Abstracts

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Mural techniques

The publications edited until recently on the techniques of mural painting are partly out of date or quickly loosing actuality. Older books are mostly based on a few, often incorrectly translated sources and a few artists' or restorers personal experiences. Scientific research became worldwide common only in the last few decades. In consequence, the bulk of information has largely increased and significantly changed. Numerous misconceptions have been proved wrong and many new questions have emerged. At the same time, barely any modern studies have been conducted on mural restoration in Hungary, and modern basic research is nonexistent. On top of it all, the most of the few results have not been published. Thus Hungarian mural remains can be studied only with the critical adaptation of foreign studies. The knowledge of pictorial techniques would, however, be important for art historians, archaeologists, architects and restorers alike. This knowledge is (or rather should be) necessary at the uncovering of murals, at the planning and in the process of restoration and the art historical analysis to arrive to the right conclusion. In restorer training, practical education has pushed theoretical pictorial knowledge into the background. If it is ever mentioned, it is never in a systematic form. Restorers had, or have, little and very random information in this field. Thus certain restorations have caused serious damages to the murals. Most of them are not known to the specialists or even to the restorer him or herself who, for lack of sufficient training in this respect, has no idea what he or she has done. As these questions are not at all discussed in universities of science or at the technical universities, the monument protection authorities, who were trained at the above universities, have no weapon to support their fight for the protection of the monuments. This urged the author to start teaching mural painting techniques based on modern knowledge at the Hungarian University of Fine Arts in the academic year of 2000/2001. Since then he has been doing his best to improve the quality of the curriculum, yet he has not yet succeeded in turning this subject into an officially integrated accredited course. Thus many lessons were cancelled for the sake of "more important things" and the knowledge the author of the study would have liked to pass was less than intended or necessary. The study is composed of two more-or-less identical parts. The first part contains the description of basic technologies, materials, recipes and technical devices. These descriptions were composed so that the various techniques could be tried out without a teacher's help. In this part the author makes an attempt to clarify the proper names of the techniques, their characteristics, grouping, since there is a relatively thick chaos in this regard among specialists and in the art historical literature. It is, for example, unclear for the professionals that very few representatives exist of the clear fresco technique. The aspects of artistic expression were more important for the painters and the commissioners than the technical limitations. If a pictorial effect could not be reached in a "fresco" the artist did not hesitate to choose another solution. It was common to complete and restore frescos in seccos in nearly every period. Thus we can call frescos all the pieces of art that were dominantly made with a fresco technique. The author tries to give a more authentic and modern recapitulation of the individual techniques than the former books written first of all for artists. In this he relies on the latest decorative painting and restoration literature and his own researches and experiences. At the introduction of the old and the modern techniques, he refers to the most important historical characteristics. The second part is devoted to history. He gives a review of the history of mural painting techniques from the beginnings of art to the latest contemporary artistic trends. (Naturally, he can only deal with those modern trends where painting in a traditional sense is applied.) The most recent and modern international literature was used in the description of the historical periods as well. The intention of the author is to pass until now unattainable information in Hungarian language. There was no premeditated balance set up between the various periods. We know too little of certain period, so these chapters are shorter than they should be, while we know more of others, which are thus perhaps more extensively discussed. There are chapters that seem to be superfluous. Such can be the somewhat too long description of glass painting. The fact that restoration analyses demonstrated one of the earliest European occurrence of soluble glass at Üröm in 2005 suggests that maybe it is not so.

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Sekler farm from Nyikómente in the Molnár István Museum at Székelykeresztúr

A Sekler farm consisting of several buildings was constructed in the Molnár István Museum at Székelykeresztúr

between 1996 and 1999. The study describes the buildings – 1. dwelling house from Tarcsafalva, 2. granary and barn from Csehétfalva, 3. baking house from Rugonfalva.

