

MINISTRY OF FOREIGN AFFAIRS OF HUNGARY

Fact
Sheets

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on Hungary

Fact Sheets on Hungary

Talent
and
Ingenuity



Ernő Rubik with the cube

Has the kind reader ever considered that...

- the 1 million EUR prize that was established in Denmark to reward the most excellent brain researchers worldwide was awarded for the first time to three Hungarians in Copenhagen on the 2nd of May, 2011: **György Buzsáki** who works in the United States, **Tamás Freund** who is active in Hungary and **Péter Somogyi** who is employed in England;
- at the world championship of traditional archers organized in South Korea in 2011, where representatives of 35 nations battled against each other, the 15-year old **Viktória Keszi** became Junior World Champion (her result would have ranked No. 4 in adult archery);
- at the Dragon boat World Championship, which was organized in Florida in 2011, the Hungarian team won a gold medal in the 2000 meter event;
- Hungarian physicians have worked at all corners of the globe – just to name a few: **Pál Gyöngyösi** was the personal physician of Katherine the Great, Tsar of Russia; **János Orlay** was the personal physician of Alexander I. Tsar of Russia; Balzac, both Dumas, Flammarton, Chopin, Gounod and Franz Liszt were all patients of **Dávid Gruby**; **Kálmán Mészáros** was the physician of Haile Selassie I. of Ethiopia; **László Sáska** was named “the Albert Schweitzer of Abyssinia”;

Rudolf Fuszek was Liberia’s sole physician for a long time; and **László Tabár** established and organized nationwide breast cancer screening in Sweden a few decades ago, while Hungarian physicians were active at both the North Pole region and at Antarctica.

- **István Báthory**, the Transylvanian monarch who later became Polish king established the University of Vilnius (in Lithuania), which functions even today;
- Freedom of religion was proclaimed for the first time in Europe at the national congress of Torda (Turda, Romania);
- It was seven years after the English Magna Charta, in 1222, that Hungary published its own version of the Magna Charta (Aranybulla), which established such legal rights that accused people cannot be imprisoned or taken into custody without a court order, that appeared only much later, in 1948, in the United Nations Universal Declaration of Human Rights;
- One of the pioneers of solar energy use, which is particularly important nowadays, was **Mária Telkes** who led the relevant research activities at the Massachusetts Institute of Technology (MIT) in Boston, USA (her last patent was sub-

mitted for approval when she was 90 years of age);

- **Tódor Kármán** received the first “National Medal of Science” in recognition of his scientific accomplishments as an expert of aeronautics and rocket science;
- As a matter of interest, we can mention that **Tsien Hsue-shen**, the father of Chinese rocket technology and the first initiator and long-time director of Chinese space research, was also a student and a later associate of the previously mentioned Tódor Kármán in the United States prior to his return to his native China; and while we are on the subject of the Far East, throughout earlier centuries up to the present several Hungarian scientists and professional experts helped China’s prosperity – **László Hudec**’s name should be cited here who was a prominent architect in Shanghai between the two world wars and many of his buildings today still remain intact enjoying national protection.

As we have indicated through the numerous examples listed here, our compatriots can be found among some of the best in science, culture, sports, and other areas that advance the world. Through this publication, we wish to introduce a few significant Hungarian personalities and their outstanding accomplishments.

Would you have thought?

A playful nation

Kecskemét is one of our cities, which represents and repeatedly creates Hungarian and European values by merging various aspects of play and art. It is here that **Zoltán Kodály** was born and it was here that the institution named after him was established advocating the so-called Kodály method based on his music teaching concepts. A collection of Hungarian and non-Hungarian folk songs was put together and preserved here by **Béla Vikár**, **Béla Bartók** and **Zoltán Kodály** (and his successors) that teach us to respect each other's values. The folk dance club, established and based on the same values, was nominated in 2011 to the UNESCO world heritage list. Kecskemét also houses the internationally renowned Museum of Hungarian Photography, which introduces Hungarian photographers and their creations. The Kecskemét Animated Film Studio created several successful animated films, which won awards in several countries by adding new colour and variety to stereotype children's stories. It is also worthwhile to visit the Kecskemét pottery workshop, where we might get motivated to create our own pottery as well on the basis of what we see. Perhaps it is not a coincidence that the "Szórákaténusz" Toy Museum was established here to further enrich the portrait of this city (it received its name after a jawbreaker nursery rhyme). Entering the building, one is faced with portraits of a few of the legendary forerunners of toy (play) history such as **Farkas Kempelen** (1734–1804) who should be remembered for constructing a world famous chess machine, since he was a multi-faceted scientist and organizer: he also led the construction of the Royal Castle in Buda, constructed a model of a circular-motion



The Chess Playing Turk of Farkas Kempelen

power transmission steam engine, designed fountains in the garden at Schönbrunn palace (Vienna) and pontoonbridges in Pozsony (Bratislava, Slovakia), while he became the forerunner of physiological phonology by introducing his speech machine and book on human speech mechanisms (*Mechanismus der Menschlichen Sprache*, Wien, 1791). Another one is mathematician **János Neumann** (1903–1957) who invented game theory and made important contributions in the field of information science, as well as architect **Ernő Rubik**, who invented the "magic cube" (Rubik's cube) and several other logical toys. Completing the list is **János Harsányi** (1920–2000) who further advanced the science of game theory and its practical applications, which earned him a Noble Prize in economics for those accomplishments in 1994.

And naturally, we are pleased to complete the list by mentioning the name of **Viktor Kassai** who (based on the evaluation of experts from 80 countries) was voted best soccer referee of the year in 2011 by IFFHS, an organization devoted to the history and statistics of the game of soccer (called football in many European countries, such as in Great Britain, for example). Prior to that, **Sándor Puhl** received the same honour 4 times in a row (1994–1997)!

It is also worth mentioning that in the vicinity of Kecskemét one can study the unique vegetation and animal life of Hungary in the area of the Kiskunság National Park, where a Horse Coach World Championship was held with the participation of Prince Philip, husband of the Queen of England.

Recently, Mercedes-Benz established a manufacturing plant on the outskirts of the city. The plant started production in March 2012, and it can be appropriately labelled a "large playground for adults".



"Hungarian folk tales" Of the cartoons made at the Kecskemét Cartoon Studio One frame of the 100 films – screening rights were purchased in over 40 countries

www.kodaly-inst.hu
www.kecskemetcartoonfilm.hu
www.icshu.org

The Magical Orient

Faraway places have always attracted inquisitive people and those wishing to explore the unknown. The East (Far East) has always been one of those "target areas".

Of those researching and exploring the ancient homeland of Hungary, we should only mention the most famous Transylvanian explorer **Sándor Kőrösi Csoma** (1784–1842) who studied at the College of Nagyenyed (Aiid, Romania), and later received a diploma from the University of Göttingen in oriental research. He was already familiar with 13 foreign languages when he set out to explore the ancient homeland of Hungarians.



He was making his way through the Balkans, the near East, Persia, Afghanistan, and India to reach his ultimate goal. However, he was unable to push on further up North from Leh, capital of the then still independent kingdom of West Tibet. The official representative of the British-Indian Government invited him to prepare a Tibetan-English dictionary. He accepted the assignment hoping that in the old manuscripts of monasteries, he would find useful information that interested him. He lived and studied in the Himalaya Mountains for 8 years enduring

hardships that were unimaginable for most Europeans. He compiled his works of scientific significance from his manuscripts, among them the Tibetan-English dictionary and Tibetan grammar, first published in Calcutta, 1834. It was typical of his human greatness that on the first page of the newly published dictionary he cited the person(s) he studied from and also coined his personal origins: a Seculo-Hungarian of Transylvania. Meanwhile, he never forgot about his original mission: in 1842, he set out on a new trip towards Central Asia, but malaria took his life and thereby he was forced to abandon his original goal.

Archaeologist, linguist and historian Sir **Marc Aurel Stein** (1862–1943) was an internationally renowned explorer of India, Inner-Asia and Iran. He completed his studies in Budapest, Vienna, Leipzig, Tübingen and England. He acquired his plotting (mapping) skills in his native Hungary during his military years. In 1887, he became a full-time professor at Punjab University in Lahore. First, he explored the cultural past of Kashmir then later he organized several large-scale archaeological expeditions, of which there were three that were organized to inner Asia that carried exceptional scientific significance. He recorded geological conditions, completed archaeological and historical-geographical studies while exploring and mapping huge territories. He was acclaimed for his scientific communiqués and books that were translated into several languages. He located a large amount of ancient written sources in various languages in the Caves of Thousand Buddhas in Dunhuang province. He acquired the rights to some of these and transferred them to museums in India and to the British Museum in London. This way,

they were preserved for future generations and today can be researched under the framework of international agreements (International Dunhuang Project). He passed away during the preparation of a Persian expedition in Afghanistan and was buried in Kabul.

One of the most significant explorations in the near-East nowadays is the exploration of the castle of Margat near the Mediterranean sea. This project is being carried out by Hungarian professionals led by archaeologist and historian **Balázs Major**. Of the research results acquired during the exploration of the largest castle of the Crusaders in the area of the Holy Land was the wash-out gutter (sewer) system and the unique mural, which was discovered in the temple of the castle. Earlier Hungarian-related findings of the castle were that the father of **St. Elizabeth** of the **Árpád** family line (of Thuringia), while returning back to Hungary from his fifth crusader expedition, spent a night at the castle, which belonged to the Knights Hospitaller and gave them a large gift of annuity.

csoma.mtak.hu
www.unesco.hu/unesco-vilagemlekezet
dunhuang.mtak.hu
stein.mtak.hu

The Castle of Margat



Exploring the Earth



The map of Hungary published by Lazarus the Scribe in 1528 UNESCO approved its listing in the Memory of the World Register

Lazarus the Scribe, secretary of Tamás Bakócz, the archbishop of Esztergom, prepared the first detailed map of Hungary in 1514, which was printed and published only after his death in Ingolstadt, Bavaria in 1528. This map was declared by UNESCO to be part of the Memory of the World Register in 2007.

