

**FRANCE
RODE**
1934-2017

**SILICON
VALLEY
PIONEER**



Rode working at Hewlett-Packard. Private Archives.

**Electrical engineer and
inventor, entrepreneur, hobby
woodworker, and avid tennis
player.**

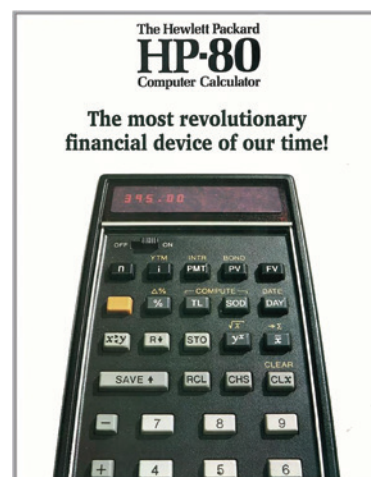
Born on 20 November 1934 into a farming family in the small village of Nožice about fourteen kilometers from the country's capital, Rode graduated from the Faculty of Electrical Engineering in Ljubljana and continued his studies in the U.S., drawn there by his secondary school sweetheart Mija, who was living with her family in Chicago and would later become his wife. In 1962, he was awarded a master's degree from Northwestern University in Illinois, whereupon he and his wife moved to Palo Alto, California, where he worked for Hewlett-Packard for almost twenty years. In 1979, he started the company Sielox with a partner, and in 1990 took a position at a satellite navigation company in Sunnyvale, CA. Nine years later he joined two colleagues in founding eRide Inc. He retired in 2008 and lived in California until his death on 7 June 2017.



Pocket calculator HP-35. Technical Museum of Slovenia. Photo: Tomo Jeseničnik.

POCKET CALCULATOR

Rode was the lead engineer on the team that invented the first scientific pocket calculator, the HP-35, which had arithmetic, logarithmic, and trigonometric functions. Hewlett-Packard had already developed a desktop computer when William Redington Hewlett came up with the idea to create a computer that would fit in his shirt pocket. Development took a year and sales exceeded all expectations. U.S. President Richard Nixon took one with him on his first visit to China as an example of the latest American technological achievement. Soon after, astronauts took it to space, recognition of what a useful instrument it was.



Rode worked on the HP-80 project as the project manager and lead co-inventor. He simplified financial calculations and thereby replaced the cumbersome and time-consuming tables that had been used by banks and other financial institutions. He was even prouder of this calculator than the HP-35 because he thought the project required more ingenuity and creativity. A leaflet for the HP-80. Private Archives.



At the declaration of the HP-35 as an IEEE Milestone Event in 2009. Private Archives.

