Tamás Roska (1940 – 2014)

"The death of Tamás Roska, a Bolyai and Széchenyi Laurate fellow academician, is a remediless, irrecoverable loss of Hungarian science" – declared the President of the Hungarian Academy of Sciences.

Less than four years ago, in September 2010, we celebrated his 70th birthday[1]. At that time nobody could have believed that today we are coming as shocked pilgrims to our National Graveyard to his coffin, to say farewell to his mortal remains and to pray: *"Angels of the Lord, receive his soul, present him to the Most High. And let perpetual light shine upon him."*

Tamás was a precious gift of God for us and for many.

(Tamás as a student)

His high school class of 1958, at the Gimnázium in Ózd, recalls him as a foil fencer, music-lover, excelling in mathematics and physics, a many-sided personality, "a role model for all"[2]. It was a class of excellence. Today three classmates are member of the Hungarian Academy of Sciences and honorary citizens of the town.

As a university student he was always curious and enthusiastic. He was interested in everything of intellectual beauty. He enjoyed his studies, the discovery of the world. His devotion to mathematics and his enthusiastic interest in understanding the secrets of nature were exceptional. He eagerly wanted to understand everything. For his professors and colleagues he was a precious gift, and now his departure is an irrecoverable loss, indeed.

(Tamás as a young scientist)

And if you asked those who had the luck to become his colleague during his fifty-years long carrier, at the industrial research Institutes of Measuring Instruments and Telecommunications, or later at SzTAKI of the Hungarian Academy of Sciences, how do they remember of Tamás, most of them would say: He was

[1] 70th Birthday of Tamás Roska (In Hungarian) PPKE ITK és MTA SZTAKI, 2010
[2] 70th Birthday of Tamás Roska (In Hungarian) PPKE ITK és MTA SZTAKI, 2010

exceptionally intelligent, bright and talented, he was a great scientist, but first of all, he was an extraordinary human being. He radiated optimism and kindness wherever he went. He has been a gift, and now his departure is a remediless loss.

As a young researcher he became engaged with Circuit Theory, the „Queen" of Electrical Engineering, bridging physics i.e. describing the order in real nature, to mathematical models of the creative designer. Logic and mathematics takes care of the correctness of the mind.

The challenge of 1960´s and 70´s was to create better and better von Neumann type binary universes in crystals (in a „chip"), i.e. to lay down the principles of design for very large scale circuits applied in computing, control and communication.

Based on his experience in Computer Aided Design of the chip he posed fundamental questions. Why did not interconnected physical devices behave as their mathematical models composed of the validated device models? What are the fundamental limits of the physical design of our complex models? What are the lessons we could learn from studies of biological information processing? What does neurobiology and brain research teach to the engineering designer? What are the consequences of the limits explored by Gödel and discovered by quantum physics?

He was curious and looked at these fundamental questions with great interest. Neuroscientists joined him in his meditations.

(Tamás Roska, one of the best known Hungarian in engineering science)

And when in the late 1980´s the National Science Foundation (NSF) reopened the possibility to start joint MTA–NSF research projects, his joint proposal with UC Berkeley was among the first welcome and fruitful initiatives[3] [4].

[3] T. Roska, L.O. Chua, The CNN Universal Machine: an analogic array computer, IEEE Trans. CAS-II, 40, pp. 163 – 173, March, 1993

[4] L.O. Chua, T. Roska, Cellular neural networks and visual computing – Foundations and Applications, Cambridge University Press, 2002

Young researchers in Hungary and all over the world became motivated by the new paradigm, and Tamás became the best known Hungarian scientist in the global community of the IEEE Circuits and Systems Society. In 2013 the Society recognized him by the prestigious Mac Van Valkenburg Award.

For the honoring invitations to take full time jobs at leading academic institutions abroad, his humble answer was “I know – he said – ´that science has no homeland, but a scientist must have one´”. And he stayed at home, in Hungary.

