

# International Micro Carving Institute e.V.



The association International Micro Carving Institute e.V. was founded on 6 December 2014 in Stuttgart, Germany. The founding statute states that the association IMI e.V., registration number 2427/2014M, tax number 99015/32353, is dedicated to the reappraisal of an almost forgotten European artistic period between 1750 and 1830.



33 x 29 mm

The aim of the institute is to present what are probably the finest sculptural works of art ever created by man.

1. scientific research, cataloguing and differentiation of the different styles of this carving art and their carvers in the individual countries, to enable regional or personal classifications and to obtain insights for basic criteria for determination on the basis of which the concept of micro-carving with precursors and descendants is to be defined.

In addition, the Institute's research is concerned with identifying historical pieces on the basis of illustrations or descriptions and assigning them locally by means of art tagging. The few images of wearers of these pieces of jewellery with micro-images that exist are also to be researched with regard to historical contexts, such as the Mozart necklace, a gift from Wolfgang Amadeus Mozart to his wife Constanze Mozart, the complete assemblage of all surviving relief depictions of the British royal family by Stephany and existing battle scenes.

2 .Another goal is the worldwide registration of all existing works of art in museums and private collections and the identification of their masters. Currently, the quantitative number of jewellery and works of art exceeds 1500 pieces of different qualities and different processing of the material (piece to piece or out of one piece).

3. Since some works of art are damaged, the Institute's research has also looked into the possibility of restoring these pieces of art and the restoration itself. Exemplary examples can be found under the item Restorations.

4. Due to damaged works, it has become a goal of research to show the exact structure and work steps in the production techniques of the different works. (cf. Diepper cans)

5. Another new objective is to apply the still relatively unknown arttagging or artcoding to individual motifs of the micro-pictures, since depicted persons, written records, buildings, harbours or bridges can provide clues to the location of the carved motif.

6. Also to try to find out, at least scientifically, some secrets of the production, how one was able at that time to produce such incredibly fine works of art with gravers as fragments or as one piece. Where and in which implementation the limits of the material lay and which techniques were used to produce these masterfully carved works of art.

7. The Institute's ultimate goal is to bring these outstanding artists and their works of this rather short artistic period of the Occident back into the general art consciousness, so that this world cultural heritage is preserved, of which we do not even know how they were really produced, before they are forgotten and lost forever for art history and the history of mankind.

Over a period of 15 years from 2008 onwards, a simple computer-assisted research system and selection system was developed with the aim of being able to assign the mostly anonymous micro-pictures to

individual artists. This system, called VIK (visual identical key) for short, is a visual method for identifying micro-pictures and uses a catalogue of criteria through x-cross selection. Overall, the program differentiates and divides the micro-pictures into worldwide museum holdings and private holdings; furthermore, a differentiation of the holdings of individual countries is made in the letters and number combinations. Furthermore, the program differentiates the individual micro-pictures in size, shape, colour and background and various other criteria. Motifs and specific criteria, as well as direct allocation by dating, literature and signature are further differentiation criteria. Finally, the materials and elaboration of the versions are further criteria for determination and classification. With this program, key words from the existing picture collection, which now comprises over 1500 works, can be selected and viewed and researched directly in the picture for comparison.

Finally, the Diepper jars from France form their very own classification and catalogue of criteria from triple wreath to single wreath and further designs such as the pearl representation as an enclosure of micro-images. The writing of a reference book on this special subject and a quantitative and qualitative evaluation of all 138 criteria is in preparation.

Therefore, we ask for your support when you read these lines, to bring this unique European art form, which is unique worldwide, of micro carving and micro pictures in wood, bone and mother-of-pearl, which can be called "almost forgotten art of European art history", back into the focus of the present and art history and to enable a unique reappraisal due to the rather few pieces of an estimated 2200 pieces worldwide, for the benefit of mankind but also for the identification of your own works.

We began by simply writing to the 21 well-known museums known at the time, based on the literature available at the time and the state of knowledge.

Should you be in possession of one or more such works of art, you are requested to provide images for scientific reasons so that they can be included in the database. Anonymity and security are guaranteed. In this way, more works could be matched with each other in the future through image matching, up to and including material traces that point to the individual cutting style of each artist and thus create a good basis for further matching possibilities.

At the same time, by creating the catalogue of criteria, each individual work can be recorded very precisely, thus also enabling conclusions to be drawn for the individual work in connection with the entire collection.

Furthermore, we ask you for financial support if you would like to support this probably currently unique worldwide research and recording. You can also become a member of the International Micro Carving Institute e.V. in order to participate directly in the developments, so that the research can be expanded and carried out more effectively and quickly, a broad public interested in art can gain access and enquiries can be made to institutions, etc.

There are hardly any European art historical epochs with comparatively so few pieces as a closed art and collector's field of the European royal and princely houses.

At that time around 1760, fortunes were paid for a single piece, as in the case of the Maria Theresa brooch, according to tradition, the equivalent of a small castle. But also in our time at the 2002 auction in Stuttgart, the Nagel auction house presumably sold this brooch with three micro-pictures from the former private Connoisseur collection for € 375,000. (Estimate € 1.2 million) Similar prices were achieved by works for Giuseppe Maria Bonzanigo in the U.S.A (\$108000). A ring with a micro-image by the Hess brothers said to have belonged to Napoleon sold at auction in Paris for the equivalent of €34,000.

The Empress Maria-Theresa Duchess of Milan, Queen of Bohemia and Hungary, Archduchess of Austria, Catherine the Great of Russia, King George III of England and Elector of Brunswick Lüneburg and King of Hanover, King Frederick of Prussia, King Louis XVI of France, Charles Emmanuel III King of Saxony and King of France were among the buyers of these works of art at the time, Charles Emmanuel III King of Sardinia and Savoy, Adolf Frederick of Sweden, Prince of Liechtenstein, Christian VII of Denmark and Norway, Francis Stephen of Lorraine, Ove Høgh Guldberg statesman, theologian and historian, but also artists such as Wolfgang Amadeus Mozart, the Esterhazy family in Hungary, Madame de la Baronne, whose father was probably a private advisor to the French king. private advisor to the French King Louis XVI. King Louis XVI and builder of Chateau de Dampierre, and even Napoleon Bonaparte and many other royal and princely houses in Europe. Later,

collectors such as the Rothschilds, Adolphe Maze-Sencier, Rosa Scherer-Gresly (1773-1859), the wealthy upper class of Solothurn, D.M. William Bullock (1773-1849), naturalist, builder and founder of the City Museum in Bristol, owned the Bulloch Collection of micrographs of the same name or Prof. John and Anne Hull Grundy, who bequeathed their extensive collection, including micrographs, to the British Museum.

