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STUDY DAYS ON VENETIAN GLASS

Venetian *Filigrana* Glass
through the Centuries

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ISTITUTO VENETO DI SCIENZE, LETTERE ED ARTI

STUDY DAYS ON VENETIAN GLASS

VENETIAN FILIGRANA GLASS THROUGH THE CENTURIES

edited by
ROSA BAROVIER MENTASTI and CRISTINA TONINI

VENEZIA
2018

Si raccolgono qui alcuni dei contributi presentati dall'11 al 13 settembre 2017
al Corso di alta formazione organizzato dall'Istituto Veneto sul tema:
Higher Education Course. Study Days on Venetian Glass.
Venetian Filigrana *Glass through the Centuries*

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INDICE DEL FASCICOLO PRIMO

Marco Verità, Sandro Zecchin and Elena Tesser

VENETIAN FILIGREE GLASS ALONG THE CENTURIES: SOME TECHNOLOGICAL CONSIDERATIONS

1. *Technological aspects of filigree glass*

Filigrana (filigree glass) is the generic name for a sophisticated decorative technique, which makes use of thin, white, or sometimes coloured, opaque glass threads twisted in different ways, encased in transparent (colourless or coloured) glass and incorporated into blown objects. Depending on the worked style, filigree is furtherly classified in: *a fili* (threads), *a retortoli* (twisted threads) *a reticello* (crisscross pattern).

The technological issues involved in the production of filigree glass require the preliminary drawing of thin rods made of an opaque white core and a transparent cladding. Rod pieces are then combined according to the desired result, fused together and hot-worked. In order to ensure physical compatibility between transparent and opaque glass fused together in a single blank and its stability over time, filigree production requires empirical knowledge and considerable skill[1]. Today, practical tests for compatibility of transparent and opaque glass are adopted for the intended type of forming (combining processes of fusing and blowing)[2].

The compatibility or «fit» of two glasses fused together is a function of their thermal expansion properties (expansion coefficient) and of their viscosity curves. This is because, by nature, most materials expand upon heating and contract upon cooling[3]. When the fit is not achieved,

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[1] Bray 2001.

[2] Scott 1991; Schwörer 2013.

[3] Schwörer 2013.

the different volume contraction occurred during cooling will lead the glass with the lower exp. coefficient to be in traction and the one with a larger expansion coefficient, to be in compression. These stresses lead to a fragile artefact and to the possibility of spontaneous fracture at any time.

The technical difficulties in the production of filigree glass canes (the softening temperature and the thermal expansion of the opaque and the transparent glass must be the same to avoid fractures during cooling) had already been mentioned by the Muranese glassmaker Domenico Bussolin in the report he presented in 1842 for the competition: «Concorso per Oggetti d'Industria» of the Istituto Veneto di Scienze, Lettere ed Arti, Venice[4].

The viscosity of a glass is equally important because it determines the possibility to shape the filigree without imperfections. In particular, thermal expansion affects compatibility predominantly in the lower temperature range (T < 500 °C), whereas the viscosity properties act predominantly at higher temperatures. The chemical composition of the glass strongly influences the expansion coefficient and viscosity[5]. Glasses having different viscosities can be compatible, if their expansions are so different as to compensate the strain introduced by the gap in viscosity. For instance, if the viscosity differences result in tension between the two glasses and the expansion differences result in an equal amount of compression between the two glasses, the two stresses cancel each other out[6].

Also other properties are fundamental in order to obtain a high quality filigree glass. In particular, a opaque white glass, very intense (*fisso* in the slang of Muranese glassmakers) and suitable to be drawn in thin threads without losing opacity and white colour (*svuotarsi)* is required. Opacity and white colour depend on the presence of opacifying micro-crystals. Some features of the opacifier have to be taken into consideration. In particular, the refractive index of the opacifier crystals must differ markedly from that of the glass, the crystals should be very small (of the order of micrometres) and roughly similar in size each

[4] Sarpellon 1990.
[5] Verità 2006.
[6] Schwörer 2013.

other; they should be stable during glassworking (refractory to high temperatures and with a low solubility in the glass melt), with a high concentration avoiding crystals agglomeration.

2. *Ancient filigree glass*

Early filigree objects date back to as far as the Roman period. These objects were initially obtained by arranging side-by-side short canes of clear, white and coloured glass, then fused together with the *murrina* technique forming a glass disk, which was finally slumped over a mould. Antimony was the opacifier traditionally employed in the Roman world[7] and it was replaced from the late Antiquity – early Middle Ages by tin opacified glass. In a study of glass finds of Northern Italy[8], goblets with thin, irregular, opaque, white trails and two fragments of filigree rods dating to the 5th-7th century were analysed. The results show that the fragments of filigree rods were probably intermediate products ready to be applied as decorative filigree to blown artefacts. The chemical analyses demonstrate the use of recycled Roman natron glass, opacified with calcium antimonate. Two finds reveal the use of tin oxide crystals (SnO_2, cassiterite) as an opacifier, with no addition of lead. As demonstrated by the analyses of two filigree goblets dated end 8th-10th century, it became later a common practice to add tin oxide as calcined lead and tin, probably because it ensured a homogeneous dispersion of the crystals and the consequent more intense opacity of the glass. These samples are the oldest Italian examples of the use of lead-tin calx, which completely displaced calcium antimonate only towards the 13th century, becoming the primary opacifier in Medieval and Renaissance Venetian technology.

The first official document related to *filigrana* manufacture in Venice is dated October 1527 (a petition to the Council of Ten). In this document Filippo and Bernardo Serena, glassmakers from Murano stated they had invented the entirely new glassworking technique «*a fascette con retortoli a fili*» (bands with twisted threads) and requested a

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[7] Turner *et al.* 1959; Mass *et al.* 1998.

[8] Uboldi *et al.* 2003.

patent for twenty-five years[9]. Luigi Zecchin named this document the «birth certificate» of the filigree technique.

The Venetian filigree glass of the 16th century was characterized by the use of the traditional Venetian transparent glass (*vitrum blanchum* or *cristallo*) and *lattimo* (milk-like) glass, a Venetian term appeared for the first time in 1420 to indicate opaque white glass[10].

Vitrum blanchum was the name attributed in Venice to the transparent glass made by melting a mixture of soda plant ash and silica mixed in nearly equal amounts; this glass was well decolorised but with a gray hue. Around the middle of the 15th century, a new perfectly decolorized transparent glass was invented in Venice, the *cristallo*. It was made by replacing part of the soda ash with a purified one, with a much less gray hue as compared to *vitrum blanchum*[11].

Until the middle of the 15th century, *lattimo* was produced in Venice only for small applications on blown glass, for the preparation of mosaic tesserae and enamels. With the arrival of the first porcelains from China, the Venetian glassmakers improved their *lattimo* for producing luxury blown glassware to be gilded and enameled (1457), in order to imitate the very expensive porcelain items (for this reason *lattimo* was initially called *porcellano*).

According to the recipe books of Venetian glassmakers and the few analyses available, the 16th century *lattimo* was made by adding a lead-tin calx to *cristallo* or *vitrum blanchum* glass. For instance, the *Trattatelli* (recipes 24 in the first book and 9 in the second one) describe the formation of the opacifier as a superficial white calx by the calcination of comparable amounts of metallic lead and tin[12]. On the other hand, recipe 35 in Darduin's book[13] prescribes to melt a batch made of 12 parts of crystal frit, and 22 parts of lead and tin calx, adding also a small amount of manganese. Once the batch is molten, the lead oxide dissolves and crystals of tin oxide separate (cassiterite). Several other Darduin's recipes report the production of *lattimo* by using lead and tin calx, whereas recipes 144 and 145 describe how to prepare opaque white glass by

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[9] Zecchin 1989: 181-186.
[10] Zecchin 1989: 346-349.
[11] Verità 2013.
[12] Zecchin 1990.
[13] Zecchin 1986.

adding antimony to the batch of *vitrum blanchum* glass, «a rediscovered secret, true and tried». In this way, the formation of calcium antimonate crystals occur thanks to the reaction between antimony and the CaO of the plant ash[14]. It is not clear how the use of antimony reappeared in the glassmaking technology after almost thousand years (antimony was the opacifier in use in the Roman glassmaking technology), and the provenance and kind of the antimony mineral used in Venice are also not yet clarified.

Several *Anonimo* recipes (17, 18, 26, 38, 39, 43, 45) describe the use of bone ash as an opacifier to form Ca-phosphate crystals[15]. However, it is quite improbable that bone ash was used for making filigree due to the weak opacity of the white glass obtained. From 1693 (Darduin, recipe 214) a new white glass opacified by lead arsenate is reported in the recipes of *lattimo* glass. By varying the arsenic concentration this opacifier was used to make an opalescent glass (*girasole*) or a very intense opaque white glass (*smalto*)[16]. Since the beginning of the 18th century, the new *smalto* made of homogeneously dispersed micrometric crystals was preferred to the previous opacifiers by Venetian glassmakers, thanks to its better properties and lower cost. Moreover, it allowed to draw much thin white canes and to obtain a much dense white glass as compared to the results achieved so far with the lead-tin calx and antimony.

3. *16th century Venetian filigree: preliminary investigation*

During the 16th century, white filigree was mainly made in Venice, even if rare examples of coloured filigree were uncovered in the archaeological excavation of S. Chiara monastery in Padua and in the Venice Lagoon[17]. A dozen of fragments of 16th century white and coloured blown filigree found in the Venetian Lagoon were studied under the optical microscope in order to improve the knowledge of the manufacture technique involved (Fig. 1).

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[14] Verità *et al.* 2008.

[15] Moretti *et al.* 2001.

[16] Zecchin 1989: 337-341.

[17] Barovier Mentasti *et al.* 2016.

The fragments were observed on the surface and on the fracture surfaces where the cross sections of the threads were visible. The artefacts are made of rods of different thickness and various structures. By observing the cross sections, it was possible to see that the thinnest threads consist of a core of opaque white glass surrounded by transparent glass, whereas the thickest canes are made of a core of transparent glass covered by a thin layer of opaque white glass which is surrounded by a layer of transparent glass. Coloured filigree rods appear to be made of a core of colourless transparent glass surrounded by a layer of opaque white glass and of a transparent coloured overlay. No chemical analysis of the layers are available to clarify the reasons of the use of two types of cane.

These results are comparable with those obtained from a case study, a 16th century filigree bowl made with white and blue glass canes (Fig. 2) excavated in Lugo di Romagna (Ravenna, Italy)[18]. The sections of the canes are elliptical (flattening), separated by thin transparent colourless layers. The white canes are made of a core of transparent colourless glass surrounded by a thin layer of opaque white glass, and by a second transparent colourless external layer. In the same way, the blue canes are made of three layers: the core of colourless transparent glass surrounded by a thin opaque white layer and by a transparent blue external layer. The canes adhere to an external surface made of a colourless transparent glass, which forms the internal part of the bowl.

A small fragment of the Lugo bowl was sampled, embedded in acrylic resin and polished in cross section with diamond paste down to 1 μm. The sample was carbon coated and the quantitative chemical analysis was carried out by energy-dispersive X-ray microanalysis (Edax) in a scanning electron microscope Philips XL30. The electron beam was scanned during measurement to avoid alkali drift. A set of reference glasses (Corning B, C and D) was analysed under the same experimental conditions as for the samples. During analysis SEM operated at 20 kV, a beam intensity of 1.5 nA and counting live-time of 200 s. A thorough discussion of the precision, accuracy and detection limits of SEM-EDS applied to the study of ancient glass can be found in[19].

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[18] Guarnieri 2007.

[19] Verità *et al.* 1994.

By observing the cane sections under the SEM in backscattered electrons (Fig. 3) the opaque white layer can be clearly distinguished. When observed at higher magnifications (3b), the white glass appears to be made of a glass phase (lead-rich glass) in which crystals of tin oxide (cassiterite) of quite irregular size (1 to 10 μm) and shape are dispersed.

The quantitative chemical compositions of the glass phases are reported in Table 1. The results demonstrate the substantially similar composition (within the standard deviation of the analytical method) of the transparent glass of the goblet and of the core of the white and blue canes, demonstrating that both the canes and the goblet were made in the same glassworks. This composition (relatively high calcium and magnesium) corresponds to the Venetian *vitrum blanchum* type. Some differences are observed in the composition of the blue glass cane: the colourless core shows a slightly lower calcium and larger sodium content, while the blue transparent glass contains also significant amounts of lead and tin. The migration of these elements from the white layer is excluded (the measures were kept far from the boundary with the white layer) and probably indicate the addition of a unselected cullet during melting. The blue colour was obtained by addition to a colourless glass of a cobalt ore containing also nickel and iron (arsenic and bismuth not detected). This type of cobalt ore was generally in use in Venice until 1520-1530[20]; suggesting for the goblet a manufacture before this date.

The white glass was obtained by adding to the *vitrum blanchum*, a lead and tin calx prepared with a lead to tin ratio of about 1/1. In this case, the differences between the two white compositions can be attributed to an increased analytical indetermination due to the heterogeneity of these layers.

4. *Conclusions*

The invention of filigree glass in the first half of the 16th century was the result of the skill of the Muranese glassmakers and of their

[20] Verità *et al.* 2015.

empirical knowledge continuously improved over the centuries in the Venetian glass furnaces. The present work is just a first scientific approach, but it is sufficient to document the astonishing skill of the Muranese glassmakers to face technological difficulties. They improved their technique in order to control viscosity and the expansion coefficient of the transparent and opaque white glasses fused together in the filigree works, to make them compatible and to avoid spontaneous glass breaking. Moreover, they achieved a dense and homogeneous opaque white glass suitable to be drawn in thin threads without losing colour. As is attested in the recipe books of the Venetian glassmakers, the raw materials were improved and since the end of the 17th century the *smalto* opacified with lead arseniate crystals replaced the traditional *lattimo* made with lead-tin calx. The scientific investigation of filigree items made in the 16th century and in later centuries deserves further research to fully understand this evolution.

5. *Acknowledgements*

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Tab. 1 - Quantitative chemical composition in wt% of the oxides of the glass layers forming the Lugo goblet. Traces of Cu close to the limit of detection of the analytical method (CuO 0.1%) were also detected in the blue glass. As, Bi, Ba, Zn: searched for and not found.

			SiO_2	**Al_2O_3**	**Na_2O**	**K_2O**	**CaO**	**MgO**	**Cl**	**PbO**	**SnO_2**	**MnO**	**Fe_2O_3**	**CoO**	**NiO**
Glass of the goblet	colorless	tr	67.3	1.10	14.7	2.14	10.0	3.2	0.80			0.30	0.44		
White cane, core	colorless	tr	67.8	1.15	14.8	2.10	9.5	3.2	0.75			0.25	0.45		
Blue cane, core	colorless	tr	67.7	1.15	15.7	2.13	8.5	3.1	0.90			0.40	0.45		
Blue cane, external	blue	tr	65.5	1.32	13.2	2.02	7.4	2.9	0.59	3.00	1.60	0.45	1.54	0.29	0.16
White cane intermediate	white	op	37.1	0.88	10.0	0.90	3.8	1.6	0.89	23.3	21.1	0.12	0.34		
Blue cane, intermediate	white	op	41.0	0.91	11.0	0.92	4.8	1.7	0.75	17.0	21.5	0.09	0.38		

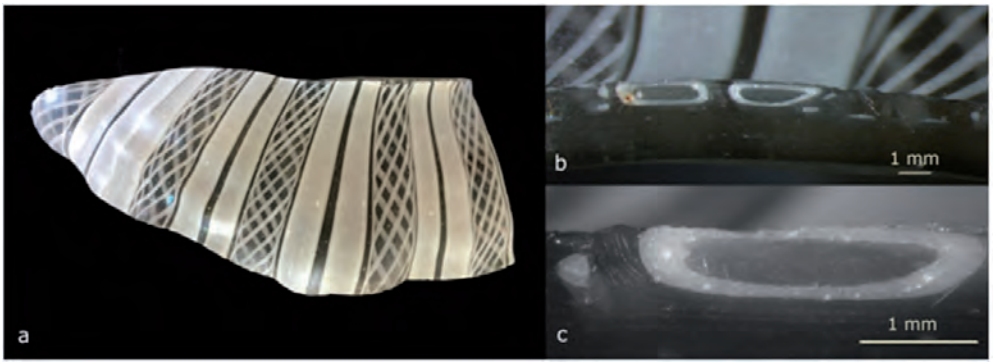

Fig. 1 - (a) White blown filigree fragment (about 90 by 30 mm) from the Venice lagoon. (b – c) Details of the cross sections of the threads studied under the optical microscope. In figure (c), a thick cane (center) and a thin one (left) are visible.

Fig. 2 - Filigree bowl of 16th century from Lugo with white and blue glass canes. Height 68 mm, base diameter 60 mm; top rim diameter 80 mm. Faenza, Palazzo Mazzolani.

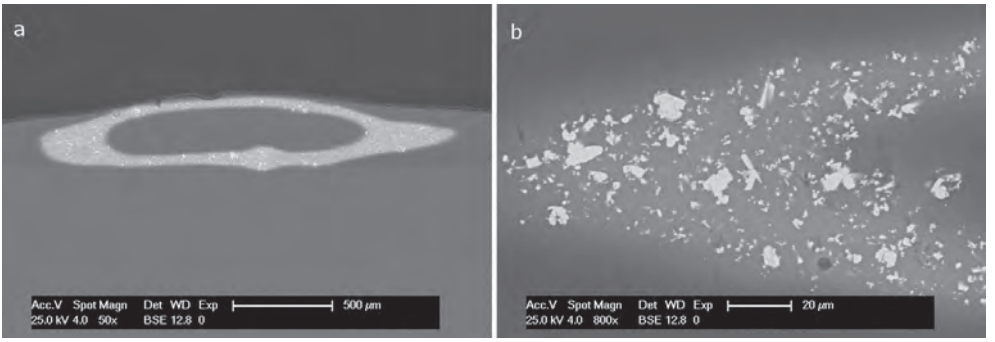

Fig. 3 - *Filigree bowl from Lugo* SEM micrographs in backscattered mode of the polished cross-section of a white cane (a). On the right (b), a detail at higher magnifications showing white particles (SnO_2 crystals) of irregular shape and size dispersed in a heavy lead-rich glass matrix.

Rosa Barovier Mentasti and Cristina Tonini

VENETIAN SIXTEENTH CENTURY FILIGRANA

1. *The Muranese Serena Family*

Filippo and Bernardo Catani, whose family name later became Serena from the sign of their glassworks Sirena (mermaid), can be considered the inventors of Venetian glass filigree technique, even if this statement has to be partially corrected and integrated.

The Catanis were not an original family of Murano. In 1483, indeed, they had immigrated to Murano from Bergamo, a Lombard city, which belonged to the Venetian republic from 1428 to 1796. They had been working as enamel painters on glass vessels for thirty four years, succeeding in melting various enamels and recovering lost colours of glass mosaics. In 1517, Filippo obtained a ten years patent for a new glass product and, more important, the permission to start a glassworks for the production of blown vessels and other items, even if he wasn't of Muranese origin.

The new product was a fire polished tile of very hard glass (*lustrato al foco et fatto di vedro durissimo tanto quanto fosse marmoro*). This tile showed a pattern or figure, which looked like a bas-relief work on its underside but its surface was flat (*monstra ogni figura sotto de relievo et è in piano*). Filippo explained that the glass tiles he had produced could be used not only to pave the floors of halls and rooms, but also to cover the tops of writing desks, fireplace hoods and other things (*de questo tale lavoro si po' fare non solum pavimenti de sale et camere, ma etiam cancelli da scriver, nape et altre cose*)[1].

[1] Levi 1895: 36, 48-50; Zecchin 1987: 210-211.

Few similar tiles survive in museum collections. Three tiles are decorated with the profile bust of the doge Andrea Gritti with the initials A G (reign 1523-1539), two kept in the Museo del Vetro at Murano (inv. classe VI no. 3; Inv. classe VI no. 1421)[2] (Fig. 1), one in the British Museum (inv. no. 1902,0626. 1)[3]. They were made by casting glass in a low metal mould with a raised border and a central low relief of the doge's bust. The result of this process is a glass plaque or tile with a flat upper side and an underside with a hollow bust, which, thanks to optical illusion, looks like a bas-relief. These pieces perfectly correspond to a bronze plaque, dated 1523 or shortly after, as to the square shape, the bust and the initials. An example of this bronze plaque is housed in the Victoria & Albert Museum (inv. no. 499-1864) and attributed to the Venetian medallist and goldsmith Vettor Gambello (1450/55 -1537), called Camelio[4]. The Gritti glass plaques were probably produced by Filippo Catani and his brother. As far as we know, they are the oldest still surviving Renaissance pieces, made by this technique, but the idea of such glass process was not completely new because already in the middle of the 15th century some artists aimed to obtain similar glass plaques using bronze bas-reliefs as moulds.

In fact Donatello made a bronze bas-relief roundel, which depicted the Virgin and Child with four Angels in 1450 ca. and he gave it as a gift to his doctor, the Florentine Giovanni Chellini, in return for his medical services in 1456. Chellini himself recorded that the roundel was hollowed out on the outer side so that it could be used as a mould on to which melted glass could be cast, to obtain an identical glass roundel «*dal lato in fuori cavato per potervi gittare suso*

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[2] Lazari 1859: 97, n. 338; Zanetti 1881: 25. While one piece in the Murano museum was acquired by the same museum in 1865, the other, already in the Correr Museum in 1859, was transferred there from the Correr Museum in the xx century. Mariacher 1963: 106, f. B. *L'avventura del vetro* 2010: 322, 504, n. II 27.

[3] Klinka-Ballestreros and Gorget 2010: 150, no. 115.

[4] Mariacher 1963: 106, ff. B-C. Vincenzo Lazari strangely wrote in 1859 that the glass plaque then kept in the Correr Museum was a mould for jelly or quince-paste and, moreover, that a bronze medallion with the Andrea Gritti (without initials) in the same Correr originated from the glass plaque, not the contrary. See footnote 2.

vetro strutto e farebbe quelle medesime figure dette dall'altro lato»[5]. This Donatello bronze *tondo* is housed in the Victoria & Albert Museum since 1976 (inv. no. A.1-1976). No Renaissance glass roundel, cast in the Donatello bronze, is known but in 1977 the Glass Department of the Royal College, London, and the Venini glassworks, Murano, managed to make a cast glass reproduction of the Chellini Madonna (V&A Museum, inv. no. REPRO.A.1976-1)[6]. Donatello lived in Padua, not far from Venice, for ten years (1443-53) and perhaps he could get in touch with some Muranese glass technicians.

Another Italian artist of the early Renaissance, Antonio Averlino, called Filarete, was interested in making carved glass tiles and he certainly was in touch with Venetian blowers. Moreover he met Angelo Barovier, the most famous Muranese glass master and technician at the time, at the Sforza court in 1455. In his *Trattato di architettura*, a treatise about architecture, handwritten in Italian in the years 1458-1465, Averlino quotes glass tiles, which were flat on the upper side and decorated with figures, animals and other subjects, inside carved (*vetri che vi parranno begli, i quali saranno piani, e dentro vi si vedrà scolpite figure, e animali, e varie cose*) . Filarete proposes himself as the designer and the maker of such tiles, fit for the lord's palace of Sforzinda, his ideal city[7]. He was an artist at the Sforza court from 1451 to 1465. Probably on the base of the connection between Filarete and Francesco Sforza, lord of Milan, Luigi Zecchin, main historian of Venetian glass, thought that the vaulted ceiling of a room, called the mirrors room (*camera dalli spechi*), in one of the large towers of the Sforza castle in Pavia was covered with similar carved and gilt glass tiles. This peculiar ceiling, restored in 1490 and destroyed by the troops of the French lieutenant general Odet de Foix in 1527, was mentioned by old authors but the description can be interpreted in different ways. Stefano Breventano, who saw it before its destruction, wrote that the vault was «covered with squared glass tiles of different colors […] and each of them, inside decorated, with human and animal figures or plants or flowers, gilt, such that they reflected sun

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[5] Pope-Hennessy 1986: 105-118; Syson-Thornton 2001: 195-196. f. 158.

[6] Bennet and Wilkins 1984: 123.

[7] Filarete [1458-1465]: 257-258; Zecchin 1889: 273; Zecchin 1990: 210.

rays» (*vetri quadrati largi quanto farebbe la palma della mano tutti variati di colore* [...] *et ciascuno di detti quadretti di vetro haveva figurato dentro la somiglianza d'huomo o di qualche animale, o d'una pianta, o fiore, fatta d'oro* [...] *i quali nel percuotimento che vi facevano i raggi del sole nell'uscire dell'oriente rendevano una tanta chiarezza et splendore che abbagliava la vista*). A *terminus ante quem* for such decoration is 1464, when some Florentine ambassadors could admire it. Other authors believe that the Pavia glass tiles were decorated with scratched gold leaf [8].

In 1473 similar glass tiles are mentioned when Marco Barovier, a Muranese blower, one of Angelo Barovier's brothers, asked the permission of running a glassworks in Mantua to Federico Gonzaga, who was to become marquis in 1478. Marco was able – he told – to make blown vessels of every kind and floor tiles, with coats-of-arms and gilt (*quadri da salicare cum arme e dorati*) [9]. We don't know if he really worked for the Gonzagas. Some authors wrongly explained his tiles as maiolica artefacts [10]. As far as we know, the earlier Venetian pieces of this kind, still surviving, are the ones with the portrait of Andrea Gritti. This production was recovered in Murano in the 19th century. At the Milan exhibition of 1881 both the Salviati glassworks and the Venice and Murano Glass and Mosaic Company showed pieces made with this technique, imitating the Renaissance tiles made in the Serena glassworks [11].

Filippo Serena managed to start his glassworks and became a successful entrepreneur. In 1521 Isabella d'Este, widow of Francesco II Gonzaga, was one of his excellent clients. She ordered twelve small bowls of white glass, some drinking glasses and small bottles, the latter «chiseled». They probably were decorated with scratched gold leaf [12].

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[8] Breventano 1570: 7-8; Bibliofilo 1875: 147-148; Bibliofilo 1879: XIII; Toesca 1908: 258-259; Pettenati 1978: XXXI; Zecchin: 1989: 182.

[9] Zecchin 1987: 210; Zecchin 1989: 209, 232.

[10] Palvarini Gobio Casali 1981: 44, 173; Wolters 2007: 230.

[11] Zecchin 2015: 309-315.

[12] In the year 1521, May 20 Isabella d'Este wrote to Giovanni Battista Malatesta, her agent in Venice: «*Gli nostri credenzieri lassarno la mesura de certi scodellini di vetro di smalto bianco a Murano all'insegna della Serena […] Haveremo piacere che tu ne facci fare una donzena […]. Et te recordamo che ne facci fare quelli vasi da bere […] et di quelle*

In May 1525 Marin Sanudo, eminent Venetian chronicler, mentioned Filippo Serena among the best Muranese glassblowers, whose pieces were exhibited at the Ascension Day fair (*fiera della Sensa*). He admired three glassblowers' shops, the ones of Anzoleto Barovier, Filippo Serena, and Francesco Ballarin, with wonderful works; among other things, a galley and a wonderful ship, besides vessels and beautiful glass products[13].

In 1527 Bernardo or Bernardino, Filippo's brother, was his partner in the glassworks with the sign of the mermaid. Together they petitioned the Council of Ten for a twenty five lasting patent for «a certain technique and new invention concerning our craft, which technique will be called bands with twisted threads, never applied before, and found with much difficulty and research» (*certo modo et nova invention di lavorar del mestier nostro, il qual modo si domanderà a facete con retortoli a fil, non più mai fatto, et con gran difficultà et studio trovato*). They requested also that «no person of any level and condition could work or make others work with the technique they had found, in any place of the Venetian state […] and mainly in Venice and Murano [...] with the exception of magnificent Messire Francesco Zen, son of illustrious Messire Piero, who hasn't to be included in this request [of prohibition], being cause and inventor of such work» (C*he niuna persona sia di qualunque grado et condition si voglia, non possi lavorar né far lavorar al modo sopraditto per noi trovato in alcun loco del dominio* [...] *et precipue in Venetia et in Muran exceptuando il mg.co ms. Francesco Zen del clr. ms. Piero, il qual essendo stato causa et inventor de simel opera non se intenda esser sottoposto alla supraditta richiesta*). They obtained a ten years lasting patent. This document, which Cesare Augusto Levi first published in 1895, was fully interpreted by Luigi Zecchin who considered it as the birth certificate of Venetian glass filigree. The *facete con retortoli a fil* were the flattened twisted rods of *retortoli* filigree vessels[14].

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bocaline di vetro cisellate ovvero con quelle tre borchie per cadauna costa»; Brown 1982: 218; Zecchin 1987: 211.

[13] «*3 botege di veri, videlicet Anzoleto, quel de la Serena, et Francesco Balarin con lavori bellissimi, inter coetera vidi una galia e una nave granda bellissima, senza altri vaxi e cose di vero meraviglioseo*»; Sanuto 1893, XXXVIII: col. 346.

[14] Levi 1895: 31-38; Zecchin 1987: 212-213; Zecchin 1989: 182.

2. *Messer Francesco Zen*

Who was *magnifico messer* (*mg.co ms.*) Francesco Zen, *causa et inventor* of filigree? Levi and Zecchin didn't seem to be interested in him. Later scholars considered Zen as a glassmaker[15], even if Astone Gasparetto had mentioned him as a patrician and a patron of the Serenas[16]. Francesco Zen was a patrician (the title *magnifico messer* was exclusive right of patricians in Venice), but actually his role was more active than sheer patronage, because he probably inspired the Serenas and he was involved in the research of their new technique.

Francesco Zen (1482-1538) belonged to a wealthy and powerful noble family, who boasted a heritage of exceptional diplomatic skills and peculiar relationships with the Islamic world. Caterino Zen, Francesco's grandfather, famous diplomat and traveller, was Venetian envoy in Persia. Piero Zen (1457-1539), Francesco's father, followed in his father's footsteps and travelled throughout the Levant both for family business and diplomatic posts. He was so tireless a servant of the Venetian state that, in 1539, he, eighty two years old, suddenly died in Sarajevo (Bosnia) on the way to Constantinople, where he had to negotiate peace, being the official envoy of the republic. Piero had already been in Constantinople several times[17]. In the years 1523-1524 he travelled with his sons Francesco and Carlo by sea to Contantinople, where he was to be ambassador and *vicebailo*. On the way they stopped at the Cerigo island, the ancient Cythera, where they saw the ruins of the so called Menelaus' palace, then the sites of Mycenae and Argos and the site which was thought to be ancient Troy. In Constantinople the Zens were, exceptionally, allowed to visit Hagia Sophia church, become a mosque, the ancient underground cisterns and the hippodrome[18]. Their attention to antiquities was consistent with the interest of cultured Venetians in the works of art of ancient Greece, which plentifully arrived at the city, a «little island of Greekness»[19].

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[15] Hetteš 1960: 23; Page 2004: 18, 339; Higgott 2011: 34, note 34.
[16] Gasparetto 1958: 81.
[17] Pedani 2002: 22-25.
[18] Fuin 1881: 104-105; Sanudo 1881: 106-123.
[19] Favaretto 2002: 27-52.

Francesco Zen, an open-minded and curious man thanks to his family heritage and his education, was intrigued by art in all its forms. In 1503 he was one of the founding members of the *Fausti* (lit. lucky men), one of the several Venetian Compagnie della Calza, clubs which promoted drama, both antique and contemporary[20]. Furthermore he and his family were fond of music. They had got a precious pipe organ, which is now housed in the Correr museum[21].

Francesco Zen was also a member of a cultural circle of amateur architects (*architetti dilettanti*). He and other Venetian noblemen were mentioned as experts of architecture by the professional architect Sebastiano Serlio, who came from Bologna and then lived in Venice, in the foreword of the fourth (the first published, in 1537) of the seven books of his treatise *Libri di Architettura.* He praised «many gentlemen of aristocracy, who not only enjoy, but practice that art [architecture] as the best masters, as messire Gabriele Vendramin, messire Marcantonio Michiel, and messire Francesco Zen» (*molti Gentil'homini de la nobiltà, che non pur si dilettano, ma fanno di quel'arte quanto i migliori maestri, come è messer Gabriel Vendramino, Messer Marcantonio Michele, et messer Francesco Zeno*)[22]. Francesco died in 1538 and Piero, his father, in 1539. In those years their huge family palace was being built on the corner between the Rio Santa Caterina and the Gesuiti square near the hospice of the Crosechieri (order of Crucifers). In his will, Piero wanted «my houses which I am building near the Crosechieri ...have to be finished following the design of late messire Francesco» (*le mie case che fabrico alli Crocechieri* [...] *le siano compide al disegno che feze el quondam messer Francesco*). His surviving sons, though, could plan the internal arrangement and decorations as they liked, with the advice of Sebastiano Serlio. If the main designer of the palace (Fig. 2) was Serlio or Francesco Zen, scholars don't

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[20] Every Compagnia della Calza, literally Sock Company, distinguished itself for the special socks, colored and decorated, worn by its members in official circumstances. The flourishing of drama in Venice around 1500 was connected with the performances of such clubs; Molmenti 1928: 381-400; Boscardin 2014: 23-25, 50-51. The socks of Zen and his partners were: one pink, the other half white and half pistachio green; Sanuto 1880: col.745.

[21] Sansovino 1581: 138v; Cervelli 1969: 21-36.

[22] Serlio 1537: III.

agree but, certainly, the latter was interested also in the technical and material aspects of architecture. Not by chance, in his own will, Francesco wanted to be brought to his tomb by Sebastiano Serlio and Innocenzo Lombardo, bricklayer, who were, also, witnesses of his will, and masters bricklayers, carpenters and stonecutters (*maestranza tra mureri, marangoni et taiapieri*)[23].

Francesco Zen was intrigued also by decorative arts, mainly jewellery, and by the art of horology, which was quickly developing in the first half of the 16th century also in Venice. As in the first half of the 16th century the wealth of Venetian patricians was still based on their trades with the Levant, Italian cities and Northern countries, even if they progressively invested in land ownerships, Francesco could translate these interests into business. We have not much information about his activity, but we know that he offered a rosary made of rock crystal beads to Isabella d'Este, who didn't buy it because too expensive (*50 ducati*), in July 1531[24]. In October of the same year Marin Sanudo records that he has seen Francesco Zen, son of Piero, *bailo* [resident ambassador in Costaninoples], holding a wonderful watch applied on a gold ring. It worked, showed the hours and rang and Francesco wanted to ship it to be sold in Constantinoples (*Vidi questa matina in ruga di zoielieri , in man di sier Francesco Zen di sier Piero è baylo a Constantinopoli, un anello d'oro, sopra il qual è uno horologio bellissimo, qual lavora, dimostra le ore et sona, et quello vol mandar a vender a Constantinopoli*)[25]. Its small size was exceptional at the time. Pietro Aretino, the Tuscan writer then living in Venice, praises Giorgio Capobianco, a famous watchmaker from Vicenza, for the watch applied on the ring made for Suleiman the Magnificent (*l'oriuolo ne l'anello del gran Turco*) in a letter of December 1537, while in 1566 Giulio Barbarani refers that a similar watch was offered also to Guidobaldo II della Rovere, condottiere for the Venetian republic and other Italian states[26]. In

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[23] Olivato 1971: 284-291; Concina 1984: 265-290; Frommel 2001: 53-70.

[24] Brown 1982: 231, 233, note 14.

[25] Sanuto 1900: col. 14. This entry in Sanudo's diary is interesting for the history of watchmaking.

[26] Aretino 1913: 369. Tiraboschi 1792: 1646-1647.

the 16th century horology was quickly improving and European clocks and watches were among the most requested items at the Ottoman court[27].

On the 14th of March 1532 Marin Sanudo saw an extraordinary work made by Luigi and Marco Caorlini, Venetian goldsmiths, in financial partnership with some patricians, Pietro Morosini, Giacomo Corner, the sons of Piero Zen, the ambassador, and others. Therefore, Francesco Zen was among the partners. Such work was a gorgeous gold helmet, similar to a papal tiara, with four superimposed crowns and decorated with pearls, diamonds, rubies, emeralds and a large turquoise. It was sold to Ibrahim Pasha, the grand vizier, who offered it to Suleiman. Its huge price was 116.000 ducats and the partners made a hundred per cent profit[28]. Suleiman wearing the Venetian gold helmet was portrayed in several European prints of the 16th and 17th century (Fig. 3).

The culture of Francesco Zen and his interest in the design and techniques of decorative arts and architecture are not enough to make us consider him the inventor of glass filigree on the point of view of its manual process, which requires a long-lasting training in glassblowing. Probably, his role was similar to the one of contemporary designers, who need the collaboration of skilled artisans and technicians to obtain a new product or an original decorative effect.

Francesco Zen might have derived the idea of blowing glass vessels with walls made of twisted rods from some archaeological bowls made by fusing similar rods together in Hellenistic glassworks, such as the laced mosaic bowl from a tomb of Canosa (Italian region Puglia), housed in the British Museum (inv. nr. 1871,0518.6)[29] and in Roman glassworks, as the bowl kept in the Corning Museum of Glass (inv. nr. 66. 1. 235) from Adria, a Roman city in the southern area of Veneto[30]

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[27] Carboni 2007: 111.