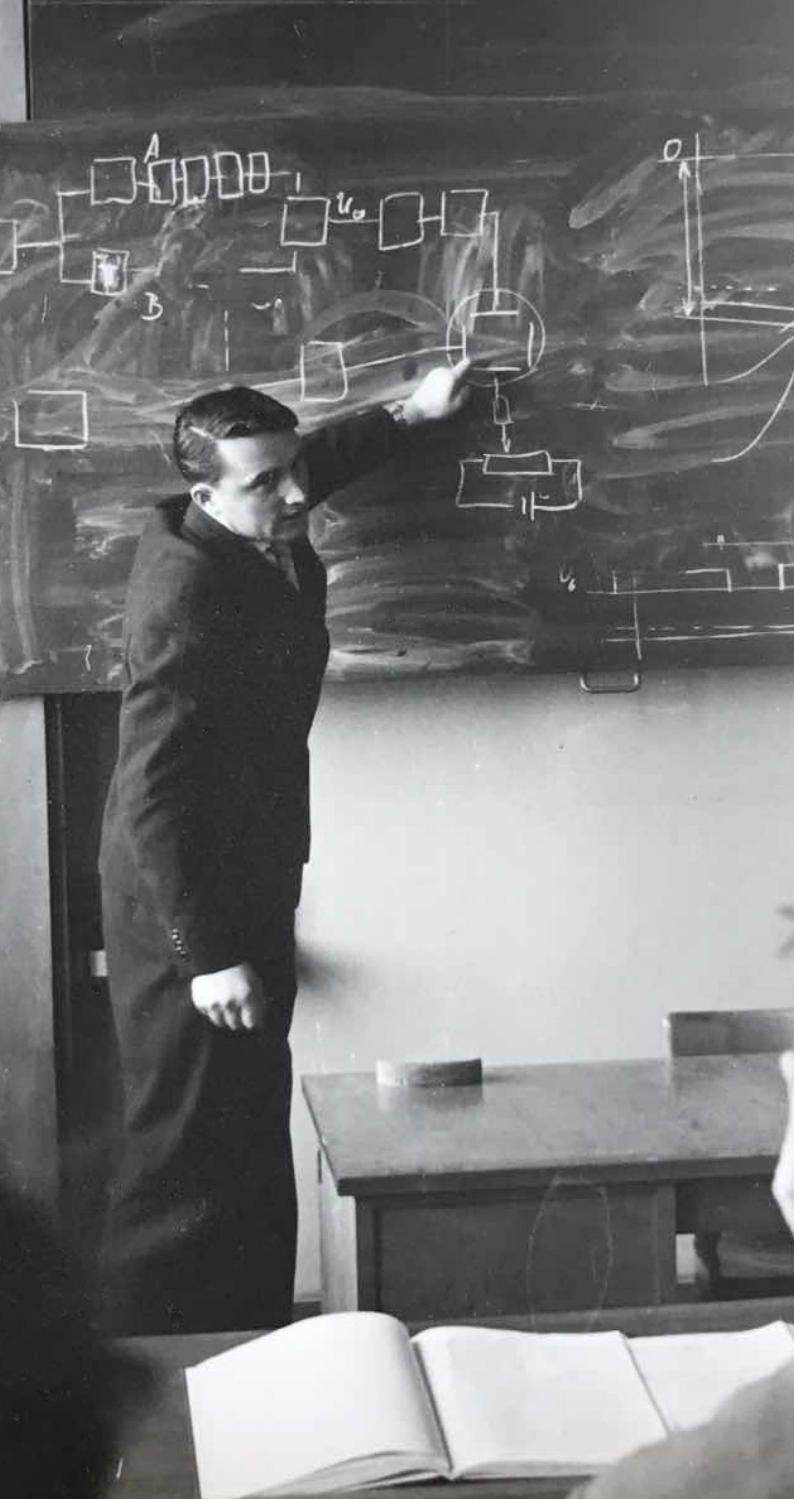
Rode and Hewlett-Packard colleagues, with the HP-80 on the desk. Private Archives.



The IEEE Milestone in Electrical Engineering and Computing Award. In 2009, the Institute of Electrical and Electronics Engineers (IEEE), the highest professional authority in this field, declared the HP-35 a “milestone in electrical engineering and computing.” A plaque displaying the text of the recognition has been installed in the lobby of Hewlett-Packard Labs in Palo Alto, CA. Technical Museum od Slovenia. Photo: Sanja Živkovič.

INVENTOR

Rode is the holder or co-holder of 23 patents in the fields of digital electronics, computer engineering, and metrology, which are used all over the world. For example, he patented the electronic lock and participated in the development of GPS-based satellite navigation for aircraft.



Rode giving a lecture in Ljubljana. Private Archives.



Rode performing calculations with a slide rule that he made himself. Private Archives.

USEFUL WOODWORKING

As a youth, Rode would spend most of his free time in his uncle's carpentry workshop, where he made toys and other useful objects that his family could not afford to buy. He made his first pair of skis, teaching aids for secondary school, the box for a radio receiver, and a slide rule that he used throughout his university studies. Many years later he would collaborate on the development of an electronic version of the tool - the HP-35 pocket calculator.