Today, more than 1500 micrographs of various sizes and qualities still exist, according to the current status of 31.10.2022 in 21 countries worldwide in 53 museums (approx. 601 copies) such as the British Museum in London, the Louvre in Paris, the Hermitage in St. Petersburg, the Metropolitan Museum in New York, and the Museum of the Arts in London. Petersburg, the Metropolitan Museum in New York, the Kunsthistorisches Museum in Vienna, the Österreichisches Nationalmuseum in Vienna, the Victoria & Albert Museum in London, to name just a few museums (for a complete list, see location and facts), and some private collections and the art market with a total of approximately 987 copies.

## **Examples**

### **In general, a few lines about the carvers**

This website lists only a few examples of the best-known representatives of micro carving. According to the research, about 34 artists carved such works in various qualities and sizes in the period from 1750 to 1860. To date, these works can be found in 50 museums and private collections and currently total more than 1500 pieces worldwide.

It must be assumed that some works are not yet known, others have disappeared or have been destroyed, so that one can speak of a total number of these unique works of art ever existing of approximately 2200 copies. Thus, this website should also contribute to hopefully being able to add the currently unknown pictorial works to the already existing database.

## Adolphe Brodbek:



Adolphe Brodbek is said to have worked as an ivory carver in the French ivory town of Dieppe around 1770. Contrary to the Dieppe school, he did not work his works of micro-engineering in one piece to some extent, but used the technique of flaking and, in addition, he used mother-of-pearl and blue glass in many of his works.

This art is one of Brodbek's masterpieces comparable to the work in the Musee du Chateau, the port of Nantes. Characteristic for Adolphe Brodbek is the water depiction with mother-of-pearl on a dark glass background, as also used by G. Stephany for his frigates. In addition, the port scene depicted is characterised by a large number of buildings with people.



**Jean-Antoine Belleteste (1731-01.05.1811)**



Jean-Antoine Belleteste (1731-01.05.1811) Antoine Belleteste and Louis Charles-Antoine Belleteste (1787-1832) Louis Charles-Vincent Belletete Louis Augustin-Gregoire Belletete, Jaque Belleteste and Nicolas Henri Belleteste (1778-1808) came from a famous Dieppe family of carvers. They worked in the Grand Rue in Dieppe, at times also in Paris. While the other microcarvers of their time produced the image structure from individual components with a background by flocking, J.-A. Belleteste, like his son and grandson, belongs to the Diepper carvers who produced the microscopically carved miniature plaquettes, if possible from a piece of ivory in high relief, and then applied them to a glass on a dark background.

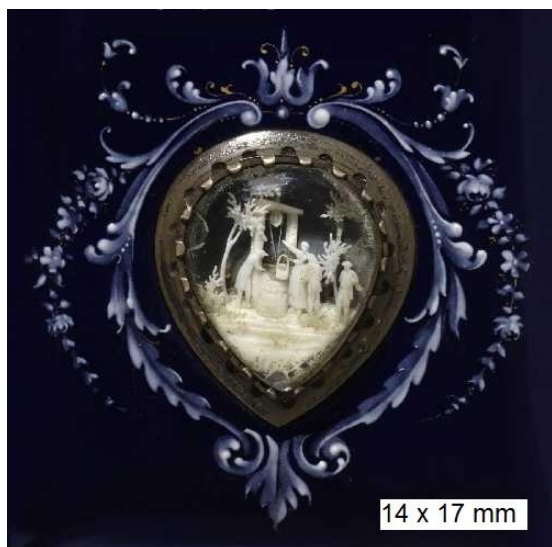
The box illustrated shows the Temple de l' Amour from the former collection of Alphonse Maze-Senier (Collection Aldph. Maze-Senier No 721 offered in March 1886 in Paris by Drouot). Depicted is an antique scene with three putti, a canopy, 2 persons, two doves, ruins and trees. The spacing between the columns of the canopy is as fine as the point of a needle. The artwork was placed in a box with a gold rim and cover





The illustration shows an oblong box with the important depiction of the naval battle of Abukir on 25.07.1799 off Alexandria in Egypt. This naval battle and the battle off Trafalgar against Napoleon Bonaparte are among the most important naval battles of the British Empire. The oblong box is made of ivory and the carving is finished off with a lidded glass of the same colour with gold edging.

**Johann Paul Hess (1743-1798) Sebastian Hess (1733-13.12.1800)**



The Hess brothers Sebastian and Johann Paul came from Bamberg. There were six brothers in total, all of whom were technically skilled and inventive. Johann Paul and Sebastian are documented to have worked for the court of the governor Prince Charles of Lorraine in Brussels from 1767. In their studio in Brussels they also trained C. Haager, among others, in the technique of micro art. Presumably they already trained G. Stephany, J. Dresch, Adolphe Brodbek and other pupils at this time. Sebastian Hess was demonstrably active again in Vienna by 1773 at the latest.

The illustrations show carvings which can be attributed to the Hess brothers. The first illustration shows a typical scene in the extremely rare heart shape, still in its primary version, as it could only have been produced by Hess. Figure 2 shows a tiny representation of a frigate in an

amber medallion. It is highly probable that this was made by Sebastian Hess. There are also several examples of this in rings with predominantly ruby settings.

### **J. Dresch**

Little is known about J. Dresch. Like G. Stephany, he was probably trained by the Hess brothers in their studio in Brussels. From 1791, he worked together with G. Stephany in London at No. 33 Old Bond Street and at Harrington Place in Bath. The present example is a rectangular box with a gold rim. The cover glass protects the landscape depiction of Windsor Castle of the English Royal Family with the River Avon. To the best of our knowledge, this design has been produced three times in slightly different versions. One box is in the Buckingham Palace Museum, another in the Hermitage in St. Petersburg and another is privately owned.



Presumably the latter, in a division of labour with G. Stephany, produced mainly landscape and historical scenes.