[28] Sanuto 1900: 634-635; Sanuto 1901: coll. 7, 10-11, 358-359, 364, 403, 792, 826; Necipoğlu 1989: 401-427. It has been written that a Venetian similar helmet or the same was bought by Antonio Rincon, French envoy, and given to Suleyman in the same 1532; Garnier 2008: 52.

[29] Harden 1968: 27.

[30] Harden 1987: 15, 39. The term *laced* has frequently been translated into *reticello* by Italian archaeologists. Hence a confusion between the Roman technique and the Venetian *reticello* technique, which is completely different.

(Fig. 4). Furthermore, mosaic glass bowls, which show twisted canes among opaque coloured ones, have been recently found in the site of Altino, a Roman city near the Venetian lagoon, which was well known by Venetians in Medieval and Renaissance times, when it already was a source of archaeological treasures[31].

As other Venetian patricians, Francesco Zen had a collection of ancient and Renaissance works of art and artefacts, which he left to Violante, his daughter, wife of patrician Michele Contarini[32]. No inventory of his collection is known. However such an inventory would be probably useless because old ceramic and glass vessels are listed as a whole or without any precise description in Venetian inventories of the Renaissance. Anyway, we may suppose that some Hellenistic laced mosaic bowls, brought to Venice from Eastern Mediterranean Sea, or Roman findings from Altino, belonged to the collection of Francesco Zen and that they were the source of inspiration for his collaboration with the Serenas and the invention of blown glass filigree vessels.

Venetian blowers were already able to pull twisted glass rods. Indeed, two-tone twisted canes were probably already made in Murano glassworks. For instance there are four of them, at least, among the glass findings in the site of the Santa Chiara convent in Padua, while no fragment of blown filigree vessels has been found in the same archaeological context. Such findings, as well as several maiolica pieces, have been dated 1480-1530 ca., that's before the invention of 1527 and the circulation of Venetian glass *retortoli* filigree in Veneto and in other countries. These Padua twisted rods are not overlaid with clear glass, as the ones used for the walls of *retortoli* filigree vessels, and they have the shape of the mobile handles of glass buckets, mentioned as containers of holy water in Renaissance inventories (Fig. 5).

The earliest Venetian retortoli vessels were made only with clear glass or *cristallo* and *lattimo* (lit. milk white glass). Clear glass (*vitrum blanchum*) was obtained melting rough material of high quality, such

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[31] Barovier Mentasti and Tirelli 2010: 108-111. Venetians used bricks, stones and decorated marbles of Altino to built Venice and also Murano. Legends record also the recovering of Roman gold coins; Filiasi 1796: 254-257.

[32] *Notizia d'opere di disegno* 1800: 83-85; Lauber 2002: 99, 108, note 8.

as powdered pebbles of the Ticino River, as vitrifier, Levantine soda ashes, as flux, and manganese dioxide as decolorizer. It was colourless but still affected by some grey tinge, which, on the contrary, didn't affect *cristallo* which was made with a certain amount of previously purified ashes. Venetian technicians found the way to guarantee the stability and the right level of viscosity of *cristallo* so that it could be used to shape blown vessels. Its invention is attributed to Angelo Barovier, Murano blower, technician and entrepreneur. The *terminus ante quem* for this invention is the year 1448, when the Florentine ambassador in Venice went to visit the Barovier glassworks, as recorded in the journal of his secretary: «*andammo a vedere el maestro de' vetrii cristallini che ci mostrò lavori molto gentili* [33]».

Opaque white glass was already produced in Medieval period and used for mosaic *tesserae* and enamels, while the invention of a different kind of *lattimo*, suitable for blowing and shaping vessels, is attributed to Angelo Barovier. It was similar to Chinese white porcelain so that the text of a patent (1457) mentions it as *vitro porcellano*, porcelain glass. *Lattimo* should not be confused with *latticino* or *latesin,* which was a white colour with a light blue tinge, in glass and in maiolica. Luigi Zecchin pointed out that *latticino* was also incorrectly used to signify *lattimo* (absolutely white glass) by some authors in the 16th century. He wrote that the first was Leonardo Fioravanti, a medician from Bologna, in 1564, while later, in 1585, Tommaso Garzoni, an encyclopaedic writer from Bagnacavallo (Ravenna), mangled *latticino* into *latticinio*[34]. Actually, also before, *latticinio* was used with the wrong meaning of absolutely white glass by authors who were not familiar with the jargon of Murano blowers. For instance, in 1499, Francesco Colonna, the author of *Hypnerotomachia Poliphili,* a successful oneiric novel, described an absolutely white stone: «*petra lactea, di tale albentia, quale non se vide il composito lacticinio murianense*» (milky stone, so white that nobody saw a similar Muranese artificial *lacticinio*)[35]. Towards the end of the 19th century, the term *latticinio* was proposed as a synonym of glass filigree by foreign historians. It is better to avoid this incorrect

[33] Lerz 1959: 262.
[34] Zecchin 1589: 342-349.
[35] Colonna 1998 [1499]: 417.

term in connection with Venetian glassmaking.

Kitty Lameris studied the retortoli filigree vessels of the 16th century and the ones made around the year 1700 and she could compare them with each other. She was able to arrive at the conclusion that only the later pieces are characterised by single-layered walls, while the walls of the earlier vessels show two layers, the inner of clear glass and the outer consisting in a series of parallel twisted canes. This is the proof that the latter were obtained by picking up a rectangular plate (made by fusing parallel canes) with an elongated clear bubble, rolled on the plate itself. The former were obtained by picking up the plate with a clear glass collar rolled along the edge of the plaque[36]. Today both processes are followed by Murano blowers[37]. Such processes belong to a consolidated tradition, but, when Francesco Zen wanted to obtain a new decorative effect, similar to the pattern of ancient laced mosaic bowls, the Serenas had to face and solve some technical problems thanks to their experience and skill, also because Venetian *retortoli* vessels had to be blown, unlike archaeological fused findings. Therefore, Filippo and Bernardo Serena undoubtedly deserved to be the recipients of the 1527 patent.

Francesco Zen wasn't the only Venetian patrician or intellectual to be attracted to Murano and to its glassworks. Only a small part of Murano was the seat of glassworks, while its larger area was occupied by suburban villas and gardens, owned by patricians and regularly visited for holidays, feast and meetings of cultural circles. Murano villas and palaces were also offered to eminent official and semi-official visitors during their sojourn in the lagoon. Therefore, the relations between local blowers and members of the upper classes of the society were frequent and sometimes friendly and they promoted the development of glassmaking. This might be the subject of interesting studies.

3. *From* retortoli *to* reticello

The success of vessels made with *lattimo* and cristallo *retortoli*

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[36] Lameris 2014: 105-116.

[37] Lino Tagliapietra tells that skilled blowers can indifferently follow both processes with the same visual result, even if everyone prefers one of them: it's a matter of habit.

canes has been documented very early among the Renaissance élites in Italy and abroad. Isabella d'Este, just two years after the invention of *filigrana a retortoli* by Francesco Zen and the Serenas, asked her agent in Venice, Jacopo Malatesta, to purchase glasses with white threads without gilding «*Persuadendoni che alle apoteche delli vitriari a questa Ascensa appariranno qualchi belli vasi novi, siate contento de retrovarni sino a X o XII vasi da bevere che siano varii di foggie, taze et bichieri, et che habbino li fili bianchi, schietti, senza oro*» (I am convinced that during the Ascension day Fair beautiful novel vases will be on show in the glassmakers' shops, therefore, please find almost X or XII drinking vases of different forms, *tazze* and beakers, which have to be with white threads, clear, without gilding)[38]. The vessels, requested by the Mantua marchioness, were made in *cristallo* ornamented with white opaque glass threads. Thus, these might be decorated with canes of twisted white threads, that is *a retortoli*. In 1530, a year later, Isabella d'Este visited the Serena glassworks which was probably one of her favourites. She used to turn to it also in the previous years for her glass purchases, as before mentioned. During her visit, on the 24th May 1530, she was deeply fascinated by Serenas' glass items which she considered as valuable as jewels: «*madama è stata a Murano con molto suo diletto et ha veduto gli vetri bellissimi che vi sono et quelli di la Serena fatti a similitudine di credenza mandata al S.* [Signor] *Turco* […] *si può dire cosa excellente et rara, ma quasi tanto rara quanto se fusse gioie*» (madame has been at Murano to her delight; she saw the wonderful glass vessels that are there and others made by the Serenas to resemble the ones for the *credenza* sent to the Turkish Lord […] these can be said excellent and rare, almost as rare as jewels)[39]. Thus, another very prominent personage, Suleiman the Magnificent, appreciated Serena artefacts to such an extent that he ordered a whole *credenza* of glass vessels that are glass vessels themselves. It is highly likely that some of them were made in filigree, which was a novelty. In Renaissance times the *credenza* was a piece of furniture (dresser) used to display a family's most precious vessels during important banquets of the élites. This term referred also to the vessels themselves. Usually, as documented

[38] Luzio-Renier 1896: 279; Brown 1982: 213; Malacarne 2000: 60.

[39] Jacopo Malatesta's letter to Federigo Gonzaga, 1530/24th May, in Luzio-Renier 1896: 279.

by inventories and paintings, the vessels on show were made of silver, agate, crystal, pewter, majolica[40] and also of glass. Indeed, a *credenza* with gilded clear glass vessels, was displayed in the palace, Palazzo Magno, of the Trent prince-bishop, Bernardo Clesio (1484-1539), and it is described in a poem by Pietro Andrea Mattioli, dated 1539[41].

Isabella d'Este returned to the Serena glassworks on the 28th May 1530, just a few days after her first visit. She was, once again, very impressed by Serenas' works, some of which had just been purchased by her brother, Alfonso d'Este who highly enjoyed and admired Venetian glass and who returned, also in the following year, to this glassworks[42]. Therefore, the Mantua marchioness could not resist buying some marvellous pieces[43]. A few years later, in 1535, Isabella d'Este requested once again some filigree vessels, as recorded by a letter sent to Benedetto Agnello, another correspondent in charge of her purchases in Venice «*Havemo havuti gli otto vasi di vetro che ni havete mandati tra quali non habbiam trovata cosa che ci sattisfaccia molto fuori che quella bocchalina lunga la qual ha tre bottoni che per essere bizarra ci piace pur più de gli altri, perhò volemo che ce ne faciate fare anchor due simili con aggiunta di qualche filo lavorato a reticella bianco*» (We received the eight glass vases you sent us and among them we didn't find anything which may satisfy us except for a little long bottle with three buttons that we love for its eccentricity, thus we want you to order two similar ones but with the addition of some threads made like a white net)[44]. The term *bocchalina* refers to a bottle, probably in the form of an *inghistera*, as quoted by Cristoforo di Messibugo,

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[40] Thornton 1991: 103, 207, figs. 101, 104-105, 236.

[41] The glasses of the *credenza* are described as follows by Pietro Andrea Mattioli (1501-1577) in his poem «Il palazzo Magno del cardinal di Trento» (1539): «V'è di cristalli nitidi, e gentili, / Ben ricamati d'oro intorno intorno, / Di fregi, groppi, e rabeschi sottili» (There are clear and delicate crystals, well decorated with gilded bands of friezes, knots or interlacements and arabesques). Castelnuovo 1995: 160, 163.

[42] Zecchin 1987: 211.

[43] Jacopo Malatesta's letter to Federigo Gonzaga, 1530/ 28th May: «*Andò a vedere gli vetri alla botega de la Serena et per essere quelli excellenti et rari, li vide con tanto suo diletto et piacere che più non potria desiderare, et al presente ha le più belle cose che già mai l'havesse. Il signor Duca di Ferrara vi era stato de poco inanci et vi lassò de molti ducati. Madama illustrissima ha anche ella comprato alcuni vasi molto belli*»; Luzio-Renier 1896: 279.

[44] Brown 1982: 219, note 27.

the master of ceremonies and banquets at the court of Ferrara (1524-1548), in his cook book *Banchetti* (1549)[45]. The words *boccalina* and *boccaline* are found, once more, in Isabella d'Este's correspondence, quoted as containers for scented waters, thus probably bottles, kept in her Studiolo[46]. Indeed, in Mantua and Ferrara these generic terms often meant bottle or flask. Therefore, the Mantua marchioness, a very demanding patron who often gave detailed instructions regarding her glass commissions, ordered two bottles with some threads worked a *reticella bianco* (white net). Which kind of filigree, ornamenting these glasses, did Isabella d'Este request to her agent in Venice? This type of *filigrana* may be identified with the *retortoli* not with the *reticello*, because Isabella is clearly asking for bottles with only a few white threads. The pattern *a reticella bianco* may be similar to a kind of *retortoli* cane decorating some vessels of the 16th century, such as a goblet, housed in the Pogliaghi museum at the Sacro Monte di Varese (Fig. 6). Its dating is consistent with the years 1540-1550, based on comparisons with some Venetian paintings: *Wedding at Cana* (1540-1550) by Bonifacio de' Pitati, called Bonifacio Veronese, in the church of San Giacomo dell' Orio, Venice, and *Supper in the House of Simon Pharisee* (1544) by Moretto, formerly in S. Giorgio in Alga convent in Venice (Figs. 7, 14)[47]. A reliquary, housed in the Museo del Vetro at Murano, bought in 1865, has a similar kind of *retortoli* with a white net (Fig. 8). The reliquary used to have a cross on the top of the lid, as seen in a drawing kept in the Museo del Vetro, dated 1881[48]. This significant religious element is a common characteristic of 16th century reliquaries as seen in a fresco in the church of S. Francesco a

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[45] *Banchetti Compositioni di vivande* 1549: 17v: «Boccalina, overo enghistarai».

[46] Brown 1982: 251, note 7: Letter sent by Isabella d'Este to Paula Fantina on 29th January 1502: «*qui inclusa è la chiave de lo armario dil nostro studiolo dove volemo andati et ne mandiati per uno cavallaro piena questa boccalina vi driciamo* [*diciamo*] *de l'aqua odorifera è in quelle boccaline nostre piene*». In another letter on 29th August 1523: «*in questo cistelletto vedereti una boccalina di acqua di profummo…*»; Malacarne 2000: 68, 88, note 88.

[47] Tonini 2001: fig. 4; Barovier Mentasti 2006: 116.

[48] The drawing is part of the drawings exhibited at Milan Exhibition in 1881 by the Abate Zanetti drawing school for glassmakers, showing glasses from the Museo Vetrario. The drawing is in a plate numbered VII.

Schio (Vicenza), an area under the political control of the Serenissima. The fresco has been attributed to Francesco Verla and dated 1520 ca[49]. Another reliquary in *filigrana*, housed in the Basilica of Assisi (Fig. 9), may be dated to the same period as the Murano reliquary. The Assisi vessel has a similarly shaped stem and a different kind of *retortoli*. Another important comparison is with a reliquary bearing a scene of *Annunciation* that has been cold painted. This reliquary, which is housed in the Museo del Vetro, shows a knop with lozenges pattern between two collars. The shape of its stem is identical to the ones of the two *filigrana* reliquaries. The difference concerns the knop's decoration; in this case it has a particular pattern which gives some dating indications, between 1530 and 1550. This dating period is also confirmed by a salt cellar bearing a similar knop, which is depicted in a painting, by Girolamo Romanino, *Supper in the House of Simon Pharisee* (1544) in San Giovanni Evangelista (Brescia), an area under the dominion of Venice[50]. Another important comparison for the stem form is a gilt and enamelled goblet in blue glass, kept in Brescia Musei Civici which have usually been dated to the beginning of the 16th century[51]. Maybe this dating has to be reconsidered but it can't be later than the early decades of that century. These comparisons and the fresco are important clues for dating the two glass reliquaries to the period 1530-1550.

Retortoli canes with a white net (probably similar to Isabella's *reticella* threads) are characterizing a goblet in the Victoria & Albert Museum (Fig. 10). This has been attributed (probably) to South Germany and has been dated 1575-1610, on the basis of the comparison with a similar piece with diamond-point engraved names and the date 1593[52]. In our opinion, the V&A goblet may have a

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[49] Gerola 1908: 339.

[50] The goblet with Annunciation has been published by Lorenzetti 1953: fig. 11 and Barovier Mentasti and Tonini 2016: 80, figs. 8-9. In the latter is published also Romanino painting. For this particular kind of knop with lozenges pattern see the forthcoming article by Rosa Barovier Mentasti, Luciano Borrelli, Cristina Tonini, in the Journal of Glass Studies, Corning Museum of Glass 2019.

[51] Barovier Mentasti and Tonini 2012: 93-94, n. I/5.

[52] Website of V&A museum: https://collections.vam.ac.uk/item/O423/beaker/ and Baumgartner 2015:150-151, cat. 57.

Venetian origin and an earlier dating. This type was in production throughout the 16th century and colourless goblets of similar shape are depicted in some paintings of the Venetian area, such as: the *Last Supper* (1530-1550) of Bonifacio de'Pitati, housed in the National Galleries of Scotland in Edinburgh, another version of this painting (1532-'36), formerly in S. Andrea church in Certosa island (Venice), today housed in Milan, Pinacoteca Brera (Fig. 11), and an early painting by Vincenzo Catena, *Supper at Emmaus* (1520-1531), housed at the Uffizi, Florence. The latter shows a goblet with a less slender form. Moreover, a drawing by Giovanni Maggi in the *Bichierografia* (1604) confirms the success of this goblet at the end of the 16th and the beginning of the 17th century[53]. This kind of glass, a Venetian type, was highly appreciated also in German countries as documented by a homogenous group of conical goblets with Nuremberg coats of arms (1515 to about 1530) exported from Murano and then, during the 16th century, also produced in Germany; a remarkable piece is enamelled with a German coat of arms, Reichsritten von Saurna, housed in the Kestner-Museum, Hannover, and it is attributed most likely to South Germany, possibly to Venice, and dated to the third quarter of the 16th century[54]. The V&A filigrana goblet closely resembles the one kept in the Manoir de Saussey (France-Normandy), attributed to Venice and dated to the mid-16th century and to a *filigrana* piece, in the British Museum[55].

4. Reticello *filigree*

Some scholars claimed that the Serena glassmakers submitted a request for a patent to the Consul of Ten, not only for the *retortoli* filigree, but also for the *reticello* technique[56]. Nonetheless, until today, there are no known documentary evidences that might link a patent

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[53] Among the paintings in which this kind of goblet is depicted are: Girolamo da Santacroce, *Banquet*, 1545 ca., Maastricht, Bonnefanten Museum; Jacopo Bassano, *Last Supper*, after 1547, Rome, Galleria Borghese. Maggi [1604] 1977, vol. II :216.

[54] Saldern 1965: 35-39, 44, figs. 10-11, 21.

[55] Lhermite 2013: no. 52; Tait 1979: 71, no. 96.

[56] Hess and Husband 1997: 8; Syson and Thornton 2001: 196; Page 2006: 18.

for *reticello* to this glassworks. The first Muranese archive paper that reports some vessels made with *reticello* technique, is dated 1540, and was published, several years ago, by the renowned glass scholar Luigi Zecchin. The document is related to the glassmaker Domenico Bortolussi «*1540, adì 5 marzo. Ave missèr Paulo da mi, Dominicho, uno paro di vasi del marchexe lavorati de redezino, monta lire 2 soldi 10*» (1540, today 5th March. Sir Paul receives from me, Domenico, a pair of vases of the marquis made in *redesino*, value 2 lire and 10 soldi)[57]. In this paper the *reticello* is named *redezino* (Fig. 12). Then, almost thirty years later, the word *redesello* appeared in archive documents. Indeed, the latter term is reported in another Venetian paper which is not related to a Muranese glassworks. This is an household inventory, drew up after Angelica Leoncini's death in 1569[58]. She was the blind sister of Giulia (Leoncini), a famous courtesan, called «la Lombarda». Giulia died in 1543, as confirmed by an inheritance document in favour of her sister Angelica who was economically dependent on Giulia. Among the goods listed in this inventory there are: paintings, silver vessels, a harpsichord, a book by Francesco Petrarca (*I Trionfi*), highly on fashion at that time, porcelains and, also, an important number of *reticello* glasses «*Vasi e fiaschi de diversa sorte de vero a redesello n. 50*» (Vases and flasks of whatever sort of *reticello* glass, no. 50). If we accept the hypothesis that this inventory lists Giulia's belongings, the *reticello* glasses would have been attested quite early, considering the year of Giulia's death (1543). Therefore, only a couple of years after Bortolussi's muranese paper (1540). The *reticello* flasks, quoted in Leoncini's inventory, were, possibly, in the form of the well-known pilgrim flasks. We do not know precisely how these flasks were employed, but some of them may have been used for scented waters because the inventory contains also various objects related to a lady's toilette. The use of pilgrim flasks for scented waters is attested in a painting, *Vanity* or *Young Woman at Her Toilette* by Nicolas Régnier, housed in the Musée des Beaux-Arts in Lyon (inv. no. 1976-7). Here the painter depicted a colourless glass flask with a straw net, displayed

[57] Zecchin 1989: 184, 186.
[58] Davanzo Poli 1988: 273-285.

on the toilette table of the lady[59]. Significantly, this painting is dated 1630-1635, a time when Régnier was already established in Venice (since 1626), where he remained until his death (1667).

Until today no *reticello* pilgrim flasks, housed in public and private collections, is known. The only known ones are made with *retortoli* canes[60]. Perhaps, also, the flasks, called *a redesello*, mentioned in the Leoncini's inventory, were made with the *retortoli* technique. In the past, just like today, the production of *reticello* vessels was far less common than that of *retortoli*: making *reticello* artefacts was, and still is, far more challenging than *retortoli*. The *reticello* technique, consisting of criss-crossing white threads, as known, is obtained by blowing a glass cylinder of diagonal crystal and white canes (*a mezza filigrana*) inside another similar cylinder of canes, arranged in the opposite direction no anticlockwise of the white canes[61]. A similar consideration has to put forward for filigree glass lamps, made in the 16th century. Two drawings (1569), housed in the State Archive of Venice, depict two kinds of glass lamps, one Islamic-shaped and the other of an elongated form. These are connected to the dispatch sent by the Venetian *bailo*, a resident ambassador, Marcantonio Barbaro, from Istanbul to the Venice republic, with a remarkable command of glass lamps by the vizier Sokollu Mehmed Pasha. It confirms, once more, that another Turkish eminent personage, desires Venetian glass vessels made in *cristallo* and in *filigrana*. The drawing with the Islamic-shaped lamp, also, shows a handwritten request with a description of the glass lamps «*Di questa forma ne vogliono esser/ 300/ altri/ 300/della forma longa qui apresso disegnata, et altri/ 300/ La mità più grandi della sorte di questi longhi / si che in tutto siano/ 900/ parte schietti et parte à redeselli*» (Of this form have to be 300/other/ 300/ of the long form hereinafter designed, and other/ 300/ half as big again as the long ones/ they have to be 900/ half in clear glass and half in *redeselli*)[62]. The long-shaped lamps, mentioned in this document, has to be identified

[59] Barovier Mentasti, Borrelli and Tonini 2016: 172, fig. 1.

[60] Barovier Mentasti and Tonini 2013, cat. no. 32; Higgott 2011: 80-82; *Glass at the Fitzwilliam* 1978: 70, no. 149.

[61] Tait 1991: 240, figs. 200-204.

[62] Archive State of Venice, *Dispacci degli Ambasciatori al Senato: Costantinopoli*, filza 4, folios 104-105v. 1569; Carboni 1986: 147-166.

with the cylindrical *cesendelli*, as named in Venetian language, and the other lamps are Islamic-shaped. The latter were, also, in use in Italy from Medieval times through Renaissance, as confirmed by glass archaeological findings and paintings[63]. The Turkish vizier clearly requests to the Venice Republic that half of the lamps have to be made *a redeselli.* Actually no lamp of these two different forms, made in *reticello*, is, today, known and published. Therefore, perhaps, the lamps of both shapes were made with *retortoli* canes or with straight white canes, like the ones housed in some public collections (Fig. 13)[64]. Is it possible that the lamps requested by the Turkish vizier were, never, produced in *reticello* because it was easier to make them with the *retortoli* technique?

The words re*tortoli* and *redesello* are both quoted in a Venetian official document of the mid-16th century. These terms are reported in a chapter (no. 137) of the Mariegola (1549) of the glassmakers, the statute of the guild: «*Che finita questa lavoration, in niuna fornasa si possa più far Vissighe de Rui et de lavori schietti* [...] *et questo perché il vero non si può ben purificar…solamente far si possino groppi et pie de redesello et retortoli, et non si possa lavorar a più di tre scagni per le ragioni predite*» (At the end of the this working [season], in no glassworks is possible to make windows roundels and clear glass vessels [...] because glass can't be so well purified at the bottom of the crucible […] it is solely possible to made knops and feet of *reticello* and *retortoli* and it is not possible to work at more than three benches for the above mentioned reasons)[65]. Therefore, the chapter probably stated that, at

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[63] Lusuardi and Zuech 2000: 243-247, figs. 2-3. A piece from Padua, S. Chiara convent, published as a small vase, is a lamp; see Cozza 2011: 97, fig. 124. Tryptich (1462 ca.) of Alessandro Benaglio in the church of San Bernardino, Verona. *Birth of the Virgin* (1504-1508), Vittore Carpaccio, Accademia Carrara, Bergamo. A Venetian enameled islamic-shaped lamp is housed in the Kunstmuseum in Dusseldorf, probably made for European market; see Ricke 2002: 79, no. 124 and Barovier Mentasti and Tonini 2013: no. 4.

[64] For Islamic-shaped lamps see Carboni 1986: 163, figs. 8-9; Bellingeri and Olcer 2009: 189; for *cesendelli* see a piece in the Victoria & Albert Museum (inv. no. 19-1965).

[65] Zecchin 1989: 43-44. The same chapter of the Mariegola is reported in the Calendar State of Papers/September 1549: «That at the close of the present working season, in no furnace may there any longer be made[at one at the same time?] glass bladders, window glass, and plain work ,nor may the chests containing such vessels be

the end of the working season, before the yearly summer closing of the glassworks, it was strongly recommended not to make window roundels and clear vessels and big vessels, otherwise flaws would noticeable because the melted glass, at the bottom of the crucible, would not be well purified at the end of the season. Consequently, the molten glass left in the crucible would be better suitable, also if less purified, to make *retortoli* and *reticello* knops and feet. This chapter of the Mariegola underscores how the Venetian republic and its guilds were concerned with protecting the quality of their products.

Papers from the middle of the 16th century record the purchase of items by the Estense ducal court (Registro di Spenderia) at the time of Ercole II (who ruled 1534-1559), son of Alfonso I Este. These papers, once again show an interest for glass vessels by the dukes of Ferrara. Among these glasses, the papers document *filigrana* glasses «*bocaline seu* [o/ovvero] *pereti di vedro perfilati di bianco*; *pereti lavorati de bianco; peretto a reticella*» (bottles or glass *pereti* with white threads, [probably ornamenting the rims]; *pereti* made with white glass that is *retortoli*; *peretto a reticello*)[66]. Thus, the *pereto*/*pereti* are bottles as the *boccaline*, above mentioned. The *pereti* were, as reported in some dictionaries of Venetian language, small pear-shaped bottles[67]. A substantial number of such items are, also, listed among the glass vessels that the Muranese glassmaker Domenico Bortolussi had to send to Milan in 1540. These are mentioned as *peretti, pereti chon bocha d'oro, perete con bocha d'oro* [with gilt mouth][68]. Probably, these items might be similar to some pear- shaped bottles that sometimes have gilt rims and are smaller

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removed from the furnace under penalty of 100 livres; and this because by taking so much glass out of the furnace all at once, it cannot be properly purified. And to give employment to a number of artisans who are exclusively occupied as glass bladders blowers, be allowed to make medicine phials (*groppi*) and "pie de redesello" and retorts (*retortoli*); nor, for the aforesaid reasons may the glassmakers work at more than three mouths of each furnace» in *Calendar of State Papers*, 1869: 240-241. Brown incorrectly states that *groppi* are medicine phials instead they are knops.

[66] State Archive Modena, Registro di Spenderia (1551), Amministrazione della Casa, Spenderia, rg .166, pags. 72,78v, quoted in Trenti 2008: 409.

[67] Boerio 1839: 425: *Pereto= piccola pera* (small pear). Pereto de vero(Glass Pereto)= piccolo boccia di vetro(small glass bottle); Cortellazzo 2007: 982. The author agrees with Boerio definition.

[68] Zecchin 1989: 188.

than the well-known *inghistera*, depicted in some Italian paintings such as in the *Supper in the House of Simon Pharisee* (1544) by Moretto for S. Giorgio in Alga convent (Venice) (Fig. 14) and in a painting by Giovanni Santi, Raffaello's father, *A Saint Martyr* (1489), housed in Urbino Galleria Nazionale delle Marche. Another interpretation identifies the *pereto* with a beaker of cylindrical form on the basis of an Italian paper another Venetian document that records a payment, partially, in kind with glass vessels. This paper (1547), remarkable for its connections with the Serena family is part of the account book of the renowned Venetuan painter, Lorenzo Lotto. It reports a payment by Zuan Domenegho Serena da le Tre Croce for the purchase of an artwork[69]. Zuan Domenegho o Giandomenico (1519-1580) was the son of Bernardino Serena, one of the inventors of the *retortoli* filigree, and he had his own glass furnace, called *le Tre Croci* [70]. Part of the payment to Lorenzo Lotto was made with money and part with glass vessels which were «*pereti comuni zoè zoneti de vetri*» (ordinary *pereti* that are glass *zoneti*). *Zoneti* have been, possibly, identified as elongated beakers[71] but the word *zoneto* is, probably, coming from *zoni* which meant skittles, which generally were conical and could resemble a bottle more than a beaker.

5. *Some examples of filigree vessels of the sixteenth century*

A salt-cellar housed in Limoges museum (Fig. 15) shows an interesting combination of two different kinds of *filigrana* pattern: the foot and the knop are made with an identical *retortoli* pattern,

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[69] Lorenzo Lotto 1969: 194 «adì 27 marzo del 1547, die dar misser Zuan Domenego Serena verier a le 3+[Croce] in Muran sopra dito per un quadro de un presepio finto de note e la luce in Christo che illumina tutto il contorno per scuti n° 30 d'oro in oro, parte a denari contadi et parte in vetri, qual valse più che 60 scuti e li scuti in oro saranno n° 20 et li diese in tanti pereti comuni zoè zoneti de vetri como apar per suo scritto».

[70] Zecchin 1987: 212.

[71] Cortellazzo 2007: 1536. This scholar identificate *zoneto* as beakers on the basis of the Italian/English dictionary by Florio 1598: 461 «*Zonetti*: a kind of Venice drinking glasse that is long and wide above». Maybe Florio, who translated very few terms of Murano glassmaking, not always correctly, gave an inexact meaning of *zonetti.*

while the *cristallo* concave part of the bowl is decorated with radiating ribs made of alternating *retortoli* and *lattimo* canes. The flat part of the bowl is decorated by circular *retortoli* canes, each set between two white threads. Several Venetian glasses of the 16th century show this combination, found also in some findings from the Venetian lagoon (Fig. 16). The Limoges salt-cellar has to be dated to the years 1540-1570 based on comparison with metal salt-cellars of a similar form, depicted by Girolamo di Santacroce, in a canvas, *Banquet* (1545), housed in the Bonnefanten Museum in Maastricht and later by Pomponio Amalteo, *Last Supper* (1574), Musei Civici, Udine, north-east Italy. Girolamo di Santacroce belonged to an established family of painters, originally from Bergamo, who settled in Venice between the 15th and the 16th centuries. Girolamo had his artistic apprenticeship in Venice, probably in Gentile Bellini's workshop.

The form of Limoges salt-cellar is almost identical to some salt-cellars in *cristallo*, housed in some public and private collections[72] and a salt-cellar of similar shape is depicted in a Romanino's painting, housed in San Giovanni Evangelista church in Brescia, dated 1544 ca. Only a few years later, some Venetian contemporary figurative sources show a change in the stem design, which became more slender, the bowl, instead, maintained its previous shape. This novelty is found in two canvas painted by Jacopo Tintoretto: in *Christ Washing the Disciples' Feet* (1547, Madrid, Prado) the stem is trumpet-shaped and in the *Last Supper* (1559, Paris, church of Saint Francois Xavier) the salt-cellar has a short baluster and a knop. Another change in the stem form is documented by a *filigrana* and *cristallo* salt-cellar, unpublished, housed in the Castello Sforzesco in Milan (Fig. 17) The stem is baluster-shaped, identical to the stems of some goblets depicted by Veronese in *Wedding at Cana* (1562-'64, Paris, Louvre) and by Giulio Campi in *Noli me tangere* (1568-'69, Cremona Cathedral, Corpus Christi Chapel)[73]. In the latter canvas, the goblet shows an identical stem to the one of the salt-cellar of the Castello Sforzesco, which may be dated to the same period.

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[72] Bauer and Gabbert 1980: 61, no. 111; Barovier Mentasti and Tonini 2013: no. 23.

[73] Liefkes 1997: 52, fig. 56; Invernizzi and Tonini 2017: 222, figs. 3a-3b.

Among vessels, decorated with horizontal bands of *retortoli*, as the Limoges salt-cellar, there is, also, a goblet, housed in Museo del Vetro at Murano (Fig. 18). This piece finds, for its mould decoration, a remarkable parallel with some findings coming from the Venetian lagoon (Fig. 19). Moreover, two goblets, for sure one, depicted by Alessandro Allori in the *Last Supper* (1582) (Fig. 20 a-b) show strict links with the piece in Museo del Vetro. The painting, originally, displayed in the refectory of Astino convent (Bergamo) is, today, kept in Bergamo Palazzo della Ragione. The Tuscan painter, Allori, received the commission from a convent situated in an area under the political rule of the Serenissima republic and he represented a refined Renaissance table. He depicted in detail different sorts of goblets, clearly Venetian, and, also, a remarkable maiolica in front of Christ. Among these goblets, one of them clearly shows a horizontal band of *retortoli* around its bowl (Fig. 20 a-b). *Filigrana* goblets are, rarely, depicted. Indeed, Renaissance painters, usually, prefer to represent colourless glass vessels, sometimes gilded. Allori's painting is, also, a significant reference for dating similar goblets, decorated with horizontal bands of *retortoli*, housed in various public and private collections.

Another goblet painted in the same *Last Supper* by the Renaissance Tuscan artist has a bowl ornamented with a gilt horizontal band between two *lattimo* threads and a gilt horizontal band along the rim while its stem shows a gilt moulded lion's head (Fig. 20a). The foot is, also, decorated with a gilt band. Some Italian Renaissance artists, Tiziano, Romanino, Moretto, Bachiacca and Allori (Fig. 20c), depicted colourless glass vessels with gilt horizontal bands. Moreover, vessels with gilt rims are, frequently, mentioned in Muranese glassworks papers throughout the 16th century, for example, in Bortolo d' Alvise's inventory (1569) «*Gotti del duca con loro* [*l'orlo*, that's the rim] *d'oro* n. 17» (Goblets of the duke with gilt rim n.17) are recorded[74]. Therefore, vessels with gilt horizontal bands on rims and

[74] For Tiziano, *Diana and Atteone* (1555-1559), Edinburgh, National Gallery; Romanino, *Last Supper* (1542-'44), Montichiari, Chiesa di S. Maria Nuova, and Moretto, *Supper at Simon Pharisee house* (1544), Venice, Chiesa della Pietà, formerly San Giorgio in Alga convent; Bachiacca, *Moses* (1525-1540), Edinburgh, National Gallery; see Tonini, 2001: 58-60, figs. 4-7; Barovier Mentasti 2006: 90, 115-116, figs. 9-10, 50-53. For Bortolo d'Alvise's inventory see Zecchin 2009: 33.

feet cannot be attributed, solely on the basis of this type of decoration, to the Netherlands (Antwerp) or to glassworks working à la Façon de Venise, as stated for a goblet in the Musée des Arts Dècoratifs in Paris[75]. Goblets and dishes with horizontal gilt bands between *lattimo* threads, are very often diamond point-engraved. Sometimes, they are made in ice-glass without any engraving. Such vessels are, usually, attributed to Venice by glass scholars[76].

Among the archaeological findings of the Venetian lagoon, one of them housed in Ca' d'Oro (Fig. 21), there are some filigree fragments belonging to vessels which were mould blown (Figs. 16; 21a). Due to this kind of blowing in a mould, the *retortoli* and the white canes of these vessels look not straight as usual but with an irregular path, as seen in a goblet of Brescia Musei Civici (Fig. 22). Generally, these *filigrana* vessels moulded with gadroons, bosses, beasts (lions, dragons) or square projections, are made in Murano and dated between the second half of the 16th century and beginning of the 17th[77]. Most part of scholars attributed the pieces of this kind definitively to Venice, few proposed that the pieces might have been made in Venice or in the *Facon de Venise* glassworks. Some pieces with wavy filigrana have been attributed to the Kasseler Venezianerhutte in Kassel or to the Netherlands[78]. The Kassel glass furnace was active only for two years (1583-1584) and only one goblet with a wavy *filigrana* decoration and with crystal bosses set with turquoise glass 'pearls' has been attributed to this glassworks[79]. Possibly, the attribution to this glassworks is

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[75] Baumgartner 2003: 92-93, no. 41.