(Roska Tamás and the University)

He became one of the mentors of many talented young researchers. In the late 1980´s he organized a doctoral school at SzTAKI. In 1992 he assisted the University of Veszprém to launch a Department for Engineering Informatics, and later in 1998 he accepted the invitation of the Rector of the Pázmány Péter Catholic University to establish an Engineering Faculty (University Department) focusing on Information Technology. The Mission Statement declares that the program will be “human-centered and nature-inspired”. It will integrate the field of electrical engineering and information technology with certain areas of life-sciences.

Five research institutes of the Hungarian Academy of Sciences and the Clinics of the Semmelweis University have contributed to the new engineering program.

The Director of the Research Institute for Experimental Medicine has become the chair of our Neuroscince Department. I quote him “I have met very few visionaries like Tamás. The air is always vibrates around him”.

Indeed, new ideas and new initiatives have emerged continuously, and the air is “vibrating”, because one of the great challenges of the 21st century is on the agenda of the new Faculty.

First time in the history of technology it has become feasible to build “hybrids” composed of living organisms and machines.

We know, the new technology should be “human centered”. Reliable knowledge, responsible and truthful personalities are needed in research and also in applications.

Reliable knowledge about nature is needed, deeply down to the atomic and subatomic level. Also reliable knowledge is needed about our artificial environment, about our machines.

But we need to know more about the „human being" as well. "Who is man?" Tamás was convinced that three dimensions of "truth" together could bring us closer to understand man.

I quote him: "Today we intend to believe that something is true if and only if natural sciences prove it to be *true*. I do not think so. If you listen to the Requiem of Mozart, you know it is *true.* Or if you read a poem of Arany János[5], or you look at a painting of Munkácsy Mihály[6], you know they are *true*. If we saw a family nurturing noble values, we know this family is *true*."

The *truth* of science, the *truth* of art and the *truth of faith* together are able to bring us closer to understand the *"world of man".*

His notion of the three-dimensional truth has evolved in his charming and "multidisciplinary family", founded almost half a century ago by Zsuzsa, a brilliant concert pianist and Tamás. Noble values are nurtured a harmonic unity of science, art and faith in their everyday experience. At home he has been surrounded by inspired actors of the art of music, the art of painting, theology, medicine, neuroscience and philosophy. „I am grateful to all of them" – he wrote.

(Tamás the role model)

The motto of the Faculty of Information Technology and Bionics – as he suggested – is "Fides et Ratio". He referred many times to the first sentences of Encyclical Letter of John Paul II: "Faith and reason are like two wings on which the human spirit rises to the contemplation of truth".

For Tamás the reasonable faith did not start where reason stopped, but when reason was lost in wonder – when we met miracles. "And these miracles are in our hearts and also in nature" – he said.

[5] János Arany (1817-1882)- great Hungarian poet.
[6] Mihály Munkácsy (1844-1900) – great Hungarian painter.

„It has been difficult for me to understand the turbulences of our world without a compass. For me this compass is the teaching of the *Bible* about man. I have lived to see some of the fundamental truth of the Gospel like the proof of a theorem"[7].

May it be that this was the source of his serenity, his glance radiating hope and source of his deep joy? During his earthly carrier he was a happy personality among us. He shared his happiness with his family, with his friends and colleagues, and with his students.

Tamás lived among us as the man of hope. His message was "*Sing with your mind"*

It is good to see, that his radiating personality has become a role model for many young talents. It is good, because nowadays real knowledge, responsible personality, truthfulness, fidelity and diligent labor have become like a glass of water in a desert.

It is good to see that his noble values are appreciated by more and more young men and women. Let they become the sign of hope. „Let they sing with their minds". Let they serve the family of man, the culture of life.

Tamás has been a precious gift of God for many. Let us give Him thanks and praise.
Requiem aeternam dona ei, Domine. Et lux perpetua luceat ei. Amen

12th July, 2014

Árpád Csurgay

[7] Tamás Roska, Sing with Your Mind (In Hungarian), Kariosz Kiadó, 2009