**Nicolaus Klammer** (1769 Wien-25.03.1830 Graz) :

Nicolaus Klammer is said to have been trained by the engravers Hess in Vienna and later moved to England and worked temporarily (probably between 1790-1793) in the studios of G. Stephany and J. Dresch. In 1793 the latter returned to Graz. Klammer died impoverished in Graz in 1830 after personal misfortunes.



The transversal oval micro-image in the same ivory ring shows a leaping stag in the morning mist with a level of detail and plasticity that is truly unique in this size. The background is formed by a mother-of-pearl disc that has been set extremely precisely into the ivory setting. The translucency of the mother-of-pearl greatly enhances the morning atmosphere. A cover glass protects the tiny scene of the hunting depiction. A total of eight representations of this type of bracket are known.

**Alexandre Perregeaux** (01.04.1749-21.05.1805)

Alexandre Perregeaux was one of the most famous designer personalities of the 18th century.

He was a goldsmith, glass cutter, ivory carver of international fame and from 1789 even worked as an architect in Vaud and Lausanne. Perregeaux's daughter was also active in this genre of micro-engineering, including the use of tiny pearls and hair techniques.



The two illustrations are works from the estate of the Swiss artist. The carving themes as well as the execution and quality are very similar to the works of J. Dresch or G. Stephany. Depiction two shows the individual carved parts, which are executed in incredibly fine quality and size before they are flocked.

**Francesco Tanadei** (11.02.1770-1828)



Francesco Tanadei was a pupil of G.M. Bonzanigo. He was born in Locarno and died in Turin. Francesco Tanadei is known for his meticulously executed works of art and bouquets of flowers. In 1819 he exhibited an ivory painting of Emperor Alex the I. of Russia in Paris. The present example shows the virtuosity with which he arranged the flower bouquets on dark fruitwood.

**Haager C.** (Hagar, Hageren) :



According to literature sources and tradition, Haager is said to have been introduced to the art of microtechnology by the brothers Sebastian Hess and Johann Paul Hess in Brussels. Furthermore, he is said to have presented three of his micro paintings to the public in London in 1773.

This very small signed carving is set in an equally beautiful fancy frame with enamel and gold of a jeweller with cover glass and shows three persons, the typical Hague sculptures on pedestals as ruins and trees. The background is probably powdered blue glass, as his teachers also used. Haager also used the device of drawing in the background to increase the plasticity of the scene.

**Guiseppe Maria Bonzanigo** (06.09.1745-18.12.1820)

Guiseppe Maria Bonzanigo was born in Asti, came from a family of woodcarvers from Bellinzona and worked for King Vittorio Amadeo III of



Sardinia and Savoy in the Royal Palace as a court sculptor in Turin, but also for Napoleon Bonaparte of France.

The picture shows a wooden box with glass cover and gold frame.



Underneath is a very fine wood carving of two doves, a bow and a quiver. The quiver is surrounded by a tiny wreath of flowers and individual plant branches. This micrograph is mounted on the black wooden background

### **Cornelius Bavelaar (1747-25.02.1830)**

Cornelis Bavelaar senior (1747 - 25 February 1830) was born in Leiden as the youngest son of the gardener Pieter Kockedee and his wife Stijntje. His parents died on 30.04.1764. As an orphan he was apprenticed to the sculptor Gijsbert Krul. Four years later he was apprenticed again to Nicolaas Lazarie, another sculptor.



Cornelis Bavelaar senior (de Oude) was a sculptor who created small works of art. Small showcases, dioramas with representations of ships, landscapes and domestic events carved out of wood and bone. These small works of art were called bavelaartjes. The background of the paintings is always blue. His son Cornelis (1777-1831), a carpenter and art worker, also made such bavelaartjes. Cornelis de Young, John Francis was the third and last of the family to make these boxes.

The illustration shows two examples of tea caddy boxes with a total of four medallions with depictions worked into the body. The Bavelaars from Leiden in the Netherlands are a special case. On the basis of individual criteria, some examples of the Bavelaars can be assigned to the microtechnical works, since some early works were made of bone or wood.

### **Restaurations:**

The structure of the micro-images provides an insight into the individual work steps at the time, the sequence of work steps, the materials used and the fragility and fineness of the individual carving fragments. These findings allow us to reflect on the production processes and techniques, but also on the involvement of different artisans up to the finished work of art.

## Example No. 1



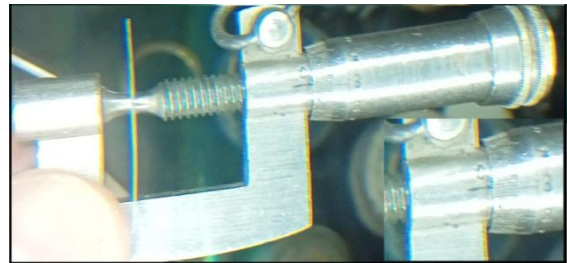
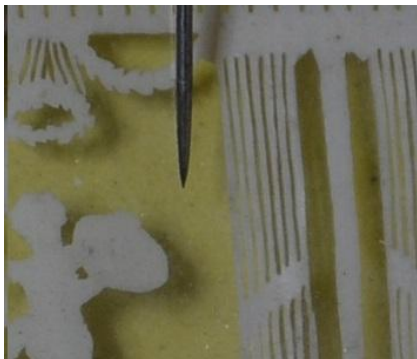
Example No. 1 shows one of currently 26 known and manufactured examples of outgoing frigates by G. Stephany in various sizes worldwide. This is the state of the database as of 29.10.2022. This motif of a three-master could not be realised by any other carver as masterfully as by G. Stephany. It consists of individually made ivory pieces (one by one piece) method, which was masterfully joined together, not visibly glued. The relief was fixed onto Bristol glass and set into the frame. Gossamer strips of mother-of-pearl, also set and glued together, were used to represent the sea. All the motifs show the frigates exclusively sailing. Presumably, each individual ship is a copy of an actually existing ship of the Royal Navy, as none of them exactly resembles the other and could also presumably be assigned to it. So far, there has been neither enough visual material nor time to do this.

For the restoration, the correct opening sequence is of eminent importance. In the comparative example, individual sails and ropes had come loose. Presumably G. Stephany had worked on the frigate from the front to the back, at least the restoration could only be carried out in this way. Such a restoration puts extreme mental and physical pressure on the restorer. We can only begin to imagine the virtuosity and sensitivity as well as the physical effort that must have been required of the micro-carver to be able to carry out the individual steps of assembling the parts. The use of the glue of the time also plays a decisive role in being

able to restore the work of art at all. It can be assumed that a single micro-painting of this size has over 100 individual parts that have to be glued together in such a way that they look as if they were made from one piece and that one wrong step can destroy the whole work. It is easy to see here that the criterion of size alone can only be one of several decisive criteria as to what constitutes a micro-image and what is called a micro-image.