[76] Tait 1979: 98, nos. 150-151, 130, 131: 224; Laméris 2015: 64-71. In the latter catalogue only one piece of the group (p. 43, no. 25), a reliquary or a drinking glass, without engraving, has been attributed to Venice or *Façon de Venise*. A Venetian origin seems more consistent.

[77] Tait 1979: 68, no. 88; Bauer and Gabbert 1980: 77, no. 149; Barovier Mentasti and Dorigato 1982: 122, no. 160; Ritsema van Eck and Zijlstra-Zweens, 1993: 66, no. 82; Barovier Mentasti and Tonini 2012: 98, nos. 26-27.

[78] Theuerkauff-Liederwald 1994: 225-226, nos. 196-197; Baumgartner 1995: 103-104, nos. 190-191 and the V&A website regarding a *tazza* (inv. no. C.202-1936) http://collections.vam.ac.uk/item/O3346/tazza-unknown/.

[79] Dreier 1969: fig. 9; Scherner and Cossalter-Dallmann 2016: 52-53. The Kassel glassfurnace (1583-'84) was run by Francesco Varisco, a Murano glassblower coming from Copenaghen and by others glassblowers from the Netherlands.

due to the detail of the turquoise glass applications, a characteristic found in other glasses, such as a goblet in gold and filigree of the British Museum, usually attributed to *Façon de Venise*, Antwerp[80]. It is important to underline that in this period the glassworks operating in Murano were more than forty. Moreover, other archaeological findings of wavy *filigrana* have been found in an area in proximity to the Venice republic: a white and *cristallo* wavy *filigrana* in the Rocca of Montefiore Conca (Rimini), where several glass fragments have been recovered and a wavy blue and white canes beaker fragment in Lugo di Romagna (Ravenna)[81]. Montefiore was under the Malatesta Signoria during the 15th century, for a short period under the Serenissima (1504-1506) and then ruled by the Pope. Meanwhile, Lugo di Romagna was ruled by Este dukes until the end of the 16th century. The fragment of the beaker with white and blue canes coming from Lugo has been analysed by Marco Verità and is also consistent with a Venetian origin[82]. This fragment has a blue and white *filigrana* pattern, almost identical to that of a bowl housed in the Musei Civici of Brescia (Fig. 23).

Among the findings from the Venetian lagoon, there is another glass fragment of a different wavy *filigrana* (Fig. 16). It has significant similarities to the *filigrana* pattern of a vessel kept in the Germanisches Nationalmuseum of Nuremberg (Fig. 24).

6. *Conclusions*

Contemporary researches and studies on *filigrana* are, mainly, based on Luigi Zecchin's writings. Nonetheless, many questions, particularly, regarding the dating and attribution of individual filigree glass vessels, housed in public and private collections, which weren't Zecchin's main interest, are, still, open and unresolved.

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[80] Tait 1991: 171, no. 218.

[81] *Sotto le tavole dei Malatesta* 2012; Guarnieri 2007: 123-125.

[82] See Verità, Zecchin and Tesser 2018 in this volume: fig. 2.

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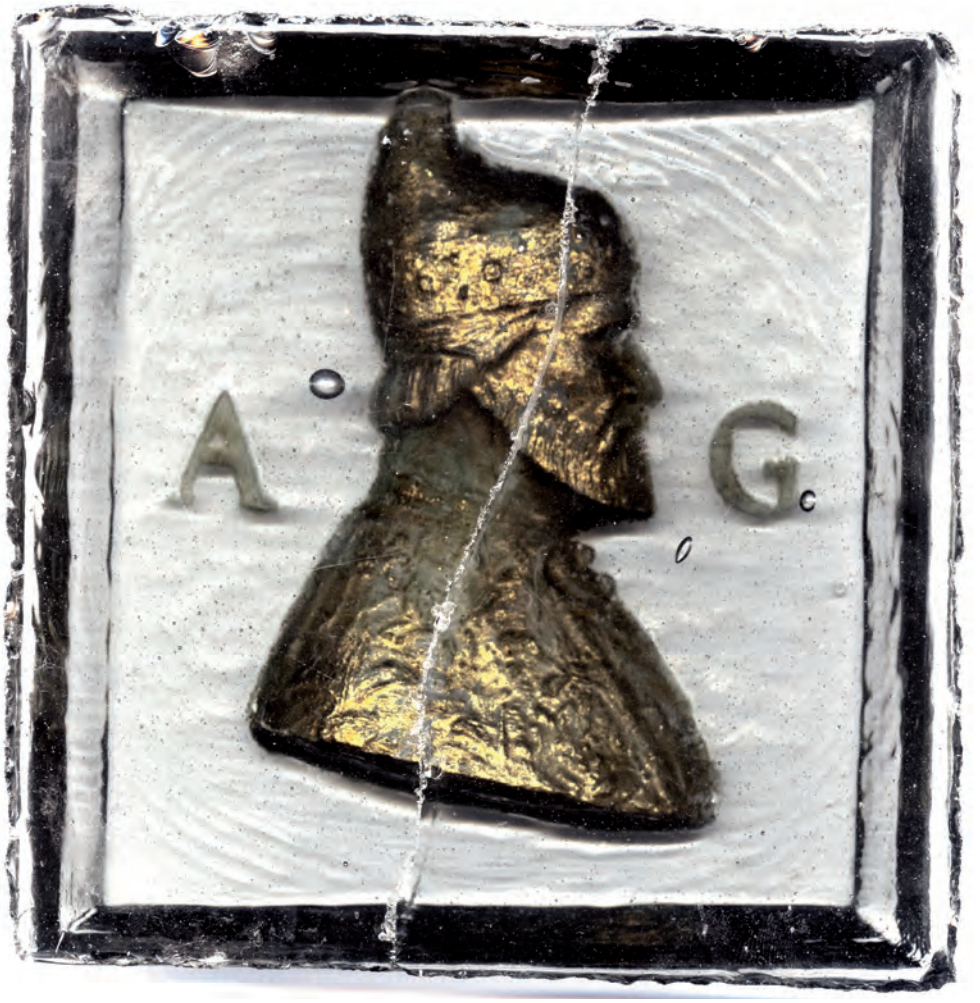

Fig. 1 - Serena, *Gilt cast tile with the portrait of Doge Andrea Gritti*. Murano, Museo del Vetro, inv. no. cl.VI 003 (courtesy of).

Fig. 2a - Marco Moro, *Palazzo Zen in Venice*, detail, engraving 1866.
Fig. 2b - *Palazzo Zen in Venice*, 1533-1553, detail. The bas-relief decorating the cornice of Zen Palace recalls the travels of eminent family members in Eastern countries.

Fig. 3 - Venetian unknown artist, *Suleiman the Magnificent,* woodcut, Venice, 1535-1550. New York, Metropolitan Museum of Art, inv. no. 42.41.1 (from the catalogue Carboni 2007).
Fig. 4 - *Twisted glass handle*, finding from Padua S. Chiara convent.

Fig. 5 - *Hellenistic bowl*, 225-100 BC. Corning, Corning Museum of Glass, inv. no. 66.1.235 (courtesy of).
Fig. 6 - *Retortoli goblet*, 1540-1550. Varese, Sacro Monte, Museo Pogliaghi, inv. no.833 (courtesy of).

Fig. 7 - Bonifacio de' Pitati, called Bonifacio Veronese, *Wedding at Cana*, 1540-1550, detail. Venice, San Giacomo dell'Orio.

Fig. 8 - *Retortoli reliquary*, 1530-1550. Murano, Museo del Vetro, inv.no. Cl VI n. 1104 - 1105 (courtesy of).

Fig. 9 - *Retortoli reliquary,*1530-1550. Assisi, Museo Tesoro della Basilica di San Francesco (©Archivio Fotografico del Sacro Convento di San Francesco in Assisi).

Fig. 10 - *Retortoli goblet*, 1540-1550. London, Victoria & Albert Museum, inv.no. 1820-1855 (courtesy of).

Fig. 11 - Bonifacio de' Pitati, called Bonifacio Veronese, *Last Supper*, 1532-1536, detail. Milan, Pinacoteca di Brera, formerly in Venice, Certosa, S. Andrea.

Fig. 12 - *Reticello goblet*, 1550 ca. Brescia, Musei Civici, inv. no. VT 49 (© Archivio fotografico Musei di Brescia Fotostudio Rapuzzi).
Fig. 13 - *Islamic-shaped lamp*, 1550-1580. Istanbul, Turkish and Islamic art museum (from the catalogue Bellingeri and Olcer 2009.
Fig. 14 - Alessandro Bonvicino, named il Moretto*, Supper in the House of Simon Pharisee House*, 1544 ca., detail. Venice, La Pietà, formerly in San Giorgio in Alga convent.

Fig. 15 - *Retortoli salt-cellar*, 1540-1550. Limoges, Musée National de la porcelaine (from *Revue Sèvres* 2014, no. 23).
Fig. 16 - *Glass findings from Venetian lagoon*. Private collection.

Fig. 17 - *Retortoli salt-cellar*, 1560-1570. Milan, Civiche Raccolte d'Arte Applicata Castello Sforzesco, inv. no. V.153 (courtesy of).

Fig. 18 - *Goblet with a retortoli band*, last quarter 16th century. Murano, Museo del Vetro, inv. cl. VI no. 1098 (courtesy of).
Fig. 19 - *Glass finding from the Venetian lagoon*. Private collection
Fig. 20 - Alessandro Allori, *Last Supper*, 1582 ca., detail. Bergamo, palazzo della Ragione, formerly in Bergamo, Astino convent (courtesy of).

Fig. 20 a-b-c - Alessandro Allori, *Last Supper*, 1582 ca. Bergamo, palazzo della Ragione (courtesy of), formerly in Bergamo, Astino convent, details: a) one colourless goblet with a horizontal band of *retortoli* on the bowl; the other with a gilt horizontal band between two *lattimo* threads and a gilt moulded lion's head stem; b) one colourless goblet possibly with a horizontal band of *retortoli* or a colourless applied pinched thread; c) colourless goblet with two *lattimo* threads and handles on the bowl; the other, colourless, with gilded knop and with gilt bands on the bowl and on the foot.

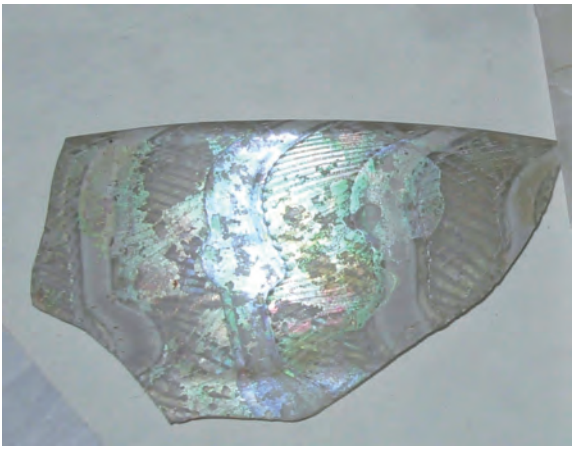

Fig. 21a - *Glass finding from Venetian lagoon*. Venice, Ca' d'Oro, inv. no. 157 (courtesy of).
Fig. 21b - *Glass finding from Venetian lagoon.* Private collection.
Fig. 22 - *Retortoli goblet*, second half of the 16th- beginning 17th century. Brescia, Musei Civici, inv. no. VT 52 (© Archivio fotografico Musei di Brescia- Fotostudio Rapuzzi).

Fig. 23 - *Retortoli bowl,* second half of the 16th- beginning 17th century. Brescia, Musei Civici, inv. no. VT 165 (© Archivio fotografico Musei di Brescia- Fotostudio Rapuzzi).
Fig. 24 - *Retortoli glass vessel,* late 16th- beginning 17th century. Nuremberg, Germanisches Nationalmuseum, inv. no. Gl 98 (courtesy of).

António Pires de Matos, Andreia Ruivo, Augusta Lima, Cesare Toffolo, Emmanuel Babled, Cristiano Ferro, Gianni Seguso, Joana Silva, Joaquim Marçalo, Luís C. Alves, Prashant Dabas, R. C. da Silva and Robert Wiley

STUDIES OF THE WHITE OPAQUE GLASS USED IN *FILIGRANA* GLASS

In this work a preliminary study was made on a few samples of white opaque glass used in Murano (Venice, Italy). Opacity in glass is the result of the precipitation of crystalline or colloidal compounds, in the cooling process, which impede the transmission of light. From earlier times, in which antimony-based opacifiers were used, the transition to the preferential use of tin-based compounds was observed[1]. The first elements used as opacifiers in Murano were lead and tin made by their calcination (lead-tin calx)[2]. According to Verità[3] a mixture of lead and tin in the proportions of 1/2 to 1/1 was added to the transparent glass, resulting in formation of a white opaque glass due to the dispersion of cassiterite microcrystals. This type of glass was known in Venice by the name of *lattimo*. Later in 1527, a new technique was invented in Murano and filigrana canes were made using rods of transparent glass with a core of lattimo. Citing Marco Verità[4], «Lead tin calx continued to be used in Murano until the 19th century, partially replaced by other opacifiers such as calcium antimonate (from middle of the 16th century), calcium phosphate (bone ash) (second half of the 15th century) and lead arsenate (from 1693)». Until recently several studios and factories

[1] Moretti-Hreglich 2007: 167-176.
[2] Tite *et al.* 2008: 67-84.
[3] Verità 2017.
[4] *Ibid.*

used canes for the technique of filigrana where the white opacifier was lead arsenate (known as smalto) which is now forbidden due to its toxicity. A few examples of reproduction of ancient glasses made in Murano by Glass Masters in this century are shown in Fig. 1. A new white opaque glass without arsenic was tested in one glass studio but when the canes are made by stretching the glass, the white colour fades slightly and so, its use for reproduction of historical and creation of new objects is not so satisfactory. The elimination of arsenic in the composition is a major problem as it is very difficult to develop an arsenic free white opaque glass with the same optical and glass working properties as the previous arsenic containing ones. Fig. 2a shows two Seguso Gianni Studio made objects demonstrating the difference between the arsenic white opaque and a more recent formulation. Reflectance spectra were obtained to compare three glass samples, one without arsenic and the other two with arsenic. From Fig. 2b it can be concluded that the glasses containing arsenic have a higher reflectance in the visible region. Both types of glass were analysed by scanning electron microscopy (SEM), Fig. 2c, which showed that the glass with arsenic has homogeneous crystals in the surface observed.

Another problem is the production of arsenic free opal glass used by one of the authors (EB) in aquamarine objects. At present there is no suitable substitute produced in Murano. Currently in industry calcium fluoride, zirconim oxide and titanium oxide, among other compounds, are being used as opacifiers but, as far as we know, they were not yet used for filigrana decoration in Murano. In this work, several samples of white opaque glasses used in Murano to produce canes with sodalime silicate were studied as well as two samples also of white opaque glasses from China and USA to be used in borosilicate glass canes. Preliminary analyses were made using microX-ray fluorescence (μ-XRF) and Fourier-transform ion cyclotron resonance spectroscopy (FTICR) in several samples and it was concluded that the opacifiers for the lattimo used for filigrana decoration of sodalime silicate glasses contained arsenic or phosphorus. Further complete analysis using micro-PIXE, Rutherford Backscattering Spectrometry and Nuclear Reactions Analysis (for boron assessment) were made,

and the results confirmed that the opacifiers mentioned above were present in the soda lime glass however the borosilicate ones contained zirconium.

A preliminary determination of the coefficients of thermal expansion (COE) of all the glasses was made using a dilatometer and the values obtained are shown in Table l.

Despite the difference of the COE values of the samples F2a and F2b, an empirical test showed that they are compatible. The compatibility between two glasses depends not only on the COE value but also on the viscosity. Unfortunately we had no values for the viscosity of the samples studied.

1. *Additional Comments*

Building on these preliminary results, the next step will focus on the preparation of glasses with new compositions without arsenic, to some extent based on several recipe books, but always avoiding, as much as possible, the trial and error processes in large pots, owing to the cost. So, small samples around 200g to 500g shall be prepared in a gas furnace and after analysing their compositions, COE and viscosities determined.

Having in mind the results obtained to prepare a glass with a desired COE and viscosity the batch compositions will be adjusted by varying the quantities of the compounds used as each one contributes to both those properties (COE and viscosity) differently. Some empirical determinations may help to speed up the process avoiding expensive analysis.

Finally, it should be added that once the experiments with small samples will come to a conclusion, tests with the successful batches will be scaled up in large furnaces, a verification deemed necessary as the melting atmospheres over the larger volumes may be different and affect the outcome of the processing.

2. *Acknowledgments*

Thanks to Daniela Nunes Gomes from CENIMAT/FCT NOVA for the SEM analysis, to Luisa Toffolo who helped in contacts with Glass Masters of Murano, Alice Fuin who sent us her Thesis "La Lavorazione a Filigrana, nell'Arte Vetraia Muranese Fra il XVI E IL XVIII Secolo", and to the following Masters/Studios not co-authors of the communication who kindly sent photos of their work, Davide Fuin, Giuliano e Roberto Ballarin, Vetreria d'Este and Seguso Vetri d'Arte.

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Tab. 1 - Coefficients of thermal expansion of different glasses.

Type of glass*	**COE ($x10^{-7}$ $^{o}C^{-1}$)**
F1a white opaque without arsenic	119
F1b white opaque with arsenic	108
F1c transparent glass	115
F2a white opaque with arsenic	97
F2b transparent glass	107
F3Ch white opaque for borosilicate	38
F4US white opaque for borosilicate	35

*Glass Samples from Murano glass factories F1 and F2 and two samples of white glass imported for work with borosilicate glass F3Ch and F4US.

Fig. 1 - *Venetian art works using canes with white opaque glass*; a) Courtesy of Giuliano e Robert Ballarin Studio; b) Courtesy of Seguso Vetri d'Arte Studio; c) Courtesy of David Fuin Studio; d) Courtesy of Vetreria d'Este; e) Courtesy of Toffolo Studio (borosilicate glass).

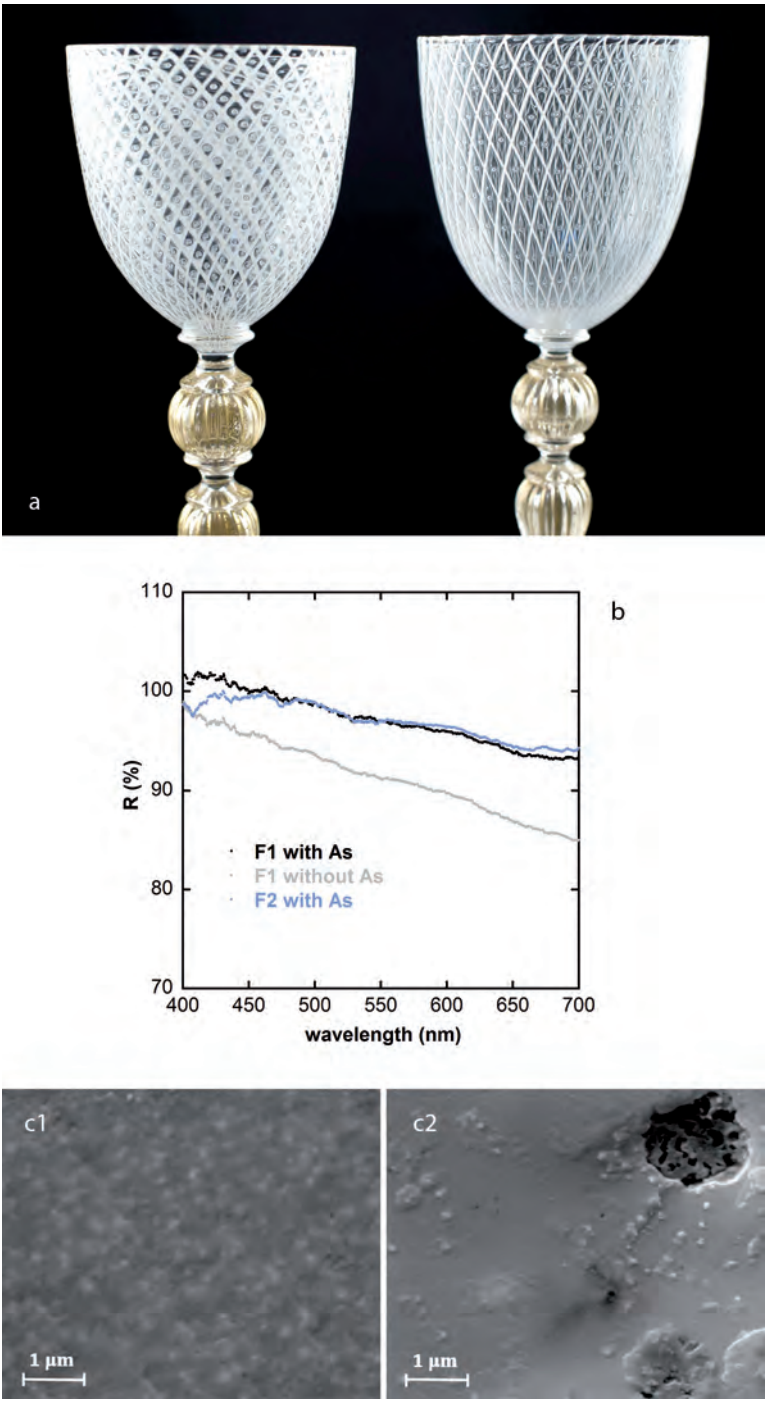

Fig. 2 - a) *Glasses made using opaque white glass, the left one without arsenic and the right one with arsenic.* b) *Diffuse reflectance spectra of the samples F1 with arsenic, F1 without arsenic and F2 with arsenic.* c) *Scanning Electron Microscopy of samples F1b with arsenic (left) and F2a without arsenic (right).*

Kitty Laméris

TALKING CANES

Since 2012 I have been researching *filigrana* glass. One of the things I am studying is whether canes can tell us something about the glasses they are used in. I am currently still busy with my research and would like to publish it in the near future. In this article I would like to expound on part of my research and on the basis of one example, show how I am studying filigree glasses and their canes.

It would be interesting to see if certain types of canes could help us in dating glasses. At the end of the seventeenth century a new type of cane decoration was produced, a cane with an internal decoration made up of a row of little balls, called *ballotini*[1]. If you see a *ballotini* cane in a glass, the cane tells you that the glass was not made in the sixteenth, or early seventeenth century. Only by seeing these canes one can date a glass.

If this holds for one type of cane, there might also be other types of canes made only during a certain period or in a certain place. Canes could become a tool to date glasses or determine their place of manufacture. The presence of a certain type of cane in a glass might sometimes indicate the country or even the city where a glass was made.

In order to let canes tell their story, it is important to establish what particular kind of canes were used in the sixteenth, seventeenth and eighteenth centuries. The possibilities are endless. When one examines filigree made today and in the twentieth century, it is evident that many of these possibilities are used to their full extent. Hundreds of types of canes are produced in all imaginable colours, some even combined with gold *avventurina* glass.

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[1] Laméris 2012: 38; Laméris 2015b: 544.

Studying the filigree glasses of the sixteenth, seventeenth and eighteenth centuries, one would expect to see the same countless range of different canes. Surprisingly enough this is not the case. A much more limited variety of canes was used in the early days.

For this paper about 3000 filigree glasses and shards were studied. Some from real life[2], others only from pictures. It is striking how few coloured filigree glasses were made in the sixteenth and seventeenth centuries, especially in Venice, compared to the number of white filigree glasses. Interestingly enough, the variety of coloured canes used in these limited number of glasses is large. This paper focuses on the white canes.

Of each *filigrana* glass the various canes were studied. They were divided into three groups (Fig. 1 and Fig. 2):

- canes with an internal decoration (ID): one or more white threads in a colourless cane.
- canes with an external decoration (ED): one or more white threads around a colourless cane.
-mixed canes (MC): a combination of the two.

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[2] I am very grateful to all the curators that allowed me to study filigree glasses from real life in the collections of the following museums: Museen der Stadt Wien Stadtarchäologie, Vienna; British Museum, London; Glasmuseum Hentrich, Museum Kunstpalast, Düsseldof; Kunsthistorisches Museum Vienna; MenA, Monuments and archaeology, Amsterdam; Museo Bagatti Valsecchi, Milan; Museo di Capodimonte, Napels; Corning Museum of Glass, Corning; Gemeentemuseum, Den Haag; Metropolitan Museum, New York; Museo della ceramica Duca di Martina in villa Floridiana, Napels; Museo del vetro Murano, Venice; Musée national de la Renaissance, Château d'Écouen, Écouen; Museum Boijmans van Beuningen, Rotterdam; Musée du Louvre, Paris; National Museum of Ancient Art, Lisbon; Rijksmuseum, Amsterdam; Stadtarchäologie Hall in Tirol; Stichting Cultureel Erfgoed Zeeland, Middelburg; VICARTE Conservation and Restauration Department of the Faculdade de Ciências e Tecnologia, Universidade Nova de Lisbon (FCT/UNL); Victoria and Albert Museum, London; Wallace collection, London. Furthermore I would like to thank all the private collectors who kindly invited me to their homes to study their *filigrana* glasses.

1. *Sixteenth and seventeenth century canes* (Fig. 1)

Internal Decoration

Glasses from the sixteenth or seventeenth century decorated with canes using an internal decoration are practically limited to one type of cane: the *a fili* cane (ID.a). This cane is made with three layers: a colourless core, a white layer and a colourless outer layer. The second cane (ID.b) is extremely rare and up till now was found in only two glasses[3].

ID.a - *a fili* cane, a cane with a white thread.
ID.b - a cane with three straight threads next to each other.

External Decoration

Sixteenth and seventeenth century glasses can also be decorated with canes with external decorations. There seem to be four types. The cane with two threads (ED.d) mostly appears to have been used in a somewhat different way to other canes, and does not seem to belong to the same group as the other canes with external decoration. This will be further explored in a future publication.

ED.a - *a rete* cane, a cane with a decoration of several threads around a colourless core[4]
ED.b - a cane with one band of several threads
ED.c - a cane with two bands of several threads
ED.d - a cane with two crossed threads

Mixed Canes

The mixed canes are a combination of an internal decoration of one or two *a fili* canes together with an external decoration of one or two bands of several threads. The *a fili* thread can be put in the middle of a cane or off centre causing it to waver.

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[3] One of them is published in Lhermite 2013: 53.

[4] The name 'rete' describes the appearance of the cane: 'rete' is the Italian word for net.

MC.a - one *a fili* with one band of several threads
MC.b - one *a fili* with two bands of several threads
MC.c - one wavering *a fili* with one band of several threads
MC.d - one wavering *a fili* with two bands of several threads
MC.e - two wavering *a fili* with one band of several threads
MC.f - two wavering *a fili* with two bands of several threads

It is very well possible that from this period more types of canes exist. Some of the canes depicted here were found only on a single glass, for example the mixed cane with an internal decoration of one *a fili* cane together with an external decoration of one band of several threads (MC.a). Until today I have only seen it on a wineglass in the Corning Museum of Glass: inv.no 79.3.371. There are probably other glasses with this type of cane decoration, as there might well be glasses with different types of canes that have as yet not been identified[5]. However, the mixed canes distinguished up till now are the most obvious combinations of the most frequently used cane with internal decoration ID.a: the *a fili* cane, together with two types of external decorations (ED.b and c). The second early period cane with internal decoration, the cane with three straight threads (ID.b) does not occur in mixed canes in combination with an external decoration. It seems that in early period glasses a mixed cane, consisting of an internal decoration of *a fili* together with an external decoration of *a rete*, does not exist. This seems logical because the *a rete* canes in early period glasses are made with comparatively thick threads, so they would cover the *a fili* thread inside the cane and make it almost invisible[6].

The canes depicted here are prototypes. Descriptions are given of the general basic forms of each type. Several versions of each type of cane can and often do exist. For example, the a fili canes (ID.a) can

[5] This was immediately substantiated during this IVSLA congress in Venice where Francisca Pulido Valente showed a cane on a shard found in Lisbon (Largo do Chafariz de Dentro) which is probably a different extra type of cane. See the publication, Pulido Valente *et al*. in this volume, Fig.1, LCD_038. Please let me know if you encounter a different type of cane decoration. I would be very interested to see it and add it to the collection of early period canes that currently have been distinguished.

[6] This combination was utilized only much later, somewhere in the eighteenth century, when the threads became much thinner.

be differentiated as having a thick or a thin white thread. There are *a rete* canes (ED.a) with different numbers of threads, in narrow and broader versions. The threads can be of different thicknesses, like the canes themselves. These differences may also indicate a different time or place of manufacture.

In these early period glasses the *a fili* canes (ID.a) and the *a rete* canes (ED.a) are by far the most frequently used canes. There are glasses decorated with only one of the two types of canes or a combination of the two. All other canes are relatively rare.

2. *Canes made around 1700 (Rosenborg castle type)* (Fig. 2)

In 2012 research showed that the cane with the internal decoration of *ballotini* (ID.c) was invented only at some point in the second half of the seventeenth century[7]. These distinctive canes were first used in the glasses of the Rosenborg castle type. According to Marco Verità, this was probably the result of a new type of *lattimo* that was mentioned in recipes dating from 1693[8].

Internal decoration

Around 1700 we see two canes with internal decoration: the *a fili* cane (ID.a) and the *ballotini* cane (ID.c). In the Rosenborg castle type glasses, the *a fili* cane is used very rarely.

ID.a - *a fili* cane, a cane with a white thread.

ID.c - *ballotini* cane, a cane with a sequence of little balls made of several threads

External decoration

Differentiating between different types of canes for the current research, did immediately uncover two more canes that only started to be used in the later *filigrana* glasses, both with external decoration:

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[7] Laméris 2012: 38.

[8] See Verità, Zecchin and Tesser 2018 in this volume.

ED.e a cane with three bands of several threads and Ed.f a cane with four bands of several threads.

ED.a - *a rete* cane, a cane with a decoration of several threads around a colourless core
ED.b - a cane with one band of several threads
ED.c - a cane with two bands of several threads
ED.e - a cane with three bands of several threads
ED.f - a cane with four bands of several threads.

Mixed canes

Another new cane that came into use around 1700 is a mixed cane with *ballotini*: a cane with an internal decoration of *ballotini* and an external decoration of two bands of several threads. The appearance of this cane can differ a lot, so much as that looking at different canes of this same pattern, they seem to be different types of canes[9]. But the base form is always the same: *ballotini* with two bands of threads around the cane.

Several mixed canes seem to have gone out of fashion in favour of this mixed cane with *ballotini*. We do not see any more mixed canes with straight *a fili* threads in the middle (MC.a and b) or complex canes with two wavering threads (MC.e and f).

MC.c - one wavering *a fili* with one band of several threads
MC.d - one wavering *a fili* with two bands of several threads
MC.g - *ballotini* with two bands of several threads

3 *«A facete a retortoli a fil»*

The next step is to research all different types of filigree glasses: what type of cane is used in which type or shape of glass. If these different groups can be dated, or by a datable filigree piece in the group or by comparing them with datable glasses made with different techniques and decorations, that have a similar shape, then these

[9] See for example Lameris: 22, 23, canes B, C, F and G.

glasses and the canes used in them can probably be attributed to the same period as well.

It might be interesting for instance to try to find out what type of canes were the first canes ever made in Murano. What were the glasses «a facete a retortoli a fil» Filippo and Bernardo Serena are talking about in 1527[10]?

To investigate what were the first canes made, we first should try to understand which glasses were the first filigree glasses. Once we know that, we could research which types of canes were used to make these glasses, in order to understand which were the first canes made in Venice. In the first half of the sixteenth century, the period in which the filigree glasses were invented in 1527, glass decorated with enameling and gold were of course very fashionable. These glasses occur in various shapes. Some of these shapes were also executed with canes, for example, footed bowls, the large goblets consisting of a bowl on a foot or variations of this type with rudimentary stems, as well as deep fruit bowls, pilgrim flasks and footed dishes. Here the focus will be on the first example: the footed bowls (Fig. 3).

Baumgartner states in his *Reflets de Venise*: «Der becher auf Fuss is einer der 'klassischen' Typen im Formenrepertoire der venezianischen Glasmacher»[11]. Only very few filigree glasses of this form do exist. The few existing examples are made in various versions. Mostly they have the same features as their enameled counterparts: the hatched glass thread on the foot of the bowl and/or the colourless broad glass band added to the foot rim. If they are covered even the covers are very much alike. They all have a solid colourless knop that is connected to a hollow knop and a broad outwardly foulded rim to rest on the opening of the bowl. Except for the added solid knop, the covers are made out of one piece.

The Österreichisches Museum für Angewandte Kunst in Vienna holds a goblet with a large bowl with flat base, directly attached to a trumpet-shaped foot (Fig. 3 A2). There are several glasses with enamel

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[10] Archivio di Stato di Venezia, *Consiglio dei X*, Parti Comuni, filza 6, n. 84, quoted in Zecchin 1987, Vol. I: 213.

[11] Baumgartner 2015: 55.

decoration of the same shape. One is depicted in *Reflets de Venise*[12] (Fig. 3 A1). The shape is very similar to the filigree glass and it has some of the same features, like the hatched band on the base of the bowl and the colourless band added on top of the rim of the foot.

In the description of the glass with enamel decoration, Baumgartner compares the glass with several datable examples. He mentions for example a painting in the Kunsthistorisches Museum in Vienna dated 1537, of Albrecht Altdorfer with a similar glass depicted on it and a glass in the Musée des Arts Décoratifs in Paris with the coat of arms of one of the Medici popes, either Leo X, who was pope from 1513 to 1521 or Clemens VII, who was pope from 1523 to 1534[13].

There are two covered filigree goblets of the same period, with a slightly different large bowl and a smaller foot, with in between a rudimentary stem consisting of a flattened filigree knop between two colourless solid *avoglio* like mereses (Fig. 3 B2 and B3)[14]. A comparable covered goblet with enameling decoration is held in the Museo Civico of Brescia (Fig. 3 B1)[15].

The most distinctive features of these glasses are the solid segments in between knop and bowl and knop and foot. The glass of the Museum in Brescia is blue and dated second half fifteenth century. There are several colourless glasses with comparable segments used to join bowls, knops and feet. For example three of them are depicted in *Reflets de Venise*[16]. Baumgartner dates them respectively second or third quarter of the sixteenth century, 1520 or 1530 and second third of the sixteenth century. All three dates would coincide with the date of the first post 1527 filigree glasses.

The Musée Curtius in Liège holds yet another type of early filigree footed bowls, this time with a three-ringed knop (Fig. 3 C2)[17]. Several colourless enameled goblets of this shape are known, usually with a three ringed mould blown knop. An example with the coat of arms

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[12] Baumgartner 2015: 55-57, no. 10.
[13] Baumgartner 2015: 55.
[14] Hettes 1960. no. 66; Drahotová 1983: 44, no. 18.
[15] Barovier Mentasti 1982: 73, no. 62.
[16] Baumgartner 2015: 92, 93, no. 28; 94, 95, no. 29; 97, no. 30.
[17] Chevalier 1999: 49, nos. 54, 55.

of Georg Kopidlnansky von Kopidlnahe is dated 1511[18]. The glass depicted here (Fig. 3 C1) is in a private collection and reminds of a similar piece in the Corning Museum of Glass (accession no. 53.3.38).

It seems that these pieces belong to the first filigree pieces ever made. If this is the case we can deduce what kind of canes were the first canes that were made in Venice. The bodies of these glasses are all decorated with *a rete* canes (Ed.a), sometimes alone (Fig. 3 A2, C2), sometimes alternating with *a fili* (ID.a) canes (Fig. 3 B2, B3).

It is interesting to see that the Venetian glassblowers immediately use both canes to decorate their glasses. The two different combinations make a completely different pattern.

Right from the start three types of decorations seem to be used: a decoration of straight canes (Fig. 3 A2, C2), of diagonal canes (Fig. 3 B2) and a mould blown variation (Fig. 3 B3).

On one of these glasses a third type of cane is found: a cane with an external decoration of a single band of several threads (ED.b). It is not used to make the body of the glass, but it is put around the base of the bowl of the glass with the three-ringed knop (Fig. 3 C2), instead of a hatched band.

Except for glass B3 none of these filigree glasses were studied yet in real life for this research. It would be interesting to investigate them, count the canes, check if they are made with two or one layers and to study the type of *a rete* canes they were made with. Anyway, working with these glasses will bring us very near to the people that invented this technique.

In October 1527 the Serena brothers asked permission to the Council of Ten to the exclusive right for 25 years to make glasses in the technique they recently developed. They were granted this for 10 years[19]. Did they succeed in keeping this monopoly? Did in fact nobody else on Murano make filigree glasses, or because they were not allowed to, or because they lacked the practice? In that case we might be looking here at *filigrana* glasses that were actually made in the glasshouse a la Serena.

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[18] Saldern 1965: 32, fig. 5.

[19] Zecchin 1989: 182.

