HVAR PRESENTS

MULTIMEDIA EXHIBITION

HVAR, THE ARSENAL

15. 5. — 20. 7. 2023.

GET TO KNOW THE GREATEST CROATIAN MINDS.
EXPLORE THEIR INVENTIONS AND ACHIEVEMENTS OF CIVILIZATION.
DISCOVER HOW THEY CHANGED THE WORLD.

GRAD HVAR

HVAR TOURIST BOARD 155 YEARS OF ORGANISED TOURISM

VISITHVAR.HR

Hvar presents: Made in Croatia
Hvar predstavlja: Made in Croatia

In the historical building of Arsenal in Hvar, one of the trademarks of the city, will be presented the founding fathers of Croatian identity, to whom we owe numerous inventions, knowledge, achievements of civilization and artefacts of cultural heritage without which it is almost impossible to imagine the functioning of modern life. With this tailor-made exhibition, visitors to the city would have a unique opportunity to explore cultural content and to meet with the great men, their inventions or works of art that have left the footprint around the globe.

Originality, visionary, wide application of ideas and inventions were the criteria for the selection of the individuals represented at the exhibition. The unique national, scientific, and cultural heritage that they left us as an inheritance is presented in the curatorial conception of dr. sc. Anita Ruso Brečić.

A total of 38 topics are presented at the exhibition. Certain topics refer to individuals such as Nikola Tesla, Faust Vrančić, Dora Maar, Slavoljub Eduard Penkala. Ivan Vučetić and Hanibal Lucić, while other topics refer to groups of people (from the same field of activity) and cultural heritage specific to the island of Hvar and/or Croatia.

The main guiding thought of the exhibition concept is to create links between the inventive and artistic past, present and future. Various works of art, author's designs, patents, archival documents, and videos, as well as appliances and devices created according to the patents and ideas of deserving individuals can be viewed in the exhibition.

Peek into the wonderful world of exceptional minds!

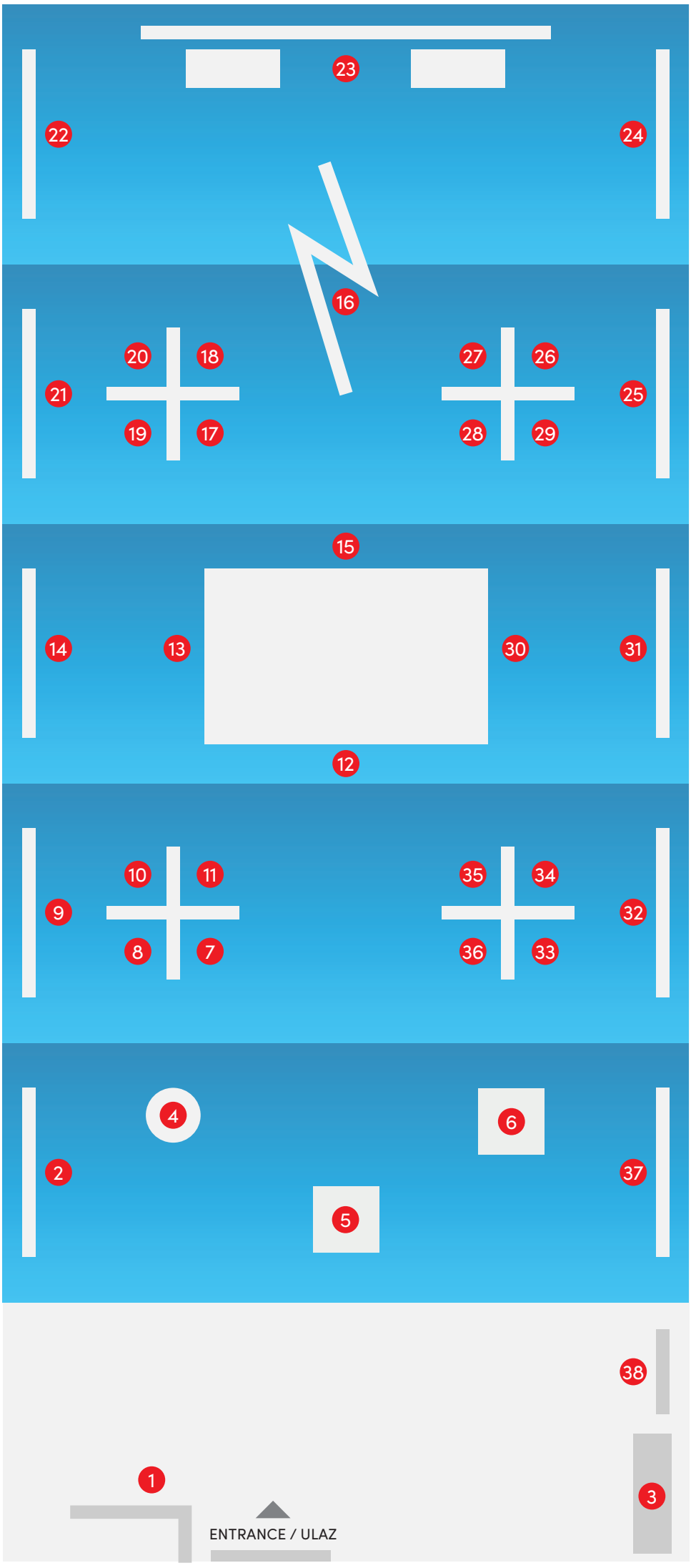
U povijesnoj građevini, hvarskom Arsenalu, jednom od zaštitnih znakova grada, smisao je predstaviti graditelje temelja hrvatskog identiteta kojima dugujemo brojne izume, saznanja, civilizacijske tekovine i artefakte kulturne baštine bez kojih je danas gotovo nemoguće zamisliti funkcioniranje suvremenog života. Ovom posebno skrojenom izložbom ponudit će se jedinstveni kulturni sadržaj i susret s velikanima, njihovim izumima ili umjetničkim djelima koja su ostavila trag na svjetskoj razini.

Originalnost, vizionarstvo, široka primjena ideja i izuma bili su kriterij za odabir pojedinaca zastupljenih na izložbi. Jedinstveno nacionalno, znanstveno i kulturno nasljeđe koju su nam ostavili u baštinjenje predstavljeno je u kustoskoj koncepciji dr. sc. Anite Ruso Brečić.

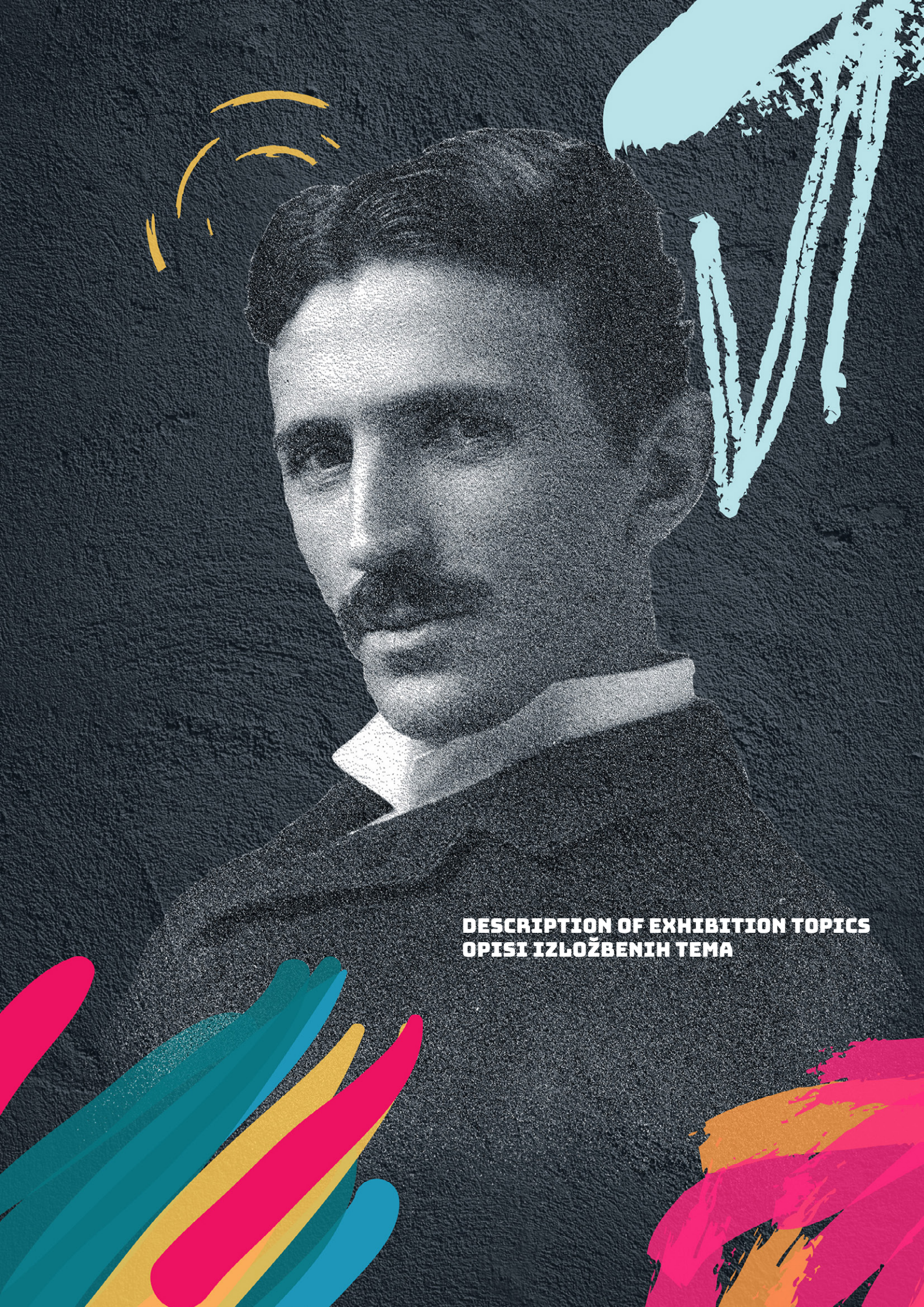
Na izložbi je predstavljeno ukupno 38 tema. Određene teme odnose se na pojedince kao što su Nikola Tesla, Faust Vrančić, Doraa Maar, Slavoljub Eduard Penkala, Ivan Vučetić i Hanibal Lucić , dok se određene teme odnose na grupe ljudi (iz istog područja djelovanja) i izdvojenu kulturnu baštinu specifičnu za otok Hvar i/ili Hrvatsku.

Glavna misao vodilja izložbenog koncepta je stvaranje poveznica izumiteljske i umjetničke prošlosti, sadašnjosti i budućnosti. U postavu će se moći razgledati razne umjetnine, autorski nacrti, patenti, arhivski dokumenti i video zapisi te uređaji i naprave nastale prema patentima i idejama zaslužnih pojedinaca.

Dobrodošli u čudesan svijet izvanserijskih umova!



1. Dry stone wall / Suhozid
2. Glagolitic script / Glagoljica
3. Benedikt Kotruljević
4. The Uskoks / Uskoci
5. Hvar Agave fiber lace / Agavina hvarska čipka
6. Four artists from Stari Grad / Četiri starogradska umjetnika
7. Grgur Bučić
8. Lavoslav Ružička, Vladimir Prelog
9. Ivan Blaž Lupis Vukić
10. Ivan Krstitelj Rabljanin
11. Juraj Julije Klović
12. Ivan Vučetić
13. Ruđer Josip Bošković
14. Faust Vrančić
15. Herman Potočnik Noordung
16. Nikola Tesla
17. Academy of fine Arts Zagreb and foundry / Akademija likovnih umjetnosti Zagreb i Ljevaonica ALU
18. New Tendencies / Nove Tendencije
19. Milka Trnina i Zinka Kunc-Milanov
20. Mia Čorak-Slavenksa
21. Dora Maar
22. Zagreb school of animated film / Zagrebačka škola crtanog filma
23. Ivan Meštrović
24. Juraj Dalmatinac
25. Antun Lučić
26. Andrija Štampar
27. Andrija Mohorovičić
28. Slavoljub Eduard Penkala
29. Josip Belušić
30. Marcel Kiepach
31. Marin Getaldić
32. David Schwartz
33. Ivo Andrić
34. Marko Marulić
35. Petar Hektorović
36. Hanibal Lucić
37. Mario Puratić (Puretić)
38. Croatian sports champions / Hrvatski sportski velikani



DESCRIPTION OF EXHIBITION TOPICS
OPISI IZLOŽBENIH TEMA

1

Dry stone-walls and Stari grad plain
Suhozid i Starogradsko polje na Hvaru

The art of building dry stone-walls is an art of building structures made of stone without the use of cohesive materials. This technique has been used on the Adriatic-Dinaric area of Croatia since prehistory until today to prevent the soil from being washed away from the island's karst, to demarcate the property and provide a piece of land on which to plant agricultural crops.

The field in Stari Grad, which is 6 km long and around 2 km wide is the best-preserved land on the whole of the Mediterranean based on the original Greek division of dry stone-walls.

Its basic structure made according to the Greek division of plots 2400 years ago has remained almost intact until today; it has been clearly divided into the rectangular plots with the dimensions of 118 m × 905 m. The field has been crossed with nets of numerous dry stone-walls of different dimensions since the ancient times. It is dotted with round stone field houses called trima, kažun or bunja, numerous water tanks, villas rusticas and late antic and old Croatian churches.

In addition, Stari Grad plain is the largest and the most fertile field on the Adriatic islands, which has retained its agricultural purpose even today through the most common crops - olives and vines.

This historical and natural reserve, which has not changed much since antiquity to the present day, has been inscribed on the UNESCO World Heritage List, as a cultural landscape, and the art of dry wall construction is on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity.

Umijeće suhozidne gradnje je umijeće izrade konstrukcija od kamena bez upotrebe vezivnog materijala. Ovim se umijećem čovjek na jadransko-dinarskom području Hrvatske služi od prapovijesti do danas kako bi spriječili ispiranje zemlje s otočkog krša, omeđili posjed te omogućili šaku zemlje na kojem bi bile zasađene poljoprivredne kulture.

Starogradsko polje, dugo oko 6 km i široko oko 2 km, najbolje je sačuvano zemljište s izvornom grčkom podjelom u kamenim suhozidima na cijelom Sredozemlju.

Njegova osnovna struktura zadana grčkom parcelizacijom prije 2400 godina ostala je gotovo netaknuta do danas: jasno je podijeljeno na 73 pravokutne čestice dimenzija oko 181 m × 905 m. Polje je premreženo brojnim kamenim suhozidima različitih dimenzija od najstarijih vremena, načičkano kružnim poljskim kućicama – trimima, kažunima ili bunjama, brojnim gustirnama za vodu, villama rusticama i kasnoantičkim i starohrvatskim crkvicama.

Osim toga, Starogradsko polje je najveće i najplodnije polje na jadranskim otocima koje je i danas zadržalo poljoprivrednu namjenu i to kroz najčešće kulture – maslinu i vinovu lozu.

Ovaj povijesni i prirodni rezervat, koji se nije bitno promijenio od antike do danas, kao kulturni krajolik upisan je na UNESCO-v Popis svjetske baštine, a umijeće suhozidne gradnje na UNESCO-ov Reprezentativni popis nematerijalne kulturne baštine čovječanstva.

2

Glagolitic script
Glagoljica

The Baška Tablet is the most important and one of the oldest Croatian epigraphic monuments written in Glagolitic letters which dates from around the year 1100. It was named after the town of Baška on Krk, where it was found in the church of St. Lucy near Jurandvor. Today it is kept in the HAZU (the Croatian Academy of Sciences and Arts) palace in Zagreb.

Along with Cyrillic, Glagolitic is one of the two Slavic scripts. In letter morphology, it shows no similarity with any known historical script. The prevailing belief is that it is the oldest script of the Slavic language, which was compiled by Constantine the Philosopher in the middle of the 9th century for the purposes of spreading Christianity among the Moravian Slavs. The name Glagolitic is derived from the verb glagolati, which originally means to speak and to perform the service of God in the Old Slavic language.

The Croats started writing in the Glagolitic script in the second half of the 9th century. Since the end of the 12th century, they had been the only nation (apart from short Czech and Polish episodes in the 14th century) that used and developed the Glagolitic script. In the 16th century, Latin began to dominate. Glagolitic remained the longest in the liturgy (the last Glagolitic Missal was printed in Rome in 1893).

Bašćanska ploča (Baščanska ploča) najvažniji je i jedan od najstarijih hrvatskih epigrafskih spomenika pisan glagoljičnim slovima oko 1100. godine. Ime je dobila po mjestu Baška na Krku gdje je pronađena u crkvi sv. Lucije kraj Jurandvora. Danas se čuva u palači HAZU-a u Zagrebu.

Glagoljica je uz ćirilicu jedno od dva slavenska pisma. U slovnoj morfologiji ne pokazuje sličnosti ni s kojim poznatim povijesnim pismom. Prevladava uvjerenje kako je to najstarije pismo slavenskoga jezika koje je sredinom 9. st. sastavio Konstantin Filozof za potrebe širenja kršćanstva među moravskim Slavenima. Ime glagoljica izvedeno je prema glagolu glagoljati čije je izvorno značenje govoriti, a označuje i obavljanje službe Božje na staroslavenskom jeziku.

Hrvati su glagoljicom počeli pisati u drugoj polovini 9. st. Od kraja 12. st. jedini su narod (uz kratke češke i poljske epizode u 14. st.) koji upotrebljava i razvija glagoljicu. U 16. st. počinje prevladavati latinica. Glagoljica se najdulje zadržala u liturgiji (posljednji je glagoljski misal otisnut 1893. u Rimu).

3

Benedikt Kotruljević

(Dubrovnik, c. 1400 – Aquila, 1486)

(Dubrovnik, oko 1400. – Aquila, 1486.)

Dubrovnik-born Benedikt Kotruljević was a merchant and an economic writer whose work put him at the top of the world's economic thought. Apart from serving as a Consul of Dubrovnik and the Grand Judge, State Minister, and Director of Mint in Naples, Kotruljević was also a merchant. He wrote four books, of which the most famous is the Book on the *Art of Commerce (Il libro dell'arte di Mercatura)*. This is the oldest known work on the skill of entrepreneurship and the theory of accountancy and balancing.

The manuscript in its amended form was published in 1573 by a philosopher and polymath Frane Petrić under the title *On Commerce and the Perfect Merchant (Della mercatura et del mercante perfetto)*. The original text was not published until 1990, when the significance of Kotruljević's work truly came to the fore. Kotruljević is one of the first economic writers who wrote on the new capitalist society of the Mediterranean and Europe. He believed that commerce creates the wealth of nations and individuals and accentuated the importance of diligence and special work ethics.

His work achieved global significance due to the descriptions of double-entry bookkeeping, which is also applied today. Kotruljević wrote on double-entry bookkeeping 36 years before the Italian L. Pacioli, who is often falsely attributed as the founder of modern economic analysis with double-entry bookkeeping.

Bookkeeping is the most important part of accountancy, since it is used to record financial transactions conducted by a company. There exists single- and double-entry bookkeeping. Single-entry bookkeeping records each transaction only once, while double-entry bookkeeping inscribes each instance on two different accounts of the general ledger, and each change in business is inscribed twice in it. Double-entry bookkeeping is therefore safer and ultimately provides much more information related to business.

Dubrovčanin Benedikt Kotruljević ekonomski je pisac koji se svojim djelom uvrstio u vrh svjetske ekonomske misli. Osim što je u Napulju obnašao dužnost dubrovačkoga konzula te velikoga sudca, državnoga ministra i ravnatelja kovnice novca, Kotruljević je bio i trgovac. Napisao je četiri knjige od kojih je najpoznatija *Knjiga o umijeću trgovine (Il libro dell'arte di Mercatura)*. To je najstarije poznato djelo o poduzetničkom umijeću te teoriji knjigovodstva i bilanciranja.

Rukopis je 1573. u izmijenjenu obliku izdao filozof i polihistor Frane Petrić pod naslovom *O trgovini i o savršenom trgovcu (Della mercatura et del mercante perfetto)*. Izvorni tekst objavljen je tek 1990. kada je značaj Kotruljevićeva djela izašao posve na vidjelo. Kotruljević je jedan od prvih ekonomskih pisaca koji je pisao o novom kapitalističkom društvu Sredozemlja i Europe. Smatrao je kako trgovina stvara bogatstva naroda i pojedinaca te je naglasio važnost marljivosti i posebne etike rada.

Globalni značaj njegov rad dostigao je zahvaljujući opisima dvojnoga knjigovodstva koje se i danas primjenjuje. Kotruljević je o dvojnom knjigovodstvu pisao 36 godina prije Talijana L. Paciolija, kojega se često pogrešno smatra osnivačem moderne ekonomske analize s dvojnim knjigovodstvom.