At present, according to available documents, no other work by G. Stephany is known to have ever been opened and restored.

## Example No. 2



This Diepper work was probably moved to the later oval frame with red velvet background in the 19th century, presumably because the original

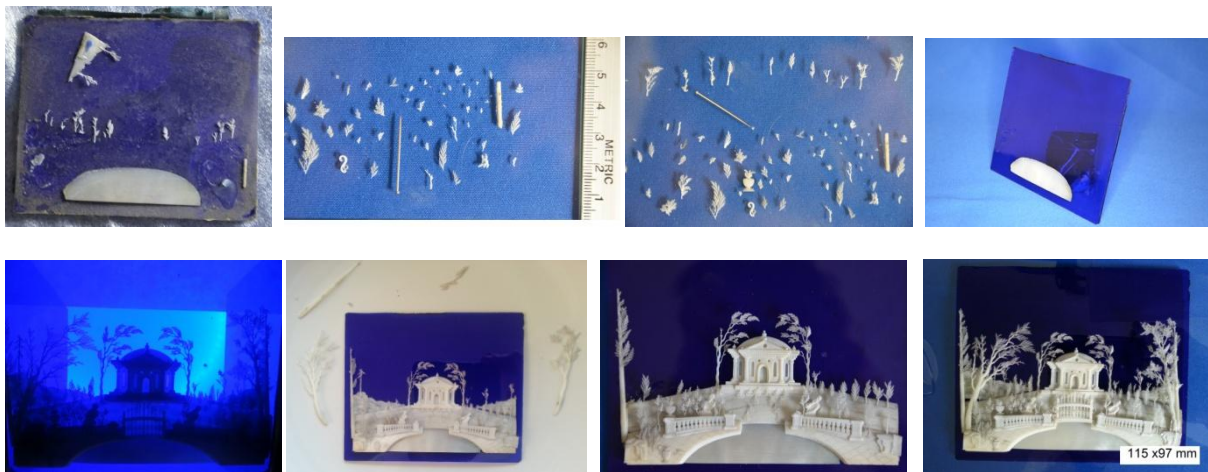
ivory box was broken and the relief damaged. Nevertheless, it was very important to a contemporary to preserve the remaining work of art for himself and or posterity. The predominant form of Diepper motifs used was the circular form in a manufactured ivory box. Therefore, the aim was to incorporate the relief as faithfully as possible into a round box of the time and to add at least part of the broken rigging in such a way that the damage of the time is no longer visible and the work appears to be complete. The result of the restoration clearly shows how differently colour and form have altered the motif. While the works of G. Stephany and J. Dresch were assembled in a kind of building block principle (piece to piece), most Diepper carvers concentrated on producing incredibly thin ivory slices from which they then carved a quite spatial scene almost to the limit of what was possible with the material. In the present case, the whole motif was worked from one piece. Gluing as G. Stephany had done is not necessary with this other holistic method (one piece) of production. In some examples where the possibilities of the material and the production technique were exceeded, even the Diepper masters resorted to a mixed method of the predominant one piece method and additions which simply could not be made from one piece were then completed by gluing (piece to piece). Both methods were used for decades. In Dieppe and other carving centres, the piece to piece method (construction from individual parts) had been known for a long time. The so-called Hessian modular principle (piece to piece), which was predominantly used by German, Swiss, Austrian, Belgian, Dutch but also Italian and other carvers, contrasts with the centuries-old tradition of the French masters from Dieppe, who produced these medallions and other works of art as far as possible from a single piece. Nevertheless, the Dieppe masters also used this other method of production. Presumably, the pressure to keep up with the extreme fineness was the decisive criterion here. Whereas with piece-to-piece it was possible for something to break and gluing errors to be corrected, in the one-piece process the work as such is lost if it breaks or an error is made. Only parts can still be used in a smaller version, e.g. as a ring or similar. In order to keep the restoration as authentic as possible, we searched the medallion for small glass splinters or foil remnants that were still present in very small particles on the residual adhesive of the relief. In this way, glass could be used as a background and the colour could finally be determined true to



the original. This is probably what the original micro-picture looked like about 250 years ago.

To show the virtuosity of the Diepper masters, here are several illustrations of the weight of such a work of art (1.4 g.) the fineness of comparison of needle point to the perforations of the ivory and the thickness/thickness of the ivory slices with 0.3 mm.

### **Example 3 extremely damaged micro picture probably A. Brodbek**



The third restoration probably shows a work by Adolphe Brodbek, due to the materials used (ivory and mother-of-pearl, blue glass possibly Bristol glass), the background and the rectangular shape which is found in many of Brodbek's works.

The first picture shows the blue background with the mother-of-pearl pane arranged in the lower part and the arrangement of trees and bushes still fixed on the glass pane. The piece-to-piece construction can be clearly seen on a fragment. The Hessian modular principle was therefore also used by Adolphe Brodbek, if this work is attributed to Brodbek.

Comparable pictures of fragments can be found in the book by Paul Bissegger (2007) *D'Ivoire et de mabre, Alexandre et Henri Perregeaux* or in the Museum Beaux Arts in Lausanne. (Fig. 3.3.8.)

The blue glass was carefully cleaned and the glued-on parts were recorded in pictures for restoration. Figure 3.3. and 3.4. shows the cleaned glass with the beginning construction of the relief from the rear view. Figure 3.5. shows how the restoration was built up. In contrast to the frigate restoration by G. Stephany, a completely different construction principle was used for this picture. A. Brodbek built up the micro-image starting with the background of the blue glass from the depth to the front and thus created the spatial effect. From this it can be concluded that different motifs of the piece to piece method required different construction techniques.

The illustrations show the individual construction steps without embedding in the corresponding frame. The ivory fragments were freed from the dirt of the last 200 years in a special cleaning process.

## Research:

### **British Royal Family**

George III 04.06.1738-29.01.1820 Windsor Castle was King of England. In his reign with coronation on 25.10.1760, the defeat in the War of Independence (1775-1788) in America. At the same time he was Duke of Brunswick-Lüneburg, from 1815 also King of Hanover.