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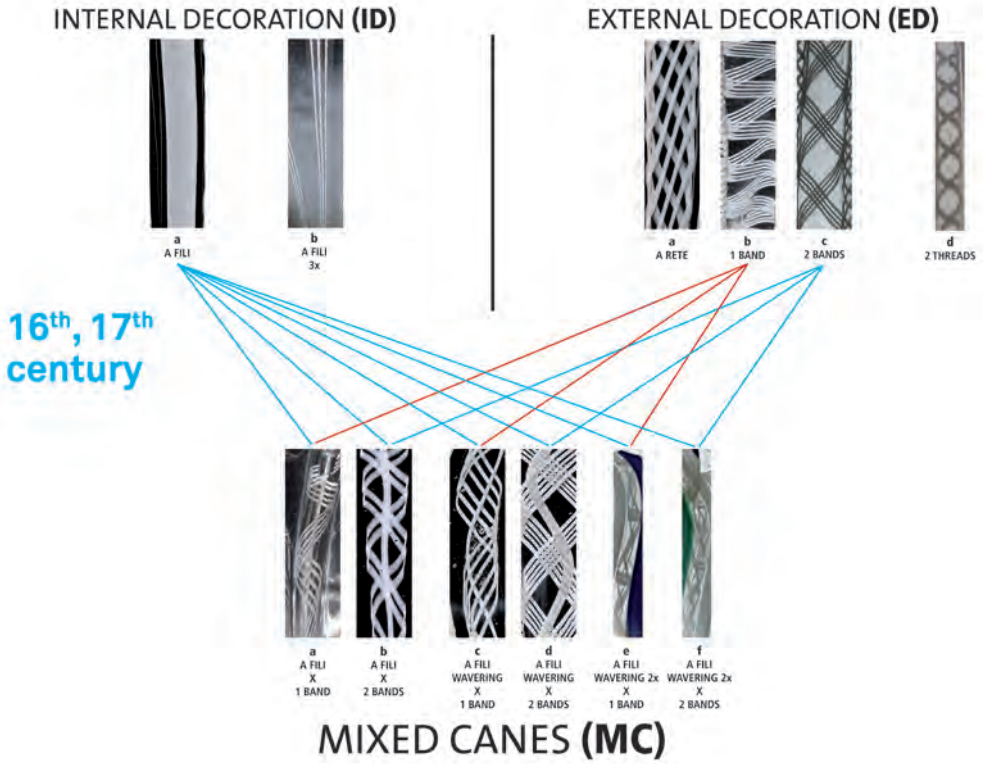

Fig. 1 - Canes used in the sixteenth and seventeenth century.

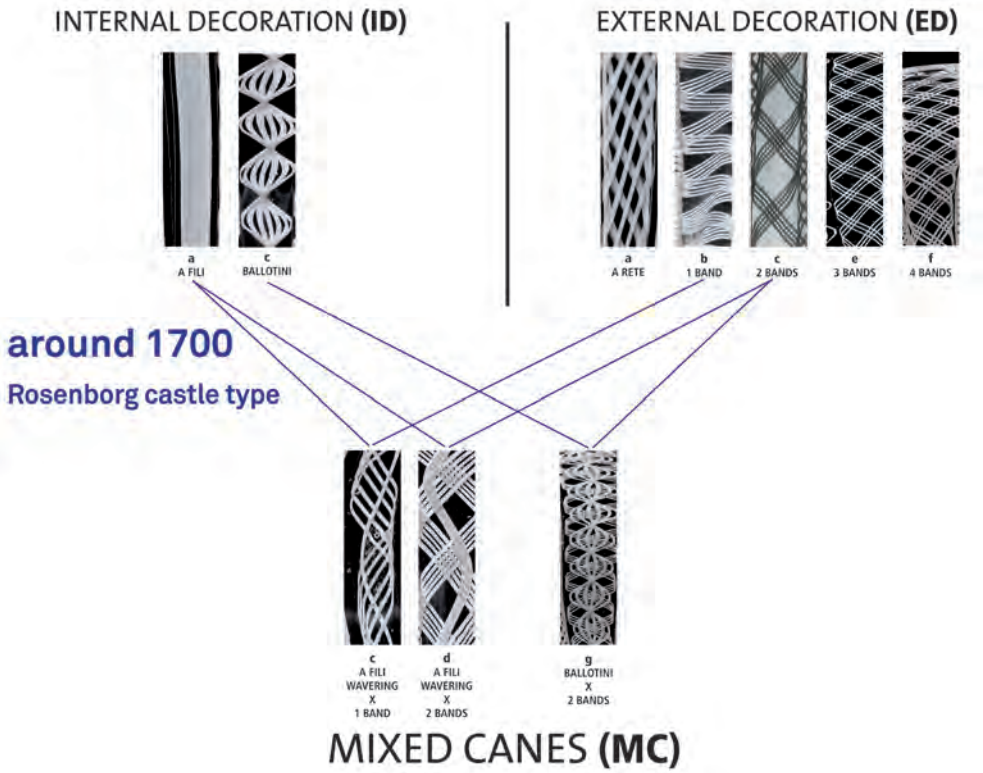

Fig. 2 - Canes used around 1700 (Rosenborg castle type).

Fig. 3 - Glasses with filigrana decoration and their counterparts made with enamel and gold decoration.

A1 Goblet with enamel and gold decoration, Venice, early sixteenth century. H 23.0 cm, D bowl 13.7 cm, foot 11.3 cm (private collection).

A2 Goblet with filigrana decoration of *a rete* canes (ED.a), Venice, second quarter sixteenth century. H 20.6 cm (Gl 661/1869, Arch-Abbey of St. Peter, Salzburg. collection MAK, Museum Angewandte Kunst Vienna, Austrian Museum of Applied arts/Contemporary Art Photo © MAK).

B1 Covered blue goblet with enamel and gold decoration, second half fifteenth century. H without cover 19.0 cm, with cover 29.0 cm, D bowl 13.5 cm, foot 10.7 cm, cover 15.0 cm (Brescia, Museo Civico, inv. v. 94, Legato Brozzoni, Archivio fotografico Musei di Brescia-Fotostudio Rapuzzi).

B2 Covered goblet with diagonal filigrana decoration of alternating a fili (ID.a) and *a rete* canes (ED.a), Venice, second quarter sixteenth century. H with cover 29.2 cm (9671/1906, ex collection Lanna, Kunstgewerbemuseum in Prague).

B3 Covered goblet with mould blown filigrana decoration of alternating a fili (ID.a) and *a rete* canes (ED.a), Venice, second quarter sixteenth century. The foot misses. Goblet: H from avolio until rim: circa 16.5 cm, D bowl 12.7 cm. Cover: H circa 10.2 cm, D widest point 14.5 cm, opening 11.2 cm. (private collection Amsterdam).

C1 Goblet with enamel and gold decoration, Venice, early sixteenth century. H. 19.5 cm, D bowl 11.0 cm, D foot 11.0 cm (private collection, Guernsey).

C2 Covered goblet with filigrana decoration of *a rete* canes (ED.a), Venice, second quarter sixteenth century. Goblet: H 18.8 cm, D bowl: 13.8 cm, foot: 10.2 cm. Cover: H 10.2 cm, D 15.4 cm, H goblet and cover: 27.8 cm (Liège, The Grand Curtius Museum, B/1938a-b).

Helena Brožková and Hedvika Sedláčková

FILIGREE GLASS FROM THE MUSEUM OF DECORATIVE ARTS, PRAGUE: VENETIAN AND REGIONAL PRODUCTION – BRIEF OVERVIEW

The glass collection of the Museum of Decorative Arts, Prague is one of the most valuable series of its kind in both European and world museums. Its foundations were laid by Vojtěch Lanna (1836-1909), an entrepreneur and collector of European renown and, in particular, the initiator of the museum's establishment. Lanna's donations formed the core of many series in the museum, including glass. In 1885 when the museum was established he took a momentous tour of Italy in order to enrich his collection, visiting Padua, Vicenza, Genoa, Brescia, Milan, Pisa and Florence. It yielded several boxes of Italian mezzomajolica, majolica and «Venetian» glass, including filigree glass. A year later Lanna donated to the museum the first specimens decorated with filigree – a cup, a plate, goblets and a vase[1].

Although the collection of filigree glass in the MDA is not exactly large and can hardly compete with Italian series or with the famous collection in Veste Coburg[2], it certainly deserves attention. It currently comprises 120 vessels made by the filigree technique; the largest group comes from Vojtěch Lanna. After individual specimens donated in 1886, the museum acquired in 1906 about 50 vessels of this kind out of 1144 glass vessels and products. A large group among them consisted of items that Lanna had acquired from other

[1] MDA inv. nos. 404, 501, 502, 505, 506 and 519.

[2] Theuerkauff-Liederwald 1994.

collections, especially the Schadow and Franz Bock collections. Apparently, Vojtěch Lanna passed on to the museum the majority of his filigree glass, as an auction held after his death in 1911 in Berlin only featured two goblets decorated with this technique[3].

The museum collection of glass including filigree glass was continuously expanded by other donors, as well as by purchases at auctions and in antique shops, especially before the 1940s. Only few specimens were added later. A major donor in the 1920s was art collector Leon Bondy, followed by Gustav E. Pazaurek a decade later. The last large collection of glass made its way to the museum from the estate of Emanuel Hloupý in 1967.

The museum made the purchases at auctions and in antique shops mainly before 1900, buying glass from L&L Hamburger in Frankfurt (1885), at the auctions of the Felix and Roesch and Zimmermann companies (1886) and from Robert Forrer in Strasbourg (1886). At an auction of the Lempertz company the museum acquired items from the collection of Karl Thewalt from Cologne (1903). The last purchases were made in 1946 and 1948 at auctions in Prague, from antique dealers K. Jeřábek and V. Hořejš.

The collection of filigree glass contains vessels spanning the 16th and the 19th century, with the majority from the 17th century (Figs. 1-2). In terms of origin, Venetian glass prevails, followed by Spanish glass, while Dutch and regional (i.e. Czech and German) products are scarce. Among the Venetian production all types of drinksware and tableware are represented: different variants of goblets, plates and bowls, tazzas, cups and carafes, as well as candlesticks and vases. The oldest specimens from the 16th century include a goblet with a lid. These goblets were exceptional and in the 19th century were provided with metal fittings.

Goblets, beakers and tazzas from the 18th and 19th centuries are decorated with white, red and blue trails, and the collection also features replicas of renaissance shapes from the second half of the 19th century.

Catalonian and Spanish glass from the 18th century is represented

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[3] Sammlung des Freiherrn Adalbert von Lanna, Prag, zweiten Teil. Auktion Lepke, Berlin 21./28. März 1911, Berlin.

by 17 specimens: covered bowls, almorratxa, cantirs (Fig. 3), poróns and jugs, while only a single goblet comes from Hall, Tyrol. Similarly, Dutch glass is only represented by several beakers, one of which has a metal fitting with a mark by the bottom, possibly of a Nuremberg goldsmith (inv. no. 9706).

Approximately ten vessels were made in Bohemian or German glasshouses (Fig. 4); two of them bear coats of arms painted in colour enamel. Little was known about the production in renaissance Bohemian glasshouses around 1900, yet the four-sided bottle with the year «1632» and an unidentified coat of arms can be considered a Czech product (inv. no. 9956). The beaker on a bell-shaped foot with a Saxon coat of arms, a dedication from a shooters' association and the year «1678» was made in a glasshouse in Saxony (inv. no. 9927), as were the tankards with pewter lids. Tall cylindrical bottles clearly belonged with the assortment of Bohemian glasshouses as they have numerous analogies among local archaeological finds. Products made in Bohemian and Silesian glasshouses are baroque faceted goblets (some with lids), the cups and stems of which have marvered red trails.

Filigree glass was first presented to the public in 1885 at the very first exhibition organised in the museum. In 1970, an exhibition involving this glass was prepared on the occasion of the 9th AIHV Congress in Prague. «The Heyday of the Italian Art of Fire» exhibition held at Prague Castle in 1973 was received to a great acclaim, and the catalogue accompanying it including filigree glass is still an important source of information for both Czech and international experts[4]. Countless specimens have been showcased at a large number of exhibitions around the globe, most recently in China in 2014-2017[5]. Filigree glass regularly features in publications on the development of glass and on the renaissance and baroque periods. The museum is currently preparing a comprehensive catalogue to be published in 2019-20.

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[4] Hetteš 1973.

[5] Brožková 2014.

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Fig. 1 - *Goblet with a lid*, 16th century. Prague, Museum of Decorative Arts, inv. 9671, 1906 donated by Vojtěch Lanna (Photo: Gabriel Urbánek).

Fig. 2 - *Goblet with a lid*, 17th century. Prague, Museum of Decorative Arts, inv. 9658, 1906 donated by Vojtěch Lanna (Photo: Gabriel Urbánek).

Fig. 3 - Cantir, Catalonia, 18th century. Prague, Museum of Decorative Arts, inv. 3842, 1890 donated by Vojtěch Lanna (Photo: Gabriel Urbánek).

Fig. 4 - *Tankard with a metal fitting*. Germany, 17th century. Prague, Museum of Decorative Arts, inv. 9684, 1906 donated by Vojtěch Lanna, originally in the Schadow Collection (Photo: Gabriel Urbánek).

Rainald Franz

THE DEVELOPMENT OF FILIGREE-DECORATION IN AUSTRIAN GLASS FROM THE 16TH-20TH CENTURY

The glass decoration technique of filigree has a long tradition in Austrian artistic glass, dating back to the Renaissance. Venetian glass objects imported for the noble courts and the Emperor made the technique familiar and Facon de Venise glass-production with filigree started in glass mills in the Tirol and later in Northern Bohemia. From the 18th until the 20th century, the filigree technique was taken up again and again in order to simulate Venetian glass and to compete with its products. Some of the pieces were even made for export to Venice. The lecture shows examples from the MAK-Collection and Austrian private collections.

Soon after the invention of Filigree glass had been made in Venice in 1527 by Filippo and Bernardo Catani with the help of Francesco Zen and under the impression of antique glass, examples of Venetian Filigree glass were exported over the alps and into the Austrian provinces of the Holy Roman Empire. Like all Venetian Glass of the time, Filigree glass was seen as a luxury good and examples were served on high aristocratic tables or made part of the emerging Kunstkammer collections. Production of luxury glass in Venetian style in the Austrian provinces of the Sacrum Imperium Romanum reached its pinnacle during the lifetime of Archduke Ferdinand II (1529-1595), the second son of emperor Ferdinand I. (1503-1564), who reigned in The Tyrol from 1567 on. So, we are celebrating the 450th anniversary of his entry in Innsbruck this year. Ferdinand II, Archduke of Austria, was not just a regent descended from one of Europe's most influential ruling dynasties who held political office in Prague and Innsbruck. As a commissioning patron he also surrounded himself with European

artists and was instrumental in promoting the Renaissance in central Europe. At Ambras Castle the most striking legacies bequeathed by the cultured humanist and sovereign prince include a unique Renaissance castle ensemble and the Archduke's own collections, specifically the *chamber of art and curiosities*. Ferdinand had the medieval fortress at Ambras modernized and in 1570/71 commissioned additional buildings to house his collections and a large library. Ferdinand's personal patronage for the expensive craft of glass working made the rise of Venetian Fillligree glass produced beyond the Alps possible. Ferdinand was said to practice glass-blowing himself, as becomes clear from the faceted beaker from 1583, still kept in the Vienna Kunstkammer of the Kunsthistorisches Museum today, said to have been blown by him. This followed the 15th century idea of "magnificenza": Renaissance Princes were encouraged to have their skills trained in a luxury craft for their personal education and large expenditures on objects like Venetian Filigree glass were justified by their splendor and scarcity. Production and possession of these luxury goods meant an increase of honor, fame and status for the ruler, as their workshops and products could be shown to state guests upon their visits. We know from documents that Ferdinand made large orders of Venetian drinking glass for his personal table (Mundgläser), Crystal glass goblets, which he kept on credenzas, mixed with rock crystal and silver, in a special paneled chamber, just adjacent to the great hall. The Imperial envoy in Venice of the time, Veit von Dornsberg, was often contacted by Ferdinand to acquire luxurious drinking glasses, made according to the Archdukes designs and specifications. Affluent customers, north of the Alps in the German speaking countries, depended on the services of the large German Merchant houses from Nuremberg and Augsburg. These houses like the Fuggers and Welser merchant families, were represented in the Fondaco dei Tedeschi, the German trade center in Venice, established in 1222-1225. They alone negotiated the trade from Venice through Tyrol for centuries. In turn one of the goods imported from Germany that was used for the Murano glass industry and badly needed, was zaffera, a mineral mixture, produced from Cobalt ore, exclusively unearthed in the mines of Leogang, used as blue colorant for glass. Ferdinand had married Filippine Welser (1527-1580), daughter of

the Augsburg Patrician Bartholomäus Welser, in 1557. As she was of bourgeois birth, he renounced from his right for the imperial throne. After he had taken over the reign of Tyrol in 1564, upon his father´s death, he focused his interest on Venetian glass making in The Tyrol. After shortlived glass houses for Venetian glass had been established in Vienna and Laibach in the first half of the 16th century, in 1534 the Augsburg Patrician and entrepreneur Wolfgang Vittl had founded the first glass factory for Venetian style glass in Hall in the Tyrol. The wood ressources of the region were used for this new factory and he hired Venetian emigrés from Altare near Genoa to produce glass for him. Due to the difficult negotiations with the council of Ten in Venice about the import of Soda, he often had to refer to Genoese imports of the raw material badly needed. As becomes clear from excavations in the city of Hall in the 1990ies, the glass factory of Vittl and his factor, the Augsburg patrician Sebastian Höchstetter, who took over the glassworks upon Vittls death in 1540, produced Venetian luxury glass, including Filligree glass. Also Archduke Ferdinand had already ordered luxury glass in Venetian style for him in Prague. Upon his settlement in Innsbruck in 1567, he visited the Hall glass mill and did not approve of the quality of the current work there. So, for his personal use, Ferdinand referred to Venetian import glass and products of the Innsbruck Imperial glassworks, which he had established in the pheasants garden there in 1570. Venetian glassmakers, appointed by their government, worked there according to the personal wishes of the Archduke. We know the names of Salvatore and Sebastiano Savonetti and Andrea Tudin, who returned to Venice right away after fulfilling their commissions in Innsbruck. Production continued until 1590 and it is well possible that also the barrel – and shipshaped glasses offered to visitors in Ferdinands Bacchus Grotto, installed in 1567 in Ambras, decorated with Filligree – might have been produced in the Court Glass House of Innsbruck. As the Venetian masters seem to have brought their own raw materials for production in Innsbruck, it is almost impossible to discern import pieces and local production. Filligree technique was also used for glass jewellry and brooches, produced in Innsbruck and still kept in the Kunstkammer today. Upon Ferdinands death in 1592, patronage and production came to a halt. By 1620, luxury glassmaking in the Tyrol, which had been

flourishing a generation earlier, had declined to the point that it was no longer an attraction for visitors. The 30 Years War also severly struck the Glass Industry in Venetian Style in the Holy Roman Empire, but Venetian glass was introduced in Bohemia through Austria. Already in the 16th century, we find Filigree technique as used for medieval decanter forms like the Kuttrolf, popular in the North since the 14th century. Filigree glass technique as a Venetian form of decoration was taken up in the Northern Bohemian and Moravian tradition of glass making as a novelty. The northern glass style and technique, dominated by cutting and engraving decoration techniques instead of blowing and melting, found ways to integrate the Venetian style. Glass making treatises, like the translation of Antonio Neris Ars Vitraria Experimentalis or vollkommene Glasmacherkunst by Johann Kunckel (Frankfurt, 1679), transferred the recipies for Filligree glass making to what was to become the heart of central European luxury glass production. Overlay glass and the invention of crystal glass in Bohemia in the late 17th was combined with the newly invented ruby or gold ruby glass. In the decoration of luxurious goblets, ruby glass threads were melted into the clear colorless glass. In other examples, cutting and engraving on the cuppa of the goblet were combined with ruby glass threads in the foot. The Filigree glass was called petinet glass (petty net) and produced in Northern Bohemia like in the Netherlands. A last strong impact from Venice came in the early 18th century. In 1713-1714 Frederik IV of Denmark had a room designed as a Glass Cabinet in Rosenborg castle. Porcelain cabinets of this type were quite common in Europe at the end of the 17th century, but this is the only known glass cabinet. The Cabinet came to hold the exquisite glass collection which Frederik had been presented with by the city of Venice, which he visited in 1709. The architect was Chief Fire Officer Gottfried Fuchs; to display the glass, he built consoles in pyramid shape, covered with marbled paper and edged with festoons of lead gilt. The walls were covered with silk, and on the ceiling was a painting of Bacchus, the god of wine, by Lorenz and Marcus Cardes. The inventory from 1718 lists 235 Filigree glasses from Venice making part of the glass treasure. The winged baroque glasses from Venice were widely copied in Northern Europe and in Bohemia, including their Filigree decoration. With the decay of Venetian Glass Industry

and the ascent of Bohemian export glass, Filigree glass was scarse, only to be taken up as a Venetianizing technique of glass decoration in the late 18th / early 19th century. In the centers of the North Bohemian Glass Industry, in Haida and Steinschönau, only refineries and no glass mills existed. Raw glass was bought and decorated. Biedermeier glass was meant to be thick and heavy, very much the opposite of Venetian glass. In his book on "Glass from the Empire and Biedermeier period", Gustav Pazaurek makes reference to the newly invented techniques to imitate Venetian Filigree. In 1839, the Preußische Gewerbeverein, made by the Pohl family in Northern Bohemia, shows examples of new Filigree glass. In 1839, the "Verein zur Beförderung des Gewerbefleisses in Preusen" (Association to spur the industriousness in Prussia) had a price in a competition for glassmakers to produce glass with decoration in Venetian style with interlaced enamel threads. Paris exhibitions with products from French glass makers like Choisy Le Roi had given the model for this. In 1842, the director of the Schafgott´sche Josephinenhütte, near Schreiberhau Franz Pohl, won the competition with his invention of mould blown net glasses, imitating Venetian decoration in Filigree. Glasses in Venetian style could be produced easily, allowing high numbers and making the glass competitive for exports, even to Venice, were glass industry on the island of Murano had come to a halt before the arrival of Antonio Salviati. After the Filigree technique had been taken up again in Bohemia in the 1840'ies, it was revived once more by the Modernist glass designers, working for commissioning retailers like J. & L. Lobmeyr and E. Bakalowits Söhne in Vienna around 1900. Teachers and pupils of the Wiener Kunstgewerbe-schule (celebrating its 150th anniversary this year) like Michael Powolny, Hans Bolek, Emanuel Josef Margold and young architects like Josef Hoffmann and Leopold Bauer, deliberately went to work with the glassmakers in the glass mills, experimenting with historic decoration techniques like Filigree. The lamp blown glass products by the Bimini glass manufacture in Vienna, founded in 1923 by the architects Fritz Lampl and Arthur Berger, revived Venetian Filigree and net glass in forms and designs in Austrian Art Déco taste. Their creations, many of them still produced by traditional Austrian glass firms today, aimed at an revival of excellent craftsmanship in order to realize timeless designs in glass.

The traditional filigree technique from Venice, invented in the 16th century, thus lives on as an expression of glass mastership in Austrian glass design.

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Fig. 1 - *Goblet*, *reticello* glass, mold blown, Venice or Hall. 1501-1600. Vienna, MAK-Austrian Museum of Applied Art / Contemporary Art, GL 661.

Fig. 2 - *Bottle*, trailing, enamel painting, Innsbruck or Hall. 1526-1550. Vienna, MAK-Austrian Museum of Applied Art / Contemporary Art, F 168.

Fig. 3 - *Covered Goblet*, goldrubyglass, cut, gilded, Bohemia. 1700 ca. Vienna, MAK-Austrian Museum of Applied Art / Contemporary Art, GL 2481.

Nikolina Topić

FILIGRANA GLASS FROM THE DUBROVNIK AREA – ARCHAEOLOGICAL FINDS

1. *Introduction*

Filigrana glass finds of Venetian or *a façon de Venice* (16th-17th century) production in the Dubrovnik area are not frequent, but they are very interesting and diverse[1]. Due to their fragile nature, the finds are primarily preserved as fragments, but graphical reconstructions allow better understanding and visual interpretation of the glass. Since the finds are mainly from rubble layers, it is not possible to date them precisely according to archaeological context, so analogous examples and differences were used to determine their date. The most numerous finds are bowl fragments, some of which stand out among the finds, as well as one *tazza* fragment. Apart from bowl fragments, there are also stem goblet, bottle and jug fragments with applied threads found in excavations from the historic center of Dubrovnik (the cathedral, the monastery of St. Mary of Kaštel, the Rector's palace, and the Upper corner tower) and in the wider region (island of Mljet and Sokol / Falcon fortress in Konavle). The finds are from excavations that were carried out between 1983 and 2016. Although these glasses are rare in the Balkan region, they were recorded at various sites (Fig. 1).

[1] The finds presented in this paper are primarily part of the author's PhD thesis defended in 2015 at the University of Zadar, Croatia.

2. *Finds*

Two bowl fragments, with white threads made in *filigrana* technique, were found in the historic centre of Dubrovnik. One bowl rim fragment (Fig. 2/1) is from excavations carried out in the monastery of St. Mary of Kaštel. The ornament consists of alternate thicker vertical trails and reticular motifs (*canne a rete*). Other finds from the same trench in the garden of the monastery are of broader chronological context (15th-17th century). This fragment can be dated to the 16th century according to analogous examples. Achaeological analogies have been demonstrated from excavations of the cemetery of the church of St. Peter near Novi Pazar in Serbia[2], as well as from Mileševa monastery[3] and the church of St. Michael in Kotor, Montenegro[4].

During the excavation of the Medieval sewage system in Dubrovnik's historic centre, a rim bowl fragment like the above-mentioned was found (Fig. 2/2). It is also ornamented by alternate thick vertical lines and reticular motifs. Pottery finds from the same context point to the 16th century, as well as analogous examples. Since both fragments are dated to the 16th century, local production cannot be excluded, as in other European centers that imitated Murano products as early as the second half of the 16th century[5].

Bowl or cup fragments made very skillfully in *filigrana a retortoli* technique stand out in particular (Fig. 2/3). The vessel was of hemispherical form and had handles that are not preserved, but their marks are visible on the walls. These fragments have different set-ups: twisted cobalt blue and white canes, twisted green and white canes, and white multiple lines between previous combinations. Polychrome threads are incorporated in the glass walls. White threads are incorporated in the glass or positioned at the exterior side of the vessel. It can also be noticed that the white threads are of a clearer white than those used for earlier glasses, which emphasizes their later

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[2] Ljubinković 1970: 214, Tab. VII/1; Han 1981: 266, tab. XIV/2.

[3] Han 1981: 178.

[4] Križanac 1993: 77-78, T. I/2.

[5] De Raedt *et al.* 1999: 494; Rohanová-Sedláčková 2015.

origin date[6]. These fragments are from the monastery of St. Mary at the island of Mljet (from the trench in the portico of the cloister). They can be dated to the beginning of the 17th century, and can be attributed to the Murano workshops.

One bowl rim fragment with horizontaly applied white threads (Fig. 2/4) was excavated in the monastery of St. Mary of Kaštel in Dubrovnik. In the upper part, the trails are of similar distances, and in the lower part, the distances are larger. It can be dated to the 16th century, and could have been made in Dubrovnik or in some other Italian workshop.

A mould-blown bowl fragment is decorated with relief „diamonds" and separately added twisted *filigrana* ornament of applied white threads at the rim of the vessel (Fig. 2/5). It was found in the rubble layer during the excavation of the Sokol (Falcon) fortress in Konavle near Dubrovnik. According to excellent parallel examples dated to the same time frame, it can be dated to the 16th century Venetian workshops. The analogous Kotor finds are dated to the mid 16th century, and are from excavations of the church of St. Thyphon[7] and the church of St. Michael in Kotor, Montenegro[8]. A bowl with the same ornamentation was found in Kumanica in Serbia and is dated to the first half of the 16th century[9]. One fragment decorated in a similar way was found in cape Seline near Pula[10], as well as one find (with addition of cobalt blue thread in the twist) from the shipwreck of Gnalić near Zadar, Croatia[11].

One bowl bottom, slightly concave, with applied ring foot and radially positioned white threads spreading from the middle of the bottom on the external side (Fig. 2/6), was found in the monastery of St. Mary of Kaštel in Dubrovnik. The fragment can be dated to the 16th century, and was made in Dubrovnik or in some of the Italian workshops.

Three bottom fragments of grey green glass, ornamented with

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[6] Laméris 2014: 86.

[7] Križanac 1993: 77, note 8.

[8] Križanac 1993: 76-77, T.I/1.

[9] Radičević-Zečević 2002: 70, 78, 98, fig. 28.

[10] Bekić 2014: 2014, 41-42, fig. 21/9.

[11] Lazar-Willmott 2006: 44, fig. 44:S9a, 116, plate 8,1-2.

radially applied white relief trials were found in the historic centre of Dubrovnik: two in the monastery of St. Mary of Kaštel (Fig. 2/7-8) and one beside the Upper corner tower (Fig. 3/1). They can be dated to the second half of the 16th century, and could be made in Dubrovnik, Murano or other Italian workshops. An excellently preserved bowl with the same ornamentation was found in Pula[12], as well as in the historic centre of Zadar during the excavation of the church of St. Grisogon[13]. A bowl fragment from the Belgrade fortress is also decorated with white relief threads[14]. Along with these analogous examples, glass vessels with this type of ornamentation were found in the monasteries of Tronoša[15] and Mileševa in Serbia[16].

Bottom bowl fragments with white radially applied trails were found during the excavation of the Rector's palace in Dubrovnik (Fig. 3/2). These finds can be dated to the 16th century, and were produced in Dubrovnik or in Italian workshops.

A *tazza,* or footed dish fragment, particularly stands out, since it is made in *filigrana a retortoli* technique with cobalt blue and white threads (Fig. 3/3). It was found during the excavation of the Dubrovnik cathedral after the earhquake that occurred in 1979. Use of the more complex *a retortoli* combination and double glass layer points to early 17th century production[17]. Although, very similar *tazza* was found in excavation in Antwerpen, and it was dated in the second half of the 16th century[18]. The upper part of the vessel is very plain, which is typical for *tazzas,* but it also can be a footed dish. According to archival data, we know that *tazzas* were popular and produced in Dubrovnik at the beginning of the 16th century in the workshop of Giovanni Tambarlinus[19]. Simply manufactured *tazza* finds have been previously demonstrated in archaeological excavations in Dubrovnik[20]. Since

[12] Bradara-Krnjak 2016: 176-177, cat. 77.
[13] Pešić 2006: 120, fig. 14.
[14] Han 1981: 178-179.
[15] Janković 1984: 152-153, fig. 8/3.
[16] Han 1981: 179.
[17] Laméris 2014: 84.
[18] Engen and Ritsema van Eck 1989: 128.
[19] Han 1971: 219.
[20] Topić 2015: 169-170, cat. 385-392.

Dubrovnik glass production ceased at the end of the 16th century, and this fragment is dated to the 17th century, it cannot be of domestic production and was likely imported from Venice.

Two stem goblet fragments with applied threads were found during the excavation of the monastery of St. Mary of Kaštel in the Dubrovnik historic centre. One fragment is a partially preserved hollow knop with thin plane disc below (Fig. 3/4). The glass is grayish in color, with white vertical, slightly slanted, threads. According to Venetian or *a façon de Venise* stem goblets with knops decorated with trailes dated to the second half and end of the 16th century[21], we can assume a similar date for the Dubrovnik finds; although, Murano jug and stem goblets from the 17th century also have similar knops[22]. According to these examples, the find from Dubrovnik can be interpreted as a late 16th / 17th century Venetian product. The other stem goblet fragment is the lower part of a bowl with disc below, ornamented with densly positioned vertical white threads (Fig. 3/5). It can be dated to the 16th century Venetian workshop.

One beautiful trefoil jug fragment with horizontaly applied white trails (Fig. 3/6) was found in excavation of the monastery of St. Mary of Kaštel in Dubrovnik. The trails are not of pure white color, and that implies 16th century, or early 17th century origin. A bottle fragment of green glass (Fig. 3/7) was found at the same site as the previous fragment. It was part of the neck of a bottle and is ornamented with horizontaly applied thin white trails. Both finds could have been made in the 16th century in Dubrovnik or Italian workshops.

Two foot fragments (of a bowl or bottle) of greyish greenish glass, with verticaly positioned white trails in *mezza filigrana* technique, are from the monastery of St. Mary of Kaštel in Dubrovnik (Fig. 3/8-9). They can be dated to 16th century Dubrovnik or Italian workshops. A similar fragment from the Sokol (Falcon) fortress in Konavle (Fig. 3/10) can be interpreted in the same way. An analogous example was found in the Gnalić wreck[23]. Similar finds are also known from the Venetian lagoon[24].

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[21] Baumgartner 2015: 259-269, 322-328, cat. 146, 148, 153-154, E-1 - E-18.

[22] Zecchin 1987: vol. 1, 185.

[23] Lazar-Willmott 2006: 84, 127, Pl. 19,3:S20c.

[24] Barovier Mentasti *et al.* 2003: 233, Fig. 9

3. *Final remarks*

These finds were excavated at diverse sites, which reveals the context of their various uses. The finds demonstrate the use of luxury vessels and a higher standard of living in the Dubrovnik Republic. Generally, *filigrana* glass seems to be rarely used, although it is dispersed across the Balkan region (Fig. 1). These glasses are found in coastal cites like Zadar, Dubrovnik, Kotor, at the Seline cape near Pula, and at the island of Mljet, but also in the hinterland at the Sokol fortress, in Novi Pazar, in Belgrade, and in the Mileševa, Tronoša and Kumanica monasteries. The sunken ship near the islet of Gnalić close to Zadar demonstrates the luxury good trade along the eastern Adriatic coast.

Some of these finds point to the use of Venetian luxury glass products in the 16th and 17th centuries in the Dubrovnik area. Although some of these glass vessels could have been produced locally, this should be proved by chemical analysis. Future excavations in the Dubrovnik area and in the Balkan region will also provide a clearer view on categories, amount, and dispersion of this beautiful glass in the eastern Adriatic and the Balkan region.

4. *Acknowledgements*

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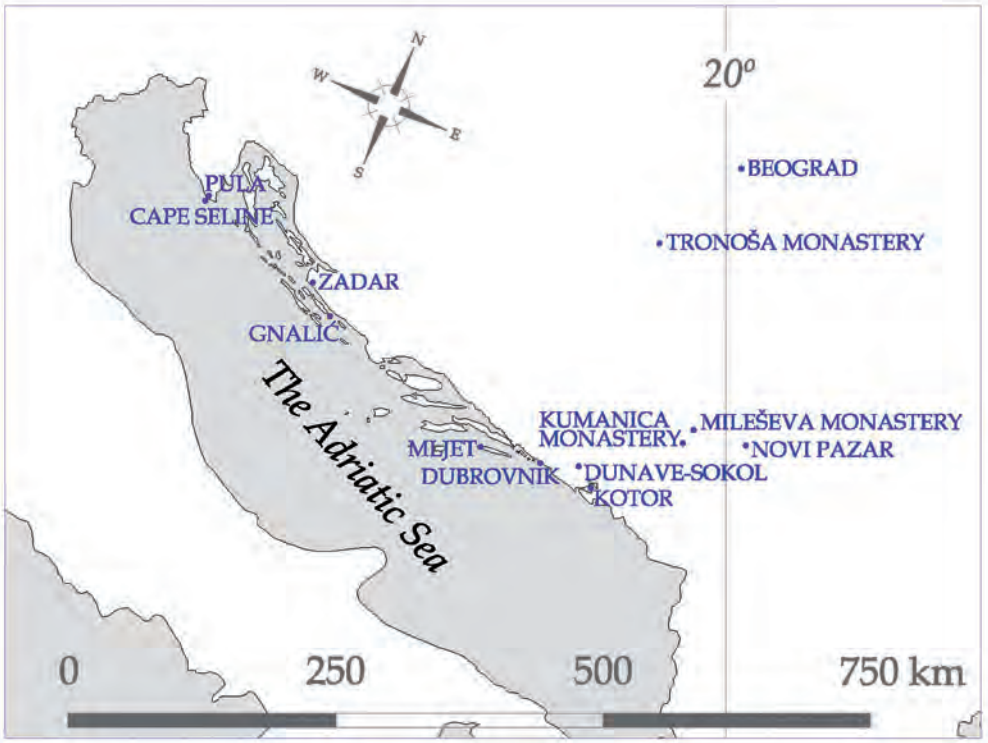

Fig. 1 - *Map of the eastern Adriatic and Balkan hinterland with marked positions of archaeological sites at which filigrana glass was found* (published finds only).

