

Driving the Future  
Interviews with successful young talents

## GÉNIUSZ BOOKS

Géniusz Library contains volumes published under Magyar Géniusz Program co-ordinated by the Association of Hungarian Talent Support Organizations. The series is designed to provide extensive and comprehensive assistance and guidance to professionals and helpers active in talent support.

# DRIVING THE FUTURE

## Interviews with successful young talents



Association of Hungarian Talent Support Organizations, 2015

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# Foreword

Dear Reader,

This book presents twelve young women and men who have been discovered by, or have participated in the programmes of, the Association of Hungarian Talent Support Organizations (Magyar Tehetségsegítő Szervezetek Szövetsége, MATEHETSZ). We have been able to contribute to the development of their talent in a brief period of their life. We are proud of all of them, and we are proud of all of the 25 thousand youths who have joined the Talent Bridges Programme, as well as the other tens of thousands of gifted students who have attended the events of the Talent Points since MATEHETSZ and the network helping gifted young people was called to life.

The dozens of YouTube videos submitted following our call, as well as the interviews published on the websites and in publications of the Talent Points have shown just how many talented young people deserve the attention of their peers even in their teens. Coordinated by MATEHETSZ and using support from the European Union, the Talent Bridges Programme was set up for them, seeking to provide as many opportunities as possible in Hungary, Europe, and beyond.

Our volume contains twelve interviews. We selected a dozen from thousands of gifted young people, who serve as an example in one way or another, through their talent, diligence and calling. Special and exceptionally mature, the individuals in this book reveal some surprising turns and often an embarrassing sense of purpose. This introduction seeks to call the reader's attention to what goes beyond individual stories: the formative power of the network of talents, the Talent Points. They have immense significance in providing positive feedback, offering new directions and opportunities, and granting financial support or personal mentoring that can determine entire careers. The careers of these gifted young people afford sufficient perspective and inspiration to assess the significance of EU-supported programmes.

*Péter Bajor*  
President of MATEHETSZ





## 1. THE FORCE OF EXAMPLE

*(Tamás Jászay)*

### **Simple things can change our lives: An interview with inventor Balázs Zsombori.**

Less than a year elapsed between the idea and its realisation: PictoVerb, an application for tablets and smartphones developed by 18-year-old Balázs Zsombori, already the winner of several Hungarian and foreign awards, helps those with impaired speech find a voice. Balázs's dream to make the product accessible to all is not far from becoming reality.

*We'll talk about the technical and IT aspects of your chosen field later, but what interests me above all is the strong emotional and human motivation. What made you become involved in this field?*

I've come into contact with disabled people since my childhood. I had real sympathy for their situation, and saw how they were just as capable of anything as members of the majority in society; it's just that the world needs to adjust to them a little. I don't like the expressions "disabled" or "handicapped": they stigmatise and exclude, assuming some kind of condition of reduced value which isn't correct. It particularly bothers me when I hear members of my own age group carelessly throwing about hurtful phrases which refuse to accept anyone different.

*There are numerous possible areas for research in this field, so what made you choose communications?*

Because I saw there are many among us who cannot speak, and they can't even answer back when someone bothers them. Even when I witnessed something like this, I didn't really know what to do: violence obviously achieves nothing,

besides which it's my experience that when I've stood up for what I think is right, no one has sided with me. This is how the idea came to me of building a bridge between those who are impaired in speech and those who are not. It might seem a banal example, but still I think it's important that everyone should be equally able to ask for a kilo of bread in the shop.

*How did you begin the research?*

Everything started in December 2012: at family gatherings I heard a lot about a pleasant acquaintance, who completely lost his voice after a throat operation and, for years, was unable to communicate with the outside world. When the idea first came to me I didn't have a tablet and didn't even know how to program one. I explained my plan to my form master and IT teacher **Gábor Czigléczy**, who encouraged me and advised me which path to take. He helped me master the basics and from then on I continually developed the idea at home, often making use of information available on the internet.

*Who helped you move to the next stage?*

I'm hugely grateful to the Hungarian Association for Innovation (MISZ). I think their National Youth Competition for Science and Innovation is wonderful as there's no fixed theme, giving every entrant room for creativity and providing exceptional mentoring support in the meantime. The competition takes place over two rounds: after someone reaches the second round based on a decision of the 20-member jury, two jury members are assigned to each competitor who can be consulted on a number of occasions. These consultations take place individually or in small groups: with the latter, it was a great experience to be able to get to know young people with similar interests for the first time in my life, who wanted to achieve something. At these consultations everyone presents their own work, then gets ideas and suggestions on how to develop it further, then finally has to submit their complete competition project for a renewed assessment by the full jury. The top three get the chance to participate in the European Union Contest for Young Scientists (EUCYS), held last year in Prague, but prior to this the mentoring process continued, or began again, over the whole summer.

*How did the Hungarian and international competitions differ?*

The jury process was more concentrated in Prague: every contestant was visited by six jury members, to whom we presented our projects in the course of individual half-hour interviews. And of course it was also different in size, since there were 126 competitors from 37 countries present. A month after the EUCYS in September, where I received a bronze medal, an invitation to Brussels came from the European Research and Development Commission, where I was able to talk about my topic in front of 250 scientists and researchers, as well as EU legislators. These are extraordinarily inspiring forums: the participants' enthusiasm, seriousness and commitment to their fields gives you a lot of strength. In both Prague and Brussels I sensed that the organisers were searching for role models which they can present before other young people. After the Brussels conference a lot of people came to me to inquire about the details, and I was able to establish numerous contacts with both experienced researchers and those at the beginning of their careers. When I got home, there were letters waiting for me which helped determine the future direction of the research. I agreed with everyone that once I had developed the product we would get in touch, and they would subsequently help to introduce and distribute it.

*What kind of feedback did you receive in Hungary?*

In Hungary I'm supported by MISZ and MATEHETSZ (the Association of Hungarian Talent Support Organisations). In the course of development I can build a lot on the experiences of my examiners, while relying on the advice of my teachers and mentors. I've applied to the Budapest University of Technology and Economics to study computer engineering. I'd like to improve my knowledge to a very high level to be able to turn the limitless possibilities of information science to noble goals.