Knjigovodstvo je najvažniji dio računovodstva jer se njime evidentiraju financijske transakcije koje neko poduzeće provodi. Postoji jednostavno i dvojno knjigovodstvo. Jednostavno knjigovodstvo evidentira svaku transakciju samo jednom dok se u dvojnom knjigovodstvu svaki događaj upisuje na dva različita računa (konta) glavne knjige računa te se u njemu svaka poslovna promjena upisuje dva puta. Dvojno knjiženje zato je sigurnije i u konačnici daje mnogo više informacija o poslovanju.

4

The Uskoks
Uskoci

The Uskoks were an organized group of *hajduks*, natives from Croatia and Bosnia and Herzegovina who were displaced because of the Ottoman threat. They "jumped in" to the crews of the Croatian border forts and continued the fight against the Ottomans with them. For a whole century, they were the only outpost of Christianity and Western Europe against the Ottomans. In that period, part of the Croatian lands along the border areas was completely devastated, and only in certain places, such as Senj, there were well-fortified refuges of the remaining autochthonous population. In the new occasion the exiles of noble origin shaped in Klis and Senj a new way of warfare and Uskok values.

When the Austrian court paid tribute to the sultan, the Uskoks showed the whole of Europe that they could successfully deal with the Ottoman power. The Uskoks disappeared from the historical stage when the Habsburg Monarchy found enough strength to resist the Ottoman Empire. The Ottoman-Austrian war (1593 – 1606) established the balance of power. Then the Uskoks become a source of instability among the Christian states. They left the historical stage undefeated. The Uskoks epic represents the last resistance of the Croatian people against foreign dominance on the Adriatic.

Uskoci su organizirane grupe hajduka starosjedioci iz Hrvatske i Bosne i Hercegovine koji su se raselili pred osmanskom opasnošću. Oni su „uskočili" k posadama hrvatskih graničnih utvrda te s njima nastavili borbu protiv Osmanlija. Cijelo jedno stoljeće bili su jedina predstraža kršćanstva i zapadne Europe protiv Osmanlija. U tom je razdoblju dio hrvatskih zemalja uz granična područja bio potpuno opustošen, a samo su se u pojedinim mjestima, poput Senja, nalazila dobro utvrđena pribježišta preostalog autohtonoga stanovništva. Prognanici plemenita podrijetla u novonastalim su prilikama oblikovali u Klisu i Senju novi način ratovanja i uskočkih vrijednosti.

Kada je austrijski dvor plaćao danak sultanu, uskoci su čitavoj Europi pokazali da se mogu uspješno nositi s osmanskom silom. Uskoci nestaju s povijesne pozornice kada je Habsburška Monarhija smogla dovoljno snage da se odupre Osmanskom Carstvu. Osmansko-austrijski rat (1593. – 1606.) uspostavio je ravnotežu snaga. Tada uskoci postaju izvor nestabilnosti između kršćanskih država. Neporaženi su sišli s povijesne pozornice. Uskočka epopeja predstavlja zadnji otpor hrvatskog naroda protiv tuđinske prevlasti na Jadranu.

5

Hvar agave fiber lace
Agavina hvarska čipka

The tradition of lace making in Croatia has its roots in the year 1400. As elsewhere, in the very beginning the lace in Croatia was made for the clergy and noblemen. However, in time the lacemaking was associated with rural population, which was not the case in other parts of Europe. Today lacemaking is a part of Croatian ethnographic heritage as well as laces made in Pag, Lepoglava and Hvar which are all included in UNESCO's Representative List of the Intangible Cultural Heritage of Humanity.

The nuns make lace from agave threads in the Benedictine monastery in Hvar, which was founded in 1664 and is in a house bequeathed to the Benedictine order by the poet Hanibal Lucić.

The Benedictine nuns vowed to remain inside the monastery forever and to live under the motto coined by St. Benedict: "Ora et labora", i.e., pray and work. Committed to their mission for more than 150 years, they have been making a special type of agave lace.

Thanks to them, the technique of processing agave leaves harvested at the foot of the Hvar fortress, as well as the production of shiny threads that are used to make this unique lace with the help of a sewing needle or a metal needle for nets, without a blueprint or template, has not fallen into oblivion.

The museum of the Hvar Benedictine monastery is a unique place where you can see and buy this unique lace, which, in addition to Croatian heritage, represents the special artistic expression of an individual nun.

Tradicija čipkarstva u Hrvatskoj vuče svoje korijene još iz 1400. godine. Kao i drugdje u samim početcima čipka se i u Hrvatskoj izrađivala za kler i plemiće, no s vremenom se čipkarstvo vezuje uz seosku populaciju što drugdje u Europi nije bio slučaj. Danas čipkarstvo čini dio hrvatske etnografske baštine te su paška, lepoglavska i hvarska čipka, upisane na UNESCO-ov Reprezentativni popis nematerijalne kulturne baštine čovječanstva.

U Benediktinskom samostanu u Hvaru, koji je osnovan 1664. godine i nalazi se u kući koju je benediktinskom redu oporučno ostavio pjesnik Hanibal Lucić, časne sestre izrađuju čipku od agavinih niti.

Benediktinke su se svojim zavjetom obvezale zauvijek ostati unutar samostana i živjeti pod geslom sv. Benedikta: „Ora et labora“ tj. moli i radi. Predane svom poslanju već više od 150 godina izrađuju i posebnu vrstu čipke agave.

Zahvaljujući njima, tehnika prerade agavinih listova ubranih podno hvarske tvrđave, izrada sjajnih niti kojima se uz pomoću šivaće igle ili metalne igle za mreže, bez nacrta i predloška, izrađuje ova jedinstvenu čipka, nije pala u zaborav.

Muzej hvarskog benediktinskog samostana jedinstveno je mjesto u kojem možete pogledati i kupiti ovu unikatnu čipku koja osim hrvatske baštine predstavlja posebni umjetnički izričaj pojedine časne sestre.

6

Four artist from Stari Grad
Četiri starogradska umjetnika

JURAJ PLANČIĆ (Stari Grad, 1899 – Paris, 1930) studied at the Academy of Fine Arts in Zagreb, where he graduated from in 1925, after which he went to live in Paris, where he experienced certain successes at the Autumn Salon in 1928 and at the Independent Salon in the Grand Palais and a solo exhibition at the Galerie de Seine in 1929, after which he died. Before leaving for Paris in 1926, he painted several landscapes and portraits, which are among the top works of Croatian new realism of classical and magical expression.

BARTOL PETRIĆ (Stari Grad, 1899 – Split, 1974) is a Croatian painter and graphic artist who also obtained a diploma from the Academy of Fine Arts in Zagreb in 1929. From 1948 until his retirement, he was a conservator and draftsman at the Museum of Croatian Antiquities in Split. He created native motifs, especially landscapes and views, among which the views of the Old Town on Hvar stand out.

PAVAO DULČIĆ (Stari Grad, 1947 - Split, 1974) was the leader of the Red Peristyle, a group of art students who painted the Split Peristyle (the central area of Diocletian's Palace, built around 300 AD) red in 1968. This was the first conceptual act in Dalmatia.

MAGDA DULČIĆ (Stari Grad, 1965 – Stari Grad, 2016) was a freelance artist, animator, illustrator, and author of comics. She is the first female author of comics in Croatia. Magda Dulčić also illustrated books and picture books and was awarded at many international animation film festivals.

JURAJ PLANČIĆ (Stari Grad, 1899. – Pariz, 1930.) školovao se na Akademiji likovnih umjetnosti u Zagrebu koju je završio 1925. nakon čega odlazi živjeti u Pariz u kojem je doživio stanovite uspjehe na Jesenskome salonu 1928. te na Salonu nezavisnih u Grand Palaisu i samostalnoj izložbi u Galerie de Seine 1929. nakon čega umire. Prije odlaska u Pariz 1926. naslikao je nekoliko krajolika i portreta koji se ubrajaju u vrhunska djela hrvatskih novih realizama klasičnog i magičnog izričaja.

BARTOL PETRIĆ (Stari Grad, 1899. – Split, 1974.) hrvatski je slikar i grafičar koji je također stekao diplomu ALU Zagreb i to 1929. godine. Od 1948. do umirovljenja bio je konzervator i crtač u Muzeju hrvatskih starina u Splitu. Stvarao je zavičajne motive, osobito krajolike i vedute među kojima se posebno ističu vedute Staroga Grada na Hvaru.

PAVAO DULČIĆ (Stari Grad, 1947. – Split, 1974.) bio je na čelu grupe studenata umjetnosti Crveni peristil koja je 1968. godine obojila splitski Peristil (središnji prostor Dioklecijanove palače sagrađene oko 300. godine) u crveno, što je bio prvi konceptualni čin u Dalmaciji.

MAGDA DULČIĆ (Stari Grad, 1965. – Stari Grad, 2016.) bila je slobodna umjetnica, animatorica, ilustratorica i autorica stripova. Prva je ženska autorica stripa u Hrvatskoj, bavila se ilustriranjem knjiga i slikovnica te je nagrađivana na mnogim svjetskim festivalima animiranog filma.

7

Grgur Bučić

(Hvar, 1829 – Hvar, 1911)

(Hvar, 1829. – Hvar, 1911.)

Grgur Bučić is a Croatian natural scientist and amateur archaeologist. In 1858, in the telegraph office in Hvar, he established a tide and meteorological station, which he ran for 40 years. He was involved in a wide range of research, from climatological, biological, zoological, paleontological, mineralogical to oceanographic, and archaeology. He was among the first to conduct archaeological excavations in Croatia. On the island of Hvar, he excavated Illyrian burial mounds and caves from the younger Stone Age.

He received worldwide recognition for his sponge breeding experiments when seven new species of sponges, shrimps and fish were named after him: the goblin fish is also called Bučić's glamoč/glamac (Gobius bucchichi) in his honor. Also, the following species bear his name to honor him: the insect Orellia bucchichi, the amphipod Nicea bucchichi, the sponges Tethya bucchichi, Anphoriscus bucchichi and A. gregorii, and the polychaete Myzostoma bucchichi. He was awarded several times and was named an honorary doctor of the University of Graz (1886).

In Hanibal Lucić's summer residence on Hvar, there is a natural history cabinet named after Grgur Bučić. It contains a collection of more than 350 items: various instruments, fossils, preparations, old natural history printed editions, herbarium, and others.

Grgur Bučić hrvatski je prirodoslovac i arheolog amater. U telegrafskom uredu u Hvaru 1858. osnovao je mareometarsku i meteorološku postaju, koju je vodio 40 godina. Bavio se širokim spektrom istraživanja, od klimatoloških, bioloških, zooloških, paleontoloških, mineraloških do oceanografskih, te arheologijom. Među prvima je izvodio arheološka iskapanja u Hrvatskoj. Na otoku Hvaru iskapao je ilirske grobne humke i spilje iz mlađeg kamenog doba.

Za pokuse s uzgojem spužvi dobio je svjetsko priznanje kad je njegovim imenom nazvano sedam novih vrsta spužava, račića i riba: riba glavoč bjelčić naziva se još i Bučićev glamoč/glamac *(Gobius bucchichi)* njemu u čast. Osim nje, njemu u čast ove vrste nose njegovo ime: kukac *Orellia bucchichi*, amfipod *Nicea bucchichi*, spužve *Tethya bucchichi*, *Anphoriscus bucchichi* i *A. gregorii* te polihet *Myzostoma bucchichi*. Više puta je odlikovan, a imenovan je počasnim doktorom Sveučilišta u Grazu (1886).

U ljetnikovcu Hanibala Lucića na Hvaru nalazi se prirodoslovni kabinet koji nosi naslov po Grguru Bučiću. U njemu je zbirka s više od 350 predmeta: razni instrumenti, okamine, preparati, stara prirodoslovna tiskana izdanja, herbarij i ostalo.

8a

Lavoslav Ružička

(Vukovar, 1887 - Mammern, 1976)

(Vukovar, 1887. - Mammern, 1976.)

Lavoslav Ružička, called Leopold by his real name, was born in Vukovar. He decided later in life to Croatize his name as Lavoslav. He was a chemist, specialising in organic chemistry. In 1939, he won the Nobel Prize for chemistry jointly with German chemist A. F. J. Butenandt for their research of polymethylenes and higher terpenes. Because of the war, Ružička could not receive the Nobel Prize in person at the ceremony in Stockholm. The Swedish ambassador gave him the prize at a special ceremony at the u ETH (Eidgenössische Technische Hochschule). Ružička's research focused on large rings, higher terpenes, and male sex hormones.

In 1917, Ružička became a Swiss national and became a titular professor. He worked in Geneva and in Utrecht and in 1929, he was appointed professor and head of the Organic Chemistry lab at the ETH. He went back to Zürich because he wanted to continue his long and fruitful collaboration with the Swiss pharmaceutical and perfume industry. He did research in the field of perfume synthesis. He proved that two musk perfumes, muscone and civetone, were in fact macrocyclic ketones. This made it possible to synthetise them and produce costly musk perfumes industrially. He also forged links with the pharma industry.

Ružička solved the riddle of the structure of pyrethrin, an insecticide obtained from a plant commonly found in Dalmatia. His research in the structure of terpenes and polyterpenes led him to study steroids. He solved the problem of the synthesis and structure of androsterone, a male sex hormone. Ružička was offered a professorship in Zagreb but could not accept because the Zagreb University did not have sufficient research resources. He invited Vladimir Prelog to come to his school in Zürich and mentored him. Prelog would later win the Nobel Prize for chemistry.

Together with his associates, he published as many as 583 scientific papers, mostly in the period from 1930 to 1950. He was the editor and on the editorial boards of several scientific journals. He received several prizes and awards, including the Marcel Benoist prize (the highest Swiss scientific prize) and eight honoris causa doctorates. He was a member of 18 academies of sciences, including the Papal Academy. Although he had taken Swiss citizenship, he considered Croatia to be his homeland and he supported several Croatian chemists.

Vukovarac Lavoslav Ružička, pravoga imena Leopold koje je sam kroatizirao u Lavoslav, organski je kemičar, dobitnik Nobelove nagrade za kemiju 1939. koju je podijelio s njemačkim kemičarom A. F. J. Butenandtom za istraživanje polimetilena i viših terpena. Zbog ratnih prilika, Ružička nije prisustvovao dodjeli Nobelove nagrade u Stockholmu, već mu je nagradu uručio švedski veleposlanik na posebnoj svečanosti u ETH-u (Eidgenössische Technische Hochschule). U svom znanstvenom radu Ružička se bavio velikim prstenima, višim terpenima i muškim spolnim hormonima.

Ružička je 1917. dobio švicarsko državljanstvo te postao titularni profesor. Radio je u Ženevi i u Utrechtu, a 1929. postao je profesor i predstojnik Laboratorija za organsku kemiju na ETH-u. U Zürich se vratio zbog mogućnosti koje je pružala švicarska farmaceutska industrija i industrija mirisa, s kojima je dugo godina uspješno surađivao. Bavio se istraživanjem sinteze mirisa. Dokazao je da su mošusni mirisi, muskom i cibeton, makrociklički ketoni, što je omogućilo sintetsku proizvodnju skupocjenih mošusnih mirisa i povezalo ga s farmaceutskom industrijom.

Ružička je riješio pitanje strukture piretrina, insekticida dobivenoga iz dalmatinskoga buhača. Istraživanja na strukturi terpena i politerpena dovela su ga do istraživanja steroida tako da je riješio i sintezu i strukturu muškoga spolnoga hormona androsterona. Ružička je dobio ponudu i za profesuru u Zagrebu, no ona se nije realizirala zbog nedostatnih sredstava za istraživački rad na Zagrebačkom sveučilištu. U Zürich je pozvao Vladimira Preloga, budućega hrvatskoga nobelovca kojemu je bio mentor.

Sa suradnicima je objavio čak 583 znanstvena rada i to većinom u razdoblju između 1930. i 1950. Bio je urednik te član uredništva mnogih znanstvenih časopisa. Nositelj je brojnih priznanja i dobitnik nagrade „Marcel Benoit" (najveće znanstveno priznanje Švicarske) te laureat osam počasnih doktorata, član 18 znanstvenih akademija uključujući i Papinsku akademiju. Dodijeljeno mu je 13 različitih medalja i nagrada. Iako je primio švicarsko državljanstvo, Hrvatsku je smatrao svojom domovinom te je pomogao brojnim hrvatskim kemičarima.

8b

Vladimir Prelog

(Sarajevo, 1906 – Zürich, 1998)

(Sarajevo, 1906. – Zürich, 1998.)

Vladimir Prelog is a Nobel Prize-winning chemist from Croatia. During childhood and adolescence his family moved often, as his father, a teacher, moved from school to school. He was born in Sarajevo, but he spent his childhood and went to school in Osijek and Zagreb.

He got his bachelor's and doctoral degrees in Prague at the Czech Technical University. He published several high-profile papers, and the Technical Faculty in Zagreb offered him a teaching position at the Institute for Organic Chemistry. On his return to Croatia, he started his career as a teacher. As he developed an interest in organic synthetic chemistry, he launched collaboration between his faculty and Kaštel company (which became PLIVA). Soon they made major discoveries in sulphonamides, quinoalkaloids, barbiturates and other biologically active substances.

In the six years Prelog worked at the Institute, his working group published 48 papers. Their triumphs include the successful launch of the production of Streptazol, a drug to treat streptococcal infections, and the synthetisation of adamantane, isolated from the Moravian oil. As a result of their success, Zagreb was world-famous in the field of organic chemistry. His colleagues were called "Prelog's school of organic chemistry".

Vladimir Prelog devoted his entire life to research. During his career, he published more than 400 papers. He is famous for defining the rule that defines the relationship between reactants and products, known as Prelog's rule and for his research into stereochemistry of organic molecules and reactions for which he received the Nobel Prize for chemistry in 1975.

Vladimir Prelog hrvatski je kemičar nobelovac. U djetinjstvu i mladosti često se selio radi očeve profesorske dužnosti. Iako je rođen u Sarajevu, svoje djetinjstvo i školovanje proveo je u Osijeku i Zagrebu.

U Pragu je diplomirao i doktorirao na Visokoj tehničkoj školi. Objavio je nekoliko zapaženih radova zbog kojih mu je Tehnički fakultet u Zagrebu ponudio poziciju za docentsko mjesto na Zavodu za organsku kemiju. Povratkom u Hrvatsku započinje svoju pedagošku karijeru. Zbog interesa za organsku sintetsku kemiju, dogovorio je suradnju između Fakulteta i tvrtke Kaštel (danas PLIVA). Nedugo potom ostvarili su znatna otkrića na području sulfonamida, kina-alkaloida, barbiturata i drugih biološki aktivnih tvari.

Prelogova radna skupina u šest godina njegova rada na Zavodu objavila je 48 znanstvenih radova; uspjesi uključuju uspostavu proizvodnje *Streptazola* – lijeka protiv streptokoka, kao i sintetizaciju adamantana izoliranoga iz moravske nafte. Zbog njihovih uspjeha, Zagreb je bio svjetski prepoznat na polju organske kemije, a njegovi su suradnici nazvani „Prelogovom školom organske kemije".

Tijekom svoje znanstvene karijere objavio je više od 400 radova. Njegovi najpoznatiji rezultati su definiranje pravila koje određuje odnose reaktanata i produkata, nazvano *Prelogovo pravilo*, te istraživanja stereokemije organskih molekula i reakcija zbog kojih je 1975. dobio Nobelovu nagradu za kemiju.

9

Ivan Blaž Lupis Vukić

(Rijeka, 1813 – Torriggia, 1875)

(Rijeka, 1813. – Torriggia, 1875.)

Rijeka's Ivan Blaž Lupis Vukić is the originator and development initiator of the modern torpedo. After his education in Rijeka, he enrolled in the Naval Academy in Venice and became a Frigate Captain. Since he participated in the Navy's various endeavours, he deliberated on diverse technical problems and came up with the idea of a device for destroying enemy ships guided from land. He conceived the device as "a small crewless boat, cast off and guided from land, while the explosive in the boat is ignited upon impact with the enemy ship." He built several models; one of them had sails made of glass so that it would be invisible from a distance. Then he made a boat with a spring-driven and propelled launch mechanism. The one-meter-long boat had two rudders and was driven by long ropes from the land. The third model had fin-shaped paddles in lieu of a propeller. The final model, the German *Küstenretter* ("the coast saver"), measured 6 meters in length. This vessel can be considered the torpedo's immediate predecessor due to its own mechanical drive, the remote control by the shooter, and the warhead with an impact igniter.