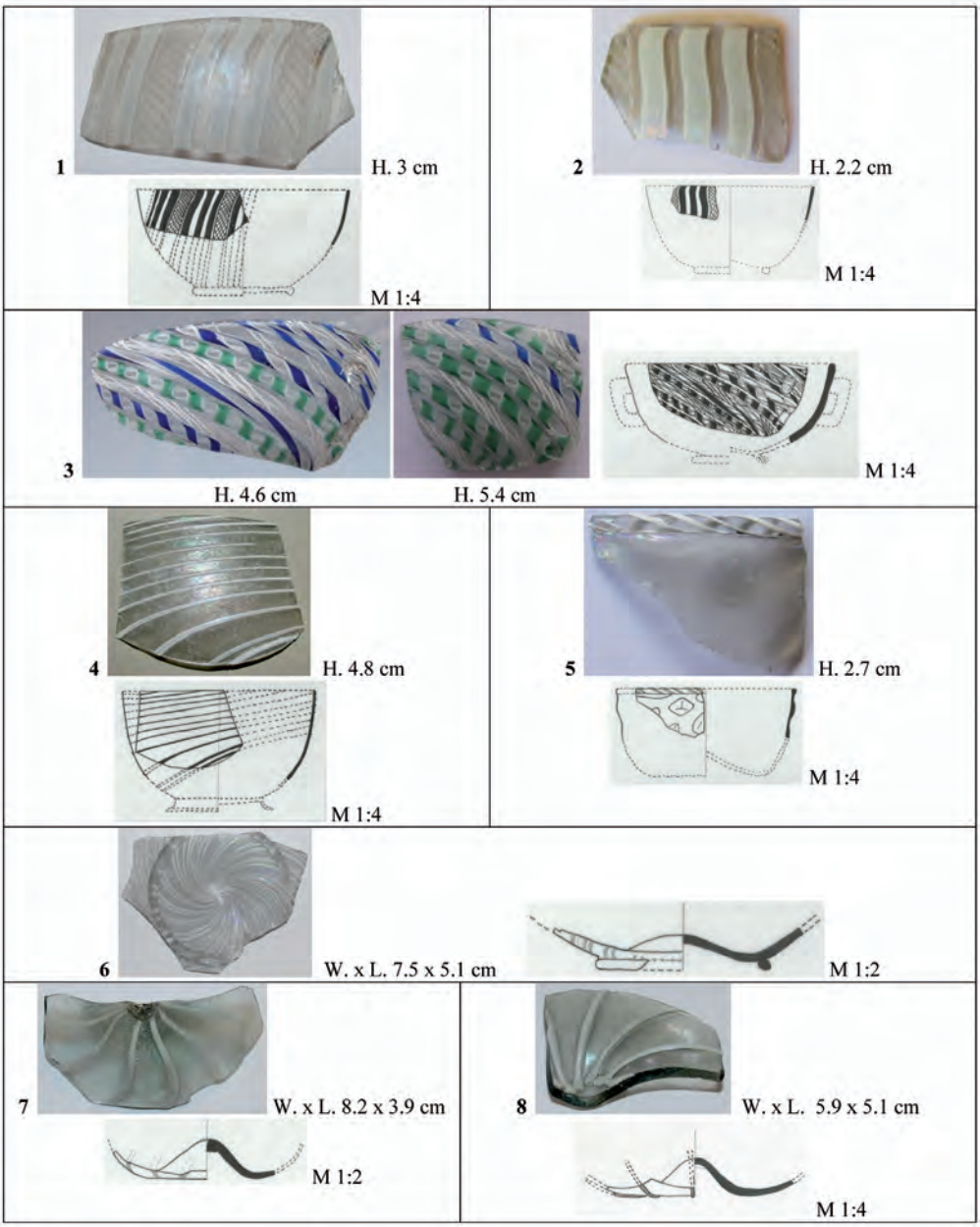

Fig. 2 - *Diverse fragments of* filigrana *glass from Dubrovnik and the region.*

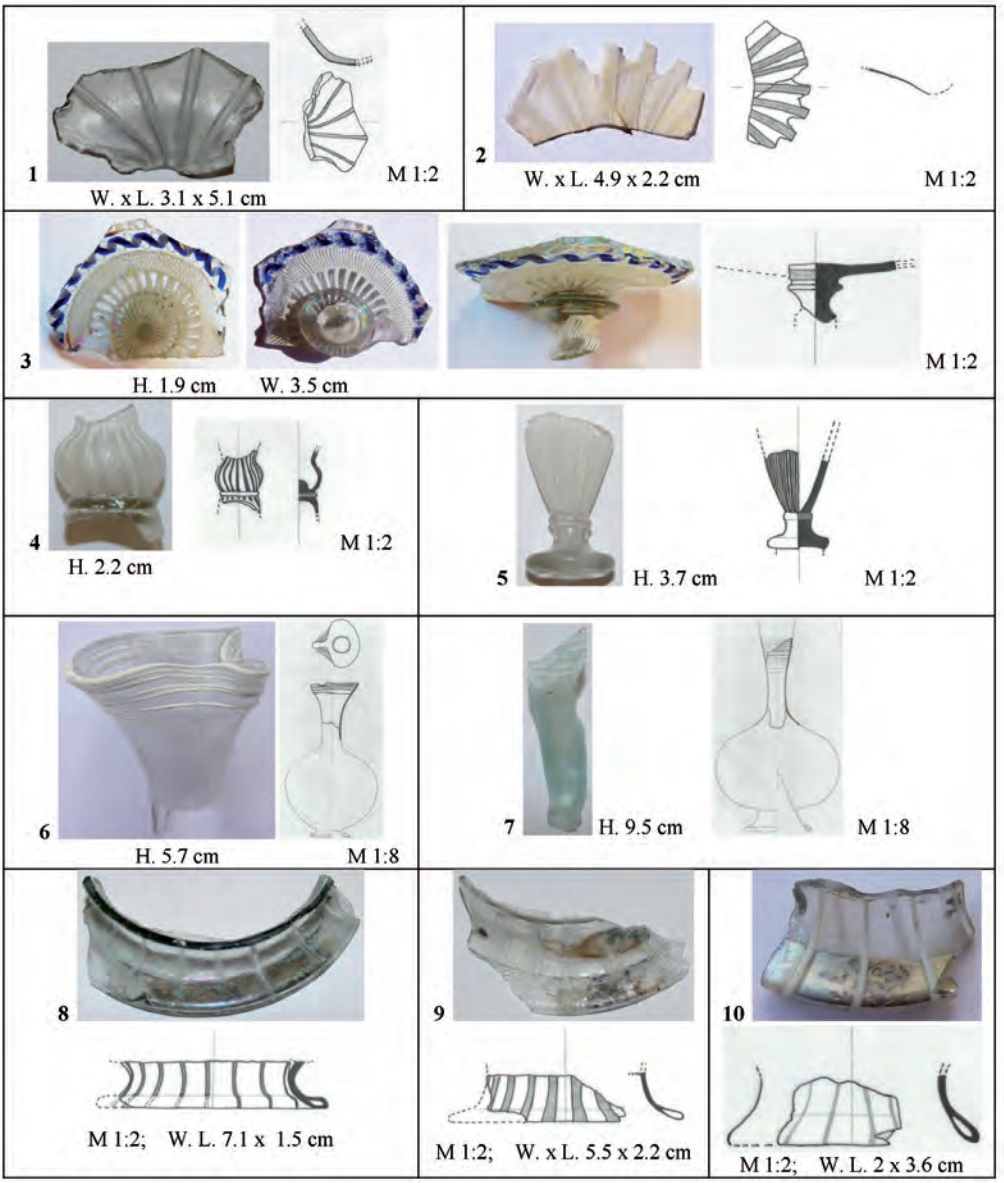

Fig. 3 - *Diverse fragments of* filigrana *glass from Dubrovnik and the region.*

Violetta Mikitina and Olga Ivlieva

THE FILIGREE GLASS FROM THE COLLECTION OF THE MUSEUM OF CERAMICS, MOSCOW: XVII-XX CENTURY

Collections of the State Museum of Ceramics in Kuskovo are known far beyond our country. In the only specialized museum in Russia, there are collections of ceramics, porcelain and glass from the countries of Europe and the East, spounding a huge time period from ancient times to our days. Many of these collections are the most significant in Russia.

The glassworks of Venetian, Bohemian, Russian and English masters were made in the filigree technique and represent a small part of the collection of glass. But it show national peculiarities of glass production in these countries, copying and imitating this technique.

Unfortunately, there are no the earliest items of Venetian glass with filigree in our museum. However, different types of Venetian filigree can be demonstrated on the objects of the XIX century. Among them items decorated with milk glass threads on the raised bowl, the items which implement colored glass threads, and that one where aventurine and milk glass were combined.

The production of Europe factories was an interesting interpretation of filigree. Twisted thread of milk and red glass in the stem of glasses, sometimes they were combined, began to produce in the middle of the 18th century by English glassmakers and remained popular until the end of the 1770s[1]. Conical glasses for liquor on high stem were decorated with filigree which called «playing mercury». Such air spiral was formed due to including air drops inside the glass

[1] Mikitina 2013.

by metal rods. The subsequent process of extension and twisting of glass mass transformed air drops into a filigree thread.

The filigree technique was embodied in the works of Bohemian and Russian glassmakers in the 18th century. However, similar methods of decoration with threads were mainly used to decorate the stems of glasses, goblets. The threads of red color became as popular as milk one. Masters didn't copy complicated Venetian decoration (patterns). They produced a kind of imitation, simplified version of that one. In the first half of the 18th century it was typical of Bohemian craftsmen, and in the second half of the century this technique was widely adopted by Russian craftsmen. First of all, it was connected with that fact, that during the formation of glass production in Russia, plants of our country employed invited foreigners who used their national methods and techniques. A good example of this is the baluster of the Imperial Glass Factory with the engraved image of St. George the Victorious, the profile portrait of Empress Elizabeth and two apostles (Fig. 1). Probably, the engraving was made an European master, who must have been a Bohemian and decorated the baluster's stem with special kind of filigree[2].

At the end of the 18th century, filigree techniques were also used at two private Russian enterprises: the private glass factory of Count Orlov and the private factory of Bakhmetevs. The survived items of this plant show that they were two preferred colors – milk and red. And items were decorated with filigree only in stems glasses[3].

During the nineteenth century, filigree was practically not used in Russia. Only in the last third of the XIX century, some Russian plants again began producing it. Moreover, glasswares were decorated not only with twisted threads, but also with delicate golden and silver painting, a golden layer on the upper edge.

In the Soviet time, glassmakers again turned to the technique of decorating objects with Venetian thread. The restoring, establishing and spreading of forgotten technology are the most significant achievements in artistic glassmaking of the 1930s. The initiative of the recreation belongs to Adel Yakobson, the professional artist who

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[2] Dolgih 1985.

[3] Asharina 1998.

was among the first, working with glass at the plant «Krasny gigant», together with the master-blower Mikhail Vertuzaev[4].

Appeal to this technique was associated with the decision to improve the artistic appearance of glass products produced in our country's plants. Together they created several series of household items with simple shapes with applying Venetian thread, milk (cryolite) or colored.

In the most cases the artists alternated four milk threads through two colored. According to the master's opinion, such products were the most attractive, while increase in the number of colored threads gave lesser decorative effect (Fig. 2). Items of spherical shape (bombonniere, fruit vase, etc.) were often decorated with a thread running in two opposite directions, forming a checked pattern (vetro reticello). This pattern required using of two billet glass pieces decorated with Venetian thread.

Moreover, another kind of decoration with «Venetian ribbon» was introduced and widely spread. During this process the artist used one or several tetrahedral shape glass strips of larger size (6-8 mm wide) instead of many thin thread. These ribbons were made from white cryolite glass, less often from two colored glasses.

M. Vertuzaev performed in this technique a lot of author's samples, some of them came into serial production. In 1939 such glasswares were presented at All-Soviet Union Exhibition. After that, the master was awarded with the title of master-artist and Ministry of light industry of the USSR issued a special order on spreading of the technology of the Venetian thread and its adoption by other plants. Next year Vertuzaev published a brochure with detailed description of the creation such products[5].

In the late 1960s, the artist of the glass plant «Neman»[6], Anatoly Fedorkov, creatively approaches the reproduction of Venetian technique. Instead of threads of simple glass, he used sulphide-zinc ones, which was invented in 1957 at the Leningrad plant of art glass

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[4] Tolstoy 1984.

[5] Vertuzaev 1940.

[6] Now the plant is located on the territory of the Republic of Belarus.

by the engineer-technologists E. Ivanova and A. Chirionen[7]. Little inclusions of sulphides and zinc have made glass especially suitable for creative experiments. Through a different number of heating, it was possible to improvise with color in the process of making, to obtain smoky glasses. Moreover, zinc implementations made the material more plastic, the surface of finished items become shine and smooth. When sulphide zinc was added to crystalglass, it was possible to obtain a wide range of opaline tones from completely transparent to almost black muffled ones. Complicated techniques of decoration are not usually used in such type of glass. Glassmakers more often worked with color, emphasizing the properties of the material.

However, in the late 1960's, A. Fedorkov, the artist of the glass plant «Neman», presented his artworks decorated with a sophisticated pattern of parallel or spirally twisted sulphide threads inside colorless glass. Imitating the Venetian technique, the artist often introduced a variety of familiar motif, deliberately deforming the filigree by a specific pattern, combining the Venetian technique with the combing technique. In his experiments, Fedorkov often turned to contrasts of white and black, black smoky pattern effects in semitranslucent milk glass, which were obtained using zinc sulphide. Complicated rhythms in thickness of the glass constitute the decorative basis of his work. Most often these are decorative bowls, which shapes resemble the traditional clay ware of Belarusian folk masters – monolithic, massive – serve as a winning background for a fractional pattern that forms complicated laces. According to this principle, the decorative composition «Flower» was made (Fig. 3). It was awarded by the «Grand Prix» at the International Exhibition of Glass and Porcelain in Jablonec on Nissa (Czech Republic) in 1973. Both the composition and the prize were donated by the author to our museum in 1983.

In one of the Soviet articles of that time it was written that «in technical skill and generosity of imagination A. Fedorkov is able to argue with the famous Venetian glassmakers»[8]. Turning to the heritage of the best masters of Europe and interpreting in its own way, the author created his own thread, called it «Neman». Unfortunately, this

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[7] Rachuk 1975.

[8] Danushevskiy 1977.

technique didn't get acknowledgement in other plants of our country. But it allowed to perform unique glassworks in small editions.

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Fig. 1 - *Baluster, engraved by foreign master(?)*, Russia, Imperial Glass Factory, 1740-1750. Moscow, The State Museum of Ceramics and the Kuskovo 18th Century Estate, inv. CT 163.

Fig. 2 - M. Vertuzaev, *Vase*, USSR. Glass plant "Krasny gigant", End of 1930s. Moscow, The State Museum of Ceramics and the Kuskovo 18th Century Estate, inv. CT 44.

Fig. 3 - A. Fedorkov, *Composition "Flower"*, USSR. Glass plant "Neman", 1972. Moscow, The State Museum of Ceramics and the Kuskovo 18th Century Estate, inv. CT 3847-3851.

Vedrana Jović Gazić

GLASS LAMPS IN CROATIA: TYPOLOGICAL OVERVIEW FROM ANTIQUITY TO THE MODERN ERA[1]

1. *Introduction*

Glass lamps were used rather frequently in the past. Archaeological confirmations of their developed typology in all historical periods are also ample, but they rarely attract researchers' attention since they are mostly reduced to small fragments of hardly recognizable forms. This has to do with the circumstances of discovery and storage conditions. Presented overview of typological distribution of glass lamps from antiquity to the modern period in Croatia is based on available published material that is deposited mostly in the most important Croatian museums[2].

2. *Sites and sources*

Rare examples of complete, or almost complete archaeological finds of ancient lamps are found in grave units, and they are related to pagan burial customs from the 1st to 4th century. The earliest late antique forms from the first half of the 4th century were also found at

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[1] Typological analysis of glass lamps in Croatia is a part of exhibition and research project *Glass lamps across time* that is conducted in the Museum of Ancient Glass in Zadar with the financial support of the Ministry of Culture of the Republic of Croatia.

[2] Museums: Archaeological Museum in Split, Museum of Croatian Archaeological Monuments in Split, Museums of Dubrovnik, Šibenik City Museum, Museum of Slavonia in Osijek, Požega City Museum, Museum of Đakovština in Đakovo etc.

necropoles, that is in individual burial units. From the second half of the 4th century, and in particular during the 5th and 6th centuries glass lamps were used frequently in early Christian complexes as indicated by increase in number of finds as well as their typological diversity[3].

Besides early Christian churches, Islamic sanctuaries were also lighted with glass lamps. Very recognizable forms developed in this context, adjusted to specific architecture and character of Islamic religious rituals. The earliest forms of Islamic lamps with recognizable handles for hanging were used from the 8th century onwards in the regions of Syria and Iran, but their expansion in considerably modified variants marked the period of 14th and later again of 16th century[4]. In this period typologically related examples were used in the western Mediterranean, in non-Islamic cultural and social context so that many Christian churches and cathedrals were equipped with lamps of the so-called mosque type[5]. Material evidence of wide everyday use of glass lamps started to increase significantly from the 14th century when the information on their production appears more often in written sources[6]. We know of big orders of the Ottoman rulers who used hanging glass lamps in the 16th century to illuminate interiors of elaborate mosques as well as the residential parts of their palaces[7]. Some completely new forms occurred in this period, developing from the rich typology of previous historical periods.

3. *Typology of lamps in Croatia*

There are only two examples of nearly complete glass lamps from antiquity in Croatia[8]. They were found at different sites, but they share probably identical context of the find – ancient necropolis,

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[3] Buljević 1994: 259; Fadić 1994: 242; Fadić 2001: 134; Fadić 2005: 224-226.

[4] Carboni 2001: 199; Ratković Bukovčan 2006: 21-23.

[5] Uboldi 1995: 112-3; Minini-Davanzo-Davanzo 1999: 52; Križanac 2001: 20-24; Carboni 2001: 77.

[6] Han 1973: 172; Han 1979: 47; Topić 2015: 90.

[7] Charleston 1964:164-165; Han 1973: 173-174; Han: 1979, 187; Carboni 2001: 199, 231.

[8] Both examples are held in the Archaeological Museum in Split.

and most likely also the source region – western workshops from the Gaulish-Rhine region or northern Italy[9]. They belong to the lamp type with nozzle and handle characteristic of the period from the 1st to 3rd century, with certain variations in forming the central container and belonging circular opening (Fig. 2, I).

Late antique lamps make a more abundant group, typologically very diverse. They are dated broadly from the 4th to 7th centuries. Therefore they are analyzed within smaller subgroups, in accordance with more precise chronological determination, context of the find and provenance. The first in a number of recognizable types of late antique lamps of the second half of the 4th and beginning of the 5th century is the type of a lamp with conical body and very slightly rounded, sometimes almost pointed base (Fig. 1). In many professional interpretations possibility of their multiple use in illuminating the space is mentioned, or as drinking glasses, beakers[10]. Scarce iconographic or written sources support both functions[11]. It is difficult to offer more precise definition of the function of individual examples due to usual site context – grave unit in whose interpretation some authors see the conical lamp (beaker) as the remains of rituals of funerary feast, and some ascribe them to common practice of offering objects from everyday life.

Late antique lamps with conical body are a relatively frequent find in the territory of Croatia. On the basis of present knowledge they are more numerous in the northern part of the country, area once belonging to the Roman province of Pannonia[12]. Only one complete example was found in Dalmatia, alongside another complete specimen from Istria[13].

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[9] Buljević 2006: 107-113.

[10] Uboldi 1995: 114; Stern: 1999, 480; Whitehouse 2001: 213-215; 250; Antonaras 2008: 27.

[11] Stern 1999: 480, Fig. 29; Whitehouse 2001: 213.

[12] Migotti 2007: 200, 203, 208; Filipović 2010: 80, 84; Balen *et al.* 2013: 52; Leljak 2015: 121-122.

[13] The lamp from Dalmatia was several times published as a possible find from Salona area, see: Buljević 1994: 262. no. 13; Fadić 1997: 202, no. 211; Barovier Mentasti *et al.* 2003: 174, Fig. 48. In 2002 Z. Buljević made a correction, see: Buljević 2002: 167, f.n. 1. For the specimen from Istria see: Milošević-Petrović Markežić 2012: 19.

Two specific examples of conical lamps have been found in Dalmatia, a kind of subtypes with body that is less conical and more cylindrical. One of these examples is the lamp (beaker) from the Žrnovnica region, near Split, that has a slightly flattened base, but still not wide enough for free standing of the object[14]. Asseria, Roman-era city in the hinterland of Zadar, was a findspot of another example of elongated, slightly conical lamp with recognizable terminal in form of a full, knob-like appliqué[15] (Fig. 2, II).

The following group of late antique lamps belongs to somewhat more restricted chronological framework of the 5th and 6th centuries, and it is a characteristic find within complexes of the early Christian architecture. Their form evidently developed from the form of cylindrical beaker with flattened wide base and slightly conical upper part of the body. They are usually found in fragments[16] just like the two very well reconstructed specimens – one from Putalj near Kaštel Sućurac[17] and the other from the site of Podvršje-Glavčine near Zadar. There are indications that the example from Podvršje might have had radially distributed handles on the rim[18] judging from analogies[19] though none of the three assumed handles was physically preserved.

Lamps in form of a beaker on a low foot with round ring base are found in similar archaeological circumstances. There is virtually no site with early Christian developmental phase where fragments of ring bases were not recorded but they can rarely be used for plausible reconstruction of the object[20]. A well preserved example from the beginning of the 5th century was found at the mentioned site in Putalj, more precisely in the church of St. George from the very beginning of the 5th century. Typologically related but somewhat younger example

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[14] Buljević 1994: 262. No. 12.

[15] Both lamps are kept in the Archaeological Museum in Split. Fadić 1988: 51, 66, T11/3.

[16] Fadić 1994: 217.

[17] Fadić 2001: Fig. 31A.

[18] Perović 2012: 594.

[19] Uboldi 1995: 111; Stevenson 1988: 199-202, plate XIX; Braovier Mentasti *et al.* 2003: 175. Fig 50.

[20] Fadić 1994: 214; Buljević 1994: 259.

(late 5th century) was successfully reconstructed from a number of fragments found at other important early Christian site in Dalmatia – Srima-Prižba near Šibenik[21].

The following widely distributed type of the early Christian lamp with an elongated hollow handle, upper part of the body in form of hemispherical or cylindrical bowl, and handles under the rim, was widespread in the broad chronological span from the 4th to 7th century[22] (Fig. 2, IV). Preserved or more precisely reconstructed early Christian examples in Croatia are not numerous. Only one, again from the church of St. George in Putalj was reconstructed with all the belonging elements[23].

Traces of typologically closely related early Byzantine lamps with an elongated handle and globular terminal[24] have not been recorded in Croatia. But just like the previously mentioned type with flat handle this form also had strong impact in the late medieval and modern period glass making[25]. Very fragmented finds of handles with globular cavity at the bottom are frequent in deposits and in refuse pits where two examples from Zadar were found, broadly dated to the 15th century[26].

Although applied handles for hanging are recognizable detail of the so-called lamp of the Islamic type, their base is usually reinforced with an annular profilation or it is raised on a full ring base. Many sites in Dalmatia yielded fragments of this type, in the cities and rural sacral complexes[27]. An assemblage of presently incomplete examples, reconstructed from a number of fragments, has been explored in the area of the cathedral complex in Zadar[28] (Fig. 3).

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[21] Fadić 2005: 227, Fig. 2.

[22] Uboldi 1995: 122.

[23] Fadić 2001: 323, Fig. 31D.

[24] Whitehouse 2001: 194-195.

[25] Stiaffini 1991: 195-196.

[26] One handle is kept in the Museum of Ancient Glass in Zadar and the other, with almost identical dimensions and state of preservation in the National Museum in Zadar. Modest number is the result of negative practice of avoiding publication of fragmented finds. Jović Gazić: 2017.

[27] Belošević 1993: 137, 139; DeMaine 1979: 130; Delonga 1988: 93; Buljević 1999: 130; Topić 2015: 192, 399; Topić 2017: 44.

[28] Material is kept in the Museum of Ancient Glass – the reconstructions are made by Šime Perović, Senior Restorer in the Museum of Ancient Glass. .

During the 16th and 17th centuries a variant of the hanging lamp type *cesendello* was particularly popular. There were very elaborate variants decorated with enamel[29] or quite simple ones without any decoration, made from almost colourless raw materials[30]. There are no complete examples of the Renaissance *cesendello* in Croatia. However there are finds of typologically related lamps, but only in fragments. Famous shipwreck in the Koločep Channel near Dubrovnik, the site of Drevine, yielded definitely the most abundant collective find of about 50 fragments of bulbous bases[31]. Approximately half of the lamps have simple decoration consisting of vertically placed *lattimo* trails. The rest is undecorated. Fragment of the same lamp type from the Zadar city nucleus, very similar to the Drevine finds in stylistic terms, confirms their presence in the urban everyday life on the Dalmatian coast (Fig. 2, V). Two more fragments of the *cesendello* hanging lamp, made by using somewhat more complex technique[32], and with more elaborate decoration in form of thicker, white and blue decorative threads, were found at other important underwater site near Cape Ratac on the island of Koločep[33]. They were ascribed to the beginning of the 17th century as well as the entire shipwreck. Among glass finds from the same shipwreck were two typologically distinct lamps with hemispherical, bowl-like body, one of which has a pair of very small handles on the rim[34]. They are preserved completely and as such they are unique examples of complete glass lamps from the 17th century in Croatia[35].

The period of the 18th century is marked by various derivations and combinations of historical lamp types. Group of lamps with conical body and very distinct thickening under the rim was found

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[29] Dorigato 2013: 23.

[30] Özgümüş-Kanyak 2013: 328, 331.

[31] Kisić 1981: 159, 161.

[32] Examples from the collective site of Drevine were made by using the technique of glass blowing in one piece, and the ones from Koločep (Cape Ratac) by a combination of blowing of the cylindrical body and applying lower part with rings and knob-like protrusion.

[33] Medici-Radić Rossi 2015: 483.

[34] Medici 2010: 117-119; Radić Rossi 2012: 55; Radić Rossi 2015: 483.

[35] Lamps are kept in the private collection of the Tolja family.

during the excavations of the Monastery of the Little Brethren on Tvrđa in Osijek[36]. These are larger fragments mostly made of colourless to slightly greenish glass, with thick walls. Only one almost complete example was made of transparent yellow glass: recognizable thickening under the rim was used as a support when lamps were inserted in circular apertures of polycandelon (Fig. 2, VI).

The rich Glass Collection of the Museum of Slavonia houses examples of ceiling lamps that were suspended individually by means of metal rings and wires. One example from the mid-19th century is ascribed to the local production in the region of Slavonia, and the lamp form is a combination of historical types of hanging lamps. In the 19th century several glass manufactures worked in north-eastern part of Croatia where mostly glass for wide use was produced[37]. One of the more successful examples was the glassworks Zvečevo near Osijek, founded in 1842, that produced recognizable glass oil lamps on a high foot with pronounced globular oil and wick container sometimes called lace makers lamp (Fig. 4). This lamp type was present in entire Europe, and at the beginning of the 18th century similar forms were made in Murano[38]. There are also examples of a kind of subtype that have a handle applied on the foot for easier handling. They were also made in the mid- and second half of the 19th century, and Croatian examples from the holdings of the Museum of Arts and Crafts in Zagreb were made in the German workshops.

4. *Conclusions and perspectives*

Glass lamps were widely used objects with everyday function of illuminating spaces but they were also votive, ritual objects full of symbolical meaning. Their forms primarily reflect practical purpose and functionality in the given context. Disbalance between the number

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[36] Tvrđa is a fortified area, nucleus of modern Osijek, economic, social and cultural center of eastern Croatia. Horvat, Biondić 2007: 116, 269, 270.

[37] Glassworks in Seona near Našice; Glassworks in Mirin Dol near Našice; Glassworks in Zečevo; Glassworks Osijek. Horvat, Biondić 2001: 9-10.

[38] Zechin 2014: 51.

of explored sites in Croatia which abound in glass finds and frequency of their publication is a known fact, particularly if the publication implies patient analysis of every, including the smallest fragment. Despite typological recognizability such material usually never sees the light of day, and often with time it becomes hardly available for the study. Typological overview based on the most available and most complete finds from Croatia is just a working frame of the project that we intend to complete with a review of the number of previously determined lamp types, and elaboration of recorded subtypes within the existing categories, regardless of their condition.

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Fig. 1 - *Late antique conical lamp (beaker)*, second half of 4th century. Split, Archaeological Museum.

Fig. 2 - *Typology selection from Antiquity to Modern Age*: I) roman glass lucerna, Archaeological Museum in Split (photo: Buljević. 2006); II) Late antique conical lamp (beaker) from Asseria, Archaeological Museum in Split (photo: Archaeological Museum in Split); III) Biconical islamic or mosques type lamp, Museum of Ancient Glass in Zadar, late 14th century; IV) Late Antique lamp from Split with elongated hollow handle on the bottom (reconstruction), 4th-6th centuries, Museum of Croatian Archaeological Monuments in Split; V) bottom fragment of 17th century hanging lamp similar to *cesendello* type, Zadar, old town area, Museum of Ancient Glass in Zadar; VI) Late 17th century conical lamp from Osijek, Archaeological Museum in Osijek (Photo: Horvat, Biondić. 2007).

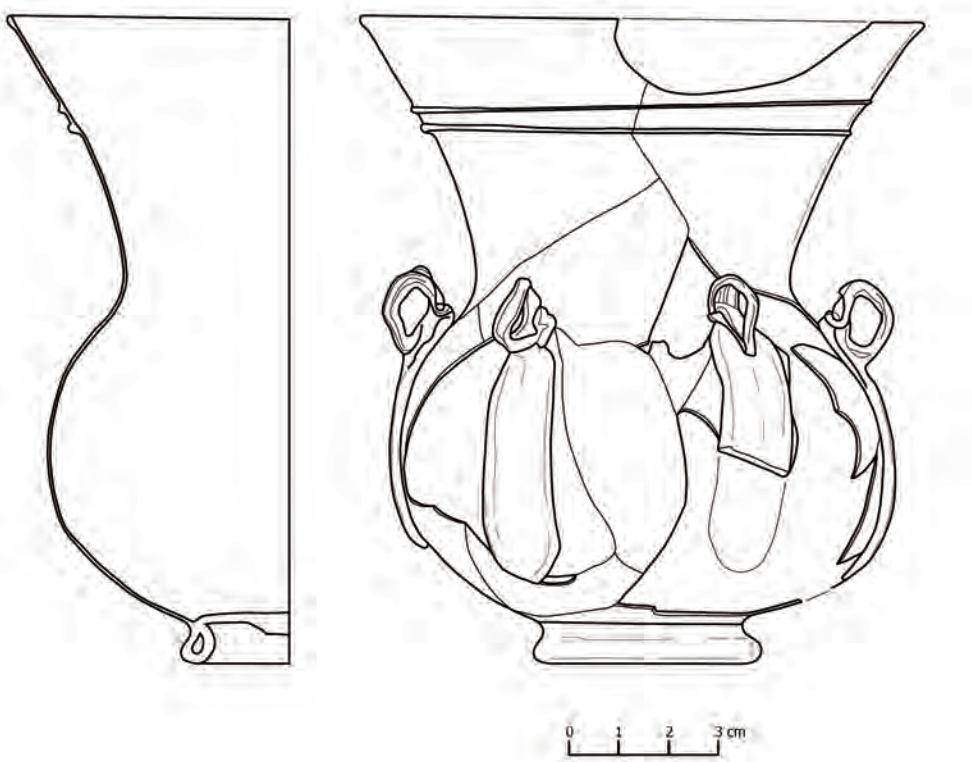

Fig. 3 - *Biconical mosques type lamp,* Zadar, late 15th century. Zadar, Museum of Ancient Glass (Drawing: Jadranka Belevski).

Fig. 4 - *Glass lamps - so called lace makers lamps,* Zvečevo manufacture near Osijek (eastern Croatia), 19th century. Osijek, Museum of Slavonija (Photo: Museum of Slavonija in Osijek).

Francisca Pulido Valente, Inês Coutinho,
Márcia Vilarigues and Teresa Medici

16th-17th CENTURY *FILIGRANA* GLASS FOUND IN PORTUGAL: SOME PRELIMINARY OBSERVATIONS

The present contribution addresses the study of more than 150 glass fragments decorated with *filigrana* technique coming from four archaeological excavations in Portugal: *Santa Clara-a-Velha Monastery* in Coimbra, *Santana Convent* and *Largo do Chafariz de Dentro* in Lisbon, and *São João de Tarouca Monastery* in Lamego.

The fragments show a wide use of different type of canes – *canna a fili*, *canna a rete*, other canes with external decoration and *canna mista* – according to the terminology used by Kitty Laméris[1]. The presence of *filigrana a reticello* and objects made in one and two layers are also evident. It is possible to determine a large variation in (1) quality of materials, (2) colours, with *filigrana* made with clear and transparent glass, or with greyish or even greenish glass, (3) quality of the technique, with the occurrence of some pieces where the termination of the canes was not removed, and with variations in the space between the applied canes in the same fragment.

This paper aims at providing some preliminary observations regarding these fragments, which are being studied as part of a larger project.

[1] Laméris 2012.

1. *Introduction*

Although considerable research has been devoted to *façon-de-Venise* glass, less attention has been paid to the systematic and transdisciplinary study of the *filigrana* technique. Few analytical works focused exclusively on *filigrana* glass[2] while the majority of the papers published so far only include *filigrana* glass among Venetian or *façon-de-Venise* objects[3].

In the frame of a PhD research project on technological development, circulation, and use of Venetian and *façon de Venise* decoration techniques in Portugal during the 16th and the 17th centuries, more than 150 *filigrana* glass fragments are currently studied. They come from four archaeological sites: *Santa Clara-a-Velha Monastery* in Coimbra (SCV), *Santana Convent* (LSC) and *Largo do Chafariz de Dentro* (LCD) in Lisbon, and *São João de Tarouca Monastery* (SJT) in Lamego. The selection has been made on the basis of the results of previous studies and it is a good representation of the different *filigrana* types circulating in Portugal between the end of the 16th and the middle of the 17th century[4].

This research intends to investigate this glass decoration technique employing a wide range of methodologies across disciplines and a multi analytical approach.

The methodology being developed will allow one to determine (1) if different ways to obtain *filigrana* are associated to technological developments or if they are a consequence of having been produced by different glassmakers, who could employ different techniques to produce the same object; (2) if the variation in the complexity of the decoration can have a chronological meaning; and (3) if a local production of *filigrana* glass can be considered. In addition, it is proposed to study the glass corrosion, concerning in particularly the burial conditions, and the potential thermic incompatibilities of the different glass compositions. Research on historical glass recipes will be performed, in order to reproduce the opaque white glass and deepen

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[2] Ramos *et al.* 2008; Rohanová-Sedláčková 2015; Wouters-Fontaine 2009.

[3] Coutinho *et al.* 2016; Coutinho 2016; Hulst - Kunicki-Goldfinger 2015; Janssens *et al.* 2013; Jackson 2006; Mortimer 1995; De Raedt *et al.* 2001; De Raedt *et al.* 1998; Verità 2013.

[4] Medici 2014; Coutinho *et al.* 2016; Coutinho 2016.

our knowledge on the color most commonly used in the fragments selected for this study.

The present contribution aims at providing some preliminary observations deriving from the morphological study of all the fragments, performed with the help of a stereoscope and an optical microscope. The accurate description is intended to support the selection of a representative group of fragments for further material characterization.

2. *16th and 17th century glass in Portugal*

During the 16th and 17th centuries, Venetian glass was very popular in Europe, and also in Portugal. It was a desired material and several documents record its import and diffusion among the wealthiest members of the Portuguese society[5]. On the other hand, documental information reports that, at that period, several glass manufactures spread throughout Portugal were producing a wide variety of objects, some of them of quality comparable to the Venetian[6]. We are unable so far of linking this production to any of the archaeological glass found in the country, because neither archaeological data concerning the furnaces, nor glass objects directly associated with these manufactures are currently available[7].

So far, only few studies characterized the chemical composition of Early Modern archeological glass found in Portugal[8]. Based on specific compositional features, these works allowed one to conclude that some glass from Santa Clara-a-Velha Monastery, Coimbra, were of genuine Venetian production[9]; they also opened the possibility that some of the other fragments could have been locally produced[10].

On the basis of these previous investigations, this work intends to deepen our knowledge on both Venetian glass import and *façon de*

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[5] Coutinho *et al.* 2016; Medici 2014.

[6] Amado Mendes 2002: 39; Valente 1950: 35-38; Medici *et al.* 2015: 413.

[7] Medici 2014: 65; Valente 1950: 19 and 23.

[8] Lima *et al.* 2012; Coutinho *et al.* 2016.

[9] Coutinho *et al.* 2016: 447; Lima *et al.* 2012: 1247.

[10] Coutinho *et al.* 2016; Lima *et al.* 2012.

Venise production in Portugal by exploring one of the most successful among the Venetian glass techniques, the *filigrana* decoration**.**

3. *Looking through* filigrana *glass in Portugal*

The examination of the samples permitted to identify a wide use of different type of canes. For the description, we will use the terminology employed by Kitty Laméris[11].