George III had seven daughters and 9 sons with his wife Queen Charlotte.

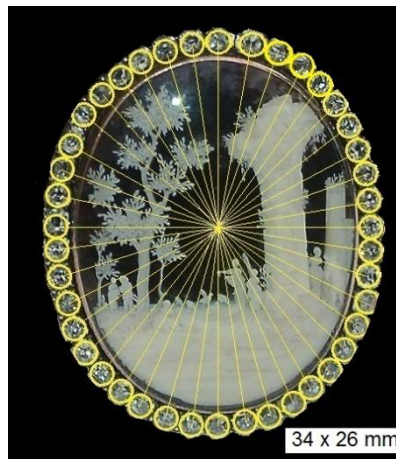




Presumably, G. Stephany portrayed both the king himself and the entire royal family with a meticulously carved rosary. Therefore, a total of at least 18 portrait paintings with a minutely carved rosary could have been produced as micro-carvings. A total of 17 of these works by G. Stephany can be found in the database. A large number of the reliefs can be found in Buckingham Place Museum, the Holborne Museum in Bath and also in the City and Art Gallery in Bristol. This micro-engineered work by members of the Royal Family is unique in the world and has not been done anywhere else. It would now need to be verified by historians whether the images in the reliefs are actually of the children of George the III and Queen Charlotte. Apart from these 15 portraits of members of the royal family known so far, the King of Prussia also commonly referred to as "Alter Fritz" (12.08.1762 26.06.1830) has been portrayed by G. Stephany according to literature and also pictures. However, the wreath naturally differs from that of the royal family. The Old Fritz was framed by G. Stephany with a finely carved laurel wreath. In the Holburne Museum in Bath there is also another portrait of a woman who was also provided with the rosary. According to the label, it is Mary Ickeringill. Of course, it could also be another daughter of George III, as the relief was attributed to an Italian artist. However, the micro-work is undoubtedly the work of G. Stephany.

## The Mozart necklace

Wolfgang Amadeus Mozart (1756-1791) came to Vienna in 1781 and married Constanze Weber on 4 August 1782. Wolfgang A. Mozart gave his beloved wife Constanze this exclusive piece of jewelry, which was made by the micro-sculptors Hesse in Vienna. The micro-image of the Mozart necklace was set with 42 old-cut diamonds. In her will written on 23 June 1843, Constanze Nissen (before Mozart) bequeathed a pearl necklace to her sons with the following words: "11 Schnüre gute Perlen mit ElfenbeinschlieÙe von dem berühmten Hesse encircled with brilliants"

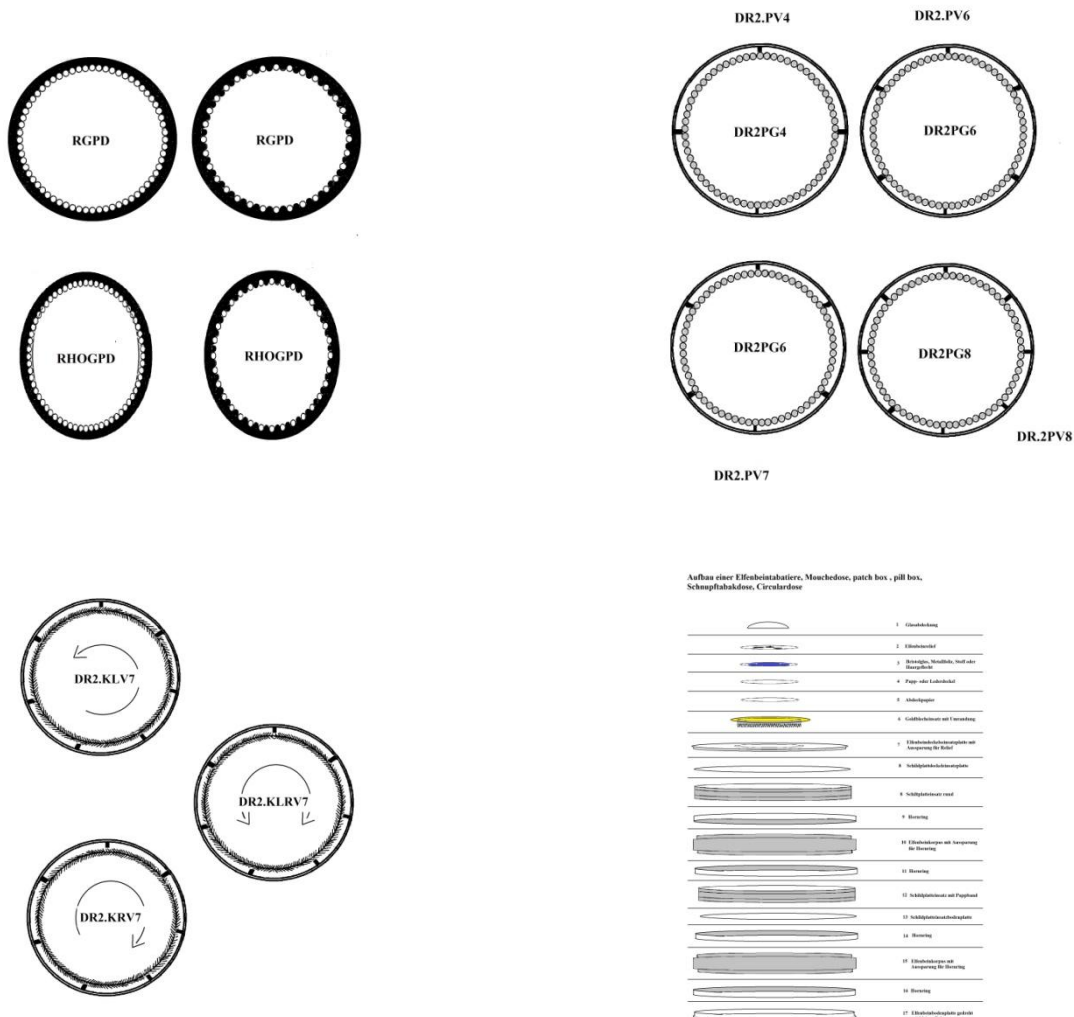


The Maria Theresa brooch with a total of three micro-images was set with 84 old-cut diamonds. The striking feature of this relief, which was even depicted in the painted picture by the painter, is the vertical format of the relief with the dark blue area in the centre of the vertical oval (central perspective). Before 1821 Constanze Mozart and her son Wolfgang had themselves painted, according to the records of Thomas Spitzer née Perwang and the Mozarteum in Salzburg. In the present picture Constanze is shown wearing the necklace. No other of the more than 1500 micrographs has such a match of border size and the dark blue dot in the centre of the micro picture.



