



# U TRAGANJU ZA RENESANSOM

Staklo iz arheoloških istraživanja  
na dubrovačkom području



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# IN SEARCH OF RENAISSANCE

Glass from the archaeological  
excavations in the Dubrovnik area

I majući na umu onaj olimpijski moto izvrsnosti *Citius-altius-fortius*, želja je Doma Marina Držića u svim se svojim aktivnostima usavršavati, odnosno mijenjati se i izgrađivati kroz dopunjavanje i odbacivanje. Tijekom posljednjih nekoliko godina ova je ustanova prestala priređivati izložbe koje nisu tematski vezane uz njeno poslanje, a fokus je proširila s lika i djela našeg najvećeg renesansnog književnika Marina Držića na književnost i na renesansu. Tome u prilog govori velika izložba “Portreti hrvatskih književnika” koja je bila postavljena u siječnju 2016. godine, a na kojoj je prikazan značajan broj slika, skulptura, crteža i grafika hrvatskih književnika, kojima su autori bili likovni umjetnici iz Hrvatske i Bosne i Hercegovine. Usto, priređeno je nekoliko autorskih izložbi umjetnika koji su tematizirali Držićeva djela, manje ili više slobodno shvaćajući i interpretirajući njegove ideje.

Izložba “U traganju za renesansom” kojoj je autorica arheologinja dr. sc. Nikolina Topić, po svemu je poseban projekt za Dom Marina Držića. Tematski, riječ je o fragmentima stakla iz 15., 16. i 17. stoljeća koji su pronađeni u arheološkim iskopavanjima na dubrovačkom području od tvrđave Sokol u Konavlima do crkve svetog Vlaha u Stonu, s naglascima na lokalitetima u Gradu – Sveta Marija, Pustijerna, kula Gornji ugao i Knežev dvor. U logističkom smislu, izložba je također zahtjevna jer je način prezentacije takve građe drugačiji od postava likovnih djela: izrađeni su panoi koji pokazuju arheološke lokalitete, postupak izrade staklenih predmeta i butige u Gradu koje su prodavale staklo, zatim su izrađene uvećane reprodukcije izloženih predmeta koji su u stvarnosti mali i na kojima je teško uočiti svu ljepotu njihovog oblikovanja, nabavljene su staklene vitrine za čuvanje i prezentaciju, u Sjedinjenim Američkim Državama su izrađene i u Dubrovnik dopremljene staklene rekonstrukcije predmeta izvedene prema nacrtima autorice, a iz Nizozemske su pristigle reprodukcije renesansnih flamanskih slika Willema Hede i Jana Brueghela Starijeg na kojima se nalaze stakleni predmeti sličnih oblikovnih karakteristika kakve nose i neki s ove izložbe. Konačno, ni financijski aspekt ovog projekta nije zanemariv, a poduzeti napor da se izložba ovog opsega i ove teme ipak postavi u Domu Marina Držića svjedoči o iskrenoj želji vodstva ustanove da građanima Dubrovnika, zbog kojih postoji i čijim kulturnim potrebama služi, ponudi kvalitetan i raznolik sadržaj kakav Dubrovnik zaslužuje. Sve navedeno nipošto ne znači da su lik i djelo Marina Držića prestali biti u središtu pozornosti njegovog Doma (dapače, u ovoj je obljet-

# Renesansno staklo u Domu Marina Držića

ničkoj godini povećan broj izložbi i drugih projekata koji u fokusu imaju samo Držićeva književna ostvarenja), nego da je naša namjera predstaviti i kontekst u kojemu je Držić živio, odnosno razdoblje renesanse. U tome se smislu otvara širok raspon novih aktivnosti koje mogu biti i izložbene – renesansna književnost, moda i drugi uporabni i umjetnički predmeti iz doba renesanse, renesansna glazba i arhitektura, Držićevi suvremenici, običaji i nematerijalna baština te čitav niz drugih podtema koje upotpunjuju i čine cjelovitom sliku o Marinu Držiću i njegovom razdoblju.

Naziv izložbe evocira proustovsku melankoliju prošlog vremena kojeg autorica izložbe oživljava prezentacijom predmeta, rekonstrukcijama i popratnim muzeografskim pomagalicama, nastojeći ispričati priču o snažnoj dubrovačkoj staklarskoj produkciji koju ili dovoljno ne poznajemo ili počesto zaboravljamo u nabranju svih onih misaonih i materijalnih vrijednosti po kojima je Dubrovačka Republika bila perjanica civiliziranog svijeta na granici Istoka i Zapada. Ponos koji zbog toga osjećamo ne smije biti samo dijelom naše prošlosti, nego nas treba podsjećati kako su običaji po kojima je Dubrovnik bio prvi, za to vrijeme predstavljali avangardu. Da bismo danas ostvarili vrijednosti koje će trajati, potrebno je gledati u budućnost umjesto u prošlost, odnosno nastojati biti suvremen u suvremenosti.

Marin Ivanović





Bearing in mind the Olympic motto of excellence *Citius-altius-fortius*, the House of Marin Držić is committed to constantly improving all its activities, to developing itself and growing by means of complementing and dismissing certain features. Over the past few years, this institution has ceased to organize exhibitions that are not thematically related to its mission, and the focus has expanded from the life and work of our greatest Renaissance writer Marin Držić to the literature and the Renaissance. This is supported by a large exhibition entitled *Portraits of Croatian writers* which was set up in January 2016 and represented a significant number of paintings, sculptures, drawings and prints of Croatian writers, the authors of which were artists from Croatia and Bosnia and Herzegovina. Moreover, there were several solo exhibitions of artists who have dealt with Držić's works and who have rather freely comprehended and interpreted his ideas.

The exhibition entitled *In search of Renaissance*, set by the archaeologist Nikolina Topić, PhD, is by all means a special project for the House of Marin Držić. Thematically, the exhibition presents the fragments of glass from the 15<sup>th</sup>, 16<sup>th</sup> and 17<sup>th</sup> century that have been found during the archaeological excavations in the Dubrovnik area extending from the Sokol Fortress in Konavle to the church of Saint Blaise in Ston, with emphasis on the locations in the City – Saint Mary, Pustijerna, Upper Corner Tower (Kula Gornji Ugao) and the Rector's Palace. In terms of logistics, the exhibition is also challenging because the way of displaying such material is rather different from displaying artworks: there are display boards presenting the archaeological sites, the process of making glassware and the stores in the City that were selling glass; there are also enlarged reproductions of the exhibited pieces that are very small, making it therefore difficult to perceive all the beauty of their design; glass display cases have been brought in for storage and presentation; glass reconstructions of items made according to the designs of the author were made in the United States and transported to Dubrovnik; the reproductions of Renaissance Flemish paintings by Willem Heda and Jan Brueghel the Elder representing glass objects of similar design characteristics that are present on some of the items in this exhibition were brought from the Netherlands. Finally, the financial aspect of the project is not to be neglected as well, and the effort made to make an exhibition of this scope and addressing this very topic in the House of Marin Držić is the real proof of the sin-

## Renaissance glass in the House of Marin Držić

cere desire of the institution's management to offer to the citizens of Dubrovnik, that it serves and whose cultural needs it responds to, a high quality and diverse content that Dubrovnik deserves. All this does not mean that the life and work of Marin Držić have ceased to be the center of attention for his House (indeed, in this jubilee year we see the increase in the number of exhibitions and other projects which are focused only on Držić's literary works); but it is rather our intention to present also the context in which Držić lived, namely the Renaissance period. This context enables a wide range of new activities that might be a part of an exhibition – Renaissance literature, fashion and other useful and art tools from the Renaissance, Renaissance music and architecture, Držić's contemporaries, traditions and intangible heritage and a variety of other sub-topics that complement the image of Marin Držić and his period.

The title of the exhibition evokes a Proustian melancholy of past times that the author of the exhibition revives by the presentation of items, reconstructions and supporting museographic tools, thus trying to tell the story of the powerful Dubrovnik glassmaking tradition that we do not know enough of or often forget when enumerating all the intellectual and material values that made the Republic of Dubrovnik a leader of civilized world on the border between the East and the West. The pride we feel should not be only a part of our past, it should also remind us that the customs that brought Dubrovnik to the leading position represented the avant-garde for that period. Today, in order to accomplish the values that will last, it is necessary to look to the future instead to the past, and try to be modern in the modernity.

Marin Ivanović

## UVOD

Dubrovnik je istaknuto urbano središte na dalmatinskoj obali u kojem se uslijed najvećeg uspona venecijanskog staklarstva tijekom XV. stoljeća razvila vlastita proizvodnja, utemeljena na iskustvu putujućih muranskih majstora. Podatke o proizvodnji stakla u Dubrovniku, namijenjenog ne samo za domaće potrebe nego i za izvoz (u balkansko zaleđe, Otomansko carstvo, Aleksandriju, Albaniju, južnu Italiju, Siciliju) nalazimo u arhivskim dokumentima gdje se navode i imena majstora, pozicije radionica i trgovina stakla, kao i vrste posuda. Ti predmeti su arheološki dokumentirani, podudaraju se s arhivskim izvorima, no arheološki materijal nam svakako pruža bolji uvid u tipologiju, dekoraciju i tehnike kojima su konkretni uporabni ili ukrasni predmeti izrađivani. Ti predmeti su vrijedno svjedočanstvo vremena, kulture življenja i društvene atmosfere kasnosrednjovjekovnog i ranonovovjekovnog Dubrovnika.

Izložba obuhvaća kasnosrednjovjekovni i ranonovovjekovni materijal iz arheoloških istraživanja koja su provedena na lokalitetima u povijesnoj jezgri Dubrovnika i na dubrovačkom području u razdoblju od 2006. do 2016. god. Prezentirani su uporabni stolni predmeti, svjetiljke, prozorsko staklo i krunice. Također su predstavljene produkcija, distribucija i uporaba stakla u tom periodu.

Nalazi su grupirani prema tipološkim kategorijama, a pronađeni su u: sakralnim objektima (crkve i samostani s grobljima), privatno-javnim građevinama te vojnim objektima (kula, utvrda). Čaše, čaše na nozi, *tazze*, zdjelice i boce su posude stolnog karaktera. Svjetiljke su upotrebljavane u samostanskim kompleksima, javnim i privatnim građevinama te na utverdama. Kružna prozorska stakla (*oculi*) prisutna su na gotovo svim vrstama građevina. Krunice su pronađene u novovjekovnim grobovima uz samostane i crkve. Nalaze uglavnom možemo pripisati razdoblju najvećeg prosperiteta Dubrovačke Republike (15.-16. st.) tj. razdoblju u kojem Dubrovnik ima i vlastitu staklarsku proizvodnju. Istovremeno, trgovina je iznimno razvijena, a lokalna proizvodnja ipak nije u potpunosti pokrivala potražnju. Brojni predmeti stoga predstavljaju uvoz iz venecijanskih, drugih talijanskih ili zapadnoeuropskih radionica.

Cilj izložbe je potaknuti daljnje proučavanje arheoloških nalaza stakla srednjeg i novog vijeka koje zaostaje za svjetskom praksom jer se prednost uglavnom davala nalazima iz ranijih razdoblja. Arheološkom analizom tog raznolikog materijala

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došlo se do spoznaja o proizvodnji, importu i eksportu stakla u Dubrovačkoj Republici, vremenu i porijeklu njihova nastanka te upotrebi i kulturi življenja.

## ARHEOLOŠKA ISTRAŽIVANJA

Nalazi koji su predstavljeni na izložbi potječu s nekoliko arheoloških lokaliteta na dubrovačkom području. Najveći broj nalaza stakla potječe iz samostanskog kompleksa sv. Marije od Kaštela u Dubrovniku. Samostanski kompleks sv. Marije na otočiću na Velikom jezeru na Mljetu dao je skromnije nalaze, kao i katedrala sv. Vlaha u Stonu. U istraživanju crkve sv. Stjepana u Pustijerni u Dubrovniku pronađeno je više staklenih nalaza, kao i na Kuli Gornji ugao u Dubrovniku. Utvrda Sokol u Konavlima obiluje raznovrsnim nalazima. Riječ je o lokalitetima s raznolikom stratigrafijom koji su dali mnoštvo materijala od prapovijesnog razdoblja, preko antike do modernog doba. Nalazi stakla svjedoče o visokoj kulturi življenja u srednjem i novom vijeku na dubrovačkom području. Najviše nalaza stakla nađeno je u istraživanju sakralnih objekata. Gradske crkve i samostani bili su bolje snabdjeveni staklenim posuđem od onih na okolnom području. Arheološka istraživanja su potvrdila da staklo nije bilo namijenjeno samo sakralnim objektima nego ga je koristilo i stanovništvo, a nađeno je u sklopu rezidencija te kula i utvrda koje su stoljećima bile važni kontrolni punktovi uz koje su prolazile brojne trgovačke karavane koje su ih snabdjevale.

## INTRODUCTION

Dubrovnik is a prominent urban center on the Dalmatian coast that, during the greatest rise of the Venetian glassmaking during the 15<sup>th</sup> century, developed its own production based on the experience of the travelling Murano master craftsmen. The data on the production of glass in Dubrovnik that was intended not only for domestic purposes but also for export (to the Balkan hinterland, the Ottoman Empire, Alexandria, Albania, southern Italy, Sicily) can be found in archival documents stating the names of the master craftsmen, the locations of the glass workshops and stores as well as the types of vessels. These items are archeologically documented and correspond to the archival sources, but the archaeological material itself certainly provides a better insight into the typology, decoration and techniques used to make specific functional or decorative items. These items are a valuable testimony to the period, the culture of living and the social atmosphere of the late medieval and the early modern Dubrovnik.

The exhibition covers the late medieval and the early modern material from the archaeological research carried out on the sites in the historic center of Dubrovnik and the Dubrovnik area in the period from 2006 to 2016. The exhibition includes a display of functional tableware, lamps, window glass and rosaries. The production, distribution and the usage of glass in this period are also presented.

The findings are grouped according to the typological categories, and have been found in religious buildings (churches and monasteries with cemeteries), private-public buildings and military facilities (tower, fortress). Glasses, stemmed glasses, *tazzas*, bowls and bottles are all vessels used at the table. Lamps have been used in monasteries, public and private buildings and forts. The circular glass windows (*oculi*) are present on almost all types of buildings. Rosaries were found in modern age graves next to monasteries and churches. The findings can mostly be attributed to the period of the greatest prosperity of the Dubrovnik Republic (15<sup>th</sup> – 16<sup>th</sup> c.) or the period during which Dubrovnik has its own glass production. At the same time, the trade was highly developed, but the local production was not able to entirely satisfy the demand. Therefore, numerous items represent imported goods from Venetian, other Italian or western European workshops.

The aim of the exhibition is to encourage further studies of the archaeological glass findings from the medieval and mod-

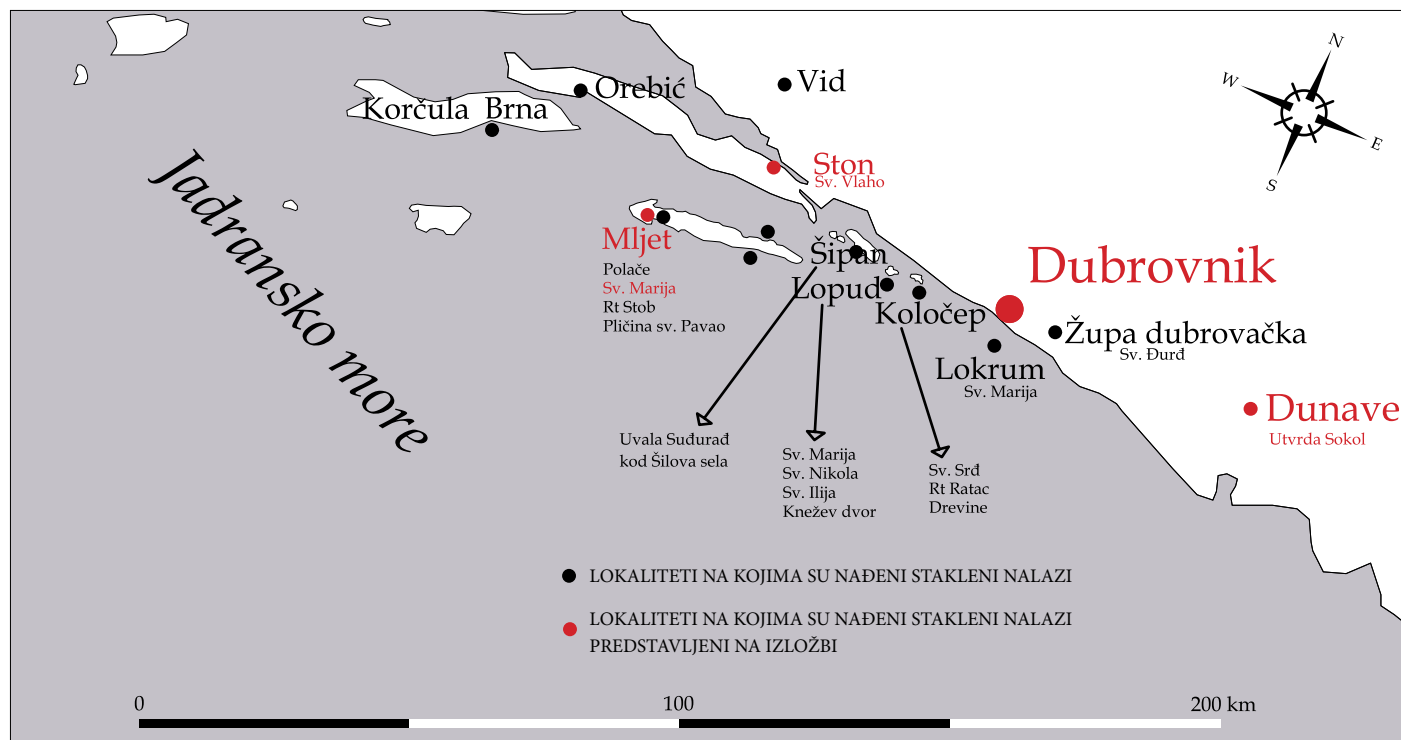
# IN SEARCH OF RENAISSANCE

## Glass from the archaeological excavations in the Dubrovnik area

ern age which are currently lagging behind the international practices because priority has mostly been given to the findings from earlier periods. The archaeological analysis of this diverse material provided insights into the production, import and export of glass in the Dubrovnik Republic, the time and origin of their creation as well as their usage and the culture of living.

## ARCHAEOLOGICAL RESEARCH

The findings displayed at the exhibition originate from several archaeological sites in the Dubrovnik area. The largest number of glass findings comes from the Convent of Saint Mary of the Castle in Dubrovnik. The Convent of Saint Mary on the islet on the Great Lake on the island of Mljet gave more modest findings, and so did the Cathedral of Saint Blaise in Ston. During the exploration of the Church of Saint Stephen in Pustijerna in Dubrovnik several glass items were found, and so were in the Upper Corner Tower (Kula Gornji ugao) in Dubrovnik. The Sokol Fortress in Konavle was rich in various findings. The sites in question have a diverse stratigraphy and provided a multitude of material from the prehistoric period, through antiquity to the modern times. The glass findings testify to the high culture of living in the medieval and modern period in the Dubrovnik area. Most glass items were found during the exploration of religious buildings. City churches and monasteries had a better supply of glassware in comparison to those in the surrounding areas. Archaeological research has confirmed that the glass was not intended only for the reli-



LOKALITETI NA DUBROVAČKOM PODRUČJU  
SITES IN THE DUBROVNIK AREA

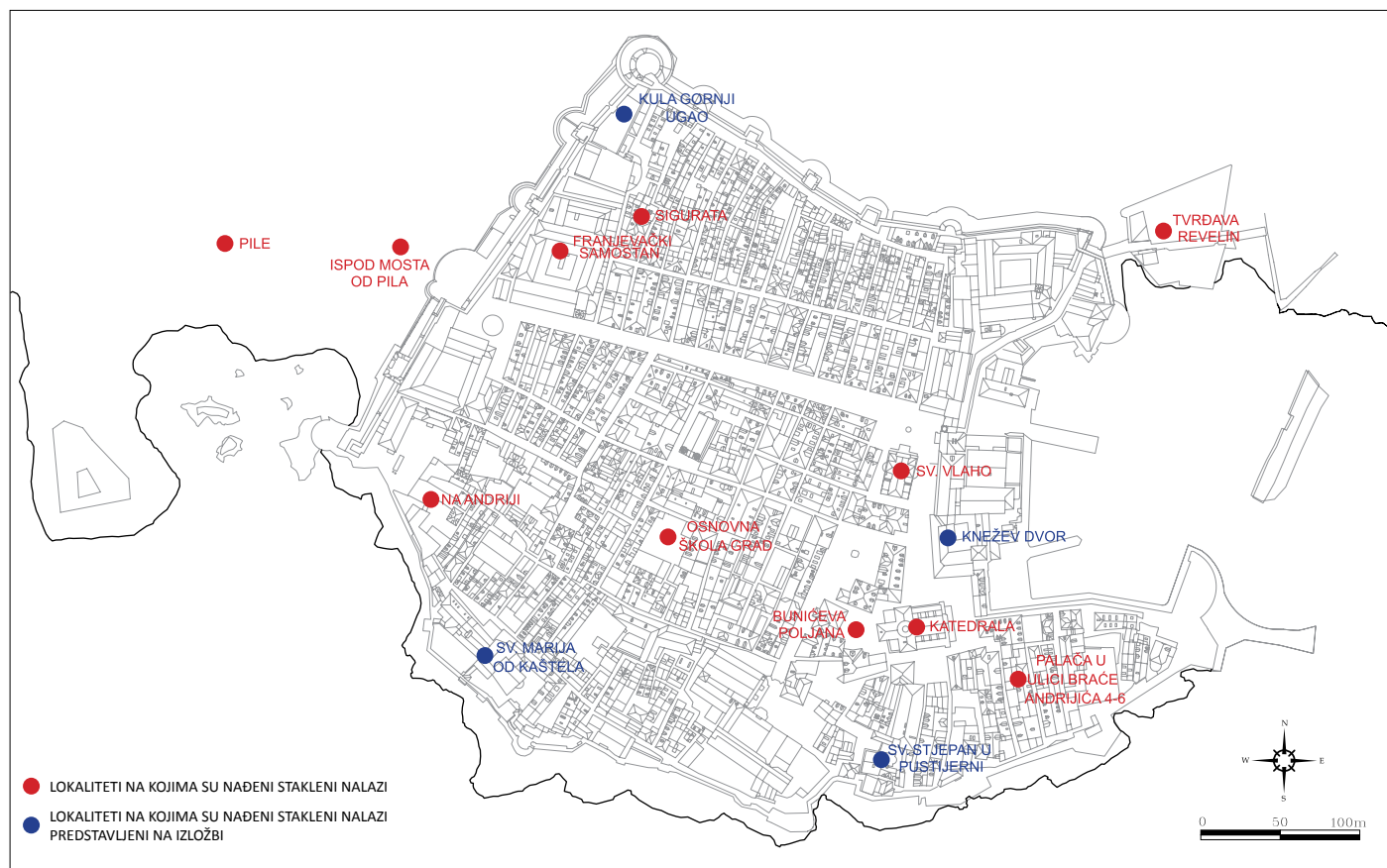
### SAMOSTAN SV. MARIJE OD KAŠTELA U DUBROVNIKU

Benediktinski samostanski kompleks sv. Marije od Kaštela smješten je na predjelu najstarijeg seksterija na najvišem južnom dijelu Grada. Samostan je osnovan oko god. 1150., no današnji oblik uglavnom datira s kraja 15. st. Crkva je stradala u Velikom potresu 1667. nakon čega je uslijedio niz preoblikovanja, a ukinućem Dubrovačke Republike ovaj prostor je bio više puta prenamijenjivan. U arheološkom istraživanju tog kompleksa 2007. i 2008. pronađeno je mnoštvo nalaza koji pripadaju razdoblju od kasne antike do novog vijeka.<sup>1</sup> Ukupno je istraženo 11 soni u kojima su pronađeni mnogobrojni nalazi: keramika, staklo, metalni nalazi, keramičke lule, pećnjaci, novac, ulomci kamene plastike. Pronađena je velika količina ulo-



Samostan sv. Marije od Kaštela u Dubrovniku  
*The Convent of St. Mary of Kaštel in Dubrovnik*  
(foto: B. Milošević, 2008, Omega engineering d.o.o. Dubrovnik)

<sup>1</sup> B. Milošević, Ž. Peković 2009.



ARHEOLOŠKI LOKALITETI U JEZGRI DUBROVNIKA S NALAZIMA RENESANSNOG STAKLA  
 ARCHAEOLOGICAL SITES IN THE CENTER OF DUBROVNIK WITH THE FINDINGS OF RENAISSANCE GLASS

gious buildings but had also been used by the general population, and has been found within the residences as well as the towers and forts that were important checkpoints passed by numerous trade caravans which catered to their needs for centuries.

THE CONVENT OF SAINT MARY OF THE CASTLE  
 IN DUBROVNIK

The Benedictine Convent of Saint Mary of the Castle (Samostan sv. Marije od Kaštela) is situated in the oldest neighborhood area (seksterij) on the highest southern part of the City. The convent was founded around the year 1150, but its present form dates mainly from the late 15<sup>th</sup> century. The church was damaged in the Great Earthquake of 1667, which was followed by a series of transformations, and with the abolition of the Dubrovnik Republic, this space repeatedly changed its purpose. During the archaeological research of the complex in 2007 and 2008, an abundance of findings was discovered

maka srednjovjekovnog i novovjekovnog stakla koji su tipološki, produkcijski i kronološki raznovrsni. Zastupljene su boce, čaše, čaše na nozi, vrčevi, zdjele, svjetiljke, tintarnice. Također su nađene perlice koje su pripadale krunicama, te prozorsko staklo.

### SAMOSTAN SV. MARIJE NA MLJETU

Benediktinski samostanski sklop sv. Marije na Mljetu na Velikom jezeru podigli su benediktinci iz Apulije u romaničkom stilu sredinom 12. st. Francuskom okupacijom 1808. ukiđa se samostan, uslijedile su godine propadanja, a kompleks je kasnije povremeno korišten.