*How much of a creative or innovative tendency exists in your family?*

A secure family background is really essential to me: I live in a family of several generations of intellectuals. At home they always believed in me, and so I came to believe in myself. My creativity was given free range from a very early age: at the age of six I received a soldering iron from my parents, and at the age of eight my brother and I took apart and fixed the washing machine together. In my ex-

perience, many of my contemporaries are capable, but if self-confidence, a good example or belief in hard work is lacking, then they won't progress.

*Where are you from?*

I'm from Pécel, where I went to primary school in a class specialising in English, but I was always interested in all technical things.

*How did you enter the Neumann János Secondary School for Computer Science?*

I wanted to get deeper into information technology and this is the best institution for this, since we learn everything here to a very high standard. Besides my form master Mr. Czegléczky, I'm also very grateful to teacher Katalin Oláh.

*You teach language to foreigners. How did that idea come about?*

Completely by accident: two years ago I passed my advanced-level English examination, and when preparing for it I came across a "language exchange" website where anyone can fill in which language they'd like to learn, and which language they can teach in return. I've met several of my English conversation partners in the flesh, but mainly we keep in touch on Skype. Many are enthusiastic about the idea of learning Hungarian but then lose interest, although there are some who stick it out. We don't follow a fixed "syllabus" but place the emphasis on speaking.

*For me PictoVerb is like a dictionary with pictures, which are spoken by pre-recorded voices. How well does this description fit the program?*

There are no recorded voices: I enter text into speech-synthesis engines, which then generate the complete speech which appears to be a live voice. In the programme I did my best to gather expressions necessary in everyday life, the things everyone needs to say. PictoVerb has three levels. On the first, users confined to sickbeds are able to express their elementary needs and feelings. The second level features thematic groups, where I gathered phrases for situations from meals to washing, from using tools to leisure time activities. I wouldn't say

that it's like a dictionary, since a sentence can also be assembled from a combination of pictures; for example when I want two glasses of water, or when girls can decide whether they want to wear a skirt with red checks or blue stripes. At the third level users can freely type in anything they want, thus permitting informal communication. The program can also notice head and eye movements, allowing it to be used by those who are unable to use the touch screen.

*During the development process did you contact members of the target group? How did you get to meet them?*

I get to know a lot of affected families as they look me up after hearing about PictoVerb. I then get on a train or bus and take a tablet to them so that they can try it out. It really moves me when after years of silence – or even for the first time in their lives – someone “speaks” with the help of PictoVerb, and this is what motivates me to continue. I imagine a future where there are no groups cut off from each other, where a person described today as disabled can lead a life like anyone else. This invention consciously reduces stigma, since the fact that the application can be accessed on mobile devices and speaks in a natural voice helps to achieve integration.

*How direct was the path to success?*

I didn't seek a target group to fit the technology after the event, but *vice versa*: in the meantime I continuously tested the program on future users, and was able to progress further based on their feedback. I'll simplify the user platform until anyone can use it. The results are encouraging here, too: my youngest tester is two years old, while the oldest 85 years old, and every one of them has handled PictoVerb equally effectively.

*How long did this all take?*

I was already planning its implementation in January 2013 and developing from March, to submit it for the MISZ competition in May; in other words, it was finished in about two months. Then came the summer, and my family dragged me off for a break. During term-time I'm doing my schoolwork during the day, but the rest of the time I'm busy with this. I was never able to finish

things well by a fixed date, and for this reason I didn't enter competitions like this: I like to do a thorough job, and reach the solution paying attention to every detail.

*How did you end up in Stockholm at the Nobel Prize ceremony?*

MISZ responded to the “Határtalan lehetőség” (Limitless Possibilities) invitation from MATEHETSZ, which generously supported my trip to Sweden. In the 1970s, the Nobel Foundation established a seminar to motivate Swedish secondary-school pupils to engage in science and innovation in the greatest numbers possible. Following a preliminary selection process, 25 young people were invited from all around the world, and it was a special honour for eight of us to be chosen on site to give lectures on our fields before students of the Royal Institute of Technology. We visited the Karolinska Institute, the Swedish medical university, as well as the Nobel Museum. There was an exciting seminar on scientific ethics, where under the moderation of two professors we had to discuss the ethical dimensions of research. It was a hugely enjoyable experience to take part in the Nobel Prize-giving ceremony, and to have the chance to speak with Nobel Prize-winning scientists at a special banquet following the event. It was a special pleasure to hear several of them emphasise their earlier experiences in Hungary.

*How much longer will you work on PictoVerb?*

My conscience will be clear when families which need this product will be able to buy it at an affordable price worldwide. I have other, similar ideas, for example a computer browsing program I wrote some years ago which simplifies internet use: with its assistance, those so far excluded will be able to spend their whole day hanging out online. If we can simplify the world, then we'll be able to accommodate the widest range of capabilities and needs.

## 2. REACHING OUT TO EACH OTHER AND MUSIC

*(Lilla Proics)*

**Zsófia Mohai is completing her oboe studies in Pécs while winning one competition after another in Hungary and abroad. An interview.**

Zsófia Mohai started learning to play the oboe in 2007. Since then she has successfully participated in numerous competitions. She won first prize in 2013 at the 8<sup>th</sup> International Music Competition “The Muse” on the island of Santorini in Greece, which she attended with the help of the “Boundless Opportunities” grant scheme of the Talent Bridges Programme. In February 2014 she took first place at the 7<sup>th</sup> National Chamber Music Competition in Szeged.

*What are your first memories of music?*

When I was little, mummy used to sing to us a lot. First nursery rhymes, later folk songs. And we'd listen to a lot of classical music, which she had come to enjoy as a child. She used to play the clarinet but had really wanted to play the oboe, which was why we listened to a lot of oboe music. And every Christmas our grandparents would give us toy instruments which my brothers and I would use to make a terrible racket!

*What are the specific characteristics of the oboe you too were taken by?*

The oboe is an almost overly emotional instrument. For instance, when an instrument is sounded in a romantic moment in a film, it's bound to be an oboe. The reason why we associate emotions with it is because its range is the closest to the human voice. The other reason is perhaps because the reed makes it so flexible to play that the sound comes alive, which of course is true for other reed instruments, too. True, though, it takes a while to learn to play really emotionally. It even takes a lot of practice to keep it from sounding like bagpipes!





*When you first started to play, did you practice a lot straight away?*

No, I gradually worked my way there at the age of nine, having done a year on the recorder and solfège. First quarter of an hour daily, then half an hour, but then Mummy had me practise every day. Then as requirements became tougher, increasingly I practised more.