1. The name of *Tarcsafalva* was first mentioned in the papal tithe list in 1332–1337. The house reconstructed here was built in 1780. It is divided into a *front house*, a kitchen, a *back house* with the *veranda* and the *porch* in front of it. The *front house* is smaller than the *back house* by the width of the *porch*. The axes of the *front* and the *back houses* are not aligned, so the purlin of the *front house*, which bears an inscription and a date, stretches over into the kitchen. The window jambs are decorated with quadruple, red-painted grooving. The *cross-beams* are also decorated with carving, grooving and painting. The doors and the windows were modified and enlarged. Holes were bored into the sides of the *door jambs*, the bore-holes were gouged out and the logs were fit into them with tenons. The window sills and the *transom* were fixed to the logs with each two pegs. In the roof construction, oak pegs held the collar-beams and the cross-beams together. The rafters were planted on the collar beams and fixed with pegs. The ends that jutted out and the tilting fillet were both decorated. The NW and SE rafters were led out only until the perch leaving smoke holes on both sides. One of the two oak roof decorations has been preserved. It was lance-shaped. The traces of a trelliswork on the rafters suggest that the roof was covered with granite. A number of tiles with dates on them have been preserved from 1807 and 1810, and one has the inscription "Unitárius GM 1909 Csehétfalva". The traces of seven posts can be seen on the ground sill of the porch. Three of the posts fixed with tenons and angle bracing were found in their original position and one built in as a railing. There are no traces of latticing in of the *veranda* and the *porch* from the time of the construction, and nothing reveals the original material and measurements of the stairs. A hearth packed with stone was discovered at the investigation of the kitchen floor, in which shards from the 17th–18th centuries were recovered. Shards dated from the 14th century also came to light, which could get into the kitchen from the digging of the cellar. The foundation needs further investigation. The cattle bladder window panels were also reconstructed at the replacement of the Tarcsafalva dwelling house. As far as we know this is the only example in Transylvania.

2. *Csehétfalva* is a hidden village in the middle stretch of the Nyikó valley. A document from 1567 mentioned 17 houses. No historical data exist about the granary reconstructed here. The passage barn was divided into the four spaces: granary, barn, granary and cart-shed. It was built of stone with dry walling. The oak ground sills were made with half-lap joints. The jambs of the two granary doors and the posts at the four corners of the barn were jointed in them. The round pine logs of the wall were laid across. The logs were left 120 cm longer on the southeastern side creating a fence to help the driving of the animals into the yard. Eaves were created with the elongation of the roof construction above the cart-shed and the two granaries. Three ceiling beams jut out from the western front, which, together with the beams pressed between the sill beam and the first log compose a protected area where the stakes of the haystack and the wheat-sheaves were stored. The windows next to the doorjambs of the granaries could not be opened. A clay layer insulated the granary between the logs, then the walls were whitewashed.

3. *Rugonfalva* is the last village in the lower stretch of the Nyikó valley. According to the construction technology and the dated shard recovered from the baking house, the farm was built in the second half of the 19th century. The baking house stood in the continuation of the dwelling house, four metres from it. It was divided into three spaces: baking house, shed and pigsty. The ground sills were made of oak, the pine and beach logs were cut to a quadrangular shape leaving the bark on the logs, then they were packed into a bracing. A poorer quality raw material was used on the side of the shed and the sty. No lintel was used at the door. The building is enclosed by crowning beams laid in two rows. The pine roof beams were laid on them. The rafters were fixed with overlapping and pegs, and lower down with a perch. The saddle roof was covered with tiles of rounded terminals. One of them had the inscription "Péterffy Gyula 1989 junius 20-án", and a few items were decorated with incisions and flower motives. The sides of the roof were closed with planks. Small pegs were hammered into the log wall, which was insulated with daub mixed with chaff and long-stalked straw. Fourteen whitewashing layers could be separated on the building. The buildings of the Sekler household of the Nyikó valley rebuilt in the yard of the Molnár István Museum were furnished with the material remains of folk lifestyle.