Istraživanje samostana i crkve sv. Marije na otočiću na Velikom jezeru na otoku Mljetu najprije je provedeno 2006. (I. faza).<sup>2</sup> Istražene su sonde unutar samostanskog kompleksa te izvan njega: unutar kastruma i uz prapovijesni bedem. Unutar samostana istraženo je više grobova u kojima je pronađen veći broj krunica čija zrna su izrađena od stakla i drugih materijala u različitim bojama. Krajem 2007. i početkom 2008. (II. faza)<sup>3</sup> nastavljena su istraživanja u samostanskom sklopu crkve, kojima se htjelo definirati ostatke starijeg romaničkoga samostana. Ukupno je istraženo deset cjelina koje su dale raznovrsne nalaze, a materijal se datira u rasponu od kasne antike do novog vijeka.

### CRKVA SV. STJEPANA U PUSTIJERNI U DUBROVNIKU

Crkva sv. Stjepana nalazi se u Pustijerni, jednom od najstarijih seksterija u jezgri Dubrovnika. Najstarija je sakralna građevina u Dubrovniku koja je navedena u pisanim izvorima. Spominje je bizantski car-pisac Konstantin VII Porfirogenet u svom poznatom djelu *De administrando imperio* sredinom 10. st.

Arheološka istraživanja 2011./2012.<sup>4</sup> potvrdila su da je prva crkva sv. Stjepana podignuta u predromaničko doba (8. st.) i da je imala pridruženo groblje. Kroz naredna stoljeća bila je podvrgnuta nizu izmjena, te ostaje u funkciji do Velikog potresa god. 1667. nakon kojeg se ne obnavlja. Budući da se neki od nalaza (ulomak pozlaćene lule, ulomci stakla) koji su prona-

đeni u grobnici unutar crkve datiraju u 19. st., znamo da su grobovi još korišteni i nakon što crkva više nije u funkciji. Nalazi nađeni unutar crkve i izvan nje (uz njezin sjeverni zid gdje je nađen veći broj grobova i kosturnica) su raznoliki, a najraniji upućuju na kasnoantički/ranobizantski period. Nađeni su ulomci kasnoantičkih amfora i tegula, koštani češljevi, pločica bizantske fibule, ulomci ranije srednjovjekovne keramike, fragmenti stakla. Uglavnom se radi o ulomcima čaša bez ukrasa ili s ukrasom izvedenim optičkim puhanjem, te manjim dijelom s apliciranim staklenim nitima i kapljicama, narebrenim ukrasom. Osim posuda pronađeni su i ulomci prozorskog stakla (*oculi*).

### KATEDRALA SV. VLAHA U STONU

God. 1345. dovršena je prva katedrala sv. Vlaha u Stonu, no proširena je i obogaćena ornamentikom 1392. Nakon Velikog potresa god. 1667. prva katedrala je stradala, te je početkom 1706. odlučeno da se izgradi nova. Kad se ukida stonska biskupija (u prvoj polovici 18. st.) katedrala postaje župnom crkvom, a u funkciji je do potresa 1843. Na mjestu prethodnih, 1872. podignuta je župna crkva s istim titularom. Arheološkim istraživanjem provedenim 2006./2007.<sup>5</sup> htjelo se istražiti sačuvanost ranijih katedrala istog titulara, prve iz 14. st. te druge s početka 18. st. Od arheoloških nalaza najviše je zastupljena keramika, u manjem broju metalni, kameni, numizmatički te stakleni nalazi.



Katedrala sv. Vlaha u Stonu / *The cathedral of St. Blaise in Ston*  
(foto: B. Milošević, 2007, Omega engineering d.o.o. Dubrovnik)

<sup>2</sup> N. Kovačević 2006.

<sup>3</sup> A. Milošević 2008.

<sup>4</sup> N. Topić, I. Radić, Ž. Peković 2012.

<sup>5</sup> B. Milošević 2007.

that belong to the period from the late antiquity to the modern times.<sup>1</sup> A total of 11 trenches were researched and among the numerous findings there were ceramics, glass, metal findings, ceramic pipes, fireplace tiles, coins and fragments of stone sculptures. A large number of fragments of medieval and modern time glass was found which differ in typology, production and chronology. Bottles, glasses, stemmed glasses, jugs, bowls, lamps, inkwells are all represented. Beads that belonged to rosaries, and window glass were also found.

### THE CONVENT OF SAINT MARY ON MLJET

Benedictine Convent of Saint Mary (Samostan sv. Marije) on the Great Lake on the island of Mljet was built by the Benedictine monks from Puglia in the Romanesque style in the mid-12<sup>th</sup> century. The French occupation in 1808 abolished the monastery, which was followed by years of decay, and the complex was later occasionally used.

The first exploration of the Convent and Church of Saint Mary on the islet on the Great Lake on the island of Mljet was performed in 2006 (phase I).<sup>2</sup> This included researching the trenches within the monastery complex as well as outside of it: inside the castrum and next to the prehistoric ramparts. Inside the convent several graves were explored and a larger number of rosaries was found with beads made out of glass and other materials in different colors. In late 2007 and early 2008 (phase II)<sup>3</sup> exploration of the convent complex of the church continued, which sought to define the remains of an older Romanesque monastery. A total of ten units were explored which provided various findings, and the material can be dated from the late antiquity to the modern times.

### THE CHURCH OF SAINT STEPHEN IN PUSTIJERNA IN DUBROVNIK

The Church of Saint Stephen (Crkva sv. Stjepana) is located in Pustijerna, one of the oldest neighborhoods in the center of Dubrovnik. It is the oldest sacral building in Dubrovnik mentioned in written sources. The Byzantine emperor-writer



Tlocrt crkve sv. Stjepana u Dubrovniku  
*Plan of church of St. Stephen in Dubrovnik*  
 (Ž. Peković, A. Radonić, I. Radić, N. Topić, 2012,  
 Omega engineering d.o.o. Dubrovnik)

Constantine VII Porphyrogenitus mentions it in his famous work *De Administrando Imperio* from the mid-10<sup>th</sup> century.

Archaeological excavations from 2011 and 2012<sup>4</sup> confirmed that the first church of Saint Stephen was built in the pre-Romanesque era (8<sup>th</sup> c.) and that it had an adjacent cemetery. Through the following centuries it was subjected to a series of changes, and it was operational until the Great Earthquake of 1667, after which it was not renovated. Since some of the findings (a fragment of a gilded pipe, fragments of glass) that were found in a tomb inside the church date back to the 19<sup>th</sup> c., we know that the graves were still used after the church was no longer in use. The findings located inside and outside of the church (next to the northern church wall a larger number of graves and ossuaries was found) are diverse, and the earliest items point to the late antique / early Byzantine period. Fragments of late Roman amphoras and roof tiles were found, as well as bone combs, a plate of a Byzantine fibula, fragments of earlier medieval ceramics and glass fragments. These are mainly fragments of undecorated glasses or glasses decorated by optical blowing, and in smaller numbers glasses with applied glass threads and droplets, ribbed decoration. In addition to glassware, fragments of window glass (*oculi*) were also found.

### THE CATHEDRAL OF SAINT BLAISE IN STON

The first Cathedral of Saint Blaise (Katedrala sv. Vlahu) in Ston was completed in 1345, but it was expanded and embellished

<sup>1</sup> B. Milošević, Ž. Peković (2009).

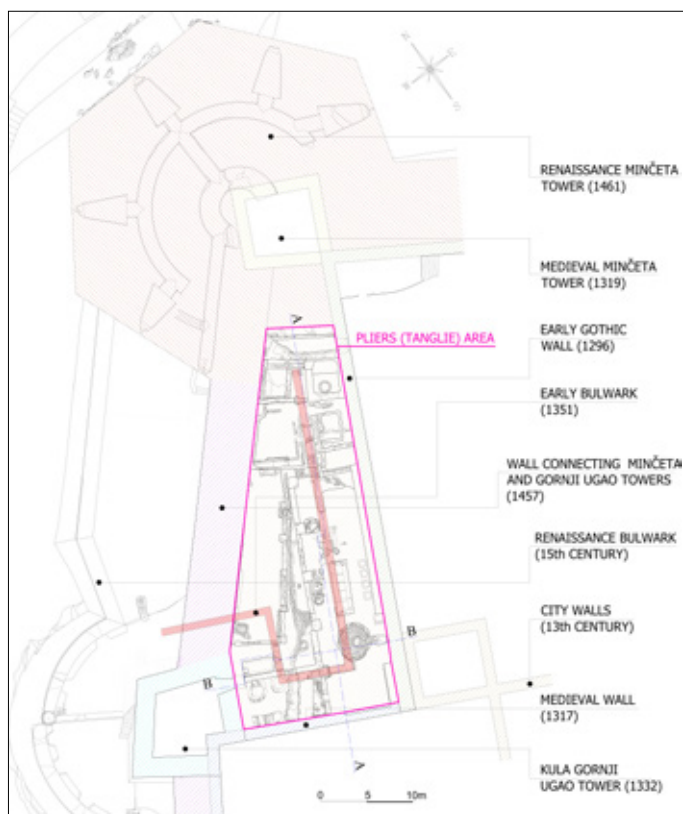
<sup>2</sup> N. Kovačević (2006).

<sup>3</sup> A. Milošević, (2008).

<sup>4</sup> N. Topić, I. Radić, Ž. Peković (2012).

## KULA GORNJI UGAO U DUBROVNIKU

Lokalitet Kula Gornji ugao smješten je na sjeverozapadnom uglu Grada, podno Minčete. Taj dio grada bio je vrlo strm i stjenovit, u 13. st. tu su izgrađene tanglije, tj. klijesta, otvoreni prostor uvučen u gradsko tkivo radi bolje obrane uglova grada. U 14. st. tu prolazi prvo predziđe, grade se kule Minčeta i Gornji ugao, sredinom 15. st. taj prostor se nivelira radi izgradnje ljevaonice a predziđe se proširuje. Dubrovačka ljevaonica spada u rijetke sačuvane objekte takve vrste, a smještaj unutar gradskih zidina čini je jedinstvenom i bez komparativnog primjera. U istraživanjima su pronađeni dijelovi arhitekture ljevaonice koji su omogućili potpuno razumijevanje tehnološke podijeljenosti i logike prostora te izradu vrlo vjerne idealne



Dubrovačka ljevaonica: faze razvoja  
*Dubrovnik foundry: phases of development*  
 (prema / after: Ž. Peković, N. Topić 2011, 269, fig. 3;  
 izradio / drawn by B. Doljanin)

rekonstrukcije. Otkriveni su fragmenti grafitnih talioničkih posuda, drozge, sedrene cjevčice za upuhivanje zraka u peći, fragmenti željeznih topovskih kugli i ostali pokretni nalazi koji su potvrdili pretpostavku o postojanju kasnosrednjovjekovnog i novovjekovnog industrijskog dijela grada. Ljevaonica funkcionira do Velikog potresa 1667. kada je djelomično prekrivena nasipnim slojem što nam otkriva da je u to vrijeme služila kao deponij za građevinski šut od okolnih kuća nastao nakon potresa. Zatim je ponovno kratko u upotrebi, a djelatnost zamire krajem 17. ili početkom 18. st. kada je teren bio prekriven velikim nasipnim slojem građevinskog šuta. U slojevima koji su nastali deponiranjem nasipa nakon potresa pronađeni su raznovrsni nalazi. Ponajviše se radi o ulomcima novovjekovnih keramičkih posuda, keramičkih lula, u manjem broju su nađeni fragmenti metala, novac, obrađeni kameni ulomci, te više ulomaka novovjekovnog stakla. Nakon arheoloških istraživanja izrađen je projekt prezentacije lokaliteta. Nad lokalitetom je izvedena armiranobetonska ploča. Zbog velikog raspona lokaliteta bilo je potrebno postaviti armiranobetonske stupove koji se temelje na kamenu živcu, a čiji je razmještaj ovisio o arheološkim strukturama. Ovaj prostor sada ima dvostruku funkciju: dječjeg igrališta i arheološkog parka ispod njega. Lokalitetu se pristupa preko kule Gornji ugao u kojoj se nalazi postav nalaza pronađenih u istraživanju.<sup>6</sup>

## UTVRDA SOKOL U DUNAVAMA U KONAVLIMA

Područje oko utvrde Sokol već je bilo naseljeno u prapovijesno doba. Nalazi svjedoče da je utvrda bila značajno središte u antičkom periodu. Najstariji povijesni podatak o utvrdi potječe iz 1373. Konavle su u 13. st. pod vlašću Raške, a sve do 1371. ostaju u posjedu Nemanjića. Bosanski kralj Tvrtko osvaja Konavle god. 1378. Dubrovčani dolaze u posjed Konavala 1419. kad sa Sandaljem Hranićem postižu dogovor da im on proda svoj dio Konavala zajedno s gradom Sokolom, a konačno zauzimaju Sokol 1423. Utvrda je napuštena 1673. te se od tada ne spominje u zaključcima Vijeća. Provedeno je opsežno arheološko istraživanje utvrde Sokol u dvije faze, 2012. i 2013.,<sup>7</sup> u kojem su istražene četiri velike sonde uz utvrdu.

<sup>6</sup> B. Milošević, N. Topić, Ž. Peković 2009; Ž. Peković, N. Topić 2011.

<sup>7</sup> N. Topić, N. Drašković Vlašić, A. Džaja, Ž. Peković 2014.

lished with ornaments in 1392. After the Great Earthquake of 1667 the first cathedral was destroyed, and at the beginning of 1706 the decision was made to build a new one. Following the abolition of the Diocese of Ston (in the first half of the 18<sup>th</sup> c.) the cathedral became a parish church, and remained in use until the earthquake in 1843. At the site of the previous churches in 1872 a parish church with the same patron saint was erected. Archaeological research conducted in 2006 and 2007<sup>5</sup> aimed to explore the state of preservation of previous cathedrals with the same patron saint, the first one from the 14<sup>th</sup> century and the second one from the beginning of the 18<sup>th</sup> century. Among the archaeological findings were mostly ceramics, with a small number of metal, stone, numismatic and glass findings.

### THE UPPER CORNER TOWER IN DUBROVNIK

The Upper Corner Tower (Kula Gornji Ugao) is located at the northwest corner of the city, at the foot of Minčeta Tower. This part of town was very steep and rocky and in the 13<sup>th</sup> century it saw the construction of a *tenaille*, an open space indented into the urban fabric of the city used for better defense of the city corners. During the 14<sup>th</sup> century this is where the first ramparts were located, Minčeta Tower and Upper Corner Tower were built, and in the mid-15<sup>th</sup> century this area was levelled in order to build a foundry and expand the ramparts. The foundry in Dubrovnik is one of the rare preserved buildings of its kind, and its location within the city walls makes it unique and without a comparative example. During the research, parts of the foundry's architecture have been found that allowed a full understanding of the technological division and the logic of space as well as the creation of a very faithful ideal reconstruction. Fragments of graphite melting pots have been found, and so were the bits of slag, travertine tubes for blowing air into the furnace, fragments of iron cannon balls and other movable findings that confirmed the hypothesis about the existence of the late medieval and post medieval industrial part of the city. The foundry operated until the Great Earthquake of 1667 when it was partially covered with a mound fill layer which reveals that at that time the foundry was used as a disposal site for the construction rubble from the surrounding

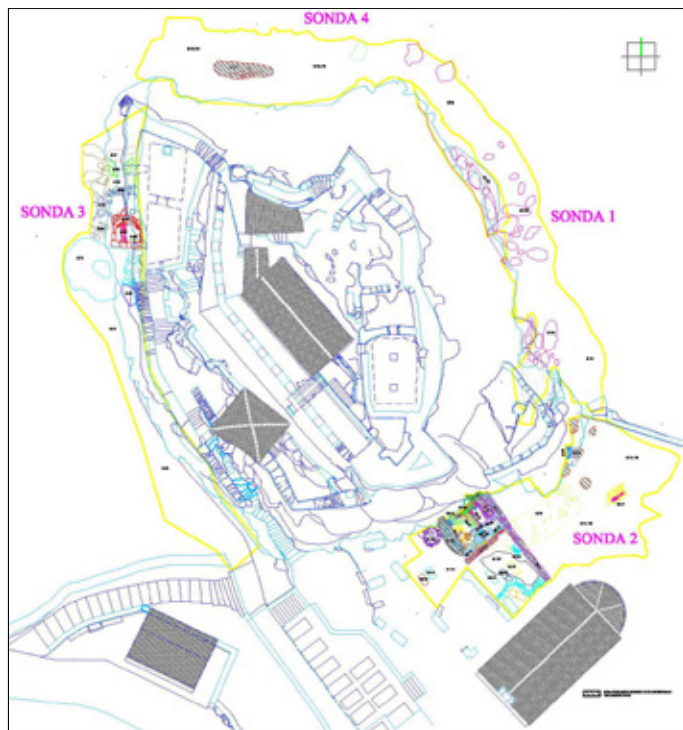


Dubrovačka ljevaonica: 3-D prikaz lokaliteta  
*Dubrovnik foundry: 3-D rendering of the site*  
 (prema / after: Ž. Peković, N. Topić 2011, 286, fig. 24;  
 izradila / drawn by L. Yu).

houses after the earthquake. It was again briefly in use but its operation ceases completely in the late 17<sup>th</sup> or early 18<sup>th</sup> century after the location was covered with a large mound fill layer of building rubble. In the layers formed by the rubble following the earthquake various findings were discovered. They were mostly modern age fragments of ceramic vessels, ceramic pipes, and a small number of metal fragments, money, processed stone fragments, and several fragments of modern age glass. After the archaeological research a project for the presentation of site was developed. Above the site a reinforced concrete slab was put in place. Due to the large span of the site it was necessary to put in place reinforced concrete columns based upon a stone foundation, whose arrangement depended on the archaeological structures. This area has a dual function now: a children's playground above and an archaeological park underneath. The site can be accessed through the Upper Corner Tower where the findings discovered during the excavations are displayed.<sup>6</sup>

<sup>5</sup> B. Milošević (2007).

<sup>6</sup> B. Milošević, N. Topić, Ž. Peković 2009; Ž. Peković, N. Topić 2011.



Tlocrt utvrde Sokol s arheološkim sondama  
*Plan of the Sokol fortress with archaeological probes*

(podloga: Geographica d.o.o. Split; sonde: N. Topić, N. Drašković Vlašić, D. Deranja, 2014. Omega engineering d.o.o. Dubrovnik)

Sonda 1 otvorena je s istočne strane utvrde. Sonda 2 istražena je s južne strane utvrde, a predstavlja stratigrafski najsloženiju sondu koja se sastoji od tri stepenaste razine. AMS metodom analizirani su kosturi iz obje faze istraživanja, te su datirani od 2. do 19. st., što svjedoči o kontinuitetu življenja na Sokolu. Sonda 3 istražena je uz zapadnu stranu utvrde. Na toj strani se došlo do kasnosrednjovjekovne razine pri čemu je nađena peć. Nađena je uništena željezna posuda s ostacima drozge, grublje ali i staklaste koja svjedoči o taljenju na vrlo visokim temperaturama. U toj sondi nađeni su ulomci kasnosrednjovjekovne / ranonovovjekovne keramike, metalni predmeti (najviše čavli, ulomci stakla, drozga). Sonda 4 je posljednja, a istražena je uz sjevernu stranu utvrde. Na istoku sonde nađeno je nekoliko poremećenih grobova. Kasnorimsko / ranobizantsko razdoblje je jedno od najvažnijih za utvrdu jer je tada u sklopu Justinijanovog limesa Sokol tvorio jedan od kontrolnih punktova na prijelazu iz kontinentalnog dijela prema moru.

Sokol je nastavio živjeti i u srednjovjekovnom razdoblju te u ranom novom vijeku što je posvjedočeno obilnim i raznolikim nalazima. Ovim istraživanjem potvrđen je kontinuitet života na utvrdi i u njezinoj blizini. Također je posvjedočena upotreba staklenih predmeta od rimskog do novovjekovnog razdoblja. Stakleni nalazi s utvrde Sokol u Konavlima pripadaju ponajviše razdoblju od 14. do 17. st.

## KNEŽEV DVOR U DUBROVNIKU

Prilikom obnove Kneževa dvora u Dubrovniku izvršen je arheološki nadzor tijekom radova u atriju (2015./2016.). Prostor između temelja stupova je betoniran tijekom obnove Dvora nakon potresa koji je zadesio grad 1979. god. Tada su temelji stupova učvršćeni betonskim konstrukcijama koje se sastoje od bočnih rebara između kojih je „kanal“ tj. središnja ispuna. Na svim stranama sonde su izvedene geomehaničke bušotine (cca  $\phi = 5, 10, 13$  cm) kojima je ustanovljeno da su kameni temelji stupova u atriju Dvora građeni od klesanaca i različitog vezivnog sredstva, temeljeni su na drvenim pilotima u sloju šljunka i mulja.  $^{14}\text{C}$  analizom na Institutu Ruđer Bošković u Zagrebu utvrđeno je da je starost drvenih pilota raspona od sredine 16. do skoro sredine 19. stoljeća.

Betonska rebra su s bočnih strana bila zasuta nasipnim slojem. Tijekom radova su ispražnjeni svi bočni prostori sa zapadne, južne i istočne strane sonde. U nasipu s južne i zapadne strane nađeno je malo nalaza (ulomci keramike, stakla, željezni nalazi, recentni nalazi), dok je nešto veća količina pronađena na sjeveroistočnom dijelu sonde (fragmenti keramike, stakla, željezni čavli).<sup>8</sup>

## PRODUKCIJA STAKLA

Poznato je da se staklarstvo uglavnom razvijalo u većim centrima, osobito na obalnim gradovima i riječnim središtima. Razlog tome je što je na obalama Sredozemlja i rijeka bilo moguće pronaći važne sirovine za izradu stakla, a transport robe je bio sigurniji i jeftiniji morskim ili riječnim nego kopnenim putem. Također je jednostavnije bilo dopremanje sirovina kojih nije bilo u blizini staklarskog centra. Staklarstvo je bio složen zanat koji je zahtijevao vrlo organiziran podijeljeni rad.<sup>9</sup>

<sup>8</sup> N. Topić 2016.

<sup>9</sup> V. Han 1981: 5.

## THE SOKOL FORTRESS IN DUNAVE (KONAVLE MUNICIPALITY)

The area around the Sokol Fortress was already inhabited in prehistoric times. Findings show that the fortress was an important center in the Antiquity. The oldest historical data on the fortress dates from 1373. During the 13<sup>th</sup> century the city of Konavle was under the rule of Raška, and until 1371 they remained in the possession of the Nemanjić family. A Bosnian king Tvrtko conquered Konavle in 1378. Dubrovnik came into possession of Konavle in 1419 when an agreement with Sandalj Hranić was made and he sold his part of Konavle together with the Sokol fortress, finally seizing Sokol in 1423. The fort was abandoned in 1673 and since then it had not been mentioned in the conclusions of the Council. An extensive archaeological exploration of the Sokol Fortress was conducted in two stages, in 2012 and 2013<sup>7</sup> during which four large trenches were explored next to the fortress. Trench 1 was opened on the eastern side of the fortress. Trench 2 was researched from the southern side of the fortress, and represents the most stratigraphically complex trench consisting of three different levels. The AMS method was used to analyze the skeletons found during both research phases. They were dated to the period from the 2<sup>nd</sup> to the 19<sup>th</sup> century which serves as evidence to the continuity of life around Sokol. Trench 3 was researched next to the western side of the fortress. On that side a late medieval level was reached and a furnace was found. A destroyed iron pot was discovered with rougher but also glassy slag residue, which proves that it was used for melting at very high temperatures. In this trench fragments of late medieval / early modern ceramics and metal objects (mostly nails, fragments of glass, mash) were found. The last one, trench 4 was explored by the northern side of the fortress. In the east side of the trench several disturbed graves were found. The late Roman / early Byzantine period was one of the most important periods for the fortress because Sokol was a part of the Justinian Limes and it served as one of the checkpoints at the crossing from the continental part towards the sea. Sokol continued to live in the medieval period and the early modern times as abundant and diverse findings clearly show. This research confirmed the continuity of life in the fortress and in its surroundings. The use of glass objects from the Roman period to the modern

age was also proven. Glass findings from the Fortress Sokol in Konavle belong mostly to the period between the 14<sup>th</sup> to the 17<sup>th</sup> century.

## THE RECTOR'S PALACE IN DUBROVNIK

During the reconstruction of the Rector's Palace in Dubrovnik (Knežev dvor), archaeological supervision was carried out throughout the works in the atrium. The space between the pillars' foundations was covered in concrete during the renovation of the Palace after the earthquake which struck the city in 1979. At the time the foundations of the pillars were reinforced with concrete structures which consisted of lateral ribs between which a "channel" or central filling was placed. On all sides of the trench geomechanical wells were made (approx.  $\phi = 5, 10, 13$  cm) which were used to establish that the pillars' stone foundations in the Palace atrium were made out of carved stone ashlar blocks and a different binding agent and were based on wooden piles in a layer of gravel and silt. The 14C analysis conducted by the Ruđer Bošković Institute in Zagreb established that the age of the wooden piles ranges from the middle of the 16<sup>th</sup> to almost the middle of the 19<sup>th</sup> century.