*Did you have to learn to play the recorder?*

Yes, it's part of the music schools' curriculum, but it doesn't matter as it's a very rewarding instrument to learn. Which is a good thing, since very difficult tasks can easily put children off.

*You've moved on from the music school to studying music at the Pécs Vocational and Grammar School of Art. What is instrumental education like there?*

Every student has his or her individual syllabus as not all students are at the same level. My tutor, **Melinda Kothencz**, taught me the oboe almost from the start, after my second year at music school.

*Do you know in advance what you'll be doing in any given period, what you'll be practising for and for what deadline?*

Yes, I know what etudes, scales and pieces we'll be working on, because every month we discuss the schedule, where I need to get to and what I need to work on. Then we try to keep ourselves to the schedule. In this system it's important to have an awareness of music history, so my studies span several periods. I play Baroque, Classical, Romantic and contemporary works. It's really developing my understanding of music history.

*Do you have a favourite period?*

The Baroque. That's partly my tutor's influence as her enthusiasm for Baroque music is contagious. And it's hard to resist, being the passionate music that it is.

*Which contemporary composers have you played?*

Bartók. And we're about to receive Lajos Huszár's autograph manuscript, *Summer Triptych* for oboe and piano, which will be the next piece I'll be learning. This is going to be an interesting task as the work was written in the year I was born.

*When learning a new piece, do you start by listening to it first, if that's possible?*

If I'm unfamiliar with the piece, I usually look it up. If I've heard it before, I try and develop my own way of playing it. My tutor helps me of course and we work out what to do with it. But it'll have a different "charge" in every concert, because the moment is crucial and I like to put myself into the music. After a while everyone tries to put themselves into the music, which is why performances of the same piece are so different. We're not all the same and have different feelings.

*How much have you changed as a performer since the outset?*

Obviously I've become more mature. Ms Kothencz says I'm really good at picking up the mood of a piece, perhaps more so than other music students. I know I'm very interested in what we're doing. I'm usually good at spotting musical idioms which are characteristic and recognisable for each period.

*How can you perfect your musical skills?*

Oboist **László Hadady** wrote me a note when I asked for his autograph, suggesting I should practise with ease: with my mind, ear and heart. And it's true; I do need to pay attention to lots of detail to be able to move on. Of course, I'm not always able to pay attention. Often it transpires I haven't learnt the connections or rhythms well – which Ms Kothencz spots straight away – and then I know I haven't paid proper attention while practising. Of course I try to correct these mistakes afterwards.

*My guess is that in a musical family like yours nobody is bothered by your practising.*

No, in fact since my younger sister started to play the oboe she practises at home and the others put up with it – it's not like they have any other option! Otherwise we often play just for fun, either on harmonisations found online, or just any old how.

*Do you ever find practising a drag?*

There are always low points. Several times a year I feel practising is the last thing I need. Then I try and think in practical terms and consider that in the long run regular practising pays off, and it's considerably more difficult to pick up again having skipped two or three days in a row. When I'm not in the mood, I play maybe quarter of an hour at least, just so I can claim to have done something to keep up my level.

*Which bit of practising could you live without?*

Playing scales, if I didn't know how important they really were. Otherwise I don't have to play pieces I don't like playing. And that's not a privilege; it's just that I can't play pieces well enough when I don't like them. On the other hand, I'm better when playing pieces I like. Which is not really surprising.

*Why do you need to do scales?*

It's about warming up and tuning in. You couldn't really play with ease and consistency without it. When practising specific passages in scales, I later simply insert them into the piece, so in that respect it is not wasted time.

*What is the most taxing thing about your instrument?*

The air support. Pieces are divided into musical phrases which don't necessarily correspond with your physical needs. I find it very difficult to cope with the breathing in some pieces. I mean I need to make a special effort not to lose intensity. Otherwise there are breathing exercises intended to improve this,

but playing the piece over a few times is in itself usually helpful in developing stamina.

*In terms of methodology, in what way have your lessons evolved since you started learning the instrument?*

When I was younger, every now and then my teacher used to show me how to play this or that – on the instrument, singing it or tapping the beat. Later she'd let me get on with it myself.

*To what extent do you become aware of any mistakes or imperfections you make, if any?*

I know just what Ms Kothencz will say, like for instance if I didn't get the musical arch right. So I do notice. A mistake you don't notice yourself, no matter how well the listener describes it to you, is considerably more difficult to correct. And I also know that if I get things right, Ms Kothencz will say so. I unconditionally accept what she says because it corresponds to what I myself know even before she says it. However, my trust in her isn't just based on her musical knowledge, but also evolved through our personal relationship which has contributed to my development at least as much as her professionalism.

*Is there anything you struggle with in particular?*

At the start I got my right-hand position wrong, which we've been correcting for a while and which requires permanent extra attention. I can't see an end to this process; I mean when I'll have managed to retrain my right hand – which, by the way, means just a few millimetres for each movement. Currently, I have most room for improvement in staccato playing, which requires harmonisation of tongue articulation, air support and finger movement.

*This does not prevent you from winning one competition after the other. What are your strengths apart from practising and your current technical skills?*

I think I'm good in competitions because the excitement brings out my best, and I'm probably even better than when I'm just practising.

*What do the competition jury look out for?*

They're looking for musicality, technical skills, stage disposition and the way we interpret the music. Ms Kothencz always says it's not the placing that counts. All it means is that there and then the jury made the decision it did, which isn't the end of the world. I can't say I'm not happy with success, but much more important is the preparation period which involves a lot of practise and lots of concerts.

*What's good about a competition? Are good assessments a cause for joy?*

Not only that. It's also about the strict preparation period which is extremely useful. Also, listening to others at international competitions is very educational.

*Do specific regions have their own characteristic oboe-playing styles?*

There are some features, mostly typical of the French, like light and ornate playing, or the German, with their fuller sonority and performance style, but outstandingly good oboists, as well as mediocre ones, can be found everywhere.

*I guess then that it is up to the individual player to develop his or her individual style.*

Exactly. And we learn to make our own reeds, although Ms Kothencz still makes mine, because they need to be made very accurately and you really need to know how wide it needs to be and where to clip bits off. We have weekly classes of instrument studies where, among other things, we deal with instrument repairs.