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On photo-technical and microscopic analyses of painted works of art in general

The proper evaluation of photos made of works of art before restoration taken in normal, incident, UV, luminescent and infra-red light can provide valuable information so it can be regarded as the first step of analyses. First an achromatic and distortionless *long shot* photo should be made of all the sides of the object, including the inside, in *normal light. Detail photos* are suitable to illustrate structural specifics, traces of tools, injuries and the condition of paint layers and coatings. In *incident light*, surface irregularities, fissures and defects appear in clear contrast. Normal photos are indispensable at the analysis of the photos made in other radiations, so the same details should be photographed in luminescent and infrared lights as well. The reflective and

absorption capacity of materials is different in *UV radiation* than in the visible light range, so *UV shots* are suitable for the detection of overpainting, retouching, varnish layers, different binding materials etc. Such an end filter is necessary (UGI) that lets only the reflected UV radiation through and not the visible light. The filter has to be inserted after focusing, and the distance must be adjusted. Black-and-white films are used for UV photos, since a monochromatic radiation is recorded. UV radiation is applied at *luminescent photography* as well, but this time the *radiation generated* in the visible range is recorded and the "luminescence" of the materials is photographed. Usually, the luminescence of the coating appears in the photos together with interventions, repairs, retouching carried out on the surface and the strokes of the brush can be seen. The luminescence of the layers depends on the binding materials and the pigments. The luminescence of varnishes, resins, oils increases by time. Oil content usually increases the intensity of emitted radiation, while siccatives can influence the colour. Copper and iron content blocks the luminescence of oil so pigments containing these materials appear in a dark shade. Other pigments favour luminescence so they appear in light shades in the photos. Colour daylight films and a transparent UV filter that filters the UV radiation but lets through the radiation generated within the visible range are used. Placing a light yellow filter (1.5 x) between the objective and the UV filter will give a more achromatic picture. At *infra-red photos*, a radiation of a wavelength larger than 700 nm should be used. The energy of infrared photons is low and most of the pigments do not absorb them, so most of the paint layers transmit them in (transparent) infra-red radiation. With this method, details and certain sketches covered with repainting or a coating can usually be demonstrated. Repainting, retouching and repairs appear with sharp contours. Copper containing pigments absorb infrared radiation so they can cover the underlying layers. They appear in dark shades in the photos. Infra-red photos are made with an infra camera, and then they are printed. We can also make analyses with a digital camera and an infrared filter in the nearest infra range with night-shot, or with a digital camera in a black-and-white mode. After the evaluation of the above-listed photo sessions, we can make an intentional sampling and carry out *microscopic analyses*. For layer analysis a sample of a diameter of at least 1 mm is needed, on which all the pigment layers can be studied in cross-section. It is important to *mark the place exactly* from where *the sample* was taken. The samples are studied under stereomicroscope (100x >) before embedding. With a polarisation microscope (100 x<) the stratification and the layer structure can be studied at *vertical illumination*. In this case, a *section of the cross-section* measuring 1–2 mm in diameter is prepared from the sample. The sample is perpendicularly glued on a silicone plate with instant adhesive, then a plastic ring is glued around and it is cast with transparent epoxy-resin. The embedded sample is ground and polished. Water soluble elements can be dissolved during wet grinding! The comparison of samples taken from the same object can reveal the differences between the original and the repainted surfaces and the dirt. At *transmitted radiated* (lower) illumination, transparent objects and samples are analysed like embedded dust samples on a glass plate, thin sections. The grain features and the optical features of the materials can be determined. We can carry out *microscopic* analyses of the same samples in *luminescent* radiation generated with UV radiation. A vertical illumination is used again in the case of cross-sections. Similarly to luminescent photography, the visible generated radiation is recorded. Any restorer with proper training and suitable equipment can carry out the above described analyses, which compose the basis of restoration documentation.

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Report on the activity of the wooden furniture restorer trainees of the Hungarian University of Fine Arts in Transylvania