Having unsuccessfully proposed his idea of the new weapon for defending the coast to the Viennese military authorities several times, he began collaborating with the English engineer Robert Whitehead, Technical Director of the factory *Stabilimento tecnico fiumano* in Rijeka, with whom he continued developing the idea. In lieu of a surface vessel, Whitehead proposed the construction of an underwater projectile reminiscent of the modern-day torpedo, which he started producing at his factory after terminating partnership with Lupis. The factory in Rijeka became the world's first torpedo factory. Already in 1866, the first successful prototype was produced, with a diameter of 355 mm, 3.4 m in length and weighing 136 kg, 8 kg of which were explosives. Whitehead named the product the Luppis-Whitehead torpedo, thereby acknowledging Lupis' original idea.

Lupis gained recognition for his work; the Imperial Order of the Iron Crown (3rd Class), the noble title of Knight von Rammer (German: the rammer, the sinker), and a coat of arms depicting the torpedoing of a steamboat.

Riječanin Ivan Blaž Lupis Vukić idejni je začetnik i pokretač razvoja modernoga torpeda. Nakon školovanja u Rijeci upisao se na Mornaričku akademiju u Veneciji te postao kapetan fregate. Budući da je sudjelovao u raznim pothvatima mornarice, razmišljao je o raznovrsnim tehničkim problemima te došao na ideju naprave za uništavanje neprijateljskih brodova vođenu s kopna. Uređaj je zamislio kao „mali čamac bez posade, koji bi se uputio i upravljao s kopna, a eksploziv u čamcu upalio bi se pri udaru o neprijateljski brod". Sagradio je više modela; jedan je imao staklena jedra kako ne bi bio uočljiv iz daljine. Zatim je sagradio čamac s pogonskim mehanizmom na pero i vijkom. Čamac duljine jednoga metra imao je dva kormila, a njime se upravljalo dugim uzdama s kopna. Treći je model umjesto propelera imao vesla u obliku peraja. Konačni model, njemački Küstenretter, dug 6 m, nosi naziv *čuvar obale*. Ovo se plovilo može smatrati neposrednom pretečom torpeda zbog vlastitoga mehaničkoga pogona, daljinskoga vođenja i bojeve glave s udarnim upaljačem.

Nakon što je od vojnih vlasti u Beču više puta bezuspješno tražio prihvaćanje svoje ideje novoga oružja za obranu obale, počeo je surađivati s engleskim inženjerom Robertom Whiteheadom, tehničkim direktorom riječke tvornice Stabilimento tecnico Fiumano s kojim je nastavio razvijati zamisao. Whitehead je umjesto površinskoga plovila predložio konstruiranje podvodnoga projektila nalik današnjemu torpedu koji je počeo proizvoditi u svojoj tvornici nakon što je prekinuo suradnju s Lupisom. Riječka tvornica postala je prva tvornica torpeda u svijetu. Već 1866. izrađen je prvi uspješan prototip promjera 355 mm, duljine 3,4 m i mase 136 kg, od toga 8 kg eksploziva. Whitehead je proizvod nazvao torpedo *Luppis-Whitehead* te tako odao priznanje Lupisovoj izvornoj zamisli.

Lupis je za svoj rad dobio priznanje: carski Orden željezne krune (3. stupanj), plemićki naslov vitez *von Rammer* (njemački: zabijač, potapač) te grb s prizorom torpediranja parobroda.

10

Ivan Krstitelj Rabljanin

(Rab, c. 1470 – Dubrovnik, 1540)

(Rab, oko 1470. – Dubrovnik, 1540.)

Ivan Krstitelj Rabljanin is a Croatian Renaissance technologist, innovator and artist best known as a bell and cannon maker. At the beginning, he worked in his foundry in Rab, where he cast a large bell for the Split cathedral (1503, cast in 1830). After 1505, at the invitation of the Senate of the Republic of Dubrovnik, to which he offered himself as a gunsmith who had gained experience with the best craftsmen in Italy, he went to Dubrovnik.

There he spent 35 years in the service of the Republic as its chief artillery expert who acted as a caster of cannons and bells in the Revelin fortress. He also tried his hand as a caster of cannons for ships, and occasionally worked for some cities in southern Italy. His long-barreled cannon (colubrina) from 1505, the first he cast for the Republic of Dubrovnik, is kept in the Armeemuseum in Vienna. Several bells have also been preserved, of which the one for the city clock in Dubrovnik from 1506 stands out for its Renaissance decoration. It is decorated with medallions with relief figures of the Mother of God and St. Blasius, the patron saint of Dubrovnik. It is one of the largest bells in Dalmatia and weighs 2,000 kg.

Ivan Krstitelj Rabljanin hrvatski je renesansni tehnolog, inovator i umjetnik najpoznatiji kao ljevač zvona i topova. Na početku je djelovao u svojoj ljevaonici u Rabu gdje je salio veliko zvono za splitsku katedralu (1503., preliveno 1830). Nakon 1505. godine na poziv Senata Dubrovačke Republike, kojem se sam ponudio kao ljevač oružja koji je stekao iskustvo kod najboljih majstora Italije, odlazi u Dubrovnik.

Ondje provodi 35 godina u službi Republike kao njezin glavni stručnjak za artiljeriju koji je djelovao kao ljevač topova i zvona u tvrđavi Revelin. Okušao se i kao ljevač topova za brodove, a povremeno je radio i za neke gradove u južnoj Italiji. Njegov dugocijevni top (kolubrina) iz 1505. godine, prvi koji je izlio za Dubrovačku Republiku čuva se u Armeemuseumu u Beču. Sačuvan je i niz zvona, od kojih se svojom renesansnom dekoracijom ističe ono za gradski sat u Dubrovniku iz 1506. na kojem su medaljoni s reljefnim likovima Majke Božje i sv. Vlaha, zaštitnika Dubrovnika. Riječ je o jednom od najvećih zvona u Dalmaciji a teži 2 000 kg.

11

Juraj Julije Klović

(Grižane, 1498 – Rome, 1578)

(Grižane, 1498. – Rim, 1578.)

Julije Klović, the most famous Croatian artist, is the last major representative of miniature painting in the 16th century, who had already become known in his lifetime. He was born in 1498 near Novi Vinodolski, in the borough of Grižane, in which the museum *House of Klović* is situated today. Already at the age of 18, he went to Venice and entered the service of Cardinal Domenico Grimani. From 1540 onwards, he resided in Rome under the auspices of Alessandro Farnese, where he met numerous artistic geniuses of the time, such as Michelangelo, Peter Bruegel, Vittoria Colonna, and El Greco. With the autograph signature "humile servitore don Julio Crovatino miniatore" or "de Crovatia," Julije Klović revealed his Croatian origin.

He lived through two war catastrophes within a short period of time: the Battle of Mohacs in 1526, and the Plundering of Rome in 1527. He vowed to be ordained should he survive the Roman catastrophe, which he also fulfilled in the following year of 1528.

In his work *The Lives of the Most Excellent Painters, Sculptors, and Architects* from 1568, the Italian architect and painter Giorgio Vasari (1511-1574), Klović's contemporary and friend, calls him the *Michelangelo of Miniature*. His earlier works show the influence of Raphael's stylistic circles, which he encountered in Rome. He is one of the pioneers of introducing the colourist and decorative elements of Mannerism in his works. He worked for the most prominent patrons of his era, King Louis II, the Grimani and Farnese families – in Hungary, Perugia, Venice, Parma, and Rome. For his patron Farnese, Klović made one of his masterpieces, *Farnese Hours*, with 28 miniatures depicting parts of the Old and the New Testament.

Among the numerous works that are kept in international museums, the most distinguished ones are *Pietà* (Uffizi), *The Three Theological Virtues* (Louvre), and *The Entombment of Christ* (British Museum). Several of his works are kept at the Strossmayer Gallery of Old Masters, as well as in the Print Collection of the National and University Library in Zagreb.

His tomb is in Rome, at the Basilica of St. Peter in Chains (San Pietro in Vincoli), near Michelangelo's *Moses*. El Greco painted a portrait in Klović's honour, in which he is holding his masterpiece, *Farnese Hours*.

Najpoznatiji hrvatski umjetnik Julije Klović posljednji je veliki predstavnik minijaturnoga slikarstva u 16. stoljeću koji je slavu stekao još za vrijeme života. Rođen je 1498. godine nedaleko od Novog Vinodolskog u mjestu zvanom Grižane u kojem se danas nalazi muzej Kuća Klović. Već s 18 godina odlazi u Veneciju i ulazi u službu kardinala Domenica Grimanija. Od 1540. pod pokroviteljstvom Alessandra Farnesea boravi u Rimu gdje upoznaje brojne umjetničke genije toga vremena kao što su Michelangelo, Peter Bruegel, Vittoria Colonna i El Greco. Julije Klović autografom „humile servitore don Julio Crovatino miniatore" ili „de Crovatia" odaje svoje hrvatsko podrijetlo.

Proživio je u kratkom razdoblju dvije ratne katastrofe: Mohačku bitku 1526. i pljačku Rima 1527. Zavjetovao se da će se zarediti ako preživi rimsku katastrofu što je i učinio naredne, 1528. godine.

Talijanski arhitekt i slikar Giorgio Vasari (1511. – 1574.), Klovićev suvremenik i prijatelj, 1568. godine u svojem djelu *Životopisi slavnih slikara, kipara i arhitekata* naziva ga „Michelangelom sitnoslikarstva". U njegovim ranijim djelima vidljiv je utjecaj Rafaelovih stilskih krugova s kojima se susreće u Rimu. Jedan je od prvaka uvođenja koloristićkih i dekorativnih elemenata manirizma u svoje radove. Radio je za najistaknutije mecene svoga doba, za kralja Ludovika II., za obitelj Grimani i Farnese – u Mađarskoj, u Perugi, Veneciji, Parmi i Rimu. Za svoga mecenu Farnesea Klović je izradio jedno od svojih remek-djela Časoslov Farnese s 28 minijatura koje prikazuju dijelove Staroga i Novoga zavjeta.

Od brojnih njegovih djela koja se čuvaju u svjetskim muzejima među najznačajnijima su *Oplakivanje* (Uffizi), *Tri teološke vrline* (Louvre) i *Polaganje u grob* (British Museum). Nekoliko njegovih djela čuva se u Strossmayerovoj galeriji starih majstora kao i u grafičkoj zbirci Nacionalne i sveučilišne knjižnice u Zagrebu.

Njegov grob nalazi se u Rimu u crkvi svetoga Petra u okovima (San Pietro in Vincoli), nedaleko od Michelangelova Mojsija. Njemu u čast El Greco je naslikao portret na kojem Klović u ruci drži svoje remek-djelo, *Časoslov Farnese*.

Ivan Vučetić

(Hvar, 1858 – Dolores, 1925)

(Hvar, 1858. – Dolores 1925.)

Ivan Vučetić, a native of Hvar, is just as important for forensic science as Nikola Tesla is for electrical engineering. His crowning achievement is the system for using fingerprints to identify people. In 1884, he emigrated to Argentina, where he got a job in the Central Police Office. He soon advanced to the post of the director of the Statistics Department in La Plata. In 1891, for the first time ever, he developed his own system for the classification of fingerprints, called *iconofalangometria*. The system was based on the observation and analysis of friction ridges. The ten-finger identification system, also called the Argentine or Vučetić system, was officially introduced in Argentina in 1902. Other countries soon followed suit.

The first major case he solved with the help of his dactyloscopy method was the one of Franciska Rojas, who killed her two children and falsely accused her lover of the crime. It was the bloody fingerprints that gave her away.

Using the ten-finger card and formulae with numbers and letters, he devised the best and most widely used scientific method for the identification of persons using friction ridges. The science that studies this is called dactyloscopy.

Using fingerprints as an identification method was studied by Francis Galton (1822-1911) in his book *Fingerprints*, published in 1892, and Edward Henry (1859-1931) in *Classification and Uses of Fingerprints* (1900). After studying Bertillon's identification procedure which was based on the classification of skeletal measurements and other physical traits, Galton's experiments, and several existing methods for the classification of fingerprints, Vučetić identified several shortcomings and devised his own original system. He immediately put it to good use in criminal investigations and proceedings.

His main works are *Instrucciones generales para el sistema antropomettrico* (*General Instructions for an Anthropometric System*, 1895), *Dactiloscopia comparada* (*Comparative Dactyloscopy*, 1904) and *Evolución de la dactiloscopia* (*Evolution of Dactyloscopy*, 1905).

The significance of Vučetić's system lies in its simplicity and the broad application in practice. In 1923, the Police Museum was opened in La Plata: it bears the name of Juan Vucetich, as does the Forensic Science Centre of the Croatian Ministry of the Interior in Zagreb.

Hvaranin Ivan Vučetić svojim izvornim sustavom uzimanja otisaka prstiju radi identifikacije u svjetskoj kriminalistici značajan je kao Nikola Tesla u elektroenergetici. Emigrirao je u Argentinu 1884. gdje se zaposlio u Središnjem policijskom uredu i ubrzo u La Plati postao voditelj Odjela za statistiku gdje je 1891. prvi na svijetu, na temelju promatranja i analize papilarnih linija, razvio vlastiti sustav klasifikacije otisaka prstiju nazvan iconofalangometria. Desetoprstni sustav identifikacije, nazvan argentinskim ili Vučetićevim sustavom, 1902. službeno je uveden u Argentini, a zatim i u drugim zemljama.

Prvi veliki slučaj koji je riješio uz pomoć svoje metode daktiloskopije bio je onaj Franciske Rojas, koja je ubila svoje dvoje djece i lažno optužila ljubavnika. Odali su je krvavi otisci prstiju.

Pomoću desetoprstnog kartona te formula brojeva i slova osigurao je do danas najuspješniju i najrasprostranjeniju znanstvenu metodu za utvrđivanje identiteta osoba pomoću papilarnih linija koje su predmet izučavanja znanosti daktiloskopije.

Metodu prepoznavanja otiskom prsta proučavali su Francis Galton (1822. – 1911.) u djelu *Fingerprints* iz 1892. i Edward Henry (1859. – 1931.) u djelu *Klasifikacija i upotreba otisaka prstiju* iz 1900. Nakon što je proučio Bertillonov postupak identifikacije koji se sastojao u klasifikaciji mjerenja kostura i drugih tjelesnih značajki, Galtonove eksperimente te više postojećih metoda za klasifikaciju otisaka prstiju i uočio brojne nedostatke, Vučetić je uspostavio vlastiti izvorni sustav i odmah ga primijenio u kriminalistici i krivičnom postupku.

Glavna su mu djela *Opće upute u antropometrički sustav*, 1895. *(Instrucciones generales para el sistema antropomettrico) Usporedna daktiloskopija*, 1904. *(Dactiloscopia comparada)* i *Evolución de la dactiloscopia* (*Razvoj daktiloskopije*, 1905.)

Vrijednost Vučetićeva sustava je u jednostavnosti i širokim mogućnostima praktične primjene. U La Plati je 1923. otvoren Policijski muzej koji nosi ime „Juan Vucetich", a ime „Ivan Vučetić" od 1977. nosi i Centar za forenzična ispitivanja, istaživanja i vještačenja „Ivan Vučetić".

13

Ruđer Josip Bošković

(Dubrovnik, 1711 – Milan, 1787)

(Dubrovnik, 1711. – Milano, 1787.)

This grand citizen of the world is one of the most important figures of the world's scientific history. He was a multidisciplinary scientist with excellent results in mathematics, structural engineering, hydrotechnics, astronomy, archaeology, geodesy, cartography, meteorology, and physics, to which he provided an array of subsequent discoveries and became the originator of modern physics. In addition to all of the above, he was also known as an engineer, he wrote poetry, and served as a diplomat for Dubrovnik and the Holy See.

Having completed his studies in rhetoric, theology, and philosophy, he worked in Rome, Milan and Paris, but also in other European capitals of the time, from London and Vienna to Constantinople and Saint Petersburg. During his lifetime, he published more than 75 works, most notably the *Theory of Natural Philosophy* from 1758, in which he provides his view of the structure of matter and the relationships in nature through a single law of forces, "the unification of all forces."

Upon request of Pope Benedict XIV, he developed plans for the repair of the dome of St. Peter's Basilica in Rome. A century and a half before Einstein, he deliberated the relativity of space and time, a constant speed of light, and the possibility of a four-dimensional space. He founded the Astronomical Observatory of Brera, the most modern of its time. Based on geodetic and astronomic measurements, the first exact map of the Papal State was drawn, which extremely positively influenced the development of cartography in Italy. In 1741, he proposed the theory that the shape of the Earth is – a geoid. He studied the aurora borealis and the tides in 1747. He was the first to propose the theory of eclipse in his poem *Eclipse of the Sun and the Moon*, 1760. Bošković was the first to claim that bodies can pass through one another at sufficiently high speeds, whereby their internal structure does not change.

Ovaj veliki kozmopolit jedan je od najvažnijih osoba svjetske znanstvene povijesti. Bio je multidisciplinarni znanstvenik s izvrsnim rezultatima u matematici, građevinskoj statici, hidrotehnici, astronomiji, arheologiji, geodeziji, kartografiji, meteorologiji i fizici kojima je omogućio niz kasnijih otkrića te postao začetnik moderne fizike. Uz sve navedeno bio je poznat i kao inženjer, pisao je poeziju te bio dubrovački i papinski diplomat.

Nakon studija retorike, teologije i filozofije djelovao je u Rimu, Milanu i Parizu, ali i ostalim europskim metropolama toga vremena, od Londona i Beča do Carigrada i Sankt Peterburga. Za života je objavio više od 75 djela među kojima je najznačajnije *Teorija prirodne filozofije* iz 1758. godine u kojem daje svoj pogled na strukturu tvari i odnose u prirodi kroz jedan jedini zakon silâ – unifikaciju svih silâ.

Na zahtjev pape Benedikta XIV. napravio je planove za popravak kupole bazilike Sv. Petra u Rimu. Stoljeće i pol prije Einsteina razmatrao je o relativnosti prostora i vremena, konstantnoj brzini svjetlosti i mogućnosti prostora s četiri dimenzije. Utemeljio je zvjezdarnicu u Breri koja je bila najmodernija u to doba. Na osnovi podataka geodetskih i astronomskih mjerenja izrađen je prvi egzaktan zemljovid Papinske Države što je vrlo pozitivno utjecalo na razvitak kartografije u Italiji. Godine 1741. iznosi ideju da je oblik Zemlje – geoid. Istraživao je polarnu svjetlost, plimu i oseku 1747. Prvi iznosi teoriju pomrčine u spjevu Pomrčina Sunca i Mjeseca, 1760. Bošković je prvi u povijesti izrekao tvrdnju da pri dovoljno velikim brzinama tijela mogu prolaziti jedna kroz druga, a da im se unutrašnja struktura pritom ne promijeni.

14

Faust Vrančić

(Šibenik, 1551 – Venice, 1617)

(Šibenik, 1551. – Venecija, 1617.)

Šibenik-born Faust Vrančić is one of the most influential Croats of all time. He was a polymath, lexicographer, inventor, priest, and bishop, and the nephew of Antun Vrančić, the dignitary who during his lifetime distinguished himself in peace negotiations with Suleiman the Magnificent. His respectable family's provenance, as well as his life and education in Hungary and the studies in law and philosophy in Padua enabled him to master several foreign languages and to enter service in high positions in public, social, political, and ecclesiastical life. He spent nearly two decades in the service of the Germanic Roman Emperor and Croato-Hungarian King Rudolph II and had a successful political career. He was a member of the Croatian Confraternity of St. Jerome in Rome.

He worked as a constructor, technical writer, linguist, philosopher, theologist, but also as an author of literary and historic works. His five-language lexicon *Dictionarium quinque nobilissimarum Europeae linguarum: Latinae, Italicae, Germanicae, Dalmaticae et* Hungaricae (Venice, 1595) included the "Dalmatian" (Croatian) language among the "five most exquisite European languages." His most famous work is the handbook *New Machines* (*Machinae novae*, Venice, 1615/1616), which has been translated into many international languages. It contains 49 sketches and projects with illustrations and descriptions of 57 technical inventions, projects and constructions executed in large-scale etchings, accompanied by around a hundred pages of text. Due to these works, he became internationally renowned already in his lifetime. In 1992, the Croatian Parliament founded the technical culture award "Faust Vrančić."

Many of Vrančić's ideas came to life in a century or more after *Machinae novae* had been printed, and some of his extraordinary ideas are used throughout the world even today, a full four centuries after their publishing.

Šibenčanin Faust Vrančić jedan je od najutjecajnijih Hrvata svih vremena. Bio je polihistor, leksikograf, izumitelj, svećenik i biskup te sinovac Antuna Vrančića, velikodostojnika koji se tijekom života istaknuo u mirovnim pregovorima sa Sulejmanom Veličanstvenim. Podrijetlo njegove ugledne obitelji kao i život i školovanje u Ugarskoj te studij prava i filozofije u Padovi omogućili su mu poznavanje nekoliko stranih jezika i službe na visokim položajima u javnom, društvenom, političkom i crkvenom životu. Gotovo dva desetljeća bio je u službi njemačko-rimskoga cara i hrvatsko-ugarskoga kralja Rudolfa II. te je ostvario uspješnu političku karijeru. Bio je član hrvatske Bratovštine sv. Jeronima u Rimu.