Concrete ribs at the sides were filled with a mound fill layer. During the excavations all the lateral areas on the west, the south and the east side of the trench were emptied. In the mound fill layer from the south and the west side a small number of findings was recovered (fragments of ceramics, glass, iron findings, recent findings), while a slightly larger number was found in the north-east part of the trench (fragments of ceramics, glass, iron nails).<sup>8</sup>

## PRODUCTION OF GLASS

It is well known that the glassmaking had mainly been developing in major cities, particularly in the coastal cities and river towns. This is due to the fact that on the shores of the Mediterranean Sea and on the river banks one could find important raw materials for glass manufacturing, and it was safer and cheaper to transport goods by sea or river than by land. It was also easier to transport raw materials which one could not find in the vicinity of the glassmaking centers. Glassmaking

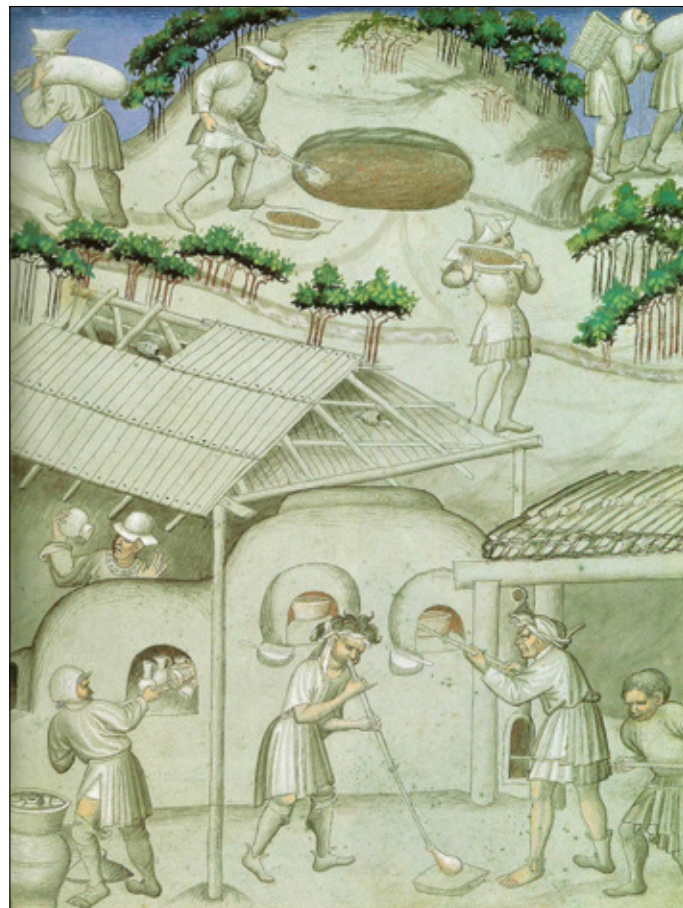
<sup>7</sup> N. Topić, N. Drašković Vlašić, A. Džaja, Ž. Peković (2014).

<sup>8</sup> N. Topić (2016).

Nije sasvim poznato kako je došlo do izrade stakla, no vjerojatno se to zbilo prije 7000 godina o čemu nam svjedoči podatak koji je zabilježio Plinije. Prenosi da su fenički trgovci pristali svojim brodom na obali rijeke Belus u Siriji. Dok su pripremali večeru, lonac su postavili na grumenje sode koje su upotrijebili kao ognjište, prilikom čega je vatra rastalila sodu te je došlo do reakcije s pijeskom na obali rijeke. Tada je prvi put ljudskim (nehotičnim) djelovanjem formirana sjajna masa poznata kao staklo.<sup>10</sup>

Prvi stakleni predmeti su vjerojatno izrađeni u Mezopotamiji ili Egiptu oko 2500 pr. Kr. Lončari su do tog otkrića mogli doći pri zagrijavanju posuda. U početku se staklo nanosilo samo u tankom sloju na površinu keramičkih posuda, a tek poslije se došlo na ideju da bi se od stakla mogle izrađivati cijele posude.<sup>11</sup> Prve posude počinju se izrađivati oko 1550. pr. Kr., kada se počela primjenjivati tehnika lijevanja oko jezgre.<sup>12</sup> U početku se staklena masa za transport lijevala u ingote ili manje blokove, no kroz rimsko razdoblje bilo je uobičajeno lijevanje stakla u velike kalupe koji su se poslije razbijali i tako transportirali.<sup>13</sup>

Izrada stakla bila je poznata u Kini i Indiji. Proizvodnja stakla odvijala se osobito u 8. st. pr. Kr. na području Iraka, Sirije, Libanona, Izraela. Slijedi produkcija u helenizmu, no u tom razdoblju još nije razvijena tehnika puhanja koja se pojavljuje sredinom 1. st. pr. Kr. na sirijsko-palestinskom području. Rimljani su u 1. st. poznavali tehnike izrade stakla, a u periodu od 2. - 4. st. dosegli su vrlo visoke standarde. Izrađivali su staklene predmete puhanjem u kalup i slobodnim puhanjem uz pomoć alata kojima su izrađivali raznolike ukrase.<sup>14</sup> Otkrićem puhanja



Staklarska radionica s prikazom različitih faza proizvodnje, 14. st.  
*Glass workshop and various stages of production, 14<sup>th</sup> century*  
 (prema / after: R. Liefkes, 1997, 37, fig. 38)

<sup>10</sup> S. Kumar 1980: 3-4.

<sup>11</sup> S. Kumar 1980: 4.

<sup>12</sup> Prvi predmeti izrađivali su se tehnikom jezgre. Jezgra je mogla biti od pijeska ili gline oko koje su se postavljali slojevi stakla, dok se ne bi dobila dovoljno debela stijenka. Posuda bi se hladila a jezgra uklanjala ostavljajući šuplji recipijent (S. Kumar 1980: 4). Velike posude su se radile tako da se staklena masa lijevala preko obrnuto okrenutog kalupa-posude, a poslije su po potrebi dodavani neki elementi kao što su ručke ili stopa. Također su se stakleni predmeti mogli dobivati rezanjem iz bloka izlivenog stakla, a sam postupak se nije puno razlikovao od tehnike rezanja kamena (R. Gajić-Lončar 1964: 10).

<sup>13</sup> I. Radić-Rossi 2012: 14-20.

<sup>14</sup> R. Liefkes 1997: 14-21.

was a rather complex craft that required a very good organization and distribution of work.<sup>9</sup>

It is not completely known how the production of glass started, but it probably happened 7,000 years ago, as testified by a story that was recorded by Pliny. His story says that some Phoenician merchants had anchored their ship on the bank of the river Belus in Syria. While making dinner, they propped a cooking pot on some blocks of natron (natural soda) in order to light a fire; the fire melted the natron and it reacted with the sand on the bank of the river. That was the first time that a human (unintentional) action created a substance known as glass.<sup>10</sup>

The first glass objects were probably made in Mesopotamia and Egypt about 2500 BC. Potters could have made this discovery while heating vessels. Initially, the glass was applied only in a thin layer on the surface of the ceramic vessels, and only later producers came up with the idea that the glass could be used for making an entire vessel.<sup>11</sup> The first vessels were produced around 1550 BC, when they started applying a technique of forming a casting around the core.<sup>12</sup> Initially, the molten glass was cast into ingots or smaller blocks in order to be transported, but during the Roman period it was common to pour glass into large molds that were broken after the transport.<sup>13</sup>

The production of glass was known also in China and India. Glass manufacturing was developing especially during the 8<sup>th</sup> century BC on the territory of Iraq, Syria, Lebanon, Israel. Then followed the production during the Hellenistic period, but in that period the glassblowing technique still had not

<sup>9</sup> V. Han (1981), p. 5.

<sup>10</sup> S. Kumar (1980) pp. 3-4.

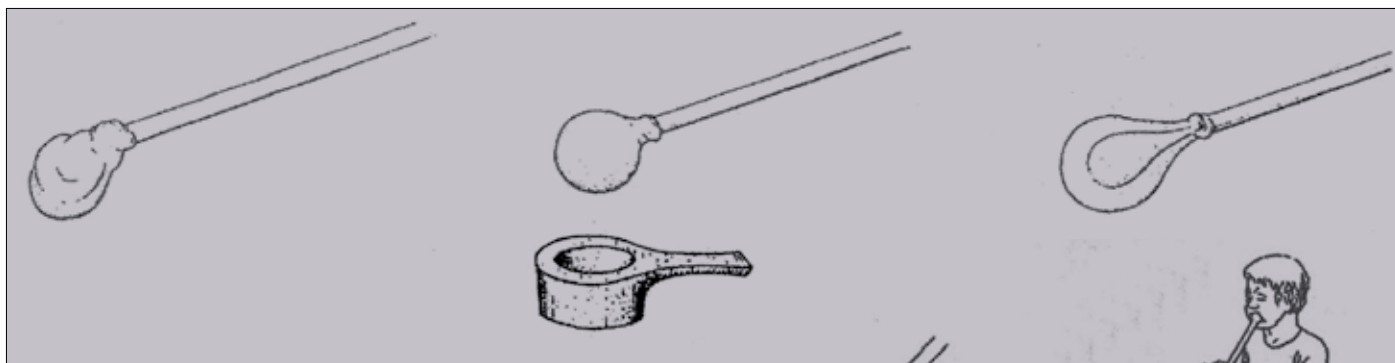
<sup>11</sup> S. Kumar (1980) p. 4.

<sup>12</sup> First items were produced with the core forming technique. The core was made either of sand or clay, around which glassmakers applied layers of glass until obtaining a body that was thick enough. They then let the vessel cool and removed the core so as to get an empty recipient (S. Kumar (1980), p. 4). Large vessels were made in a way that the glass was poured over a reversed mold-vessel, and later, if necessary, elements such as handles or a foot were added. The glassware could be produced by cutting a block of cast glass, and the process itself was not much different from the technique of cutting stone (R. Gajić-Lončar (1964), p. 10).

<sup>13</sup> I. Radić-Rossi (2012), pp. 14-20.



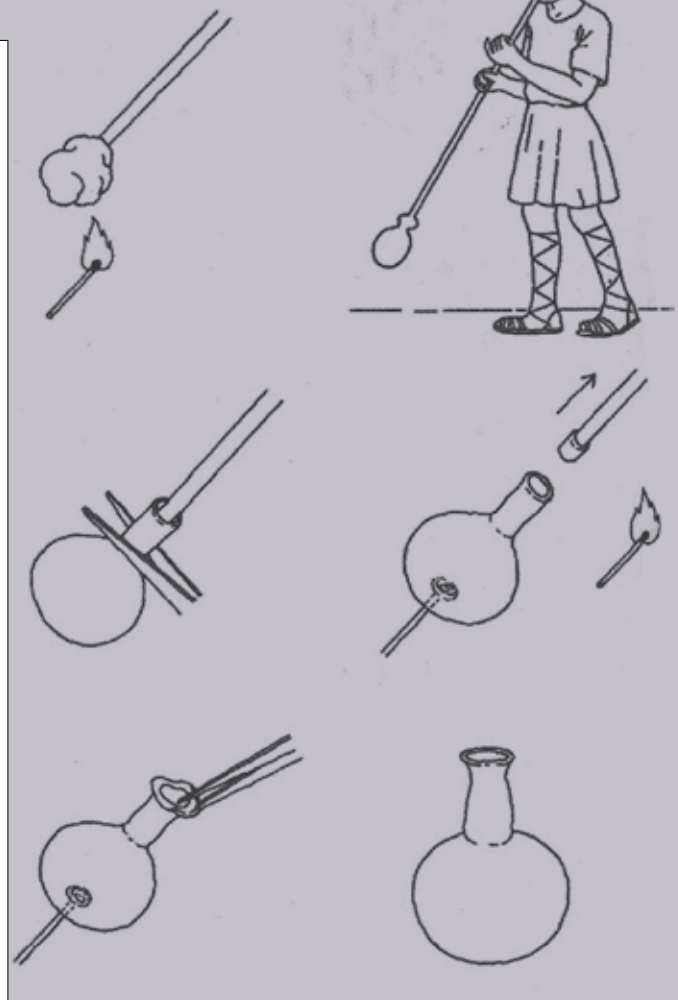
Staklarska radionica, 16. st.  
Glass workshop, 16<sup>th</sup> century  
(prema / after: G. Agricola, knjiga XII, str. 591)



stakla polako se napušta tehnika lijevanja, zadržava se oblikovanje u kalupu u kombinaciji s puhanjem. Tehnika puhanja stakla se izvodi tako da se najprije u vreloj staklenoj masi puhačkom lulom zahvati potrebna količina staklene smjese, zatim se puhanjem stvara stakleni mjehur koji teba postati dovoljno čvrst da bi se opet u vreloj staklenoj smjesi zahvatila potrebna količina. Puhanje se nastavlja do postizanja željene forme, a može se još dodatno oblikovati na mramornoj ploči, obraditi škarama, kliještima i drugim alatima.<sup>15</sup>

Važni staklarski centri u Rimskom Carstvu bili su Aleksandrija, Sidon i Rim iz kojih se staklarstvo proširilo u Porajnje i Galiju, a kasnije se opet seli u Bizant. Car Konstantin je u 4. st. utemeljio novu prijestolnicu Istočnog Rimskog Carstva kamo pristižu rimski staklari, a grad postaje jednim od vodećih staklarskih centara.<sup>16</sup> Budući da su Franci bili glavni baštini Rimskog carstva u bivšim sjeverozapadnim provincijama, staklarstvo je cvijetalo u Franačkoj a radionice stakla su postojale u Porajnju, Belgiji, sjevernoj Francuskoj. Do 9./10. st. stakleni predmeti su bili dobre kvalitete koja se ponovno javlja tek u vrijeme renesanse.<sup>17</sup> Damask u Siriji bio je važan staklarski centar gdje su se proizvodili bogato ukrašeni stakleni predmeti.<sup>18</sup>

Staklo srednjeg vijeka je do nedavno bilo slabo poznato za razliku od antičkoga koje se sačuvalo zahvaljujući običaju stavljanja priloga uz pokojnike. To je u srednjem vijeku često izostalo, osobito jačanjem kršćanstva, pa uglavnom nalazimo

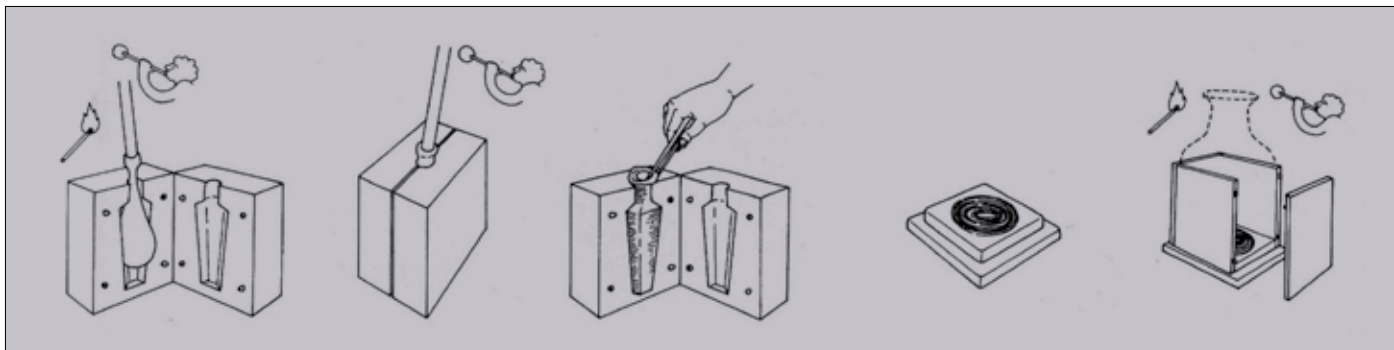


<sup>15</sup> R. Gajić-Lončar 1964: 10.

<sup>16</sup> S. Kumar 1980: 7-8.

<sup>17</sup> R. Liefkes: 1997: 22.

<sup>18</sup> S. Kumar 1980: 8-10



Puhanje u kalupu / *Mould-blowing* (prema / after: D. Ignatiadou, A. Antonaras 2011, 33)

been developed; it was invented in the mid-1st century BC in the Syria-Palestine area. In the 1st century the Romans were familiar with the techniques of manufacturing glass, and in the period from 2<sup>nd</sup> to 4<sup>th</sup> century they reached rather high standards. They made glass items using the method of mold-blowing and free-blowing with the help of tools that served for making a variety of ornaments.<sup>14</sup> The casting technique was gradually replaced by glassblowing, but what was retained was the mold design in combination with the blowing. The technique of glassblowing consists of dipping the blowpipe into the furnace which then comes out with a gob of molten glass on the end, then the glassblower blows through the pipe to create a glass bubble which needs to become strong enough in order to dip the glass attached to the blowpipe back in the batch and add another layer of glass. The blowing continues until the desired form is achieved, and the glass may be further rolled on a flat slab of marble, and treated with shears, tweezers and other tools.<sup>15</sup>

Important glassmaking centers in the Roman Empire were Alexandria, Sidon and Rome from which the art of glassmaking spread to the Rhineland and Gaul, and later moved back to Byzantium. In the 4<sup>th</sup> century the Roman Emperor Constantine founded a new capital of the Eastern Roman Empire which attracted Roman glassmakers, and the city became one of the leading glassmaking centers.<sup>16</sup> Since the Franks were the

ultimate heirs of the Roman Empire in the former north-western provinces, the glassmaking flourished in Francia and glass workshops existed in the Rhineland, Belgium, and northern France. Up until 9<sup>th</sup>-10<sup>th</sup> century the glassware was of good quality which was not achieved again until the Renaissance.<sup>17</sup> Damascus was a major center of Syrian glassmaking where richly decorated glassware was produced.<sup>18</sup>

Until recently, the glass of the Middle Ages was little-known, unlike the glass products from Antiquity that survived thanks to the custom of burying various objects with the deceased. That tradition was often neglected in the Middle Ages, especially with the strengthening of Christianity, so we find only fragments of glass which are not easy to reconstruct.<sup>19</sup> Glass from the Middle Ages is mostly a story of drinking vessels and those for carrying liquids, but during the 12<sup>th</sup> century there was a production of wider scope of glassware intended for medicine, science and religious rites. Glassmaking reached a high level in the late Middle Ages with the production of luxury vessels, mirrors and windows.<sup>20</sup> The most important people for preserving the knowledge about glass production were monks from the Benedictine monasteries, particularly those in Monte Cassino in Italy. They copied Roman manuscripts containing the description of the glassmaking skills. The Benedictine monks were highly devoted to glassmaking

<sup>14</sup> R. Liefkes (1997), pp. 14-21.

<sup>15</sup> R. Gajić-Lončar (1964), p. 10.

<sup>16</sup> S. Kumar (1980), pp. 7-8.

<sup>17</sup> R. Liefkes (1997), p. 22.

<sup>18</sup> S. Kumar (1980), pp. 8-10.

<sup>19</sup> R. Liefkes (1997), p. 36.

<sup>20</sup> I. Radić-Rossi (2012), pp. 35-36.

fragmente stakla koje nije jednostavno rekonstruirati.<sup>19</sup> U srednjem vijeku su se uglavnom radile posude namijenjene pijenju i prijenosu tekućina, no kroz 12. st. počinje se proizvoditi širi repertoar namijenjen medicini, znanosti i religioznim obredima. Staklarstvo doseže visok stupanj u kasnom srednjem vijeku, proizvodile su se luksuzne posude, ogledala i prozorska stakla.<sup>20</sup> Najvažniji za sačuvanje znanja o tehnici izrade stakla su bili redovnici u benediktinskim samostanima, osobito u Monte Cassinu u Italiji. Tamo su se prepisivali rimski rukopisi u kojima je bila opisana staklarska vještina. Povezanost benediktinaca s izradom stakla bila je izrazita od 9. do 12. st., a smanjivala se kroz 12. i 13. st.<sup>21</sup> Najstariji sačuvani srednjovjekovni prikaz staklarske peći datira u god. 1023. Nalazi se u rukopisu benediktinca Rabana Maura, a potječe iz benediktinskog samostana u Monte Cassinu.<sup>22</sup>

O izradi i sastavu staklenih predmeta koji su se proizvodili u antičko doba doznajemo preko nekoliko autora iz kasnijih razdoblja. Theophilus Presbyter u 12. st. piše djelo *Schedula diversarum artium* (Popis različitih umijeća) ili *De diversis artibus* (O različitim umijećima). U II. knjizi bavi se staklarstvom i daje upute o bavljenju tim zanatom.<sup>23</sup> Georgius Agricola sredinom 16. st. piše djelo *De re metallica* (O metalurgiji) te u XII. knjizi donosi podatke o pripremi sirovina, staklarskim pećima i o puhanju stakla.<sup>24</sup> Vannoccio Biringuccio u Pirotehniji u 16. st. također opisuje gradnju staklarskih peći i daje upute o pripravi sirovina za izradu stakla. Staklo naziva polumineralom objašnjavajući da je na jedan način sličan metalu a na drugi dragom kamenju. Navodi da su staklari radili imitacije smaragda, rubina, dijamanta i ostalog dragog kamenja tako vješto da ponekad i dobri poznavatelji dragog kamenja ne bi odmah uočili da se radi o staklenim imitacijama.<sup>25</sup>

Preko tih djela doznajemo na koji se način u antičko doba izrađivalo staklo te da se tehnologija nije puno promijenila kroz stoljeća. Osnovni sastojci su bili kvarcni pijesak ( $\text{SiO}_2$ , silicijev dioksid), vapnenac ( $\text{CaCO}_3$ , kalcijev karbonat) i soda ( $\text{Na}_2\text{CO}_3$ , natrijev karbonat) ili potaša ( $\text{K}_2\text{CO}_3$ , kalijev karbonat). Receptura je preuzeta kroz srednji vijek, a osnovni sastav zadržao se do danas.<sup>26</sup> Staklarstvo se još od otkrića vrlo malo promijenilo kao zanat a staklari koriste davno otkrivene tehnike još i danas. Temperature u staklarskim pećima iznose oko 1200 °C. Taj zanat zahtijeva velike vještine, majstori su često učili zanat u vrlo ranoj dobi, a u samom procesu proizvodnje staklenih predmeta obično su sudjelovali tri do četiri staklara pri čemu glavni majstor izrađuje najkritičnije korake tijekom procesa. Vješti timovi dnevno izrade oko stotinjak staklenih predmeta.<sup>27</sup> I danas se duga staklarska tradicija zadržala na Muranu gdje je moguće prisustvovati izradi staklenih predmeta.

## BOJE STAKLA

Da bi se postigle različite boje stakla dodavani su metalni oksidi. Kobaltni oksid služio je za dobivanje plave boje, bakreni oksid za postizanje crvene i zelene, manganov oksid za ljubičastu, a dodavanjem klorida zlata dobivala se rubinsko crvena boja. Venecijanski staklari su u 16. st. dodali određenu količinu sode čime su postigli da staklo bude prozirno i bezbojno. U drugoj polovici 16. st. engleski staklari dodavanjem olovnog oksida dobivaju kristal. Kroz 19. st. staklari su usavršili postizanje raznih nijansi (poput žućkastozelene, zelenkaste), a mješanjem uranija i antimona postignute su nove boje (topaz, jantar).<sup>28</sup> Ako se želi dobiti neprozirno staklo treba mu dodati kalcij, za izbjegavanje mjehurića u staklu dodaje se arsen, za postizanje morsko plave boje potrebni su olovo i kobalt.<sup>29</sup>

<sup>19</sup> R. Liefkes 1997: 36.

<sup>20</sup> I. Radić-Rossi 2012: 35-36.

<sup>21</sup> R. Liefkes 1997: 36.

<sup>22</sup> A. Gasparetto 1958: 23, bilj. 46.

<sup>23</sup> Theophilus, 2nd book, (engl. prijevod: J. G. Hawthorne - C. Stanely Smith, 1979: 45-74).

<sup>24</sup> G. Agricola, Book XII, (engl. prijevod: H. C. Hoover - L. H. Hoover, 1950: 584-592).

<sup>25</sup> V. Biringuccio, Book II, (engl. prijevod C. S. Smith - M. T. Gnudi, 1990: 126-133).

<sup>26</sup> R. Gajić-Lončar 1964: 9.

<sup>27</sup> R. Liefkes 1997: 8.

<sup>28</sup> R. Gajić-Lončar 1964: 9-10.

<sup>29</sup> D. Rostuhar 2008: 29.

from 9<sup>th</sup> to the 12<sup>th</sup> century, which gradually decreased in intensity during the 12<sup>th</sup> and 13<sup>th</sup> century.<sup>21</sup> The oldest preserved medieval representation of a glass furnace dates back to the year 1023. It can be found in a manuscript by a Benedictine monk Rabano Mauro, which originates from the Benedictine monastery of Monte Cassino.<sup>21</sup>

The manufacturing and composition of glassware that was produced in Antiquity was described by several authors from later periods. In the 12<sup>th</sup> century Theophilus Presbyter wrote a text known as *Schedula diversarum artium* (List of various arts) or *De diversis artibus* (On various arts). The second book deals with the production of glass and provides instructions on this craft.<sup>22</sup> In the mid-16<sup>th</sup> century Georgius Agricola wrote *De re metallica* (On the Nature of Metals), and the Book XII thereof provides information on the preparation of raw materials, glass furnaces and glass-blowing.<sup>23</sup> In the 16<sup>th</sup> century Vannoccio Biringuccio wrote *Pirotechnia* in which he described the construction of glass furnaces and provided instructions on the preparation of raw materials for producing glass. He called the glass a semimineral and explained that it is similar both to metals and precious stones. He also said that glassmakers made imitations of emeralds, rubies, diamonds and other precious stones that were so excellent that sometimes even the connoisseurs of precious stones would not be able to immediately notice that those were glass imitations.<sup>24</sup>

The above mentioned works help us get to know the way in which the glass was made in Antiquity only to realize that the technology has not changed much over the centuries. The basic ingredients were quartz sand (SiO<sub>2</sub>, silicon dioxide), limestone (CaCO<sub>3</sub>, calcium carbonate) and soda (Na<sub>2</sub>CO<sub>3</sub>, sodium carbonate) or potash (K<sub>2</sub>CO<sub>3</sub>, potassium carbonate). The recipe was used in the Middle Ages, and the basic composition has been maintained till today.<sup>25</sup> Since its beginnings, the glass-making has seen very little changes as a craft, and glassmakers

still use the techniques that were discovered a long ago. The temperatures in glass furnaces are around 1200 °C. This craft requires great skills; master craftsmen were often trained at a very early age, and in the very process of manufacturing glassware there were usually three to four glassmakers, the main master craftsman being in charge of the most critical steps in the process. Skilled teams can make about hundred pieces of glassware per day.<sup>26</sup> The long glassmaking tradition still exists on the island of Murano where you can watch the process of making glassware.

## COLORS OF GLASS

In order to obtain different colors of glass, the glassmakers started adding metal oxides. Cobalt oxide was used to obtain blue color, copper oxide would result in red and green, manganese oxide in purple, and by adding gold chloride you could get ruby red color. In the 16<sup>th</sup> century Venetian glassmakers started adding a certain amount of soda, which made the glass transparent and colorless. In the second half of the 16<sup>th</sup> century English glassmakers added lead oxide to produce crystal. Throughout the 19<sup>th</sup> century glassmakers had developed various shades (like yellowish-green, greenish) and by mixing uranium and antimony they obtained some new colors (topaz, amber).<sup>27</sup> In order to obtain opaque glass you need to add calcium; to avoid bubbles in the glass you need to add arsenic, and to obtain sea blue color you need to add lead and cobalt.<sup>28</sup>

## GLASSMAKING IN DUBROVNIK

Murano master craftsmen were leaving their country when their production was stopped due to the remodeling of workshops because that would leave them without their income, so they were forced to look for work elsewhere. Probably some of them came to Dubrovnik or to the Balkan region.<sup>29</sup> There were master craftsmen from Murano who came to Dubrovnik, but there were also Dubrovnik master craftsmen who went to Murano.<sup>30</sup> As it was recorded in the archives, the glassmaking was

<sup>21</sup> A. Gasparetto (1958), 23, note 46.