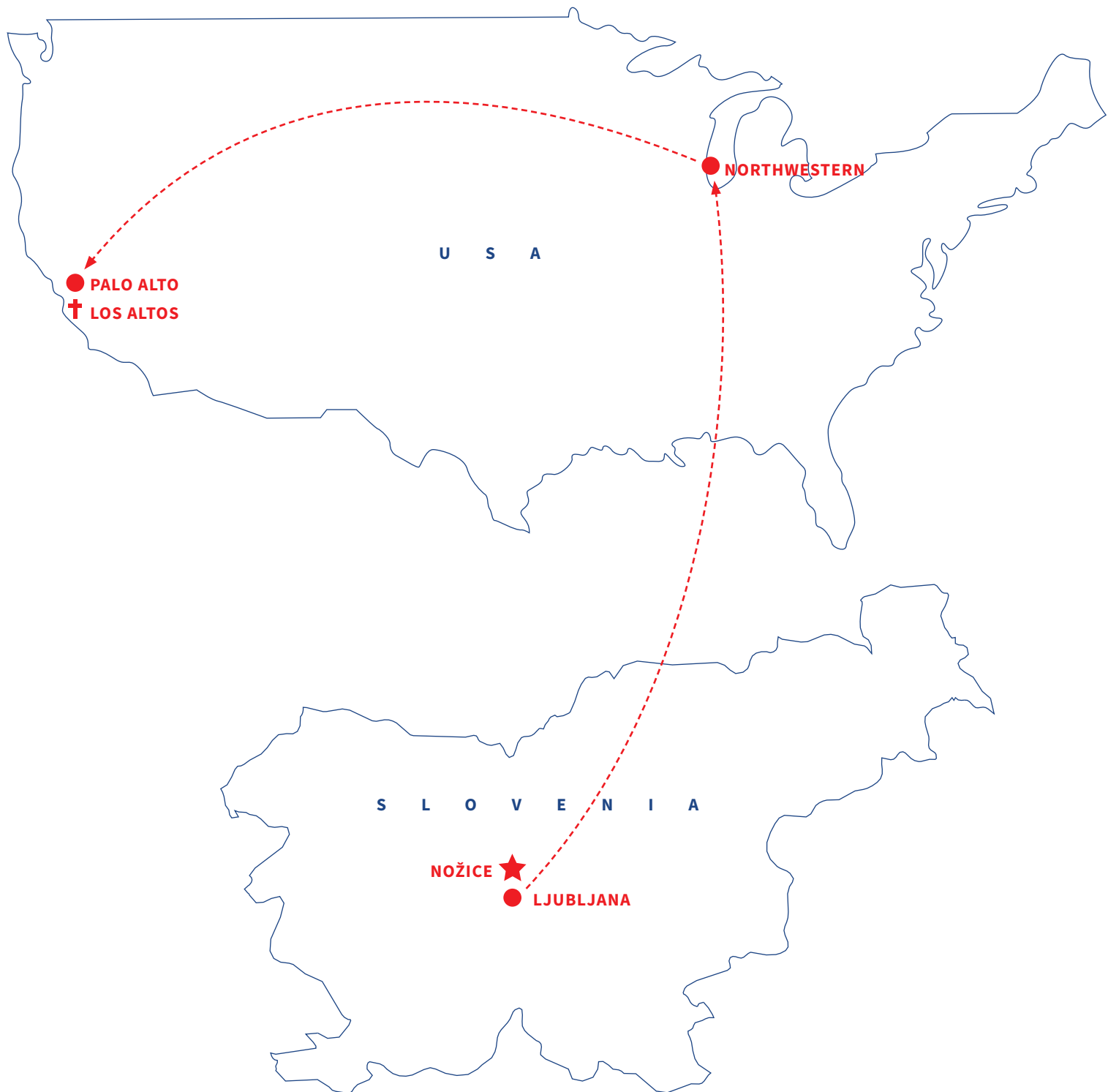
Rode's family donated to the museum his personal belongings from both professional and private life. Technical Museum of Slovenia. Photo: Tomo Jeseničnik.



Rode's wallet. Technical Museum of Slovenia. Photo: Nebojša Tejić, STA.

LIFE IN A WALLET

In addition to business cards testifying to his professional career and the electronic lock that he invented, Rode always kept a dinar (currency in former Yugoslavia), a tolar (Slovenian currency from 1991 until the introduction of the euro) and a dollar banknote in his wallet, somewhat symbolizing the life of a migrant.



Literature

Gobec, Edi: Slovenski ameriški izumitelji in inovatorji : njihove sledi na Zemlji in v vesolju. Ljubljana, Družina, 2015.

Kobal, Edvard: Strast po znanju in spoznavanju : pogovori z velikimi slovenskimi znanstvenicami in znanstveniki. Ljubljana, Ustanova Slovenska znanstvena fundacija, 2003.

Interview with Rode: <https://www.youtube.com/watch?v=UUaRQ3rqvPg>

THE ADDRESS OF THE DIRECTOR OF THE TECHNICAL MUSEUM OF SLOVENIA

I am excited that the Technical Museum of Slovenia's exhibition *Knowledge without Frontiers* will finally cross the border, even the ocean, and make the journey of the Slovenian women and men who emigrated time ago and, either themselves or their descendants, became established professionals in various fields, in particular science, engineering, innovation and research.