At the order of Pope Pius IV., another detailed map of Hungary was completed to decorate the Loggia della Cosmografia (corridor of maps) at the Vatican in 1562. This artistic mural decoration piece was at the same time an important aid to bringing diplomatic decisions. It also confirmed that at the time, Hungary was ranked as one of the ten most recognized countries at one of the world's spir-

itual and intellectual centers (the Vatican). The map was drawn by French-born Etienne Tabourot and painted by an Italian, Giovanni Antonio Vanosino.

Finally, in 1804, another outstanding project to draw a detailed map of Hungary was launched by János Lipszky, which map also had an index containing the names of 30 thousand localities.

Hungarian explorers were instrumental in exploring other parts of the world as well. There were several Hungarian missionaries who took part in the exploration of South America during the 17th and 18th centuries. One of the most famous of these was Ferenc Xavér Éder who helped introduce the Moxos Indians of Peru to the world. Ignác Szentmártonyi on the other hand, discovered and mapped the Amazonas area and its tributaries. Ágoston Haraszthy was instrumental in the establishment and advancement of grape and wine growing in northern California, thereby deserving the label "father of California grapes".

There were a large number of active Hungarian explorers in Asia, Lajos Lóczy who took part in the east-Asian expedition



Lajos Lóczy Sr. prepared one of the best geographical-geological map of China

of Béla Széchenyi and during this period, travelled to all corners of China. Based on his research findings he compiled a historical portrait of the Chinese Empire and prepared its geographical map as well (Budapest, 1886). Mór Déchy attempted to get acquainted with the Caucasian region during several expeditions. Professor Fu Zhi-liang, who among other Chinese researchers completed his university studies in Budapest and spoke excellent Hungarian, wrote a Chinese-language book titled Outstanding Hungarian Explorers in China.

To move to other areas of the world, Sámuel Teleki's expeditions unveiled the yet unknown areas of East Africa, while László Magyar did the same in West Africa. Emil Torday was instrumental in the ethnical profiling of the Congo region, while taking photographs to document his research work. A large share of his pictures are now on exhibit enriching museums in England. László Almásy, whose life was reincarnated in the Oscar-winning movie The English Patient, was a devoted desert researcher who attempted to explore the Sahara by car and by airplane.

Our one-time Prime Minister Pál Teleki (1879–1941) was also known as an outstanding geographer. He published his work Atlas for the cartography history of the Japanese islands in 1909, which was awarded the Jomard Prize in Paris. In 1925, Pál Teleki, acting as Special Commissioner of the League of Nations, participated in a fact finding mission to the oil-rich Mosul region together with Swedish and Belgian experts. The mission was aimed at determining the legal status of the Mosul region. He emphasized that the wishes of the Kurd population should be taken into consideration and Kurdish officials should be appointed for the public administration of Kurdish territories. He also proposed that Kurdish should be the official language of the judicial system and in public schools.

www.typographia.oszk.hu
www.foldrajzimuzeum.hu

The new science of networks

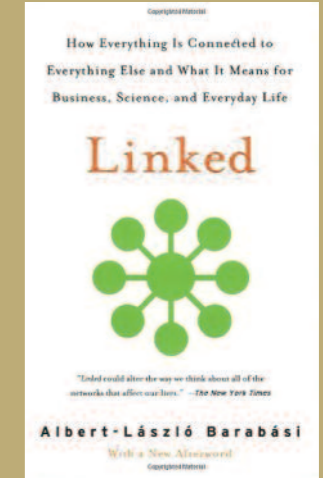
One of the Hungarian researchers who lived abroad, Albert-László Barabási and his work team, began to study the characteristics of networks by examining the mathematical aspects of the Internet and its related networks. He extended his research to nature, society, and business life from the standpoint of networks and attempted to comprehend and put into a structure the aspects of web democracy through the spreading of viruses to the vulnerability of the Internet. He realized that most events and phenomena are part of a complex universal "puzzle" whose pieces are largely interrelated and mutually affect each other. In his writings, he called attention to the fact that we essentially live in a world, in which all pieces of events and occurrences are interdependent on one another. These networks, which are seemingly quite different from one another, can be described by the same mathematical formulas in most cases.

His research conclusions gained new acclaim after the terror attacks against America in 2001, and subsequently his book entitled "Linked" became best seller of the year in 2002. His assessment was that by understanding the real nature of existing networks in our world, we can get closer to answering questions that haunt us with respect to the containment of viruses, the management and reversing of economic crises, the curbing of terrorism and other challenges in human society that are linked directly to the existence of networks.

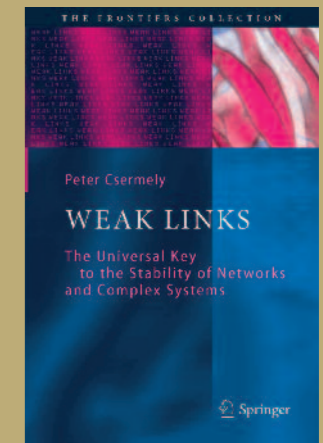
In Hungary, biologist Péter Csermely among others attempted to research the question of how crisis situations can be tackled using the intimate knowledge of biological networks that we gained over time. He tried to design crisis management models with his colleagues. If we consider responses by our cells as a crisis containment model, then we can observe processes that occur in relative isolation from one another from the very beginning of the crisis. As a result of this research, they have concluded that network based reasoning that we detected in biological processes make those properties transferrable to societal conditions as well.

In our time, when almost everything has shifted to electronic communications it is worthwhile to remember an institution from the not-too-distant past, an essential network, the postal service, which delivered handwritten or at the maximum typed letters to us all. In contrast to what was previously cited, we should all be reminded of this personal form of human relations, particularly because the Hungarian Postal Service has attained valuable international achievements. For example, Europe's most beautiful postal stamp was designed by Hungarians for three successive years in a row (2008, 2009 and 2010).

barabasi.com
www.posteurop.org



Albert-László Barabási's book "Linked" won the title: Business Book of the Year in 2002

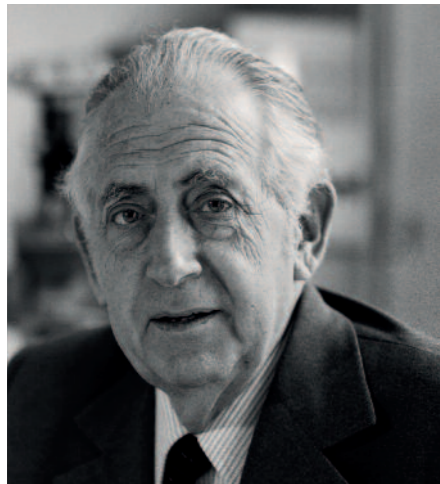


According to Péter Csermely, weak networks and weak human relations may actually help us become more successful and stable at the same time

Europe's most beautiful postal stamps in 2008 and 2010



The image of the human body



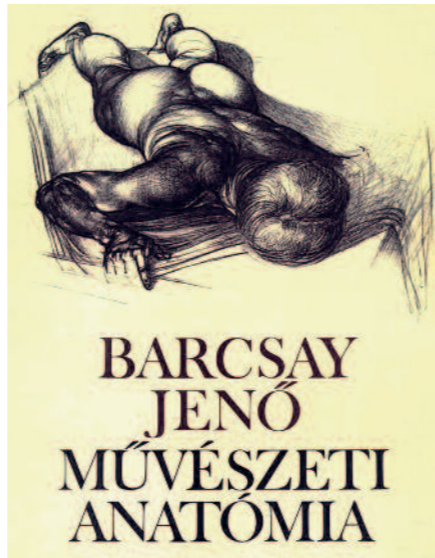
János Szentágothai

The 100th anniversary of his birthday of world-renowned Hungarian physician, anatomist **János Szentágothai** (1912–1994) was considered an important event even by UNESCO. His internationally acclaimed findings are related to the structure of the nervous system, nerve cells and various networks created from these nerve cells. He was considered to be one of the foremost experts in this general area. He was a trendsetter who helped the unravelling of other talented scholars. According to his colleagues, he was able to guide young people so that they could utilize their best talents. He was motivated by the same principles in assessing his colleagues and students of new generations to come as those that he used to evaluate his own research activities. His university lectures on anatomy were sensational: there was practically no one else who could hold such captivating and witty lectures about possibly one of the most boring and stale scientific subject of all. For several years, he held the position of President at the Hun-

garian Academy of Sciences. His name is associated with the completion of several handbooks, one of these is particularly outstanding, a three-volume atlas entitled the Anatomy of Man, which he published with co-author **Ferenc Kiss**. From 1946 on, this piece was translated into more than 30 languages and lived through numerous publications – generations of physicians studied anatomy from this highly acclaimed medical atlas. Another successful textbook of his was the three-volume Functional Anatomy (first published in 1971), which treated anatomy, histology and developmental biology as a three-tiered unified science guiding future physicians in the shaping of their correct perception and assessment of the human body.

Jenő Barcsay who was known as a fine artist and an expert of applied arts had a book published called Artistic Anatomy, which was published and re-published 20 times since 1953 and translated into several languages. Artistic anatomy is nowadays a subject that several of the top art schools internationally teach and quite a few of these schools consider Barcsay's work as fundamental in advancing this field. Normally, medical students can obtain anatomical skills from anatomy atlases, animated films and actual autopsies. Compared to the number of students, there are relatively scant opportunities for autopsies, further constrained by humanitarian considerations, therefore obtaining skills in this area is expensive and is not always at the disposal of medical students. Spatial imaging and spatial skills, on the other hand, are often difficult to obtain purely from atlases and only by way of animated exercises.

To help bridge this knowledge gap, a new Hungarian invention was offered by neurosurgeon **Attila Balogh** and his associates in the form of a four dimensional,



An artistic anatomy book used worldwide

interactive anatomical atlas, named 4D Anatomy. By using this device they can display a particular dissection's 3 dimensional picture and then this will be "peeled" to individually show all of its layers. The student and the user of this mechanism can view these layers from any and all angles, sort of roaming through them all from a fourth dimension. By doing so, autopsy room exercises can be simulated in a life-like presentation using a computer monitor.