In this assemblage one can observe *canna a fili* (with only one thread) and *canna a retortoli* which is characterized by having crossed threads around a colourless core (Fig. 1). *A retortoli* canes can be divided in two categories: canes with external decoration spiralling around a colourless core (being that *canna a rete* is the most common with its characteristic net pattern; the other canes have groups of threads and/or bands), and *canna mista*, with external and internal threads, as in fragment SCV_0527.

A third type of *canna a retortoli*, with internal decoration (*canna a ballotini*), was not observed. It is generally assumed that a greater complexity of *filigrana* canes is associated with a later production[12]; according to this, the use of *canna a ballotini* is usually dated from the end of the 17th century / beginning of the 18th century onwards[13]. The absence of this type of cane from the contexts under study is consistent with the proposed chronology for the glass sets.

The *filigrana* patterns *a fili* and *a retortoli* can be produced in one layer (only canes) or two layers (body glass plus cane) (Fig. 2, a-b). Detailed description of the two different techniques is offered by K. Laméris[14] and W. Gudenrath[15]. According to K. Laméris, *filigrana* glass objects composed by two layers date to the 16th and 17th centuries, having an earlier chronology than the ones with only one layer, probably made from the very end of the 17th century onward[16].

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[11] Laméris 2012.
[12] Laméris 2015: 149; Laméris 2014: 111.
[13] Page 2014: 17; Laméris 2014: 112; Laméris 2015: 86.
[14] Laméris 2014: 107-108.
[15] Gudenrath 2012: 262-263.
[16] Laméris 2015: 148; Laméris 2014: 109.

In some cases the canes were applied with a huge relief, while in others they are perfectly embedded in the body glass (Fig. 2). Hugh Tait suggested that the earlier pieces are those which have canes in relief[17]. These objects remind the oldest methods of «applying trailed threads decoration»[18]. They are also attributed to Catalan or Castilian production[19].

Vetro a reticello is also recorded (Fig. 2). It implies a more complex technique, involving blowing an *a fili* twisted bubble into an *a fili* cylinder with the canes twisted in the opposite direction. The characteristic net with small air bubbles between the crossed threads is the consequence of joining the two parts as described[20].

The *filigrana* glass recovered so far in Portugal employs more frequently white threads. More rarely, other colours such as blue, green, red, and yellow appear. Coloured threads were observed in three *a fili* canes and in three *a rete* canes in six different fragments found at the Santa Clara-a-Velha Monastery (Fig. 3b). Although it remained always rarer than the white one, coloured *filigrana* was already produced during the middle of the 16thcentury, becoming more popular afterwards[21].

Concerning the type of glass, it is generally assumed that Venetian *filigrana* objects were made with *cristallo* glass, the best type of glass available at that time, due to its transparency, and perfectly decolorized and homogeneous matrix[22]. However, besides the colourless glass, it is possible to observe in the assemblages under study a colour variation of the body glass that ranges from greyish to greenish hues.

In Fig. 3a, the canes' terminations on different areas of the objects are shown: base, rim, handle, and near the pontil mark. This kind of rather careless finishing is quite different from what is usually seen in

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[17] Tait 2012: 168.

[18] *Ibid.*

[19] Laméris 2013: 19.

[20] Gudenrath 2012: 262-264; Laméris 2012: 34, Barovier Mentasti 2012: 20; Revi 1958: 14; Tait 2012: 168; Tait 1979: 49.

[21] Tait 1979: 50; Tait 2012: 170-172. Especially yellow glass has been used rarely in Venice before the 18th century: Barovier Mentasti-Tonini 2015: 13-18.

[22] Hills 1999: 126; Laméris 2012: 9; Page 2014: 9; Revi 1958: 14; Tait 2012: 168; Tait 1979: 49.

genuine Venetian *filigrana* glass[23]. In addition, it is also possible to observe that the canes are not homogeneously distributed and spaced on the surface.

4. *The canes*

Deepening the observations of the white canes, it is possible to see that the majority of them are composed by three layers: a colourless core, then a white layer, and finally another colourless layer. However, it is also possible to found *a fili* canes with only two layers, that is to say, a white core imbedded in a colourless rod. The three layers' canes are frequently dated to the 16th and 17th centuries[24].

On the surface of the objects where three layers' canes are used it is commonly observed that in the middle of the cane the colour is less intense. This is due to the presence of a colourless core[25] (Fig. 3a).

Concerning the coloured canes, they have bigger complexity (Fig. 3b).

On the SCV_0521/V_140 fragment all the yellow, blue and red canes have a white core, but in the SCV_0522 fragment the core of the red cane is colourless; in those canes it does not seem to exist a last colourless layer of glass.

In the SCV_0523/V_142 and SCV_0524/V_143 fragments all the coloured canes have a colourless core, covered with a white layer and subsequently with a coloured layer, blue and green respectively. It is interesting to note that the glass fragment which has blue colour is made in two layers while the green one is made only with canes.

Together with *filigrana* glass fragments, archeologists also found some *filigrana* canes in Lisbon and Coimbra. Similar finds are known to have been recovered from the glass waste related to the glasshouse *De Twee Rozen* (The Two Roses) in Amsterdam[26]. This discovery points out to some questions, such as:

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[23] Gudenrath 2012: 262-263.

[24] Laméris 2012: 25.

[25] *Ibid.*

[26] Gawronski *et al.* 2010: 132-133; Hulst - Kunicki-Goldfinger 2015: 552.

Does this mean that there was *filigrana* production in Portugal?

Were the canes imported or locally produced?

If there was no local production of *filigrana* objects in Portugal, for what purpose were the canes used for?

5. *Final remarks and future work*

The use of a stereoscope and an optical microscope has revealed to be a strong factor for obtaining a detailed description of the stratigraphic structure of the glass fragments and the canes.

The accurate observation made possible to identify a variety of canes, *a fili* and *a retortoli* (*a rete, mista* and with external decoration), and of *filigrana* techniques, from the simplest, made in one or two layers, to the most complex *vetro a reticello.*

White was the most popular colour used. The presence of blue, green, yellow and red canes has been detected in the Santa Clara-a-Velha Monastery assemblage. It was also verified that the stratigraphic structure of the canes with white threads is less complex than the coloured ones.

A degree of variability in the finishing technique was noted, with the occurrence of some pieces where the *filigrana* bubble was not drawn in order to close the decoration, and the terminations of the canes were consequently not removed. In some cases, the canes are spaced at irregular intervals or are left in huge relief.

Different hues in the body glass as well as unequal corrosion stages were also observed.

The planned chemical analysis of the glass will allow one to combine the morphological study with the compositional information.

Applying this methodology, we expect to be able to discuss the significance of the recorded features, determining for example if they represent the outcomes of technological development, or the signatures of different workshops, which could have employed different techniques to produce the same decoration. We also intend to verify if the variation of the accuracy and complexity in making *filigrana* glass can have chronological and/or geographical meaning, and if it is possible to distinguish imported items from objects of probable local production.

We hope that this systematic study will not only contribute to enhance the historic and artistic value of these decorative technique in Portugal, but it will also improve the knowledge about the trading relations between Portugal and other European countries as well as to provide a body of knowledge that might assist the preservation of this important heritage.

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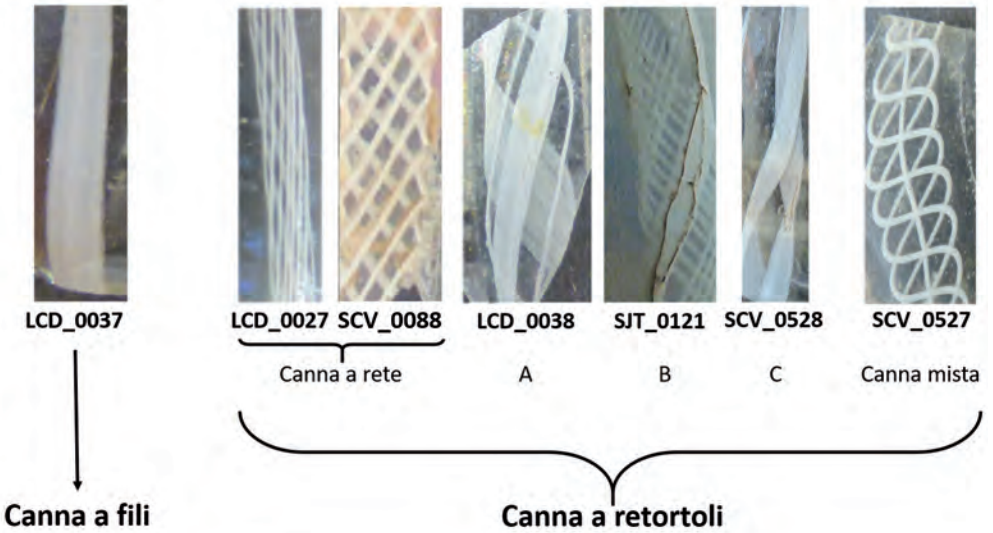

Fig. 1 - *Different types of canes from: Santa Clara-a-Velha Monastery in Coimbra (SCV), Largo do Chafariz de Dentro (LCD) in Lisbon, and São João de Tarouca Monastery (SJT) in Lamego.* A) Cane with external decoration with one band and one thread; B) Cane with external decoration that combine one band with a group of eleven threads; C) Cane with external decoration with two bands.

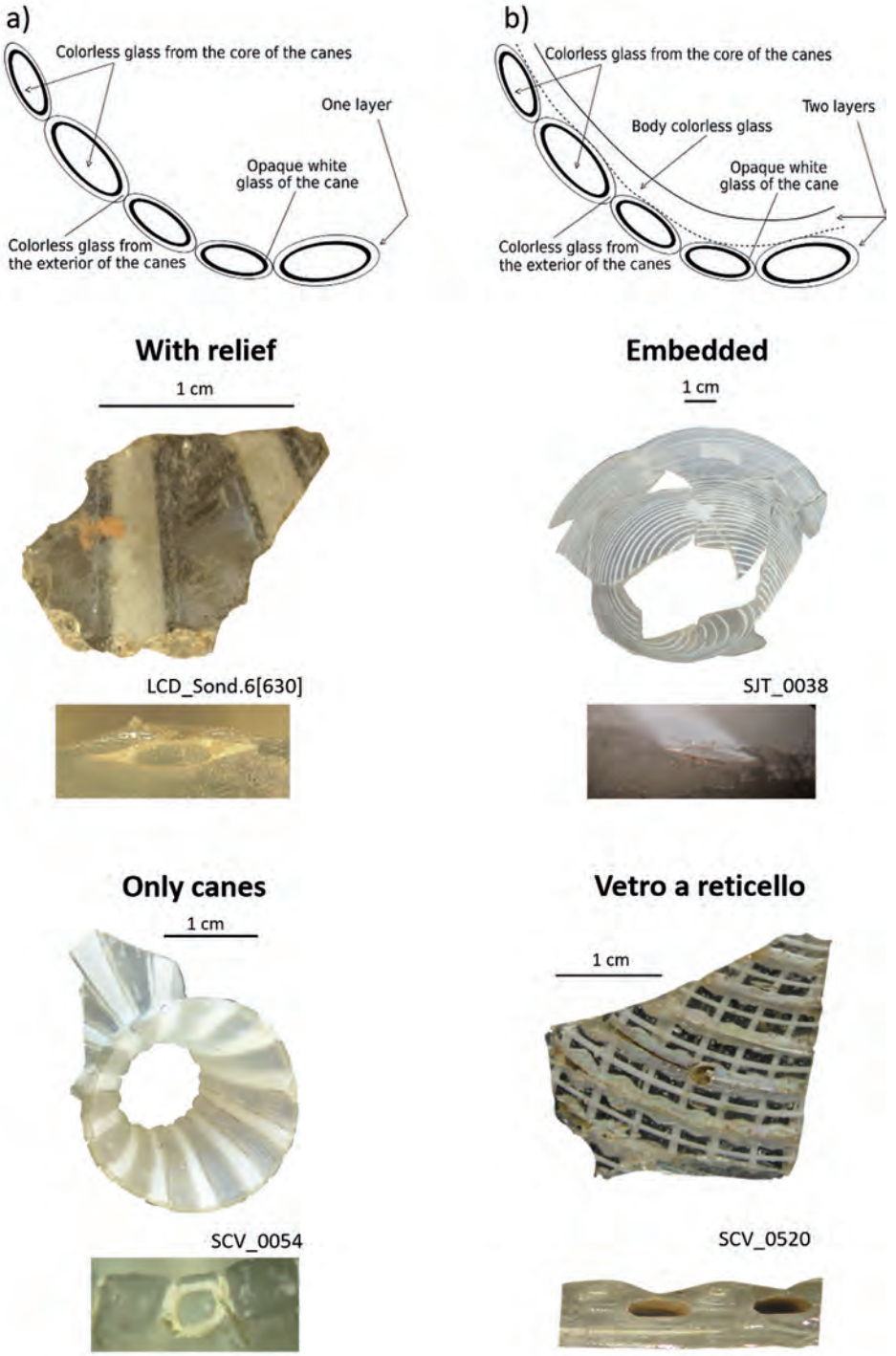

Fig. 2 - *Scheme of the terminology used in the description: one layer fragments* (a) *and two layers fragments* (b) (© Maria R. Varela: see Verela *et al.* 2018)) *and examples of different types of filigrana observed in the assemblages under study.*

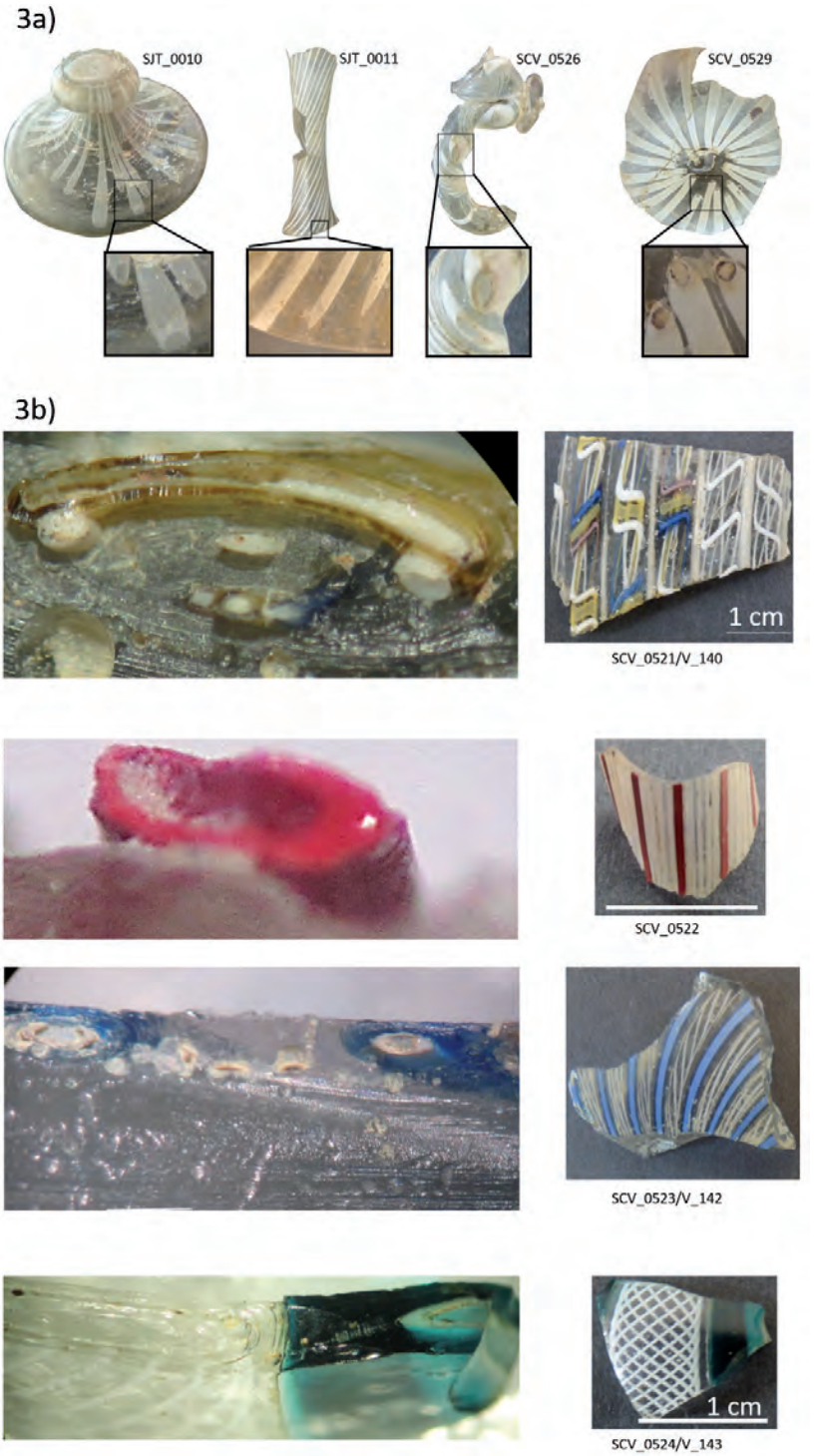

Fig. 3a - *Canes' termination on different areas of the glass objects.*
Fig. 3b - *Different stratigraphy of coloured canes.*

Andrea Bellieni

CULTURAL CLIMATE AND SOURCES OF INSPIRATION IN SIXTEENTH-CENTURY VENETIAN DECORATIVE ARTS

The invention of *filigrana*-glass, the subject of this volume, is attributed to the glass-maker Filippo Catani, who, with his brother Bernardin, in October 1527 asked the Council of Ten for the exclusive right to produce those glass pieces '*a facete con retortoli a fil*' (bands with involvements of *lattimo* wires) for 25 years. Indeed, this is known be an innovative application of the already existing *lattimo* canes, at the origin of so-called *filigrana*-glass. The name *filigrana* appeared later, at the end of the seventeenth century. Traditional Murano glass accounts always refer to the essential data that can be deduced from the original text of the petition, that is, besides the date, the name of the inventors and the, so characteristic, *muranese* terminology (*retortoli*), which was to become a part of the history of Murano glass.

Only by fully reading that text can we now find that the historical reality of that circumstance is much more complex and even more interesting. It tells not only about glass, but also about the extraordinary moment that Venice was experiencing in the cultural and artistic field and, with even more vitality, in the decorative arts.

Indeed, *filigrana* was by no means a fortuitous, albeit ingenious, invention by glass masters of special value; this important innovation directly and indirectly involved several other very significant figures. The incredible personalities of those involved were so closely linked to the artistic, intellectual and scientific, but also political and economic environment of Venice at that time (a truly crucial moment in the millennial history of the *Serenissima*), that taking them into account

opens up an extraordinary horizon of knowledge. Right in front of our eyes, the most noble history of Murano glass became connected, in a totally consistent way, to the 'Venetian landscape' with regards to various already well-studied and well known aspects, substantially enriching to both.

In view of the above, my essay will briefly - but in the clearest and least superficial way I can - outline the exceptional Venetian context that saw the birth of *filigrana*. This was the same very complicated, rich and extraordinary context as that of the contemporary flowering of all the other arts. It is well known: the first half of the sixteenth century was one of the highest moments of civilization developed by Venice, a beacon of unmatched intensity at a European level, though - as noted - historically and politically it was among the most difficult and decisive of times. We will return to this below.

From the field of glass and from that period so rich and decisive for glass art, our glimpse will extend over other arts that flourished particularly in Venice; above all, I shall attempt to find a 'Venetian specific' in the evolution of taste during the century, with its various parts. 'Local', indigenous components; among them, above all, the influence that can be attributed to the long Sansovino lesson and the activity of 'production design' of his pupils and late imitators, until the end of the century.

So there were external components (*foreste*), primarily those sensitive to the East, and hence the taste for decoration *alla Damaschina*, a truly distinctive feature of the Venetian artistic environment, and the development of some techniques related to the Orient and Islam, such as damascening (*agemina*), leather processing, lacquer and so on.

I would like to start from the text of the petition addressed to the Ten by the skilled masters Filippo and Bernardin Catani: they ask that '*a niuna persona sia di qualunque grado et condition si voglia, non possi lavorar né far lavorar al modo sopraditto per noi trovato , in alcun loco del dominio del Stato della ex.ma Signoria nostra: et precipue in Venetia et in Muran* […]', but they explicitly say '*exceptuando ilmagnifico Messer Francesco Zen del clarissimo Msesser Piero, il quale essendo causa e inventor de simel opera non se intenda sottoposto alla supreaditta rechiesta*' (no one, of any rank and condition, can work nor put to work in the way we have discovered, in any place of the State domain

and especially in Venice and Murano […] except for the Magnificent Mr Francesco Zen, son of the most distinguished Mr Piero, who is the cause and inventor of this piece of work).

The terms used to define the role of the nobleman Francesco Zen with regards to the new invention seem very clear: '*causa et inventòr de simel opera*'. He was the stimulus and the inspirer.

But not only, because he was also an *inventòr*: he was the one who guided the craftsman's hand to the happy end result, until the *inventio* of the extraordinary new kind of glass. This is very interesting and tells a lot about Francesco Zen, and about his leading family as the new class of young patricians, very close and in agreement with the resolute and morally strict figure of Doge Andrea Gritti. Hence, I will use the figure of Francesco Zen as a proponent of the general situation in which my subject is framed.

But first, I believe it is useful to mention the historical moment of that same 'fatal' year 1527, when the political and military balances in Italy became absolutely precarious: that same year, in May, there had been the Sack of Rome and, also in May, the Medici were expelled from Florence and the Republic, known as the Florentine Republic, was established.

In Venice, after the storm of the Cambrai war, Andrea Gritti, a key figure in the diplomatic solution to the war, was elected doge in 1523. Venice, with Gritti doge for a good fifteen years, acted cleverly on the Italian, European and Mediterranean stage.

The problem of the Duchy of Milan was still open, with Venice supporting the French dominance of the Duchy and the government of Francesco II Sforza; but in order to pacify Charles V, Venice had to surrender to him almost all the ports of Puglia.

Although he was an element of division within the Venetian political class, Gritti inspired a balancing action of Venetian foreign policy, especially towards the Ottoman Empire.

Gritti began an extraordinary and very expensive defensive plan of the Venetian region with the commanding general, Francesco Maria della Rovere, which Ennio Concina effectively defined as 'territorial machinery'. The ancient towns were radically transformed into modern fortresses, updated above all with the technology of weapons and military architecture, in which the main figure was Michele

Sanmicheli. This plan also involved the *Stato da mar*, with the cities and fortresses of the Dalmatian coast and the Venetian islands in the Aegean Sea.

New attention was paid to regulating the course of the rivers, especially those that led into the lagoon, respecting the equilibrium of the water.

Previously unseen attention was given to the region by the Venetian leadership, especially the fertile lands of Treviso, Padova and Polesine, also with an eye to land investment; this century also saw the beginning of the vast phenomenon of villas, which Alvise Cornaro justified and theorised from an ideological point of view.

Another major factor in the climate of that moment was the religious unrest surrounding Venice. The germs of reform had a truly formidable echo in Venice, where ideas were certainly more free and reverberated loudly in the work of intellectuals and especially artists – art historians are well acquainted with the opinion of a painter such as Lorenzo Lotto on this topic.

The debate over a profound change in the Church was very lively in Venice, so, in the second half of the century, the consequences of the Council of Trent had direct influences there on intellectual and cultural life, and therefore on the artists.

Artisan activities were always considered very important for Venice's economy and were a very significant export item; we know, and we shall see with some examples, that the nobility were sometimes so interested in these activities that they financed and invested in them.

The guilds in Venice, their organization into *Scuole*, the strict internal regulation of these corporations and the rigid rules for being part of them are a well-studied and well-documented subject. They were very democratic organizations for those times, with effective self-regulation. But there was also strict central control, headed by the highest State magistracies, such as the Senate and the Council of Ten. This was because of the great strategic importance of these activities.

Our interest is in the decorative arts, but I would like to widen it to all the arts related to the construction industry. Over the centuries, because of the city's unique characteristics, these created absolutely special and uncommon technologies and traditions.

The many arts that contributed to the construction of a merchant

or war ship could also be considered; briefly, all the rather privileged arts that were applied within that extraordinary complex apparatus that was the Venetian Arsenale: those of the carpenters, caulkers, oar-makers and rope-makers (*Marangoni, calafati, remeri, corderi*).

Along with the guaranteed supply of materials, primarily wood, these activities and their related arts were always considered to be of primary interest to the State, no less than the economic flourishing and prestige that the decorative arts had always given the *Serenissima*.

To sum up, the main points, already valid in the Middle Ages, but certainly consciously strengthened in the sixteenth century in relation to the growing difficulties in the traditional Venetian manufacturing trade routes, were:

1. Self-regulation within the Arts, especially regarding the guarantee of quality
2. State control with protectionism aimed at defending national products from imported products
3. Benefits and incentives for production improvements and the introduction of new qualified production in Venice.

Two of these points are referred to by Francesco Zen: new production and technological research.

There is no doubt that the age we are dealing with in Venice, particularly during the first half of the sixteenth century, was characterized by a special interest in the 'liberal arts', fueled by the youngest and most open patrician class; a truly modern scientific interest, which did not fail to reverberate outside Venice into the world thanks to the press. The activity of the many printing presses, as is well-known, had long made Venice the European capital of the book. This interest is typical of Humanism. It can already be seen in Veneto at the end of the fifteenth century, then maturing in the first half of the sixteenth century.

I'd like to offer an extraordinary figurative example of this: the frieze (*fregio*) in the so-called 'Giorgione house' in Castelfranco – a set apparently without order of objects that are technical man's artefacts, symbols of liberal and mechanical arts, combined with Latin mottos and the figures of ancient philosophers and emperors. According to Adriano Mariuz's intelligent interpretation, that fresco is the exact expression of the Renaissance philosophical ideal combining *Praxis*

and *Virtus*, the performance of all the arts related to man's spiritual qualities.

I think that this ideal is the basis of our consideration of the Arts in Venice throughout the sixteenth century. It is an ideal that was also shared by the circle of Venetian intellectuals and noblemen close to Giorgione, and to which Francesco Zen, the inventor of *filigrana*, belonged at the beginning of the century: a patrician who personally carried out research and made technological innovations, thus corroborating his virtue.

Born around 1485, Francesco belonged to the Zen family, of the branch with houses at the *Crosichieri*, the convent and hospital of the Crociferi Friars, in front of which the Jesuits were established, and descended from the heroic Carlo Zen, *pater Reipublice* of the fourteenth century. This family – in common with the Cornèr – boasted old relationships of female kinship with the Imperial House of Trebisonda and, through that, even with the imperial family of Persia.

Zen was a family of wealthy merchants, active and present on Venice's Eastern Mediterranean trade routes since the Middle Ages; for this reason Pietro – Francesco's father – was appointed by the Republic for several important diplomatic missions to Constantinople, Persia, Damascus, the islands of the Eastern Mediterranean and Greece.

Marin Sanudo, who was a friend of Francesco and collected in his *Diari* the stories of his travels and experiences, tells us that in 1523 Francesco was in Constantinople with his father, ambassador for the *Serenissima* at the court of Suleiman II the Magnificent (Pietro was there too in 1531-1532).

Francesco's special interest in technical and constructive aspects is also recalled here, along with the aesthetics of architecture, both ancient – Francesco was one of the first western travelers to study the architecture of Hagia Sophia –, and the bold and original constructions of Islamic architecture. So he was a figure of a particular openness, with a great interest in the technical and scientific aspects of architecture, but not only.

Francesco Zen is generally remembered by scholars for his long and close friendship and intimacy with Sebastiano Serlio. Fleeing Rome in 1527, like many other artist and intellectuals, he found a great deal of interest for his architecture studies in Venice, especially its

technical and practical aspects, here formatting text and illustrations for his important treatise, also thanks to the fruitful comparison with figures like Francesco Zen. The Fourth Book was printed in 1537 by the famous printer and publisher Francesco Marcolini, who had set up his own press, which was frequented by all the main artists and men of culture present in or passing through Venice. This was the society frequented by Francesco Zen. The name of Aretino stands out, accompanied by others, such as Titian, Sansovino, Doni, Bembo and Daniele Barbaro. Marcolini himself was a significant figure with the same interest in technology, particularly watch-making and civil engineering.

It is Serlio himself, in the foreword of the Fourth Book of his important and influential treatise, who points out Francesco Zen among some Venetian nobles '*che fanno di quell'arte quanti I migliori maestri* […]' (who practise that art on a par with many of the best masters'. Together with Francesco, Serlio mentions Gabriele Vendramin and Marcantonio Michiel; it is important to emphasise that they were all young patricians of that specific circle and also collectors and clients of Giorgione, the inspirers of that remarkable poetry and philosophy of nature and the world, of man and his soul, expressed by Giorgione's paintings. We also know that Francesco shared other artistic passions with those young patricians; as a member of the Compagnia della Calza, he also promoted dramatic performances that were very free, sometimes licentious and bold in their content, right at the Zen's protected and favoured Crociferi Monastery. Francesco loved music, also its technical aspects; he owned an extraordinary *organo positivo* made by the famous Lorenzo Gusnaco of Pavia, a friend of Leonardo and correspondent of Isabella d'Este around 1500. Francesco considered it so precious that in his will he designated it *fidecommesso* (belonging to the first-born male, the organ could not leave the family). That precious instrument, with its strange cardboard pipes, similar to paper *retortoli*, still exist and is today one of the secret treasures of the Correr Museum, observed and studied by many international scholars.

Pietro Zen, Francesco's father, who died in 1539, just one year after his son, mentioned Francesco in his will as the author of the project for the radical restoration of the ancient houses of the Zen to

reobtain the original large building of the *palazzo* on the Fondamenta Santa Caterina, a unique facade about 50 metres long, with unusual windows and inflected arches, truly 'heretic' compared to the classical canons, which some scholars have interpreted as the will of the Zen to clearly emphasise Venice's privileged relationship with the East through their family.

Architectural historians fiercely debate Serlio's actual role in the design of Palazzo Zen, given his documented close relationship with that family. The *palazzo*, begun in 1532, was finished in the following decade and the exterior facade painted by Schiavone assisted by an already fiery young Tintoretto. It is very significant that in his will Francesco ordered that he be accompanied to his tomb by building craftsmen, obviously the bricklayers and carpenters who were working at the *palazzo*, along with Serlio and the head master, Innocenzo Lombardo.

Francesco was obviously interested in the arts, but also in the business and earnings they could afford. It is again Sanudo who tells us how one day in 1531 Francesco showed him '*un anello d'oro, sopra il quale è un orologio bellissimo, qual lavora, dimostra le ore et sona*' (a golden ring over which there is a beautiful watch that plays, shows the hours and rings) and he also tells us that he wanted to sell it – of course with a good profit – to the Ottoman court of Constantinople.

In relation to this we must certainly remember the 'bargain of the century' in which Francesco was the main figure, with all his brothers and other nobles. In 1531-32, a 'company' was formed to make a fabulous gold helmet with an extraordinary number of precious gems. The goal was of course to sell it, with a large profit margin, to the only possible buyer, Suleiman II. Its very significant form is known from an engraving, based on a drawing by Titian, featuring four concentric crowns, one above the other; one more than in the pope's triple crown, about which the Venetians had no scruples. The artisans were the renowned Caorlini, goldsmiths at Rialto. The deal went well and the gain was 100% above the invested capital.

Now that we know him well, we have no difficulty imagining Francesco Zen in the Serena glassworks[1] discussing the peculiarity of

[1] With regard to the Serena/Sirena glassworks see in this volume R. Barovier Mentasti and C. Tonini.

those canes with the Catani and their workers, how to work, pull and twist them; over a long period, with many attempt and failures, until the success of 1527.

I have talked at length about a figure like Francesco Zen (others will talk about him far better than I, *in primis* Rosa Barovier in this volume) taking advantage of his relationship with the birth of our *filigrana*, because his figure and his case, documented and historical, seem to me very emblematic for representing the special Venetian situation in the sixteenth century, characterised by a close interaction between the following:

- High-level of intellectual activity;
- High-quality of manufacture, with a great boost for research and innovation;
- Individual economic profit for the artisan, the trader, the noble, the bourgeois, the entrepreneur and the investor;
- Conscious interest of the State, which protected all these cooperative interests even in their superior and general interest.

I am really struck by the fact that, while describing this Venetian situation of the sixteenth century, I see a programme that – today – would have an extraordinary relevance in Europe and especially in Italy.

Even on the social level the scene was very significant because it saw the involvement of all social orders: the pinnacle of the ruling class of the State, namely the patricians; the intellectuals and those we now call 'free professionals'; the middle-class artisans and workers; the latter two orders framed in the Schools of Arts, meaning self-organization, as protection, in a very advanced and 'modern' way for that era, under the control of the State.

Discussion of artistic production in Venice in the sixteenth century requires the consideration of some peculiar factors. A very important one is the 'internal' commission, that part of the production not intended for the market and export. It was the part relating to commissions by the State, especially for large representative buildings; by religious organizations and the *Scuole Grandi*; and by private clients, mostly patricians.

It is important to consider that in Venice the difference between artistic commitments was very nuanced, almost inexistent, that the Church was included in the State and that in Venice all the patrician class identified itself with the State.

Hence, the image that art purchasing could have given to the religious institutions or to the patrician family coincided with the image of the State itself. An image that could only be one of splendour and wealth. In Venice the arts had a special mark to answer this main need. That is why the export of arts also represented an aspect of 'political propaganda' for the *Serenissima*: the luminous image of Venice art was also that of a desirable mythical urban location and a personal envied way of life. The Venetian rulers were absolutely aware of this.

The peculiar political consideration of art in Venice derives from this. Of course every art was involved, but especially the decorative ones, with products widely exported: *arti suntuarie*, for prestigious luxury goods whose fame and admiration were equal to those of Venice itself.

This situation regarding the arts did not establish a hierarchy between the major arts. Painters, sculptors and architects (mostly framed in their *Scola*) often practised these various disciplines simultaneously; above all, they applied themselves to decoration and design.

This is the general landscape where we have to place all aspects of our subject; particularly those linked to the evolution of style, taste, preferences, influences and fashion in the decorative arts field in sixteenth-century Venice.

Opening this chapter – I realize – is very complicated, due to the variety and complexity of aspects that should be recorded and discussed extensively. This is obviously impossible on this occasion: the lack of completeness and precision would certainly be a limit.

However, I would like to draw at least one 'general trace', a 'Venetian line', of sixteenth-century arts. Perhaps this will be possible so I will try, very briefly.

Once again, I would like to follow a *fil rouge* that is – fortunately for us – well-documented, to proceed chronologically along the same path, to find further confirmations and make other observations

extending to the general situation of the arts in sixteenth-century Venice.

Let us go back to the Catani glassworks *alla Sirena* a few years later: they had the *privilegio* for ten years, but it is clear that other Murano masters were already practising to produce *retortoli*. They could not wait for the Catani's *privilegio* to expire. Some glass masters were already trying to cross layers of canes with bands of *lattimo* threads. The *reticellio* was to be invented soon after (the *mariegola* records it with this name in 1541).

While, in September 1531, the Duke of Ferrara, Alfonso I d'Este, Titian's sophisticated client, was on holiday in Murano – the island was then a splendid place where the main Venetian families had holiday villas and gardens –, the Senate allowed the Catani to reignite the furnace – interrupting the rigidly established general holy days for two weeks – so that the Duke could 'make certain glass pieces in his own way'; perhaps *filigrana* glass? In any case, it is curious that a military figure as singular as Alfonso (his nickname was Duke Artillery) wanted to test himself as a glass designer.

In that same year Pietro Aretino sent to the Duke of Mantua, Federico II, '*una cassetta che, piena di vasi di vetri, vi mandai solo perché voi vedeste la foggia de l'antiquità disegnata da Giovanni da Udine. La qual novitade è tanto piaciuta ai padroni de le fornaci de la Serena, che chiamano gli aretini le diverse sorti di cose ch'io vi feci far ivi*' (a little box, full of glass vases, I sent you in order to let you admire the design of the antiquity created by Giovanni da Udine. That same invention delighted the masters of the Serena glassworks so much that thay started calling the different types of objects I made for them *aretini*). He also added that that type of vase design, bought by the pope's chamberlain, was highly appreciated by Clement VII.

Once again, ten years later, Giovanni – by then living permanently in Udine, after his Venetian experience decorating the Grimani palace in Santa Maria Formosa – was asked by Aretino to send him other sheets with drawings of vases *all'antica* invented by him.

The reference to drawings sent expressly by Giovanni da Udine, Raphael's associate, educated to the new Renaissance creation *all'antica* through the direct study of original classic vestiges, is very interesting; he was the inventor of the Renaissance *grottesca*, painted

or in stucco reliefs, inspired by the decoration of the Domus Aurea. Raphael's animated studio became the hotbed of the elaboration of sophisticated 'ancient' inventions; models that immediately unfolded and circulated mainly through print engraving, assembled in the form of ready-to-use handbooks.

Some of Raphael's pupils and epigones applied themselves to those activities with Giovanni da Udine, such as Polidoro da Caravaggio, Luca Penni and Giulio Romano. Even after their escape from Rome, because of the sack in 1527, these artists continued to create amazing 'ancient fantasies', unlikely for a modern archaeologist, in their new locations, such as Fontainebleau, Genoa and Mantua.