Djelovao je kao konstruktor, tehnički pisac, jezikoslovac, filozof, teolog, ali i pisac književnih i povijesnih djela. Njegov petojezični leksikon *Dictionarium quinque nobilissimarum Europeae linguarum: Latinae, Italicae, Germanicae, Dalmaticae et Hungaricae* (Venecija) iz 1595. uvrstio je „Dalmatinski" (hrvatski) jezik u društvo „pet najizvrsnijih europskih jezika". Njegovo najpoznatije djelo je tehnički priručnik *Novi strojevi* (*Machinae novae*, Venecija, 1615. / 1616.) koje je prevedeno na brojne svjetske jezike. Djelo sadrži 49 skica i projekata s prikazom i opisom 57 tehničkih izuma, projekata i konstrukcija koji su izvedeni u bakropisima velikoga formata, a koje prati stotinjak stranica teksta. Zahvaljujući ovim djelima već za života stekao je svjetsku slavu. Hrvatski sabor je 1992. ustanovio Državnu nagradu tehničke kulture „Faust Vrančić".

Mnoge Vrančićeve zamisli u praksi su zaživjele stoljeće i više nakon što su otisnute u djelu *Machinae novae*, a neke od njegovih izvanrednih ideja rabe se diljem svijeta i danas, puna četiri stoljeća od njihova objavljivanja.

15

Herman Potočnik Noordung

(Pula, 1892 – Vienna, 1929)
(Pula, 1892. – Beč, 1929.)

Herman Potočnik Noordung was born in Pula. His father was Slovene, and served as a medical doctor in the Austro-Hungarian navy while his mother was of Czech origin. He studied bridge construction at the military academy. He was mobilised and served during the war in Galicia, Serbia, Bosnia and on the Soča River where he contracted tuberculosis, which led to his early retirement. As a young pensioner, passionate about rockets and space, he enrolled in the ballistics studies at the University of Technology in Vienna. He was an expert in rocket technology and one of the pioneers of astronautics.

Two widely known rocket science enthusiasts, inspired by Jules Verne's stories, served as his role models: the Russian Konstantin Ciolkovski, and the Romanian German Hermann Oberth. And Werner von Braun, who was Oberth's pupil, said to the press during the launch of the first Apollo that «we would not have space travel if there had not been for Potočnik» and claimed on another occasion that Potočnik's book «The Problem of Space Travel» (Das Problem der Befahrung des Weltraums, 1929, Berlin), was the *Bible of space technology.* Potočnik used Noordung as his pseudonym when he published his book, which many interpreted as having to do with the north, but in the Vienna dialect *noordung* means *disorder*.

Miha Turšić, a Slovene designer, and Dragan Živadinov, a Slovene director and actor, branded Noordung as the first space architect as part of *The Problem of Space Travel – Three Machines project* – Slovenia's project for the 14th Venice biennale in 2013.

Along with his ideas that contributed to the development of space travel, geostationary satellites represent his main invention. He made calculations about their possible existence, as well as about velocity and force that rockets need to be able to hover above the Earth in the space. Without them it would be difficult to imagine today's communication technology, mobile phones, the internet, meteorological, military, scientific and GPS satellites as well as the scientific miracle of the millennium: the *Hubble* telescope.

He died young, before reaching the age of 37. The ideas from his book are still fresh since technology has not yet managed to bring all of them to life. The Herman Potočnik Noordung Center of Space Technologies is located in Vitanje, Slovenia.

Herman Potočnik Noordung rođen je u Puli. Otac mu je bio Slovenac, liječnik austrougarske mornarice, a majka je bila češkoga podrijetla. Studirao je mostogradnju na vojnoj akademiji. Mobiliziran je ratovao u Galiciji, Srbiji, Bosni i na Soči gdje je dobio tuberkulozu zbog čega je rano umirovljen. Kao mladi umirovljenik upisao je studij balistike na Bečkom tehničkom sveučilištu jer je u njemu tinjala strast prema raketama i svemiru. Bio je stručnjak za raketnu tehniku i jedan od pionira astronautike.

Uzor su mu bili dvojica svjetskih raketnih znanstvenika zanesenjaka, koja su se nadahnula pripovijetkama Julesa Verna: Rus Konstantin Ciolkovski i rumunjski Nijemac Hermann Oberth. Oberthov pak učenik bio je Werner von Braun koji će kod lansiranja prvoga Apolla izjaviti novinarima da „bez Potočnika ne bi bilo letova u svemir", a drugom prilikom tvrdit će kako je Potočnikova knjiga *Problem vožnje svemirom* (*Das Problem der Befahrung des Weltraums*, Berlin, 1929.) „Biblija svemirske tehnike". Prilikom izdanja knjige Potočnik je uzeo pseudonim Noordung što su mnogi tumačili kao poveznicu sa sjeverom, ali noordung na bečkom narječju znači nered.

Slovenski dizajner Miha Turšić i slovenski redatelj i glumac Dragan Živadinov Noordunga su brendirali kao prvoga svemirskoga arhitekta u projektu Problem svemirskih putovanja – tri stroja autora koji je predstavljao Sloveniju na 14. Venecijanskom bijenalu 2013.

Uz zamisli koje su utjecale na razvitak svemirskih putovanja, Potočnikov glavni izum su geostacionarni sateliti. Izračunao je mogućnost njihovoga postojanja te brzinu i snagu raketa potrebnih za njihovo postavljanje da lebde nad Zemljom u svemiru. Bez tih satelita bilo bi teško zamisliti današnju komunikacijsku tehniku, mobitele, internet, meteorološke, vojne, znanstvene i GPS satelite kao i znanstveno čudo tisućljeća: teleskop Hubble.

Umro je mlad, u 37. godini života. Ideje iz njegove knjige još nisu zastarjele jer tehnika još nije dostigla sve njegove zamisli. U Vitanju u Sloveniji nalazi se *Centar za svemirske tehnologije Herman Potočnik Noordung*.

Nikola Tesla

(Smiljan, 1856 – New York, 1943)

(Smiljan, 1856. – New York, 1943.)

Nikola Tesla was born in Lika in a family of Serb origin, so he used to say that «he was proud of his Serbian origin and his Croatian homeland». Owing to his work, electricity is today available to all. His inventions in the field of electrical engineering and discoveries in the field of physics have strongly impacted world science, and their application has significantly enhanced our quality of life. He invented the alternating current motor, and he discovered polyphase electricity and transformer, allowing for a cheap long-distance transmission of high voltage power. Tesla was the one who invented radio engineering although Marconi claimed all the inventions in this area.

Thanks to Tesla the first hydroelectric power plant for alternating current in Europe and the second oldest in the world was built on Krka River in Croatia. It provided a Croatian town of Šibenik with electric streetlights and its households with alternating current before any large city in the world. A few years later Tesla's polyphase alternating current system spread all over the world and more than a century later it has not fundamentally changed. He worked on wireless energy transmission, helped discovering X rays and advocated «the global system that would connect communications into a single system», the idea that eventually resulted in the invention of the Internet.

Tesla's legacy includes 147 patents, out of which he registered 112 in the US. Additionally, he received many awards and honoris causa doctorates for his inventions. The Nobel Prize slipped through his fingers because he refused to share it with Edison. *Tesla high frequency currents*, *Tesla coil* and an older electrotherapy procedure teslinisation are all named after him. The greatest recognition of his work came when the unit of the magnetic induction was named *tesla*.

Nikola Tesla rođen je u Lici u obitelji srpskoga podrijetla pa je za sebe govorio da se „ponosi srpskim rodom i hrvatskom domovinom". Zahvaljujući njemu danas je električna struja dostupna svima. Njegovi izumi iz područja elektrotehnike, kao i otkrića iz polja fizike ostavili su snažan utjecaj na svjetsku znanost, a njihova primjena znatno je doprinijela kvaliteti života. Izumio je motor na izmjeničnu struju, otkrio višefaznu struju i transformator, što je omogućilo jeftino prenošenje struje visokoga napona na velike udaljenosti. Tesla je zaslužan i za izum radiotehnike iako je zasluge na tom području prisvojio Marconi.

Zahvaljujući Tesli na rijeci Krki u Hrvatskoj otvorena je Jaruga, prva hidroelektrana izmjenične struje u Europi te druga najstarija na svijetu. Hrvatski grad Šibenik tako je dobio javnu električnu rasvjetu i izmjeničnu struju u kućanstvima prije svih metropola u svijetu. Za nekoliko godina Teslin se sustav višefaznih izmjeničnih struja počeo upotrebljavati u cijelom svijetu, a tijekom više od jednoga stoljeća u osnovi se nije promijenio. Tesla je tako postao i pionir održive, zelene energije. Bavio se bežičnim prijenosom energije, doprinio otkriću X zraka, a njegov „svjetski sustav za povezivanje komunikacija" realizirao se pojavom interneta.

Tesla je iza sebe ostavio više od 147 patenata od kojih je 112 prijavio u SAD-u i za svoje izume dobio mnoga priznanja i počasne doktorate. Nobelova ga je nagrada zaobišla jer je nije htio podijeliti s Edisonom. Po njemu se nazivaju *Tesline visokofrekvencijske struje*, *Teslin transformator* i stariji elektroterapijski postupak teslinizacija. Najveće je priznanje Teslinu radu bilo dano kada je za jedinicu magnetske indukcije prihvaćen naziv *tesla*.

17a

Academy of fine Arts Zagreb
Akademija likovnih umjetnosti Zagreb

The present-day Academy of Fine Arts in Zagreb was established in 1907. Among the first lecturers at the newly established school were famous Croatian artists: Robert Frangeš Mihanović, Rudolf Valdec, Oton Iveković, Robert Auer, Bela Čikoš Sesija, Branko Šenoa, and Menci Clement Crnčić.

The Academy has been reconstructed on multiple occasions throughout its history. The institution's name has also changed. In 1918, it became the Royal College of Arts and Crafts, and in 1921 the Royal Academy of Arts and Crafts. From 1941 onwards, its official name has been the *Academy of Fine Arts*, when it has also acquired the status of a higher education institution.

Numerous significant artists – such as Ivan Meštrović and Slavko Kopač, and members of the art movement New Tendencies – have worked at the Academy, and therefore the history of the Academy of Fine Arts is also largely the history of Croatian art of the 20th century.

Današnja Akademija likovnih umjetnosti u Zagrebu utemeljena je 1907. godine a njeni prvi nastavnici bili su poznati hrvatski umjetnici: Robert Frangeš-Mihanović, Rudolf Valdec, Oton Iveković, Robert Auer, Bela Čikoš Sesija, Branko Šenoa i Menci Clement Crnčić.

Tijekom povijesti Akademija je u više navrata nadograđivana. Nazivi ustanove su se također mijenjali. Godine 1918. postaje Kraljevska viša škola za umjetnost i umjetni obrt, a 1921. Kraljevska akademija za umjetnost i umjetni obrt. Od 1941. službeno se zove Akademija likovnih umjetnosti kada i dobiva status visokoškolske ustanove.

Na Akademiji su djelovali brojni značajni umjetnici koji su djelovali i u inozemstvu poput Ivana Meštrovića i Slavka Kopača te umjetnika pripadnika Novih tendencija pa je povijest Akademije likovnih umjetnosti dobrim dijelom i povijest hrvatske umjetnosti 20. stoljeća.

Foundry of the Academy of fine Arts
Ljevaonica Akademije likovnih umjetnosti

Soon after the founding of the Academy of fine Arts, the bronze foundry was established as part of it in 1908, followed by the plaster foundry in 1909. Alongside executing commissions, the foundries primarily served educational purposes. Here, the students went through the overall process of statue construction, while the plaster foundry was supposed to furnish the collection of casts *meant to show the historic development of plastics and substantial architectural forms*. The initiator and first manager was Robert Frangeš-Mihanović, while technical work was performed by a Master Moulder. Alongside the sculptors, moulder apprentices were also educated here.

The scope of users and delivered works was extremely broad: from utilitarian ironmongery and mechanical parts, equipment for interiors and architectural facilities, to plaques and medals, reliefs, busts, and gravestone figures. The Foundry soon gained prominence and began collaborating on more relevant projects, of which the most significant one is certainly Rudolf Lubynski's art nouveau University Library in Zagreb. The figures of owls on columns between the atrium and the vestibule, the figural reliefs and other decorative elements were produced according to plans and models by Rudolf Valdec.

Following the First World War, the arrival of Meštrović in 1922 brought a turning point in the Academy's life. Classes became more oriented towards cultivating artistic expression, and less towards métier objects.

A large portion of monumental plastics authored by our sculptors in Croatia, the neighbouring countries and the world has been made at the Art Foundry of the Academy of Fine Arts.

Uz Akademiju je 1908. osnovana ljevaonica bronce, a sljedeće godine pridružena joj je i ljevaonica sadre. Osim izvedbe narudžbi, ljevaonice su ponajprije trebale služiti u obrazovne svrhe. Studenti su prolazili kroz cjelokupan tehnički postupak izrade kipa, a ljevaonica sadre trebala je opskrbiti zbirku odljevaka koja „ima svrhu da pokaže povijesni razvoj plastike i znatne arhitektonske oblike". Inicijator osnivanja i prvi upravitelj bio je Robert Frangeš-Mihanović, a tehničke poslove vodio je majstor-ljevač. Uz kipare su se u ljevaonici obrazovali i naučnici ljevači.

Raspon korisnika i isporučenih predmeta bio je vrlo širok: od utilitarnih bravarskih i mehaničkih dijelova, preko opreme za interijere i arhitektonske objekte, do plaketa i kolajni, reljefa, poprsja i figura za nadgrobne spomenike. Ljevaonica je ubrzo stekla ugled i počela surađivati na ozbiljnijim projektima, od kojih je svakako najznačajniji rad na secesijskoj zgradi Sveučilišne knjižnice Rudolfa Lubinskoga u Zagrebu. Izrađene su figure sova na stubovima između atrija i vestibula, figuralni reljefi i drugi ukrasni elementi prema nacrtima i modelima Rudolfa Valdeca. Stalne su bile i narudžbe arhitektonskoga ureda Huga Ehrlicha i Viktora Kovačića.

Nakon Prvoga svjetskoga rata veliku prekretnicu u životu Akademije donosi dolazak Ivana Meštrovića 1922. godine. Nastava se više usmjerava k njegovanju umjetničkoga izraza, a manje se bavi obrtničkim predmetima.

Velik dio spomeničke plastike u Hrvatskoj, u susjednim zemljama i u svijetu izrađen je u Ljevaonici ALU.

New Tendencies (1961 – 1973)
Nove tendencije (1961. – 1973.)

In 1961 a group of Croatian artists and critics, with the support of their like-minded colleagues from France, Italy, Germany, Spain and Russia, founded an international art movement the *New tendencies* in Zagreb, which during the Cold War brought together artists, gallerists and theorists from across Europe, the USA, the Soviet Union and South America, as well as from Africa and Asia. The movement stemmed from the Zagreb *Gallery of Modern Art*, the predecessor of today's *Contemporary Art Museum*, where the Brazilian painter Almir Mavignier encountered the Croatian art critic Matko Meštrović in 1960.

The movement focused on the relationship between art and society, aiming at socialisation and democratisation of art. It strived to assign an equivalent value to the original and the multiple original as well as to place art and science on an equal footing. Artists were defined as researchers and were encouraged to create in the spirit of science. During this period of a boom in international art production of the highest level and quality, screen printing gained prominence as a readily available multiple original, which, as a permeable printing medium, was an advocated art form in line with the programme of the *New Tendencies*.

The New Tendencies movement left many innovative artistic ideas, works and exhibitions representing a turning point in the understanding of contemporary art. The New Tendencies phenomenon is also significant because its first exhibitions in 1961 and 1963 are considered some of the most significant art events in Europe in the first half of the 1960s. It reached its peak internationally in 1964 when the *Nouvelle Tendence* exhibition took place in the *Musée des arts décoratifs* in Paris. The international critics consider *the New Tendencies* one of the most significant art movements after World War II.

Skupina hrvatskih umjetnika i kritičara uz podršku istomišljenika iz Francuske, Italije, Njemačke, Španjolske i Rusije osnovala je 1961. godine u Zagrebu međunarodni umjetnički pokret *Nove tendencije* koji je u doba hladnoga rata okupio umjetnike, galeriste i teoretičare iz cijele Europe, SAD-a, Sovjetskoga Saveza i Južne Amerike te Afrike i Azije. Pokret je krenuo iz zagrebačke Galerije suvremene umjetnosti, preteče današnjega Muzeja suvremene umjetnosti, u kojoj su se 1960. godine susreli brazilski slikar Almir Mavignier i hrvatski likovni kritičar Matko Meštrović.

Pokret se bavio problemom odnosa između umjetnosti i društva s ciljem socijalizacije i demokratizacije umjetnosti. Težilo se davanju istoznačne vrijednosti originala i multioriginala i izjednačavanju umjetnosti i znanosti. Umjetnik se definira kao istraživač i potiče ga se da razvija svoje radove u duhu znanosti. U tom vremenu bujanja internacionalnih sadržaja najviše umjetničke razine i kvalitete, kao lako dostupan multioriginal probila se serigrafija koja je kao medij propusnoga tiska bila poželjna likovna vrsta u programskom konceptu *Novih tendencija*.

Pokret *Nove tendencije* ostavlja u naslijeđe brojne inovativne umjetničke ideje, radove i izložbe koje predstavljaju prekretnicu u poimanju suvremene umjetnosti. Fenomen *Novih tendencija* značajan je i po tome što su prve dvije izložbe, 1961. i 1963., upisane u kroniku i povijest najvažnijih umjetničkih priredbi u Europi u prvoj polovici 60-ih godina. Vrhunac međunarodne slave bio je 1964. kada je izložba *Nouvelle Tendance* prikazana u Muzeju dekorativnih umjetnosti u Parizu. U međunarodnoj kritici *Nove tendencije* smatraju se jednim od najznačajnijih umjetničkih pokreta nakon 2. svjetskog rata.

19a

Milka Trnina

(Vezišće, 1863 — Zagreb, 1941)

(Vezišće, 1863. — Zagreb, 1941.)

Milka Trnina (known internationally as Ternina) is the greatest Croatian opera singer and one of the greatest in the entire history of opera. She showed her exceptional singing talent at the age of 13 and started her education at the Zagreb Conservatory in the class of Ida Wimberger and Ivan Zajc, and later she pursued her education in Vienna in the class of the famous Vienna voice teacher Josef Gänsbacher.

In 24 years on the stage, she appeared in 65 roles in more than 1200 performances and is remembered as one of the best sopranos in the world. She performed in Leipzig, Graz, and Bremen, and became a member of the Munich Royal Opera, where she received the honorary title of the Royal Bavarian chamber singer. Then she went to London and was the first to perform Tosca in Covent Garden as well as at the Metropolitan Opera in New York.

Her contemporaries and critics described Milka Trnina as an exceptional dramatic soprano, praising her wide vocal range and volume. They also underlined her fantastic interpretation and stressed that her acting skills almost matched the quality of her singing. She was specially acclaimed as an excellent interpreter of Wagner's characters. She particularly advocated the performance of Wagner's operas outside Germany and was the first to perform Kundy in *Parsifal* in New York in 1903. The best critics of the time thought she performed Wagner's characters exactly how Wagner had imagined. Apart from Wagner's characters, she was magnificent as Beethoven's Leonora in *Fidelio* and as Fiordiligi in Mozart's *Cosi fan tutte*. Giacomo Puccini claimed that no Tosca could compare to that performed by Trnina.

Unfortunately, there is not a single sound recording of her performances because she had all of them destroyed believing that they were not good enough. She had Zinka Kunc as one of her students, who herself later conquered the Metropolitan Opera.

Milka Trnina (u svijetu poznatija kao Ternina) najveća je hrvatska operna umjetnica i jedna od najvećih u cijeloj povijesti opere. Već s 13 godina pokazala je iznimni talent za pjevanje te započela školovanje na zagrebačkom konzervatoriju u klasi Ide Wimberger i Ivana pl. Zajca, a potom ga nastavila u Beču, u klasi znamenitoga bečkoga pjevačkoga pedagoga Josepha Gänsbachera.

U svojoj 24 godine dugoj pjevačkoj karijeri u kojoj je utjelovila 65 uloga u više od 1200 nastupa ostala je zapamćena kao jedna od najboljih svjetskih sopranistica. Nastupala je u Leipzigu, Grazu i Bremenu, a bila je i članica državne opere u Münchenu, gdje dobiva počasni naslov bavarske dvorske komorne pjevačice. Potom odlazi u London gdje u Covent Gardenu prva izvodi Toscu jednako kao i u Metropolitanu u New Yorku.