*How often do you need to change reeds?*

Sometimes a reed will still work months after it's been blown in, but sometimes it will become blown out in a few weeks. You become aware of it first, and soon you get audibly poor vibration.

*How long does an instrument last?*

Ages when you keep it properly maintained. Oboes are made of ebony or rosewood. The key mechanisms will wear, but can be repaired and replaced from time to time, and the instrument will last a very long time when properly looked after.

*Obviously a lot depends on the quality of a subtle instrument like this. What kind of oboe do you play?*

Currently I play an oboe loaned to me by the school, which was refurbished with support from the Pécs Rotary Club. In the past year or two Ms Kothencz has written dozens of applications for funding, some of which were successful. As a result, and with the help of many generous donations, we just recently managed to buy a professional instrument. True, it is a second-hand oboe, but it's new to me, and I'm extremely happy to have my own oboe.

*You mentioned you were about to learn a work with piano accompaniment. My guess is this isn't your first.*

I've been playing with an accompanist since the age of nine. That's how we play in concerts and exams. Since last year I've been playing a lot with a pianist classmate of mine, Kármén Stephany Boateng, who accompanied me in the Santorini competition in September, where I won first prize and she received the piano accompanists' prize.

*Obviously it's more complicated to play together with others than in solo. How do you prepare?*

After we've prepared our own parts individually, we rehearse a lot together and see how we can reach out to each other and the music, because there's certainly a lot to pay attention to. For me, it's about the timbre compared to the others, and with time one learns how to catch up with the others or find one's way back. Last week, for instance, we won a special prize at the Szeged Chamber Music Competition as an ensemble of flute, oboe, bassoon and harpsichord. There, too, we made an real effort to pay careful attention to each other.

*What did you play?*

Telemann's Sonata in A minor. The third movement is my favourite. I adore it.

*Apart from being well-rehearsed, what else does it take to play together "in harmony"?*

Being similar in personality helps. When we feel each other and often think the same. That can be heard in our performance.

*For years now you've been practising day and night. How does music affect you?*

An oboe class with flamboyant music makes my day, and if the music's more melancholic, I become rather sentimental. Nothing else has such profound power over me.





### 3. THE THRILL OF LOOKING IN THE MICROSCOPE

*(Lilla Proics)*

#### **Graphic art and extracellular vesicles: an interview with Viktória Szeifert.**

**Viktória Szeifert**, a pharmacy student at Semmelweis University, has taken part in microbiological research for some years and is currently occupied with extracellular vesicles. She is acting president of the Student Researchers' Movement.

*What did you like to do as a young child?*

I loved to draw. Later, at primary-school age, I started to attend an arts workshop as I found the framework of drawing classes too narrow: I wasn't interested in everything we did there and really had to strain to produce anything worthwhile because of this. This is what made the Railways Art Workshop in Debrecen so liberating, as everyone could engage in whatever stimulated them, choosing the technique they wanted to work with, and this generated a fairly diverse set of works.

*What form of collaboration did the leader of this workshop provide?*

The painter Katalin Kolozsváry observed us and talked to us about the directions we could take in our chosen themes, also helping us out in those cases. In reality, of course, the learning process plays out internally, as we increasingly think about what we're doing. I remember at nursery school how I discovered that when I drew or painted people there was something strange about them and then I realised that the real problem was that they had no neck. While I'd already heard this earlier – they'd obviously told me – it's no accident that I can remember how I came to realise it. Even if they tell me exactly what the prob-

lem is, even if I agree with them in given instances, until I've actively internalised it on its merits I don't know how to handle it.

*How do you develop a sense of taste?*

Through a wealth of feedback which we find both well-founded and truthful. As well as through what you get to learn with time: there are objectively definable systems which we make our own, towards which some internal urge naturally carries us. Clearly it can be fairly difficult to identify the nature of these internal urges, as well as the external stimuli which alter them. Of course this isn't the kind of influence which makes someone give up on their ideas: those who have ideas and plans know well that they have nothing to fear from this, that all it signals is openness and the will to learn. Anyway I haven't had an experience where I created something I found beautiful and others would have said the opposite.

*So a person also develops a sense of taste as an adult.*

The fundamental characteristics perhaps don't change any more; an adult's taste scarcely alters at its roots. But still, it's constantly taking shape.

*To what extent do the dynamics of thinking and intuition of someone engaged in scientific research resemble the development of artistic taste?*

There are numerous similarities, but the proportions – and perhaps the priorities – of learned and applied elements are still different. Although they proceed according to protocols, researchers also have a great need for free and creative thinking, which can be generated by reading professional studies or talking with other researchers – and, I hardly need to say, not only about their own narrow field of specialisation. A good researcher is one able to develop a capacity to utilise such creative energies. I've never thought about whether I might apply my curiosity or capabilities as an artist to my research work, since for the moment I'm still a student who is learning these things, but manual dexterity is undoubtedly also useful in a laboratory.

*When did you first take an interest in biology?*

Initially I took the entrance exam for the Kossuth Lajos Training Secondary School of Debrecen University to study law: this is what I came up with for myself in the 7th grade. At that time my favourite subjects were literature and history – and this didn't change even in the 9th grade, indeed it stayed like this for years, for a while even after I started to attend biology classes in the 10th grade, which really stimulated my interest. We picked a geranium leaf, stripped off its epidermis and looked at it under a microscope. It was indescribably exciting. Then came the dissections, which heightened the experience further. Then one day, when I was talking with a girlfriend about how we could find the queen among a colony of ants, my biology teacher happened to overhear us and immediately said that if I was really interested I should look into it and join the Student Researchers' Movement. I duly applied but for a long time I was quite a passive participant as for a while I was only able to wonder at how things like this worked at all, and I would only read the tender invitations. In the meantime, with the help of my teacher **Dr. Zsolt Krakomperger**, I contacted **Dr. András Tartally**, the ant research specialist at Debrecen University, and I became involved in a population survey in the city's Great Forest. In the spring of 2010, I read an invitation to an international research camp in Croatia on the website of the Student Researchers' Movement, and thought that it had what interested me; what's more, I thought it would be useful to polish up my English, and anyway I still had no specific area of research and would get an insight into a variety of fields.