## Diepper boxes :

The ivory centre of Dieppe produced many talents over the centuries. The predominant form of box production, so-called Diepper boxes for micro-technical artists, had a circular shape. Presumably, the circular shape was the most stable and economically effective form of case, also because of the shape of the tusks and the thin processing to the point of being translucent.



If you look at the boxes and both the construction and the representations, you can see different criteria and also degrees of difficulty concerning the production and elaboration of the miniature pictures in microtechnology. Here are some examples of the processing of the miniature pictures in microtechnology into the boxes and a sketch of the construction of a box. This shows that extensive work was



necessary in order to be able to produce the total product of the tabatiere.

The ivory period of the princely collectors and wonder objects ended in the middle of the 18th century due to the emergence of the new coloured material porcelain as well as the political and economic changes in Europe.

### **Art Coding:**

#### **Example Trancaville**

Art tagging or geo-coding makes it possible to identify both people and places. Based on a name, a place, a coordinate transformation can be carried out by means of the search engine Pelias. By means of the image matching program of google, a comparison can be made, for example, of a painting with a real place or person. Correspondingly, a facial outline of a person can be made with the database in order to be able to identify the person.

In the following example, the location of the micro-image as well as the direction of gaze can be determined by local assignment.



A comparison of the motif with old engravings led to the identification of the location. The image shows the ruins of Trancaville Castle at the mouth of the Seine near Le Havre on the English Channel. In the meantime, the waters of the Seine no longer reach as far as the site as depicted in the engraving of that time. This could also be a landscape depiction by A. Perregeaux or J. Dresch.

### Example Gresly necklace Switzerland:

The present miniature picture of Rosa Gresly, together with the picture of Constanze Mozart (Mozarteum Salzburg), are currently the only known pictures of the wearers and owners of the time and their jewelry or works of art. In the present case, the necklace, presumably made by Alexandre Perregeaux and consisting of three tiny micro-pictures, came into the possession of the Rosa Scherer-Gresly family (1783-1859). According to the information in her will provided by the State Archives of the Canton of Solothurn, Mrs. Scherer-Gresly was a very wealthy woman at the time. Thus, with the available data, a local as well as personal assignment could be made.



### Example Rose Josephine Bonaparte:

The third example, set in a small box, shows a portrait of a woman which was used more often in the art period as a pictorial representation. There are obvious similarities with a portrait of Rose Josephine Bonaparte. The micro-image is a typical flower wreath as Guiseppe Maria Bonzanigo was able to produce it.



It is known from literature that Guiseppe Maria Bonzanigo and the Empress Bonaparte were acquainted. G. M. Bonzanigo was given a building by the French state. He probably worked directly for Napoleon. One of G. M. Bonzanigo's works showing the Empress is in the Louvre in Paris. It is very likely that the depiction is of the Empress Rose Josephine Bonaparte.

### **Targets:**

### **Virtual Rekonstruction:**

The virtual reconstruction process has no precedent and is unique worldwide. It is a research project of the Fraunhofer Institute for Production Systems and Design Technology (IPK).

It was developed by the FIPK team around Dr. Ing. Nikolay to replace manual construction. Since then, about 1.67 million sheets from a good 500 bags of the Stasi past have been reassembled in the manual reconstruction and sorted into the archive. Since 2007, a procedure for computer-assisted reconstruction has been developed in a pilot project. In the test phase since the end of 2013, around 91,000 pages from 23 sacks have been reassembled.

The Fraunhofer Institute for Production Systems and Design Technology (IPK) was already able to prove to the BStU in October 2013 that the "e-Puzzler" works.



A further developed computer programme and improved scanning technology with a more powerful scanner should lead to the automated digitisation of hundreds of thousands of scraps in a manageable period of time. Until now, shadowing and lack of colour fastness had to be calculated out again after scanning in order to be successful. Thanks to the scanning technology adapted to the vReko project, which is now in use, the snippets can be digitised faster and more precisely than before. Overall, however, the system is a complete success and unique.

A film about the Stasi reappraisal period of the former GDR led to the idea of a transfer. To apply this worldwide unique procedure to damaged and almost destroyed unique works of art history, where one does not know how they looked like before the destruction.

The Fraunhofer Institute has pointed out in its Internet site that museums and collections house over 100,000 such artefacts and that there is therefore a wide range of possible applications.

The publications of the Fraunhofer Institute show that, apart from the Stasi Aufarbeitung, the procedure for virtual reconstruction has already been applied to multiple fragmented multi-dimensional objects of chipped glass mosaic fragments in Buchholz Fürstenberg/Havel. The starting point for the IPK's work is the double-sided recording of the fragments to be reconstructed using a 2.5D scanner. In this process, all information relevant to the reconstruction is recorded, such as the motifs and outlines of each individual element. The illustrations of the assistance

system and a drawing of the 2.5D scanner are taken from the website of the Fraunhofer Institute IPK.

Three micro-pictures (inventory number 1172, 1808 by Nikolaus Klammer (1769-1830) which were bought by Prince Johann I von und zu Liechtstein for around 3000 gulden and belong to him have been stored in Austria for many years. Two of the three works, flower vases with bouquets, are currently completely destroyed. There are no pictures of what the micro-pictures originally looked like. These works were acquired in 1815 on the occasion of the Congress of Vienna. (List of purchases 1824)



Whether a virtual reconstruction of spatial parts in contrast to paper scraps is possible would have to be clarified with the research team of Dr Ing Nicolay of the Fraunhofer Institute for Production Systems and Design Technology (IPK). The techniques for restorations after virtual restoration are available.

It might be possible to save the two shattered works of art after more than 100 years and restore them almost to their original condition, thanks to this unique and now tested and improved technology.

Two micro-paintings by Guisepppe Maria Bonzanigo were also shown in the program Kunst und Krempel on Second German Television a few years ago. All these works and probably more could be reconstructed and preserved for humanity.