Milku Trninu suvremenici i kritičari opisivali su kao izrazito dramatski sopran, ističući njezin veliki raspon glasa i volumena. Naglasili su i njezinu iznimnu interpretativnu sposobnost, gotovo izjednačavajući njezin pjevački i glumački talent. Posebice se etablirala kao vrsna interpretkinja Wagnerovih likova. Dodatno se zauzimala za potrebu izvođenja Wagnerovih opera izvan Njemačke te je u New Yorku 1903. godine prva utjelovila lik Kundy iz *Parsifala*. Najbolji kritičari njezina doba smatrali su da je Wagnerove junakinje pjevala onako kako je to Wagner zamišljao. Osim Wagnerovih likova, veličanstveno je interpretirala i Beethovenovu Leonoru u *Fideliju* ili Fiordiligi u Mozartovoj *Cosi fan tutte*. Giacomo Puccini tvrdio je da se nijedna Tosca ne može usporediti s onom koju izvodi Trnina.

Nažalost, ne postoji nijedan zvučni zapis njenih nastupa jer je snimke svojih izvedbi dala uništiti smatrajući ih nedovoljno kvalitetnima. Jedna od učenica bila joj je i Zinka Kunc koja će i sama kasnije osvajati pozornicu Metropolitana.

19b

Zinka Kunc-Milanov

(Zagreb, 1906 – New York, 1989)

(Zagreb, 1906. – New York, 1989.)

Zinka Kunc-Milanov was a world-renowned soprano and was called the *voice of the century*. She pursued her education at the Academy of Music in Zagreb in the class of Marija Kostrenčić and under Milka Trnina's supervision.

Zinka Kunc was the leading soprano of Zagreb Opera from 1928 until 1935. During that period, she sang numerous characters from different operas ranging from Verdi to Strauss. After this successful period in Zagreb, she moved to New York. In 1966 she made 424 performances at the Metropolitan Opera as the *primadonna assoluta*.

Her most successful performances include: *Aida*, both Leonoras *(Il trovatore, La forza del destino)*, *Amelia (Un ballo in maschera), Desdemona (Othello), Santuzza (Cavalleria rusticana), Tosca* and *Norma*. She also performed as a concert singer (Verdi's *Requiem* being her highlight).

Her exceptional music performances were recorded for the RNC record company and her contribution to the world of music in New York and the US earned her a special state medal that was awarded to not more than some eighty deserving foreign nationals.

Zinka Kunc-Milanov svjetski je poznata sopranistica koju su nazivali „glas stoljeća". Školovala se na Muzičkoj akademiji u Zagrebu u klasi Marije Kostrenčić pod nadzorom Milke Trnine.

Zinka Kunc postala je prvakinjom Zagrebačke opere 1928. kojom je ostala do 1935. godine. U tom periodu utjelovila je brojne likove u različitim operama od Verdijevih do Straussovih. Nakon uspješnoga zagrebačkog perioda kratko je boravila u Pragu prije preseljenja u New York. Tamo je 1966. godine u Metropolitanu ostvarila 424 nastupa u kojima je bila *primadonna assoluta.*

Njezine najuspjelije uloge su: Aida, obje Leonore *(Trubadur, Moć sudbine)*, Amelija *(Krabuljni ples)*, Desdemona *(Otelo)*, Santuzza *(Cavalleria rusticana)*, Tosca, Norma. Nastupala je i kao koncertna pjevačica (najviši domet bio je u Verdijevu *Requiemu*).

Njezin iznimni glazbeni opus ovjekovječen je na snimkama za gramofonsku kuću RNC, a zbog svoga doprinosa glazbi, čime je zadužila New York i SAD, dodijeljena joj je specijalna državna medalja koju je primilo samo 80-ak istaknutih osoba stranoga podrijetla.

Mia Čorak-Slavenska

(Brod na Savi, 1916 – Los Angeles, 2002)

(Brod na Savi, 1916. – Los Angeles, 2002.)

The famous Croatian prima ballerina Mia Čorak-Slavenska is one of the most important artistic figures of the 20th century. She is among the 10 most famous ballerinas of the 20th century.

Having completed her studies in Vienna, Mia Čorak-Slavenska began an impressive international career by winning First Prize at the 1936 Dance Olympics in Berlin. She won first place with the act From My Homeland, in which she performed a Croatian folk dance in an authentic national costume from the Posavina region. She performed at the Paris Opera and in Monte Carlo, where she joined Myasin's famous Ballet Russe. She completed a three-year tour in the US in 1941.

In the season of 1954/55, she was the prima ballerina of the Metropolitan Opera in New York, one of the world's most distinguished theatre houses.

She was the protagonist of the film The Ballerina (1937), based on the ballet The Dying Swan. She was supposed to represent the country at the World Exposition in Paris in 1937; however, she was prohibited from doing so by the Belgrade authorities, since they resented her criticism and the attempts at improving the cultural policy.

Many have called her the most beautiful ballerina of all time, and her dancing the masterpiece of human mechanics. In the 1940s, Slavenska moved to the US, where she was a guest dancer in the performances of numerous ballet companies. With Frederic Franklin, Slavenska founded the ballet troupe Slavenska-Franklin Ballet, with which she delighted audiences, and produced the ballet A Streetcar Named Desire. She successfully performed choreographies by Léonide Massine and Serge Lifar, as well as the stylisations of Croatian folk dances.

Following the end of her dancing career, she became engaged in pedagogical work, and lectured at dance schools in New York and Los Angeles.

Čuvena hrvatska primabalerina Mia Čorak-Slavenska jedna je od najvažnijih umjetničkih ličnosti 20. stoljeća. Ubraja se među deset najpoznatijih balerina prošloga stoljeća.

Nakon završenoga studija u Beču, Mia Čorak-Slavenska započinje impresivnu međunarodnu karijeru osvojivši prvu nagradu na Plesnoj olimpijadi u Berlinu 1936. godine. Prvo mjesto osvojila je točkom *Iz moje domovine* u kojoj je izvela hrvatski narodni ples u originalnoj posavskoj nošnji. Nastupala je u Pariškoj operi i Monte Carlu, gdje se pridružuje čuvenom Ruskom baletu Mjasinova. Trogodišnju svjetsku turneju završava u Americi 1941. godine.

U sezoni 1954./55. bila je primabalerina Opere Metropolitan u New Yorku, jedne od najuglednijih svjetskih kazališnih kuća.

Bila je protagonistkinja filma *Balerina* (1937.) snimljenoga prema baletu *Labudova smrt*. Trebala je predstavljati Kraljevinu Jugoslaviju na Svjetskoj izložbi u Parizu 1937., ali su joj beogradske vlasti zabranile jer im se zamjerila svojim kritikama i nastojanjima za poboljšanje kulturne politike.

Mnogi su je prozvali najljepšom balerinom svih vremena, a njezino plesanje „remek-djelom ljudske mehanike". U četrdesetim godinama 20. stoljeća Slavenska se preselila u SAD, gdje je gostovala u izvedbama mnogih baletnih kompanija. S Fredericom Franklinom Slavenska je osnovala baletnu trupu *Slavenska-Franklin Ballet* s kojom je oduševljavala publiku i postavila balet *Tramvaj zvan čežnja*. Istaknula se u koreografijama L. Massinea i S. Lifara kao i stilizacijom hrvatskih narodnih plesova.

Nakon plesne karijere, počela se baviti pedagoškim radom te je predavala u plesnim školama u New Yorku i Los Angelesu.

Dora Maar

(Paris, 1907 – Paris, 1997)
(Pariz, 1907. – Pariz, 1997.)

Photographer and painter Dora Maar (Henriette Théodora Marković) is a French native of Croatian descent. She is the daughter of the Croatian architect Josip Marković. She received education in Paris, at *Académie Julian*, where she was taught painting under the mentorship of André Lhote and began studying at the *School of Photography* in 1926. Shortly after completing her studies, she opened her own photography studio and produced portraits, nudes, and fashion photographs for numerous magazines in Paris.

Dora Maar collaborated with Surrealist artists such as André Breton, Jean Cocteau, and Paul Éluard, whose portraits she took with her camera. Surrealist elements extend throughout the entirety of her oeuvre. Works such as *Onirique* (*Oneiric*, 1935) and *Le Simulateur* (*The Simulator*, 1936) are supposed to incite provocation and anxiety, and to put emphasis on the absurdity of the image itself.

With her camera, she recorded the making of Picasso's famous *Guernica* in the course of 1937. She was often featured in Picasso's works (*The Weeping Woman – La Femme qui pleure*, 1937) including the *Guernica* itself. By using photomontage, she created anthological works of photographic realism, such as *Portrait of Ubu* (*Portrait d'Ubu*, 1936) and 29 Astorg Street (29 rue d'Astorg, 1936). During the Second World War, she fully turned to painting and limned Parisian vedutas and Provençal landscapes.

London's Tate Modern organised a large-scale exhibition of Dora Maar in 2020, with which she was unveiled to the world as a superb Surrealist photographer, who herself often posed as a model to her fellow photographers such as Man Ray, who strongly influenced her photographic oeuvre.

Fotografkinja i slikarica Dora Maar (Henriette Théodora Marković) Francuskinja je hrvatskoga podrijetla. Kći je hrvatskoga arhitekta Josipa Markovića. Obrazovala se u Parizu na Académie Julian, gdje je studirala slikarstvo pod mentorstvom Andréa Lhota te od 1926. godine pohađala Školu fotografije. Nedugo nakon završetka školovanja otvorila je vlastiti fotografski studio i fotografirala portrete, aktove i modne fotografije za brojne pariške časopise.

Dora Maar često je surađivala s nadrealističkim umjetnicima kao što su André Breton, Jean Cocteau i Paul Éluard čije je portrete zabilježila svojom kamerom. Nadrealistički elementi protežu se kroz cijeli njen opus. Djela kao što su *Oniričan* (*Onirique*, 1935.) i *Simulator* (*Le Simulateur*, 1936.) trebaju potaknuti provokaciju i tjeskobu te staviti naglasak na apsurdnost samoga prikaza.

Svojim fotoaparatom zabilježila je stvaranje čuvene Picassove *Guernice* tijekom 1937. godine. Često se pojavljivala kao lik na Picassovim djelima (*Žena koja plače/La Femme qui pleure*, 1937.) pa i na samoj *Guernici*. Upotrebom fotomontaže stvorila je antologijska djela fotografskoga nadrealizma kao što su *Portret Ubua* (*Portrait d'Ubu*, 1936.) i Ulica *Astorg 29* (*29 rue d'Astorg*, 1936). Tijekom Drugoga svjetskoga rata u potpunosti se okreće slikarstvu te slika pariške vedute i provansalske pejzaže.

Londonski Tate Modern priredio joj je veliku retrospektivnu izložbu 2020. godine čime je Dora Maar otkrivena svijetu kao sjajna nadrealistična fotografkinja koja je i sama često bila model kolegama fotografima poput Mana Raya koji je izvršio velik utjecaj na njezin fotografski opus.

Zagreb school of animated film
Zagrebačka škola crtanog filma

Zagreb School of Animated Films was founded in 1956 and represented with its activity a breakthrough towards a new generation of artists aimed at avant-garde elements. Seventeen authors, in a collective endeavour, created various animated works, but in them we recognise a new concept of animated film. This new concept includes, inter alia, the reduction in the number of sketches, whereby an animated film's visual abundance and attractivity are not diminished. By applying the new concept of reduced animation, the number of sketches was decreased from 12,000-15,000 to 4,000-5,000. Flatness and geometricity of characters were introduced, which resulted in simplicity in their animation, ellipticity in the animation concept of the frame, and simple and effective dramaturgical solutions. Music is also used differently (different use of noises, sound effects), and it itself becomes part of the content and a counterpoint to the cinematic image. The verbal element is replaced by graphic solutions.

The tradition of animated film in Zagreb began with Sergije Tagatz in 1922 (two animated short advertisements) and continued with the *School of National Health* (cinematographer Stanislaw Novoryta, dramaturg, and director Milan Marjanović, painters Petar Papp and Vilko Šeferov) with films "Ivo's Tooth" and "Kitty's Nose" in 1928, and "Martin in the Sky" in 1929. The company *Maar-Reklama*, which produced numerous advertisements, also operated in the 1930s.

Nikola Kostelac, Vatroslav Mimica, Dušan Vukotić and Vladimir Kristl were authors of the golden era of Zagreb's animated film (the period between 1957 and 1962 was termed the School's golden period by film critic Ronald Holloway). Their work is known as animated painting. The first significant award at the Venice Film Festival was given to Vatroslav Mimica for his animated film *The Loner*, which provided the School with a major breakthrough towards international fame. The animated film *Surrogate* by Dušan Vukotić from 1962 won an Oscar.

More than 400 titles came out of the School through years of creation, and their work has been recognised worldwide with more than 400 awards.

Zagrebačka škola crtanoga filma utemeljena je 1956. godine i svojim je djelovanjem predstavila iskorak prema novom naraštaju umjetnika okrenutih avangardnim elementima. Sedamnaest autora u zajedničkom htijenju stvara različita animirana djela, ali u njima prepoznajemo novi koncept animiranoga filma. Taj novi koncept među ostalim podrazumijeva smanjenje broja crteža, pri čemu crtani film ne gubi na svom vizualnom bogatstvu i atraktivnosti. Primjenom novoga koncepta reducirane animacije broj crteža smanjen je s od 12000 do 15000 na 4000 do 5000. Uvedena je plošnost i geometričnost likova što je rezultiralo jednostavnošću u pokretanju likova, eliptičnošću u animacijskom koncipiranju kadra te jednostavnim i efektnim dramaturškim rješenjima. Drugačija je i upotreba glazbe (drugačija upotreba šumova, zvučnih efekata) koja postaje dio sadržaja ili kontrapunkt filmskoj slici. Verbalni element zamjenjuju grafička rješenja.

Tradicija animiranoga filma u Zagrebu počinje od Sergija Tagatza 1922. godine (dvije kratke animirane reklame), a nastavlja se sa Školom narodnoga zdravlja (snimatelj Stanislaw Noworyta, dramaturg i režiser Milan Marjanović, slikari Petar Papp i Vilko Šeferov) s filmovima *Ivin zub*, *Macin nos*, 1928. godine i *Martin u nebo* 1929. godine. Tijekom 1930-ih aktualna je firma *Maar-Reklama* koja radi razne reklame.

Autori Nikola Kostelac, Vatroslav Mimica, Dušan Vukotić i Vladimir Kristl pripadaju zlatnome dobu zagrebačkoga crtanoga filma (period od 1957. do 1962. godine kritičar Ronald Holloway naziva „zlatnim razdobljem Škole"). Njihov rad poznat je kao animirano slikarstvo. Prvu važnu nagradu na Filmskom festivalu u Veneciji dobio je Vatroslav Mimica sa svojim crtanim filmom Samac koji Školi omogućuje velik iskorak prema svjetskoj slavi. Animirani film Surogat Dušana Vukotića iz 1962. godine nagrađen je Oskarom.

Više od 400 naslova izašlo je iz Škole tijekom godina stvaralaštva, a njihov rad prepoznat je diljem svijeta s više od 400 nagrada.

Ivan Meštrović

(Vrpolje, 1883 – South Bend, 1962)

(Vrpolje, 1883. – South Bend, 1962.)

Ivan Meštrović is one of the more distinguished figures of world art in the first half of the 20th century, whose work saw international recognition in its day. He produced around 3,000 sculptures in his lifetime. He was educated in Vienna at the Academy of Fine Arts (1901-1906), where one of his professors was also architect O. Wagner. In European museums, he studied Egyptian and Assyrian, as well as European classical, medieval, and Renaissance sculpture (with emphasis on Michelangelo's works), and in Paris he became familiar with works by contemporary sculptors Antoine Bourdelle, Auguste Rodin and Aristide Maillol.

He advocated the creation of art with national features inspired by heroic folk songs and founded the group *The Medulić Association of Croatian Artists*. He was a Rector of Zagreb's Academy (1923-1942), and a member of the JAZU (today the HAZU) since 1934. He went to Italy and Switzerland in 1942, and in 1947 to the US, where he was a Professor in Sculpture at the University of Syracuse, and afterwards in South Bend.

At the International Exhibition in Rome in 1911, Meštrović won the Grand Prix for Sculpture, and Gustav Klimt for Painting. This was a major artistic recognition that was even celebrated in Otavice. He had solo exhibitions at the 11th Venice Biennale, at the Victoria and Albert Museum in London, at various expositions in Paris, and throughout the US. He was the first living artist to have exhibited at America's most renowned Metropolitan Museum of Art in New York. Auguste Rodin stated that "Meštrović is the greatest phaenomenon among sculptural artists."

In 1926, Benjamin Ferguson commissioned from Meštrović two sculptures that were set up in Chicago's city centre. Meštrović insisted that the Native Americans be moulded in Zagreb. Meštrović received a 150,000-dollar award for them. In 1928, the *Equestrian Indians* were unveiled at the entrance to the Grant Park in Chicago, with which Meštrović offered a peace pipe to the American people by making two horsemen (a bowman and a spearman) sans their weapons. They stand approximately five meters high, measuring nearly eleven meters in height together with the pedestal.

Ivan Meštrović jedna je od istaknutijih osobnosti svjetske umjetnosti prve polovice 20. stoljeća čije je djelo u svoje doba doživjelo svjetska priznanja. Izradio je za života oko 3000 skulptura. Školovao se na bečkoj Akademiji likovnih umjetnosti (1901. – 1906.). U europskim muzejima proučavao je egipatsko i asirsko te europsko klasično, srednjovjekovno i renesansno kiparstvo (s naglaskom na Michelangelova djela), a u Parizu je upoznao radove suvremenih kipara Antoinea Bourdellea, Augusta Rodina i Aristidea Maillola.

Zalagao se za stvaranje umjetnosti nacionalnih obilježja nadahnute junačkim narodnim pjesmama te je osnovao skupinu Društvo hrvatskih umjetnika „Medulić". Bio je rektor Akademije likovnih umjetnosti u Zagrebu (od 1923. do 1942.), a od 1934. član tadašnjega JAZU-a (danas HAZU). U Italiju i Švicarsku odlazi 1942., a 1947. u SAD gdje je bio profesor kiparstva na američkom sveučilištu Syracuse te nakon toga u South Bendu.

Na Međunarodnoj izložbi u Rimu 1911. Meštrović je osvojio prvu nagradu za kiparstvo, a Gustav Klimt za slikarstvo. Bilo je to veliko umjetničko priznanje koje se slavilo čak i u Otavicama. Samostalno je izlagao na 9. bijenalu u Veneciji, u muzeju *Victoria and Albert* u Londonu, na raznim izložbama u Parizu te diljem SAD-a. Prvi je živući umjetnik koji je 1947. imao svoju izložbu u Metropolitanu u New Yorku. Auguste Rodin rekao je kako je „Meštrović najveći fenomen među umjetnicima skulpture".

Zaklada Benjamina Fergusona 1926. je od Meštrovića naručila dvije skulpture koje su sredinom listopada 1928. postavljene u samo središte Chicaga. Na Meštrovićevo inzistiranje Spomenik Indijancima izliven je u Zagrebu. Meštrović je za njih nagrađen sa 150 tisuća dolara. Godine 1928. spomenik je otkriven na ulazu u Grant Park u Chicagu kojim je Meštrović, izradivši dva konjanika (kopljanik i strijelac) bez oružja, ponudio američkom društvu svoje viđenje „lule mira". Skulpture konjanika visoke su oko pet metara, a s podestom sežu gotovo 11 metara uvis.

Juraj Dalmatinac

(Zadar, the beginning of 15th century – Šibenik, between 1473 and 1475)
(Zadar, početak XV. st. – Šibenik, između 1473. i 1475.)

Georgius Mathei Dalmaticus (Giorgio Orsini) is a Croatian sculptor and builder who worked in Dalmatia from 1441 until his death. In that period, he was the main builder of the magnificent Cathedral of St. James in Šibenik, whose long construction lasted from 1431 to 1536. The Dalmatian was responsible for the design of the eastern part of the church, the transversal nave, and the dome over the intersection, three semicircular apses, the baptistery, and the sacristy. In the construction work of Georgius Dalmaticus, the sacristy of the Cathedral of St. James in Šibenik occupies a special place because it is almost completely devoid of decorations, which allows this exceptional engineer and sculptor to be observed in the light of his architectural thought.

He left several brilliant micro-units on the cathedral, among which the crown of a total of 71 naturalistically carved heads on the apses stands out. All of them have highly individualized features. However, it is not known whether they are portraits of the author's contemporaries or whether the portrait features are the result of his imagination.