Object restorer artist training is carried on in the fields of wooden furniture, metal-goldsmith, paper-leather, silicate and textile-leather within the frames of the Faculty of Object Restoration in the Institute for Training of Conservators of the Hungarian University of Fine Arts. The curriculum is the same in the first 3 years of the 5-year training. The students learn theoretical subjects and also the technologies and the conservation methods of inorganic works of art. From the 4th year, the students continue their studies in the field they had chosen at entering the university. Regrettably, even thirty years after the introduction of the training, instruction is carried out in part time, usually in 40–80 hours a month, divided in one or two weeks time. Beside theoretical lecturing, practical training is also emphasised. Students restore pieces of art as a practical exam during the 5 years. As their diploma work, they conserve one or more pieces of art according to a conservation plan prepared after the study of the technology and the raw materials, unlike in the majority of foreign training institutions, where the diploma work is the planning of the conservation of a piece of art or a unit of works of art based on assessment, studies and material analyses carried out in groups. Since 2003, the students of the Object Conservation Faculty, regrettably only one or two persons in a year, can visit foreign universities for the length of a semester. Student exchange means that a number of students of the Erasmus partner institutions came to do the practical training courses or prepare diploma work with the help of the professors of the Department in the Object Conservation Faculty, or their hosting institution. Foreign universities have organised numerous excursions in other countries and the students can take part in international conservation projects, which are financed

from institutional sources and grants, while the students pay for their personal expenses. This cannot be expected from the majority of Hungarian students due to the different costs of living in Hungary and abroad and the university does not have a budget separated for this purpose. In the of Object Conservation Faculty, the students attend lectures with slide shows in art history and the specifics of objects and can study works of art in the exhibitions and the depositories of major Hungarian museums. The students of furniture conservation were the first to raise the idea of studying monuments and their furnishings in historical Hungary, especially Transylvania. The professors welcomed the suggestion and completed it with a professional restoration program in a museum or an ecclesiastic collection in Transylvania. In 1995, 8 medieval and baroque wooden statues and 3 painted ethnographic chests were conserved in the Csíki Székely Museum in Csíkszereda, in 1997, 7 guild chests were conserved in the Haáz Rezső Museum in Székelyudvarhely and 20 pieces of painted folk furniture in the same museum in 1998 and 2000. The latter ones can be seen in the permanent exhibition "Flowers of Székelyföld" opened in the museum in 2000. In 2000, the students took part, as members of an optional program, in the conservation of the altars that had been stolen from the Sövénység church and later found. In 001, 5 statues of the church were conserved at Szováta, in 2005, 5 guild chests were conserved in the Haáz Rezső Museum. International practical courses were also carried out in Transylvania. One was titled "The restoration of Transylvanian Saxon painted furniture" and it was organised on the initiation of the Object Conservation Faculty within the intensive Erasmus program. The theoretical program was held in Budapest, followed by a three-day trip to Transylvania, then the furniture conservator students of the participating universities (MKE – Budapest, EVTEK – Vantaa, HAWK – Hildesheim and Universitate Lucian Blaga – Nagyszeben) worked two weeks in the Astra Museum in Nagyszeben. The same year, 5 Hungarian and 15 German students restored some of the painted jointed chests preserved in the attic of the museum of Segesvár within the frames of the joint practical course of the Hildesheim University and the Object Conservation Faculty of the MKE. The Transylvanian restoration practices and the study trips connected with them are extremely popular among the students. Beside international practise and the exchange of ideas, they widen the scope, the cooperation capacities and the English language knowledge of the students.

The author of the paper has been directing the above described Transylvanian conservation practices for 10 years. During this time, object conservation training started in Romania. Although these trainings are not always accredited, the first years have already left the university. With the expansion of travel opportunities and the enrichment of technical literature in the internet offer a new perspective to students as well as practiced restorers for further development. It can bring new results in respect of aid type restoration practices in Transylvania as well and they can advance them in the direction of mutual or multilateral cooperation projects.

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Conservation and identification of incunabula from Csíksomlyó