One of the favourite themes for these inventions was the 'closed form', which is the jar, the cup and the glass. These were the models for the glass-makers, but also for the ceramists, goldsmiths, silversmiths and, more in general, for artists working with copper, brass, bronze and enameled metals.

The taste for antiquities was an essential element in Venice, too, particularly in the applied arts, from the middle of the fifteenth century. A myriad of ancient objects, especially weapons, vases and 'closed forms' were very abundantly inserted in the *candelabre* of *Lombardo* architecture, such as in Santa Maria dei Miracoli, San Giobbe and the Scuola di San Marco; in funeral monuments and in their pictorial versions.

In the third decade of the sixteenth century – contemporary with the Roman diaspora of Raphael's pupils – even in Venice the old models were those coming from Rome. Such models seemed to come and be established as the result of the fortune and the wide circulation of the taste for the *grottesca*, undoubtedly the most successful decorative invention of the sixteenth century, rightly named *raffaellesca* by some historians of the twentieth century. The *grottesca* then became truly 'invasive' in the field of architecture and architectural decoration and in almost all the arts applied to the production of objects for use or ornament.

It is very interesting to follow the evolution of the *grottesca* in Venice and Veneto throughout the century.

We could distinguish the authentic Raphaelesque source, the subsequent elaboration in Padua – with Sustris and Gualtiero active

in the Odeo of Alvise Cornaro – and then the rapid arrival in the Venice area.

We could even distinguish local inflections between Verona and Vicenza; we could observe the *grottesca* in the elaboration of individual artists and studios; finally, how *grottesche* are used, even with very different quality levels, by many foreign painters, especially Venetian influenced Flemings.

With this mature *grottesca* type we can now properly talk about Mannerism also in the field of decoration.

The *maniera* established itself in Venice with the new 'romanist wave' that arrived in the area towards 1540, with the support of Aretino and the Grimani. The artists that changed that period were Vasari, Francesco Salviati, Battista Franco and – shortly afterwards – Federico Zuccari.

From this decisive 'external' impulse beautiful Venetian fruits were born: Andrea Schiavone, with his original language derived from the style of Parmigianino; the young Tintoretto, Veronese, Jacopo da Bassano and Alessandro Vittoria.

All of these are for us mainy the names of painters and sculptors; actually, only the most important ones. As a whole they developed the - entirely Venetian - local style, which immediately also invested the applied arts; a mix of external contributions, local tradition from the past and personal originality. All of these artists also devoted themselves to the decoration of architecture and interior design and – as true designers – to the creation of objects for decoration and practical use.

It is quite logical that the line of taste came from the 'major arts', although there were specific exceptions, along with technical and practical conditioning related to different production and materials.

It is necessary to put a special emphasis on Sansovino, active in the lagoon with his great and eclectic studio for over forty years, from the start of his permanent residence in 1527 until his death in 1570. In the official role of *proto*, trustee of the Procuratori of St. Mark, he authoritively governed all the works of architecture and town planning, decorative enrichment and State *mise en scene*, in St. Mark's, the Basilica and the Procuratie: the universal image of Venice and the *Serenissima*.

Especially under the clear ideological direction of Doge Gritti, in 1537 Sansovino began construction of the Marciana Library: a true Roman civilian basilica dedicated to the precious code of the ancient classical Greek and Roman authors, donated to Venice by Cardinal Bessarione. It was a very clear way of asserting the idea of Venice before the new European monarchies, through architecture and decoration, as the direct and legitimate heir of Rome, being republican and classical like ancient Rome; above all to assert the supremacy of the *Serenissima* in terms of culture, but also of the economy.

Venice could unfortunately no longer boast such supremacy on a political and military level. Sansovino, assisted by two 'tutors', Titian and Aretino, and with the help of a very large circle of pupils and assistants – some of them of special value, such as Tiziano Minio - was the great 'director' of this operation. He used the full classical *repertoire* in a very mature and original way for the Library and the Loggetta, where the strongly sculptural architecture and architectural-decoration gave rise to what Palladio soon afterwards defined as '*l'edificio più ricco e più ornato che si sia mai fatto dagli antichi fin qua*' (the richest and most ornate building ever made from the Ancients until this moment).

Architecture and sculpture on the exterior, stucco and paintings on the inside, play together in extraordinary strength, suggestion and coherency. It is natural and logical that such works were immediately viewed by both buyers and craftsmen as paradigms, landmarks and inspirational, comparative models.

During the preparation of this volume I had the pleasure and the curiosity to observe the *grottesche* decorations that cover many parts of the Library: for example the intrados of the portico, many closed-shapes useful for the glass-makers, ceramists and silversmiths: a sort of *Bichierografia* carved on Istrian stone.

In general, we can recognize some of Sansovino's characteristic decorative figures, always very 'sculptural', with a strong emphasis on the third dimension, and a tendency to frame with 'eared' (*auricolari*) and rib boned elements: vortex frames and *cartocci*, garlands of flowers and fruit, human and animal protomes, caryatids and sphinxes; all highlighted by a strong *chiaroscuro*, on a very colourful surface preferably covered with gold. An unmistakably Venetian taste for

appearance, richness and colour. This may at times seem just a step away from kitsch, but more often it settles into a 'gorgeous equilibrium'. Imagine the Doge's Palace ceilings designed by Cristoforo Sorte: those ceilings could only been created in Venice in the middle of the sixteenth century. A rich repertoire used by Sansovino himself, but above all by his then actively working, direct assistants. And it was they who brought this style up to the seventeenth century. The abrupt passage to the Baroque in Venice was not necessary: in some ways it already existed. It was inevitable that in Venice this rich repertoire of images and shapes should also have been adopted for a glass or metal vase, for a bed or a headboard, for the cover of a book or a little jewel.

Until now we have talked about the dominant line of sixteenth-century Venetian art, the classicist and mannerist, relevant for the figurative arts, which made their mark on the decorative arts.

However, we know that the decorative arts, by their characteristics, are always very permeable and receptive to different influences. In fact, it is easy to explain the impact of the insertion of new materials and new processing techniques, deduced from other foreign traditions, into local traditions. There were two main lines of such integration: imitation by local artisans of successful and admired products arriving on the market, sometimes with partial, not faithful and only external techniques as in the case of Oriental lacquer; or the direct immigration of craftsmen from other regions and countries. Both of these were valid throughout the history of the arts in Venice.

Perhaps in no other place as in Venice, over all the centuries of its history, was this mix so strong and decisive as to form an original synthesis; that is, the sum of so many different influences – from earth and sea, from north and south, from east and west – created a new experience that can only be defined as 'Venetian'. There are so many examples, especially in the sixteenth century, that is impossible to enumerate them.

We could mention the influences coming from the Alps, or perhaps we would be fascinated by the many influences coming from the East , the Far East and especially China – a road travelled not only by Marco Polo but also other Venetians, the eastern Mediterranean; the Latin, the Greek and the Islamic Mediterranean, where Venice was actually considered 'home', especially in the sixteenth century.

We could also talk about the peculiar techniques of metalworking, lacquer processing or leather processing. We could look for elaborate, minute, decorative Islamic motifs – which were named in Venice after the city of Damascus – taken back right in Venice by the goldsmiths, the manufacturers of leather book-covers, the framers and furniture painters, and the textile makers.

To be objective, we should also mention the arts that in Venice had less fortune, for which the city could not take primacy over other places. Venice was primarily a 'client' for these products, possibly for trade purposes and not only 'domestic' demand.

Among these we ought to mention the tapestries, whose primacy remained in Flanders; even in the field of majolica – which had some important artists in Venice in the sixteenth century such as Maestro Ludovico or Maestro Domenico, with some typical Venetian characteristics – the most valuable and sought after products were always imported from factories in the Marches, especially Pesaro and Urbino, with little fortune for those ceramists from the Marches who had moved to the lagoon.

This is a really broad issue, but there is a statement that we can all share: the decorative arts in Venice in the sixteenth century were not just 'art' for decoration and objects, but represented the most 'concrete substance' of its unique material, historical and human existence.

Christopher Maxwell

REFLECTIONS ON THE *FILIGRANA* STYLE IN RENAISSANCE VENICE

The artistic and technical virtuosity of the Muranese glassworkers earned them universal approbation which rapidly grew following the breakthrough-development of *cristallo*. While Northern countries maintained a simultaneous fondness for colorful enamel decoration and green-tinted roemers, until the second half of the seventeenth century few parts of Europe could resist the delicate charms of undecorated, thin, colorless glass in one form or another. As a new achievement in the field of glassmaking, it was both an aesthetic novelty and a technical feat, and within these parameters the possibilities for consumer approval were limitless.

The questions posed in this short paper are: having enchanted the world with its delicate, colorless glass, what could have influenced or inspired the Muranese glassmakers and their followers to reconsider the qualities of opacity, and drove them to experiment with, and perfect the art of, *filigrana*? What are the possible associations of the style? And what is the significance of their overwhelming preference for white? The *filigrana* style, imbued with Venetian genes, was appreciated, exported and emulated throughout Europe, but this paper will restrict itself to considering what white *filigrana* could have meant within the culture of its inception, namely: Venice. The thoughts which follow are admittedly conjectural, yet they are informed by the research of colleagues in other fields of art history, which this author attempts to apply to the subject of *filigrana*. It is hoped they might prompt further reflection and research on this aspect of the subject.

As Paul Hills writes, «of all the colour preferences of the early 1500s, the most quietly transforming was the growing esteem for

white»[1]. It coincided with a growing appreciation of the sculpture of antiquity, and impacted the use of colour in architecture, as well as painting, dress and the production of ceramics and glass. Design does not exist in a vacuum, and the use of white canes on Murano was not incidental, but part of a much more profound and pervasive aesthetic movement and consequently carried with it certain significance and connotations.

In the dream romance *Hypnerotomachia Poliphili* of 1499, a wall of milk-white stone is described as being of a whiteness excelling even that of the *lattimo* of Murano[2]. *Lattimo* glass was doubtlessly the Muranese answer to imported Chinese porcelain, which began to captivate Europe during the 1400s. White was confirmed as a colour of prestige in the Venetian mind by its association with gold ranking above scarlet and crimson as the colours of the doge, as represented by Bellini in his portrait of Doge Leonardo Loredan, c.1501-1502 (National Gallery, London, Inv. NG189). In costume it signified leisured civility, in architecture in came to represent the sacred, and its associations with purity, in every sense, were readily accepted. In Venetian oil painting, the growing interest in the pictorial qualities of white is notable in Bellini/Titian's *Feast of the Gods*, c.1514 (National Gallery of Art, Washington, Inv. 1942.9.1) in the rendering of luxurious Chinese porcelain and the sensuously flowing robes of the gods. Similar effects of the splendor and intimacy of white are explored by Titian in the sumptuous bridal gown worn in *Sacred and Profane Love*, c.1514 (Galleria Borghese, Rome) and the shirt and breeches of the richly-dressed shepherd in *The Holy Family with a Shepherd*, c.1510 (National Gallery, London, Inv. NG4).

More broadly speaking, white became even more highly-regarded as the taste for gold declined after about 1500. This shift in taste towards a preference for white is evidenced by Isabella d'Este's orders of Venetian cristallo. In 1496 she placed an order with the Murano glasshouses for vessels *schietta senza oro* (plain without gold). This was followed in 1529 with another order stipulating decoration of *fili*

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[1] Hills 1999: 151. The work of Paul Hills has been invaluable in my consideration of this subject.

[2] Cit. in Hills 1999: 127.

bianchi (white stripes). A further order in 1535 requested the even more elaborate *filigrana* technique *lavorato a reticella bianco* (white reticello)[3].

Venice was also the centre for trade and processing of sugar, an expensive commodity imported from Egypt. It was used not only in the preparation of sweet foods, but sculpted into elaborate table ornaments for the visual pleasure of diners, adding a further significance to the colour white as a statement of prosperity and prestige. In 1574, Venice lavishly hosted Henry of Valois, the elected king of Poland and future king of France. After a visit to the Arsenale, the king and his entourage were invited to a table laden with the arts of the Venetian confectioners on which even the napkins, crockery, cutlery and breads were crafted from sugar[4]. At the official state banquet, Venice presented two hundred of its most beautiful noblewomen, all clad in white silk, alongside a collection of more than three hundred figures made of the whitest sugar[5]. What greater endorsement for the primacy of white?

During the 1500s white fabrics became more evident as expressions of wealth, and are particularly noticeable in the emergence of the *camicia* or chemise. As these white undergarments became more luxurious, often in fine linen, embroidered or, eventually, trimmed with lace, it became fashionable to flaunt them at collar and cuff, as seen in Titian's *Man with a Glove* (Musée du Louvre, Paris, Inv. 757) – a fashion that grew to almost absurd proportions as the century wore on, and fed the growing lace industry of Burano, which seems to have been well established by the end of the 1400s. Wearing such undergarments was considered an hygienic and more healthy alternative to bathing, which was believed to expose the body to all manner of harmful humours, and they commonly doubled as nightwear too. The sight of this delicate white linen or lace next to flesh, and its associations with informality and the bed chamber, carried sensuous, even erotic overtones and the diaphanous qualities of these materials were explored by artists such as Titian and Veronese. It is difficult not to be aware of the subtle sensuality of these part-

[3] Hills 1999: 126.
[4] Imorde 2015: 107.
[5] *Ibid.*

transparent, part concealing garments. Compare, for example, Titian's *Lady in White* (Gemaldegalerie Alte Meister, Dresden) and his semi-clad portrait of an *Unknown Lady* called *Titian's Mistress* (English Heritage: The Wellington Collection, Aspley House, London), both c.1550-1560; or the delicate exploration of a diaphanous veil in Veronese's *Portrait of a Venetian Lady* called *La Bella Nani*, c.1560 (Musée du Louvre, Paris, Inv. R.F.2111).

Trading contacts in the east and the large number of foreigners resident in or passing through Venice, exposed Venetians to many fashions in veils, shawls and kerchiefs. The veiling of women in public, often remarked upon by visitors to Venice, suggests an affinity with Islamic society (although this was blatantly challenged by the conspicuous freedom and immodest dress of the city's courtesans). One account of 1494 reads like a description of a Muslim society:

«The general run of the women who go out of the house, and who are not among the number of pretty girls [courtesans?], go out well covered up and dressed for the most part in black, even up to the head […] The marriageable girls dress in the same way, but one cannot see their faces for the world. They go about so completely covered up, that I do not know how they can see to go along the streets»[6].

Such effects were apparent not only in costume, painting and (this author would argue) glass, but were imbued in the very townscape of Venice. The waterfront houses of medieval and early renaissance Venice appeared veiled in delicate, semi-transparent traceries, shielding secluded yet, at the same time, open *sale*, and windows glazed with a myriad of glass roundels both revealing and obscuring the life beyond. Public-facing and architecturally prominent, such 'veiled' vignettes (both outward and inward) were part of the common and everyday aesthetic experience of Venetians.

Venetian sumptuary laws placed restrictions (at least officially) on the use of colour in dress. Consequently, chromatic differences were heavily dependent on the texture of the material to which the dye was applied: wool, velvet, silk of damask. A fifteenth century Venetian manual offers 109 recipes for red dye, 10 for black, and five for green. For example, *scarlatto* was a shade or red associated with fine wool,

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[6] Newett 1907: 145.

cremisino and *rosa secca* with silks, and *sanguigno* with linen or cotton[7].

Veronese fully exploits the Venetian sensitivity to these subtle differences in hue in his rendering of the black costume traditionally worn by Venetian noblemen in the portrait of Count Giuseppe da Porto and his son, c.1551 (Palazzo Pitti, Florence), and equally in the shades of red (a colour ranking just beneath white and gold in its prestige) worn by his wife, the Countess Livia da Porto Thiene and her daughter (Fig. 1).

If we consider the different types of *filigrana* (*vetro a fili*, *vetro a retortoli*, and *vetro a reticello*) as offering the consumer different 'textures', we gain a new perspective on how these vessels might have been appreciated. Red was, of course, also the colour of the wine with which many of these vessels were filled[8].

The dappling of red wine by white *filigrana* would softened its hue to varying degrees of pink, while also providing a stark background against which the delicate canework could be appreciated. In vessels of *vetro a fili* or *vetro a retortoli*, the effect is similar to lace cuffs against a red sleeve, as seen in Veronese's *Portrait of a Woman*, c.1565 (Fig. 2). A vessel of *vetro a reticello*, must surely have sparkled like a jewel in candlelight, or revealed the gentlest hints of pink like the red gown seen through the diaphanous folds of a light-weight, white linen over-skirt in *Lady with a Squirrel*, attributed to Francesco Montemezzano, c.1565-1575 (Fig. 3). The effects of filling such glasses with white wine would have doubtlessly brought similarly delightful shades of gold.

That renaissance diners paid so much attention to the aesthetics of their drinking vessels is born out by the numerous courtesy manuals and essays, which instruct the reader on how to hold and use various types of vessel and dining implements. The quantity and variety of wine glasses, trick glasses and puzzle cups, which still survive, along with related texts, attest to the importance of drinking rituals as a

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[7] Hills 1999: 176.

[8] In 1562 a German priest, Johann Mathesius, observed: «It is true that a red wine looks truly beautiful in a white and clear Venetian glass, and gives off its shine and light, when the glass would stand in the sun or in front of a light by night». Cited in Liefkes 2002: 78.

focus of social life, and the consequent significance of the design of drinking vessels at this time.

Such theories as this might at first seem somewhat tenuous but owning finely crafted objects was more than a badge of wealth: it was a key component of renaissance sociability. That they should have been imbued with significance and associations beyond the merely functional or decorative, and touch on broader sensibilities and philosophies would therefore seem only logical. As Pietro Belamonte wrote in *Institutione della sposa*, a small conduct book published in 1587, when receiving guests, a diligent hostess should:

Take them by the fire, or the window, or the garden, according to the seasons, and times, and guide them around the house, and in particular show them some of your possessions, either new, or beautiful, but in such a way that it will be received as a sign of your politeness and domesticity, and not arrogance: something that you do as if showing them your heart[9].

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[9] Cit. in Ajmar-Wolheim 2006: 209.

Fig. 1 - Paolo Veronese, *Portrait of Countess Livia da Porto Thiene and her Daughter Deidamia*, Venice, 1552. Baltimore, Walters Art Gallery, inv. 37.541.

Fig. 2 - Paolo Veronese, *Portrait of a Woman*, Venice, c.1565. Douai, Musée de la Chartreuse, inv. 751.

Fig. 3 - Attributed to Francesco Montemezzano, *Lady with a Squirrel*, Venice, c.1565-1575. Amsterdam, Rijksmuseum, inv. SK-A-3990.

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Higher Education Course
Study Days on Venetian Glass
Venetian *Filigrana* Glass through the Centuries

Istituto Veneto di Scienze,
Lettere ed Arti
September 11-13, 2017

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The Venice Glass Week

Venice, 10-17 September 2017

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Fondazione MUVE, Fondazione Cini, Istituto Veneto and Consorzio Promovetro Murano are promoting the first international festival devoted to Murano glassmaking. All the major institutions of Venice are invited to take part. The aim of the festival is to revive and promote the most important artistic and industrial activity of Venice.

We would like to thank Fiorella De Boos Smith and her husband Phillip De Boos Smith for the loan of the filigree glass exhibited during the Study Days.

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The program of the festival will include exhibitions, conferences, seminars, screenings and open-days of furnaces.

A new far-reaching program of events devoted to glass – the main artistic and economic driver in Venice known throughout the world - is scheduled to take place in Venice from 10th to 17th September 2017.

The main promoters of the festival are important city institutions that already have experience in this field: Fondazione Musei Civici di Venezia, Fondazione Giorgio Cini, Istituto Veneto di Scienze, Lettere ed Arti and Consorzio Promovetro Murano, the most important association in the glass sector, which also manages the Vetro Artistico Murano trademark of the Veneto Region.

The Venice Glass Week will feature exhibitions, conferences, seminars, educational activities, screenings, events, the opening of the furnaces to the public and other happenings all linked to artistic glass. Besides the initiatives organized by the four main promoters, the program envisages to include events promoted by all those who wish to participate in the festival. About a hundred partners, including foundations, art galleries, glassworks, museums, cultural institutions, universities, training centers and private collectors have already confirmed their participation in the festival.

The Study Days on Venetian Glass 2017, in its sixth edition, take place in the context of The Venice Glass Week and register the presence of thirty or so glass experts from all over Europe and the United States, including museum curators, scholars, collectors, restorers, glass artists. In three Study Days a rich programme features seminars, lessons, visits and practical demonstrations of the ancient techniques, with papers and communications by scholars, all specialists in the field, making this event one of the most important of its kind organised on an international level.

Our aim is again to offer an opportunity for in-depth study and encounters, with an ample exchange of knowledge and experience to glass historian.

Thanks to this initiative, started in 2012, Venice may become the world centre for the study of old and contemporary glass and also an outstanding meeting place for scholars, artists and collectors.

Higher Education Course
Study Days on Venetian Glass
Venetian *Filigrana* Glass through the Centuries

Istituto Veneto di Scienze, Lettere ed Arti
September 11-13, 2017

With the support of
Corning Museum of Glass
Ecole du Louvre
Fondazione Musei Civici Venezia
LE STANZE DEL VETRO
Venice Foundation
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Organised with the collaboration of
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The "Study Days on Venetian Glass" are an opportunity for in-depth study on Venetian glass and are tuned to an audience of Museum conservators, collectors and experts.
The programme includes lessons by experts who, after a general overview, will guide participants through the direct study of methods and pieces, encouraging participants to actively take part, also through presentations. Lessons and discussions will be held in English.
Contributions in Italian will be translated into English by the seminar curators.

The topics that will be touched upon will include:

General overview of the history and art history of glass; Raw materials and casting/processing techniques; Archaeometrics; Conservation and Restoration; Training and consistency of glassmaking in the Museums collections; Recovery techniques and ancient models during the nineteenth century.

The seminars will be completed by a tour of the Murano Glass Museum and by a practical demonstration in a Murano glassmaking studio.

Secretariat
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MONDAY, 11th SEPTEMBER

Chairperson **ROSA BAROVIER MENTASTI**

SESSION 1

9.30 a.m. **ROSA BAROVIER MENTASTI**
Opening remarks

10.00 a.m. **ANDREA BELLIENI**
The Venetian cultural climate. Sixteenth-century Venetian decorative arts. The sources of inspiration.
Abstract - After the dominant Greek-Byzantine imprinting, so above all after the fifteenth century, Venice's open and cosmopolitan vocation, in its very DNA, meant that its vast, varied and highly exported artistic-manufacturing production was marked by a synthesis of ideas, techniques, decorative patterns, tastes and fashions of the most diverse origins. This absolutely Venetian synthesis was quite original in its innovative reworking and very high aesthetic and qualitative values. The project is intended to provide a general picture of the decorative arts in Venice in the sixteenth century, a golden period of its production, luxurious and of the highest technical and material quality, which then became emblematic of an unparalleled and desirable way of life in Europe and beyond. It is precisely the period of the invention, development and success of Murano filigree glass that is the focus of these study days. Taking into account the specific economic-commercial and social organisation of the artistic production, supervised, promoted and defended by the state, and also self-regulated in its quality by the 'scuole', an effort will be made to go through the century identifying, gradually and with the peculiarities of the various production specialties, the main sources of 'external' inspiration (Italian and international). After indicating the possible reasons, channels and means of circulation in Venice, the way in which these interacted with the original Venetian inflections before Renaissance classicism will be analysed, followed by the various 'mannerisms' from that of Sansovino to those of central Italy and the world.

11.00 a.m. **COFFEE BREAK**

11.30 a.m.

MARCO VERITÀ, SANDRO ZECCHIN AND ELENA TESSER

Venetian filigree glass along the centuries: some technological considerations

Abstract - White opaque glass has been manufactured since the beginning of the history of glassmaking. In the Middle Ages it was used mainly for the preparation of mosaic tesserae, enamels, and small decorations on blown glass.
It is in the Venetian glass factories of the 15th-16th centuries that the white opaque glass (lattimo) undergoes important improvements to be used for new applications (invention of a new white opaque blown glass called porcellano, used to imitate Oriental porcelain items and the invention of filigree). These results were achieved by overcoming technical difficulties, such as the control of viscosity of the opaque glass during shaping of blown objects and the thermal expansion compatibility between the white opaque and the clear transparent glasses fused together in the filigree works. These improvements did not happened by chance but were the result of a long perfection process started several centuries before in the Venetian glass furnaces.
In this work the technology of Venetian filigree glass and its developments up today are investigated on the basis of the information provided by historical sources, particularly the recipe books of Venetian glassmakers, and the data obtained by the scientific investigation of glass samples.

12.30 p.m.

CHIARA SQUARCINA

Reliquary Deposit of Saint Peter Vestry in Murano

Abstract - The terminology reliquary means spare or extra and it comes from the late Latin term reliquarium which in turn comes from the classic Latin term reliquia.
Its functions are to preserve and display Christian-religion Saints' relics or to keep private objects such as tools, clothes, and martyrdom devices of the Saints.
The structure and appearance of the reliquary changes depending on what it contains.
The reliquary are exposed to the believers' veneration usually during the days that celebrate said Saints or during processions.
Between 1861 and 1888 Saint Peter Martyr church vestry donated 21 reliquaries from the XV and XVII century. All of these reliquaries present Venetian manufacturing (whose precise indications of execution of forgeries and artists have

been individuated).
Three of this pieces are now being displayed to the public in Murano Glass Museum main saloon.
The procedure is the same for all the reliquaries: glass-blowing (some of which with a mold) and freehand decoration for the details.
The structure is cylindrical and made of transparent or lightly tinted glass and some have the peculiarity of presenting a dark color at the bottom instead of the main color of the piece.

12.50 p.m. **LUNCH**

SESSION 2

Chairperson **MARCO VERITÀ**

2.00 p.m. **ROSA BAROVIER MENTASTI**
The invention of filigree
Abstract - In the year 1527 Filippo and Bernardo Catani, Murano blowers and entrepreneurs, running their glassworks with the sign of the Sirena (mermaid), obtained a patent for a new glass technique: filigree. In their application they wrote that their invention had been inspire by patrician Francesco Zen, a collector and an amateur architect, who probably had been able to examine ancient mosaic glass bowl, made of twisted roods. After some years the family name of the Catanis become Serena.

2.30 p.m. **CRISTINA TONINI**
Sixteenth-century filigree
Abstract - Venetian filigree glass of the 16th century: shapes and kind of different filigree related to dated inventories from Murano, Venice, Italy and to figurative sources of the period. Both are used to suggest dating strategies, identify specific glass products and terminological references.

3.00 p.m. **COFFEE BREAK**

3.30 p.m. **SPEECHES OR COMMENTS BY**

ANTÓNIO PIRES DE MATOS, AUGUSTA LIMA, CESARE TOFFOLO, EMMANUEL BABLED, FERRO CRISTIANO, GIANNI SEGUSO, JOAQUIM MARÇALO, LUÍS C. ALVES, PRASHANT DABAS, RUI C. DA SILVA, ROBERT WILEY

Studies of the white opaque glass used in filigrana glass

Abstract - the filigrana glass has been used in Murano since the XVI century and now several studios and factories are making reproductions of ancient glasses. A few examples of filigrana glass objects made in the XXI century by Muranese Masters are shown in this work.

For the filigrana decoration they have been using a white opaque glass with lead arsenate, called in Murano "smalto", which production is now forbidden. The new white opaque glass acquired in the glass industry, without arsenic, is not so good. When the canes are made by stretching the glass, the white colour fades slightly and so, their use for reproduction of historical and creation of new objects is not so satisfactory. The elimination of arsenic is a major problem as it is very difficult to develop a white opaque glass with the same optical and physical properties as the previous one.

Samples of both types of glass were compared regarding the different intensities of transmitted light. In order to understand the differences between them their analytical characterization was made using micro-XRF spectroscopy, micro-PIXE, Rutherford Backscattering and Laser Desorption/ FTICR Mass Spectrometry, and the results are presented and discussed.

3.50 p.m. **WILLIAM GUDENRATH, KITTY LAMERIS, DORA THORNTON, DENISE LING, ANDREW MEEK**

Two 16th Century filigree glass tankards in the British Museum

Abstract - Two filigree glass tankards in the British Museum collection are not only extremely rare examples of their type but are dated by what appear to be their original silver mounts, which are hallmarked for London 1548-9. In this paper we approach these tankards from a variety of angles: their technique and making; how one might date them and attribute them; the early collecting of this type of glass in England in the 16th Century and the history of the pieces. We attempt

to use various approaches to find a context for these rare and special pieces as early examples of filigree glass which have been in London since 1548.

4.20 p.m. **KITTY LAMERIS**

Talking canes

Abstract - From the moment filigrana glass was invented, around 1527, it was a runaway success, and not only in Venice. It was made both in and outside Venice, in various places in Europe by Venetians or by locals who interpreted it in their own way. Filigrana glass became a valuable gift among dignitaries. Shards of filigrana glass, found everywhere in the whole world in contemporary layers, as far away as for example in America and even Japan, are testimony to how highly the glass was appreciated.
Writing the catalogue 'a collection of filigrana glass' about a private collection of filigree pieces in 2012, aroused my interest in glasses made using this technique. Since then I have continued to study it, preparing a book about the subject.
I visited many museums and studied their filigrana glasses, talked with curators and spoke with glassblowers. During my talk I would like to propose some new thoughts that I have developed about filigrana, showing several fascinating glasses from collections all over the world.

4.40 p.m. **ELENA DOLGIKH**

The development of the traditions of Venetian glass in the art glassmaking of Europe and Russia. Baroque and historicism.

Abstract - The report on the basis of the study of the history of Venetian glassmaking and its artistic features reveals certain features that formed the typology of Venice glass of the Renaissance. The Venetian glass of this historical period is the deepest basis of the artistic development of European glass of subsequent centuries.

5.00 p.m.

GUILLAUME SERRAILLE

Glass filigree: some technical and visual proposals

Abstract - Filigrees are a key element of Murano glass ornamental repertory and almost symbols of Venetian production. Masters raised these patterns, which mysterious complexity of realization associates both ingeniousness and virtuosity, to a unique level of delicateness, embodying their habitus and high level of practice. The different and successive rises of new figures in the glass field (artistic directors, designers, contemporary artists and members of the Studio Glass Movement) offered some new filigree uses reflecting tensions between tradition and novelty. Based upon historical and technical examples of these ornamental transformations, and considering also to other craftmenships and technics, the talk will suggest some other potential forms of the filigree, with a view to achieve these with technical partners.

TUESDAY, 12ve SEPTEMBER

Chairperson **ROSA BAROVIER MENTASTI**

SESSION 3

9.00 a.m.

WILLIAM GUDENRATH

Making and Using Glass Canes: A Historical and Practical Perspective

Abstract - Glass cane-making is the ancient technology that eventually led to the celebrated filigrana in Renaissance Venice. Despite the infinite possibilities in the shape of the cross section, color, size, and decoration of canes, the process itself is, in principle, straightforward: compact mass of molten glass is stretched to become long and narrow. Interestingly, the myriad varieties of canes that we see in historical objects fall into one of two general categories: canes meant to be viewed from the side (retortoli canes, for example) and those intended to be observed from the end (millefiori canes, and the like). In this lecture, both types will be examined.

The history of glass canes is impressively long. The manufacture and use of canes to create both structure and decoration coincided with the beginning of glass vessel making about 1500 B.C. The evolution of glass cane applications will be traced through two and a half millenniums.

Workshop practices will also be explored: through custom-made videos, the lecturer will show how various types of canes are manufactured. Then, various traditional Venetian ways of using canes will be demonstrated.

9.50 a.m.

SPEECHES OR COMMENTS BY PARTICIPANTS

HELENA BROZKOVA AND HEDVIKA SEDLAČKOVA

The Filigree Glass from the Museum of Decorative Arts in Prague. Venetian and domestic Produktion.

Abstract - The series of filigrana glass amounting to about 120 items is part of Venetian and Venice-inspired European glass in the collections of the Museum of Decorative Arts, Prague. It was formed due to contributions from Prague collectors such as Vojtěch Lanna, Gustav E. Pazaurek and others, and partially also through purchases from European antique shops and auction houses. Apart from a few items from the first half of the 16th

century, the majority of the specimens come from the second half of the 16th century and the first half of the 17th century, with only a small proportion dating from the 18th and 19th centuries.

10.15 a.m. **COFFEE BREAK**

10.45 a.m. **ROHANOVÁ DANA and HEDVIKA SEDLAČKOVA**

Filigrana Glass Made in Central Europe – Regional Production

Abstract - We dealt with the occurrence and composition of filigree glass mostly Venetian provenance in the Journal of Glass Studies, 2015. After completion of this work, we have acquired new evidence of the production of filigree glass in the regional glasshouses in Central Europe (Moravia, Bohemia, Hall - Austria, Hungary). Chemical analyses present the specifics of this type of glass within the Renaissance glass production.

11.05 a.m. **RAINALD FRANZ**

The development of Filigree-decoration in Austrian Glass from the 16th-20th century

Abstract - The glass decoration technique of filigree has a long tradition in Austrian artistic glass, dating back to the Renaissance. Venetian glass objects imported for the noble courts and the Emperor made the technique familiar and Facon de Venise glass-production with filigree started in glass mills in the Tirol and later in Northern Bohemia. From the 18th until the 20th century, the filigree technique was taken up again and again in order to simulate Venetian glass and to compete with its products. Some of the pieces were even made for export to Venice. The lecture shows examples from the MAK-Collection and Austrian private collections

11.25 a.m. **MICHEL HULST**

Amsterdam 17th-century glass finds: everyday use or a rarity?

Abstract - archaeological research of two early 17th- century cesspits in the Jodenbreestraat in the city centre of Amsterdam, revealed a fairly large amount of drinking glasses. Some of the glass objects are clearly for common use but others are extremely rare or even without parallel. Among the extraordinary vessels

are glasses made by local Amsterdam glasshouses in façon de Venise style, but there is also a glass that is most likely of genuine Venetian origin. In this paper I will explore the purpose and meaning of such rare glass vessels in Amsterdam in the early 17th century.

11.45 a.m.

NIKOLINA TOPIC

Filigrana glass from the Dubrovnik area– archaeological finds

Abstract - Filigrana glass finds of Venetian / a façon de Venice (16th-17th ct.) glass in Dubrovnik and in the Dubrovnik area are not frequent, but they are very interesting and diverse. Due to their fragile nature, the finds are primarily preserved as fragments. Graphical reconstructions of the fragments were made for the purpose of better understanding and visual interpretation. There are several excellent bowl fragments with white threads made in a fili technique, as well as bowl or cup fragments skillfully made with green, cobalt blue and white threads in a retortoli technique. Finds of mould-blown bowls with twisted filigrana ornament at the rim of the vessel are already known in the Balkan region. Apart from bowl fragments, there are also stem goblet, bottle and jug fragments with applied threads found in excavations in the historic center of Dubrovnik and in the wider region. According to our excavations, these finds were mostly used in the monasteries, cathedral, public buildings, and fortress. They demonstrate the use of luxury vessels and the higher standard of living in the Dubrovnik Republic.

12.05 p.m.

MIKITINA VIOLETTA and IVLIEVA OLGA

The Filigree glass from the collection of the Museum of Ceramics (Moscow). XVII-XX century.

Abstract - In the report will be resented the glass works decorated with filigree from the collection of the State Museum of Ceramics and the Kuskovo 18th Century Estate (Moscow, Russia) made at the factories of Bohemia, England and Russia. In Russia, the manufacturing of items with "Venetian thread" began in the second half of the 18th century, when the technique was mastered by craftsmen at the Saint Petersburg glass factory, and later at other private factories. Such works were produced until the beginning of the 20th century. After the revolution of 1917,

because of complexity, filigree was not used in the decoration of objects. Only by the end of the 1930s this technology was restored, but still was not widely used. Only in the second half of the century the masters again turn to the filigree, using the new technical capabilities of sulphide-zinc glass and the original methods of decorating. It was offered by A. Fedorkov, the belarusian artist of Neman glass factory. This technique was called "Neman thread" and became recognized among artists in Soviet Union.

12.30 p.m. **LUNCH**

Marc Barreda will offer a lunch time presentation that will bring Trick Glasses to the table, literally to explore their function and history. We know where and when these glasses were made, but the why and for whom still remains an enigma as does the purpose and function of some of the more exotic examples. And while many of the objects remain, the social practices and experiences that surround them are less tangible. Please share a drink and any story you might have?

SESSION 4

Chairperson **DORA THORNTON**

2.30 p.m. **SPEECHES OR COMMENTS BY PARTICIPANTS**

VEDRANA JOVIC GAZIC AND STEFANAC BERISLAV

Glass lamps in Croatia. Observations on the type from Antiquity to the Nineteenth century

Abstract - This is a preliminary presentation of the glass lamp typology in a very broad chronological period from antiquity to the end of the nineteenth century originating in the Republic of Croatia. The material examined is owned by a number of Croatian museums and comes from their specialist archaeological or general collections. The typological analysis of lamps is part of a wider project that should end with an extensive and detailed monograph, particularly on the subjects of production and distribution, and on the practical use of some kinds or groups of lamp. The results will then be presented at a scientific-educational exhibition.