In parallel with the work on the Šibenik cathedral, which was completed by Nikola the Florentine, he also undertook work in other Dalmatian and Italian cities. He worked in Split, Dubrovnik, Zadar, Pag, and in the Italian cities of Rimini, Ravenna, Urbino, and Ancona, where his preserved work made between 1451 and 1460 stands out: Loggia dei Mercanti.

Georgius Mathei Dalmaticus probably studied in Venice in the workshop of sculptors Giovanni and Bartolomeo Bono and was their collaborator in the production of statues and decorations on the Porta della Carta next to the Duke's Palace. It is assumed that Georgius Mathei Dalmaticus is the sculptor of Schiavone who, according to the records of Filarete and Vasari, did significant things in Venice.

He used the style of ornate Gothic (so-called gotico fiorito), but also accepted elements of the Tuscan Renaissance. The interweaving of Gothic and Renaissance is present throughout his work. This makes him the first and most distinctive representative of the mixed Gothic-Renaissance style, which characterizes the regional art of Dalmatia in the second half of the 15th century, and the beginning of the 16th century.

Juraj Dalmatinac hrvatski je kipar i graditelj koji je djelovao u Dalmaciji od 1441. do smrti. U tom razdoblju bio je glavni graditelj velebne šibenske katedrale sv. Jakova čija je duga gradnja potrajala od 1431. do 1536. Dalmatinac je odgovoran za oblikovanje istočnoga dijela crkve, poprečnog broda i kupole nad križištem, tri polukružne apside, krstionice i sakristije. U graditeljskom opusu Jurja Dalmatinca sakristija katedrale sv. Jakova u Šibeniku zauzima posebno mjesto jer je gotovo u potpunosti lišena ukrasa što omogućuje da se ovog iznimnog inženjera i kipara promatra u svjetlu njegove arhitektonske misli.

Ostavio je nekoliko blistavih mikrocjelina na katedrali, među kojima se ističe vijenac od sveukupno 71 naturalistički klesane glave na apsidama. Sve imaju izrazito individualizirana obilježja no nije poznato je li riječ o portretima autorovih suvremenika ili su portretne karakteristike rezultat njegove mašte.

Usporedno s radovima na šibenskoj katedrali, koju je dovršio Nikola Firentinac, preuzimao je i poslove u drugim dalmatinskim i talijanskim gradovima. Radio je u Splitu, Dubrovniku, Zadru, Pagu te u talijanskim gradovima Riminiju, Ravenni, Urbinu i Anconi u kojoj se posebno ističe njegov sačuvani rad nastao između 1451. i 1460.: Loža trgovaca (Loggia dei Mercanti).

Juraj Dalmatinac vjerojatno se školovao u Veneciji u radionici kipara Giovannija i Bartolomea Bona i bio njihov suradnik pri izradbi kipova i ukrasa na Porta della Carta uz Duždevu palaču. Pretpostavlja se da je Juraj Dalmatinac kipar Schiavone koji je, po zapisima Filaretea i Vasarija, učinio značajne stvari u Mletcima.

Koristio je stil kićene gotike (tzv. *gotico fiorito*), ali je prihvatio i elemente toskanske renesanse. Ispreplitanje gotike i renesanse prisutno je u cijelome njegovu djelu, pa je on prvi i najosebujniji predstavnik mješovita gotičko-renesansnoga stila, koji obilježava regionalnu umjetnost Dalmacije u drugoj polovici XV. i početku XVI. st.

Antun Lučić

(Split, 1855 - Washington, 1921)

(Split, 1855. – Washington, 1921.)

Antun Lučić, a native of Split, a mechanical engineer, oil and mining entrepreneur, pioneered mass exploitation of oil.

He completed his studies in mechanical engineering in Graz and joined the Austro-Hungarian Navy. He went through additional training in Rijeka and Pula, and finally emigrated to the US in 1879. He anglicised his name to Anthony Francis Lucas. He discovered one of the largest iron ore deposits in Northern Carolina and opened a consultancy for mining and mechanical engineering in Washington.

He found an oil field around the Spindletop mound near Beaumont in Texas and obtained a lease on 268 hectares of land. He started drilling for oil using a hydraulic rotary drill, which was rare in those days. He encountered technical problems and money was tight, and he had to look for help to continue exploiting the field. In February 1900, Rockefeller refused to help him finance the endeavour, but he managed to get J. M. Guffey and J. H. Galey to invest. He became their partner with a minority stake. He was thus able to lease more than 6,000 hectares of land and to rent a more powerful drill. This was the first time that mud was used instead of water to flush out rock fragments and to maintain the borehole.

When Lučić struck oil on 10 January 1901 at the depth of about 350 metres, there was a huge eruption. Oil gushed up to the height of 60 metres. Between 12,000 and 16,000 cubic metres of oil were ejected high into the air every day until the well was brought under control on 19 January. Lučić designed a set of valves and pipes called a preventer to control the gusher. From then on, the US became the world leading oil producer, overtaking Russia. The Spindletop area was entered into the National Register of Historic Places in 1966.

Lučić's innovative engineering solutions resulted in the unprecedented development of modern oil industry which completely transformed the US economy. Oil soon became the most important source of energy in industry and transport and its widespread use had a huge impact on our way of life.

Splićanin Antun Lučić bio je strojarski inženjer, naftno-rudarski poduzetnik i pionir masovne eksploatacije nafte.

U Grazu je završio studij strojarstva pa je pristupio austrougarskoj ratnoj mornarici. Školovao se i obučavao u Rijeci i Puli te se 1879. odselio u SAD gdje se počeo koristiti amerikaniziranom verzijom imena: Anthony Francis Lucas. U Sjevernoj Karolini otkrio je jedno od najvećih ležišta željezne rude pa je u Washingtonu otvorio savjetnički ured za rudarstvo i strojarstvo.

Oko uzvisine Spindletopa kraj Beaumonta u Teksasu pronašao je naftno polje te je zakupio 268 hektara zemljišta koje je počeo bušiti tada rijetkom hidrauličnom rotacijskom bušilicom. Zbog tehničkih i novčanih poteškoća, bio je prisiljen potražiti pomoć kako bi nastavio akciju. Rockefeller mu je u veljači 1900. odbilo financirati nastavak istraživanja, ali je uspio privući ulaganja J. M. Guffeya i J. H. Galeya te postati manjinski partner. To mu je omogućilo da zakupi više od 6000 hektara terena i iznajmi snažniju bušilicu. U tom se procesu prvi put za održavanje kanala bušotine i iznošenje krhotina stijena umjesto vode rabila glinena isplaka.

Kada je Lučić 10. siječnja 1901. na dubini od približno 350 m pronašao naftu, dogodila se dotad neviđena erupcija (od 12 000 do 16 000 m^3 na dan u mlazu visine 60 m) koja je trajala do 19. siječnja. Lučić ju je zaustavio sustavom ventila i cijevi nazvanim preventer. Sjedinjene Američke Države postale su tada vodećim svjetskim proizvođačem nafte što je do toga trenutka bila Rusija. Područje Spindletopa proglašeno je nacionalnom povijesnom znamenitošću 1966.

Lučićeva inovativna inženjerska rješenja rezultirala su dotad neviđenim razvojem moderne naftne industrije koja je dovela do potpune preobrazbe američkoga gospodarstva. Nafta je ubrzo postala najvažniji energent u industriji i prometu, a njezina široka primjena uvelike je utjecala na promjene u načinu svakodnevnoga života.

Andrija Štampar

(Brodski Drenovac, 1888 – Zagreb, 1958)

(Brodski Drenovac, 1888. – Zagreb, 1958.)

The Croatian medical doctor Andrija Štampar completed his medical studies in 1911 at Vienna University. In the eleven years as head of the Hygiene Department of the Ministry of Public Health in Belgrade, he organised the establishment of 250 health institutions across the Kingdom of Yugoslavia. He advocated health care that would be available and equal for all.

In the 1930s he moved abroad where he started working for the Health Organisation of the League of Nations, the forerunner of the United Nations. He also worked in China for four years as an advisor to the Chinese government. He carried out a reorganisation of the entire health system, and particularly focused on the protection of maternity and small children.

In 1927 he established the School of Public Health. From 1945 to 1947 the School was a part of the Ministry of Health and after that it got attached to the Medical Faculty in Zagreb and the first Master's Degree courses were organised there. It kept this role until the present day. Štampar's mission was to educate people on disease prevention, hygiene, and infectious diseases such as tuberculosis, syphilis, children's infectious diseases, but also about alcoholism and smoking that were present back then too.

His definition specifying that „Health is a state of complete physical, mental and social wellbeing, and not merely absence of disease or infirmity" entered the preamble of the Constitution of the World Health Organisation. In 1946 he was elected the first vice-president of the UN Economic and Social Council and chairman of the Interim Commission, which played the role of the World Health Organisation until its Constitution got ratified. He chaired the first World Health Assembly of the World Health Organisation in Geneva in 1948. His contribution to the development of public health earned him the most prestigious Leon Bernard prize awarded by the WHO in 1957.

Andrija Štampar studij medicine završio je 1911. godine na Bečkom sveučilištu. Tijekom jedanaestogodišnje dužnosti načelnika higijenskoga odjeljenja pri Ministarstvu narodnoga zdravlja u Beogradu organizirao je uspostavljanje 250 zdravstvenih ustanova diljem tadašnje Kraljevine Jugoslavije. Zalagao se za svima dostupnu jednaku medicinsku skrb.

Tridesetih godina 20. stoljeća odlazi u inozemstvo gdje započinje s radom u Higijenskoj organizaciji Lige naroda, preteče Ujedinjenih naroda. U Kini je četiri godine bio savjetnik kineske vlade. Proveo je reorganizaciju cjelokupnoga javnoga zdravstva, a posebice se zauzimao za pitanja zaštite majčinstva i male djece.

U Zagrebu je 1927. osnovao *Školu narodnoga zdravlja*. Škola je od 1945. do 1947. bila dio Ministarstva zdravlja, a nakon toga razdoblja postala je dio Medicinskoga fakulteta u Zagrebu te mjesto prvih poslijediplomskih studija medicine što je i danas. Štamparovo poslanje bilo je educirati narod o prevenciji bolesti, o higijeni i zaraznim bolestima poput tuberkuloze, sifilisa, dječjih zaraznih bolesti, ali i o već tada prisutnom alkoholizmu i pušenju itd.

Štamparovom definicijom „Zdravlje je stanje potpunoga fizičkoga, mentalnoga i socijalnoga blagostanja, a ne samo odsustvo bolesti i iznemoglosti" formirana je preambula ustava Svjetske zdravstvene organizacije. Godine 1946. bio je izabran za prvoga potpredsjednika Ekonomsko-socijalnoga vijeća UN-a te za predsjednika Privremene (Interimne) komisije koja je do ratifikacije ustava Svjetske zdravstvene organizacije obavljala dužnost te organizacije. Predsjedao je prvoj Svjetskoj zdravstvenoj skupštini Svjetske zdravstvene organizacije (SZO) u Ženevi 1948. godine. Zbog njegova doprinosa razvoju javnoga zdravstva Svjetska zdravstvena organizacija mu je 1957. godine uručila najprestižniju nagradu „Leon Bernard".

Andrija Mohorovičić

(Volosko, 1857 – Zagreb, 1936)

(Volosko, 1857. – Zagreb, 1936.)

Geophysicist Andrija Mohorovičić is one of the best-known Croatian scientists. He was educated abroad, but he spent his entire career in Croatia, unlike so many Croatian scientists. He is considered as one of the greatest figures in seismology, yet at the start of his career he focused mainly on meteorology.

He got his degree in mathematics and physics in Prague in 1879, and he got his doctoral degree in 1893 at the University of Zagreb. He established a meteorological station in the Nautical School in Bakar and was then appointed director of the Meteorological Observatory in Zagreb. He was put in charge of all the weather stations in Croatia.

A strong earthquake hit Zagreb on 9 November 1880. Mohorovičić decided to do some research and in 1901 he set up a seismological station in Zagreb. In 1908 and 1909, it was fitted with the state-of-the-art seismographs. Studying the data from several earthquakes, Mohorovičić made a substantial contribution to the process of establishing the epicentre of an earthquake. The hyperbolas used in the procedure are called the Mohorovičić epicentrals.

He studied extensively the strong earthquake in Pokupsko, with the epicentre some 40 km southwest of Zagreb. The earthquake struck on 8 October 1909 with a maximum intensity of VIII ° on the MCS scale. Based on his observations, Mohorovičić discovered the discontinuity between the Earth's crust and mantle. This is in fact the greatest scientific discovery to ever come from Croatia. The discontinuity was named after him and is known as the MOHO layer for short. It is the biggest natural structure to be named after a person. Under the mountain ranges it is up to 90 km deep, and under the deep oceans it lies at the depth of only five kilometres. The average depth of the discontinuity is 33 km. A century and a half before Mohorovičić's time, Ruđer Bošković wrote about the Earth's crust rising and dipping in places. His views of the internal structure of our planet were proven right after the discovery of the discontinuity between the crust and the mantle. Both Bošković and Mohorovičić have had Moon craters named after them. Planetoid *8422 Mohorovičić* also bears his name. The Geophysical Institute of the Faculty of Natural Sciences and Mathematics in Zagreb is also named after Andrija Mohorovičić.

Andrija Mohorovičić hrvatski je geofizičar i jedan od najpoznatijih znanstvenika koji je nakon školovanja u inozemstvu cijelu svoju profesionalnu karijeru proveo u Hrvatskoj, za razliku od većine drugih najvećih hrvatskih znanstvenika. Ubraja se među najveće svjetske seizmologe. Na početku karijere intenzivno se bavio meteorologijom.

Matematiku i fiziku diplomirao je u Pragu 1879., a doktorirao je 1893. na Sveučilištu u Zagrebu. Pri Nautičkoj školi u Bakru osnovao je meteorološku postaju te je potom postao upravitelj Meteorologijskoga opservatorija u Zagrebu. Preuzeo je nadzor i upravu nad svim meteorološkim postajama u tadašnjoj Hrvatskoj.

Jak potres koji je pogodio Zagreb 9. studenoga 1880. Mohorovičića je potaknuo na istraživanja pa je već 1901. postavio u Zagrebu seizmološku postaju koja je 1908. i 1909. nabavila dva tada najmodernija seizmografa. Proučavajući podatke o više potresa, Mohorovičić je znatno pridonio razvoju postupka određivanja epicentra potresa pa se hiperbole koje se rabe u tom postupku nazivaju Mohorovičićeve epicentrale.

Mohorovičićevo proučavanje snažnoga pokupskoga potresa intenziteta od VIII °MCS-ljestvice od 8. listopada 1909. čiji je epicentar bio 40-ak km jugoistočno od Zagreba rezultiralo je otkrićem diskontinuiteta u Zemljinoj kori što je njegov najveći doprinos znanosti. To je ujedno i najveće znanstveno otkriće koje se dogodilo u Hrvatskoj. Nazvan njegovim imenom, *Mohorovičićev diskontinuitet* (skraćeno MOHO-sloj) označava diskontinuitet između Zemljine kore i plašta i to je najveća prirodna tvorevina na Zemlji nazvana po nekom čovjeku. Podno planinskih lanaca MOHO-sloj doseže dubinu i do 90 km, a podno dubokih oceana nalazi se na dubini od samo 5 km. U prosjeku se nalazi 33 km ispod Zemljine površine. Stoljeće i pol prije Mohorovičića Bošković je pisao o Zemljinoj kori koja se negdje uzdiže, a negdje spušta. Njegova gledišta o unutrašnjoj strukturi Zemlje pokazala su se točnima upravo u plohi diskontinuiteta između Zemljine kore i plašta. Kao i po Boškoviću, i po Mohorovičiću je nazvan krater na Mjesecu. Planetoid *8422 Mohorovičić* također nosi njegovo ime kao i Geofizički zavod Prirodoslovno-matematičkoga fakulteta u Zagrebu.

Slavoljub Eduard Penkala

(Liptovsky Mikulaš, 1871- Zagreb, 1922)

(Liptovsky Mikulaš, 1871. – Zagreb, 1922.)

He was born in 1871 in Slovakia. His father was Polish, his mother Dutch. He received his doctorate in chemistry from the Royal Saxon Polytechnic Institute in Dresden in 1900. He was soon appointed the royal technical supervisor in Croatia. In late 19th and early 20th century, he played a key part in the development of industry in Zagreb, in his new homeland. He is best known as the inventor and manufacturer of a world-famous automatic mechanical pencil (known as penkala), a safe fountain pen with a retractable tip, a fountain pen and pencil clip which made it possible to clip the pen and pencil to the exterior or interior pocket and keep them upright. The clip is still in use.

At first, Penkala made his pencils in his own workshop, but as the invention gained popularity, the demand increased, and pencils had to be serially produced. He soon established a company with the Moster brothers, called Penkala-Edmund Moster & Co., which operated as *Penkala factory Plc* from 1926 to 1937. It was a major manufacturer of writing instruments in the world. It exported to more than 70 countries. Other plants were built in Lepoglava and Berlin, which employed about 800 workers.

Among the 80-odd patents obtained by Penkala there are various chemical products (e.g., washing powder and blue detergent that replaced soap and lye for washing clothes; the latter was the first product to remove wine, fruit, and ink stains), a thermos flask and a hot-water bottle. In 1910, he built the first Croatian airplane.

He was interested in phonographic records; he found a way to make them less breakable and improve the sound quality for the recording and reproduction. Penkala signed a deal with the Edison-Bell company and launched the production of phonographic records and phonographs under the label Edison Bell Penkala. He improved the mechanical phonographic needle and cartridge which in turn led to improvements in the design of military audio surveillance radios called Penkala.

Rodio se 1871. u Slovačkoj od oca Poljaka i majke Nizozemke, a kemiju je doktorirao 1900. na Visokoj tehničkoj školi u Dresdenu. Ubrzo je bio postavljen za kraljevskoga tehničkoga kontrolora u Hrvatskoj, pa je potkraj 19. i početkom 20. st. izvršio jak utjecaj na razvoj industrije u Zagrebu, u svojoj novoj domovini. Najpoznatiji je kao izumitelj i proizvođač svjetski poznate automatske mehaničke olovke (penkale), sigurnoga nalivpera (s uvlačenjem pera), držača nalivpera i olovke, tzv. knipse koja je omogućila čuvanje pisaljki u uspravnom položaju pričvršćene za unutarnji ili vanjski džep te je i danas u uporabi.

Penkala je u početku olovke proizvodio samostalno u vlastitoj radionici, no izum je ubrzo postao iznimno popularan pa su i narudžbe zahtijevale serijsku proizvodnju. Uskoro je s braćom Moster osnovao poduzeće Penkala-Edmund Moster & Co. da bi od 1926. do 1937. poslovalo pod nazivom Penkala tvornica d. d. Tvornica je bila među najvećim proizvođačima pisaćega pribora u svijetu, s izvozom u više od 70 zemalja, a slični pogoni pokrenuti su i u Lepoglavi i Berlinu, gdje je bilo zaposleno oko 800 radnika.

Penkala je među 80-ak svojih patenata izumio niz kemijskih proizvoda (npr. praškasti deterdžent i plavilo koji su prvi put zamijenili sapun i lužinu za pranje rublja te prvi uklonili mrlje od vina, voća i tinte), termos-bocu i termofor, a 1910. konstruirao je i izradio prvi hrvatski zrakoplov.

Zanimale su ga i gramofonske ploče pa je smanjio njihovu lomljivost i povećao kvalitetu zvuka pri snimanju i reprodukciji ploča. Penkala je sklopio ugovor s poduzećem Edison-Bell te je počeo proizvoditi gramofonske ploče i gramofone „Edison Bell Penkala“. Uspio je poboljšati mehaničku gramofonsku iglu i zvučnicu gramofona čime je utjecao na usavršavanje vojnih prislušnih radiostanica nazvanih Penkala.

Josip Belušić

(Županići, 1847 – Trieste, 1905)

(Županići, 1847. – Trst, 1905.)

Josip Belušić was a physicist and mathematician. He invented the first device that monitored the movement of vehicles automatically. He went to school in Pazin, Kopar and Vienna and went on to teach mathematics and physics at the Imperial School in Kopar. His invention was called a velocimeter. It was an electrical device that measured the speed of passenger coaches, duration of rides and periods when vehicles were stationary, the number of passengers and the time when they entered and left the carriage. All this information was recorded on a roll of paper. Belušić's velocimeter was the first tachograph and taximeter, and the first speedometer.

In 1898, France organised the world exposition to mark the 100th anniversary of the French Revolution. Eiffel built his famous tower for the exposition and for the first time, the public could visit the exposition at night because it was lit by the recently invented Edison's lightbulbs. The exposition lasted for six months and was visited by 28 million people from all over the world. As the visitors needed transportation in Paris and the coachmen would cheat the carriage owners by not reporting all the rides that they had taken, the Paris city council announced an open tender for a device that could monitor what the coachmen were doing and prevent them from cheating.