Unfortunately, our knowledge of these important individuals and their achievements, time and again accomplished through hardships, leaves much to be desired, as they deserve to be remembered and appreciated.

Let us recall few more individuals of Slovenian descent who are not presented in this catalogue, but they left a strong mark in North America. Friderik Irenej Baraga was a Catholic missionary and later a bishop who ministered to a vast diversity of peoples in the region of Lake Superior in the 19th century. Baraga made a difference in the native Indian community. For example, he published a grammar – the first ever of any Indian language – and a dictionary of the Otchipwe language (Otchipwe-English and English-Otchipwe) spoken by the Chippewa Indians.

Quite a few Slovenians tried their luck in the entertainment industry as actors, singers or musicians, while others became successful journalists, artists and athletes. Currently, Goran Dragič, Anže Kopitar and Luka Dončić are at the top of the best-known-Slovenian-athlete list.

Not to forget people who made it in politics. Frank Lausche (Lovše) was elected senator and governor of Ohio and mayor of Cleveland, being the first mayor of Slovenian origin of any American major city. George Voinovich's political career was similar to Lausche's. Best known today is Amy

Klobuchar, the first woman senator from Minnesota and an important figure in the political and public life of the United States. Her father was of Slovenian descent, and one of her ways to honor her ancestors' heritage is to make poticas for Christmas, sending them to her fellow politicians.

(Too) often, migrations are associated with "an emergency situation", "a problem", while completely ignoring that they are a historical and social structural phenomenon that makes a positive contribution to the communities we live in.

Old as humankind, migrations contribute significantly to economic and social development, and as such, they will be a key to reaching the objectives of sustainable development in the future.

Through dedication to science, our compatriots presented in the exhibition went beyond frontiers; not only the state borders of their homeland, but they also defied those most persistent – frontiers in our heads and minds.

What can museums do to break them? A modern museum involves the public, it doesn't exclude anybody, meaning it is accessible, inclusive and participatory. Its objective is to preserve, protect, hold, pass down, interpret and exhibit heritage identified valuable enough to be preserved. The Technical Museum of Slovenia is a keeper of movable technical heritage, while at the same time it is our mission, a major one, to make the achievements in science and engineering, together with the people credited for them, known and appreciated. In the end, museum is people, and only people can cross the frontiers they have set themselves.

Science and engineering contribute to progress, and museums are a place for a critical assessment of progress and development.

Our fellow compatriots – to whom this awarded exhibition is dedicated and who we proudly present in the catalogue – found their new homeland in the U.S. But first, they had to find a way to make this land their own. How did they

accomplish that? By doing their best to add to its prosperity and welfare of its people, and by affecting a lot more than a particular geographic area and their own time. They live on through their knowledge, findings, inventions, research, innovations and, quite often, their role in education, proving it is possible to (co)shape the future and make it better.

I am confident they never abandoned the memory of their ethnic origins and the homeland of their fathers and grandfathers. This year, Slovenia celebrates the 30th anniversary of independence. The exhibition we present perfectly coincides with the anniversary which symbolically lifts *Us and Them without Frontiers* to a higher level.

Identity and heritage enrich us, they demonstrate who we are. Once we know it, we can add our little piece to the mosaic of the world which belongs to all of us. Following the example set by the featured individuals, the world can be made a better place, more connected and gentler to the lives of us all, without exceptions.

A big thank you to Ms. Alenka Jerak, General Consul of the Republic of Slovenia in Cleveland, without whom our exhibition would never make it to the United States, my colleagues at the museum and in particular Dr. Estera Cerar and Irena Marušič, curators at the Technical Museum of Slovenia and project managers of the exhibition, which was in the Republic of Slovenia properly acknowledged by being granted the 2018 Valvasor Award, the highest award for achievements in the field of museology.

Sincere thanks to the Ministry of Culture of the Republic of Slovenia for their financial support to the project.

Safe journey to the exhibition on its U.S. tour. I am sure it will do a lot of good and open many new worlds.

Dr. Barbara Juršič

Director of the Technical Museum of Slovenia

THE ADDRESS OF THE GENERAL CONSUL OF THE REPUBLIC OF SLOVENIA

Here it is. Finally. The exhibition *Us and Them without Frontiers*, what else.