*And so you applied for this.*

Yes, and after my application and interview succeeded, I was invited to attend the camp. I was looking at the topics – which included microbiology, in which I'd already taken something of an interest – and when at the start of the camp all the project leaders gave informative presentations about what they intended to cover and how, afterwards we chose what we wanted to do and this is how the groups were formed. I joined the team dealing with the diversity of multi-resistant bacteria, where I worked together with two boys, a Croatian and an Estonian. First of all we received a huge amount of text, part of which we had to work through in detail before starting the practical tasks. We divided the topics among ourselves, although we immediately tried to help each other as there were expressions which we only knew in our mother tongue, but among the three of us we worked it out in English.

*How did you then work in practice?*

We spent eight hours a day in the laboratory, in the primary school of the small Croatian village of Višnjan where the school labs were temporarily converted into laboratories suitable for more advanced research. For the duration of the camp appliances needed for microbiological research were taken there: centrifuges, an apparatus for gel electrophoresis, some advanced microscopes and micropipettes. When we started work, we learned a huge amount of the basics and rules in just moments. We planned the experiment step by step, took samples, counted colony numbers, carried out fundamental genetic investigations and so on. In the evenings we had lectures and at the end of the camp we obviously gave an account of what we had accomplished.

*How did you continue your professional studies after the camp?*

As I already knew then that I could search for an expert on the list of mentors of the Student Researchers' Movement who were willing to cooperate with students, and given that, by then, I'd already decided that I'd like to work in microbiology, I sought out **Dr. Judit Szabó** at the Institute of Medical Microbiology at the Medical and Health Science Centre of Debrecen University, who became my supervisor.

*How do you collaborate?*

First and foremost by learning a huge amount from her – to this day it warms my heart to think about how ready she was to help. I carried out a comparative examination of antibiotics on a bacterial strain of Enterococci. I compared a new member of a given family of antibiotics with antibiotics used in medical practice at the time, the effects of which had been least investigated on this particular strain.

*What did you find?*

That this antibiotic is not terribly effective on this strain, while proving very successful against other more common strains. In the end I entered with this topic the 11th National Conference of Scientific Student Circles in 2011, where I won first prize in the Medical Biology section.

*Why do you think someone wants to act as a mentor? Why does a researcher devote attention to something like this when they surely already have enough on their plate?*

They usually say – and this is something they’re frequently asked – that young people are inspiring, and that they raise questions and new angles which refresh their own creativity. Besides which, in the spirit of mutual assistance, it can also be useful for professors who really do have a lot of other things to do in their life as scientists and can’t always be in the lab where the real work is carried out. For this reason it can be helpful if their students following various forms of training take part in the work – permitting wider-ranging research to be conducted in the given field, for example.

*What specific area are you working in now?*

Our laboratory at the Institute of Physiology of Semmelweis University, under the guidance of **Prof. Erzsébet Ligeti**, is investigating neutrophil granulocytes. A couple of years ago they also began examining the antibacterial effects of neutrophil-derived extracellular vesicles. For a while vesicles surrounded by a lipid bilayer have been visible on photographs, but little significance was attributed to them and they were described as no more than “cellular garbage cans”. In the past decade, however, it has been discovered that these have active biological functions, for example in the process of blood coagulation. So they are very active transmitters, e.g. some have written that they transport RNA. Anyway this area of research is still so new that even in specialist publications the terminology is not yet standardised, even though there are many people researching extracellular vesicles. It’s a very nice link that in the field where I began as a 11th-grade secondary-school student I’m now working as a second-year university student, on an entirely new and evolving theme.

*You said that at the international research camp you were in a group with two men. What’s the typical division of genders wherever you’ve attended these scientific forums so far?*

Wherever I’ve been I haven’t noticed that women are in the minority in any field. Among the Student Researchers, but at university, too, at least half of the students in many fields of study are women, but in many places there are even

more women than men. Then as we move upwards towards the doctoral ranks it's apparent that female participation increasingly peters out. I believe that it's desirable to have women present in every career and at every level, and not primarily for reasons of social equality. Not long ago I took part in a workshop, where a technology company had set the express goal of bringing in women in greater numbers. They had discovered when analysing the company's operation that many male employees were thinking in too similar a manner, with a consequent lack of diversity to help move the work forward.

*And yet why do you think women so seldom end up in managing positions?*

In Hungary there's a system of social conventions in which women are primarily expected to carry out the tasks at home necessary for a family to function – presumably this might explain the disproportion. Today I live devoting time to things I consider important, and I think men generally share this approach. I don't know how this changes over time, or for whom. I might add that what I glean from conversations on this topic is that this is primarily a girl's way of looking at things, and this, for example, is why they abandon further education after their BA. Saying that they want to start a family, they give up on pursuing a profession for this reason, and even fail to comprehend why other girls want to devote so much energy to their careers. It's possible that I don't see things clearly, but at the moment my view is that women can work just as well as men while raising a family – though obviously there are temporary periods when they have to spend a lot of time with the children.

*You have other role models, like Dr. Judit Szabó as you mentioned, the associate professor at the Institute of Medical Microbiology in Debrecen, with whom you began research as an 11th-grade secondary-school student.*

Yes, she really set an important example by always treating me as an equal: she offered me opportunities, asked questions and answered them. This was really useful for me because it encouraged me and because of the partnership she offered with this attitude I was able to think responsibly about professional tasks, which is very inspiring for a student. Fortunately, my current lab has a very similar approach and attitude, for which I'm very grateful.

*How much does the way of thinking specific to scientific work impact your life?*

I think it has an impact, but I'd like to be able to live in a way that's even more consistent and planned. I often have Plan A and Plan B, and of course very often it's Plan C which works out, but I think this is very human. Of course I know people who live much better-planned lives than mine, but there are also those who shudder to hear how resolutely consistent I am. Obviously there are many ways to live your life.





## 4. PLAYING WITH THOUGHT

*(Lilla Proics)*

**He's played chess all around the world, and yet he's still barely 15 years old: we spoke with Benjamin Gledura.**

Fifteen-year-old **Benjamin Gledura** has been playing chess competitively for a decade. In various age groups, he has been European Champion in Italy and silver medallist at the World Championship in Brazil, has twice won the European Rapid Youth Championship and finished in 4th place at the U16 Olympiad in China. He is one of the four individual competitors at Hungary's Central Chess School. Before the age of 12, he also won several national competitions in swimming. In 2013 he won the main prize of the National Talent Support Council in the "Felfedezettjeink" (Our Discoveries) competition.