The council received a total of 129 applications. The French Academy of Inventors praised Belušić's invention, the velocimeter, awarding it the gold medal. Belušić was inducted into the Academy as an honorary member.

Belušić patented his invention and called it a velocimeter (speedometer). The device was later renamed *Controlare automatico per vettura da nolo* (monitoring device for hired vehicles). Belušić's invention was well-known all over the world, as evidenced by the contemporary scientific literature in Germany, America, France and Italy.

Josip Belušić hrvatski je fizičar i matematičar te izumitelj prvoga nadzornoga uređaja koji je radio bez posredstva čovjeka. Školovao se u Pazinu, Kopru i Beču te potom predavao matematiku i fiziku na Carskoj školi u Kopru. Izumitelj je velocimetra, električnoga uređaja kojim se mjerila brzina putničkih kočija, vremensko trajanje vožnje i stajanja vozila, broj prevezenih osoba te vrijeme ulaska i izlaska putnika. Sve te informacije bilježile su se na papiru okrugla formata. Belušićev velocimetar zapravo je prvi tahograf i taksimetar, a neizravno i prvi brzinomjer.

Prigodom stote obljetnice Francuske revolucije, odnosno pada Bastille, 1889. godine Francuzi su priredili Svjetsku izložbu poznatu po izgradnji Eiffelovoga tornja i mogućnosti razgledavanja izložbe u noćnim satima zahvaljujući Edisonovom izumu žarulje. Izložbu koja je trajala šest mjeseci došlo je vidjeti 28 milijuna posjetitelja iz cijeloga svijeta. Budući da su posjetitelji trebali prijevoz Parizom, a kočijaši su vlasnicima kočija krali zarađen novac ne prijavljujući im sav prihod od vožnji, pariška komuna raspisala je međunarodni natječaj za uređaj koji će kontrolirati kočijaše i onemogućiti vožnju na crno.

Na natječaj je stiglo 129 prijava. Francuska akademija izumitelja pohvalila je Belušićev izum velocimetar te ga nagradila zlatnom medaljom i proglasila počasnim članom Akademije.

Svoj uređaj Belušić je patentirao i nazvao ga velocimetar (brzinomjer), ali taj je naziv kasnije zamijenjen nazivom *Controlare automatico per vettura da nolo* (uređaj za nadzor vozila u najmu). Belušićev izum imao je odjeka u cijelom svijetu što svjedoče onovremena stručna literatura Njemačke, Amerike, Francuske i Italije.

Marcel Kiepach

(Križevci, 1894 – the Russian front, 1915)
(Križevci, 1894. – ruska fronta, 1915.)

Marcel Kiepach, a native of Križevci, was an inventor in the field of electrical engineering whose work has remained mostly unknown. He went to school in Križevci and Zagreb and went on to study in Halle and Berlin. At the age of sixteen, his parents encouraged him to visit major engineering plants in Germany. He also visited the World Exposition in Brussels, the air show in Lille, the Zeppelin factory in Friedrichshafen, the largest wireless radiotelegraphy station in Nauen where he gained a thorough and broad knowledge of the various technologies. When he went to Berlin as a young high school student to apply for a patent, the clerks thought he had brought in his father's designs.

Kiepach invented the remote maritime compass, a device which reliably indicates north because it is not affected by magnetic forces or iron in the ship hull. He invented the vehicle dynamo, a device that could be used to light all kinds of wheeled vehicles (carriages, cars, omnibuses, and railways cars). The French Ministry of Trade and Industry recognised the invention in 1912. The dynamo was an electric generator powered by the movement of the vehicle. Marcel's third invention was an electric switch for X-ray devices which was based on gas pressure. Another key patent is the small transformer for low voltage, patented jointly with the famous constructor Heinrich Weiland. Marcel's inventions confirm that he was indeed a pioneer of off-grid technology.

His death cut short his endeavours. He was killed on the Russian front, in Poland, as a soldier in the Austro-Hungarian Army, on 13 August 1915.

Marcel Kiepach rođeni je Križevčanin nedovoljno poznat po svojim izumima na polju elektrotehnike. Školovao se u Križevcima i u Zagrebu, a na studiju je bio u Halleu i Berlinu. Već kao šesnaestogodišnjaka roditelji su ga poticali da posjećuje najveća tehnička i strojarska postrojenja u Njemačkoj. Posjetio je tako i Svjetsku izložbu u Bruxellesu, letački miting u Lilleu, postrojenja Zeppelin u Friedrichshafenu, najveću postaju za bežičnu telegrafiju u Nauenu te stekao temeljito i opširno znanje. Kada je kao mladi gimnazijalac sam pošao u Berlin prijaviti svoj patent, zaposlenici ureda mislili su da je donio očeve nacrte.

Kiepach je izumio *žiro-kompas*, uređaj za daljinski prijenos pokazivanja otklona brodskoga kompasa na koji nisu utjecale ni magnetske sile ni željezno okruženje broda. Izumio je *dinamo*, stroj za rasvjetu svih vrsta kola (kočija, automobila, omnibusa i željezničkih vagona). Ovaj izum priznalo je 1912. francusko Ministarstvo trgovine i industrije. Bio je to električni generator s mehaničkim pogonom samoga vozila. Marcelov treći izum je *strujni prekidač za rendgenske aparate* koji je djelovao na principu tlaka plina. Jedan od njegovih važnih patenata je i *mali transformator za niski napon* koji je prijavio s poznatim konstruktorom Heinrichom Weilandom. Marcelovi izumi potvrđuju ga kao pionira „off-grid", odnosno izvanmrežne tehnologije.

Prerana smrt prekinula je sva njegova istraživanja. Kao austrougarski vojnik poginuo je na ruskoj fronti u Poljskoj 13. kolovoza 1915. godine.

Marin Getaldić

(Dubrovnik, 1568 – Dubrovnik, 1626)

(Dubrovnik, 1568. – Dubrovnik, 1626.)

Marin Getaldić from Dubrovnik is a Croatian Renaissance mathematician and physicist. He wrote the first comprehensive handbook in algebraic analysis and made an important contribution to the affirmation of symbolic algebra and the development of mathematical methods. He was called "the Lucifer of geometry." Getaldić's work strongly influenced the development of algebra in geometry prior to the discovery of analytical geometry, which was founded seven years later by the French philosopher and physicist Descartes.

He received his education in his hometown, for which he performed various functions. In the titles of his debates, he always highlighted his origin, calling himself "a Patrician of Dubrovnik." He travelled to London, Antwerp, and Paris, where he met F. Viète, who influenced his mathematical work. He also knew G. Galilei, whose lectures in mathematics, mechanics, and astronomy he attended in Rome, and later held correspondence with him. He was engaged in the practical application of mathematics in solving geodetic problems.

Getaldić is remembered for his work in the field of optics. Already during his lifetime, there were stories prompted by his experimental work with parabolic mirrors. He tested spherical and parabolic mirrors in front of a cave, and observed the sky, thereby drawing attention to himself, and he was proclaimed a soothsayer and magician.

Today, his construction of the parabolic mirror enables communication for satellite and space vehicles. It is also used for microwave transmission, ground-based and aircraft radar antennas, and wireless WAN/LAN connection. Furthermore, the parabolic mirror is widely applied in instruments such as the telescope and the microscope, as well as in devices such as reflectors and collectors.

A reprinted edition of Getaldić's complete works was published in Zagreb under the title Opera omnia (1968). One of Getaldić's original parabolic mirrors is kept at the National Maritime Museum in London.

Dubrovčanin Marin Getaldić hrvatski je renesansni matematičar i fizičar. Napisao je prvi cjeloviti priručnik algebarske analize te dao važan doprinos afirmaciji simboličke algebre i razvoju matematičkih metoda. Zvali su ga „Lucifer geometrije". Getaldićevo djelo znatno je utjecalo na razvoj primjene algebre na geometriju prije otkrića analitičke geometrije kojoj će sedam godina nakon toga francuski filozof i fizičar Descartes položiti temelje.

Obrazovao se u rodnom gradu za koji je obavljao različite poslove. U naslovu svojih rasprava uvijek je isticao i podrijetlo nazivajući se „dubrovačkim patricijem". Putovao je u London, Antwerpen te Pariz gdje je upoznao F. Viètea koji je utjecao na njegov rad u matematici. Poznavao je i G. Galileija čija je predavanja iz matematike, mehanike i astronomije slušao u Rimu te se s njim kasnije i dopisivao. Bavio se praktičnom primjenom matematike u rješavanju geodetskih problema.

Getaldić je zapamćen po radu u području optike. Još za života kružile su priče potaknute njegovim eksperimentalnim radom s paraboličnim zrcalima. Naime, dok je ispred spilje iskušavao sferna i parabolična zrcala i promatrao nebo, privlačio je pozornost pa su ga proglasili vračem i čarobnjakom.

Njegova konstrukcija paraboličnoga zrcala danas omogućuje komunikaciju za satelitske i svemirske letjelice. Upotrebljava se i za mikrovalni prijenos, radarske antene na tlu i u avionu, bežične WAN/LAN veze. Osim toga, parabolično zrcalo ima široku primjenu u instrumentima poput teleskopa, mikroskopa ili uređajima kao što su reflektori i kolektori.

Reprint-izdanje sveukupnih Getaldićevih djela izišlo je 1968. u Zagrebu pod nazivom Opera omnia. U pomorskom muzeju u Londonu čuva se jedno od Getaldićevih izvornih paraboličnih zrcala.

David Schwarz

(Keszthely, 1852 – Zagreb, 1897)
(Keszthely, 1852. – Zagreb, 1897.)

The inventor David Schwarz attended the Jewish elementary school in his birthplace and then moved to Županja in Croatia where he learned the shopkeeper's trade. He lived in Osijek for a while and then moved to Zagreb with his family.

He developed an interest in technology and started reading up on it. The books inspired him to ponder the ways in which an airship could be designed. He thought that the craft should be shaped like a short, pointed pencil, with a sturdy aluminium structure. The ships were to be steered from a metal gondola. A new material – aluminium – was first unveiled at the World Exposition in Paris in 1889. Schwartz quickly realised its features made it ideal for building aircraft. To learn more about aluminium and its alloys, Schwarz got a job in Carl Berg's aluminium factory. They jointly made a new aluminium alloy called duralumin or Schwarz aluminium. Duralumin is slightly heavier than ordinary aluminium, but it is much, much stronger. It is widely used today, especially in aircraft construction.

The Austro-Hungarian War Ministry rejected the project, but the Russian embassy advised its government to go ahead with it. And thus, the construction of the first airship began in St. Petersburg. The construction of the first metal airship was completed under Schwarz's supervision in the summer of 1894. The airship was 31 metres long, it weighed 2530 kilos and had a volume of 3284 cubic metres.

There were others before Schwarz who tried to construct airships powered by engines and propellers, but the craft could not be steered because they were like inflated balloons in rope netting. Despite the propellers, they could not fly straight. Schwarz's airship (which was perfected by Zeppelin) revolutionised aviation. It could fly from Europe to America. The crew included pilots and navigators just like on sea vessels. The German emperor made sure that the credit for the invention went to a German. As a result, Count von Zeppelin is world famous as the inventor of the airship.

David Schwarz izumitelj je koji se nakon završene židovske osnovne škole u rodnom gradu u Mađarskoj doselio u Županju u Hrvatskoj gdje je izučio zanat za trgovca. Živio je u Osijeku da bi se konačno s obitelji doselio u Zagreb.

Zanimala ga je tehnička literatura koja ga je navela na razmišljanje o konstrukciji zračnoga broda. Smatrao je da bi letjelice trebale biti poput zašiljene, kratke olovke s čvrstom strukturom od aluminija i upravljačkom gondolom od metala. Na Svjetskoj izložbi u Parizu 1889. predstavljen je novi materijal – aluminij čiju je primjenjivost u zrakoplovnoj tehnici uočio Schwartz. Kako bi naučio što više o aluminiju i njegovim legurama, Schwartz je počeo raditi u tvornici aluminija za Carla Berga. Zajedno su došli do otkrića nove aluminijske legure – duraluminija ili *Schwarzovoga aluminija*, kako se tada zvao. Duraluminij ima nešto veću specifičnu težinu, ali je čvrstoća mnogo veća od aluminijeve. Danas ima veliku primjenu, posebice u konstrukciji zrakoplova.

Za razliku od austrougarskoga Ministarstva rata koje je odbilo projekt, rusko veleposlanstvo dalo je preporuku na temelju koje se u Sankt Peterburgu započeo graditi zračni brod. Pod njegovim je vodstvom u ljeto 1894. dovršen prvi metalni zračni brod duljine 31 m, mase 2530 kg i obujma 3284 m^3.

I prije Schwarza izumitelji su izrađivali zračne brodove s motorima i propelerima, ali ti brodovi nisu bili upravljivi jer su bili poput napuhanih mjehura svezanih u mrežu od užadi pa bi unatoč propeleru vrludali. Schwarzov brod čije je nacrte Schwarzova udovica Melanija prodala njemačkom generalu, grofu Ferdinandu von Zeppelinu, bio je revolucija u zrakoplovstvu jer je mogao letjeti sve do Amerike, a imao je pilote i navigatore kao brodovi na moru. Ondašnji njemački car nije dopustio da itko osim Nijemca bude imenovan izumiteljem i zbog toga je grof Zeppelin doživio svjetsku slavu.

Ivo Andrić

(Travnik, 1892 – Belgrade, 1975)

(Travnik, 1892. – Beograd, 1975.)

Ivo Andrić is Croatia's only Nobel laureate in literature, who in 1961 competed for the most prestigious literary award with J. R. R. Tolkien, among others. He was born to a Croatian family in Travnik in Bosnia and Herzegovina. He started his education in Sarajevo; having received a scholarship in 1912, he came to study in Zagreb. He began writing under the influence of Modernity and A. G. Matoš. With the famous commemorative address at Matoš's funeral, published in the journal Vihor, he gave his first critique of the state of pre-war Croatia. From a young age, he had shown tendency towards political activism and the Yugoslav uprising. He gave fifty percent of the money he received for the Nobel Prize to the People's Republic of Bosnia and Herzegovina to improve the public libraries. In 1965, he gave the rest of the prize money, for the same purpose.

Andrić stayed in Zagreb for a little over three years, which completely changed his existential and artistic status. Alongside beginning his studies in Zagreb and making a grand entrance into literature, it was there where he also developed intense literary and critical activity by publishing his first two books (Ex Ponto and The Journey of Alija Đerzelez), and by initiating the journal The Literary South. Furthermore, it was Zagreb where he saw his first literary successes.

He left Zagreb in 1913 as it made him unwell; he wrote about it with plenty of apathy and discontent. He even prohibited a friend of his to ever give to anyone the descriptions of Zagreb that he had then written, since he believed that the City of Zagreb would never erect a monument honouring him should these descriptions ever come to light. He enrolled in the studies at the University of Vienna, enabled by the scholarship of the Croatian literary society "Progress."

In many historic novels (The Bridge on the Drina, Travnik Chronicles, The Damned Yard) he thematises the transience of human life and the cruelty of Ottoman conquests in our territories. He depicted contemporary political events in the Balkans in the novel The Woman from Sarajevo from 1945.

Due to his counter-Austrian activity, he was imprisoned several times at different locations, the last one being in Maribor, from which he wrote to a friend as follows: "I love Lady Croatie (as he calls Croatia) incessantly and unhappily, as always; do visit her when you go to Grič, and give her my regards"...,"I hear very little of her nowadays; she is unhappier than ever, but I love her more than ever."

Ivo Andrić jedini je književni nobelovac u Hrvata koji je 1961. za najprestižniju nagradu za književnost bio, između ostalih, u konkurenciji s J. R. R. Tolkienom. Rođen je u hrvatskoj obitelji u Travniku u BiH. Obrazovanje je započeo u Sarajevu, a nakon što je 1912. godine dobio stipendiju, dolazi na studij u Zagreb. Počinje stvarati pod utjecajem moderne i A. G. Matoša. Slavnim, komemorativnim govorom na Matoševom sprovodu objavljenim u časopisu Vihor donosi prvu kritiku stanja u predratnoj Hrvatskoj. Od mladih dana pokazivao je sklonost političkom aktivizmu i jugoslavenskom buntu. U doba prve Jugoslavije djelovao je kao diplomat, među ostalim bio je i veleposlanik u Berlinu. Cjelokupan iznos novca od Nobelove nagrade poklonio je Bosni i Hercegovini kako bi se unaprijedile narodne knjižnice.

Andrić se u Zagrebu zadržao tek nešto više od tri godine koje su posve promijenile njegov egzistencijalni i umjetnički status. Osim što je u Zagrebu započeo studij tu je razvio intenzivnu književno-kritičku aktivnost objavivši svoje prve dvije knjige (Ex ponto i Put Alije Đerzeleza) i djelujući kao pokretač časopisa Književni jug. Konačno, u Zagrebu je doživio prve književne uspjehe.

Godine 1913. napušta Zagreb u kojem se ne osjeća dobro i o kojem piše s dosta apatije i nezadovoljstva. Čak svome prijatelju zabranjuje da ikome daje opise Zagreba koje je tada ispisao jer je smatrao kako mu Zagreb, kad bi se za njih saznalo, nikad ne bi podigao spomenik. Upisao je studij na Sveučilištu u Beču koji mu je omogućila stipendija društva „Napredak".

U mnogim povijesnim romanima (Na Drini ćuprija, Travnička hronika, Prokleta avlija) Andrić tematizira prolaznost ljudskoga života i okrutnost turskih osvajanja na našim područjima. Suvremena politička zbivanja na Balkanu opisao je u romanu Gospođica iz 1945. godine.

Zbog protuaustrijskoga djelovanja, neko je vrijeme boravio u tamnicama u različitim gradovima da bi posljednji zatvor bio onaj u Mariboru odakle piše prijatelju: „Gospogju Croatie (tako naziva Hrvatsku) volim stalno i nesrećno, kao uvijek; posjeti je kad odeš na Grič i pozdravi mnogo" (...), „o Gospogji malo čujem; nesrećnija je nego ikad, ali je volim više nego ikad".

Marko Marulić

(Split, 1450 – Split, 1524)
(Split, 1450. – Split, 1524.)

Marko Marulić from Split was a literary star of his era, one of the most prominent representatives of European Christian humanism and Renaissance epics. It is assumed that, following Split, Marulić also received education in Padua, where he studied law; however, there are no records proving that Marulić was one of their students. He wrote in Latin, Croatian and Italian, and created a vast and influential oeuvre.

Few writers have gained such popularity in their lifetime as was the case with Marulić, whose writings saw great success in Europe in the 16th and 17th centuries. Up until the present day, *An Instruction on How to Lead a Virtuous Life Based on the Examples of Saints (De institutione bene vivendi per exempla sanctorum)* and *Evangelistarium* have been reprinted more than 70 times (in Latin and translated into around ten languages), and *Carmen de Doctrina* around 130 times (in Latin and translated into seven languages). Marulić's *Instruction* found itself on the list of banned books due to his opinion that lying is sometimes permitted.

His works were read by many notable Europeans, including saints such as St. Francis Xavier, St. Francis of Sales, St. Thomas More, the English King Henry VIII, the scholars Sebastian Münster, Francisco de Quevedo, Piotr Skarga, Pierre Bayle, and others.

In 1507, Marulić completed *The Life of St. Jerome (Vita diui Hieronymi)*. He supplemented the saint's biography with a polemic debate on his origin: *Against Those Who Claim that St. Jerome Was Italian (In eos qui beatum Hieronymum Italum fuisse contendunt)* and the *Poem in Praise of St. Jerome (De laudibus diui Hieronymi carmen)*.

Splićanin Marko Marulić književna je zvijezda svoga doba, jedan od najistaknutijih predstavnika europskoga kršćanskoga humanizma i renesansne epike. Pretpostavlja se da se Marulić nakon Splita obrazovao u Padovi te da je tamo studirao pravne znanosti, no nema zabilježenih podataka o tome. Pisao je na latinskom, hrvatskom i talijanskom jeziku, ostvarivši golem i utjecajan opus.

Rijetko je koji pisac stekao slavu za života kao što je to bio slučaj s Marulićem čiji su spisi doživjeli velik uspjeh u Europi tijekom 16. i 17. st. *Do danas su Pouke za čestit život na primjerima svetaca (De institutione bene vivendi per exempla sanctorum)* i *Evanđelistar* tiskani više od 70 puta (na latinskom i u prijevodima na desetak jezika), *Carmen de doctrina* oko 130 puta (na latinskom i u prijevodima na sedam jezika). Marulićeva knjiga *Institucija* našla se na indeksu zabranjenih knjiga zbog Marulićevoga stajališta da je laž ponekad dopuštena.