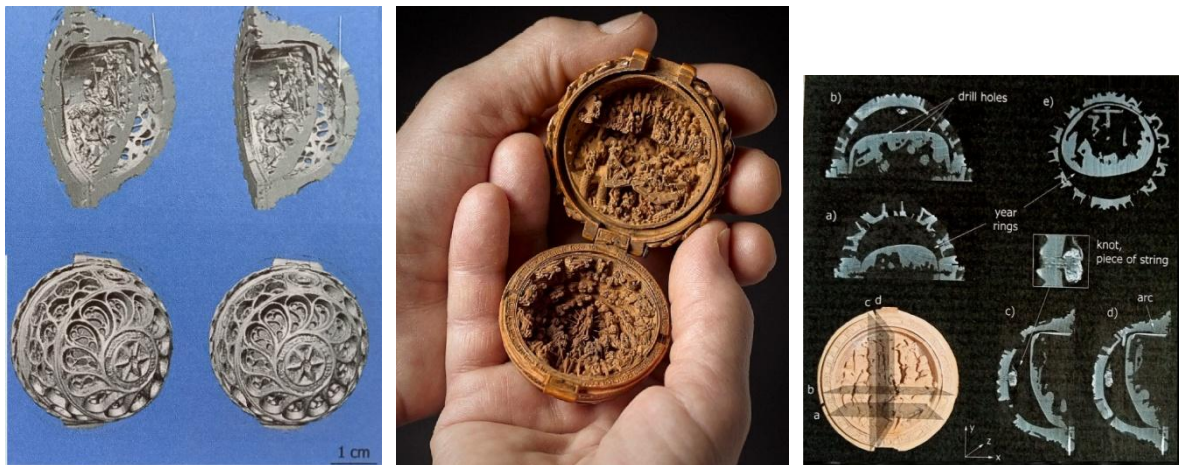


## The synchrotron process:

Similar to the micro-pictures, amazingly small wood carvings had also been made 200 years earlier in Flanders or in the Netherlands.

According to publications by the Art Gallery of Ontario in collaboration with the Rijksmuseum Amsterdam, the Dutch and European Synchrotron Radiation Facility (ESRF) and TU Delft, there are only 135 known miniature carvings made of boxwood.

Art specialists and researchers assume that these wood carvings were only produced during a short period between 1500 and 1530 either in Flanders or in the Netherlands.



The rise of a new merchant class in Europe also created a demand for high quality portable religious carvings. Due to the onset of the Reformation and the assumption that ecclesiastical accessories were going out of fashion, these miniature pieces of boxwood disappeared again. It is also possible that the carver died and was unable to pass on his knowledge. These carvings can also be seen as a kind of precursor to micro-carving.

With the help of micro-CT scans and advanced 3D analysis software, the AGO and Delft University researchers found out how these prayer nuts were constructed. The new scanning technique revealed the structure and composition. It turned out that the joints of the miniature altars are so hidden that they can only be seen with a microscope or an X-ray. In larger pieces, they had also incorporated needles that are smaller than

grass seeds. Nevertheless, despite the synchrotron method, a good part of the manufacturing process remains unknown.

This X-ray technique could also be applied to some examples of micro-carving in cooperation with the University of Delft in the Netherlands in order to better understand their production process.

Research with synchrotron radiation began in 1982 in Berlin Wilmersdorf. In the following 20 years, Bessy I and Bessy II were developed. "This radiation covers a very wide spectral range. There are no comparable alternative light sources. Therefore, synchrotron radiation is an analytical tool for research and development in physics, chemistry, materials research and biology", but also for applications in the field of materials are structural research, spectromicroscopy and related to this also for the research of works of art without damaging them.

## **Global image and knowledge platform**

In the course of many years of research and close examination of the micro-images which were available on the internet through auction houses, dealers, collectors and museums and were freely accessible or were photographed on site in museums or were made available free of charge, an image database and a criteria system called VIK (Visual identity key) with 138 sub-criteria for cataloguing and classifying the micro-images developed over the years.

By means of the so-called CSC (cross selection criteria), all criteria related to the micro-image can be set in relation to each other. The computer can therefore generate image combinations in seconds that no human being has ever seen before.

The main classification is made up of the existing stock in museums and the stock in private collections. This is followed by a classification according to individual museums, differentiation according to countries, the choice of picture, size, shape, colour, background, special criteria, allocation according to individual artists and dating. Differentiation is made according to the type of versions and the versions themselves. It is also possible to search by keyword.

The four main criteria for assessing a micro-picture, which emerged during the examination of the artworks, the cataloguing and the development of the program, as well as the conspicuous special criteria for the Diepper boxes, form the basic scientific framework. All these

criteria were stored in a sequence of numbers and letters comparable to the ASCII code for each individual work of art.

Therefore, no real computer program is required to make the selections. This allows a search in Windows as well as in the Apple operating system or any other computer operating system that uses an ASCII code. ASCII American Standard Code for Information Interchange is a 7-bit character encoding. The ASCII code was first approved by the American Standards Association (ASA) on 17 June 1963 as standard ASA X3.4-1963 and was substantially updated in 1967/1968 and most recently in 1986 (ANSI X3.4-1986) by its successor institutions and is still in use today. The character encoding defines 128 characters. This coding of the VIK is based on this assignment of the character code of the ASCII code. The sequence of character combinations, results in a sequence of letters and numbers. In simplified terms, only a combination of numbers and letters is placed in different relations and sequences, whereby mathematically the sequence has no meaning, but which can then be easily selected by searching for parts.

An example to illustrate this: the code for a single image could be:

```
MB_GB_CM0_000001_A0_000x000_G03_H0_blue_gla_SK_pic_gms_pi  
c_666_Hess-S_title
```

Of course, the letters and number sequence could also be longer, it depends on the previously established criteria.

Each individual criterion or several can be related to another or several letter sequences of another figure. The result is that all criteria can be cross-checked with practically all criteria in CSC. How large this range of variation is can hardly be imagined, only mathematically calculated. The human eye would have no way of comparing all these different criteria at the same time, and in fact this would not be possible due to the different storage locations of the artworks. The more exact and precise the coding is, the more exact the later image selection and the result.

But back to the present example of how such a sequence of characters is constructed. One could also have coded simply in 0 and 1. But as a human being, such a coding would be too abstract and probably nervously unfeasible, so this mnemonic method was used.