*You play chess and swim competitively, so you have a basis for comparison: why or how do you think chess is a sport?*

I've nothing special to say: chess as an intellectual sport has joined this category; what's more, it's been an Olympic sport for ages. At best I can give a sense of its sporting character: a game lasts four or five hours, which is a challenge both mentally and physically.

*How is your stamina?*

Once I had a match which lasted five and a half hours. Then I got tired. But I think that for me swimming is definitely a good complementary sport – which I've given up competitively in the meantime, by the way, because there's no longer room in my life for the training effort expected at the top level of two sports.

*The fact that you started swimming when only a few years old is perhaps not so unusual, but you also learned to play chess at a fairly early age.*

I was four years old when my Dad taught me how to play, then when still at nursery school I started going to a club with my cousin. Coach Tamás Bódi pretty soon spotted that I picked up chess easily.

*How old were you when you first beat your Dad?*

Five.

*And were you already able to read and write at that time?*

No. What's more, I started competing before I learned to read.

*What interested you about chess then?*

I don't remember, but I have a hunch that I really loved winning. Mind you, that hasn't changed since.

*What's changed in your game since then?*

I see further and further ahead. Tactically my options have also become much broader, as I've learned an awful lot in the meantime.

*How can someone learn chess?*

We spend a lot of time on openings – from the first couple of moves up to various middle games: we study and analyse a huge number of variations. Then we practice these, too.

*Does this mean that you remember all of these?*

Of course. We practice them so we can remember them.

*Approximately how many moves constitute an opening?*

Fifteen to 20. You need to memorize those.

*Does this require some special kind of exercise to improve memory?*

No, your memory develops because of this. But with a little practice an opening does not require too much memory.

*That's what you think. How much can you use this ability at school?*

Obviously I use it, I memorize things easily. Of course I don't know exactly what this means at my age group because I'm taught privately, so since finishing primary school I haven't met kids of my age in a school situation.

*In swimming you obviously competed in your age group – perhaps the rules don't permit otherwise. Did you train with kids of your own age, too?*

Yes, I trained with children of my age, although a little less than they did as I was already playing chess at that time.

*How did you still manage to succeed with less training?*

I can't keep pace with the leaders in swimming any more, for that I'd really need to do an ever-increasing amount of training. A couple of years ago my natural build and explosiveness was still enough to achieve success, as well as the fact that I was a better competitor than others of my age – I last won a national student Olympiad in the sixth grade at elementary school.

*What made you a better competitor than others?*

I think I can stay more focused. In the hours before a competition I already start to tune to the task, and then I can concentrate right to the end. Of course

others also try hard to concentrate, but most young sports people become over-excited, and this is at the expense of performance.

*And don't you ever get overexcited?*

Only at really big competitions, but generally it's not typical since with most things there isn't as much at stake as most people imagine.

*Do you play any other games? After all you're still a child. Isn't it all a bit too much at times?*

If I don't feel like playing chess, I don't play chess for a couple of days – though this doesn't happen often. For example when I play badly in a competition, it's good to do something else for a couple of days, maybe even for a week or two. These days, for example, I've got into doing the Rubik's Cube: I've already got down to under a minute – which is naturally far away from the world record, but it keeps me amused to solve it quicker and quicker. I can also enjoy doing calculations in maths, especially after periods when I haven't been busy studying for months because I've been playing chess constantly. But there's nothing unusual about this, everyone needs some variety.

*I suppose chess also involves a lot of maths.*

Yes, the endgame is strictly mathematical, for example, where you have to take pieces and checkmate. I get less enjoyment out of this; the play here is drier than around the opening, where you have much more freedom to move.

*You've improved an awful lot since you were at nursery school, and I assume your coach has had a serious part to play in this.*

Tamás Bódi was an important coach for me not only because he taught me to play chess competitively, and to realise what my basic strategy was, but also because when I started playing stronger than him at the age of 10, he immediately helped me move on. This is real proof of his professionalism, as if I'd stayed with him it's almost certain that I would never have been able to grow as much

as my results demonstrate. Afterwards András Mészáros, who is a good tactician, became my coach: I learned a lot of tricks from him.

*What is your basic strategy?*

We identify two kinds of player, although obviously not everyone has to be purely one type or the other, but still in general outline it's possible to distinguish them: there is the positional or deep player, who takes little risk, more or less waiting for his opponent to make a mistake; and there is the tactician, who thinks in series of moves. Russian chess is considered to be positional, while Asian and Indian is typically tactical and Hungarian chess similarly leans towards the tactical.

*Do you need a greater memory for tactical play?*

There's no difference. More tactical players tend to be stronger on the creative side – that's how I play, too.

*To what extent is a game purely mathematical?*

Tacticians play for endgames, essentially pressing their opponent: this is a kind of attacking game, especially if the player does not make a mistake in the process and succeeds in carrying out their own plan. Consequently, I wouldn't say it's purely mathematics. And this is without even mentioning that often the biggest enemy is time.

*Do you prefer training or competition?*

Sometimes I love training: when I learn something new. Practice matches too. But I truly enjoy the competitive situation – and definitely if I'm playing well.

*How much do you observe your opponent's reactions?*

I don't attach great significance to this because there are those whose every movement can be understood, but there are also real poker faces... in the end

it's enough if I understand what's happening on the board, so I tend to think more about the moves I'm going to make.

*Do you notice how your game improves?*

After the matches we analyse what happened – often with the player I've just played. Here we compare what we envisioned beforehand with what we actually did.

*Well, that's quite unusual after a sporting contest.*

We don't necessarily talk over the opening – there players may prefer to keep their secrets. But we go through the rest of the game from the middle game onwards.

*Why?*

I'm really interested in what my opponent was trying to set up, in how much of it he managed to accomplish, and what he didn't. These conversations are often variations of the game: we play with the idea of what other move the player might have made in the given situation, and what move I would then have made in reply.

*Do you remember the entire game?*

Of course. For a few days, perhaps for one or two weeks, or until the next match.

*I see. Do you also watch top-level adult matches?*

I pay attention to what they're doing: a lot of games can be accessed online involving competitors with Elo rating. For example, I like to follow Magnus Carlsen's strikingly attacking play – he became world champion in 2013. By the way, he cannot be classified as an unequivocally tactical player because he very skilfully combines positional play with attacking tactics.