Čitali su ga mnogi europski uglednici, od budućih svetaca poput Franje Ksaverskoga, Franje Saleškoga, Thomasa Morea do engleskoga kralja Henrika VIII., francuske kraljice Margarete Navarske te učenjaka Sebastiana Münstera, Francisca de Queveda, Piotra Skarge, Pierrea Baylea i drugih.

Godine 1507. Marulić je dovršio *Život svetoga Jeronima (Vita diui Hieronymi)*. Svetčevu životopisu pridodao je polemičku raspravu o njegovom podrijetlu: *Protiv onih koji tvrde da je sveti Jeronim bio Italac (In eos qui beatum Hieronymum Italum fuisse contendunt)* i *Pjesmu u hvalu svetoga Jeronima (De laudibus diui Hieronymi carmen)*.

Petar Hektorović

(Hvar or Stari Grad, 1487 – Stari Grad 1572)

(Hvar ili Stari Grad, 1487. – Stari Grad, 1572.)

Petar Hektorović is considered one of the greatest Croatian poets. He was born in the town of Hvar or in Stari Grad in 1487. His youthful love lyrics have not been preserved, but it is known that they were written in Latin and Italian, which is attributed to his good education, he most likely acquired at the Dominicans. He was skilled at writing poetic epistles, which were also written by many other Croatian humanist poets.

Thanks to his correspondence with friends and writers, a lot of information about his life, work and worldview has been known. The friends he often mentions were all respected writers of the time: Mikša Pelegrinović, Jeronim Brtučević, Nikola Nalješković and Mavro Vetranović. He published one edition during his lifetime, in 1568, which contains the following texts: an epistle to J. Bartučević (1552), ''Fishing and Fishermen's Talk'' (written in the form of an epistle to J. Bartučević in 1556), an epistle to M. Vetranović (1556) and the second prose letter to M. Pelegrinović (1557).

''Fishing and Fisherman's Talk'', one of the most famous works of Croatian literature, stands out among the above. Hektorović was personally engaged in the construction of the palace and Tvrdalj manor in the Stari Grad on Hvar, which was supposed to serve not only as the owner's summer residence but also as a possible protection for the family and commoners in case of an attack by Turks and pirates. Wanting to rest, the poet embarks on a fishing trip with two friends, and based on what he experienced, he wrote an epistle-travelogue in three parts.

Hektorović describes the beauty of nature and his homeland and recounts events that he and his companions experienced on the way. The poet often quotes his companions' conversations, who were simple fishermen, writing down their wise sayings "in truth", as he claims. The text is sung in double rhymed twelve syllable verses and composed symmetrically, with an equal arrangement of the material in each of the three parts. Through literature, the poet approaches the feeling of endangered heritage in the context of Turkish incursions into the area of the province of Dalmatia.

Petar Hektorović smatra se jednim od najvećih hrvatskih pjesnika. Rodio se u gradu Hvaru ili u Starome Gradu 1487. godine. Njegova mladenačka ljubavna lirika nije sačuvana, ali je poznato da je pisana na latinskom i talijanskom što se pripisuje njegovoj dobroj naobrazbi, najvjerojatnije kod dominikanaca. Bio je vješt u pisanju pjesničkih poslanica koje su pisali i mnogi drugi hrvatski humanistički pjesnici.

Zahvaljujući njegovim korespondencijama s prijateljima i književnicima poznato je mnoštvo podataka o njegovu životu, radu i svjetonazoru. Prijatelji koje često spominje su svi redom cijenjeni književnici onoga doba: Mikša Pelegrinović, Jeronim Brtučević, Nikola Nalješković i Mavro Vetranović. Za života je objavio jedno izdanje i to 1568. koje sadrži sljedeće tekstove: poslanica J. Bartučeviću (1552.), Ribanje i ribarsko prigovaranje (pisano u obliku poslanice J. Bartučeviću 1556.), poslanica M. Vetranoviću (1556.) i drugo prozno pismo M. Pelegrinoviću (1557.).

Posebno se među navedenima ističe *Ribanje i ribarsko prigovaranje*, jedno od najpoznatijih djela hrvatske književnosti. Hektorović je bio osobno angažiran na gradnji polače i dvora Tvrdalj u Starome Gradu na Hvaru koji je trebao služiti vlasniku kao ljetnikovac ali i kao moguća zaštita za obitelj i pučane u slučaju napada Turaka i gusara. U želji za odmorom pjesnik odlazi na izlet i ribarenje s dva prijatelja te na temelju proživljenog piše poslanicu-putopis u tri dijela.

Hektorović opisuje ljepotu prirode i zavičaja te pripovijeda o događajima koji su se njemu i njegovim suputnicima na putu događali. Pjesnik često citira razgovore svojih suputnika, priprostih ribara, navodeći „po istini", kako sam tvrdi, njihove mudre izreke. Tekst je ispjevan u dvostruko rimovanim dvanaestercima i komponiran simetrično, s podjednakim rasporedom građe u svakom od triju dijelova. Pjesnik kroz književnost približava osjećaj ugrožene baštine u kontekstu turskih prodiranja u područje pokrajine Dalmacije.

Hanibal Lucić

(Hvar, 1485 – Hvar, 1553)

(Hvar, 1485. – Hvar, 1553.)

Hanibal Lucić is considered the most prominent Croatian Renaissance poet. Lucić comes from one of the most distinguished Croatian noble families. The rare information that is known about his life refers to his ministry. He held high political and administrative positions in his hometown. He was an excellent connoisseur of classical literature, medieval Glagolitic and oral Croatian literature as well as the contemporary Italian and Croatian literature of his time.

It is thanks to his son Antun, that we are acquainted with a part of his literary work published in 1556 in Venice under the title *Skladanja izvarsnih pisan razlicih (Collection of Diverse Excellent Poems)*. It is an anthology containing 22 love poems, the play *Robinja (The Slave Girl),* several poetical epistles, two epitaphs and the translation of Ovid's Heroides *(Paris to Helen)*. Lucić destroyed the rest of his oeuvre in a fit of self-criticism.

Among the love poems, the most famous is *Jur nijedna na svit vila*, in which the beauty of Lucić's beloved one is described in symetrically structured octosyllabic octaves. The poems in his *Collection of poems* (Canzoniere) represent a masterpiece of Croatian Renaissance love lyrics in the tradition of Petrarch and Petrarchism, and in the tradition of Croatian oral love poetry. In addition to exceptional love lyrics, Lucić also contributed to Croatian literature with the drama *Robinja (The Slave Girl),* which was long considered the first secular drama in the Croatian language. It consists of three acts and is written in double rhymed twelve syllable verses.

At around 1530, at the outskirts of his native town, he started building his Renaissance style summer residence where he spent the final years of his life. He was buried in the family vault in front of the main altar in the church of the Franciscan monastery in Hvar.

Hanibal Lucić smatra se najvećim hrvatskim renesansnim pjesnikom. Lucić potječe iz jedne od najuglednijih hrvatskih vlastelinskih obitelji. Rijedak podatak koji je poznat o njegovu životu odnosi se na njegovo službovanje. U rodnom gradu obnašao je visoke državničke i upravne dužnosti. Bio je vrstan poznavatelj klasične književnosti, srednjovjekovne glagoljaške i usmene hrvatske književnost kao i suvremene talijanske i hrvatske književnosti.

Zahvaljujući njegovom sinu Antunu poznat nam je dio njegova opusa objavljen 1556. godine u Mlecima pod naslovom *Skladanja izvarsnih pisan razlicih*. Riječ je o antologiji u kojoj se nalaze 22 ljubavne pjesme, drama *Robinja*, nekoliko pjesničkih poslanica, dva epitafa te prijevod Ovidijeve heroide *Pariž Eleni*. Ostatak opusa Lucić je uništio zbog nezadovoljstva vlastitim radom.

Među ljubavnim pjesmama najpoznatija je *Jur nijedna na svit vila* u kojoj se opisuje ljepota Lucićeve odabranice u osmeračkim oktavama raspoređenima u simetrične kompozicije. Pjesme u kanconijeru predstavljaju remek-djelo hrvatske renesansne ljubavne lirike i to u tradiciji Petrarke i petrarkizma, ali i u tradiciji usmene hrvatske ljubavne poezije. Osim iznimnom ljubavnom lirikom Lucić je hrvatsku književnost zadužio i dramom *Robinja* koja se dugo smatrala prvom svjetovnom dramom na hrvatskome jeziku. Sastoji se od tri čina a pisana je u dvostruko rimovanim dvanaestercima.

Lucić je oko 1530. godine počeo malo izvan grada graditi svoj ljetnikovac u renesansnom stilu u kojem je proveo posljednje godine života. Pokopan je u obiteljskoj grobnici ispred glavnog oltara crkve franjevačkog samostana u Hvaru.

Mario Puratić (Puretić)

(Sumartin, 1904 – Santa Barbara, 1993)

(Sumartin, 1904. – Santa Barbara, 1993.)

Mario Puratić (or Puretić) was born on the island of Brač in 1904. Already in his childhood, he showed gumption and inventiveness. The line in the stone threshold of his birth house, which Mario carved as a young boy so that the Sun's shadow would fall on it at high noon, is still visible today. He moved to the US in 1929. He worked in steel mills and at the Brooklyn Port in New York. Following the end of the Second World War, he began working as a fisherman in San Pedro. Since fishing is an extremely strenuous and physically demanding activity, Mario, a sharp-witted native of Brač, invented around twenty fishing tools, the most successful one being the mechanical pulley.

This device is used for pulling the net from the sea more quickly and easily, named the Power Block, due to which he was proclaimed Inventor of the Year by the Intellectual Property Owners Education Foundation in 1954. Puratić patented the mechanical pulley in 1954, and it has been used in Croatian fishing since 1963. Puratić's invention was of fundamental relevance to international fishing, which thanks to him increased annual catches five-fold, while cutting the workforce in half. The Croats call Puratić's pulley "purić."

Between 1969 and 1979, the Canadian five-dollar banknote showed an image of a fishing boat with Puratić's pulley. Since Puratić was not only inventive but also spirited, he used to say that he does not owe his success to reason, but rather to laziness.

Puratić's mechanical pulley consists of a particularly customisable pulley with rubber-coated ribs, suspended on a ship's crane. The sides of the winch are V-shaped, and they can be pushed together or apart to adapt to lighter or heavier, and full or empty nets. The first pulleys were driven by a winch or a rope, while today hydraulic systems are used, which enables remote control, i.e., a change in pulley direction and RPM.

Mario Puratić (ili Puretić) rođen je na otoku Braču 1904. godine. Već kao dijete pokazao je snalažljivost i inventivnost. Još danas može se u kamenom pragu njegove rodne kuće vidjeti crta koju je Mario kao dječačić izdubio kako bi sunčeva sjena, kad bi pala na tu crtu, točno pokazivala podne. Odselio se u SAD 1929. godine. Radio je u čeličanama te u luci Brooklyn u New Yorku. Po završetku Drugoga svjetskoga rata u San Pedru zaposlio se kao ribar. Budući da je ribarenje bilo veoma naporan i fizički iscrpljiv posao, Mario je kao oštroumni Bračanin izumio 20-ak ribarskih pomagala među kojima je najuspješniji mehanički koloturnik.

Riječ je o uređaju za brzo i lako izvlačenje mreže iz mora koji je nazvan „power block" zbog čega je Obrazovna fundacija za vlasnike intelektualnoga vlasništva Puratića 1975. proglasila izumiteljem godine u SAD-u. Puratić je mehanički koloturnik patentirao 1954., a u hrvatskom se ribarstvu rabi od 1963. Puratićev je izum bio od temeljne važnosti za svjetsko ribarstvo koje je zahvaljujući njemu povećalo godišnji ulov za pet puta prepolovivši pritom radnu snagu. Hrvati Puratićev koloturnik zovu „purić".

U razdoblju od 1969. do 1979. na kanadskoj novčanici od pet dolara nalazila se slika ribarskoga broda s Puratićevim koloturnikom. Kako je Puratić bio ne samo inventivan, nego i duhovit, govorio je da svoj uspjeh ne duguje pameti nego lijenosti.

Puratićev mehanički koloturnik sastoji se od posebno prilagodljive koloture sa žlijebom obloženim gumom, ovješenom na brodsku dizalicu. Stranice vitla su u obliku slova V i one se mogu približavati ili razmicati tako da su prilagodljive za lake ili teške, kao i za pune ili prazne mreže. Prvi koloturnici bili su pogonjeni brodskim vitlom i užetom dok se danas rabe hidraulični sustavi koji omogućuju daljinsko upravljanje, tj. promjenu smjera i broja okretaja koloturnika.

How the "Vatreni"* wrote football history
Kako su „Vatreni“ ispisali nogometnu povijest

Football was brought to Croatia from England - the country of the cradle of football in 1880. 127 years later, 2007. The Croatian national team defeated England in the middle of London - in one of the most impressive victories in its history.

The peak of Croatian football success was the bronze medal at the Mundial in France in 1998. when the coach Miroslav Ćiro Blažević and his team wrote the football history of the young, independent Croatia.

Just like 20 years earlier, nobody expected what happened at the 2018 World Cup in Russia. The "Vatreni" made their fifth appearance at the World Cup and for head coach Zlatko Dalić, this was the first major competition with the national team. The “small” Croatia achieved the greatest success in the history of Croatian football and won the silver medal.

The Croatian national football team delighted the world once again and won the bronze medal at the 2022 World Cup in Qatar. They won a medal in two consecutive world championships; thus, they will spend at least eight years in a row at the very top of football - among the three best national teams in the world.

The generation of greats such as Šuker, Boban, Prosinečki, Bilić, and others under the leadership of Ćiro Blažević paved the way for their successors, who made the most of the opportunity in the world's biggest clubs. Croatia’s best player of all time - Luka Modrić already won the Champions League five times with Real Madrid and after Russia, he became the best player in the world officially – by winning Ballon d’Or.

Great names such as Modrić, Srna, Mandžukić, Rakitić, the Kovač brothers, Prša, Olić, followed by younger generation of players - Gvardiol, Kovačić, Oršić, Petković, etc. are the best ambassadors of Croatia in the world and an unquestionable confirmation of the quality of our national football team.

*The Vatreni – nickname of the national football team; the Fiery Ones

Nogomet ju u Hrvatsku, daleke 1880. stigao iz Engleske - zemlje kolijevke nogometa. 127 godina poslije, 2007., reprezentacija Hrvatske pobijedila je Engleze usred Londona u jednoj od najdojmljivijih pobjeda u svojoj povijesti.

Prvi veliki uspjeh hrvatske reprezentacije je bronca na Mundialu u Francuskoj 1998., kada je momčad predvođena trenerom Miroslavom Ćirom Blaževićem ispisala nogometnu povijest tada mlade i samostalne Hrvatske.

2018., kao i 20 godina ranije - nitko nije očekivao ono što je uslijedilo na Svjetskom prvenstvu u Rusiji. „ “ su upisali peti nastup na Svjetskom prvenstvu, a izborniku Zlatku Daliću bilo je to prvo veliko natjecanje s reprezentacijom. „Mala“ Hrvatska ostvarila je najveći uspjeh u svojoj povijesti i osvojila srebro najzlatnijeg sjaja.

Hrvatska nogometna reprezentacija ponovno je oduševila svijet i osvojila brončanu medalju na Svjetskom prvenstvu 2022. u Kataru. Na dva je uzastopna svjetska prvenstva osvojila medalju i tako se na najmanje osam godina u nizu pozicionirala na sam nogometni vrh – među tri najbolje reprezentacije svijeta.

Generacija velikana sa Šukerom, Bobanom, Prosinečkim, Bilićem i ostalima pod vodstvom Ćire Blaževića utrla je put svojim nasljednicima koji su igrali u ponajboljim svjetskim klubovima. Naš najbolji igrač svih vremena, Luka Modrić već je pet puta osvajao Ligu prvaka s Real Madridom, a nakon srebra u Rusiji – osvojio je i Ballon d'Or za najboljeg igrača svijeta. Predvođeni Lukom, Srna - rekorder po broju nastupa uz Mandžukića, Rakitića, braću Kovač, Pršu, Olića, a sada i sa mladim Gvardiolom, Kovačićem, Oršićem, Petkovićem,... naši su najbolji i najprepoznatljiviji ambasadori Hrvatske u svijetu te neupitna potvrda kvalitete naše nogometne reprezentacije.

A small country of NBA greats
Mala zemlja velikih NBA košarkaša

The Mozart of Basketball – Dražen Petrović, a boy born in Šibenik in 1964., was a basketball artist with a life story so surreal - dreamy and tragic at the same time. He started his NBA career with the Portland Trail Blazers and later with the New Jersey Nets. Dražen was the first Croatian who played more than 250 games during four NBA seasons. He was declared the team's best shooter, and the best European player who had ever played in the NBA at that time. He also got the award for the best shooting guard in the 1992 NBA season. At the 1992 Olympics, he was the captain of the Croatian national team in the legendary final against the USA Dream Team (Jordan, Bird, Pippen, Drexler...).

Dražen´s life tragically ended at the height of his career in 1993, when he died in a fatal car accident. However, his legacy still lives on – in the Naismith Memorial Basketball Hall of Fame in Springfield and a memorial center in Zagreb. His jersey no. 3, in which he played for the Nets was retired.

Soon after Dražen - many others like Kukoč, Rađa, Vranković, Giriček and Hezonja found their place in the best league in the world. At the moment, Šarić, Bogdanović, and Zubac are Croatians playing in the NBA.

One of the best players of all time, Toni Kukoč, was a junior world champion, European and Italian champion, and silver medalist at the Olympic Games. From 1993 until 2000, he played for the Chicago Bulls with NBA greats such as Jordan, Pippen, and Rodman (won three NBA championships). After he played for the Philadelphia 76ers, the Atlanta Hawks, and the Milwaukee Bucks until 2006. Toni was inducted into the FIBA Hall of Fame in 2017. Later, when he was inducted into the Basketball Hall of Fame in 2021, he was given the award by Michael Jordan himself.

Dino Rađa, in 1993. joined the Boston Celtics and was nominated for the NBA All-Rookie Second Team. He continued to play for the Celtics for four seasons until 1997, earning the title of legend already at that time. Dino was named one of FIBA's 50 greatest players in 1991. He is a member of the Basketball Hall of Fame, class of 2018. Along with winning two Olympic silver medals, Dino deserves his place among the greatest athletes in our area.

Košarkaški Mozart – Dražen Petrović, dječak rođen u Šibeniku 1964., bio je umjetnik u košarci sa životnom pričom koja je istovremeno nestvarna, sanjarska i tragična. Svoju karijeru u NBA ligi je započeo igrajući za Portland Trail Blazerse, a nakon njih za New Jersey Netse. Bio je prvi Hrvat koji je odigrao više od 250 utakmica tijekom svoje četiri sezone u NBA ligi. Proglašen je najboljim strijelcem svoje momčadi te najboljim europskim košarkašem koji je ikada igrao u NBA ligi u to vrijeme. Dobio je i nagradu za najboljeg bek šutera u NBA sezoni 1992. Na OI 1992. godine bio je kapetan Hrvatske u legendarnom finalu protiv američkog Dream Teama (Jordan, Bird, Pippen, Drexler...).

Draženov je život tragično završio na vrhuncu njegove karijere 1993. godine kada je poginuo u strašnoj automobilskoj nesreći. Usprkos tome, njegovo nasljeđe i dalje živi dobivši svoje mjesto u Košarkaškoj kući slavnih u Springfieldu i svoj memorijalni centar u Zagrebu. Njegov je dres s brojem 3, u kojem je igrao za Netse - umirovljen.

Nakon Dražena, ubrzo su u najboljoj ligi svijeta zaigrali i Kukoč, Rađa, Vranković, Giriček, Hezonja i mnogi drugi, dok su trenutno aktivni igrači Šarić, Bogdanović i Zubac.

Toni Kukoč - juniorski prvak svijeta, prvak Europe, Italije, srebrni na Olimpijskim igrama, od 1993. do 2000. igra za Chichago Bullse sa NBA velikanima poput Jordana, Pippena i Rodmana i osvaja tri naslova prvaka NBA lige. Igra i za Philadelphiu 76-erse, Atlanta Hawkse i završava 2006. u Milwaukee Bucksima. 2017. je primljen u Kuću slavnih FIBA-e, a kad je 2021. primljen u Kuću slavnih košarke, nagradu mu je uručio sam Michael Jordan.

Dino Rađa se 1993. godine pridružio se Boston Celticsima kada je nominiran za NBA All-Rookie Second Team. Nastavio je igrati za Celticse četiri sezone sve do 1997. te je već tada stekao titulu legende. Dino je proglašen među 50 FIBA-inih najboljih momaka 1991. te je član Basketball Hall of Fame od 2018. Uz osvojene dvije olimpijske srebrne medalje Dino je apsolutno zaslužio svoje mjesto među najvećim sportašima s naših prostora.

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