The module containing one of the most complicated body part, the head-neck region, was already completed, while modules showing other body sections and parts are continuously being upgraded. This invention enables users with the help of appropriate hardware and software to record live surgeries, while studying the same afterwards in detail.

www.4danatomy.com



Ignác Semmelweis (1818–1865) was known at the end of the 1840s for discovering the importance of preventing infections during and after medical procedures, which many felt preceded the state of medicine of the time. It was then that he began to apply a procedure he developed, washing hands using a chalky chlorine solution. He held a series of lectures about this new advance in 1850 at the Vienna medical association, when he saw that the death rate of birthing mothers dropping and wrote a series of articles on the same subject in the Medical Weekly, and finally, wrote a book about it in German in 1860. Today, the daily practice of preventive sterilization is entirely accepted prior to medical procedures. Semmelweis is rightly considered the saviour of mothers and is regarded as the early initiator of disinfection practices. There are many statues all over the world to serve as mementoes of

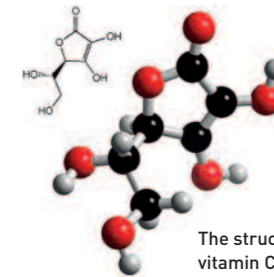
Improving the quality of life

his accomplishments, even at the Medical Memorial Museum in Chicago.

Endre Hőgyes (1847–1906) was a researcher at the University of Kolozsvár (Cluj, Romania) who carried out pioneering studies pertaining to the sense of balance and the structure of the inner ear. As a professor in Budapest, in 1886, he introduced a new vaccine procedure at the Hungarian Academy of Sciences applied against rabies. He established and led the Pasteur Institute in Budapest, where they inoculated, produced vaccines and completed research in this subject. They worked out the so-called "diluted" vaccine production method, which were used by Pasteur Institutes in numerous countries (and which method is used even today during the production of vaccines).

József Fodor (1843–1901) was the first domestic lecturer at college level on public health and raised this scientific area to an international stature as well. His research related to pollution of our environment – air, soil, and water – are of essential importance. He was able to prove that water played a role in spreading typhoid disease and found that blood had properties that can kill bacteria. He raised the issue of the necessity of a national public health institute and an institute of infectious diseases for the first time. Professionals from several countries flocked to Budapest to pursue studies under his guidance. Based on his recommendations, a school medicine service network was instituted. He was not a "specialist" in the narrow sense of the word, his grandson **Gedeon Gerlóczy** for example, (in his recollections) learned the respect and love for fine arts and thereby was motivated to become a fine arts collector and saviour of the works of one of the greatest Hungarian painters, **Tivadar Csontváry Kosztka**.

Albert Szent-Györgyi (1893–1986) was able for the first time to extract ascorbic acid (hexuron acid) from adrenal glands in 1928. Next year, he isolated vitamin C from the pressed juice of red bell peppers in Szeged. In 1937, he received a Nobel Prize in medicine and physiology for his discoveries in the area of "biological combustion processes, particularly with respect to vitamin C and fumeric acid catalysis". In 2012, in the presence of eight Nobel Prize winning scientists, he was remembered at an international festive event at Szeged on the 75th anniversary of his winning of the Nobel Prize.



The structural model of vitamin C (ascorbic acid)

President of the Hungarian Academy of Sciences (MTA) said that: "The one-time professor and later dean of the University of Szeged (referring to Albert Szent-Györgyi) received the Nobel Prize for his research he completed in Hungary after returning home from abroad where he conducted studies and research as well. This happened only 18 years after his country lost a war and two thirds of its territories." According to the president, the life and work of this famous Hungarian scientist still means a lot of inspiration to many people (young and old).

www.sztnh.gov.hu/feltalalok



Anna Dévény portrayed with severely handicapped children

Physical and spiritual health

János Selye (1907-1982), medical doctor, chemist, and college professor. He began his academic studies at Komárom, which he later continued abroad. Between 1945–1976, he was professor at the Institute of Experimental Medicine and Surgery of the University of Montreal. He became world famous in Canada as the discoverer and researcher of stress theory. His first work was published in 1936 about this subject in *Nature* magazine. From 1976, he was President of the International Institute of Stress Research. His discovery was that stress plays a main role our life and this concerns all of us.

Mihály Csikszentmihályi, a psychologist and teacher who works in the United States, recorded his “flow experience” in 1975. In his view, what is most important in life is that we find what causes pleasure to us, under which we can fulfil ourselves, and this way we can advance our narrow and even broader communities. His description of the desirable state of happiness gained international interest in his profession. His book was published in several languages worldwide.

András Pető (1893–1967) medical doctor, special education expert worked in Austria and later in Hungary as he developed his conductive pedagogy (i.e. teaching instruction) system, from the 1930s on, to help trainers, particularly aimed at handicapped children’s recovery who were suffering from certain types of had disorders of their central nervous system. The Pető method spread worldwide as a result of the excellent results that it produced (it was particularly popular among parents who were indirectly affected) as many of these parents brought

their children to Budapest for treatment. To satisfy excess demand that was beyond the institute’s capacity more and more humanitarian aid arrived thanks to generous donors including Lady Diana who supported the expansion of the Pető Institute. The method’s international popularity is actively promoted – the instruction and preparation of trainers is completed at the Budapest centre, while trainers and professionals who received their skills here are now active from England to Vietnam in numerous other countries as well.

Anna Dévény, special gymnastics and artistic gymnastics trainer worked out a special gymnastics method from the 1970s (DŠGM), which assisted professionals to achieve results in two main areas: one is in the post-trauma treatment of infants who suffer from oxygen-deficiency after birth and the other is adults who have some type of bone injury or mobility problems, in both cases this exercise method speeding up their way to recovery. Besides reducing or eliminating the actual suffering of these patients, successful rehabilitation had significant cost-saving aspects as well.

Music and shared singing are factors that help create physical and spiritual harmony, which is an ancient method in healing those suffering from various ailments. One of Zoltán Kodály’s pupils, **Klára Kokas** (1929–2010) was a music teacher and music psychologist who developed a method to apply music and the joy of visual expression as a complex instruction style for children and naturally adults as well, thereby aiding their personal development.

www.peto.hu, www.kokas.hu



The rehabilitation of injured children at the Pető Institute

Klára Kokas helped people with a mixed method of listening to music and movement



Medical technology

József Dallos was an ophthalmologist in Budapest who developed a glass-technology based process in 1934, by which asymmetry between the eyes was addressed in preparing contact lenses. In 1939, **István Gyórfy**, an eye doctor, and **János Pálvolgyi** who was an optical grinder in Budapest, for the first time in the world, were able to develop unbreakable, plastic contact lenses. Colour blindness (parachromatism) is a hereditary condition, which could be corrected by a special eyeglass – this was discovered by two professors at the Technical University of Budapest, **György Ábrahám** and **Klára Wenzel**. Both the equipment that diagnoses colour blindness and the eyeglass (equipped with special colour filters) made as a result of this diagnosis are their patented inventions. This special type of diagnostic service and the preparation of eyeglasses are now available in several countries in the world.

László Hangody, orthopaedic surgeon developed a new process towards the end of the 1980s – the so-called mosaic plastical method – in order to improve longevity and durability of the so-called hyaline cartilage tissues in knee joints that are exposed to heavier stress. Those cartilages that are regenerated to a slower and/or smaller degree can be corrected by taking out healthy cartilage tissues from other, less important bone surfaces and then implanting them in the knee joint. This surgical method was first applied in 1992. The set of instruments that was necessary to complete this transplantation was developed and manufactured in Hungary. The procedure achieved domestic and international ac-

claim: it received first prize at the European Knee Surgery and Arthroscopic Congress in 1994. This method is taught ever since, and after ten years of the introduction 40 thousand surgical operations were completed worldwide using this method annually.

The **77 Electronics** Company, headquartered in Budapest, developed its own invention, a blood sugar monitoring device for home use, which has conquered the Hungarian market and was able to make inroads into international markets as well. Using this experience, it developed similar devices in another analytical area, testing urine samples, which were very successful internationally as well. Their success was confirmed when – next to American and Japanese competitors – one of these devices carved out a 35 per cent market share from worldwide commercial sales in this market segment. The device is currently being sold in over 70 countries.

The Semmelweis University of Medical Sciences in Budapest and Heidelberg University jointly developed a liquid solution, in which hearts awaiting transplantation can be stored significantly longer (and therefore their transportation distance and their chances of locating the proper receiver will increase). The uniqueness of this successful cooperative venture was that it was two Hungarians who led the research part of this effort, professor **Béla Merkely** on the domestic front and professor **Gábor Szabó** heart surgeon in Heidelberg.

Csaba Vértési researcher in Budapest developed a radio frequency resonance method that is applied in detecting and removing viruses that attack the human body and bacteria that are immune to pharmaceuticals. This method was particularly successful in curing various forms of Lyme disease, which has become somewhat like a new epidemic caused by ticks.

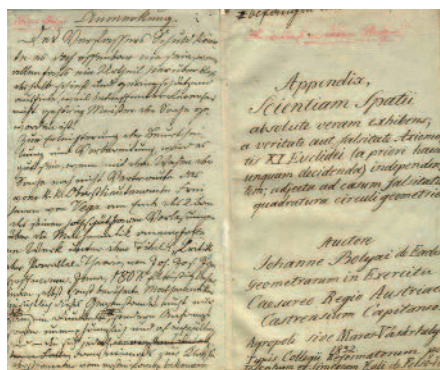


László Hangody, the inventor of mosaic plastics

Inventors with their special eye glasses to correct colour blindness



Calculating wizards



The cover page of János Bolyai's Geometry creating a new world. The work was approved to be a part of for UNESCO's of Memory of the World Register in 2009-ben

János Bolyai (1802–1860) was an ingenious, young military engineer and mathematician, who wrote a letter to his father Farkas Bolyai in 1823, announcing his new discovery in geometry, which he called “non-Euclidean” geometry. In 1832, at Marosvásárhely (Târgu Mureş, Romania), János Bolyai's famous work “absolute geometry” was published in

Latin language, which was a truly trend-setting work. It was a 26-page analysis of the “absolute or true science of space” as Appendix “A” of his father's, Farkas Bolyai's first text book of mathematics entitled “Tentamen”. It was also printed as a separate publication in 1831.