<sup>22</sup> Theophilus, 2<sup>nd</sup> book, (translated in English: J. G. Hawthorne - C. Stanely Smith, 1979, pp. 45-74).

<sup>23</sup> G. Agricola, Book XII, (translated in English: H. C. Hoover - L. H. Hoover, 1950, pp. 584-592).

<sup>24</sup> V. Biringuccio, Book II, (translated in English: C. S. Smith - M. T. Gnudi, 1990, pp. 126-133).

<sup>25</sup> R. Gajić-Lončar (1964), p. 9.

<sup>26</sup> R. Liefkes (1997), p. 8.

<sup>27</sup> R. Gajić-Lončar (1964), pp. 9-10.

<sup>28</sup> D. Rostuhar (2008), p. 29.

<sup>29</sup> V. Han (1981), p. 10.

<sup>30</sup> V. Han - L. Zecchin (1975).





## DUBROVAČKA PRODUKCIJA

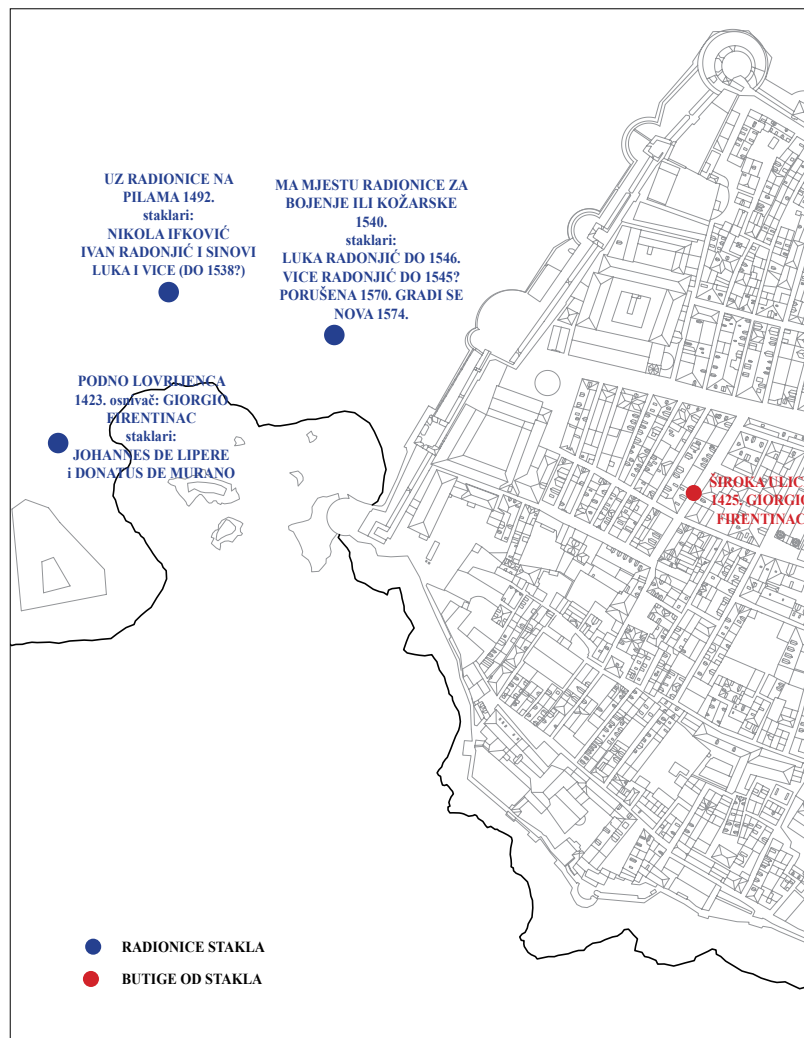
Muranski majstori odlazili su iz domovine kada se proizvodnja prekidala radi preuredbe radionica jer su ostajali bez prihoda, pa su bili primorani potražiti posao drugdje. Vjerojatno su neki od njih dospjeli u Dubrovnik ili na područje Balkana.<sup>30</sup> Bilo je majstora iz Murana koji su dolazili u Dubrovnik, ali i Dubrovčana koji su odlazili u Murano.<sup>31</sup> Arhivski zapisi bilježe staklarsku djelatnost na istočnom dijelu grada, ali i na zapadnom na Pilama, gdje je postojala industrijska zona. Tamo su se nalazile staklarske radionice s pećima i alatima. Vjerojatno su u toj zoni postojale i peći za taljenje olova jer je bilo uobičajeno da se staklo stavlja u olovne okvire. Kroz 15. i 16. st. u Dubrovniku je postojala proizvodnja stakla i staklorezački zanat. U arhivskim podacima nazivaju se *ars vitrii* zbog čega je ponekad teže ustanoviti na koji se od tih zanata misli.<sup>32</sup> Najstarija peć koja se spominje u dubrovačkom staklarstvu postojala je u prvoj četvrtini 14. st. Vezuje se uz muranske majstore pa je vjerojatno bila sagrađena po uzoru na muranske peći,<sup>33</sup> no nije poznata njezina lokacija. Tada su u Europi konstrukcije peći bile slične: imale su vatrište, iznad je bila etaža s posudama u kojima se talila staklena masa, a u gornjem dijelu prostor u kojem su se postepeno hladili stakleni proizvodi. Druga peć sagrađena je u sklopu Dominikanskog samostana 1419., dok se kasnije peći ne grade unutar zidina zbog opasnosti koja je prijetila gradu od vatre. Tako se spominje da je izgrađena peć podno Lovrijenca 1423. Kuća u kojoj se nalazila peć imala je površinu od 100 m<sup>2</sup>. U zadnjem desetljeću 15. st. Nikola Ifković-Alegretti imao je radionicu površine 120 m<sup>2</sup> u kojoj je moglo biti nekoliko staklarskih peći. Ifković je imao jednog pomoćnika, dva novaka i nekoliko peći pa se može zaključiti da je proizvodio veće količine stakla, a to potvrđuju i arhivski dokumenti koji bilježe da je svoje staklo izvezio u Apuliju, Kalabriju, na Siciliju i Aleksandriju. To je prvi spomen veće produkcije, a upućuje na bolju organizaciju staklarskog zanata. Pri osnivanju staklarskih radionica u Dubrovniku Vlada se uvijek spominje kao zainteresirana za proizvodnju stakla. Radili su domaći i strani staklari. Budući da je sama proizvodnja bila vrlo složena, zahtijevala je rad majstora skupa s pomoćnicima. Od 14. do 16. st. u Dubrovniku su se proizvodile posude, svjetiljke, prozori.

<sup>30</sup> V. Han 1981: 10

<sup>31</sup> V. Han - L. Zecchin 1975.

<sup>32</sup> D. Roller 1951: 137-138.

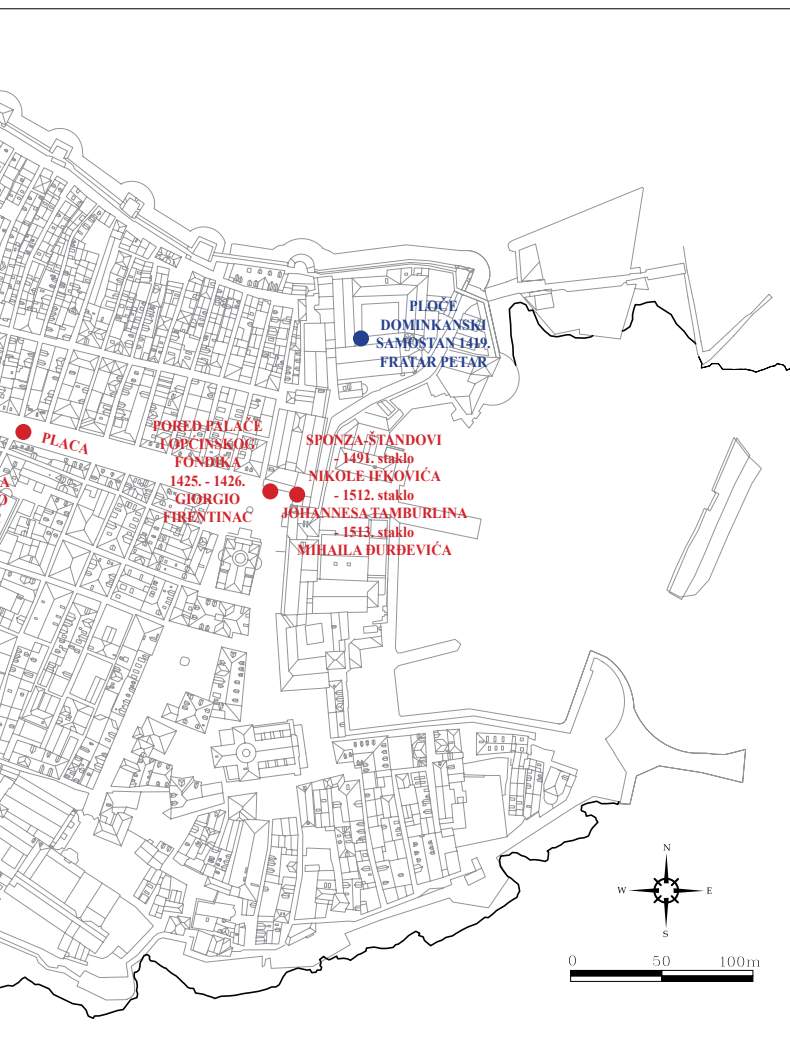
<sup>33</sup> V. Han 1975-1976: 88.



RADIONICE I BUTIGE OD STAKLA U DUBROVNIKU, 15.-16. ST. PREMA PODACIMA IZ DUBROVAČKOG ARHIVA

1979. – Verena Han, Arhivska građa o staklu i staklarstvu u Dubrovniku, (XIV-XVI v.), Posebna izdanja Balkanološkog instituta, knjiga 9, Srpska akademija nauka i umetnosti, Beograd. (izvorni naslov: Архивска грађа о стаклу и стакластву у Дубровнику, (XIV-XVI в.))

1981. – Verena Han, Tri veka dubrovačkog staklarstva (XIV.-XVI vek), Posebna izdanja Balkanološkog instituta, knjiga 11, Srpska akademija nauka i umetnosti, Beograd. (izvorni naslov: Три века дубровачког стакларства (XIV.-XVI век.))

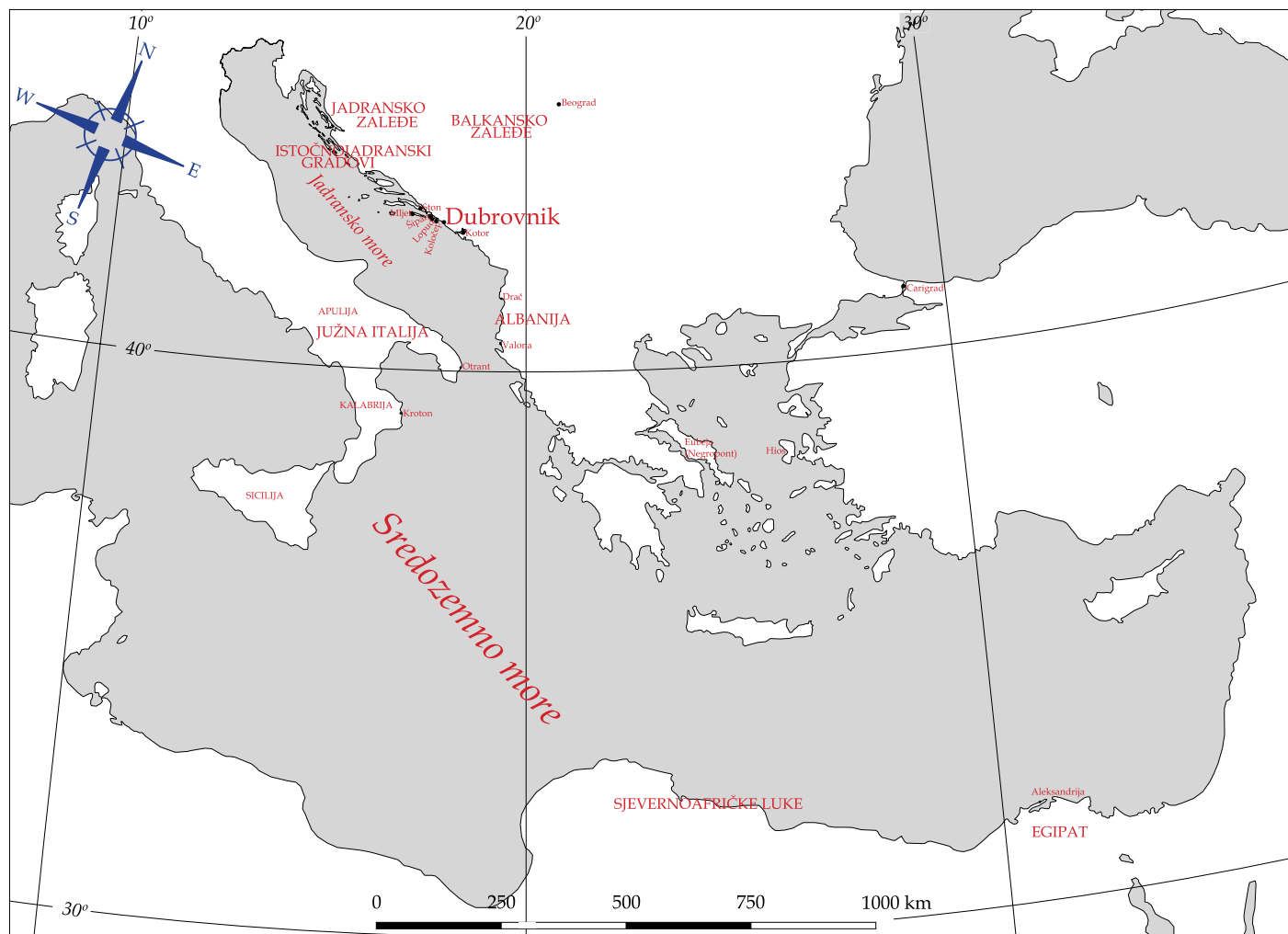


WORKSHOPS AND GLASS BOUTIQUES OF DUBROVNIK IN THE  
15<sup>th</sup> AND 16<sup>th</sup> CENTURIES ACCORDING TO DATA FROM  
DUBROVNIK ARCHIVE

present in the eastern part of the city, but also in the western part at the Pile Gate, which was an industrial zone. There were glass workshops with furnaces and tools situated in that zone. It is very likely that there were also lead melting furnaces in that zone since it was common to put the glass in lead frames. In the 15<sup>th</sup> and 16<sup>th</sup> century Dubrovnik there was a production of glass and glass cutting. Those crafts were recorded as *ars vitrii* making it sometimes difficult to determine to which one the record refers to.<sup>31</sup> The oldest furnace which was mentioned within the frame of Dubrovnik glassmaking era dates from the first quarter of the 14<sup>th</sup> century. It was associated with the Murano master craftsmen so it was probably built based on the model of a Murano furnace<sup>32</sup>, but we do not know its location. Back then the furnaces across the Europe were constructed in a similar way: they had a firebox, above that there was a floor with the pots in which the glass was melted, and in the upper part there was a space in which the glassware was gradually cooled. The second furnace was built as a part of the Dominican monastery in 1419, while after that the furnaces were built only outside the city walls because they represented a potential threat of fire. Thus, it is mentioned that the next furnace was built in 1423 at the foot of Fort Lovrijenac. The house where the furnace was situated had a surface area of 100 m<sup>2</sup>. In the last decade of the 15<sup>th</sup> century Nikola Ifković-Alegretti had a workshop on a surface area of 120 m<sup>2</sup> which could accommodate several glass furnaces. Ifković had one assistant, two novices and several furnaces, so it can be concluded that he had been producing significant quantities of glass, which was confirmed by archival documents recording that his glassware was exported to Apulia, Calabria, Sicily and Alexandria. This is the first mention of a greater production which points to the better organization of the glassmaking craft. When the glass workshops were founded in Dubrovnik, the government was always mentioned as being interested in the production of glass. There were local and foreign glassmakers. Since the production itself was very complicated, it required the master craftsman working together with assistants. Vessels, lamps and windows were produced in the Dubrovnik area from the 14<sup>th</sup> to the 16<sup>th</sup> century. The types of glass produced were: tableware, alchemist, pharmacist, medical and window glass. Concerning the quality,

<sup>31</sup> D. Roller (1951), pp. 137-138.

<sup>32</sup> V. Han (1975-1976), p. 88.



EKSPORT DUBROVAČKOG STAKLA PO JADRANSKOJ OBALI,  
BALKANSKOM ZALEĐU I MEDITERANU, 15.-16. ST. PREMA  
PODACIMA IZ DUBROVAČKOG ARHIVA

EXPORT OF DUBROVNIK GLASS ACROSS THE ADRIATIC COAST,  
BALKAN HINTERLAND AND THE MEDITERRANEAN IN THE  
15<sup>th</sup> AND 16<sup>th</sup> CENTURIES ACCORDING TO DATA FROM  
DUBROVNIK ARCHIVE

1979. – Verena Han, Arhivska građa o staklu i staklarstvu u Dubrovniku, (XIV-XVI v.), Posebna izdanja Balkanološkog instituta, knjiga 9, Srpska akademija nauka i umetnosti, Beograd. (izvorni naslov: Архивска грађа о стаклу и стакластву у Дубровнику, (XIV-XVI в.))

1981. – Verena Han, Tri veka dubrovačkog staklarstva (XIV.-XVI vek), Posebna izdanja Balkanološkog instituta, knjiga 11, Srpska akademija nauka i umetnosti, Beograd. (izvorni naslov: Три века дубровачког стакларства (XIV.-XVI век.)

Dubrovnik glass was of so called plain and crystalline quality. In the archival records we can find about 30 names for different items. The glasswork in Dubrovnik was being mentioned in the period from the 14<sup>th</sup> to the 16<sup>th</sup> century. During the first two centuries there were 27 glassmakers in Dubrovnik, seven of which were from Murano and Venice, one master craftsman was of unknown origin, while the rest were local craftsmen. Glassmakers in Dubrovnik archival records were called: *fiolar-ius*, *magister vitri*, *magister a vitris*, *maestro dello vetro*, *magister congie vetri*, *magister fenestrarum de vitro*. There was an interesting mention of a master craftsman who produced glass in the mass (*magister congie vitri*) and was also known in Murano. That job could have been done by an honorable craftsman who was an expert in determining the ratios of raw materials because that affected the quality of the glass.<sup>33</sup>

The glassware was sold in glassmakers' houses and in stores around the City (huts and stands near the Divona-Sponza Palace). The need for glass grew as the city developed through the 14<sup>th</sup> and 15<sup>th</sup> century, which caused also an increasing demand for glassware and led to the habit of using them. Dubrovnik glass was referred to as *laboreria*, *laboreria de vitro* or some other name. Window glass was called *oculus*, it was colorless or colored, and it was used for religious, secular and private buildings. The vessels were called *patrine*. The most commonly mentioned were bottles and drinking glasses. Bottles were called *fijale*, while the drinking glasses were known as *ciatos* and *christalinis*. Dubrovnik glass was mainly inspired by the Murano glass.<sup>34</sup> In addition to Murano and Dubrovnik master craftsmen, glassware was also made by other Italian glassmakers in Dubrovnik.

In 1418 Small Council made a decision that a small house should be built next to the Dominican monastery in the City in which a friar (*frater magister fenestrarum de vetrio*) would produce window glass. There is a mention of the construction of a glass furnace next to the Dominican monastery in 1419. Documents testify that the friar Petar worked as a glassmaker probably from 1418 or 1422 to 1444.<sup>35</sup> Other glassmakers' names that were mentioned were Petar Božiković-Natalis and

Nikola, son of the glassmaker friar Petar.<sup>36</sup> In addition to producing glass, Petar Božiković-Natalis also did glass painting.<sup>37</sup>

In 1423 the Great Council concluded an agreement with a businessman Giorgio from Florence in which they agreed that he would bring glassmakers who will work in Dubrovnik for five years. Since then, production of glass was no longer associated with the Dominican Monastery and the Ploče Gate, now it was located in the western part of the city – the Pile Gate, where other crafts were located as well. Glass production at the Pile Gate began in 1424. Giorgio from Florence brought two glassmakers, Donatus from Murano and Johannes de Lipera who probably originated from southern Italy. Giorgio also had his store in the city where he was selling the produced glassware. The contract with Giorgio from Florence was terminated in 1425 after more than a year of work.<sup>38</sup> In his store he was probably selling "covered" bottles (*patrine coperte*), with woven straw coverings which were made in his workshop at the Pile Gate.<sup>39</sup>

The glass products of the Dubrovnik Republic in the first half of the 15<sup>th</sup> century were not precisely cited in the Dubrovnik archives, but the glassware which was used at that time probably came mostly from local workshops and included glass vessels for daily use and lamps: *bichieri*, *moioli*, *coppe*, *patene*, *piatene*, *gastare*, *zuche*, *bochali*, *salieri*, *lampe de vitro*.<sup>40</sup> These findings are mostly archaeologically documented on the sites in the City and its surrounding area, and now we have a clearer image of their typological and stylistic features.<sup>41</sup>

Archival documents testify that in 1492 a municipal workshop for the manufacture of glass was founded at the Pile Gate and Nikola Ifković worked there; and that from 1494 this glassware was exported to Italy.<sup>42</sup> Dubrovnik has the best preserved archival documents in the Balkans.<sup>43</sup> They contain evidence that the City traded its products and that it had an

<sup>33</sup> V. Han (1977a), pp. 129-130.

<sup>34</sup> V. Han (1977a), p. 132.

<sup>35</sup> V. Han (1970), pp. 108-109; V. Han (1971a), pp. 42-43.

<sup>36</sup> D. Roller (1951), pp. 137-138; V. Han (1971a), p. 45.

<sup>37</sup> V. Han (1971a), pp. 48, 55, 60.

<sup>38</sup> V. Han (1975), p. 125; V. Han (1971b), pp. 216-221.

<sup>39</sup> V. Han (1970), pp. 109-113; V. Han (1971a), pp. 43-46.

<sup>40</sup> V. Han (1980-1981), pp. 47-48.

<sup>41</sup> N. Topić (2015).

<sup>42</sup> V. Han (1974a), p. 164; V. Han (1979b), p. 142.

<sup>43</sup> V. Han (1975-1976), p. 85.

Izrađivalo se stolno, alkemijsko, apotekarsko, medicinsko, prozorsko staklo. Dubrovačko staklo je po kvaliteti bilo tzv. obično i kristalinsko. U arhivskim dokumentima spominje se oko 30-ak naziva za različite predmete. U Dubrovniku se staklarstvo spominje u razdoblju od 14. do 16. st. Tijekom prva dva stoljeća u Dubrovniku je radilo 27 staklara od kojih su sedmorica bila iz Murana ili Venecije, jedan majstor je bio nepoznatog porijekla, dok su ostali bili domaći zanatlije. Staklari se u dubrovačkim arhivskim dokumentima nazivaju: *fiolarius*, *magister vitri*, *magister a vitris*, *maestro dello vetro*, *magister conchie vetri*, *magister fenestrarum de vitro*. Zanimljiv je spomen majstora koji je priređivao staklenu masu (*magister conchie vitri*), također poznat u Muranu. Taj posao mogao je raditi uvaženi majstor koji je bio izvrstan poznavalac omjera sirovina jer je o tome ovisila kvaliteta stakla.<sup>34</sup>

Staklo se prodavalo u kućama staklara i u dućanima po Gradu (barake i štandovi kod Divone-Sponze. Potreba za staklom je rasla kako se grad razvijao kroz 14. i 15. st., što je uzrokovalo i veću potražnju za staklenim predmetima i dovelo do navike njihovog korištenja. Dubrovačko staklo navodi se kao *laboreria*, *laboreria de vitro* ili pod drugim imenom. Prozorsko staklo nalazimo pod terminom *oculus*, bilo je bezbojno ili obojeno, a služilo je za sakralne, profane i privatne građevine. Posude su se nazivale *patrine*. Uglavnom se spominju boce i čaše za piće. Boce se nazivaju *fijalama*, dok su čaše za piće poznate kao *ciatos* i *christolinis*. Dobrovačko staklo je uglavnom izrađivano po uzoru na muransko.<sup>35</sup> Osim muranskih i dubrovačkih majstora, staklo su izrađivali i drugi talijanski staklari u Dubrovniku.

1418. Malo vijeće donosi odluku da se kod Dominikanskog samostana u Gradu sagradi kućica u kojoj bi jedan fratar (*frater magister fenestrarum de vetrio*) izrađivao prozorsko staklo. 1419. spominje se izgradnja staklarske peći uz Dominikanski samostan. Podaci prenose da je fratar Petar radio kao staklar vjerojatno od 1418. ili 1422. do 1444.<sup>36</sup> Među staklarima spominju se i Petar Božiković-Natalis te Nikola, sin staklara fratra Petra.<sup>37</sup> Petar Božiković-Natalis se osim izradom stakla bavio i slikanjem na staklu.<sup>38</sup>

Veliko vijeće 1423. sklapa ugovor s poslovnim čovjekom Giorgiom iz Firenze, te dogovaraju da on dovede staklare koji će u Dubrovniku raditi pet godina. Od tada izrada stakla nije vezana za Dominikanski samostan i Ploče nego za zapadni dio grada - Pile, gdje su bili smješteni i drugi obrti. Proizvodnja stakla na Pilama počinje 1424. Giorgio iz Firenze dovodi dva staklara, Donatusa iz Murana i Johannes de Lipere koji je vjerojatno bio iz južne Italije. Giorgio je imao i svoj dućan u gradu gdje je prodavao proizvedenu staklenu robu. Ugovor s Giorgiom Firentincem raskinut je 1425. nakon nešto više od godinu dana rada.<sup>39</sup> U njegovom su dućanu vjerojatno prodavane „pokrivene“ boce (*patrine coperte*), opletene slamom, koje su izrađivane u njegovoj radionici na Pilama.<sup>40</sup>

Stakleni produkti Dubrovačke Republike iz prve polovice 15. st. nisu precizno navedeni u dubrovačkom arhivu, no staklo koje se u to vrijeme upotrebljavalo u gradu vjerojatno velikim dijelom potječe iz lokalnih radionica a uključuje staklene posude svakodnevnog upotrebe i svjetiljke: *bichieri*, *moioli*, *coppe*, *patene*, *piatene*, *gastare*, *zuche*, *bochali*, *salieri*, *lampe de vitro*.<sup>41</sup> Ti nalazi su većinom arheološki dokumentirani na lokalitetima u Gradu i okolici, a sada imamo jasniju sliku o tipološko-stilskim karakteristikama.<sup>42</sup>

Arhivski dokumenti svjedoče da je 1492. osnovana općinska radionica za izradu stakla na Pilama u kojoj je radio Nikola Ifković, a da se od 1494. to staklo izvozilo u Italiju.<sup>43</sup> Dubrovnik ima najbolje sačuvane arhivske podatke na Balkanu.<sup>44</sup> Preko njih doznajemo da je Grad trgovao svojim proizvodima i da je imao značajnu posredničku ulogu u trgovini staklom. Izvezio je svoje proizvode u balkansko zaleđe (Bosna i Hercegovina, Srbija), Otomansko carstvo, Aleksandriju,<sup>45</sup> Albaniju,<sup>46</sup> južnu Italiju i Siciliju,<sup>47</sup> Eubeju i Hios.<sup>48</sup>

<sup>34</sup> V. Han 1977a: 129-130.