So far at least ten typological groups of lamps with various subtypes have been recognised. The most numerous among the materials examined are those of archaeological origin. The context of locality and origin of the objects was then taken particularly into account. The oldest typological form belongs to the Roman production of the first century. It is a common form of lamp with handle. It is followed by the most varied forms in late antiquity; various Oriental and Byzantine influences affected early medieval and medieval production, then Veneto or Murano production dominated with particular influences from new production centres in southern Europe towards the end of the eighteenth and the early nineteenth century.

2.50 p.m.

FRANCISCA PULIDO VALENTE, INÊS COUTINHO, TERESA MEDICI, MÁRCIA VILARIGUES

16th – 17th century filigree glass found in Portugal: some preliminary observations

Abstract - The present contribution addresses the study of more than 150 glass fragments decorated with filigree technique coming from four archaeological excavations in Portugal : Santa Clara-a-Velha Convent in Coimbra, Santana Convent and Largo do Chafariz de Dentro in Lisbon, and São João de Tarouca Monastery in Lamego. These fragments show a wide use of different type of canes - canna a fili, canna a rete, canna a balotini and canna mista - according to the terminology used by Kitty Laméris, A collection of filigrana glass, Amsterdam. 2012. The presence of filigrana a reticello and pieces made in one and two layers are also evident. It is possible to determine a large variation in (1) quality of materials, (2) colours, with filigree made with clear and transparent glass, or with greyish or even greenish glass, (3) quality of the technique, with the occurrence of some pieces where the termination of the canes were not removed, and with variations in the space between the canes in the same fragment.

This communication aims at providing some preliminary observations regarding these fragments, which are now being studied as part of a PhD project. This larger project consists on the study of technological development, distribution, and use of filigree and pick-up decoration techniques, which were relevant

across Europe during the 16th and the 17th centuries. Although considerable research has been devoted to façon-de-Venise glass, rather less attention has been paid to the systematic and transdisciplinary study of the filigree technique. Therefore we intend to employ for the first time a wide range of methodologies across disciplines to investigate this glass decoration techniques.. We will combine a morphological study with an analytical approach. For the former we will use stereoscope and optical microscopes; for the later Proton Induced X-ray Emission (PIXE) will be employed to characterize the chemical compositions of the glass, Raman Spectroscopy will be used to study the opacifiers, and, finally, UV-visible Reflectance Spectroscopy will be used to assess the glass chromophores. This methodology will allow us to determine (1) if different morphologies are associated to a technological development or are a signature of glasshouses, which could employ different techniques to produce the same object; (2) if the variation in the complexity of the decoration can have a chronological meaning; and (3) if the glass objects which have less quality can be considered as local production.
Finally, this study will not only contribute to the history and artistic value of these decoration techniques in Portugal, but it will also improve the knowledge about the trade between Portugal and other European countries as well as provide a body of knowledge that might assist the preservation of this important heritage.

3.10 p.m.

JEAN LUC OLIVIE

Georges Bontemps (1799-1883), studying " verres filigranés" and practising at Choisy-le-Roi factory from 1839 to 1847

Abstract - The presentation will explain the context of the development of filigrana glass in 19th century France. The specific collaboration of a very important glass technique specialist and a scholar studying one of the most important French Venetian glass collection of the time. Together they study historical samples, and published detailed explanations and figures on the subject, chairing their knowledge with others glassmakers as allowing them to include it in their practise and production in middle century.

3.30 p.m.	**COFFEE BREAK**
4.00 p.m.	**CHRISTOPHER MAXWELL AND SUSIE J. SILBERT** *Some thoughts on filigrana at the Corning Museum of Glass* **Abstract** - The newest curators at the Corning Museum of Glass, Dr Christopher Maxwell and Ms Susie J. Silbert, will present a survey of filigrana at their institution. They will consider its historical place in the museum's collection and future interpretations of the technique.
4.20 p.m.	**GIOVANNI MARANI** *Traditional and unconventional glass components* **Abstract** - When we think about Venetian artistic glass we mostly think of a relatively small group of iconic objects: chandeliers, lamps, vases, sculptures, jewelry. These are indeed the objects that in our collective imagination represent the highest points in the traditional and modern Murano production. It may be argued that this production is now also driven by a high market demand for the type of objects that traditionally represent Murano's excellence. However, there is also a whole set of "lesser" objects, items that have not been created to satisfy a market request, but, rather, every day, and sometimes accidental, needs of the people making the glass itself. These unconventional glass objects represent interesting stories, challenges to stretch the limits of the material, answers to common or uncommon needs that reflect life around glass making art and business. In this contribution I will discuss a few examples of unconventional glass objects, taken from interactions with glass masters and furnace workers over many years. A classical example is the "Goto de Fornasa", a drinking glass that glass makers originally produced for their own needs, on the side of their regular production. Hence, the result does not necessarily respond to market aesthetic criteria, but to personal taste, usefulness, or, simply, ease of production. Other examples I will cover include dining tables, or their glass supports, chairs with glass legs, built just to prove it can be done, sofas with glass parts. Unconventional objects are also oversize glass furniture and accessories, glass boiseries or monumental chandeliers, built just to prove a master's virtuosity. These unconventional, and sometimes random or

serendipitous glass creations, often acquire a life of their own and become popular objects themselves. I will thus close my contribution by discussing some modern glass creations that, by intentional design, attempt to mimic this unconventionality, and explore the limits of the material, take unusual shapes, or perform unusual functions.

WEDNESDAY, 13rd SEPTEMBER

SESSION 5

9.30 a.m.

DEMONSTRATIONS OF FILIGREE TECHNIQUES IN MURANO BY DAVIDE FUIN

Davide Fuin grew up around glass on Murano, often accompanying his father to his job at Barovier & Toso. Although he was too young to actually work, he was fascinated by the activity and the interactions between the glassblowers. When he was fifteen, he left high school and, as was required at that time, he went to work at a glass factory. What was generally considered a punishment, was for him a revelation. He found his calling.

In 1968, he began working at Venini and in 1980, a number of masters, including his father, left Barovier & Toso to open their own factory, Toso vetri d'arte. He joined his father and began working with the master Carlo Tosi Caramea.

By the late 1980s, Fuin was considered a young maestro and a new factory, Elite Murano, offered him the position of first master, with his father as the principal assistant and support.

In the late 1990s, Fuin founded D.F. Glassworks with two assistants. They primarily produce glasses and stemware, together with museum reproductions in Venetian style.

Although he doesn't consider himself an artist, he takes great pride in his abilities to carry on the specific craft and language of forms developed in the furnaces of Murano over the last thousand years.

11.30 a.m.

VISIT OF THE MUSEUM OF GLASS IN MURANO

The museum is housed in the ancient Palazzo dei Vescovi of Torcello. Since 1923 it is part of the Musei Civici Veneziani.

The collections are chronologically ordered: in addition to an archaeological section, which includes notable Roman finds from between the first and third century AD, it boasts the largest historical collection of Murano glass, featuring important pieces from between the fifteenth and twentieth century, including world-renowned masterpieces.

Particularly important are the collections of Renaissance glass in the seventeenth and eighteenth centuries.

During the visit, which will be directed by Rosa Barovier Mentasti and guided by the Director of the Museum Dr. Chiara Squarcina, it will be possible to have access to the deposits of the Museum to study some of the most important pieces.
http://www.visitmuve.it/it/musei/

LUNCH

5.30 p.m. **ISTITUTO VENETO DI SCIENZE LETTERE ED ARTI**
The prize giving ceremony for the Glass in Venice Prize and the Riedel Award 2017

TEACHING STAFF

ROSA BAROVIER MENTASTI

Descending from one of Venice's ancient glass making families, Rosa Barovier Mentasti was awarded a degree in Ancient Literature by the University of Padua in 1973 with a thesis on antique glass. Since then, she has been dedicated to studying the history of both ancient and modern Venetian glass. In addition to many articles and publications, including *Il Vetro Veneziano dal Medioevo ad oggi,* published in 1982, she has curated several international exhibitions of ancient and contemporary glass, including Vetri. Nel Mondo. Oggi, hosted by the Istituto Veneto di Scienze, Lettere ed Arti in Venice in 2004.

WILLIAM GUDENRATH

As resident advisor for the Studio of the Corning Museum of Glass, he teaches introductory and advanced courses in Venetian techniques. A glassblower, scholar, lecturer and teacher of glassblowing, he is an authority on historical hot glassworking techniques from ancient Egypt through the Renaissance and has presented lectures and demonstrations throughout the world. He demonstrates techniques he believes to have been employed by glassmakers of the past and these are described in a number of books and video segments including: *Chronicle: the Portland Vase, Five Thousand Year of Glass, Journey through Glass: A Tour of the Corning Museum Collection and MasterClass Series II: Introduction to Venetian Techniques, Glass Masters at Work: William Gudenrath, Glassworking Processes and Properties.* Mr. Gudenrath's most recent major publication is *The Techniques of Renaissance Venetian Glassworking* available free of charge on the Corning Museum of Glass website, or renvenetian.cmog.org. His numerous glassworking videos have a world – wide audience with viewings currently well over 40 million in number.

ANDREA BELLIENI

An architect from Treviso, he has primarily worked professionally on the restoration of monumental-historic buildings and museum-exhibition installations. In 2003 he won the public competition for conservator of the Musei Civici di Treviso, contributing to the installation and opening of the new Museo di Santa Caterina. He moved to the Musei Civici di Venezia in 2008 where he is director and conservator of the Museo and Biblioteca Correr, and the Torre dell'Orologio. At the Correr he coordinates the gradual project of general historical-critical reconsideration and the new installation layout of the exceptional civic historical-artistic collections. He recently completed the systematic rearrangement of Canova's works and the decorative reordering of the Galleria Napoleonica (2015-16) and is directing the now advanced artistic-furnishing restoration of the Appartamento Reale. He curates temporary exhibitions, of which recently "Gloria di Luce e Colore. Quattro secoli di pittura a Venezia" (Mibact and Fondazione Mu.Ve., Beijing - National Museum, 2016). A research scholar, his scientific achievements include the recovery/cataloguing of the Musei Civici di Treviso's significant ceramics collection (13-19th centuries), heavily damaged in 1944 (1991), and the rediscovery/recomposition of the thirteenth-century doorway of Treviso cathedral, a masterpiece of Romanesque sculpture in Veneto, 'lost' for about two centuries (2005). He has written numerous publications (books, art catalogues, magazine articles etc.) mainly on the Veneto region, in the field of art, architecture and applied arts.

LINO TAGLIAPIETRA

Exceptional glass master and well known world-round as glass artist. He was born in Murano and was just a young man when he first entered a glass makers shop: he became a glass *maestro* in the 1950's and has worked for some of the most prestigious glass makers in the island. Since the late sixties his creativity resulted in models of great quality, both from the point of view of technique and beauty, that were a clear success on the market. He has been an independent glass artist since 1990 and

is now committed to creating unique pieces that are exhibited in the most prestigious private collections and museums worldwide. In 2009, the Tacoma Art Museum dedicated a retrospective to his works with an exhibition that was then lent to other US museums. In 2011, the Istituto Veneto dedicated to him the exhibition *Lino Tagliapietra, da Murano allo Studio Glass*.

CRISTINA TONINI

With a degree in History of Art awarded by the State University of Milan under the guidance of Prof. De Vecchi, from 1989 to 2004 she acted as Conservator for the classification and the new layout of the Bagatti Valsecchi Museum in Milano. Together with Rosa Barovier she published the catalogue of the museum's Venetian glass. She also curated the catalogues of the Medieval and Modern glass collections of the Civic Museums of Pavia, of the Pinacoteca Ambrosiana in Milano and the Pogliaghi Museum in Varese, the latter is about to be published. Other articles on Venetian and Medicaean glass have been published by Decart and the Journal Glass Studies of Corning Museum of Glass. She is part of the Board of Directors of the Italian section of the Association Internationale Histoire du Verre. She is professor of art in the Orsoline Artistic Liceo in Milano.

MARCO VERITÀ

Holding a degree in Chemistry, he worked for over thirty years in the Stazione Sperimentale del Vetro in Venice-Murano, performing research and assessments on glass materials, both modern and ancient, the latter for archeometric purposes and also to assess issues relating to conservation and restoration. Member of numerous international organisations, since 2009 he has been working with the Laboratory for the Assessment of Ancient Materials (LAMA) of the IUAV University of Venice.

LIST OF PARTICIPANTS

FRANÇOIS ARNAUD
He has been a glassblower for 23 years. For 7 years he learned and worked in several workshops in France. Then, he worked for 5 years in various countries including Italy, Canada, South Africa, Argentina, the Czech Republic, India and Syria. After these 12 years of experiences he decided to create his own studio in a process of experimental archaeology, «Atelier PiVerre - Souffleur de Verre» at La Plaine-sur-Mer, France.
Today François Arnaud is a glassblower working alone "on his thighs" like Mesopotamian craftsmen.

FRANÇOISE BARBE
Curator in the Louvre Department of Decorative Arts, Françoise Barbe is responsible for the Renaissance ceramics, painted enamels and glasses. She is currently involved in several research projects with the Centre de Recherche et de Restauration des Musées de France, especially on 17th century French ceramics, Renaissance Venetian enameled glasses (Cristallo project) and Italian enamels. She is publishing with the Fondazione Cini and the C2RMF the proceedings of the colloquium on the so-called "Venetian" enamels on copper from the Italian Renaissance, together with the corpus of the pieces conserved in public and private collection.

MARC BARREDA
He is an American artist who has been working with glass for nearly 14 years. Marc's foundation as a glassmaker was formed in a studio heavily influenced by mid 20th Century Venetian glass. He currently lives in Amsterdam where he completed his Master of Applied Art at the Sandberg Institute. Marc Barreda has studied and worked around the world with artists and craftsmen and at various institutions including: The Corning Museum of Glass (US), The Vrij Glas Foundation (NL), Fundacion Centro Nacional del Vidrio (ES), Domaine de Boisbuchet (FR) and the Creative Glass Center of America(US). Currently he is developing a project in the Netherlands focused on exploring and highlighting the extensive Dutch glass history through academic and practical approaches.

ERWIN BAUMGARTNER
He finished his studies in history of art at the Basel University with a master thesis on a private collection of medieval glass (the Amendt collection, exhibited in Düsseldorf, Rotterdam and Coburg 1987/88). Together with Ingeborg Krueger he wrote the catalogue «Phoenix aus Sand und Asche. Glas des Mittelalters» for the exhibition in Bonn and Basel 1988. While working for the Denkmalpflege Basel from 1989 to 2013 he published articles on European glass and several catalogues, mainly on Venetian and «Façon de Venise» glass (e.g. Musée Ariana, Genève, 1995, Musée des Arts décoratifs, Paris, 2003). His latest publication is the catalogue for the exhibition «Reflets de Venise» at the Vitromusée Romont, 2015.
He has been a member of the

«Association Internationale pour l'Histoire du Verre» since 1979 and is presently member of the Executive Committee and of the Swiss Committee editing the Annales of the 20th AIHV Congress 2015.

MARIA JOAO BURNAY
From 1995 to 2011 she worked in the Education Department of Palácio Nacional da Ajuda in Lisbon.
With a Master degree in Arts, Heritage and Conservation by the History Institute, Humanities Faculty, University of Lisbon,
since 2012 is Curator of Glass where she has been improving the cataloging files and development of the historical knowledge of the glass collection the palace owns, which incorporate objects from Bohemia, Austria, France, Spain, Great-Britain, Portugal and about 600 Murano pieces (Salviati, Compagnia Venezia Murano, Fratelli Toso, Testolini).
In 2015 curated, with Rosa Barovier Mentasti the exhibition: "Ricordo di Venezia. Murano Glass of the Portuguese Royal House" in Palácio da Ajuda, with a catalog.
Maria João Burnay is also an ICOM Glass and Light & Glass Society member."

FIORELLA DE BOOS-SMITH
She and her husband Phillip are collectors of Murano glass going back to the period of the Grand Tour, thus between 1800 and the early 1900's. The collection comprises around 800 works, coming above all from the production of Salviati, acquired for the most part during their sojourn in London and currently housed in their residence in Venice. Items from the collection have been displayed in exhibitions of Venetian glass, including some organised by the Murano Glass Museum. In 2010 the Venice Institute for Sciences, Letters and Arts, in collaboration with the Venice Region, inaugurated the new ground floor exhibition rooms at Palazzo Loredan with an exhibition of about 300 pieces from the collection.

ELENA DOLGIKH
Moscow
Associate professor (Russian State University for the Humanities)
Art critic
Member of the Independent Association of Art Experts

RAINALD FRANZ
Art Historian, Studies in Vienna, Munich, Rome, London, Venice. Since 1992 working with the MAK-Austrian Museum of Applied Arts / Contemporary Art 1996-2011 Deputy Head Library and Works on Paper Collection, since 2000 Provenance Research officer, since October 2011 Head of the Glass and Ceramics Collection and in charge of EU-Projects. Various Exhibitions and publications, symposia e.g. "Gottfried Semper and Vienna", Vienna 2005 and "Leben mit Loos (Living with Loos)", Vienna 2008. "The Glass of the Architects. Vienna 1900-1937", Venice, Vienna 2016/2017, "Glasses from the Empire and Biedermeier Period. From the MAK Collection

and the Glass Collection of Christian Kuhn.", Vienna 2017.
Assistant professor at the Vienna University and the University of Applied Arts: History of Ornament 2007-2013 Chair ICDAD-International Committee of Decorative Arts and Design, 2011-2013 Head of the Austrian Art Historians Association. Major topics of Research: History of Architecture, History of Ornament, Decorative Arts and early Design.

ALICE FUIN
Born in Murano in 1993, graduated from the University of Ca' Foscari in Venice, with a bachelor's degree in the history of art, in 2015, her final thesis an in depth study of Venetian filigree glass. She is currently in her first year of master's studies towards a degree in modern art at Ca' Foscari, and in her second year of piano at the Benedetto Marcello Conservatory of Music, in Venice.

AURELIE GERBIER
She has been a curator at the National Museum of the Renaissance (Chateau d'Ecouen, France) since July 2012. She is in charge of the glass collection, the stained glass collection, the German stonewares and Palissy wares.

MICHEL HULST
Although Michel Hulst has a formal education in mechanical engineering, He was always fascinated by archaeology. When volentering at excavations he developed a keen interest in glass. From 2000 he is part-time glass-specialist in Amsterdam at Monumenten en Archeologie (MenA) under prof dr Gawronski. Here he is researching glass found in cesspits as well as glass waste from several facon de Venise glasshouse which worked in the city for the whole 17th century.

OLGA IVLIEVA
Education:
Russian State University for the Humanities (Moscow),
Art History Department, graduate student
Affiliation:
The State Museum of Ceramics and the Kuskovo 18th Century Estate (Moscow, Russia),
Ceramics and Glass Department, curator of Modern Russian Glass Collection

VEDRANA JOVIC GAZIC
Art Historian with the Ph.D. degree in Classical Archaeology (Department of Archaeology of the University of Zadar, 2015), works as a senior curator in the Museum of Ancient Glass in Zadar (from 2009). Her scientific and professional interests focus on the history of urbanization from Roman to Late Medieval period (Ph.D. thesis), and particullary on the history of glassmaking. She is responsible for a Study Collection of post-classical glass of the Museum of Ancient Glass (Museum collection in the process of forming) mostly composed of Medieval and Modern Era glass material.

KITTY LAMERIS
She is, together with her sister Anna and brother Willem, the owner of the antique shop Frides Laméris Art and Antiques, specialized in glass and ceramics. One of her specialties is Venetian and Façon de Venise glass of the 16th and 17th century.
In honor of the Amsterdam/Venice year in 1991, she organized together with her father Frides Laméris an exhibition and catalogue about Venetian and Façon de Venise glass in the church at the Dam Square de Nieuwe Kerk in Amsterdam. Kitty also teaches future restorers of glass at the University of Amsterdam (UVA), and gives lectures about the subject. In 2012 she wrote the catalogue *A collection of filigrana glass,* (Amsterdam 2012) where she proposed some new insights about filigree glass. Since then she continued studying filigree glass, published several articles about the subject and is preparing a publication on the history and techniques of filigree glass.

DAVID LANDAU
He is an art historian but claims no scholarly knowledge in the history of glass. He is, however, a passionate collector of glass made by Cappellin in the 1920s and by Venini, from 1921 up to about 1970. With his wife, Marie-Rose Kahane, he has set up a foundation in Switzerland, the Pentagram Stiftung, whose only purpose is to encourage research and appreciation of glass made in the last hundred years. It has set up, with the Fondazione Giorgio Cini, the Stanze del Vetro on the island of S. Giorgio, where two exhibitions about glass are shown every year. It has also started the Centro Studi del Vetro at the Manica Lunga, where a library and an archive of original material on glass manufacture are being built up, and where scholarships and bursarships have been established for research in the field.

SARAH MALTONI
After a Bachelor in Art History she completed a Master's in Science and Technologies for Archaeological and Artistic Heritage and a PhD in Study and Conservation for Archaeological and Architectonical Heritage at the University of Padova (Italy). Her research field is the archaeometric characterisation of ancient glass. She is currently a post doctoral fellow at the University of Padova within a project on experimental replica of ancient glass opacification techniques.

GIOVANNI MARANI
Before graduating in Architecture at the University of Venice, he has lived in the United States, where he had the opportunity to frequent design circles in Washington DC, New York, Miami, and San Francisco. After graduation Marani started his own studio in the Venice area. With over 18 years of experience in the international design community, Marani currently designs personalized furniture components in artistic glass, in collaboration with some of the most important Murano furnaces and famous masters like the Signoretto's,

Bubacco, Cenedese, and others. The common thread underlying all of Marani's projects is the use of Murano glass artistic techniques to create contemporary, yet classic, furniture. Giovanni Marani's creations were exhibited and sold in Milan, Cologne, Miami, New York, Montreal, Verona, and Padova where he lives.

CHRISTOPHER LUKE MAXWELL
He was appointed Curator of European Glass at The Corning Museum of Glass in 2016. A curator and scholar, Maxwell has a varied background in the academic, museum, and gallery world.
Maxwell graduated with a BA in History of Art from the University of Cambridge in 2001 and took a post at the Royal Collection, first in the Royal Library and Print Room at Windsor Castle, followed by the Publications Office at St James's Palace. In 2005, he completed his master's degree in Decorative Arts and Historic Interiors at the University of London, and became an assistant curator in the ceramics and glass section at the Victoria & Albert Museum. For five years, he worked on the reinterpretation of the museum's ceramics galleries, developing a specialty in 18th-century European ceramics, with a particular focus on French porcelain.
In 2010, Maxwell left the V&A to pursue his PhD at the University of Glasgow, which he completed in 2014. The topic of his dissertation research was the dispersal of the Hamilton Palace collection. Maxwell rejoined the Royal Collection as project curator during this time, and since 2013, worked with Travis Hansson Fine Art, a private art dealer based in Beverly Hills.

VIOLETTA MIKITINA
The State Museum of Ceramics and the Kuskovo 18th Century Estate, Moscow, Russia
Curator of Russian and foreign glass
Head of the Department of Ceramics and Glass
Institute of Art History(Moscow), graduate student

JEAN LUC OLIVIE
Conservateur en chef, musée des arts décoratifs, Paris. In charge of the glass collection, more than 5000 pieces, and one of the most important in France, world famous mostly for its art nouveau, art deco and contemporary sections.
Teacher at Paris IV Sorbonne and at Ecole du Louvre.
Main Curating or co-curating shows and catalogues «Cent ans d'Art du Verre en France», Galerie Ho-am, Séoul, 1986, « Verres de Bohême, 1400-1989, chefs-d'œuvre des musées de Tchécoslovaquie », musée des Arts décoratifs, Paris, 1989-90, « Chefs-d'œuvre de la verrerie et de la cristallerie française au musée des Arts décoratifs 1800-1990 », Suntory Museum, Tokyo, 1991, « René Lalique, Bijoux-Verre », musée des Arts décoratifs, Paris, 1991-92 « Jean Royère, décorateur à Paris », Musée des Arts décoratifs, Paris, 1999, « Miquel Barcelo, un peintre

et la céramique », Musée des Arts décoratifs, Paris, 2000, "Venise et façon de Venise, verres renaissance du musée des Arts décoratifs" Paris : Musée des Arts décoratifs,2003, "Verres XXe XXIe siècles, collection des Arts décoratifs" Paris, les Arts décoratifs, 2012, "Trésors de sable et de feu : Verre et cristal aux Arts Décoratifs, XIVe-XXIe siècle", Paris, Les Arts décoratifs, 2015.

CELESTINE OUSSET
As a glass conservator she has been currently in charge of conservation and care for glass collections of the majors french museums. She get specialized in the care of roman glasses (Musée du Louvre), venitian glasses (Musée national de la Renaissance, Ecouen) and flameworked glasses (Musée des Arts décoratifs). As consultant in preventive conservation, she intervenes for storage reorganization, transfer, exhibition of glass collections. She also teaches glass conservation at the Sorbonne University for several years.

ANTÓNIO PIRES DE MATOS
Degree in Chemical Engineering, Technical University of Lisbon 1962. PhD in chemistry, Cambridge, U.K., 1970. Fellow of the Society of Glass Technology, U.K. since March 2009. Emeritus Invited Full Professor at the Universidade Nova de Lisboa. Current research activities at the Research Unit Glass and Ceramics for the Arts, VICARTE (www.vicarte.org): Provenance studies of Portuguese glass; Science applied to contemporary glass art.

EVA MARIA PREISWERK
Ph.D. in art history, University of Zurich, Switzerland 1971, responsible for applied arts (especially silver) in Koller Gallery and Auction House, Zurich 1971-74, Abegg Foundation, Riggisberg/Switzerland (internationally renowned museum for applied arts and restoration of historic textiles) 1974-78, Free lance art historian and writer (publications on Swiss silver and applied arts in Switzerland) 1978-1989, Museum Langmatt, Baden, Switzerland (French impressionist art collection, historic house museum), director, 1989-2005. Since two decades I am close to Venice and the glass art world. With my late husband we started collecting Murano glass of the twenties until today, having had the pleasure to meet scientists, connoisseurs and contemporary glass artists. Being often in Venice, my interest goes far beyond acquiring pieces, but also to its history and all the amazing and revolutionary techniques of glass, which have been invented by Venetian glass masters and artists during centuries. My special interest is to learn more about the origin of modern glass art in Venice and Europe.

FRANCISCA PULIDO VALENTE
She is a Ph.D. fellow in conservation and restoration at the Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Campus da Caparica, Caparica, Portugal. She received her

master's degree in conservation and restoration from that university in 2013. She co-authored (with Inês Coutinho, Teresa Medici, Márcia Vilarigues and Colin Brain) "A Group of Early English Lead Crystal Glass Goblets Found in Lisbon" published in JOURNAL OF GLASS STUDIES, vol. 58, 2016, pp. 211–225.

DANA ROHANOVÁ

She is working as Assistant professor at the University of Chemistry and Technology, Prague (Department of Glass and Ceramics), Czech Republic. She studies archaeological glasses, mosaics and stained glass (chemical analysis and glass corrosion) as well as a glass technology.

HEDVIKA SEDLÁČKOVÁ

She is an archaeologist. Last three decades she was working and publishing about Moravian glass (Czech Republic). Her interest is focused on mediaeval and post-mediaeval glass finds from the archaeological excavations. She collaborates with the Museum of Decorative Arts, Prague from 2016. In this time, together with Helena Brožková they are preparing the reconstruction of collection of glass donated by Vojtěch Lanna.

GUILLAUME SERRAILLE

2001 - Professional and technical graduate (ultimate level, equivalent a Higher Leaving Certificate) of glazier - window maker.
2002 - Glass workshop opening (fusing and glaziery).
2005 - Master degree in History of art (mention very well), Lumière Lyon 2 University, France: A contemporary approach of glass: the work of Jean-Michel Othoniel, under the direction of Professor François Fossier.
2009 - Glass Review, Jutta-Cuny-Franz Foundation, Düsseldorf. Sculpture presented in selected entries catalogue (under sculptor pseudonym Romain Quattrina).
2009-2014 - PhD in History of art (mention very honorable), Lumière Lyon 2 University, France: Glass and contemporary art: the example of the Italian production. An attempt to contribute to the study of art glass, under the direction of Professor François Fossier, thesis committee composed of Christophe Bardin, François Fossier, Rémi Labrusse (President) and Bettina Tschumi.
2015 - Post-Doctoral Fellowship, Fondazione Giorgio Cini onlus, Venice, Le Stanze del Vetro, Centro Internazionale di Studi della Civiltà Italiana Vittore Branca: Ornamental Repertory of Murano Glass: Uses and Transformations of Filigree and Murrine.

SUSIE J. SILBERT

She was appointed Curator of Modern and Contemporary Glass at The Corning Museum of Glass in 2016. In this role, she is responsible for acquiring, exhibiting, cataloguing, and researching the Museum's modern and contemporary collection, a period ranging from 1900 to the present day. Prior to joining the museum, Silbert was an independent curator as well as

a lecturer on the History of Glass at the Rhode Island School of Design. Her recent exhibitions include #F*nked!, exploring the relationship between digital interfaces and handmade objects, Concept:Process, at Parsons The New School for Design, andMaterial Location at UrbanGlass. Her writing has appeared in several exhibition catalogs, magazines, websites, and books, including the recent publication Cast on casting in all media. She holds an MA in Decorative Arts, Design History, and Material Culture from the Bard Graduate Center.

RODICA TANASESCU VANNI

She was awarded a degree by the Institute of Plastic Arts in Bucharest with a specialisation in monumental painting
She has participated in numerous exhibitions, including the United States Bicentennial in Washington in 1976, the 61st Rassegna dell'Opera Bevilacqua La Masa in Venice in 1977, and in 1987 in the Collective "Paris-Foyer International" VIII Biennale Europea C.E.I.C. Premio della Regione ; "Fidesarte" and "Verifica 8+1" Mestre; " La Schola" in Venezia ; Bologna Arte Fiera; Biennale Internazionale Dantesca Ravenna 1992/94/96.
In 1989 she was awarded the first prize of the Premio Murano for a glass sculpture.
She took part in the Fiera Internazionale dell'Arte di Padova in the years 2001/02/03/04/05 and the Museo Internazionale del Vetro in Montegrotto Terme exhibited five of her sculptures in 2013.
In 2010 she once again started attending the experimental graphic techniques at Atelier Aperto in Venezia.
In 2013 several of her pieces were exhibited in the Centro Candiani in Mestre (Venice).

DORA THORNTON

Curator of Renaissance Europe and Curator of the Waddesdon Bequest at the British Museum. The collections for which she is responsible include one of the world's most important collections of Venetian glass from the Felix Slade Bequest of 1868, and the Waddesdon Bequest. Publications on glass include entries for the exhibition Art and Love in Renaissance Italy at the Metropolitan Museum of Art in 2008, an article in Glass Studies on a single enamelled dish from the British Museum's collection in 2009; an article with Andrew Meek, Ian Freestone and William Gudenrath on a turquoise glass in the Waddesdon Bequest for the British Museum Technical Bulletin 2014, and an article on Bohemian girasol glass written with Andrew Meek and William Gudenrath for Glass Studies 2015. in memory of David Whitehouse. Her book, A Rothschild Renaissance: Treasures from the Waddesdon Bequest, includes new research on the important glasses in the collection and was published in March 2015 to accompany the opening of its new gallery. Most recently she co-edited A Rothschild Renaissance; a New

Look, with Pippa Shirley, which brings together further papers on the Bequest including new research on glassmaking and glass history.

NIKOLINA TOPIC
Graduated archaeology from the Faculty of Humanities and Social Sciences, University of Zagreb, in 2004. She defended PhD thesis at the University of Zadar in 2015. She led many archaeological excavations carried out by Croatian teams and participated in international teams. She published in international and Croatian journals, presented papers at international conferences, and also presented exhibitions on glass finds in Dubrovnik and Zadar in 2017. Her scholarly interests are mostly in the field of late- to post-medieval archaeology.

ELISE VANRIEST
She is a PhD student at the Labex HASTEC (Ecole Pratique des Hautes Etudes) in Paris. Her thesis is entitled « Verre et verriers à Paris dans la seconde moitié du XVIe siècle (1547-1610), production, commerce, usages » and is supervised by professor Guy-Michel Leproux. Before her PhD, she graduated from the Ecole des chartes in 2015 (and received the diploma and title of "archiviste paléographe"). She dedicated her school thesis to the story of glass and glassmakers in Paris during the second half of the 16th century, this thesis was supervised by Thierry Crépin-Leblond, director of the Musée national de la Renaissance (Ecouen). She has a master degree in archeology and history of art and was also a student at the Ecole du Louvre for four years (speciality : applied/ decorative arts). She worked as an intern in several museums and led glass-related projects. She published in several periodicals such as the Bulletin de l'Association Française pour l'Archéologie du Verre (2015 and 2016) and the Journal of Glass Studies (2017 issue). She wrote about the Italian Renaissance glasshouses located in Paris and Saint-Germain-en-Laye, she also studied the paternosters and bead-makers. She is interested in the link between the Venetian art of glass and the French art of glass and in the influence of the Italian glass on the French Renaissance production."

SANDRO ZECCHIN
He is born in Murano in 1942. After the obtention of the university degree in Chemistry, he worked for about 40 years as Researcher at the Consiglio Nazionale delle Ricerche. He is interested for about 20 years to the study of the technology of the Venetian glass. On this matter, he published, in collaboration with Marco Verità, various articles of Archaeometry of vitreous shards of Venetian production, in national and international scientific journals.

GLASS IN VENICE

Glass in Venice is based on an agreement between the Istituto Veneto di Scienze, Lettere ed Arti and the Fondazione Musei Civici di Venezia, presented on November 2012, on the occasion of the first edition of the Glass in Venice Prize.
This agreement is the expression of the two Venetian institutions' decision to launch a close collaboration for a series of events promoting the legacy of glass art on an international level. The aim is to support the lagoon city in its role as a cosmopolitan laboratory of culture and a meeting place for the masters of the exquisite Muranese art, artists, and institutions.
The agreement, signed by the President of the Istituto Veneto, and the President of the Fondazione Musei Civici di Venezia, entails joint action regarding the Prize, the Study Days and the creation of a website.
For the Istituto Veneto today, Glass in Venice is the natural outgrowth of its commitment to the art and technique of glass since the 19th Century. Among the Istituto's cultural activities, especially in the past ten years, exhibitions, lectures, and, since last year, seminars for specialists have focused on the glass arts.
The Fondazione Musei Civici di Venezia and the Glass Museum of Murano play an essential role in promoting the preservation of this heritage and in diffusing knowledge about this ancient artistic expression.
Founded in 1861, first as an archive, and now recognised as one of the most interesting exhibition venues of the international circuit, the Murano Museum has recently benefited by an important extension and a new museological design.

glass in venice

IstitutoVeneto diScienzeLettere edArti

MUVE Fondazione Musei Civici Venezia

The Istituto Veneto and Glass

The sequence of events

Already in the 19th Century a great many Murano glassworks, with their capacity to innovate processing techniques, won the Industry Prizes the Istituto Veneto awarded to the leading manufacturers in the Veneto.

Exhibitions

2017 - Glasstress
2016 - ViruX Paesaggio
2015 - Glasstress 2015 Gotika
2015 - All'interno di luce / vetro all'interno
2014 - Toots Zynsky
2013 - Glasstress
2012 - Bertil Vallien
2012 - Miniature di vetro
2011 - Glasstress-11
2011 - Lino Tagliapietra
2010 - Vetro Galanteries
2009 - Glasstress-09
2004 - Glass. Nel World.Today

http://www.glassinvenice.it/home

Study Days on Venetian Glass

2017 - Venetian Filigrana Glass through the Centuries
2016 - The Origins of Modern Glass Art in Venice and Europe. About 1900.
2015 - The Birth of the Great Museums:
the Glassworks Collections between the Renaissance and Revival
2014 - Approximately 1700's
2013 - Approximately 1600's
2012 - Glass in the Venetian Renaissance in approximately the year 1500.

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Reliquary,
mid 16th Cent.,
Glass Museum,
Murano

ATTI

Gli ATTI rappresentano da oltre un secolo una delle voci più significative nel panorama italiano degli studi superiori e specialistici, fornendo ogni anno decine di saggi su temi di storia, letteratura, critica d'arte, filologia, diritto, filosofia e delle scienze umanistiche in genere, e nelle scienze naturali, fisiche e matematiche. Una attenzione particolare è data a temi relativi alla cultura veneta e veneziana. A partire dal 1993 gli Atti escono in fascicoli trimestrali ed è possibile sottoscriverne l'abbonamento, ricevendone i vari numeri non appena editi.

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diScienzeLettere
edArti

In copertina:
Reliquary, mid 16th Cent., Glass Museum, Murano

Progetto grafico della copertina:
Paolo Roggero design

The "Study Days on Venetian Glass" are an opportunity for in-depth study on Venetian glass and are tuned to an audience of Museum conservators, collectors and experts.
The programme includes lessons by experts who, after a general overview, will guide participants through the direct study of methods and pieces, encouraging participants to actively take part, also through presentations.

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