The library of the Csíksomlyó monastery is the only medieval Catholic ecclesiastic library in Transylvania that survived Reformation. It preserved volumes of a number of medieval libraries of Hungary and Transylvania that had been closed and those of secular and religious personalities in Székelyföld. After the suppression of the Franciscan Order (1951), they were transported to the Csíkszereda Museum in 1961 and they have been kept in the medieval building of the Csíki Székely Museum since 1970. In the 50's scholars noted that the majority of the incunabula, and notably the most valuable manuscripts were missing. In 1980 and 1985, the "treasures" that had been considered lost were found under the Mary statue and in the walled-in window niches of the refectory in Csíksomlyó, where the Franciscan monks had hid them between 1944 and 1948. The well preserved finds from 1980 did not contain incunabula, while the 123 old books recovered from the wall of the refectory in 1985 suffered a grave biological and chemical damage. No book conservator worked in the museum at that time, so the books were conserved in Bucharest, where 30 of them were declared being beyond repair. The restored and the unrestored materials were returned to the museum. Erzsébet Muckenhaupt identified 84 incunabula and 10 prints from the 16th and 8 ones from the 17th centuries and also 9 manuscripts. In the meantime, a paper conservation workshop was established in the museum. The trained paper and leather conservator repeatedly checked the material and stated that active mould attacked the books despite former disinfection. So she started treating the books declared to be beyond repair. Another reason for conservation was to gain data on the occasion of the monographic publication of the incunabula of the Franciscan library of Csíksomlyó. The books were mouldy, dirty, defective and friable, the pages stuck together and the decoration of the hard, shrunken and defective leather bindings could hardly be seen. Penicillium spp. and Torulopsis spp. were cultivated from the mould samples. The pH value of the paper was 7.49 according to the average measured from

a number of pages. The leathers of the binding were calf skin and cowhide. The pH value of the leather samples was 5 and the results of the burning test indicated vegetal tanning. The books were divided into three groups: 1. defective books, where the leaves could be separated, 2. medium well preserved books that could be opened at several pages, 3. hardened incunabula where the leaves stuck together and the books could not be opened. The books were individually placed into plastic sacks and disinfected with paraformaldehyde purum fungicidal, while Basileum fungicide and insecticide was used on the wooden plates. Two methods were used to separate the leaves of the third group: 1. mechanical separation and 2. separation after moistening under a polyethylene foil. In the next stage of disinfection, 2% solution of Preventol CMK in ethyl-alcohol was injected into the books, and filter papers saturated with 10% solution of thymol in ethyl-alcohol were placed between the separated leaves. Wet cleaning was only applied on the incunabula the leaves of which had been separated. First the edges of the leaves were reinforced with 2% solution of Klucel M in ethyl-alcohol, and the coloured initials were fixed with the 5% solution of Regnal in ethyl-alcohol. Fatty alcohol sulphate was added to the cleaning water as a surface active matter. The paper became visibly cleaner yet the discolourations caused by the fungi could not be removed. Posterior gluing was made with 2% solution of Glutofix 600, and the leaves were reinforced with the partial or complete covering of the leaves with Japanese paper. The leather bindings were cleaned first mechanically then with lfatliquor. The hard leathers that had lost the structural water were softened: they were placed between two vetex foils, then a filter paper saturated with the 1:1 mixture of Glutofix 600 and licker, and, above it, a plastic foil were placed. A protective paste was applied on the leather bindings. Due to the mechanic weakness of the wooden plates, the deformations were not restored. The broken pieces were glued together with Planatol BB Superior. The solution of Selecton B2 was used for the cleaning of the metal mounts, then the Krefting method was applied. Each book was placed into storage box after restoration. The body of the book was packed into a filter paper and sometimes the body of the book, the leather binding, the wooden plate and the metal mounts were packed into a large, enduring envelope. As nearly every book body remained stuck together even after conservation, an uncustomary method was chosen for their study. First the topic of the books was determined, then the titles were compared first with the list of incunabula of Csíksomlyó made in the 19th–20th centuries, then the fragments, of which high quality copies were made, were compared with items of the same edition preserved in Transylvanian (Batthyaneum, Gyulafehérvár) or Hungarian libraries (OSzK, EK, MTAK, Ráday Collection, Budapest). Altogether 26 incunabula were identified in 23 volumes during the scrupulous identification process. One volume was an edition in Hungarian language from the 17th century, it contained Káldi's catholic Bible first edited in Vienna in 1626. The recently identified incunabula came from the most famous printing houses of the period: Augsburg, Basel, Bologna, Brescia, Hagenau, Nürnberg, Pavia, Strassburg, Venice.