<sup>35</sup> V. Han 1977a: 132.

<sup>36</sup> V. Han 1970: 108-109; V. Han 1971a: 42-43.

<sup>37</sup> D. Roller 1951: 137-138; V. Han 1971a: 45.

<sup>38</sup> V. Han 1971a: 48, 55, 60.

<sup>39</sup> V. Han 1970: 109-113; V. Han 1971a: 43-46.

<sup>40</sup> V. Han 1980-1981: 47-48.

<sup>41</sup> V. Han 1975: 125; V. Han 1971b: 216-221.

<sup>42</sup> N. Topić 2015.

<sup>43</sup> V. Han 1974a: 164; V. Han 1979b: 142.

<sup>44</sup> V. Han 1975-1976: 85.

<sup>45</sup> V. Han 1973; V. Han 1974b: 216, 220.

<sup>46</sup> V. Han 1976.

<sup>47</sup> V. Han 1979b.

<sup>48</sup> V. Han 1979a: 138 (dokument 272), 239 (dokument 475).

important intermediary role in the glass trade. The City exported its products to the Balkan hinterland (Bosnia and Herzegovina, Serbia), the Ottoman Empire, Alexandria<sup>44</sup>, Albania<sup>45</sup>, southern Italy and Sicily<sup>46</sup>, Euboea and Chios.<sup>47</sup>

In 1511 the glassmaker Giovanni Johannes de Murano (*Johannes Tambarlinus*) asked to be granted a house at the Pile Gate which would serve as a glass workshop for producing different glassware items. The request was approved, and it was the same house in which Nikola Ifković previously worked. Tambarlin had already been mentioned in Dubrovnik in 1494, but we do not know whether he worked as a glassmaker at that time. In 1512 he started expanding his business and teamed up with a couple people from Dubrovnik, and in 1513 he had already had a store in the City next to the Sponza Palace where he was selling his products. Mihajlo Đorđev (*Michael Giorgii*, a cooper) also had a hut next to Tambarlin's where he was selling glassware. Tambarlin's business was not doing so well because he undertook the debt of the previous glassmaker from this workshop. In order to improve his situation, he teamed up with Ivan Radonjić (*Johan Radognich*) from Konavle. Tambarlin undertook to produce both plain glass and crystal glass (*vetro cristallino*). He agreed to produce glass items inspired by the Venetian glassware. He produced ingastare (*angistara*, *inghiestara*) type bottles intended for household use. The bottles ranged from simple to decorated (*inzoiate*), made from plain and crystal glass, varying in sizes and prices. Four simple bottles cost one groat (silver coins) and one made of crystal glass cost 15 follari (copper coins). A dozen glasses called *gotti* (probably ordinary glasses without decoration) cost one groat. More expensive were the stemmed glasses. He was also selling glasses of *gotti gropolosi* type (with applications in the form of drops and nodules). Glasses named *gotti cristallini* were twice as expensive as ordinary glasses. He used crystal glass in making cups – *coppe*, glasses – *tazze*, bottles – ingastare type, small pitchers, salt shakers, and the prices of that glassware were higher, often by double. On Tambarlin's price list one could find bottles that were called *zuche*, shaped like squashes and which were intended for export to the Balkan countries under

Turkish rule. He had been producing *zuche doppie* ("double squashes") with volumes slightly less than four liters, and which probably had two round bulges. They came in larger and smaller sizes, and some were with woven straw coverings.<sup>48</sup> In the 16<sup>th</sup> century there is a mention of somewhat different bottles called *carabelle*, *barabelle*, *carafe mezane*.<sup>49</sup> Tambarlin also produced items of crystal glass for medical use (urinals). Doctors used them when making a diagnosis and they were in use until the 18<sup>th</sup> century. This item was mentioned in the price list, which means that it was wanted in the 16<sup>th</sup> century Dubrovnik. It is possible that these double urinals (*orinali doppie*) were used as part of the distillation apparatus. Such an apparatus is shown in Asclepius' capital of the Rector's Palace in Dubrovnik. The capitals are dating from the second quarter of the 15<sup>th</sup> century, which means that the City was already familiar with such vessels.<sup>50</sup>

## GLASSES

During the late Middle Ages the production of glasses referred to in the archival documents as *moioli* was very frequent. These were undecorated glasses shaped by using free blowing techniques. It is assumed that simpler glasses were produced in the workshops of Dubrovnik, while the more luxurious samples were imported, primarily from Venice, but also from other workshops.<sup>51</sup> However, the workshops of Dubrovnik, whose production was initially supervised by the Murano master craftsmen, in all probability, produced certain complex objects, in addition to the simple ones. In Venice, the term *moioli* designates glasses of simple, cylindrical or conical shape, without the stem and foot. These vessels are mentioned in the archive documents as glassware present in the houses of Dubrovnik.<sup>52</sup> Depictions of the above simple vessels are found in Italian frescoes, which testify to their frequent daily use, primarily due to their simplicity.

Luxurious medieval vessels included herein are glasses painted with enamel from Venetian workshops. Fragments of such decorated glass were found in the Sokol Fortress of

<sup>44</sup> V. Han (1973; V. Han (1974b), pp. 216, 220.

<sup>45</sup> V. Han (1976).

<sup>46</sup> V. Han (1979b).

<sup>47</sup> V. Han (1979a), pp. 138 (document 272), 239 (document 475).

<sup>48</sup> V. Han (1971b), pp. 213-221.

<sup>49</sup> V. Han (1974b), p. 231.

<sup>50</sup> V. Han (1971b), pp. 219-220.

<sup>51</sup> V. Han (1969), pp. 13-14.

<sup>52</sup> V. Han (1971a), p. 58.





1511. staklar Giovanni Johannes de Murano (*Johannes Tambarlinus*) tražio je da mu se dodijeli kuća na Pilama, koja bi služila kao staklarska radionica za izradu različitih predmeta. To mu je odobreno, a u istoj kući ranije je radio Nikola Ifković. Tambarlin se spominje u Dubrovniku već 1494., no ne znamo je li tada radio kao staklar. 1512. širi svoje poslove te se udružuje s nekoliko Dubrovčana, a 1513. već ima i dućan u Gradu kod Sponze gdje je prodavao svoje proizvode. Također je Mihajlo Đorđev (*Michael Giorgii*, bačvar) imao baraku odmah do Tambarlinove gdje je prodavao staklene predmete. Tambarlinu poslovi nisu išli najbolje jer je na sebe preuzeo dug od prethodnog staklara iz te radionice. Da bi si olakšao situaciju udružuje se sa staklarom Ivanom Radonjićem (*Johan Radognich*) iz Konavala. Tambarlin se obavezao da će proizvoditi obično i kristalo staklo (*vetro cristallino*). Pristao je na izradu staklenih predmeta po uzoru na venecijanske. Proizvodio je ingastare (*angistara*, *inghiestara*) – boce namijenjene kućnoj upotrebi. Bilo je jednostavnih i ukrašenih (*inzoiate*), od običnog i kristalo stakla, različitih veličina i cijena. Četiri jednostavne boce koštale su jedan groš, a jedna od kristalo stakla 15 folara. Tucet čaša koje se nazivaju *gotti* (vjerojatno obične čaše bez ukrasa) koštao je jedan groš. Skuplje su bile čaše na nozi. Prodavao je i čaše tipa *gotti gropolosi* (s aplikacijama u vidu kaplji i čvorića). Čaše pod nazivom *gotti cristallini* bile su dvaput skuplje od običnih čaša. Od kristalo stakla izrađivao je kupce - *coppe*, čaše - *tazze*, boce – *ingastare*, bokaliće, soljenke, a cijene tog stakla bile su više, često i duplo. U Tambarlinovom cjeniku pojavljuju se boce koje su nazivane *zuche*, imale su oblik tikve i bile su rađene za izvoz u balkanske zemlje pod turskom vlašću. Proizvodio je *zuche doppie* „dvostruke tikve“ čija je zapremnina bila nešto manja od četiri litre, a vjerojatno su imale dva trbušasta ispupčenja. Bilo je većih i manjih takvih boca, a neke su bile opletene slamom.<sup>49</sup> U 16. st. spominje se i izrada nešto drugačijih boca pod nazivom *carabelle*, *barabelle*, *carafe mezane*.<sup>50</sup> Tambarlin je proizvodio i predmete od kristalo stakla za medicinsku upotrebu (urinale). Liječnici su ih upotrebljavali pri postavljanja dijagnoze, a bili su u upotrebi do 18. st. Taj predmet je naveden u cjeniku što znači da je bio tražen u 16. st. u Dubrovniku. Moguće je da su ovi dupli urinali (*orinali doppi*) korišteni kao dio destilacijskog aparata (retorta). Takav aparat prikazan je na

Asklepijevom kapitelu Kneževa dvora u Dubrovniku. Kapiteli su iz druge četvrtine 15. st. što znači da su u Gradu već tada poznate takve posude.<sup>51</sup>

## ČAŠE

U kasnom srednjem vijeku učestala je proizvodnja čaša koje se u arhivskim izvorima nazivaju *moioli*. To su neukrašene čaše izrađene tehnikom slobodnog puhanja. Postoje pretpostavke da se jednostavno staklo izrađivalo u dubrovačkim radionicama, a da se ono luksuznije vjerojatno uvozilo, ponajprije iz Venecije ali i iz drugih radionica.<sup>52</sup> No, vjerojatno su dubrovačke radionice, koje su svoj rad počele pod nadzorom muranskih majstora, osim tih jednostavnih proizvodile i složenije predmete. U Veneciji naziv *moioli* označava čaše jednostavnog oblika, cilindričnog ili koničnog, bez stope. Te posude spominju se u arhivskim dokumentima kao staklena roba prisutna u dubrovačkim kućama.<sup>53</sup> Prikazi tih jednostavnih posuda poznati su na talijanskim freskama a svjedoče o učestaloj svakodnevnoj upotrebi na što je utjecala i njihova jednostavnost.

Luksuznije srednjovjekovne posude koje obuhvaća ovaj rad su čaše slikane emajlom iz venecijanskih radionica. Ulomci tako ukrašenog stakla pronađeni su na utvrdi Sokol u Konavlima. Ukrašeni su crvenom, bijelom, plavom, žutom (koja je sada gotovo nevidljiva) bojom i pripadaju tipu čaša *Aldrevandin* a datiraju se u kraj 13. i prvu polovicu 14. st.<sup>54</sup> Pronađeni su unutar gustijerne na utvrdi. Ulomci imaju sačuvane tragove slikanja s obje strane, no emajl je u vrlo lošem stanju te je izuzetno teško sa sigurnošću opisati motive. No, može se pretpostaviti da se radi o biljnim i geometrijskim ornamentima. To su prvi takvi nalazi u Hrvatskoj, no već ranije su ulomci emajli-ranog stakla nađeni u Bosni i Hercegovini.<sup>55</sup>

Ukras apliciranih staklenih niti ima dugu tradiciju. Bio je poznat u Rimskom carstvu, osobito u aleksandrijskim, sirijskim, talijanskim radionicama.<sup>56</sup> Aplikacije niti (*cum filo*,

<sup>49</sup> V. Han 1971b: 213-221.

<sup>50</sup> V. Han 1974b: 231.

<sup>51</sup> V. Han 1971b: 219-220.

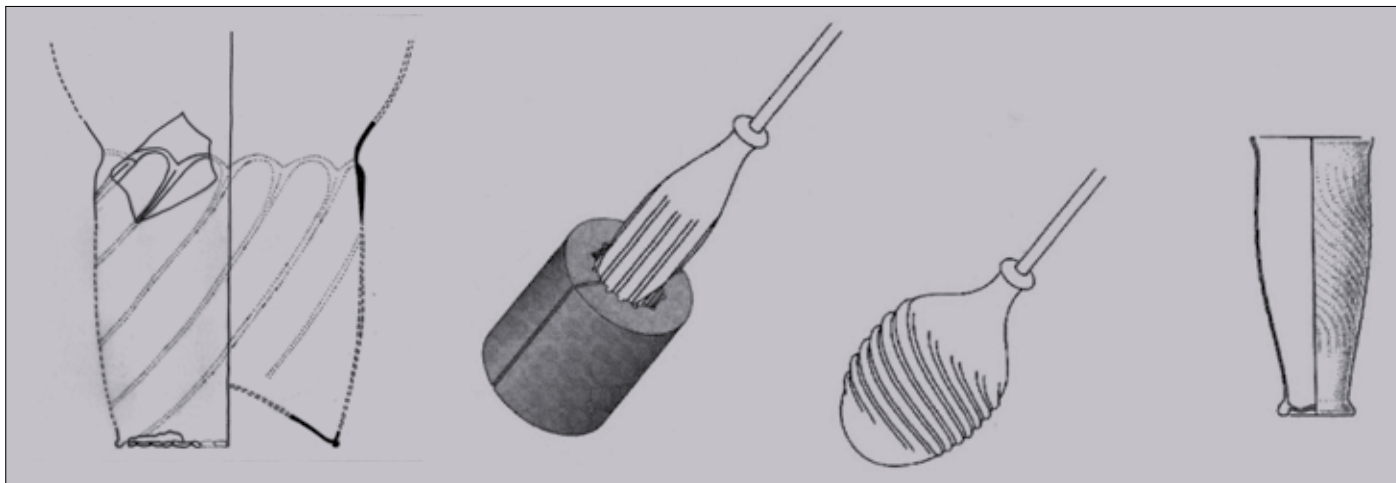
<sup>52</sup> V. Han 1969: 13-14.

<sup>53</sup> V. Han 1971a: 58.

<sup>54</sup> N. Topić 2015: 120-126, kat. 014-023.

<sup>55</sup> P. Anđelić 2004: 150, 227; V. Han 1977b.

<sup>56</sup> R. Gajić-Lončar 1964: 18; V. Han 1969: 24.



Grafička rekonstrukcija čaše / *Graphic reconstruction of a glass*: N. Topić

Optičko puhanje / *Optic blowing*  
(prema / *after*: D. Ignatiadou, A. Antonaras 2011, 34)

Konavle. They are decorated with red, white, blue and yellow (which is now almost invisible) and belong to the type of glass called *Aldrevandin*, dating from the end of 13<sup>th</sup> and the first half of the 14<sup>th</sup> century.<sup>53</sup> They were found inside the tower's water tank. The fragments show traces of painting on both sides, but the enamel is in very poor condition, making it extremely difficult to describe the depicted motives with any certainty. However, it can be assumed that they included floral and geometric patterns. These are the first findings of that sort in Croatia, but fragments of enameled glass had already been found in Bosnia and Herzegovina.<sup>54</sup>

Glass thread decorations have a long tradition. They were known in the Roman Empire, especially in the Alexandrian, Syrian and Italian workshops.<sup>55</sup> Glass thread applications (*cum filo*, *da filo*) were first made in Murano in 1288<sup>56</sup> and were common in the Italian glassmaking between the 13<sup>th</sup> and 15<sup>th</sup> centuries.<sup>57</sup> In the second half of the 15<sup>th</sup> and throughout the 16<sup>th</sup> century, Murano master craftsmen largely applied glass threads on their products.<sup>58</sup> Although the threads on these

glasses were mostly dark blue, there were also clear, brown and gray threads, which are very rare and are dated to the end of the 14<sup>th</sup> and the beginning of the 15<sup>th</sup> century. There are numerous examples of vessels with applied glass threads in Western Europe and some on the eastern Adriatic coast and in the hinterlands.<sup>59</sup>

Decorative ribs on glass vessels were known throughout the Roman Empire. Vertical ribs in ancient times were modeled after metal utensils.<sup>60</sup> Ribbed glasses (*bichieri incostati*) have been largely made since the beginning of the 14<sup>th</sup> century.<sup>61</sup> The collection of findings presented herein is characteristic of the Adriatic and Balkan hinterlands, while very few glasses with such combination of shape and ornaments were found in the coastal cities. Threads were typically applied on the upper part of the glass, which was wider, while the lower part was either unadorned or ribbed. The bowl of such glasses was generally cylindrical in form, while some examples were conical, also with a broad rim and the bottom part decorated with applied ribbon.<sup>62</sup>

<sup>53</sup> N. Topić (2015), pp. 120-126, cat. 014-023.

<sup>54</sup> P. Anđelić (2004), pp. 150, 227; V. Han (1977b).

<sup>55</sup> R. Gajić-Lončar (1964), p. 18; V. Han (1969), p. 24.

<sup>56</sup> V. Han (1981a), 36, note 193.

<sup>57</sup> D. Whitehouse (1983), p. 116.

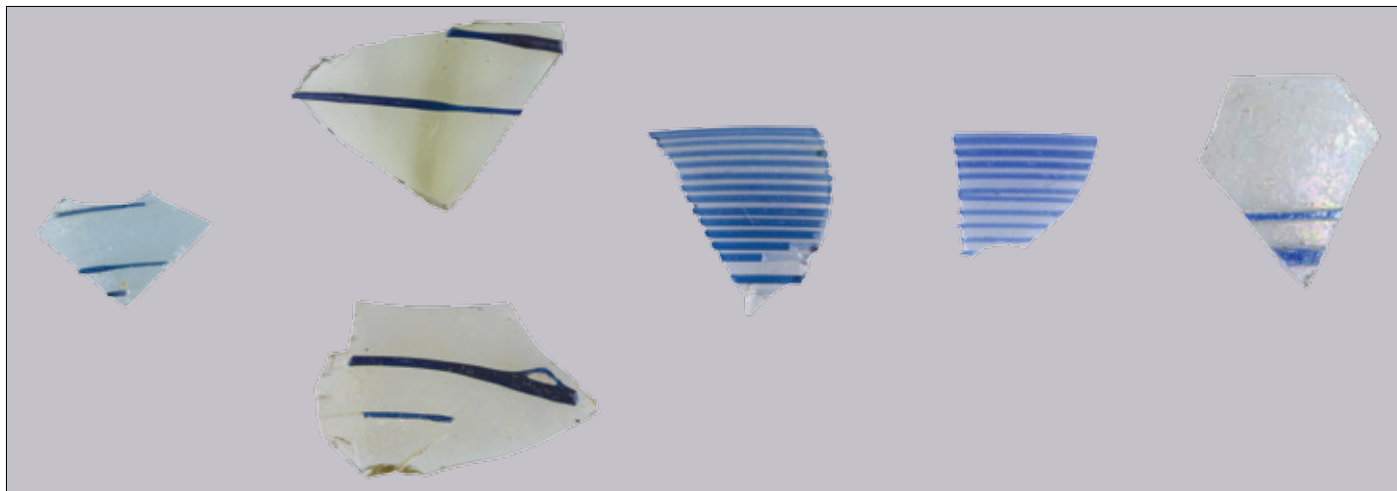
<sup>58</sup> V. Han (1969), p. 24.

<sup>59</sup> N. Topić (2015), pp. 126-128, 144-155.

<sup>60</sup> V. Šaranović-Svetek (1986), pp. 10-11, cat. 1, 4, 5, T. I/5-7.

<sup>61</sup> D. Minić (1982), p. 20.

<sup>62</sup> N. Topić (2015), pp. 144-155.



Fragmenti čaša s apliciranim nitima / *Fragments of beakers with applied threads* (foto / photo: M. Skvrce)

*da filo*) radile su se u Muranu od 1288.<sup>57</sup> i bile su učestao ukras u talijanskoj produkciji između 13. i 15. st.<sup>58</sup> U drugoj polovici 15. i u 16. st. muranski majstori u većem opsegu apliciraju staklene niti na svoje produkte.<sup>59</sup> Iako su niti na takvim čašama većinom modre boje, pojavljuju se i prozirne, smeđe i sive koje su vrlo rijetke a datiraju se u kraj 14. i početak 15. st. Brojni su primjeri posuda s apliciranim staklenim nitima poznati u zapadnoj Europi a ima ih i na istočnoj jadranskoj obali i u zaleđu.<sup>60</sup>

Ukrašavanje staklenih posuda rebrima bilo je poznato diljem Rimskog carstva. Vertikalna rebra su u antici rađena po uzoru na metalno posuđe.<sup>61</sup> Čaše s rebrima (*bichieri incostati*) osobito se rade od početka 14. st.<sup>62</sup> Ovdje predstavljena skupina nalaza karakteristična je za jadransko i balkansko zaleđe, dok u obalnim gradovima čaše takve forme i dekoracije u kombinaciji nisu pronađene u velikom broju. Niti su redovno aplicirane u gornjem dijelu čaše koji je bio proširen, dok je donji

uglavnom mogao biti neukrašen ili dekoriran rebrima. Tijelo takvih čaša uglavnom je cilindrične forme dok su neki primjeri konični, također s proširenim obodom, a dno im je ukrašeno apliciranom vrpcom.<sup>63</sup>

Čaše s optički puhanim ornamentom bile su vrlo popularne krajem srednjeg vijeka. Pri izvođenju ukrasa staklo se puhalo u jednodjelne drvene ili brončane kalupe nakon čega je slijedilo dodatno slobodno puhanje. Uglavnom su se primjenjivali geometrijski motivi rombova, kružića, cik-caka, heksagona i pčelinjih saća različitih veličina i razmaka ornamenata.<sup>64</sup> Puhanje u optičkom ili u otvorenom kalupu izvodi se tako da se ukras na posudi djelomično formira u kalupu, zatim se nastavlja slobodno puhanje pri čemu se ukras mijenja ili zatupljuje.<sup>65</sup> To posuđe proizvodilo se u Toskani, u gradovima Gambassi i Germagnana, što potvrđuju pisani i arheološki izvori. Srednjovjekovni dokumenti svjedoče da su se ovakve čaše nazivale *bicchieri gambassini*, a bile su popularne u drugoj polovici 14. st. i bile su vrlo pristupačne cijenom.<sup>66</sup>

<sup>57</sup> V. Han 1981a: 36, bilješka 193.

<sup>58</sup> D. Whitehouse 1983: 116.

<sup>59</sup> V. Han 1969: 24.

<sup>60</sup> N. Topić 2015: 126-128, 144-155.

<sup>61</sup> V. Šaranović-Svetek 1986: 10-11, kat. 1, 4, 5, T. I/5-7.

<sup>62</sup> D. Minić 1982: 20.

<sup>63</sup> N. Topić 2015: 144-155.

<sup>64</sup> I. Lazar 2001: 70.

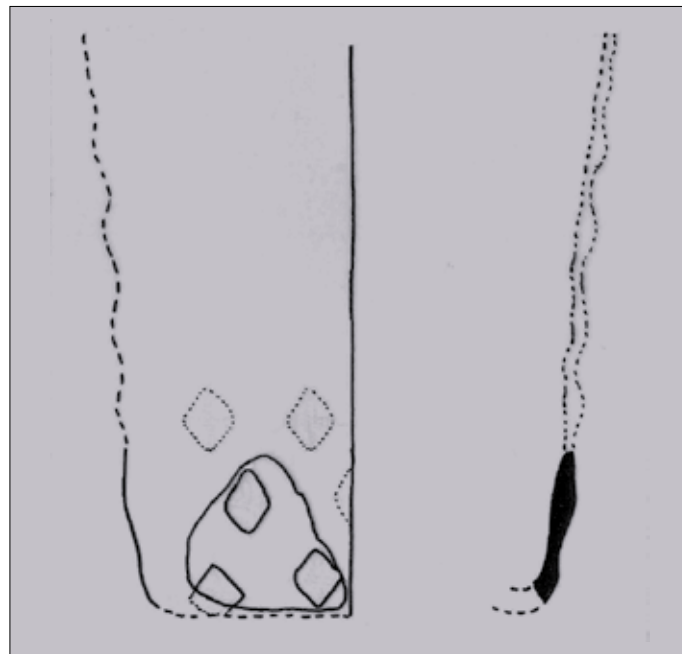
<sup>65</sup> D. Ignatiadou - A. Antonaras 2011: 33-34.

<sup>66</sup> I. Lazar 2001: 70.