János Neumann (1903–1957) was a mathematician, chemist and a decisive personality in information technology. He joined the early technological developmental work in the United States. In 1945, he wrote his important essay contribution to the field of information science (First Draft Report on the EDVAC), in which he reviewed, summed up and expanded existing developmental concepts in a creative way. He described the make-up of a digital computer with a storing capacity, its characteristics and logical functioning. His theoretical work is valid even today: all computers manufactured for commercial purposes are based on the Neumann concept, only technical applications have changed. **János Kemény** and his associate are credited for creating the BASIC language

of computers. Next to Neumann and his colleague, several other Hungarian professionals contributed to the development of both hardware and software applications.

In 2005, the Abel Prize, named after the Norwegian mathematician Niels Henrik Abel (one of the most prestigious prizes in this field) was awarded to **Péter Lax**, a Hungarian-American mathematician. The one-time Budapest student has been living in the United States since 1941 and has been a professor emeritus at New York University. In 2012, **Endre Szemerédi**, another mathematician from Budapest received the Abel Prize for his fundamental contributions to discreet mathematics and theoretical computer sciences.

László Lovász who was considered a mathematics genius at his younger age, achieved excellent results at various competitions. His professional career showed similar success. In 2010, he received one of the most significant prizes that can be awarded to a scientist: he won the Kyoto prize, the Japanese equivalent to the Nobel Prize.

bolyai.mtak.hu
www.abelprize.no

Péter Lax received the Abel Prize in 2005 (Norwegian equivalent of the Swedish Nobel Prize)



László Lovász won the Kyoto prize in 2010 (Japanese equivalent of the Swedish Nobel Prize)



Talent Management

We can see numerous examples of both individual and societal forms of talent salvaging and talent management programs worldwide. Peoples have recognized from ancient times that the promotion of youngsters who have special talents advances the interests of the community and will provide a payback as society's future base. This process in Hungary is also rooted in the deep past. This is the way the children of simple farmers or village workshop employees were able to become the country's leading pontifical hierarchs, successful artists or excellent college professors.

The so-called High School Math Papers (KÖMAL by its popular name) were launched in Hungary in 1894 by editors **Dániel Arany** and **László Ráztz**. A column in physics was later added in this magazine. Its purpose was to raise the interest of talented young people to compete with one another. Beyond the monthly puzzles or tasks that editors designed for readers to solve, at the suggestion of **Loránd Eötvös**, the editors organized nationwide competitions and the winners later often ended up among the top ranks of scientists worldwide. We need to mention that the assignments, designed jointly by teachers and students alike, became so popular that three volumes were already published in English with the title Hungarian Problem Book series.

The unravelling of talents and hidden resources in young people was helped by a special approach that both human and science-related subjects were treated of equal stature in the leading grammar schools of Hungary e.g. at the renowned Evangelical High School of Budapest.

www.komal.hu
www.hagyomanyokhaza.hu
geniuszportal.hu/node/286
www.kutdiak.hu

After World War II., **György Gulyás** established a music school (college) in an old castle at Békéstarhos for managing and teaching talented young people, particularly from rural areas. This legendary institute functioned for decades and raised numerous well-known musical performers and personalities both domestically and internationally.

The Hungarian State Folk Assembly was established more than 60 years ago, in 1951, to preserve, nurture and introduce folk music and folk dance traditions. The House of Traditions was set up in 2001 to promote and advance folk arts and crafts by introducing and pass on these skills to future generations.

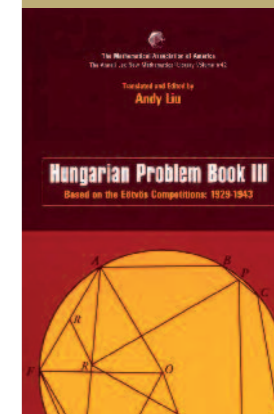
Nowadays, scientific talent management is served by the Association of Student Researchers, which was established by **Péter Csermely** to involve talented high school students with the guidance of mentors in actual research activities. Many youngsters started their careers with the help of this new concept. Another form of managing young talent nowadays is the Hungarian Genius program, under which dedicated teachers are being prepared to identify outstanding talent and corresponding areas of interest in young people. Those selected will be sent to “talent points” (in various institutions) who can then offer them scholarships and support. This method is now being used by several countries.



Members of the Hungarian State Folk Ensemble perform a dance from the Kalotaszeg region



Péter Csermely, an internationally recognized expert of talent nurturing



The most interesting assignments of the last 100 years of competitions for talented Hungarian students

Most of the winners have become world renowned scientists



The steam power plant in Rome and the hydro-electric power plant of Tivoli were both built by the Ganz Factory of Budapest

The Valtellina railroad's engine. It was designed by Kálmán Kandó and made by the Ganz factory. With this, the alternate-current electrification of railroads have begun in the world.



Power plants and trains

Three young engineers of the Ganz Factory of Budapest: **Károly Zipernowsky**, **Miksa Déri**, and **Ottó Titusz Bláthy** in 1885 invented and patented the transformer and the alternating-current energy distribution system, which was based on the transformer. This patented innovation made it possible to transport electric energy to faraway places, its delivery to individual users and thereby enabled its worldwide use. During the following decades, numerous (several hundred) Ganz patented electric power plants and distributor facilities were built worldwide. In 1886, the Rome-Cerchi steam power plant was opened, which was the first such metropolitan-scale power plant. Following this, the Ganz factory supplied all of Rome's and several Italian cities' electric energy equipment needs for decades.

In 1892, a hydroelectric power plant was built in Tivoli by the Ganz factory, which was Europe's largest such plant at the time. The energy that was produced here was transported to Rome by a 5,000 Volt aerial transmission cable. It was here that they applied a combination of steam engine-driven (Rome-Cerchi) and water turbines-driven (Tivoli) generators for the first time in the history of electric technology to work in unison, in a parallel connection. Unfortunately, we all need to pay for the energy that we use. For that purpose, the Ganz Factory designed and marketed the first induction technology based watt-hour counters (alternate current consumption meters) in 1889. Today's electric meters that are so close to our hearts, although updated by modern improvements, work essentially using the same principle. From the beginning

of the 1900's, **Ottó Titusz Bláthy** designed turbo generators that ensured the Ganz Factory's international competitiveness for a long time to come. Patents of the four-pole rotor construction was purchased by Swiss-based BBC and SSW in Berlin.

In September of 1902, the Italian Valtellina railroad was opened from Lecco to Sondrino, which was a 106 kilometres electricity-powered line. This was the world's first electricity-powered main railroad line that used high voltage alternating current. Practically all of its main elements – engines, cars, transformer stations and most of the electric line equipment - were developed and manufactured by the Ganz factory under **Kálmán Kandó's** direction with the active and creative participation of many of his associates. Installation work was also provided by the Ganz factory. Success of this venture was confirmed when the Italian government ordered an additional 2000 kilometres of electric railroad lines using the same system. The first engines to run on these lines were manufactured using Kálmán Kandó's plans. He was an outstanding designer both in the fields of machinery and in electricity, many of his patents were utilized elsewhere in the world. An electric engine factory was built in Vado Ligure, Italy, where the engines were designed by Kandó. The first type, called Cinquanta, was put into operation in August of 1908. It became world famous in railway history. Several hundred were manufactured. Their durability was widely known and it was a testimony to their reliability until the 1960s.

Vehicles on Land and in the Air

Hungarian Chief Design Engineer in the citadel of automobile manufacturing
After completing his technical studies in Budapest and Western Europe, **József Galamb** (1881–1955), moved to America in 1903. In 1905, he joined the Ford Motor Company. Henry Ford soon discovered this young man who had superb drawing techniques and had excellent technical skills and selected the 26-year old man to be the chief design engineer for Ford's Model T. Galamb designed most of the parts of the Model T and was instrumental in organizing serial production of this automobile. Manufacturing of the Model T started in 1908 and this was the first car of which 15 million units were produced. In 1999, the Model T was selected the "Automobile of the 20th Century".

The person who discovered that accidents are unavoidable, but we can still stay alive!

Béla Barényi (1907–1997) mechanical engineer was a legendary character in automobile manufacturing. He worked at various firms in Austria, Germany and France, and then became an employee at Daimler Benz AG in 1939 for 35 years. He had more than 2,500 patents focusing on passenger safety, his pioneering research ideas contributed to a completely new approach in automobile design. Each year, his ideas save the lives and health of tens of thousands of people ever since. He was the first living person who was inducted in the Automobile Hall of Fame in Detroit.

At his point, we also need to mention the name of **Ferenc Anisits** whose design concepts were trendsetting in de-

veloping BMW's new generation diesel engines, some of which won "engine of the year" awards.

A collapsible two-seater automobile on the Moon

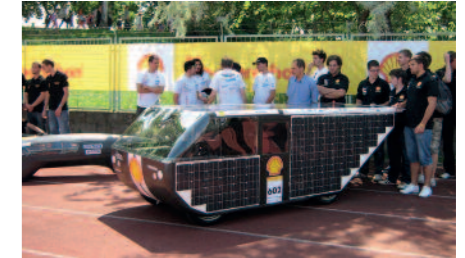
Ferenc Pavlics mechanical engineer studied at the Technical University of Budapest, then moved to the United States in 1956, and became a full-time employee at General Motors. He took part in the development of special all-terrain vehicles then was appointed to direct the design and manufacturing of the Lunar Roving Vehicle – LRV as chief engineer during the Apollo program. Designers used a technology that was similar to the collapsible stroller, wheels were made of titanium wires, which was Pavlics's patent. Four such vehicles were made. The first such lunar vehicle was launched on 26 July, 1971, on the deck of Apollo-15, the next two on Apollo-16 and Apollo-17, while the fourth was placed on display at the Smithsonian Museum in Washington, D.C.