The letter sequence for the associated picture says that it is a picture of a museum collection in the UK and is stored in the City and Art Gallery in Bristol, that picture is number 1 of several, that it is a picture and is not literature or any other reference.

It lists the size in mm, the size in the corresponding category, in this case G03 (up to 39 mm) in longitudinal or horizontal format, that the motif is oval, that the background is glass, that the colour of the background is blue, that it is a ship/coastal scene, that it is a wall painting, that the frame is gold smooth, i.e. golden and smooth, that the ivory is dusted, i.e. has been stippled, that it is signed, that Hess Sebastian created the work and that it has a title. The individual criteria can be further supplemented by keywords such as frigate, ruin etc. about what is depicted in the picture and the like.

If you are looking for one or more rectangular micrograph, simply enter the criterion rectangular Rt in the search bar. Let's say 150 images appear. If you enter Rt and perl (mother-of-pearl), perhaps 25 images will appear on the monitor. If you then enter 777, which stands for the criterion allocation by literature or museums, perhaps only 2-3 specimens will appear. These can then be compared with the other 25 examples. This is because, according to literature and in comparison with other works, the material mother-of-pearl was only used by Adolphe Brodbek.

Thus, interesting comparisons can be made using the criteria of format and material of use in combination with signing or literature attribution. Museums could check their holdings in a very short time and find out more background information, art auction houses could very quickly find comparative examples in the database and then draw up an expert opinion, private collectors could also compare their works of art and make assignments. A win – win situation for everyone who cares about this art and for many who have never experienced or seen anything of this unique occidental art in micro format. And if one would like to see an

original, the database also provides references to all known museums worldwide.

The prerequisite would be that at least one picture, be it from a museum platform itself, can be accessed and collectors provide protected and anonymous pictures and auction houses give their permission for the already existing pictures to be used.

This would create an image database that is unique in the world and that everyone can access free of charge, regardless of skin colour, religion, social origin or political conviction.

Currently, this Giga database already exists, but due to possible image rights, these 1587 images cannot all be put online so easily. Legally, permission is required from each individual museum and each auction house or collector.

To actively research or simply look at a worldwide unique world collection that no one has ever seen before.

If these images are put on the internet e.g. under a website like this, all that is needed is the key directory for the criteria and anyone could access this world-spanning global collection of all museums and collectors worldwide.

For the book of micro-carvings, which is in preparation, this database, which has been developed and constantly updated for 15 years, forms one of several bases for the content of the book, which is in preparation.

### **Inclusion in the UNESCO World Heritage List:**

Ultimately, the aim is to have the world's remaining micro-images included in UNESCO's World Heritage List. The best micro-images are breathtaking when you see these works in the original. Therefore, it is also desirable that travelling exhibitions and special exhibitions can be organised in consultation with private collectors and museums in order to show mankind these unknown but virtuously produced works of art, which were rightly described as miraculous things as early as 250 years ago, at least to a part of mankind, what achievements mankind can accomplish. Because these pieces of jewelry and works of art were

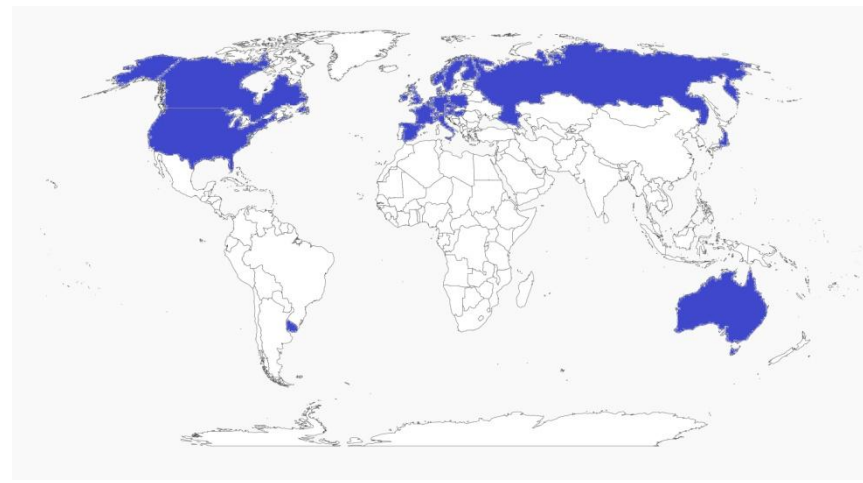


stored in art chambers, they are still largely unknown to this day. Moreover, these works of art are forgery-proof.

In order to be able to present the artists' achievements of the time more vividly, the aim should be to use the latest technology in conjunction with enlargement through controllable monitors or tablets or voice control with the FIPK and electronics companies and to redesign the museum experience entirely in the spirit of William Bulloch.

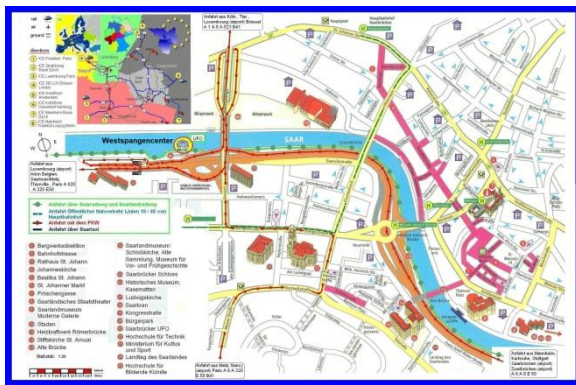
In addition, each individual work of art should be included in the artloss register, because then these works are reasonably safe from theft (can of Waddeston House) and at the same time this area of art no longer touches the past.

**Locations an dates:**



Länder	Museen	Anzahl Museumsbestand	Privatbesitz Kunsthandel	
Australien				2
Canada				1
Dänemark				1
Deutschland	9	19		95
Finnland	1	5		
Frankreich	6	141		167
Großbritannien	9	212		146
Italien	4	124		112
Irland				1
Japan				31
Liechtenstein	1	3		
Luxembourg				1
Niederlande	2	2		10
Österreich	7	25		51
Polen	1	1		
Russland	2	29		
Schweiz	3	19		20
Schweden	2	4		
Spanien				2
Uruguay				9
USA	6	8		50
derzeit nicht zuortbar				296
	21	53	601	986
				1587

## Approach:



## **Data policies and donations**

International Micro Carving Institute. e.v.

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