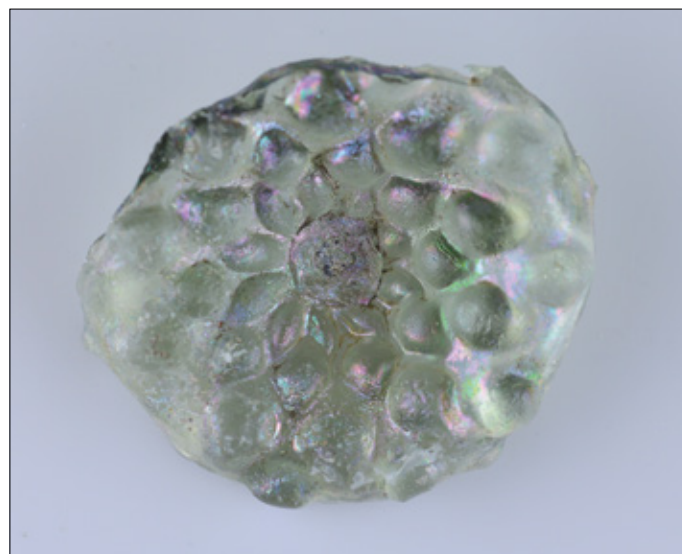
Glasses with blown optic ornaments were very popular at the end of the Middle Ages. When making such ornaments, glass was blown into single-piece wooden or bronze molds, and subsequently free-blown. The most commonly applied ornaments were geometric motifs, such as rhomboids, circles, zigzag lines, hexagons and honeycomb patterns of various sizes and different spacing.<sup>63</sup> Optic or open-mold glass blowing was done by partially forming the ornament on the vessel in a mold, and then free-blowing it in order to alter or smoothen it.<sup>64</sup> Such vessels were produced in Tuscany, in the cities of Gambassi and Germagnana, which is confirmed by both written and archaeological sources. Medieval documents testify that these glasses were called *bicchieri gambassini* and were both popular and very affordable in the second half of the 14<sup>th</sup> century.<sup>65</sup>

Droplet applications on glass are known since ancient Egypt.<sup>66</sup> Glasses with such applications were produced from the 11<sup>th</sup> century in the Middle East until the 16<sup>th</sup> century in northern Europe.<sup>67</sup> Droplet glass applications were primarily ornamental, but also served as handles. Among the findings from the Dubrovnik area, there are glasses with applications of the *Nuppenbecher* type (with wart-like, droplet and snail-like applications) and the *Krautstrunk*<sup>68</sup> type (with applications that are reminiscent of cabbage leaves). The *Nuppenbecher* type is older and such applications were smaller in size and were made in the late 13<sup>th</sup>, throughout the 14<sup>th</sup> and in the early 15<sup>th</sup> century.<sup>69</sup> Glasses of the *Krautstrunk* type are characterized by larger applications and were made in the late 15<sup>th</sup> and throughout the 16<sup>th</sup> century.<sup>70</sup>

A larger number of glass fragments came from vessels made by blowing glass into molds with different kinds of relief ornaments. These ornaments included relief diamonds, rhombi, ellipse, circular protrusions, petals, elongated droplets. Such



Grafička rekonstrukcija čaše s reljefnim ornamentom  
Graphic reconstruction of a glass with relief ornaments: (N. Topić)



Dno čaše s reljefnim ornamentom  
Bottom part of a glass with relief ornaments  
(foto / photo: M. Skvrce)

<sup>63</sup> I. Lazar (2001), p.70.

<sup>64</sup> D. Ignatiadou - A. Antonaras (2011), pp. 33-34.

<sup>65</sup> I. Lazar (2001), p. 70.

<sup>66</sup> V. Han (1969), p. 23.

<sup>67</sup> G. R. Davidson (1940), p. 308.

<sup>68</sup> N. Topić (2015), pp. 135-144.

<sup>69</sup> E. Baumgartner - I. Krueger (1988), pp. 210-218.

<sup>70</sup> E. Baumgartner - I. Krueger (1988), pp. 296 -298.

Kapljičaste aplikacije na staklu poznate su još od starog Egipta.<sup>67</sup> Staklene čaše s takvim aplikacijama su se proizvodile od 11. st. na Bliskom Istoku sve do 16. st. u sjevernoj Europi.<sup>68</sup> Staklene kapljičaste aplikacije su bile dekorativni element, no imale su i funkciju ručki. Među nalazima s dubrovačkog područja zastupljene su čaše s aplikacijama tipa *Nuppenbecher* (s bradavičastim, kapljičastim, pužolikim aplikacijama) i *Krautstrunk*<sup>69</sup> (s aplikacijama koje podsjećaju na listove kupusa). Tip *Nuppenbecher* je raniji a takve aplikacije su manjih dimenzija, izrađivale su se u kasnom 13., kroz 14. i u ranom 15. st.<sup>70</sup> Čaše tipa *Krautstrunk* odlikuju se većim aplikacijama, a izrađivale su se krajem 15. i u 16. st.<sup>71</sup>

Više ulomaka stakla pripadalo je čašama izrađenim puhanjem u kalup s različitim vrstom reljefnog ornamenta. Ti ukrasi su izvedeni u vidu reljefnih dijamantata, rombova, elipsi, kružnih istaka, latica, izduženih kapljica. Istaci su, kao i bradavičasto kapljičasti aplicirani ornamenta, mogli služiti za lakše držanje čaše, da ne klizne iz ruke. Najveća skupina takvih čaša potječe iz istraživanja utvrde Sokol u Konavlima, nalazi se datiraju u period od 14. do 17. st. a vjerojatno su importi iz zapadne Europe.<sup>72</sup>

## ZDJELICE I ZDJELE NA NOZI

Nalazi zdjelica su raznovrsni, no vrlo su fragmentarno sačuvani. Među nalazima su ulomci zdjelice od kobaltnoplavog stakla, te forme ukrašene optičkim puhanjem ili u kalupu s kosim blago naglašenim rebrima, a nađeni su u istraživanju utvrde Sokol. Ulomak zdjelice s apliciranom mliječno bijelom niti na obodu i reljefnim ukrasom stijenke (motiv rombova) nađen je u samostanu sv. Marije od Kaštela koji je dao najraznovrsnije ulomke stakla. Također su na istom lokalitetu nađene stope zdjela/zdjelica. Datiraju se u 16. st. a mogle su biti izrađivane u Veneciji, Dubrovniku ili u nekoj drugoj radionici pod venecijanskim utjecajem. Zastupljeni su i ulomci zdjelica sa spiralno apliciranim bijelim nitima na obodu, čime se razlikuju od ostalih čaša i zdjelica koje su ukrašene reljefnim „dijamantima“, a



Zdjela na nozi / Footed bowl  
(foto / photo: M. Skvrce)

također su mogle biti izrađene u venecijanskim radionicama. Među nalazima je i ulomak zdjelice ukrašen mliječno bijelim nitima.<sup>73</sup>

Filigransko staklo je izvorno muransko, a potječe iz druge četvrtine 16. st. Tehniku *filigrana a retortoli* izumio je Filippo Cattani 1527. u Muranu.<sup>74</sup> Niti se postavljaju na tri osnovna načina: paralelno izvedene niti (*vetro a fili*), niti koje tvore mrežasti ukras (*vetro a reticello*) i kombinacija ravnih i uvijenih niti (*vetro a retorti*).<sup>75</sup>

<sup>67</sup> V. Han 1969: 23.

<sup>68</sup> G. R. Davidson 1940: 308.

<sup>69</sup> N. Topić 2015: 135-144.

<sup>70</sup> E. Baumgartner - I. Krueger 1988: 210-218.

<sup>71</sup> E. Baumgartner - I. Krueger 1988: 296-298.

<sup>72</sup> N. Topić 2015: 132-133.

<sup>73</sup> N. Topić 2015: 170-171.

<sup>74</sup> R. Barovier Mentasti 2003: 176.

<sup>75</sup> L. Ratković-Bukovčan 1996: 26.



Dna zdjelica / Bottom parts of bowls  
(foto / photo: M. Skvrce)

protrusions, much like the wart-like droplet applications, could serve to facilitate holding the glass and prevent it from slipping out of one's hand. The largest collection of such glasses was found during the archaeological research of the Sokol Fortress of Konavle, it is dated to the period from the 14<sup>th</sup> to the 17<sup>th</sup> century and most likely includes imports from Western Europe.<sup>71</sup>

<sup>71</sup> N. Topić (2015), pp. 132-133.

## BOWLS AND FOOTED BOWLS

As far as bowls are concerned, findings are varied, but quite fragmentary preserved. The findings include fragments of a bowl made of cobalt blue glass and vessels decorated by optic-blowing or mold-blowing with sidelong, gently protruding ribs, which were found in the Sokol Fortress. A fragment of a bowl with a milky white thread application on the rim and relief ornaments on the surface (rhomboid pattern) was found in the convent of St. Mary of the Castle, where the most diverse fragments of glass were found. Furthermore, basin/bowl foots were also found on the same site. They date back to the 16<sup>th</sup> century and could have originated in Venice, Dubrovnik or a different workshop under Venetian influence. The findings also include fragments of bowls with spiral white thread applications on the rim, due to which they stand out among other glasses and bowls which were decorated with relief "diamonds" and which also could have originated in Venetian workshops. Among the findings, there is also a fragment of a bowl decorated with milky white threads.<sup>72</sup>

Filigree glass originated in Murano and dates from the second quarter of the 16<sup>th</sup> century. The filigree technique (*filigrana a retortoli*) was invented by Filippo Cattani in 1527 in Murano.<sup>73</sup> Threads were placed to create three basic patterns: parallel threads (*vetro a fili*), threads forming a web-like pattern (*vetro a reticello*) and a combination of straight and twisted threads (*vetro a retorti*).<sup>74</sup>

A fragment of the rim of a bowl from the Benedictine convent of St. Mary of the Castle in Dubrovnik was decorated using a filigree technique. The ornament consists of full vertical white threads alternating with a web-like pattern, and based on similar examples, it dates from the 16<sup>th</sup> century. The bowl was decorated using the a fili technique, where threads were first placed on a ceramic or metal base and heated until soft, and then a glass bubble was rolled over the surface to incorporate the threads into the glass. Subsequently, the glass bubble was once again heated and blown into the desired vessel shape.<sup>75</sup>

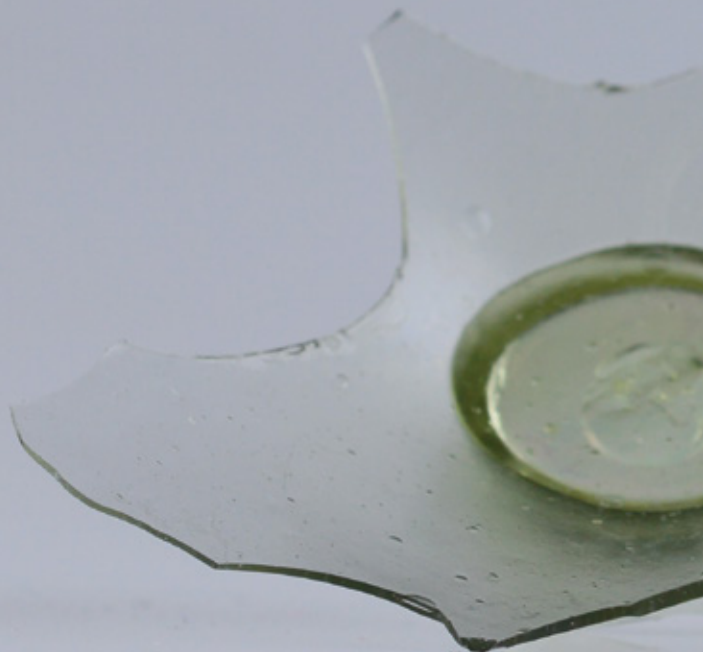
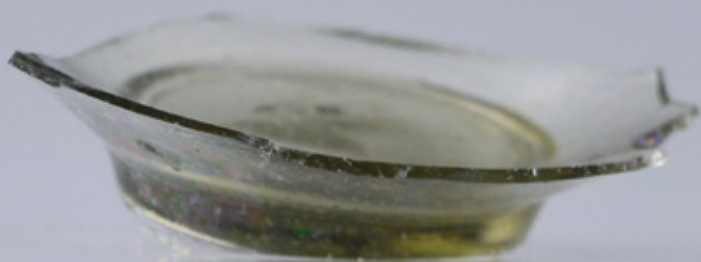
The excavations at the convent of St. Mary on the island of Mljet resulted in finding two fragments of a bowl or a large cup

<sup>72</sup> N. Topić (2015), pp. 170-171.

<sup>73</sup> R. Barovier Mentasti (2003), pp. 176.

<sup>74</sup> L. Ratković-Bukovčan (1996), p. 26.

<sup>75</sup> N. Topić (2015), pp. 172-173, sl. 92, catlg. 407.





Ulomak oboda zdjelice iz Benediktinskog samostana sv. Marije od Kaštela u Dubrovniku ukrašen je filigranskom tehnikom. Ukras je izveden punim vertikalnim bijelim trakama i mrežastim motivom naizmjenično, a prema analognim primjerima datira se u 16. st. Zdjelica je ukrašena tehnikom *a fili* koja se izvodila tako da su niti najprije bile postavljene na keramičku ili metalnu podlogu i zagrijavane dok ne bi omekšale, zatim bi se stakleni mjehur zarolao po toj podlozi da bi se niti inkorporirale u staklo. Nakon toga bi se početni stakleni mjehur ponovno zagrijao i nastavio bi se puhati željeni oblik posude.<sup>76</sup>

Pri istraživanju benediktinskog samostana sv. Marije na Mljetu nađena su dva ulomka zdjelice ili veće šalice s ručkama koje se nisu sačuvale, no njihovi četvrtasti otisci su vidljivi na stijenci posude. Posuda je polukuglastog oblika, ukrašena je tehnikom *a retorti* (retortno staklo) isprepletenim trakama zelene, kobaltnoplave i bijele boje. Ukras je izveden tako da je izrađena neukrašena zdjelica koja je prislonjena na kalup u kojem su posložene staklene višebojne niti, a zatim je zdjelica prekrivena drugim slojem prozirnog stakla. Na kraju su još aplicirane mliječnobijele niti na površinu posude. Arheološku analogiju dubrovačkom primjerku nalazimo u Italiji (16.-17. st.).<sup>77</sup>

Zdjele na nozi i stopi zastupljene su s nekoliko ulomaka, od kojih je neke bilo moguće rekonstruirati. Recipijent je vjerojatno bio hemisferičnog oblika, a stoji na šupljivoj kratkoj nozi ili stopi. Na jednom fragmentu je uočljivo da recipijent nije pravilno spojen s nogom, nakošen je, a ta nespretnost odaje manje vještog majstora. Uglavnom su izrađene od zelenog i žućkastog stakla, a datiraju se u 16. ili 17. st. Moguće je da su produkt dubrovačkih radionica ili import iz venecijanskih ili drugih talijanskih središta.<sup>78</sup>

## BOCE I VRČEVI

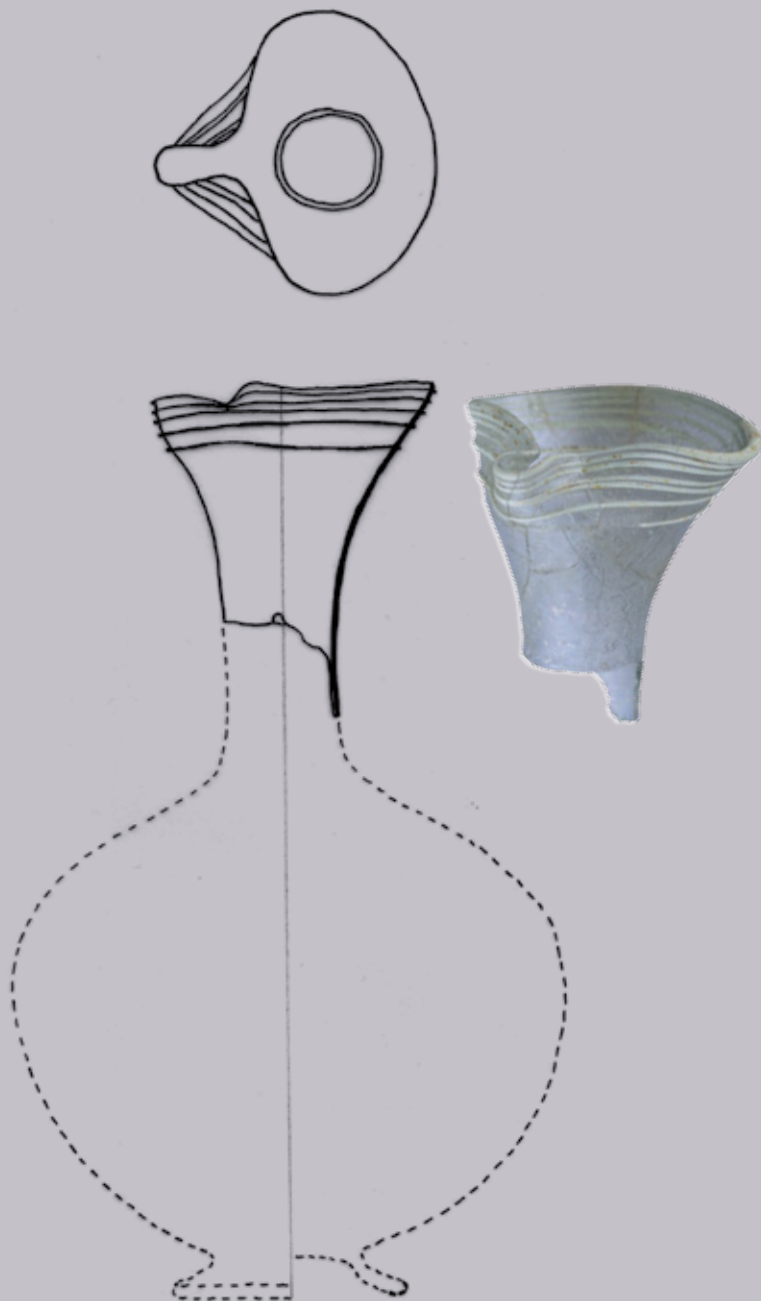
Među nalazima boca zastupljene su različite tioploške kategorije. Odlikuju se i raznovrsnim ukrasima i tehnikama, a uglavnom su fragmentarno sačuvane.<sup>79</sup>

<sup>76</sup> N. Topić 2015: 172-173, sl. 92, kat. 407.

<sup>77</sup> N. Topić 2015: 172-173, sl. 94, kat. 408.

<sup>78</sup> N. Topić 2015: 173-174, kat. 409-415.

<sup>79</sup> N. Topić 2015: 174-189.





Ulomci boca / *Fragments of bottles*  
(foto / *photo*: M. Skvrce)

with handles that were not preserved, but whose square marks are visible on the surface of the vessel. The vessel had a hemispherical shape and was decorated using the *a retorti* technique (retort glass), with intertwined threads of green, cobalt blue and white. The ornament was created by firstly making an undecorated bowl, which was later placed against a mold with multicolor threads and then covered with another layer of clear glass. In the end, milky white threads were applied on the surface of the vessel. A similar archaeological sample can be found in Italy (16<sup>th</sup>-17<sup>th</sup> c.).<sup>76</sup>

<sup>76</sup> N. Topić (2015), pp. 172-173, sl. 94, catlg. 408.

Stemmed and footed bowls are represented through several fragments, some of which it was possible to reconstruct. Their bowls were probably hemispherical in shape, and stood on a hollow short stem. One fragment testifies to the fact that the bowl was not properly attached to the foot, but rather tilted, and such shortcoming exposes the craftsman's lack of skill. They were mostly made of green and yellowish glass, and they date to the 16<sup>th</sup> or 17<sup>th</sup> century. They could have been produced in the workshops of Dubrovnik or imported from Venetian or other Italian centers.<sup>77</sup>

## BOTTLES AND JUGS

Among the findings, there are bottles belonging to different categories, based on their type. They also differ in terms of ornaments and techniques used in their production, and they are mostly fragmentary preserved.<sup>78</sup>

### Bottles of the ingastare type

The neck of an ingastare bottle is generally quite elongated and cylindrical with a somewhat wider rim, while its body is spherical or pear-shaped. The vessel can either have a circular foot, or simply a thicker pushed-in bottom. Such bottles have been used since 1120 to carry wine, and since 1279 they have been used as tableware. They were made by the so-called *buf-fadori*, the less skilled masters, and their price was consequently lower.<sup>79</sup> The ingastare bottles were used in Dubrovnik at the beginning of the 14<sup>th</sup> century (1318) and they were first referred to as inguistare and later as ingastare.<sup>80</sup> In the Murano Archive they are mentioned as early as 1280. The tradition of making such bottles was present in the Roman glassmaking, which served as inspiration to the master craftsmen of the Islamic centers. They produced bottles with a long tubular neck and a toroidal foot. These bottles were also found in Dubrovnik, in the Sokol Fortress of Konavle and the convent of St. Mary of the Castle in Dubrovnik in the mound fill layers. Among the findings, there are several small fragments of undecorated in-

<sup>77</sup> N. Topić (2015), pp. 173-174, catlg. 409-415.

<sup>78</sup> N. Topić (2015), pp. 174-189.

<sup>79</sup> A. Antonaras (1999), p. 38.

<sup>80</sup> V. Han (1971b), p. 218.



## LAMPS

gastara bottles and the whole neck of one such vessel. Among the decorated vessels, there are samples with soft spiral ribs and thread applications around the neck. There are several fragments with soft spiral ribs, belonging to vessels whose reconstruction was possible. Fragments of the rim, neck, foot and body of bottles were also discovered. Only two fragments have thread applications, one of which is very small in size, while the other fragment includes a bottle neck preserved almost in its entirety.<sup>81</sup> Similar examples can be found along the coast and its hinterlands. Such bottles are commonly depicted in frescoes.

## JUGS

Given that ceramic vessels were greatly popular in the Renaissance Italy, they inevitably affected the production of glass objects. Glassmakers imitated ceramic jugs and fruit bowls, making them with a heavier foot, a short neck and a wide opening.<sup>82</sup> Along with ceramic jugs, which were more common, frescoes also depicted glass jugs used as tableware.

Fragments of jugs can be easily identified through their upper part. The whole upper part of a trefoil rim jug made of clear glass with milky-white thread applications was found during the research of the convent of St. Mary of the Castle in the center of Dubrovnik. Threads are very closely applied starting at the rim of the jug and ending under the spout at the top of the neck. During the research of the Sokol Fortress of Konavle, a fragment of the upper part of a green trefoil mouth jug was found. A handle of similar color that may have belonged to the above jug was also found. The findings were discovered in the fill layers around the tower, where objects dating from different periods were found (14<sup>th</sup>-17<sup>th</sup> c.), and the aforementioned jug could be dated to the late 16<sup>th</sup> or 17<sup>th</sup> century. Based on similar examples, both jugs were reconstructed. There are several other smaller fragments of jug rims, which are, unfortunately, poorly preserved and thus the date of their origin and their provenance cannot be accurately determined. Several jug handles, of various types, age, color and glass quality, were also found on the archaeological sites of Dubrovnik.<sup>83</sup>

Lamps represent a very widespread category of findings, due to their function as lighting units, which is the reason why they are found in various buildings. Their importance and daily use is confirmed through works of art depicting various types of lamps, both biconical and funnel-shaped.

The prototype of hanging lamps with handles can be found in early medieval Levant workshops (6th-7th century),<sup>84</sup> which served as a model for the later Venetian centers (14<sup>th</sup>-16<sup>th</sup> c.), due to frequent trade lines between Venice and the Levant.

Lamp findings presented at the exhibition are mostly quite fragmentary preserved, but with the help of similar examples, it was possible to reconstruct some of them. Biconical lamps usually had three handles through which strings were pulled in order to hang them, and they might have had smooth surface with no applications. Such lamps were very widespread across the Dubrovnik area, as well as the entire Adriatic coast, and generally across the Mediterranean and the Balkan hinterlands, where various findings of mosque lamps have been recorded, including fragments painted with enamel, but among the findings in Dubrovnik there are no ornaments of that sort.<sup>85</sup>

The findings come from monasteries, churches, public buildings and towers, which testifies to the use of lamps in buildings with different functions (religious and secular) in late medieval and early modern periods. The archaeological context of these findings is generally very similar in the Dubrovnik area, where fragments of lamps are found discarded as waste or in fill layers formed after an earthquake, making it impossible to reconstruct their original location through stratigraphy,<sup>86</sup> but it is known that lighting units were primarily located in the apses of religious buildings. They could have been hung on a metal chain individually or they could have stood on a metal stand (Greek *polykandilon*) as a group of lamps (biconical or conical with an open upper part).

These items mainly originated from Venice or Dubrovnik. The prevalence of this type of vessels is also proven by travelers

<sup>81</sup> N. Topić (2015), pp. 183-186, catlg. 439-451.

<sup>82</sup> R. Gajić-Lončar (1964), p. 24.

<sup>83</sup> N. Topić (2015), pp. 190-191.

<sup>84</sup> D. Stiaffini (1991), pp. 199-200, notes 66, 67.

<sup>85</sup> N. Topić (2015), pp. 191-194.

<sup>86</sup> N. Topić (2015), pp. 191-194.

## Boce ingastare

Vrat ingastara je uglavnom vrlo izdužen i cilindričan s manjim proširenjem oboda, dok je tijelo loptasto ili kruškoliko. Stope su kružne a posuda može biti i bez stope, s debljim dnom uvučenim u trbuh. Takve boce upotrebljavale su se od 1120., u njima se prenosilo vino, a od 1279. upotrebljavaju se kao stolno posude. Izrađivali su ih *buffadori*, manje vješti majstori, pa su im i cijene bile niže.<sup>80</sup> Boce ingastare upotrebljavane su u Dubrovniku početkom 14. st. (1318.), najprije se navode pod nazivom inguistare a kasnije ingastare.<sup>81</sup> U muranskim arhivskim zapisima spominju se od godine 1280. Tradicija izrade takvih boca već je prisutna u rimskom staklarstvu, što je majstorima u islamskim centrima poslužilo kao uzor. Radili su boce s dugim cjevastim vratom i prstenastom nogom. Te boce su zastupljene među dubrovačkim nalazima, a nađene su na utvrđi Sokol u Konavlima i u samostanu sv. Marije od Kaštela u Dubrovniku u nasipnim slojevima. Nađeno je nekoliko manjih ulomaka boca ingastara koje nisu ukrašene ali i cijeli vrat jedne takve posude. Među ukrašenim posudama zastupljene su posude s blago izvedenim spiralnim rebrima i s apliciranim nitima oko vrata. Više je ulomaka sa spiralnim blagim rebrima, a te je posude i bilo moguće rekonstruirati. Nađeni su ulomci oboda, vrata, stopa i tijela. Samo dva ulomka imaju aplicirane niti, od kojih je jedan vrlo malih dimenzija dok je drugi sačuvan skoro cijelom dužinom vrata.<sup>82</sup> Analogne primjere nalazimo duž obale i njezina zaleđa. Takve boce su čest prikaz na freskama.

## VRČEVI

Budući da su u renesansnoj Italiji bile vrlo popularne keramičke posude, neizbježno su utjecale na izradu staklenih predmeta. Staklari su imitirali keramičke vrčeve i posude za voće, pri čemu je noga bila masivnija, vrat kratak a otvor širok.<sup>83</sup> Uz keramičke, koji su bili učestaliji, na freskama su prikazivani i stakleni vrčevi za stolnu upotrebu.