What today's Hungarian youngsters are capable of

The Shell Eco-Marathon International Fuel Savings and Environmental Protection Competition for alternative-powered and special vehicles was organized in the year of 2010, in Germany at the Lausitz race track. The solar energy automobile, (the Hungarian name of the model is "SZEvolution") developed by the SZEnergy Team of the Széchenyi István University of Győr won for the third time in the urban cars (Urban Concept) solar energy-powered (Solar) vehicle category.



The Lunar Roving Vehicle (LRV) was made under the direction of Ferenc Pavlics Hungarian mechanical engineer



The SZEvolution Car, the three-time winner solar energy automobile made by students of the Széchenyi István University



Megameter II., experimental car of the Kecskemét graduate school

Another vehicle called Megameter II. developed at the Technical School of Kecskemét was ranked No. 3 in fuel consumption in 2011 with an amazing 2661 kilometres per 1 litre of gasoline consumed in the gasoline-powered vehicle category. Also in 2011, at an international competition organized in Cartagena (Spain) the same team participated in the bioethanol (alternative-fuel powered vehicle category) and won first prize.

www.pulispace.com
www-robotics.jpl.nasa.gov

The search for energy

Hungarians in the search for oil

Loránd Eötvös (1848–1919) is an internationally recognized scientist in physics. He completed his university studies at Heidelberg, then became professor at the University of Budapest. During the 1880s, he invented the torsion balance to measure gravitational force, which became known as the world-famous Eötvös balance in theoretical and pragmatic scientific research.

Based on the torsion balance and following Eötvös' concepts, Hungarian geologists developed a testing method to measure geophysical gravitation and used its applications in raw material exploration, particularly in the search for crude oil and natural gas. This method was first applied in Hungary in 1915. After the first successful application, large oil companies conducted fruitful explorations worldwide – often with the assistance of Hungarian experts. The balance was further improved by Hungarian scientists and these instruments were manufactured and exported by Hungarian industry. The torsion balance

Field work using the Eötvös torsion balance. At numerous locations of the world, this is how they located crude oil reserves.



called E-54 won Grand Prix at the Brussels World Expo (1958). The Eötvös balance was used for 50–60 years and therefore it can be said that at least the incipient exploration of a large percentage of today's oil drilling sites were completed using this instrument.



Leó Szilárd, one of the creators of the nuclear age

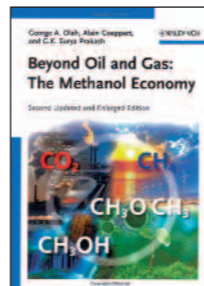
The 1 dollar patent

Leó Szilárd (1898–1964) who was living in England in 1934, submitted a claim for a patent for the principle of releasing nuclear energy, based on a nuclear chain reaction initiated by a neutrons. In the description of this patent, he suggested uranium as an element to utilize the neutron-doubling effect and noted that a self-sustaining chain reaction was only possible above a critical mass. On December 2, 1942 the first experimental nuclear reactor started operating in Chicago. The plant was built with the co-operation of several scientists, but the main role was played by Italian-born Enrico Fermi and the Hungarian Leo Szilard. It is not a coincidence that based on the

patent they submitted on December 19, 1944, they received full patent rights to this technology on May 17, 1955, which thereafter was purchased by the U.S. government for a symbolic fee of 1 USD.

Charting new courses

Chemical engineer **György Oláh** studied at the Technical University of Budapest, then later became lecturer and researcher there. He lives in the United States since 1956 (first in Canada and later in the United States). He received a Nobel Prize for the results of his fundamentally essential in 1994. With his work team, recently, he has been exploring new energy resources. It is possible (based on his research) that a future energy source may be methanol, which is manufactured by using the carbon-dioxide content in the air. He had a book published on this topic in 2006. This book became a best seller in the scientific subject area, was translated into several languages, e.g., to Japanese, Chinese, Swedish, and, of course, Hungarian. Today, a series of manufacturing plants are being built using methanol and its derivatives.



We can crawl out of garbage

Iván Raisz and **István Barta** put forth an invention that is capable of manufacturing methanol, economically and in industrial quantities, from communal garbage that is flooding our world. In October, 2011, in Nuremberg, at one of the most significant innovation expos, their technology won the main prize, the Green Oscar, from among 750 contenders from 30 different countries.

www.elgi.hu, www.nobelprize.org

For a liveable world

At the initiative of Italian scientist Aurelio Peccei, on December 1, 1968, the so-called **Roman Club** was established, a privately managed international society that sets out as its goal the study of the world's global problems. There are several Hungarian scientists among its approximately 100 members, or actually had been, for example, Nobel prize winner **Dénes Gábor** who actively participated in preparing the institute's studies.

In 1971, **Lajos Jócsik's** fundamental work "Suicidal Civilization" was published in Budapest, which he wrote from an ecological aspect (first draft completed in 1969). The author has recorded viable achievements in biomass utilization, selective garbage collection and garbage recycling during the 1950s and 1960s in Budapest. His book "Protection of our Environment" was published in 1976.

In 1998, Roman Herzog, President of the Federal Republic of Germany decorated Professor **Antal Festetics** with the I. degree of Germany's Grand Medal who has been Director for 25 years of the Wildlife Biology Institute of Göttingen University of Sciences. This prize was awarded to him for his multi-faceted work in the areas of nature protection research, teaching, public education and information dissemination efforts. Antal Festetics had a major role in the organization of international aid efforts provided for the protection of Hungary's natural resources. He has helped both Austria and Hungary in connection with work projects aimed at the preservation of Fertő tó (Neusiedler See) and its environments.

Shenzen, which was planned to become Hong Kong's "twin city" in China, has already become a regional centre of 10 million inhabitants. Just like other metropolitan areas of similar size, it has quite a

few infrastructural challenges. One of these challenges, sewer treatment, is being resolved with the help of Hungarian-developed technologies, such as bio-technology using an artificial living ecosystem. One test facility is already in operation.

One of Hungary's best known nature conservation areas is the **Horto-**



A view of Hortobágy

bágy. In December of 1967, as part of the Pro Natura action plan, 22 world famous scientists appealed to the Hungarian government in a memorandum to preserve the unique natural and cultural values of this area in the form of a national park. As a result, the first national park in Hun-



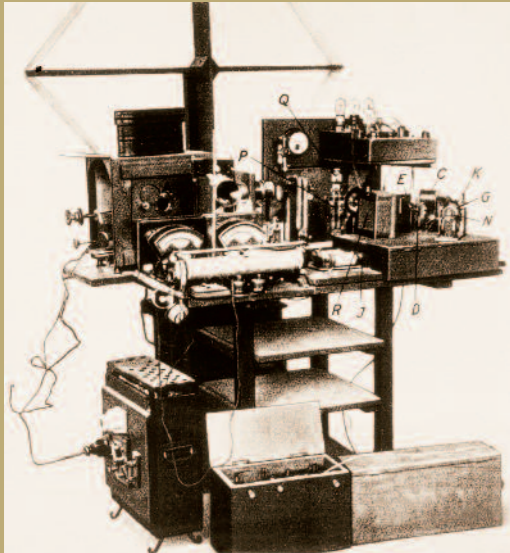
The Chinese City of Shenzen uses Hungarian technology to perform biological sewer treatment.

gary was created in 1973. Originally it had a total area of 51 thousand hectares but by today it has a territory of nearly 82 thousand hectares – rendering it the largest single protected area of the country. The Hortobágy National Park is considered to be a UNESCO Biosphere Reserve, one-third of it being a living waterland area of international significance.

On the other hand, the future of nature protection and environmental protection is in the hands of today's children,

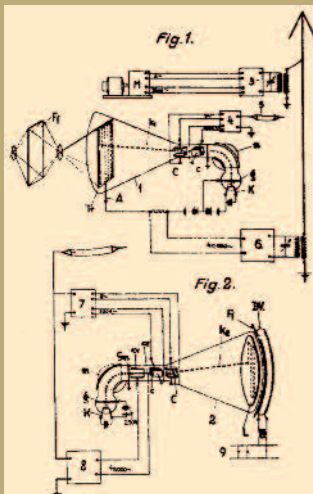
as it largely depends on them if the world will remain to be a liveable entity. To illustrate this, let's see an instructive example. Once upon a time, a high school class went on a trip to the mountains and found the ruins of a water mill. They could have passed by it, but that is not what they did. They decided to restore the area. Upon returning to the same location, they camped out there, collected all the refuse, cleaned the ruins and also cleaned up the creek bed. The beauty of this story is that it is not an invented story at all: the characters were actually students of Mihály Fazekas High School of Budapest and the location is the Börzsöny mountains in the area of Ipolytölgyes.

www.clubofrome.org
whc.unesco.org/en/list/474



The television receiver of Dénes Mihály

The invention of Kálmán Tihanyi, which made television viewing possible without any movable parts. His invention was registered in the UNESCO Memory of the World Register.



Voice and picture

Dénes Mihály mechanical engineer as part of his experiments that he began in 1914, submitted a patent application on April 30, 1918 that he was making a “talking” film called Projectophon. His procedure consisted of affixing voice (volume) with an optical technology onto 35 mm normal film; therefore he can be regarded as the inventor of “talking movies”, or films with voice tracks. The patented procedure was published in written form on October 18, 1922.

Physicist Kálmán Tihanyi announced a Hungarian patent on March 20, 1926 under the name “Radioskop”, which increased the light sensitivity of television systems for storing capacity thereby further enhancing reception and broadcast capabilities. In his 1928 patents, he described several versions of these practical applications both with respect to television tubes and image recording tubes. His patents were purchased by RCA and were used to develop serial production television modules during later years. Charge storage capacity technology is still a valid principle and it is used in modern television production. For this reason, Tihanyi’s technology that he developed in 1926 was declared to be a part of UNESCO Memory of the World Register in 2001 and is being preserved in the Hungarian National Archives.