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The elaboration of the collection preservation program of the National Archives of Hungary using the results of a statistical condition assessment

Historians regard the National Archives of Hungary as the "memory of the nation" since the overwhelming majority of the documents of 1000 years of the history of Hungary is preserved here. The institution preserves more than 70 thousands document metres of archival material – parchment documents, manuscript and printed maps, designs, paper documents, various photographic materials, audio tapes, microfilms, electronic data media, and original paper, metal and wooden storage boxes in three buildings. The Archives has been dealing with restoration/conservation activities since 1949. The preventive preservation work started in the 1970's. First it only meant the measurement of climatic conditions and the dusting of the depositories. Modern preservation can be dated from the 1980's. The changes were initiated by the Department of Collection Preservation, which had a staff of 21 persons at that time. They were, however, random activities and did not extend to all the parts of the collection. The archivist did not always agreed with the suggestions regarding the solution of the problems. A complex preservation control was entered into the plan of the department in 1993, which was based on a regular inspection of the circumstances in all the departments where collections were stored. The inspection revealed that the climatic, technical and hygienic conditions of the depositories and the majority of the storage media were not up to the standard. Problems were found concerning the use and studying of archival materials as well, and it turned out that the knowledge of the colleagues regarding the protection of the collection were also incomplete. The inspection did not inform about the condition of the collection, only on their storage circumstances and use, yet it was instructive. The archival material that had been stored in packages was repacked into card-boxes with acid-free lining. Hair hygrometers were placed in the depositories. The document lending regulations were modified, and the documents were no more

posted. In 1999, the Universal Procedure for Archive Assessment (UPAA) provided by the National Archives of Netherlands meant a break-through in the preservation work of the NAH. The assessment was carried out in all the three buildings between 2000 and 2003 and the results were pooled. The essence of the assessment is that the condition of about 300 samples representing the entire collection, which were chosen with statistical methods, is analysed, and the results are registered in a data sheet. After its analysis by a computer program the condition of the entire collection is assessed by the most frequent damage types. The four steps of the *sampling procedure* are the followings: characterisation of the given collection, measuring the length of the collection (in document metres), determination of the number of the sample and the route of sampling, choice of the samples and registering the references. Two data sheets are used in the *assessment of the condition of the samples*. One is for the general condition of the document, and in the other one, traces indicating acidity and the degree of the acidity of the paper are registered. The heading tells the general information, then the damage types (mechanical, chemical, biological etc) and their measure (medium, great) are registered as the pack of documents or the volume have been checked. The acidity and the lignin content of the paper are measured with pH and lignin pens. At the determination of the extent of deterioration, it must also be taken into account to what degree it influences studying and what chance there is for information loss. The computer program groups the documents into four categories according to their condition: No. 0. Very good condition, open to study, No. 1. slightly deteriorated, open to study although it may cause damages, No. 2. poorly preserved, studying can reduce its lifetime. No. 3. Very poorly preserved, information is certainly lost at studying. The method is only suitable for the assessment of archival documents and volumes. The results of the assessment surprised even the leaders of the institution. Thirty-nine percent of the examined material was grouped into category No. 3. because of mechanic deteriorations. Apart from the less acidic materials from before the 18th century, 65% of the documents proved to be acidic. Six percent of the documents were gravely acidic, brittle and not studiable, which had urgently to be copied. In consequence of the assessment, the technical condition of the depositories have been analysed, the climate is constantly controlled and registered. In certain depositories, the climate has been improved, and they have been furnished with shutters that reflect light and heat. Dusting of the documents, the walls and the floors have been started, and the shelves have been swept with disinfectant cleaner. The preservation program was prepared in 2004. Original material can only be borrowed for exhibition. A digitalisation program has been started, which affords the withdrawal of original documents from investigation. Heating has become controlled, and the climate of several depositories is controlled with dataloggers in the three buildings. Chemical air filters have been supplied in the climate system of the depositories where photos and acidic documents are kept. Preservation was added to the homepage of the Archives and the training of the staff in this respect has also started. In order to be able to follow the condition of the collection, the UPAA assessment has to be made in every 5–8 years.