Ulomke vrčeva je najjednostavnije identificirati po gornjem dijelu. Cijeli gornji dio vrča trolisnog oboda od prozirnog stakla s mliječnobijelim apliciranim trakama nađen je u istraži-

vanju samostana sv. Marije od Kaštela u jezgri Dubrovnika. Niti su vrlo gusto aplicirane počevši od oboda vrča, a aplikacije završavaju pod izljevom na vrhu vrata posude. Iz istraživanja utvrde Sokol u Konavlima potječe ulomak gornjeg dijela vrča zelene boje koji je imao trolisni izljev. Nađena je i ručka slične boje koja je mogla pripadati toj posudi. Nalaz potječe iz nasipnog sloja oko utvrde u kojem je nađen materijal šireg kronološkog konteksta (14.-17. st.), a vrč bi se mogao datirati u kraj 16. ili 17. st. Prema analognim primjerima izvršene su rekonstrukcije oba vrča. Još je nekoliko manjih ulomaka oboda vrčeva, no sačuvanost im je lošija pa nije moguće pobliže odrediti datum njihova nastanka ili provenijenciju. Nekoliko ručki vrčeva, različitog tipa, datuma, boje i kvalitete stakla, nađeno je na dubrovačkim lokalitetima.<sup>84</sup>

## SVJETILJKE

Svjetiljke su vrlo raširena kategorija nalaza, što je uvjetovala i njihova funkcija rasvjetnih tijela pa ih nalazimo u različitim objektima. O njihovoj važnosti i svakodnevnoj upotrebi svjedoče i umjetnička djela koja prikazuju različite vrste svjetiljki, bikonične i ljevkaste.

Prototip visećih svjetilji s ručkicama nalazimo u ranosrednjovjekovnim levantskim radionicama (6.-7. st.)<sup>85</sup> koje su poslužile kao uzor kasnijim venecijanskim centrima (14.-16. st.) a uzrok tome su učestale trgovačke veze Venecije i Levanta.

Nalazi svjetiljki predstavljeni na izložbi su uglavnom vrlo fragmentarno sačuvani, no uz pomoć analogija neke je bilo moguće rekonstruirati. Bikonične svjetiljke su obično imale po tri ručke koje su služile za provlačenje uzice za njihovo vješanje, a mogle su imati i glatke stijenke bez aplikacija. Takve svjetiljke bile su vrlo učestale na dubrovačkom području kao i na cijeloj jadranskoj obali, općenito na Mediteranu, te u balkanskom zaleđu gdje je zabilježeno više nalaza džamijskih lampi među kojima ima i fragmenata oslikanih emajlom, no kod dubrovačkih nalaza izostao je takav ukras.<sup>86</sup>

Nalazi potječu iz samostana, crkve, javne građevine i utvrde što svjedoči o upotrebi svjetiljki u objektima različite funkcije (sakralnima i svjetovnim) krajem srednjeg vijeka i u ranom

<sup>80</sup> A. Antonaras 1999: 38.

<sup>81</sup> V. Han 1971b: 218.

<sup>82</sup> N. Topić 2015: 183-186, kat. 439-451.

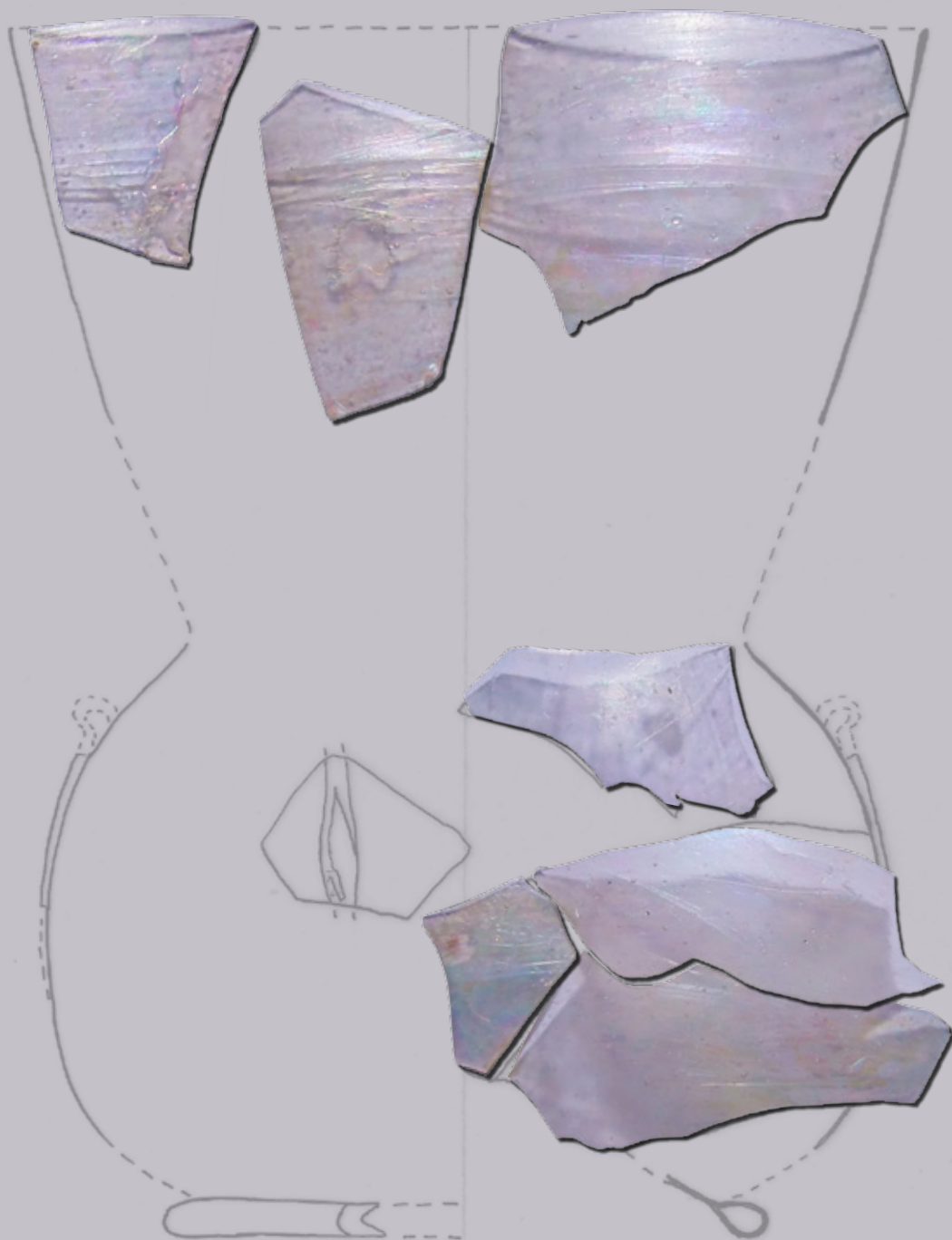
<sup>83</sup> R. Gajić-Lončar 1964: 24.

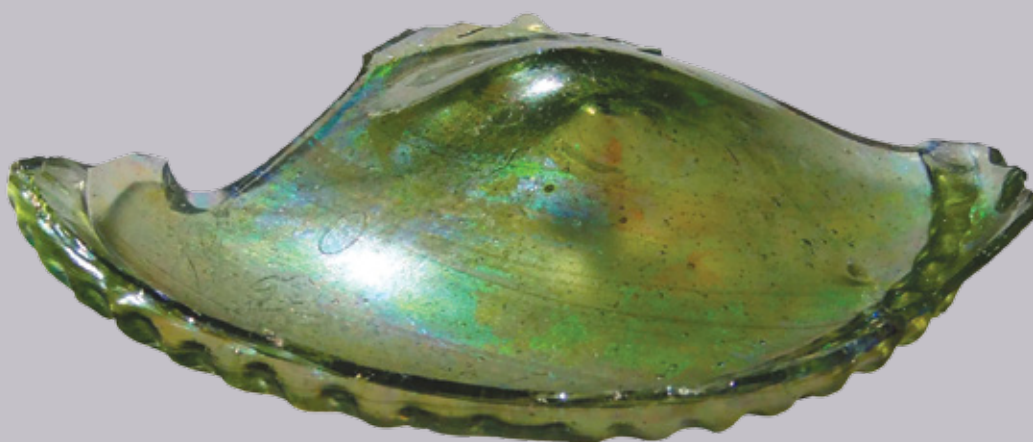
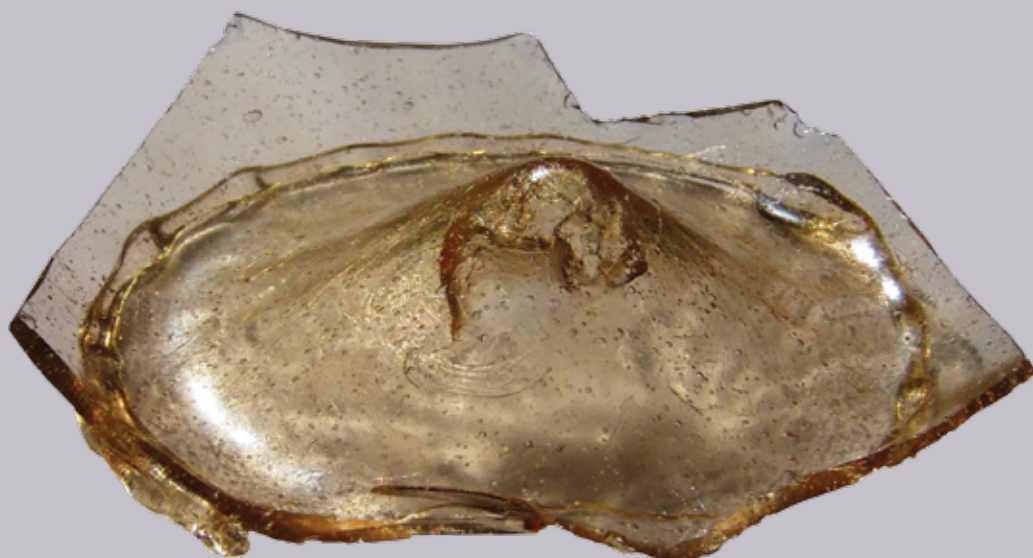
<sup>84</sup> N. Topić 2015: 190-191.

<sup>85</sup> D. Stiaffini 1991: 199-200, bilješke 66, 67.

<sup>86</sup> N. Topić 2015: 191-194.







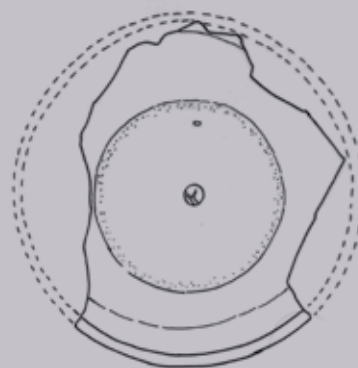
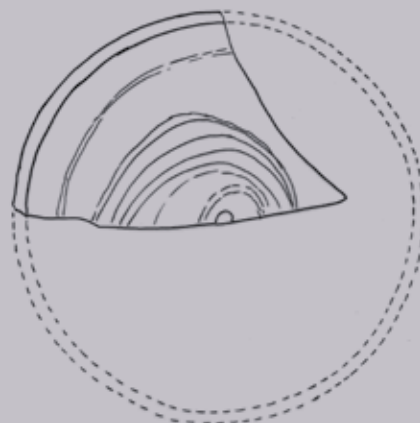
novom vijeku. Arheološki kontekst takvih nalaza je uglavnom vrlo sličan na dubrovačkom području, gdje fragmente lampi nalazimo kao odbačeni otpad ili u nasipnim slojevima nastalima nakon potresa pa njihov izvorni smještaj u objektima nije moguće rekonstruirati preko stratigrafije,<sup>87</sup> no poznato je da su rasvjetna tijela uglavnom stajala u apsidalnom dijelu svetišta. Mogle su biti obješene na metalni lanac pojedinačno ili su mogle stajati na metalnom nosaču (grč. *polykandilon*) kao skupina lampi (bikoničnih ili koničnih s rastvorenim gornjim dijelom).

Porijeklo tih predmeta je uglavnom venecijansko ili dubrovačko. O raširenosti tog tipa posuda svjedoče i putnici koji često spominju brojne lampe od stakla u džamijama koje su posjetili na Balkanu, u Hadrijanopolu, Solunu, Konstantinopolu u veremenu od 16. do 18. st.<sup>88</sup> Svjetiljke se često spominju u narudžbama za džamije u Otomanskom Carstvu. U dubrovačkim arhivskim podacima lampe se spominju kao *candilarchi* i *candile*, imale su tri drške (*candile di tre maniche*) a radile su se u 15. st. (1452.) u domaćim staklarskim radionicama.<sup>89</sup>

## PROZORSKA STAKLA – OCULI I VITRAJI

Prozorska stakla su bila poznata dosta rano, možda već kod Egipćana, a Rimljani su ih sigurno znali izrađivati.<sup>90</sup> Puhano staklo u obliku diskova (*oculi*) bilo je poznato već u 4. st. na Bliskom Istoku (Gerasa, Samarija).<sup>91</sup> Muranski staklari su bazirali svoju tehnologiju izrade ocula i repertoar staklenih predmeta po uzoru na orijentalne radionice. Kružna prozorska stakla izrađuju se tako da se puše stakleni mjehur koji se otvori i ubrzano okreće, te pod centrifugalnom silom poprima oblik diska. U središtu ispuhanog diska ostaje kružni otisak koji se naziva i bikovo oko (*bull's eye*) na mjestu odvajanja od lule.<sup>92</sup>

Izrađivana su i poligonalna stakla za vitraje. Staklorezarstvo je bio odvojeni zanat za koji se od majstora nije tražilo da znaju taliti staklenu masu nego da je znaju ravnati te rezati u različite



<sup>87</sup> N. Topić 2015: 191-194.

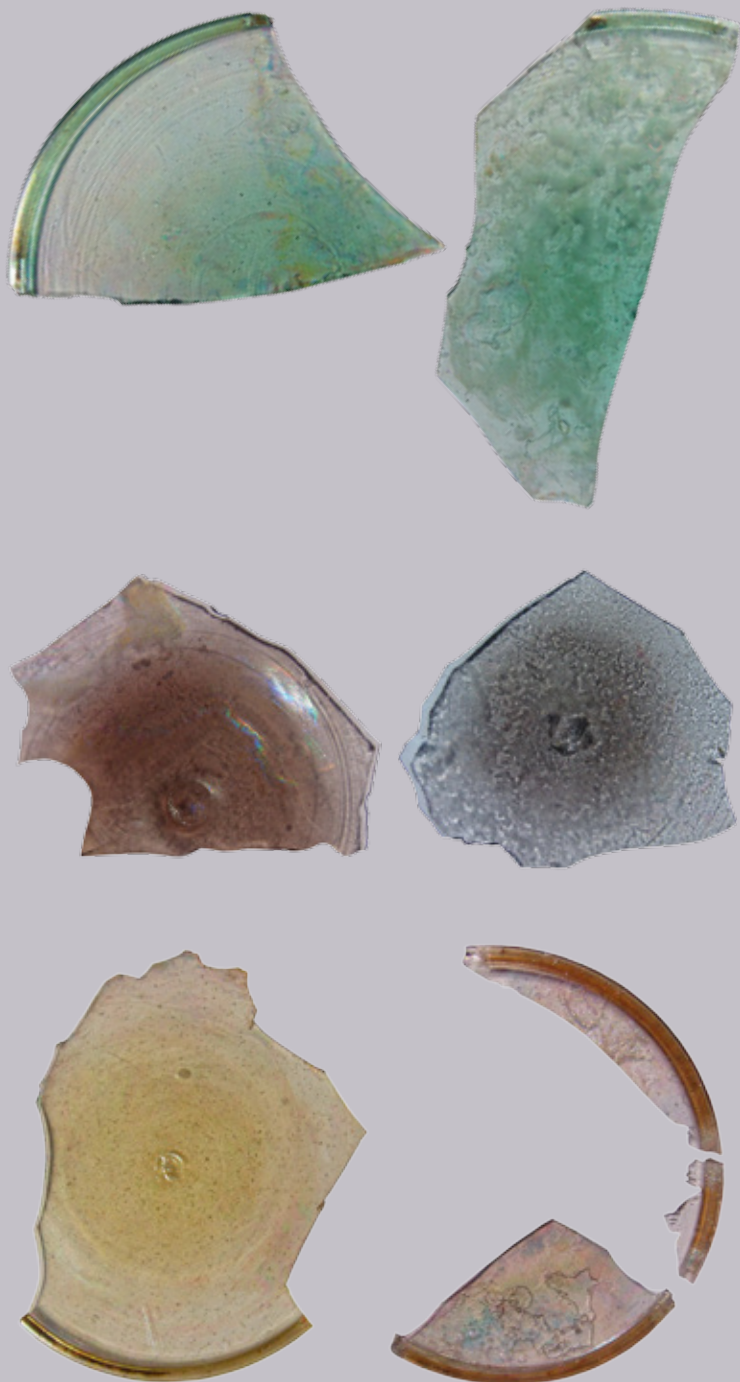
<sup>88</sup> V. Han 1985: 264-265.

<sup>89</sup> V. Han 1974b: 231.

<sup>90</sup> A. Gasparetto 1958: 149.

<sup>91</sup> J. Lafond 1969: 37.

<sup>92</sup> D. Ignatiadou - A. Antonaras 2011: 55.



who often spoke of numerous glass lamps in mosques they had visited all over the Balkans, in Hadrianopolis, Thessaloniki and Constantinople in the period from the 16<sup>th</sup> to the 18<sup>th</sup> century.<sup>87</sup> Lamps were often mentioned in orders made for mosques in the Ottoman Empire. In the data from Dubrovnik Archive lamps are mentioned as *candilarchi* and *candile*, they had three handles (*candile di tre maniche*) and were made in the 15<sup>th</sup> century (1452) in domestic glass workshops.<sup>88</sup>

### WINDOW GLASS - OCULI AND STAINED-GLASS WINDOWS

Glass windows were known quite early, perhaps already by the Egyptians, while Romans were certainly able to make them.<sup>89</sup> Blown glass in the form of discs (*oculi*) was known as early as the 4<sup>th</sup> century in the Middle East (Gerasa, Samaria).<sup>90</sup> Murano glassmakers modeled their oculi production technology and glass objects repertoire after oriental workshops. Circular windows were made by blowing a glass bubble and spinning it rapidly until the centrifugal force caused it to “flash” open and take the form of a disc. At the center of the deflated disk remained a circular mark, also called *bull's eye*, at the point of its separation from the pipe.<sup>91</sup>

Polygonal glass for stained-glass windows was also produced. Glass cutting was a separate trade whose masters were not required to melt glass, but rather to know how to flatten it, cut it in different shapes and insert it into the provided frames. Glass was cut in different shapes and embedded into wooden or lead frames that matched the size of the glass.<sup>92</sup> This kind of flat glass was produced using the cylinder technique.

As Dubrovnik prospered in the 14<sup>th</sup> and 15<sup>th</sup> centuries, numerous churches and secular buildings were built, leading to an increasing need for window glass - *oculi*. Records show that in the mid-14<sup>th</sup> century there were glass windows in the churches of Dubrovnik<sup>93</sup> (the church of the Friars Minor in 1348

<sup>87</sup> V. Han (1985), pp. 264-265.

<sup>88</sup> V. Han (1974b), p. 231.

<sup>89</sup> A. Gasparetto (1958), p. 149.

<sup>90</sup> J. Lafond (1969), p. 37.

<sup>91</sup> D. Ignatiadou - A. Antonaras (2011), p. 55.

<sup>92</sup> D. Roller (1951), p. 137.

<sup>93</sup> V. Han (1971a), p. 52.

oblike i umetati u predviđene okvire. Stakla su se rezala u različitim oblicima i umetala u okvire od drva ili olova koji su odgovarali veličini stakalaca.<sup>93</sup> Takva vrsta ravnog stakla izrađivana je tehnikom cilindra.

Kako je Dubrovnik prosperirao, u 14. i 15. st., izgradilo se dosta crkvenih i svjetovnih građevina pa je tako rasla i potreba za prozorskim staklom – *oculima*. U arhivskim dokumentima spominje se da su u Dubrovniku sredinom 14. st. postojali prozori od stakla na crkvama<sup>94</sup> (crkva Male braće je 1348. vjerojatno imala vitraje; Dominikanska crkva dobiva prozore 1360-ih<sup>95</sup>). Iako postoji teza o dubrovačkoj produkciji tog stakla, moguće je i da je uvezeno iz Venecije ili da su ga muranski majstori izradili u Dubrovniku. Upotreba *ocula* bila je učestala u crkvenoj arhitekturi u balkanskim zemljama u kasnom srednjem vijeku, a muranske radionice zasigurno nisu bile jedini izvor gdje se moglo nabaviti tu vrstu stakla.<sup>96</sup>

U 15. st. također se spominje u arhivskim dokumentima zastakljivanje prozora. Majstor Petar Božiković je 1442. dobio zadatak izraditi *ocule* za Knežev dvor<sup>97</sup> koji su vjerojatno bili oslikani.<sup>98</sup> Fratar Petar izradio je prozore za dubrovačku katedralu i samostan sv. Klare.<sup>99</sup>

U drugoj četvrtini 15. st. spominje se zastakljivanje prozora na privatnim kućama plemića i bogatijih trgovaca (palača Sandalja Hranića, kuća Nalka Dobrića, kuća obitelji Zizer (Cice-ronović)).<sup>100</sup> Prozori na stambenim kućama su sastavljani od *ocula* koji su stavljani u olovne okvire, što je karakteristično za gotičko razdoblje gotovo u cijeloj Europi.<sup>101</sup>

U Kneževu dvoru se čuvaju dijelovi nekoliko *ocula* promjera 16.2 cm, nađeni su na Pilama, a pripadaju 15. ili 16. st. Uglavnom se prozorsko staklo javlja pod nazivom *oculus*, zatim *ogio*, *logio*, te *oziza de vitro*. Radili su se od bijelog i bojenog stakla. U ugovorima o zastakljivanju prozora spominje se

da će prozori biti zaštićeni mrežom izrađenom od bakrene ili željezne žice da bi se staklo sačuvalo od oštećenja. Izrada prozora od *ocula* bila je jeftinija od ravnih prozorskih ploha što je pridonijelo popularnosti ove vrste prozorskog stakla.<sup>102</sup>

Podaci o proizvodnji *ocula* nisu tako brojni, no u drugom desetljeću 16. st. spominje se majstor *Johannes Tambarlinus* koji je u Dubrovniku izrađivao staklene predmete, a među njima i kružna prozorska stakla (*vetri tondi*). Tambarlinus je imao cjenik za sve staklene predmete koje je izrađivao u Gradu, no zanimljivo je da jedino za *ocule* navodi da će ih prodavati po istoj cijeni kao venecijanske. Postoji i dosta arhivskih vijesti o uvozu stakla, među njima i *ocula*, iz Venecije u Dubrovnik koji je bio posrednik za nabavu tih predmeta. Spominje se da je Ajas-paša naručio 200 bojanih stakala preko Dubrovčana vjerojatno za svoje zadužbine u Visokom i Sarajevu i da je tražio da budu isti kao i oni koje je prije naručio Daut-paša.<sup>103</sup>

Krajem 15. st. česte su dubrovačke narudžbe venecijanskog stakla, što nam govori da je potražnja za staklom bila velika u balkanskim zemljama pod turskom vlašću, a da je gradnja sakralnih, javnih ili privatnih građevina napredovala. To ukazuje da Dubrovnik, iako je imao vlastitu produkciju, nije mogao snabdijevati cijelo tržište (balkansko zaleđe, svoje potrebe, i dr.). Balkanske zemlje i Turska nisu imale razvijeno staklarstvo, pa je Venecija u ta područja plasirala svoje proizvode.<sup>104</sup>

*Oculi* su se izrađivali u različitim veličinama, a osim u Muranu koji je bio veliki proizvođač prozorskog stakla proizvodnja se u većim razmjerima odvijala i u Dubrovačkoj Republici. U arhivskim podacima postoji nacrt *ocula* u različitim veličinama koji spominje narudžbu tog tipa stakla.<sup>105</sup>

U 14. i 15. st. na zapadu je bila učestala upotreba *ocula* kao prozorskog stakla na zgradama svjetovnog karaktera i privatnim stambenim objektima, dok se na crkvama uglavnom primjenjivala tehnika vitraja. Na istoku, pod utjecajem bizantskog orijenta, prozori su se zastakljivali *oculima*, uglavljenim u drvene ili olovne okvire.<sup>106</sup>

<sup>93</sup> D. Roller 1951: 137.

<sup>94</sup> V. Han 1971a: 52.

<sup>95</sup> V. Han 1979c: 457-458.

<sup>96</sup> V. Han 1975: 118.

<sup>97</sup> V. Han 1971a: 54-55.

<sup>98</sup> V. Han 1979c: 464.

<sup>99</sup> V. Han 1979c: 461-466.

<sup>100</sup> V. Han 1970: 118-119.

<sup>101</sup> V. Han 1971a: 56.

<sup>102</sup> V. Han 1971a: 56-57.

<sup>103</sup> V. Han 1971b: 220.

<sup>104</sup> V. Han 1972: 202-203.

<sup>105</sup> V. Han 1973: 174-175.