*Have chess books been pushed into the background now that so much information is available on the Internet?*

No, they are still important; if I knew Russian, for example, then I'd have access to a vast amount of material. Naturally the Internet has really changed the sport, with a lot more young people having access to information which was only available to a narrow circle before. Chess has made giant strides with the spread and evolution of computer technology. Playing with a machine is no pleasure at all, of course: it's almost impossible to beat chess programs because, for one thing, they can see 30 moves ahead, not to mention other developments. Even world champions can only play out draws with them at best. But analytical programs are very useful during preparation.

*What institutionalised forms does chess study take in Hungary?*

Primarily the Central Chess School, which I entered at the age of nine – and where we were trained by grandmasters. Then when I became a European champion at the age of 10, Grandmaster József Horváth looked after me for three years. Since then I prepare with Olympic champion player-coach and Grandmaster Zoltán Ribli, as well as with his two assistants, Pál Gábor Kis and Miklós Galyas, both international masters. I practice openings and newly discovered things with them, but we also play live games. Not to mention that they also help me at competitions: after the draw we prepare for the opponent – sometimes in the morning – so that I can be in good condition and well prepared to play in the afternoon.

*When you know you're up against a stronger chess player, then I suppose you realise you stand a good chance of losing. Isn't it harder to play at such times?*

No, because then my goal is not to win, but perhaps to squeeze out a draw.

*How do you relax after a competition?*

Most of all by travelling, because I play primarily in Budapest, and I have to get home to Eger.

*Don't you get bored of the constant travel?*

No, this trip is luckily quite short, particularly with my Dad, who takes me and brings me back, though the longer journeys are really boring. Recently I was at the World Championship in China, the European Championship in Montenegro, and the World Championship again in Dubai, and soon I'm heading off to Iceland. And it looks like I'll be a member of the U16 team, too, so I'll be going to Kazakhstan as well.

*Well, now I understand why you find travel boring. I don't suppose you get to see a lot of the city where you go to play chess.*

There isn't a lot of opportunity to do so, but anyway it's a big challenge to do well on such a trip, to achieve what you've gone there for. After the World Championship in Brazil, for example, we came home in November and when changing flights in Rome we changed into warmer clothes: it was there I found out that my trousers were slipping down, and thought I'm skinny in build by nature, I'd lost another four of my 44 kilos even though we'd been staying in a five-star hotel where we were looked after superbly. But the long, tiring competition had taken a lot out of me.

*Do your parents always go with you?*

Yes, often, though recently mostly my Dad, but I've also been to competitions without them when it's turned out that way. They also help me with organising other activities when I'm not competing or preparing – and generally just make sure that we have a normal life: we live in a house with a garden, we have a dog, and it's good to be at home with them. Of course I also enjoy this during periods of preparation, because when I'm training through Skype I'm still in the same milieu.

*Can your parents follow your play in a match?*

No, although as we talk about it afterwards, they can tell a lot from my face – if they see it in a given game – and it doesn't matter if they don't understand the game completely. Those not involved in chess at most see the difference in ma-



terial at a given point of a match, so it's not so strange that they can't follow it. For me it already seems like an effort that I have to sit still for five hours continuously – moreover, with a high level of attention.

You can't concentrate fully for five hours. In the meantime you learn when you need to reflect, when you really need to make a good move and how to use the time wisely.

*And how do you find out whether you've used the time well or badly?*

I usually write down how much thinking time I've used every five or ten moves, then I discuss this with my coach. Recently, for example, we looked through the thinking times after a match, and it turned out that an easy move which I'd thought about for ten minutes beforehand I could have taken in under a minute, while I realised later that there was a move I'd made after two minutes of thinking which I should have taken as much as 20 minutes over.

*So next time you'll be better aware of these thinking times?*

Yes, the more I learn about every detail of the game, the more complex and useful the knowledge which accumulates.



## 5. MOUNDS OF EARTH, NOT CONCRETE SKELETONS

*(Tamás Jászay)*

### **A straight line from a Waldorf kindergarten to a Sólyom Scholarship: an interview with Veronika Holczer.**

In 2012 Veronika Holczer, holder of an architect's degree from Budapest University of Technology and Economics (BMGE), won the Sólyom **László Scholarship**. She hopes to popularise her environmentally aware brand of social architecture in Hungary, relying on local materials and communities. Her colourful, wide-ranging work is an example of harmonization between theory and practice.

*What is social architecture?*

Many people have many different interpretations, but for me it means supporting socially disadvantaged regions through architectural means. In Hungary the concept is still at the phase of searching for locations and roles: an efficient method of cooperation has not yet evolved among organisations with interdependent needs.

*Did you encounter this tendency as an architecture student at Budapest University of Technology and Economics?*

Not yet as a student, but since then I've come into contact with **Balázs Kemes** and Barna Láris, who organise university building camps in disadvantaged regions. Before completing my degree thesis, I decided to approach the subject from the direction of environmentally aware architecture that responds to real needs, with the intention of harmonising all this with the problems of subsistence level. Consequently I spent six months as a volunteer at a Gypsy row housing in Magyargéc, a village in Nógrád County, but people there had such deep

problems that I couldn't tell them everything would be solved by putting up a building. I planned my diploma work for the village of Markóc near the border with Croatia, where I was able to put earlier experiences to use: the advantage here was that there was already a will among the locals to act themselves to change their environment.

*Where did you acquire this kind of sensibility?*

In secondary school we had one month of social work experience, which I completed at the nursery school section of the Pető Institute, where my work ranged from cleaning out potties to playing with the children. At first I was afraid of what was in store, but I learned a lot there: if these kids are not constantly being compared to their contemporaries, if they develop within their own milieu, then they form a unified world of their own. One other area made me responsive to social issues: the theatre. In terms of reflecting society, they are further ahead than we are as architects: they create a performance in one or two months, while our models change slowly.

*You attended a Waldorf school for 13 years, first primary and then secondary school. What made your parents take this decision?*

What's more, I also went to the first Waldorf kindergarten in Hungary. My parents were among the founders of the Waldorf School in Pesthidegkút, so they had a strong conviction that this is a good model. They had to fight over it with a lot of people because the decision wasn't easily accepted within the family, but they persevered; moreover, my Mum was the secondary school's bursar, thus taking an active role in its operation. My older brother and I both passed our final school exams there.