Beginning in 1910, Dénes Mihály was interested in the subject of distance vision. He began to implement his ideas and inventions at the Telephone Manufacturing Factory of Budapest, then from 1924, he carried on as an associate at the German Bundespost and consultant engineer for the AEG company. His working equipment, the Telehor, was in-

troduced in 1919 in its earliest form, then its improved version was introduced first in 1928 and later, on March 8, 1929, the Berlin-Witzleben radio station for the first time in Europe launched a mobile television broadcast using Dénes Mihály’s electro mechanic system.

On December 2, 1933, Hungarian Radio launched its first broadcast from its Lakihegy-based large transmitting station. All equipment required for this radio station were produced by Hungarian manufacturers making it one of the most modern such facilities of the time. Its 314 meter tall antenna tower was built by the MÁVAG factory with its telescopic rod, which made it the world’s largest antenna tower and it was Europe’s tallest structure for a long time to come.

In certain branches of telecommunications, from the 1920s, for a few decades to come, Hungarian industry achieved high international recognition. For example, the ORION factory (using radio tubes made by Egyesült Izzó) exported a large portion of its products. In 1942, ORION had a 30 per cent share of the world market in radio receivers. In 1958, ORION’s AR-306 receiver won the Grand Prix at the Brussels World Expo.

Engineer Péter Károly Goldmark (who became associate and later research director, then director at CBS Broadcasting Company) developed the first electro mechanic colour television model that could be used for everyday purposes – CBS introduced this model in August, 1940. In 1948, he developed and implemented the “long-playing” (LP – long-playing) microgroove record. In 1977, he received the National Medal of Science.

What more can we expect?

The person who made personal computers user-friendly for us



Simonyi, the space tourist

Charles Simonyi studied first in Budapest and later, in the United States, then began to work at the Xerox company. From 1981 to 2002, he was in charge of Microsoft’s software development work, as his team developed Windows, Word and Excel among others. These programs were capable of making even layman users more keen on using personal computers and this opened the way to worldwide use and applications.

There are two remarks that need to be added here. Up to now, Charles Simonyi was the only person who embarked on two missions as a space tourist (in 2007 and 2009). During these missions, he completed several hours of research work on the International Space Station (ISS).

And secondly, his father, Károly Simonyi (1916-2001) was a professor at the Technical University of Budapest whose textbooks were translated to several languages and used in other countries as university textbooks (in Germany and even in the Soviet Union). He

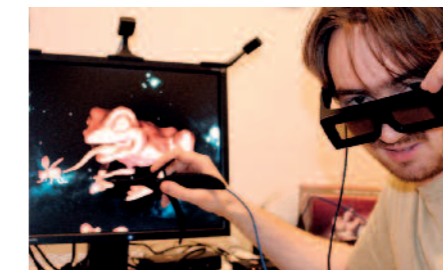
wrote the “Cultural History of Physics”, which was a unique intellectual product (1978), and it was published four times in Hungarian. Beside this the German translation (Kulturgeschichte der Physik) was published three times, making an overwhelming success with hundred thousand copies.

3D for everyone!

The beginning: in May of 2005, the “Olympics” for scientists below age 21 was organized in Phoenix, Arizona (USA), at which 1,444 participants from more than fifty countries competed. Hungarian competitor Dániel Rátai became absolute first place winner with 6 first-prize inventions (this has never happened up to that time and since). The invention he introduced was a simple personal computer that he was able to convert into a 3D equipment at a very reasonable cost. In addition to the prizes they even named an asteroid after him: “Rátai 21724”.

From the winning equipment – using his concept and guidance – the Leonard3Do equipment and program was produced, which is now available commercially as well. It is being used to solve and experiment with new concepts at numerous institutions. For example,

Dániel Rátai at work



the Kecskemét Animated Film Studio, the University of Industrial and Fine Arts (in industrial design and modelling), the University of Medical Sciences (brain research) and other educational institutions use it regularly. The spatial experience it offers opens new dimensions for users. Prince Charles also became familiar with the device and tried it at the Hungarian Academy of Sciences.

Cool yourself!

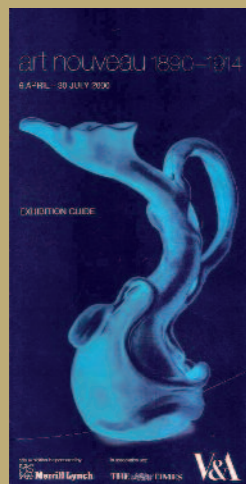
The worldwide spreading of computer technology has caused a rapid increase in energy demands as well. Cooling equipment has become necessary and all kinds of solutions to accomplish this could be important. That is why Krisztina Sugár and Dávid Szabolcs Simon designed a “waste heat pump”, which they introduced at the international scientific and innovation competition in San Jose (USA). Their invention was a great success there. Heat produced by a computer is being utilized by a calorific engine (Stirling-motor) thereby replacing two cooling fans at the same time. With this new solution, energy required to cool a computer is reduced by half. They ended up being second in the team achievement category at this competition that involved 1,611 students from 59 countries, while the Chinese scientific and technology association (CAST) awarded them first prize using their own rating system. A small planet will be named after them as well, so by adding their names to those of Dániel Rátai and Márton Spohn, there will be four Hungarian students honoured by naming space objects circling above us.

www.charlesinspace.com
leonar3do.com



The Herend vase made in honour of the Hungarian EU presidency (2011)

The Zsolnay vase selected for the official brochure's cover page of the international Art Nouveau exhibition, which was organized at the Victoria and Albert Museums in London in year 2000 (on loan from the Museum of Industrial Arts of Budapest)



Vase and roof tiles

To decorate the table of Kings

Herend is a small Hungarian village in the Bakony mountains, near the town of Veszprém. It was here that **Mór Fischer** established a porcelain manufacturing plant in the first half of the 19th century. In 1851, at the first world exposition organized in London, Hungary was represented by various exhibitors and factories, among these the Herend manufacturing plant as well. The Herend brand captivated visitors with its beautiful products. Even Queen Victoria ordered a dining set decorated with butterflies and flowers. The so-called "Queen Victoria design" has been one of the most sought after designs painted by the factory. Hence the first successful international appearance was London, which was followed by many others up to our day. Although Queen Victoria was the first royal customer, it is unlikely that any royal family nowadays would not own some sort of Herend product that would appear on the dining room table. On the other hand, we common folks can also purchase Herend products for ourselves or for our loved ones. We can now purchase Herend porcelain products in numerous countries, yet it may also be worthwhile to pay a visit to Herend to do the same!

During the first half of 2011, Hungary filled the honourable position of the EU presidency. This development was commemorated by the Herend factory as well: a one-meter tall vase was manufactured, decorated by Apponyi motives weighing 25 kilograms and put on exhibit at the Royal Castle of Gödöllő (where most of the international conferences took place), which was subsequently donated to the European Parliament as a gift.

Pyrogranite and eosin

In the city of Pécs, at the beginning of the 1850s, **Miklós Zsolnay** established a plant

to manufacture construction materials and stone dishes. Later, his son **Vilmos Zsolnay** (1828–1900) took over the plant and developed it into a European-quality manufacturing facility first with the help of foreign professionals and later, by applying his own expertise from 1872 on. During his experiments, he launched new techniques (e.g., porcelain glazing). Decoration schemes also became richer as he involved excellent artists and members of his own family who were trained in applied arts (his two daughters and his son-in-law). The factory gained its first international success at the 1873 Vienna world exposition. Subsequently, at the Paris world exposition in 1878, it received the expo's Grand Prix and gold medal, while Vilmos Zsolnay was awarded the Cross of the Legion of Honour. From the end of the 1880s, the plant began to manufacture frost-proof, coloured pyrogranite building decoration elements, which during the following decades appeared on practically all new or restored public buildings in the Carpathian basin. During the 1890s, Vilmos Zsolnay developed a coating called "eosin" with a metallic shine in various colours and forms with the cooperation of technical university professor **Vince Wartha**. Objects prepared using this technology achieved great success at the Paris world exposition in 1900.

In 2010, Pécs was one of Europe's cultural capitals. On this occasion, a cultural centre was built in the city, called the Zsolnay Quarter. This is where the Gyugyi-collection was placed. Electric engineer **László Gyugyi** was an inventor and has been living in the United States from 1956 on. His collection of several hundred artefacts, mainly old Zsolnay masterpieces became a centre-piece of this exhibition, hence they returned to become public treasure at the very place where they were created.

herend.com, www.zsolnay.hu

A world constructed

Ödön Lechner created Hungarian standards in architecture using motives of Hungarian folk art. His monumental buildings (city hall, museum, church, institute of sciences, bank building, etc.) were built at the turn of the 19th century and in the early 20th century. Coloured pyrogranite covering materials are characteristic external features, but we need to know that Lechner designed his own buildings from bottom up, from early drafts and architectural plans to window and door placement and applied fittings and accessories. His works represent lasting values.

Károly Kós and his associates used Transylvanian folk architectural elements and integrated them into their own 20th century architectural schemes. Significant works that they created are stand-out architectural masterpieces even by today's standards: churches (Zebegény, Kolozsvár), Szekler National Museum (Sepsiszentgyörgy), zoo pavilions (Budapest), school (Budapest, Városmajor). The civil servant officers' and workers' residential complexes that were built approximately a 100 years ago remained practically intact in their original form (Budapest, Civil servants' complex and Wekerle habitat) ensure the feeling of village life in the middle of a city environment.

Engineer **István Menyhárd** designed concrete shell-structure halls in Hungary from the 1940s on. The first such structures were erected in the Csepel Port area and in the Kőbánya beer factory. The bus garage building along Hamzsabégyi road had a main hall that was the world's largest 82-meter span ecliptic, parabolic shaped structure in 1941, cov-

ered by sectional shells that rest on reinforced concrete arches. Today, it is still in everyday use. Several airplane hangars built by Menyhárd had "world-record" spans across.

Marcell Breuer was a student of Bauhaus active in Weimar, then later teacher of the same. His metal tube frame furniture makes him a noted designer. He worked and taught in several countries. His most significant buildings (generally co-designed with other associates) are the UNESCO headquarters in Paris (1953–1958), several new buildings at New York University, IBM's research centre (La Grande, France), and the Whitney Museum (New York City).

