The original case was cleaned using the Faber Castell Natural Rubber Eraser 7041-40 and a soft brush. The photo and its surrounding passe-partout were cleaned using an air bulb. Repairs were made using Japanese tissue (Awagami Papers, Fuij Kozo, 10 g/m^2) and wheat starch paste was used as adhesive. A calendered micalent paper was placed between the photo and the original case to protect the image (Fig 10).

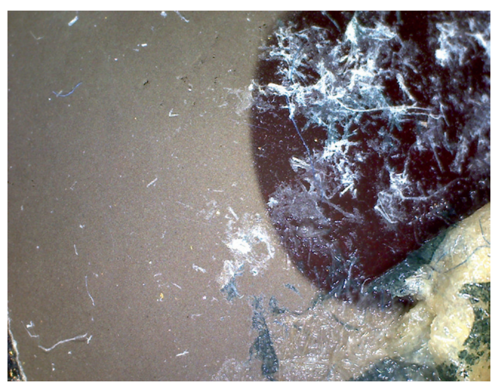

Fig 9. Removing the mounting paper from the surface of the photo. Paper fibres can be detected in close view.

Fig 10. Ferrotype after conservation.

In order to avoid deformation, the photo was encased between two archival-safe sheets of corrugated cardboard (OÜ Maksing) and thereafter placed in a compliant envelope for storage (Fig 11).

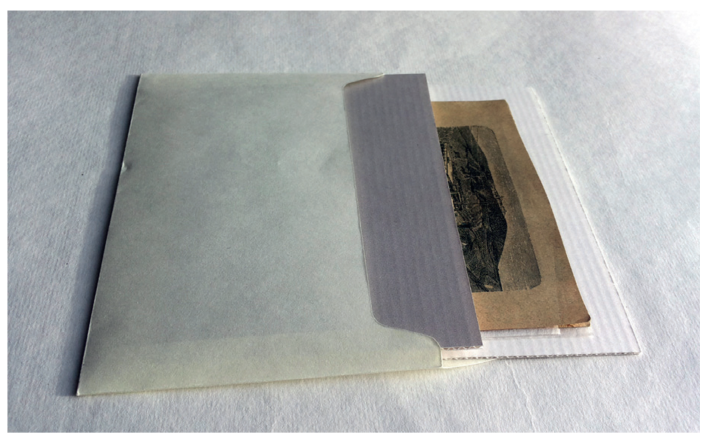

Fig 11. Protective enclosure.

The second ferrotype of 60 × 95 mm depicts the portrait of Artur Fahl, a pharmacy student at the University of Tartu. The photo is dated 1880 and the photo studio was in Poland, the original case has not been preserved. Unlike the first ferrotype, this photo has clear evidence of corrosion damage in the upper part, accounting for almost 1/3. Therefore, there is also noticeable surface damage (emulsion layer of sheet metal base is detached, losses of material). A crack has emerged in the upper part of the photo due to corrosion. The ferrotype contains visible dents and the photo as a whole is deformed (Fig 12). The scope of corrosion damage is well visible on the back of the photo (Fig 13).

Fig 12. Front side of portrait of Artur Fahl before conservation (EAA 402-2-6004, p. 9).

Fig 13. Reverse side of the corroded ferrotype.

Conservation was started through careful mechanical removal of rust from the back of the photo using fine sandpaper and brush. The surface was then cleaned with a soft cotton swab.

The corroded areas on the back side were covered with corrosion inhibitor. 2.5% tannic acid (pH 2–3) was applied to the surface five times with a brush. Subsequently, the surface was treated with Paraloid B-72 15% solution in toluene, which also serves to protect from further spread of corrosion. It was applied to the corroded area four times with a soft brush. As a clarification, tannic acid solution acts as a chelating agent. The reaction produces complex iron tannate, which inhibits iron ions from actively participating in corrosion processes. Paraloid B-72 creates a protective film on the metal base, preventing contact with atmospheric oxygen and humidity, which are important factors involved in corrosion formation and acceleration of its spread[5]. Only a fine brush was used to remove loose rust from the image side. The tannic acid aqueous solution was not used here to prevent damage to the emulsion layer. Paraloid B-72 15% solution was applied to problematic areas to fix the emulsion layer and slow down corrosion processes (Fig 14 ja 15).

Fig 14-15. Front and reverse side of the photo after conservation.

A protective enclosure was made from archival quality materials to conserve the ferrotype (Fig 16).

Fig 16. Window mat mounting.

CONCLUSIONS AND RESULTS

Even in perfect storing conditions and correct use old photographs have a tendency to deteriorate over time. Glass plate negatives provide unique preservation challenges for conservators and curators due to their fragile physical format and highly varied chemical composition. The collodion emulsion layer of ferrotypes is susceptible to mechanical damage, the sheet metal base may corrode due to humidity and therefore the preservation of the image could be problematic in certain cases.

The best option to minimize the risk of losing the photographic image and to increase access to these fragile materials is digitization.

All collection, even glass plates which are broken into many tiny pieces, was successfully digitized and online access to the users was created (photo database FOTIS http://www.ra.ee/fotis/index.php?lang=en). Digital files are available in TIFF formats and a copy of security enables A3 size images to be printed. At present (10.05.2016) there are 540,684 digital images available in the database.

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