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Folk furriers' works in the collections of museums in the Székelyföld

Furriers' trade is also called complex trade since the same master could do all the stages of work from the tanning of the raw material to the end product. Furriers gathered in guilds already in the 14th century. They worked for citizens and villagers just as well as for the poor and the wealthy. In Transylvania, 1850 furriers worked even in the 1840's. By the end of the century, their number drastically fell and only a few representatives remained by beginning of the 20th century. As an ancient trade, shepherds and farmers also prepared furry clothes for themselves and their families. Their expertise was different but they actually used the same tanning matters. The sheep was *skinned* right after slaughtering and the fell was immediately sprayed with salt or the mixture of salt and corn flour. It was left alone for a day, and then it was *dried* in a well aired space. At *taning*, the fell was turned with the fur outside and immersed in a vat full of tan pickle for five-six days. Tan pickle was the decoction of salt (sodium chloride), alum (potassium-aluminium sulphate), bran, barley or corn flour, groats, and grits mixed with sour milk and whey to advance leavening. Taning with whey is considered to be the oldest, while the use of groats is a later invention. Only the furriers used alum. Skin tanned in tan pickle with whey could not be *washed*, while the one tanned with groats and corn flour had to be washed until it became clean. The skin was *dried* in a shady place, then *stretched* in its length. *Bleaching* was made on a bleaching wood with a bleaching knife, while lime powder was strewn on it to temper the skin. If any meaty spot remained, the skin was *skived*. Skins meant to be coloured were also bleached and skived. The names of the working phases and the clothes were different in the various regions, yet the steps were the same – taking the measurements, cutting, assembling, sewing, embroidering, fur-trimming, preparing pockets and sewing them on the clothes and the preparation of buttons and button-holes. *Cutting* was usually made after a hard paper pattern. The *stitches* were sometimes covered with embroidered leather bands. The bottom and the arm and necklines were trimmed with leather bands of the same skin or coloured leather. *Dyeing*: reddish lilac colour was prepared from cochineal, while

brown was gained from the concoction of dried oak-gall. Walnut stain and aniline dyestuffs were also used in the 19th – 20th centuries. White onlay on a white skin is considered the oldest type of *decoration* on folk leather clothes. This onlay of a continuous tendril ornament was preserved the longest in Transylvania, where it was prepared even in the 1930s. The flower-shaped ornament made with the threading of 2–3 mm thick leather strips was another popular ornamental motive. Later more and more colourful flower embroidery became dominant beside the tassel, trappings and sequin ornaments. Embroideries were made with silk thread, which was often replaced by wool and cotton thread in the 19th–20th centuries. Where did these folk clothes disappear? We could suppose that a rich collection can be found in the museums of Székelyföld. In reality, however, not a single item can be found in the Tarisznyás Márton Museum in Gyergyószentmiklós, four pieces are kept in the Haáz Rezső Museum in Székelyudvarhely, eleven ones are preserved in the Molnár István Museum in Székelykeresztúr, and about 30 items can be found in the Csíki Székely Museum in Csíkszereda. It would be important to secure the privately owned objects in museums before purchasers seize them who take advantage of the old owners. The museums, however, must provide a suitable storage since furry skin collections are the most harmful units of collections. Fur, especially if it is fatty and dirty, is an attractive food for insects. The larvae chew holes in the fur. They chew the hairs of fur close to the skin, so when the object is moved the hairs fall out in bunches. They eat wool embroidery threads as well. Mechanical injuries (unstitching, tearing, holes) and dirt (dust, fatty depositions, food stains, bled dyes) can originate from use or improper storage. The strong acids used in the manufacture of the 20th century can cause hydrolytic decomposition. In effect of durational moisture, the tanning matter can be dissolved and the skin becomes hard and rigid, it can change colour, micro-organisms can proliferate, which weaken and stain the skins. With the world-wide known methods of preventive conservation – the assessment of the collections, proper storage, ensuring a pest free environment etc. –, the deterioration of clothes made of fur can be reduced to the minimum. The author and her colleagues elaborated a data sheet, on which the condition of the objects kept in collections in Transylvania, the Gyimes and Moldva Csángó territories can be assessed, the technology can be described and a procedure of the interventions can be determined in order to rescue these objects. The study describes certain disinfectant procedures, it lays emphasis on delicate dusting, deals with cleaning with wet solvent packing and on the basis of minimal intervention suggests that the completion and reconstruction of the embroidery should be made on a photo of the object instead of the original object.