Sándor Tarics was a waterpolo player at the 1936 Berlin Olympics, a member of the gold-medal winning national waterpolo team. He was also a student of the Technical University of Budapest, then later an off-campus, private teacher of the same institution. He has lived in the United States since 1949. His planning office designed the foundations (static plans) of more than 700 construction projects. In 1985, he designed the first special, flexible foundation in the US, which was supposed to be earthquake proof.

A trendsetting personality of organic architecture was **Imre Makovecz** who passed away recently. His fame and influence reached far beyond the Carpathian basin. He designed the internationally renowned Hungarian pavilion for the Sevilla World Expo (1992). Several of his churches, public buildings and residential buildings enshrines his mentality and intellectual heritage.

Today, one of the most outstanding Hungarian architects is **Gábor Zoboki** who designed the Palace of the Arts in Budapest and won the International Real Estate Development Standard Award (FIABCI Prix Excellence). Representatives of the city of Shenzhen (China) during their visit in Budapest, asked him to design a building of similar stature (to the Palace of the Arts) for them as well.

<http://eloepiteszet.hu>



The UNESCO headquarters, Marcell Breuer's famous creation

The Hungarian pavilion of the Sevilla World Expo, designed by: Imre Makovecz





Pages of the remaining Corvin books from the time before the Gutenberg galaxy indicate the detailed work and skills of trained illuminators

Cover page of the award winning organic products



Under the spell of letters

Mátyás Hunyadi, King of Hungary (ruled 1458–1490) had a library called Corvina, which was one of Europe’s richest and most famous book collection during the second half of the 15th century with its 2,500 volumes. After the stormy periods of history, today only about 10 per cent of the library’s original stock exists in Hungary and in 15 other countries of the world. Fortunately, thanks to the latest technological achievements, the remaining volumes have become common treasures in Hungary and can be viewed on the Internet as well.

A few books with certain Hungarian aspects:

1473: **András Hess** printed the Buda Chronicles in Buda, which introduced the history of the Hungarians (Chronica Hungarorum), and by doing so Hungary – after Germany, Italy, Switzerland, France and the Netherlands – became the sixth country in Europe, where the printing of books began.

1496: A collection of sermons of a Europe-wide famous Hungarian monk, **Pelbárt Temesvári** was published in Strasbourg, which became a “best-seller” with 20 known editions afterwards.

1499: in the Netherlands the first mathematics book in Latin was published by a Hungarian author **György Magyarországi** who taught there. At the same time, this was the country’s first printed book of this nature, therefore in 1965, it was published again in the Netherlands as a facsimile edition.

In the multiple, ten-language dictionary of **Ambrosius Calepinus** (Lyon, 1585), one of the ten languages was Hungarian.

Printer **Miklós Misztótfalusi Kis** (1650–1702) was active in the Netherlands as he became an internationally recognized master of typography, his characters were used in numerous countries of Europe. He engraved Hebrew, Greek and Armenian letters, he prepared the first printed Georgian ABC, and Cosimo Medici ordered a full supply of print characters from him for his new Florence-based press. Kis was known to create the popular Jansen character type.

Many experimented with the creation of the ball point pen, but no one found a perfect prototype. **László József Bíró** (1899–1985) was the one who, after decades of experimentation, developed the first, functioning ball point pen, thereby ending the era of ink spots. He began his research in Budapest with a few of his associates, later emigrated to Paris and Argentina and continued his work alone. In 1943, he received patent rights for his invention. His name has become practically synonymous with the ball point pen: in English many call it “biro-pen”, in French it is called “biron”.

Nowadays, the ICO writing materials and stationary manufacturing plant (Pomáz, Hungary) has become successful worldwide with its product family called **ICO Green Planet**, which uses environmentally friendly solutions. Most of the parts they use are made of vegetable-based materials, which are readily converted to organic material after they are disposed of. Bio pens, for example, (with the exception of the ball and the spring) totally decompose.

www.corvina.oszk.hu
www.mol.gov.hu

The agricultural sector

In this varied and complex subject area, we try to send a message by addressing only wheat and herbal plants.

Wheat

In accordance with Hungary’s agricultural capabilities, machine-grinding (water mills, wind mills, dry mills) were consistently being used. During the 1870s, one former Executive Director of the Ganz Factory, **András Mechwart** recognized that it is worthwhile to venture into the production of food production equipment as well. He purchased patent rights to the most modern roller system (a grinding equipment used in mills) and using his factory’s well working technologies, he further improved this product and invented the roller system using chilled iron rollers. This product family, which was convertible by using different parts and elements for variable capacity, became one of the most successful product of the Ganz factory and it was sold worldwide.

During the 19th century, **Károly Haggemacher** developed the flat strainer and several semolina cleaning machines in Budapest so that powder products such as flour could be classified and packaged separately.

Also around this time, **Imre Pekár** developed a simple, inexpensive and fast flour classification process, which worldwide spread and still in used today and called in many languages (e.g. in English, French, German, Russian) „pekarling” or „pekar probe”. In 1881, Imre Pekár published his internationally renowned comparative study of wheat and flour products. His book was translated to more than twenty languages. By manufacturing excellent mill industry machines and entire mills, developed grind-

ing capacity, the quality of grinding from 1880 Budapest was the world’s mill industry centre for about 30 years.

At the world wheat exposition (1933) organized in Regina, Canada, the product called “Bánkúti 1201” was selected to be the world’s best wheat product and **László Baross**, breeder of this brand received a gold medal for his achievement.



Advertisement from the Australian Miller, June, 1896.

Herbal plants

Hungary has a thousand year old tradition in the identification, collection, production and use of herbal plants, since the Carpathian basin was always a very richly endowed area for these types of plants.

Even our first coherent Hungarian texts (which were written between the



The famous Bánkúti wheat brand bred by László Baross

12th and 13th centuries) mention several plant varieties and names.

The first botanical work in print that addressed herbal plants in Hungary was the work of **Péter Melius Juhász’s** Herbarium (Book of Herbs), which was published in Kolozsvár (Cluj, Romania) in 1578. **János Lippay** wrote the first Hungarian-language horticultural book titled “Garden of Poson” (1664–1667). This three-volume work contained the description of herbal plants as well in one of its chapters.

Botanical handbooks published in the 20th century introduce several herbal products. Such expert work is the Hungarian Flora In Pictures with the text of **Sándor Jávorka** (Iconographia florae Hungaricae, Budapest, 1934), to which **Vera Csapody** (1890–1985) prepared fine illustrations. She was a mathematics and physics teacher at a girls’ high school, then dean of the same, while she compiled a huge and practically invaluable collection of beautiful plant drawings and left it to generations to come. Her memory is preserved by her 14 or 15 thousand ink drawings and 10 to 12 thousand water colour paintings. She also saved lots of children during the war, which is also part of her legacy.

mek.niif.hu
www.etnofarmakologia.hu

Animal world

To cite some examples, we mention Hungarian horse breeding and the work of two entomologists that brought international significance.

Horses

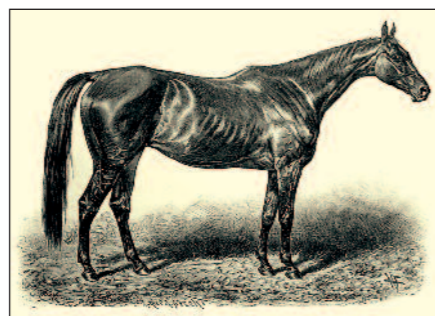
Horses are ancient companions of Hungarians. As nomadic peoples who specialized in agriculture, Hungarians always needed excellent horses as a necessary way to sustain themselves. This has remained unchanged even after settling in the Carpathian basin. But let's not go back that far, instead, let's just examine the recent past.

At the 1878 world exposition in Paris, 20 horses of the Hungarian Royal State Stud Farms (Bábolna, Kiszér, Mezőhegyes, Fogaras) were featured together by putting on a performance show. They have brought such success that judges recommended that the French President award a special prize of a 5 thousand franc value gold medal that was minted for this special occasion. **Ferenc Kozma** (1825–1892) elevated horse breeding in Hungary to world class standards. The success of Hungarian stud farms was repeated at the Paris World Expo of Paris in year 1900.

A separate mention should be made of **Kincsem**, the greatest race horse of all times: the legendary pure bred mare reaped 54 victories in 54 starts between 1876 and 1879. No one has surpassed that feat ever since.

Our lives have changed substantially and because of this transformation, horses need to be used for other new roles such as healthcare, for example. It was discovered that riding horses has outstanding

therapeutic benefits, particularly for children. Naturally, this therapy needs to be applied by employing specially trained people and also specially trained horses. Another sport (and we are not thinking of betting at the track) is horse-back archery, which was rejuvenated by decades of hard work by **Lajos Kassai** who resides in southern Hungary. This sport has become a popular sporting event in many countries, even international competitions are now being organized to promote it.



Kincsem, the wonder horse

“Bug hunters”

Zoltán Kaszab zoologist (1915–1986), a former director of the Museum of Hungarian Natural Sciences, was an internationally renowned specialist of mourning beetles (Tenebrionidae) and bubble or goop dragging bugs (Meloidae). From the 1960s, he travelled to Mongolia 6 times for singlehanded collection expeditions, to this country that was not well known from the standpoint of animal sciences. According to legends, what he collected



Zoltán Kaszab in Mongolia

during the day, he dissected overnight. During his expeditions, he collected roughly half a million bugs, while 200 some scientists took part in dissecting and analysing these. According to one of his colleagues, he ventured to do so much work by himself as an entire research institute.

János Balogh (1913–2002) was a zoologist and ecologist. Between 1963 and 2001, he led UNESCO funded soil zoology expeditions to Africa, South America, Asia, New Guinea, Australia, Oceania, and New Caledonia. His findings and the results of his trips to tropical areas were destined to provide testimonials with respect to nature's current state of affairs. A proof of the large degree of environmental destruction is that 30 per cent of the samples that he collected were



The cover page of János Balogh's biographical book

sourced from rain forests that have been destroyed since. Nature films were made of his journeys that were featured in many countries and he summarized his journeys at length in several books.