A tour of the Technical Museum of Slovenia's exhibition to the United States has been planned for quite a while. Unfortunately, the new "normality" of the COVID-19 pandemic crushed all our plans to the point that we almost gave up hope on showing it to the American public and the Slovenian immigrant community.

So it happens that the presentation of the scientific, engineering, technological and other achievements of successful Slovenians, both men and women, in the United States coincides with the 30th anniversary of Slovenia's independence. It is an extra reward for all the effort invested in the preparation of the exhibition installations in Cleveland, Milwaukee, Chicago and Washington, as well as over eighteen months of uncertainty, waiting to be finally able to meet in person, like human beings normally do, not over some high-tech web application. Which is perfectly fine, it just doesn't feel the same.

In the pandemic, the scientists from different disciplines and all four corners of the world proved once again that science and knowledge indeed have no frontiers – neither in relation to time nor country. And it is still true that the past can be a great teacher for the future.

Knowledge, with a right dose of courage, can be the inspiration to fulfill the dreams and build a better world. We need to dream, have the courage to take a step forward and make our dreams come true.

This step was taken by many Slovenian women and men who emigrated in search for work, a better life, new experience or because of political situation in the country. Today, about 350,000 people of Slovenian descent live in the United States of America, and as much as seventy-five percent in six states (Ohio, Pennsylvania, Illinois, Minnesota, Wisconsin and California). Together with other Americans and immigrants, they actively participate in the political and economic development of the U.S., representing a small piece in a most diverse cultural landscape.

The same as in other large cities, the Slovenian community in Cleveland – which lost the title of the “third largest Slovenian city” long ago – maintains the national and cultural identity through the activities organized by national homes (*narodni dom*), various societies, parishes with the Slovenian language schools held on Saturdays, fraternal organizations, recreation centers, museums, newspapers and radio shows. Despite being the third or fourth generation of immigrants, Slovenian Americans, one way or another, preserve their ethnic identity.

This exhibition in particular draws attention to Slovenians who are - except Primož Trubar - somehow related to the USA. Through their work and knowledge, scientific achievements and innovations, they contributed to the progress and welfare of the American society. These individuals include the expert in electron microscopy

Aleš Strojnik, the first space architect Herman Potočnik Noordung, the space voyager Anton Mavretič, the planet hunter Marija Strojnik, the space walker Sunita L. Williams, the Silicon Valley pioneer France Rode and the world-class innovator Peter Florjančič who passed away last November.

However, there are a lot more Slovenians who left their mark in different walks of life on this side of the Atlantic. To mention just few of them: Joseph Frederick Sutter – aeronautical engineer, the “father of the 747”; Frank J. Lausche and George Vojnovich – Senators, Ohio Governors and Mayors of Cleveland; Frankie Yankovic – “America’s Polka King”; Ronald J. Zlatoper – U.S. Navy Admiral; Dr. Ronald M. Sega – Major General in the U.S. Air Force and NASA astronaut; Prof. Dr. Duncan Haldane – 2016 Nobel Laureate in Physics; Ivan Zorman – poet and composer, and as many as ten Catholic bishops – from Frederic Baraga to the current bishop of the Diocese of Cleveland, Edward C. Malesic.

I could not agree more with the words of the exhibition curators – never has knowledge acknowledged any frontiers, be it visible or invisible. It is usually the scientists who dare to go beyond the familiar, known and safe, capable of crossing any frontier. Because their only frontier is (lacking) knowledge.

Congratulations to the Technical Museum of Slovenia and the exhibition curators Irena Marušič and Dr. Estera Cerar. *Knowledge without Frontiers* won them the 2018 Valvasor Award, the highest Slovenian award in museology. It further validates the significance of the exhibition and its aim: learn from the past for the future. Learn about migrations, a phenomenon as old as humanity, which made our world a better place.

Alenka Jerak

General Consul of the Republic of Slovenia

US AND THEM WITHOUT FRONTIERS

Contributors: **Estera Cerar, Milojka Čepon,
Orest Jarh, Edvard Kobal, Irena Marušič,
Martina Orehovec, Marija Strojnik, Blaž Šef**

BEHIND US AND THEM

The concept of Slovenia has existed since around the 6th century, but its ethnic lands – be it through the domination of powerful monarchies or as the result of a movement for self-determination – always formed a part of something bigger, the two best-known examples being the Austro-Hungarian Empire and Yugoslavia, respectively. Because of this heritage, the geostrategic location as a gateway from the southeast to western and northern Europe, and a variety of other reasons, including historical, religious, ethnic, socioeconomic, political, climate, etc., its territory has seen a lot of people come, leave or – especially over the recent years due to instability in the Middle East – just pass through.