<sup>106</sup> V. Han 1972: 197-198.

probably had stained-glass windows; the Dominican church got windows in 1360s<sup>94</sup>). Although there is a thesis about the production of such glass in Dubrovnik, it is possible that it was imported from Venice or created by the Murano masters in Dubrovnik. The use of the *oculi* was common in church architecture in the Balkans in the late Middle Ages, and the Murano workshops certainly were not the only source of this particular type of glass.<sup>95</sup>

Records from the 15<sup>th</sup> century also mention the glazing of windows. In 1442 master craftsman Petar Božiković was given the task to make *oculi* for Rector's Palace<sup>96</sup>, which were most likely painted.<sup>97</sup> Friar Petar made the windows for Dubrovnik cathedral and the Convent of St. Claire.<sup>98</sup>

In the second quarter of the 15<sup>th</sup> century there are mentions of the glazing of windows in the private homes of noblemen and affluent traders (the palace of Sandalj Hranić, the house of Nalko Dobrić, the house of the Zizer (Cicerović) family).<sup>99</sup> The windows of the residential homes were assembled from *oculi* placed in lead frames, which is typical of the Gothic period virtually throughout the entire Europe.<sup>100</sup>

In the Rector's Palace there are several preserved *oculi* parts, 16.2 cm in diameter, which were found at the Pile Gate and are dated to the 15<sup>th</sup> or 16<sup>th</sup> century. Window glass is primarily mentioned under the name of *oculus*, and subsequently *ogio*, *logio*, and *oziza de vitro*. It was made of white and colored glass. In the contracts regarding the glazing of windows there is mention of protecting the windows with a screen made of copper or iron wire in order to preserve the glass from damage. Making a window out of *oculi* was cheaper than using flat window panes, which contributed to the popularity of this type of window glass.<sup>101</sup>

Data on the production of *oculi* are scarce, but in the second decade of the 16<sup>th</sup> century there is mention of the master craftsman *Johannes Tambarlinus*, who produced glass objects, including circular windows (*vetri tondi*) in Dubrovnik. Tambarlinus had a price list for all glass objects which he made in the City, but, interestingly, only for the *oculi* was it stated that they will be sold at the same price as the Venetian ones. Furthermore, there are plenty records on the import of glass, including *oculi*, from Venice to Dubrovnik, which served as the mediator in the purchase of these items. It is mentioned that Ayas Pasha ordered 200 pieces of colored glass, through the mediation of Dubrovnik, most likely for his endowments in Visoko and Sarajevo, and that he requested them to be identical to those previously ordered by Daut Pasha.<sup>102</sup>

At the end of the 15<sup>th</sup> century, there were frequent orders of Venetian glass from Dubrovnik, which indicates that the demand for glass was great in the Balkans under Ottoman rule and that there was progress in the construction of religious, public and private buildings. This points to the fact that the production of glass in Dubrovnik, although present, could not cater to the needs of the entire market (Balkan hinterlands, its own needs etc.). The glassmaking of the Balkan countries and Turkey was underdeveloped, causing Venice to place their products in the markets of that area.<sup>103</sup>

The *oculi* were made in various sizes and, in addition to Murano, which was a major manufacturer of window glass, their production largely took place in the Dubrovnik Republic. The archival data include drawings of the *oculi* in a variety of sizes and mention an order of this type of glass.<sup>104</sup>

In the 14<sup>th</sup> and 15<sup>th</sup> centuries in the west, the use of the *oculi* as window glass was very common on secular buildings and private residences, while churches generally had stained-glass windows. In the east, under the influence of the Byzantine Orient, windows were glazed using *oculi*, embedded in wooden or lead frames.<sup>105</sup>

<sup>94</sup> V. Han (1979c), pp. 457-458.

<sup>95</sup> V. Han (1975), p. 118.

<sup>96</sup> V. Han (1971a), pp. 54-55.

<sup>97</sup> V. Han (1979c), p. 464.

<sup>98</sup> V. Han (1979c), pp. 461-466.

<sup>99</sup> V. Han (1970), pp. 118-119.

<sup>100</sup> V. Han (1971a), p. 56.

<sup>101</sup> V. Han (1971a), pp. 56-57.

<sup>102</sup> V. Han (1971b), p. 220.

<sup>103</sup> V. Han (1972), pp. 202-203.

<sup>104</sup> V. Han (1973), pp. 174-175.

<sup>105</sup> V. Han (1972), pp. 197-198.

Ulomci *ocula* pronađeni su na lokalitetima u jezgri Dubrovnika i okolici. Ovdje se obrađuju nalazi od bezbojnog i obojenog stakla (prozirno ljubičasta, zelenkasta, žućkasta). Imaju oblik diska sa zadebljanim rubom, na nekima se u sredini zamjećuje tzv. pupak i zadebljanje središnje plohe. Ima i gracijskih primjeraka koji vjerojatno pripadaju 15. ili 16. st. Zamjećuje se drugačija tehnološka izvedba što ukazuje na različite radionice, a materijal se datira od 14. do 16. st. Promjeri su im u rasponu od cca 9 do 18 cm.<sup>107</sup> U dubrovačkom arhivu nalazi se nacrt manjih *ocula* koji su bili dimenzija 10.9 i 11.5 cm.<sup>108</sup>

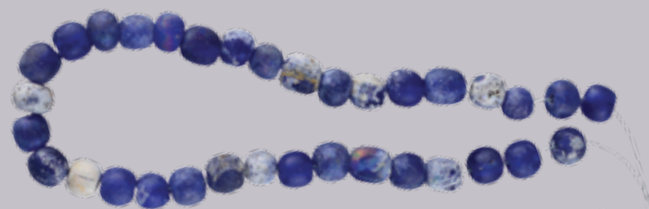
I danas takve građevine u Dubrovniku, Buranu, Veneciji i drugdje, koje su u prošlosti imale kružna staklaca, imaju rekonstruiran isti tip zastakljenja, no nešto moderniziraniji.

Među poligonalnim staklom zastupljeni su ulomci za koje nije sasvim moguće utvrditi kojoj poligonalnoj formi su pripadali. Nekoliko ulomaka ljubičastog i jedan od modrog stakla nađeni su u istraživanju samostana sv. Marije na otoku Mljetu. Svi su nađeni u istraživanju prostora vrta samostana u nasipnom sloju. Datiraju se u renesansno razdoblje, dakle u vrijeme kad je dubrovačka produkcija stakla aktivna. Možda bismo ta stakla mogli dovesti u vezu s dubrovačkim staklarima koji u to vrijeme izrađuju stakla u različitim bojama za mnoge građevine u Dubrovniku.<sup>109</sup>

## KRUNICE

U sklopu izložbe predstavljene su krunice od staklenih zrna koja su bila nanizana na vrpce ili metalnom lančiću. Nosile su se oko vrata, na ruci ili na pojasu. Osim zrna krunica, nađeno je i nekoliko perlica koje su mogle biti dio nakita ili su imale drugačiju funkciju.

Izrada staklenog nakita rano se spominje u Dubrovniku, u doba kada prvi majstori dolaze u Grad. No, ne spominju se staklene perle iako su se tada naveliko proizvodile u Veneciji te izvozile. Upotreba neprozirnog stakla za imitaciju poludragog kamenja i mramora zabilježena je u radionici Vice Radonjića, a također je i njegov brat Luka upotrebljavao istu sirovinu.<sup>110</sup>



<sup>107</sup> N. Topić 2015: 202-204.

<sup>108</sup> V. Han 1972: 195.

<sup>109</sup> V. Han 1979c: 461-464.

<sup>110</sup> V. Han 1981: 168.

Fragments of *oculi* were found at sites in the center of Dubrovnik and its surroundings. This work analyzes findings of clear and colored glass (translucent purple, greenish, yellowish). They have the shape of a disk with a thickened edge, some with the so-called navel or thickening in the center. There are more elegant specimens probably dating to the 15<sup>th</sup> or 16<sup>th</sup> century. The findings also differ in terms of technology applied in their production, which points to different workshops, while the material from which they were made is dated from the 14<sup>th</sup> to the 16<sup>th</sup> century. Their diameters range from approximately 9 to 18 cm.<sup>106</sup> The Archive of Dubrovnik holds drawings of smaller *oculi*, 10.9 and 11.5 cm in diameter.<sup>107</sup>

To this day the buildings in Dubrovnik, Burano, Venice and elsewhere, which in the past had circular window glass, have been reconstructed using the same type of glazing, but somewhat modernized.

As far as polygonal glass is concerned, there are fragments for which it is not quite possible to determine which polygonal shape they belonged to. Several fragments of purple and one fragment of blue glass were found in the research of the convent of St. Mary on the island of Mljet. All were found while exploring the area of the garden of the convent in the fill layer. They are dated to the Renaissance period, i.e. the time when the production of glass in Dubrovnik was quite active. Perhaps such glass could be connected to the glassmakers of Dubrovnik, who at that time produced glass of different colors for numerous buildings in Dubrovnik.<sup>108</sup>

## ROSARIES

The exhibition includes samples of glass rosary beads threaded on a string or a metal chain. They were worn around the neck and the wrist or on a belt. In addition to rosaries, several beads that may have been part of a piece of jewelry or had a different function were also found.

The production of glass jewelry is mentioned early in Dubrovnik, at the time when the first masters came to the City.

However, there is no mention of glass beads although they were widely produced in Venice and exported at the time. The use of opaque glass in the imitation of semi-precious stones and marble was recorded in the workshop of Vice Radonjić, and his brother Luka also used the same raw material.<sup>109</sup> Perhaps they made beads of opaque glass, and one such bead was found in the convent of St. Mary of the Castle in Dubrovnik. Through the mediation of Jewish merchants, people of Dubrovnik traded glass beads and pearls in Egypt (Alexandria) in the 1670s.<sup>110</sup>

Venice was a major manufacturer of glass rosaries, made by casting, cutting and drilling. The rosary makers from the 13<sup>th</sup> and 14<sup>th</sup> centuries had their own associations in major European cities. They were called *paternostreteri*, *maestri margariteri*, *maestri corallieri*. They mainly specialized in particular types of material, and the Venetians of the 16<sup>th</sup> century were especially known for making glass and crystal rosaries. Rosary beads were also made from luxurious materials, mentioned in written documents, such as amber, coral and gold.<sup>111</sup>

During archaeological research of the convent of St. Mary in Dubrovnik, St. Mary on the island of Mljet and the Church of St. Stephen in Dubrovnik, several rosaries were found as grave goods. Some of the rosaries had a medal and a cross. Although typically black, some rosaries were colored (red, green, blue, dark blue). In addition to glass beads, wooden and metal rosary beads were also discovered. Among the findings from Mljet, Ston and Dubrovnik, there are several different beads preserved individually or in small groups. These were most likely rosaries made by combining different less durable materials, such as wood or bone, which were not preserved. The bead that stands out is a black pearl with white spots, onto which dots of red and blue were applied, and which was discovered during the archaeological research of the Benedictine convent on Mljet. It was imported from Venice, probably in the early 16<sup>th</sup> century.<sup>112</sup>

<sup>106</sup> N. Topić (2015), pp. 202-204.

<sup>107</sup> V. Han (1972), p. 195.

<sup>108</sup> V. Han (1979c), pp. 461-464.

<sup>109</sup> V. Han (1981), p. 168.

<sup>110</sup> V. Han (1981), p. 120.

<sup>111</sup> T. Burić (2003), pp. 231-236.

<sup>112</sup> N. Topić (2015), pp. 205-211.

Možda su radili perle od neprozirnog stakla, a jedna takva je nađena u samostanu sv. Marije od Kaštela u Dubrovniku. Posredstvom židovskih trgovaca Dubrovčani trguju staklenim perlama i kuglicama u Egiptu (Aleksandrija) 70-ih godina 16. st.<sup>111</sup>

Venecija je bila veliki proizvođač staklenih krunica, a zrna su se izrađivala lijevanjem, rezanjem i bušenjem. Izrađivači krunica su od 13. i 14. st. imali svoja udruženja u većim europskim gradovima. Nazivali su se *paternostreři*, *maestri margariteri*, *maestri corallieri*. Uglavnom su bili specijalizirani za pojedine materijale, a Venecijanci su od 16. st. osobito bili poznati po izradi staklenih i kristalnih krunica. Krunice su se radile i od luksuznijih materijala, spominju se u pisanim dokumentima, a bili su izrađeni od jantara, koralja, zlata.<sup>112</sup>

U istraživanju samostana sv. Marije u Dubrovniku, sv. Marije na Mljetu i crkve sv. Stjepana u Dubrovniku nađeno je nekoliko krunica kao prilog u grobovima. Neke od krunica imale su medaljice i križiće. Riječ je uglavnom o crnim ali ima i krunica u boji (crvene, zelene, plave, modre). Osim staklenih, nađena su drvena i metalna zrna krunica. Među nalazima s Mljeta, iz Stona i Dubrovnika nekoliko je različitih zrna koja su sačuvana pojedinačno ili u manjim skupinama. Vjerojatno se radi o krunicama koje su bile izrađene u kombinaciji s trošnim materijalima poput drva ili kosti koji su propali. Ističe se crna perla s većim bijelim mrljama na koje su nanesene točkice crvene i plave boje, a potječe iz istraživanja Benediktinskog samostana na Mljetu. Riječ je o venecijanskom importu, vjerojatno iz prve polovice 16. st.<sup>113</sup>

### ČAŠE NA NOZI I TAZZE

Čaše na nozi bile su poznate još u ranije rimsko doba,<sup>114</sup> osobito su se radile u kasnoj antici i predstavljaju mediteranski tip posude, a ti nalazi pripadaju 4. st. ili kasnijem periodu. To su bile čaše s malom nogom i stopom.<sup>115</sup>



<sup>111</sup> V. Han 1981: 120.

<sup>112</sup> T. Burić 2003: 231-236.

<sup>113</sup> N. Topić 2015: 205-211.

<sup>114</sup> C. Isings 1957: 103, Form 86

<sup>115</sup> I. Fadić 1994: 213.

## STEMMED GLASSES AND *TAZZAS*

Stemmed glasses were known as early as the Roman times,<sup>113</sup> they were made especially in the late Roman period, representing a Mediterranean type of vessel, and such findings are dated from the 4<sup>th</sup> century onwards. These were glasses with a small stem and a foot.<sup>114</sup>

Stemmed/footed glasses were used in the late Middle Ages to drink wine, typically by the clergy and the noblemen.<sup>115</sup> Of all the findings analyzed herein, stemmed glasses represent the most numerous, typologically diverse and best preserved group, although, due to their fragile nature, none of them has been fully preserved. They consisted of several segments - a bowl, a stem and a foot, but sometimes these parts were merged together or the stem and the foot formed a single unit. The bowls have been preserved to a smaller extent, including mostly undecorated glass, rarely made by blowing into a mold. Glass stems had various ornaments and represent a typologically rich repertoire. The stems typically had twisted ends, but were sometimes straight.

Among the findings of Dubrovnik, there are glasses with stems in the shape of balusters, glasses with hollow stems, glasses with stems in the form of a lion masks, symbolizing the Venetian Republic, glasses with discoidal / round protrusions on the stem etc. This type of glass was widespread, and possibly produced in Dubrovnik in the 16<sup>th</sup> century. However, we cannot dismiss the thesis that these findings originated from Murano-Venetian or other Western European workshops because there are samples that date from the late 16<sup>th</sup> century, as well as the 17<sup>th</sup> and 18<sup>th</sup> centuries, when there were no more active glass workshops in Dubrovnik.<sup>116</sup>

Since stemmed glasses were considered a luxury, their large number testifies to a higher standard of living in the convents of Dubrovnik, where most of them were discovered. Given that nuns came from patrician and aristocratic families, they brought a dowry with them, which enabled them to buy valuable objects made of glass and ceramics. Nevertheless, such



<sup>113</sup> C. Isings (1957), p. 103, form 86

<sup>114</sup> I. Fadić (1994), p. 213.

<sup>115</sup> R. Liefkes (1997), p. 38.

<sup>116</sup> N. Topić (2015), pp. 156-158.





Staklene replike / *Glass replicas*  
(foto / *photo*: Harry Seaman, The Studio of the Corning Museum of Glass).

Čaše na nozi/stalku su u kasnom srednjem vijeku upotrebljavane za pijenje vina, a uglavnom su ih koristili kler i plemstvo.<sup>116</sup> Od svih nalaza koji se obrađuju u ovom radu čaše na nozi su najbrojnije, tipološki najraznovrsnije i najbolje sačuvane, mada niti jedna nije nađena cjelovita zbog krhke prirode. Rađene su od nekoliko segmenata – čašice, noge i stope, a ponekad su ti dijelovi spajani ili su noga i stopa u jednom dijelu. Čašice su se sačuvale u manjem opsegu, uglavnom se radi o staklu bez ukrasa dok su rijetko izrađivane puhanjem u kalup. Noge čaša su raznovrsno ukrašene i predstavljaju tipološki bogat repertoar. Stope uglavnom imaju uvijene krajeve, a ponekad su ravne bez uvijenog završetka. Među dubrovačkim nalazima su zastupljene čaše na nozi u obliku balustra, čaše na šupljnoj nozi, zatim čaše s nogom u obliku lavlje maske što simbolizira Mletačku republiku, čaše s diskoidalnim / kugličastim zadebljanjima na nozi, i slične varijacije. Takav tip čaša je brojan, a moguće je da se radi o dubrovačkoj proizvodnji 16. st. No, ne može se isključiti mišljenje da ti nalazi potječu iz muransko-venecijanskih ili drugih zapadnoeuropskih radionica jer ima i primjeraka koji se datiraju u kraj 16. st., te kroz 17. ili 18. st., dakle u vrijeme kad dubrovačke radionice stakla prestaju s radom.<sup>117</sup>

Budući da su se čaše na nozi smatrale luksuzom, njihov veliki broj svjedoči o višem životnom standardu u dubrovačkim samostanima jer su tamo nađene u najvećem broju. Budući da su redovnice dolazile iz građanskih i iz vlasteoskih obitelji, donosile su i miraz sa sobom, tako da su si mogle priuštiti skupocijene predmete od stakla i keramike. No, takvih nalaza ima i u svjetovnim objektima, iako u manjoj količini, što ukazuje na upotrebu tih predmeta i među stanovništvom.<sup>118</sup>

Među nalazima je i ručka čaše na nozi izrađena u venecijanskom stilu.<sup>119</sup> Krilati i zmijoliki stalci čaša na nozi radili su se u Veneciji prije 1550., a vjerojatno i u Antwerpju.<sup>120</sup> Čaše s ručkama izrađene u obliku zmija ili morskih konjica te krila bile su popularne u 17. st. i dosta korištene.<sup>121</sup>

Rijetki su pehari među dubrovačkim nalazima koji se ovdje obrađuju. Sačuvan je dio stope pehara od kobaltnoplavog stakla s blago valovitim rubom. Stopa ima narebreni radijalni ukras koji se penje prema nozi; gornji dio posude nije sačuvan.<sup>122</sup> Bliska analogija je kalež iz Murana koji je datiran u kraj 15. st.<sup>123</sup> Dubrovački nalaz vjerojatno pripada početku 16. st.

## TAZZE

*Tazze* su dekorativne zdjele ili čaše na nozi, najviše su upotrebljavane za pijenje a mogle su služiti i za držanje voća, slatkiša ili samo dekorativno.<sup>124</sup> Izrađivale su se od 15.-18. st. Među dubrovačkim nalazima ima više ulomaka staklenih stalaka za koje nije jednostavno odrediti radi li se o uobičajenim čašama na nozi ili je riječ o *tazzama*, koje su nešto pliće i proširenije forme. Sačuvani su uglavnom ulomci noga čaša, dok je recipijent često loše sačuvan ili ga uopće nema. Ponekad baze recipijenata daju naslutiti da se radi o vrlo plitkim posudama. Takve posude spominju i arhivski podaci kao produkte dubrovačkih radionica, a poznato je da su izrađivale u radionici Giovannija Tambarlina početkom 16. st.<sup>125</sup> Spominju se kao *taza-tacia*, a radile su se od običnog ili kristalinskog stakla.<sup>126</sup> Noge su oblikovane slično kao kod čaša, samo što se radi o većim stalcima s plitkim recipijentom. Nekoliko *tazza* ima šuplju nogu u obliku izduženog ljevka, a rjeđe su u formi cigare. Vrlo je vjerojatno da su ti nalazi *tazza* produkti dubrovačkih radionica s kraja 16. st.<sup>127</sup>

<sup>116</sup> R. Liefkes 1997: 38.

<sup>117</sup> N. Topić 2015: 156-158.

<sup>118</sup> N. Topić 2015: 158.

<sup>119</sup> N. Topić 2015: 166-168.

<sup>120</sup> I. DeRaedt et al. 1999: 495.

<sup>121</sup> R. Liefkes 1997: 53, 55, fig. 61.

<sup>122</sup> N. Topić 2015: 168.

<sup>123</sup> A. Gasparetto 1958, kat. 25.

<sup>124</sup> <http://www.cmog.org/research/glass-dictionary> (konzultirano 13.07. 2014.)

<sup>125</sup> V. Han 1971b: 219.

<sup>126</sup> V. Han 1974b: 230.

<sup>127</sup> N. Topić 2015: 169-170.

findings were also discovered in secular buildings, although in smaller quantities, which testifies to the use of these items among the general population as well.<sup>117</sup>

Among the findings, there is a handle of a stemmed glass made in Venetian style.<sup>118</sup> Glasses with winged or serpent stems were made in Venice prior to 1550, and most likely in Antwerp.<sup>119</sup> Glasses with handles made in the form of snakes or sea horses and wings were popular and widely used in the 17<sup>th</sup> century.<sup>120</sup>

There are but few goblets among the findings of Dubrovnik analyzed herein. Part of the stem of a cobalt blue glass goblet with a slightly wavy rim has been preserved. The foot contains a ribbed radial ornament that goes up the stem; the upper part of the vessel has not been preserved.<sup>121</sup> A similar example is a chalice from Murano, dated to the late 15<sup>th</sup> century.<sup>122</sup> The one found in Dubrovnik probably belongs to the beginning of the 16<sup>th</sup> century.

### TAZZAS

*Tazzas* are decorative bowls or stemmed glasses, primarily used for drinking, but they were also used to hold fruit and sweets, or simply as ornaments.<sup>123</sup> They were made in the period from the 15<sup>th</sup> to the 18<sup>th</sup> century. Among the findings of Dubrovnik, there are various fragments of glass stems, which could have belonged either to the usual stemmed glasses or *tazzas*, which are slightly shallower and wider. The preserved fragments mostly include parts of glass stems, while the bowls are typically poorly preserved or not preserved at all. Sometimes the base of the bowl suggests that it is a very shallow vessel. Such vessels are mentioned in the archives as products from the workshops of Dubrovnik, and it is known that they were made in the workshop of Giovanni Tambarlino in the early

16<sup>th</sup> century.<sup>124</sup> They were referred to as *taza-tacia*, and were made of plain or crystalline glass.<sup>125</sup> The stems are similar in shape to glass stems, only larger with a shallower bowl. Several *tazzas* have a hollow stem in the form of an elongated funnel, and less frequently in the form of a cigar. The found *tazzas* were most likely made in the workshops of Dubrovnik in the late 16<sup>th</sup> century.<sup>126</sup>



*Tazza* (foto / photo: M. Skvrce)

<sup>117</sup> N. Topić (2015), p. 158.

<sup>118</sup> N. Topić (2015), pp. 166-168.

<sup>119</sup> I. DeRaedt et al. (1999), p. 495.

<sup>120</sup> R. Liefkes (1997), pp. 53, 55, fig. 61.

<sup>121</sup> N. Topić (2015), p. 168.

<sup>122</sup> A. Gasparetto (1958), catlg. 25.

<sup>123</sup> <http://www.cmog.org/research/glass-dictionary> (visited on 13 July 2014)

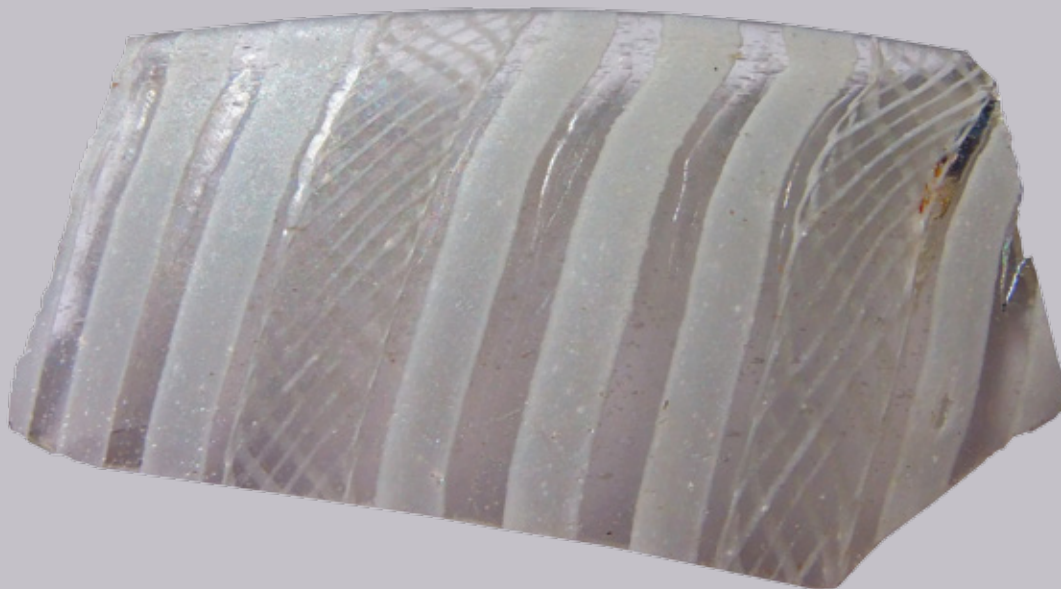
<sup>124</sup> V. Han (1971b), p. 219.

<sup>125</sup> V. Han (1974b), p. 230.

<sup>126</sup> N. Topić (2015), pp. 169-170.



Ulomak zdjelice ukrašen tehnikom *a retorti*  
*Fragment of a bowl decorated using the a retorti technique*



Ulomak zdjelice ukrašen filigranskom tehnikom  
*Fragment of a bowl decorated using the filigree technique*

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Izdavač | *Publisher:* Dom Marina Držića | *House of Marin Držić*

Za izdavača | *For the Publisher:* Nikša Matić

Urednik kataloga i predgovor | *Catalogue editor and foreword* : Marin Ivanović

Koncepcija izložbe i tekst kataloga | *Exhibition concept and catalogue text:* Nikolina Topić

Prijevod na engleski jezik | *English translation:* Kristina Juričić & Ivana Žiger

Likovno oblikovanje | *Design & Layout:* Nedim Meco - Mec dizajn Dubrovnik

Fotografije | *Photographs:* Miho Skvrce & Nikolina Topić

Postav izložbe | *Exhibition layout:* Marin Ivanović

Tehnička realizacija | *Technical support:* Marita Dužević

Tisak | *Printed by:* Stega tisak, Zagreb

ISBN: 978-953-7905-08-8

CIP zapis dostupan u računalnom Skupnom katalogu  
hrvatskih knjižnica pod brojem 570109099

Dubrovnik, siječanj 2017.



dmd | Dom Marina Držića

Široka ulica 7 | 20000 Dubrovnik | [www.muzej-marindržic.eu](http://www.muzej-marindržic.eu)

ISBN: 978-953-7905-08-8