He was one of the first scientists who called attention to prevailing threats to our planet, the necessity to observe the laws of ecology and nature, and the protection of our forests, waters, and the air.

www.tbheritage.com
www.nhmus.hu

Shining Stars

One of the most ancient pastimes of people on Earth is that we “stare at the sky”. Our predecessors have known quite a bit about the movement of stars for thousands of years. In the search and acquisition of this knowledge Hungarians always participated.

After completing his studies, **Miksa Hell** (1720–1792) taught at Kolozsvár (Cluj, Romania), then became court astronomer for Maria Teresia in Vienna. As the first director of the university observatory, he began to publish his annual books that were internationally acclaimed. On June 3, 1769, from the northern part of Norway (from where this phenomenon was easy to observe) he, along with his travel companion **János Sajnovics**, studied the passing of Venus in front of the Sun. From the data they gathered, they were able to calculate the Solar Parallax (the distance of the Sun from the Earth) to the degree that was most accurate up until that time. Because of this and other scientific results he produced he was selected to be a member of several scientific associations and societies.

Ferenc Xavér Zách (1754–1832) was a true European persona. He was born in Pest, became a military engineer in Vienna, then taught at the University of Lemberg (Lviv, Ukraine). After this, he spent a few years in London, where next to W. Herschel he took part in the observation of the recently discovered planet, Uranus. He was selected to be a member of the Royal Society. Serving the Prince of Saxon-Gotha, he moved to Gotha. Here, he created the famous observatory on Seeberg, where several significant personalities (e.g., C.F. Gauss) were actively becoming familiar with the fineries of observing the stars.

He organized the first international astronomer congress and in 1800, he

launched and edited the world's first astronomical journal for decades. Later on, he lived in Genoa and Paris.

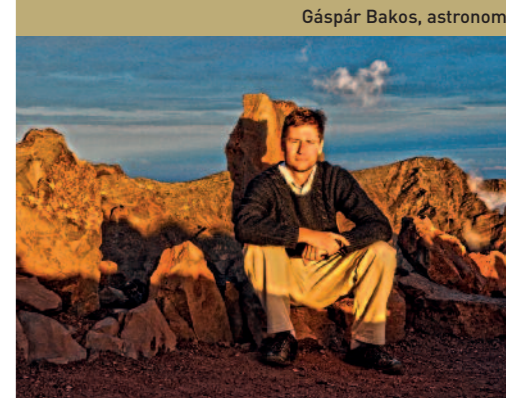
After the second world war, the issue of whether it is possible to create contact with distant space objects (planets) with the help of radar equipments, developed for sensing objects (airplanes) circling near to the Earth. Physicist and university professor **Zoltán Bay** (1900–1992) along with his associates – as pioneers of radar-astronomy – on February 6, 1946, completed successful Moon-reflex experiments sensing reflected radar signs from the Moon. Leading American space researchers preceded them only by days in doing so. The Hungarian scientists, on the other hand, (with less developed tools and technologies) made up for this knowledge gap by developing a new sensory system that was capable of synthesizing the incoming far away signals. This method is still being used. This was the beginning of Hungarian space research.

In the current search for planets (and external planets) outside our solar system Hungarian experts are very resourceful and successful. They use Hungarian-developed and Hungarian-manufactured tools, so-called HAT (Hungarian-made Automated Telescopes). More than a quarter of known extra solar planets (exo-planets) were discovered by them. Since 1974, the American Astronomical Society awards the Newton Lacy Pierce Prize each year to a young astronomer below 36 years of age who demonstrated outstanding achievement in the field of astronomic observation during the past 5 years. In 2011, this prize was awarded to **Gáspár Bakos**, who is the leader of the US-Hungarian HATNet project.

www.konkoly.hu



Miksa Hell, one of the most accurate estimators of the distance between the Earth and the Sun in the 18th century



Gáspár Bakos, astronomer

Let's understand each other!

The beauty, rich variety, uniqueness and special characteristics of the Hungarian language have captivated several experts – from the linguistic genius Cardinal Mezzofanti all the way to Bernard Shaw. We will not go into analysing this in any more detail in this essay. However, what can be deciphered from this fact is that because of our language's uniqueness, we had to prepare dictionaries if we wanted to understand other peoples. What is typical is that Hungarians are generally receptive to the need of others trying to be understood. Two examples for this statement. One is a seldom known fact that Hungarian bank notes have multi-lingual descriptions on them – from the first Hungarian paper money, the Kossuth bank note (1848) through paper banknotes used at the time of the Austro-Hungarian Compromise (1867) all the way to those that were used up until 1946. The other is that Béla Vikár – using phonographs to record folk songs for the first time in Europe (in 1896) in addition to recording Hungarian folk songs, he also recorded Slovakian, Romanian, and Slovenian folk music as well.

A few peculiar developments in our dictionary making efforts

József Károly Habsburg crown prince (1833–1905) wrote a book about the gypsies, prepared the first Gypsy-Hungarian dictionary and for the first time in Europe, prepared a book on gypsy grammar. Perhaps it is excusable that we take a leap in time and denote that today's Hungary initiated the development of a European Roma strategy (maintaining that since this is a European issue, there has to be a European

strategy in tackling it). Also, Hungary was the first nation in Europe to send a Roma representative to Brussels to the European Parliament.

A new scientific field at the time of the birth and unfolding of space research was that a Hungarian poet and linguist who lives in United States, **Adam Makkai**, discovered that even language experts assign different meanings to various words and expressions. For this reason, he published in English the first space age “Webster's” dictionary under the title Dictionary of Space English (1973). Since he was a poet, he, along with his associates, created a comprehensive collection of Hungarian poetry in English for the English-speaking world. This anthology was called “In Quest of the Miracle Stag: The Poetry of Hungary” (1996).

Several Hungarian Jesuit missionaries in China worked on the completion of a Chinese-Hungarian and Hungarian-Chinese dictionary. Ultimately, **Tibor Vajda** compiled and published one from the available literature. The Chinese-Hungarian part's manuscript was prepared but never published. The 10-volume Hungarian-Chinese dictionary was first published in 1993 in Taiwan.

One of our contemporaries, **Gyula Paczolay**, was active in the international comparative analysis of proverbs. As a result of his research, his work, “European Proverbs in 55 languages with equivalents in Arabic, Persian, Sanskrit, Chinese and Japanese” was published (Veszprém, 1997).

On another level, and in a different form, the goal of mutual interaction and understanding was served by **Árpád Bogsch** (1919–2004) who was Director

of the World Intellectual Property Organization (WIPO) in Geneva. This purpose is being served by **Katalin Bogyay** who became Hungary's permanent representative to UNESCO after her extraordinarily successful years in London to promote cultural cooperation. She was elected President of UNESCO's 36th general session (assembly) for a two-year period in 2011. Similar honour was assigned to **Gabriella Vukovich**, ex-President of the Central Statistical Office who was elected President of the Statistical Committee of the United Nations for a two-year period from February 2012.

The Club of Hungarian Speaking Ambassadors lends a unique dash of colour to the international diplomatic life of Budapest. Despite the natural alternating of personalities being members of this club, there is always an excellent team there. The former British Ambassador, later professor at Oxford, Sir Bryan Cartledge particularly honoured us, Hungarians, by learning our language. But he did even more than that, he devoted a book to our history entitled “The Will to Survive – A History of Hungary” (Timewell Press Ltd. UK, 2006). **John Lukacs** wrote a preambule to the Hungarian edition (2008) as follows:

“...perhaps it is not an exaggeration to claim on my part that of all the history books written on Hungary by foreign experts, Cartledge's work is hitherto the best.” We can only thank the author that he devoted his time and lived through our long “journey” with his soul.

mek.oszk.hu

Hungary was

Europe's sixth country

Ad uenerandum dñm Ladizlaū prepositū ecclesie buden: pthonorariū apostolicū: necnon uicecācellariū serenissimi regis Matthei cronica hūgaroz Andree prefatio.

Quoniam in superiori tempore uenerande dñe in latio uersarere: uiderēq; quāto emolumento ac decori hoīm generi hī uiri forēt: q; magno pstantes ingēio suā diuinā industriā comprēmēdis libris adhibebant: placuit mihi tam dignū tamq; excellens studiū mea pro uirih capessere: ut siquid demū assequi possem: id non in meam dūtaxat: uerū etiam pluriū mortaliū utilitatē conuerterē. **V**nde cū dei benignitate p uoto meo aliquātis per profecissem: & ob id rei ad inclytum hungarie regnū tua gratia accerlitus uenirem: effemq; nō parum ociosus: sulcepti labore ingentem diezq; plenū: imprimendi uidelicet cronicū pānonie opus: laborē in quā: quē omnibus hungaris gratū atq; iocundū fore putauī: quādoquidem: ut quisq; natale solum unice diligit: reliquisq; orbis terrarum partibus longe antepōnit: ita & suos: qualem uitam egerint: quicq; uernaticus scire plurimū exoptat: ut siqua preclara: memoratuq; digna cōspexerit: imitari debeat. siqua uero minus feliciter gesta compererit doctus precauere possit. **S**ed cum animaduertērem: & diu mecum ipse uolūtare: cui meam primam in hoc sedulitatē pluribus diebus lucubratā dirigerē: te preter domine mi obseruandissime inuenio neminē. **Q**uipe & tu de me optie meritis es: & sine te suscepi labor neq; imiri: neq; expleri potuisset. **A**ccipe itaq; hoc munusculum nostrum iure quodam tue excellentie dedicādū: ut q; uidelicet potissima laboris causa extitisti: ipsius quoq; operis particeps esse debeas. **E**t siqua indies maiora excudemus: tuo etiā illustri nomini dedicanda putabimus.

Incipit prima pars cronicę de origine hūgaroz: de descensu de scitia in pānomiam: de bellis cōtra diuerlas natiōes habitis: ac de expulsionē eorū dē & re litu in scitiā.

The Buda Chronicles of András Hess, 1473

1473

begun.

where book publishing