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Geometrical subdivision, exaggerated optical effects, restrained colouring. General restoration problems of art deco glass windows. Restoration of the glass windows of the Liszt Ferenc Music Academy in Budapest

The Music Academy of Budapest built after Flóris Korb and Kálmán Girgl's designs between 1903 and 1907 is the symbol of music life in Hungary, an educational and concert centre. The ornaments of the building were made with the co-operation of Hungarian artists' and industrial artists groups. Miksa Róth was commissioned to prepare the decorative glasses and the glass mosaics. Both the designs and the execution were made in the Róth workshop. The turn of the 19th–20th centuries brought a new trend in the use of materials and colours. The surface painting of glass ceased partly or entirely, and the stress was shifted onto optical effects and the graphic pattern outlined by the lead grids. Most of the windows and door panels of the Music Academy are leaded, and only a few were prepared with acid etching technology. The applied reticular composition system, which totally contradicts the leading technique, makes the window panels extremely exposed to injuries. Leaded windows can be seen in the most representative parts of the Music Academy: in the vestibule and the corridors along the large hall on the ground floor, in the upstairs vestibule, in the staircases and on the walls of the Large and the Small Halls. The glass restoration campaign in 2001–2002 did not extend to the windows of the lecture rooms and a few of the windows of the staircases. The glass windows and the wooden doors and windows were repeatedly repaired with handicraft methods. The glass completion of different shades and textures, the new lead grids that have changed the graphic design of the composition, the surface deformations and overpainting coming from the careless painting of the door sills were the aesthetically most disturbing elements beside the broken and missing glass fragments. The windows and doors, which were designed with a weak structure to offer a more favourable visual effect, sagged and deformed under the too heavy lead grids, and the wings could often not be closed and fixed. The warping of the frames, the corrosion of the lead grids, the aging of the sealant led to the deformation of the leaded glass panels. First the warped, defective and damaged wooden frames and cases were repaired with joinery work. The glass windows were restored in a temporary restoration workshop set up in the building. The exchange of the former glass completions of uncountable shades and patterns started with the cutting of the lead grids with an electric hand tool and the removal of the glass replacements. Austrian sheet glass was used to replace the light green and light yellow glasses. It was more difficult to obtain colourless glasses. The so-called garden glass no. 28 once produced in the Sajószentpéter glass factory was the suitable one. Its shade and pattern agreed with the original. Its thickness was different by half a millimetre, which was advantageous

because of the long, elongated shapes. The original colour composition of the decorative row in the adjoining doors of the corridors along the Large Hall, which was composed of antique lyre motives built on brown, pink and green colours in a triple segmentation, was changed when they were repaired. In the course of the restoration, the original sequence was reconstructed after the preserved cardboard drawing. The original lead grids were rebuilt into the doors and windows where it was possible. The new grids got a medium grey patina (20% watery solution of hydrochloric acid with the addition of 5% copper sulphate). The glass elements, which were cut along patterns and polished along the edges, were fixed with a thin liquid mass of linseed oil, sifted mineral chalk, siccative and black pigment dust on both sides because of the poor static condition of the glass panels. Then the lead grids were bent back and the cut soldered points were re-soldered. The conchoid plastic glass ornaments made of crystal glass cannot be bought in shops and they could not be reproduced in industrial glass production. The completions of the plastic ornament were made of two components: a round base made of glass sheet and a two-component transparent epoxy-resin (Araldit 2020) built on it. An original glass inlay was the pattern for the mould. The new elements show the same optical effect as the original ones. The removal of the dirt that got stuck in the depressions of both surfaces of glasses of light shades having a more-or-less textured structure was carried out mechanically and with the 5% solution of fatty alcohol sulphate in water, which was then washed off with clear water. Abbeizer and Szuperkromofág were used to remove the flowing of paint, and dry mineral chalk was used for the cleaning of the surfaces of the lead grids. The aesthetic and hidden symbolic contents (spring as the source of music, lyre motive as the ancient symbol of music etc.) of the restored glass windows once again contribute to the spiritual and material unity that was originally realized in the building of the Liszt Ferenc Music Academy according to the original intentions of the creators.

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