The exhibition *Us and Them without Frontiers* is all about movement of people in both directions – in and out of the countries. If anything, migrations are not a new phenomenon, they have been a part of human history since ancient times. Which is good. Just imagine the world had people never left their homelands. No exploration of foreign lands and civilizations, no dissemination of knowledge, no exchange of ideas, no collaboration, no scientific and technological milestones and breakthroughs. No nothing. A truly miserable place.

So why do we insist on using the terms such as “us” and “them” or “ours” and “theirs”? What does it mean, and feel, to be Slovenian or American, a migrant or an immigrant or any other word (some nice, some not so nice) that we use to describe the migration of people? How come that intelligent and reasonable beings keep failing to realize that nothing lasts forever? In fact, what is claimed “ours” today could easily become “theirs” tomorrow.

Migrations have an undeniable and permanent influence on society. They did prove to be a good thing in the past, just think of the “no nothing” world. What changed? Why are many hesitant to the notions of “foreign”, “different” and “unknown”, which are often associated with

migrants? The fact is that our society is changing, public opinion is divided, politicians and the media are, for obvious reasons, sensationalist and the outcome is that people are confused. As a museum, we inspire the visitors to look beyond the known and to move across frontiers; not just the visible ones, but even more importantly, those invisible, to embrace the ideas and people who carry them across the borders.

The original project of the Technical Museum of Slovenia *Knowledge without Frontiers* focused on the positive impact of migration on society, aiming to point to a strong connection between technical and scientific heritage on the one side, and cultural and national identity on the other. The exhibition was dedicated to successful individuals across different fields of science and engineering who migrated to or from Slovenian lands from the 16th century to the present.

Scientists and inventors have always crossed frontiers for a variety of reasons, either out of their own free will or because they were forced to leave. Sometimes they did it to improve their living conditions and job opportunities or simply to expand their knowledge. However, history also bears witness to the fact that a person can become a “stranger” in their own land. States and their borders change, and Slovenia is a perfect illustration as this happened several times in the previous century alone. From the Austro-Hungarian Empire to Yugoslavia, gaining independence 30 years ago and becoming a part of the European Union. There are many scientists and inventors who were born in one country, lived in another and died in a completely different one.

Now, probably this is not unique to Slovenians, but we are so proud of “our” scientists when they make it abroad, and yet a lot more restrained when “foreigners” are successful in our country. Two examples that illustrate the challenge perfectly: the record-holding astronaut, Sunita Williams was born in the USA to an ethnic Indian

father and a mother descended from Slovenian immigrants. However, Slovenians think of her as one of “ours”. Williams is often featured in the national media and we seem to be extremely proud of her. She won over even the most reluctant by taking a traditional Slovenian sausage up to the International Space Station! At the other extreme is Fritz Pregl. Not featured in this exhibition because he has no connection to the U.S., he provokes mixed emotions. He was born in Ljubljana (the capital of Slovenia) to a Slovenian father and a German mother. Pregl studied and worked in the Austro-Hungarian Empire and in later years in Austria (after the collapse of the empire), his working language was German, hence he was considered “not Slovenian” enough. For decades he was left out of our science history records and books despite being one of the two Nobel Prize winners of Slovenian origin to date!

The tour of the *Us and Them without Frontiers* exhibition to the United States coincides with the 30th anniversary of Slovenia’s independence, and we thought it was a perfect opportunity to show “our” contribution to the advancement of scientific and technological development within “your” great nation. We want people to understand how misleading and narrow-minded such assumptions can be by portraying the lives of the featured individuals, who not only made a difference with their achievements, but did so because of migration.

The exhibition explores the fascinating connections between our two nations and the benefits of sharing the knowledge beyond frontiers, the idea which is best summed up in the line of the Slovenian rap song *From People to People* by Murat & Jose: “It does not matter where you come from, what counts is what’s in your mind”. We might just add – and in your heart.

Irena Marušič, Estera Cerar

Exhibition Curators, Technical Museum of Slovenia

US &
THEM
WITHOUT
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