*What makes the Waldorf different from other schools?*

I have no basis for comparison, the nearest I can do is compare it with university. There's no competitive spirit at the Waldorf; everything is measured against our own progress via written evaluations, with academic grades given only when necessary for entrance examinations. The full education programme is 13 years because there is an extra year to prepare for matriculation, prior to which we have to carry out a single project over an entire year in the 12th grade,

oriented towards a given choice of career. I spray-painted a car with colour at this time, probably because of my strong interest in design and drawing. I wasn't always at peace with the system there, but by now I greatly appreciate that I didn't experience any kind of stressful situation until university, and in the meantime we learned no less than anyone else, just differently.

*What was stressful for you at university?*

I'm a perfectionist when I'm studying something. At the University of Technology, however, we learned so many different things in parallel that it was impossible to study everything to the same high level. In the first semester I was among the top ten of the 300-strong year, and yet I was a bit disappointed in the system there. I later got to learn the logic behind it, but today my view is that if the individual subjects were better integrated with each other, there would be less pressure on the students and they would attain a higher level of knowledge.

*Did you take part in competitions as a Waldorf pupil?*

I was at a maths competition in 8th grade because I was declared the best in class, but in the end I only finished somewhere in the middle. It was then that I realised the Waldorf is a little bit of a narrow pool, but I wasn't bitter about it, I learned the lesson: I have nothing to do with being good at maths. This result only qualifies me: our class produced a very wide spread of people, who have become successful in humanities-based, scientific or artistic careers.

*From painting a car, how did you get to the profession of an architect?*

I decided quickly: I was always good at maths and drawing, and if we put the two together this is what we get.

*How much of a male profession is architecture?*

When I was at university, 60% of the students were female, but it's true that practising architects do tend to be men. According to my master Mihály Balázs, although girls perform better at university, they later drop out for family reasons and there's no path for them to return. Among architects I haven't suffered

any kind of unfair discrimination because I'm a woman, although it's a fact that it's harder to discuss things with master builders and contractors as a woman. We have to prove ourselves first, and then everything goes fine.

*When you go into a village, how do you overcome the “Pest intellectual coming down to the provinces” syndrome?*

It's a question of time: in Magyargéc, for example, it took a month to break the ice. During this time I won some local allies: if they see that you really want to accomplish something there, that you're trying to help, then there's always someone who will notice and appreciate this. When I arrived nothing was settled: I went out to the Gypsy row, spread a big piece of paper out on the table and started painting with the kids, and of course word got around and others came too.

*What's the situation with follow-ups and sustainability?*

This is a difficult issue. When I worked as a volunteer in Magyargéc, the film director András Salamon was there for two months: he organised a film club, shot a film with local youngsters, and I helped him with this as a general dog-sbody. Later we returned twice at Christmas for a community action each time, but of course this isn't a living relationship. I keep in constant contact with the Markóc residents; we happen to be writing a tender together right now. We renovated a barn there, saving it from collapse, and now would be the next step, to fit out the interior so the facility can begin functioning. Whether the relationship continues always depends on the locals as well. I want to follow up, but it's typical of me that if I have something to do somewhere then I'm there straining every nerve, but when the work is done then my energies regroup elsewhere.

*In your article entitled “Building from the bottom”, in which you write about your degree thesis, you outline a kind of architecture which doesn't exist in Budapest, which can function without computers or solar cells. How alone were you with these views at the University of Technology?*

Still fairly alone at that time, although even then there were teachers who were fighting windmills for a sensible approach to sustainable architecture – a situa-

tion which fortunately has changed since then. The defence of my thesis went well, as they valued an architectural approach taking realistic possibilities as its starting point. As far as my contemporaries are concerned, I was lucky because in the second semester of university I met the three people whom I studied with until the end: we were all different, but among the four of us my attitude wasn't strange. What caused a problem – and partly still does today – is the lack of relevant specialised literature. I translated a professional article for my teacher Erzsébet Lányi, who dealt with environmentally conscious building materials at the BMGE, and while doing it I suddenly realised that I wouldn't be able to design a building exclusively based on its content because I wouldn't have sufficient information. This also motivates me to find and document an equivalent of this kind of architecture in Hungary, and not simply to copy the foreign model.

*As a university student you spent a year in Paris. Why?*

I went on an Erasmus scholarship, and although the courses I took were not accepted here – thus extending my university time by one year – I had a really enjoyable time. It's difficult to immediately find good courses at a foreign university. I did a very exciting course in stage design and a shipbuilding course, but these were only overviews. During the classes on sustainable development, meanwhile, I sensed that it was really about lobbying for certain products and not about genuine environmental awareness. The year in Paris helped me decide that I had to come home and do something here in Hungary.

*At home you plan what to do in a village living in deep poverty, and then you face the reality on site. How do you reconcile the plans with reality?*

In any event, work like this entails compromises, but I like to improvise in fieldwork. For this I naturally need a well-grounded plan as I think thoroughly through the possibilities, then I make changes and decide on site, perhaps in a matter of seconds, whether – for example – it might be safer for the contractor to implement a different solution. Certain things were altered in Markóc, too: a reclaimed wooden wall became a wall of reclaimed bricks. What's more I took it apart myself, which really pleased the locals, but was primarily instructive for me because I saw that they simply pitched the wall into the mud, without cement and perhaps without mortar.

*You won a Blue Award for the Markóc project. What kind of prize is this?*

The prize of the Vienna University of Technology for environmentally sustainable architecture, which is announced every two years and for which there are entrants from all over the world. I'm keeping the 3,500 euros that came with the award on my bank account for the further construction of the barn in Markóc, which will probably now be the self-financed part of the tender.

*Your former professor and head of department Ferenc Cságoly recommended you for the **Sólyom Scholarship**. How did you get the scholarship?*

Besides [former] President **László Sólyom** there is a board of trustees which evaluates the tenders, but three of us were called in for a personal interview and all three were granted the scholarship. At the meeting I outlined three possibilities: besides further study at a university abroad I also mentioned the continuation of the Markóc building project. But what interested me the most was the third plan, to build from local materials in the Carpathian Basin, and so I chose this one. This is a topic which is increasingly little understood even in villages, and yet we're talking about cheap and simple solutions where often only the specialised knowledge is missing. It's ostensibly easy to implement a programme like this, but in reality a series of unexpected difficulties make the job harder. In Nagybacon, for example, where I was able to document brick-firing, the furnace is loaded on two days, but exactly when is almost impossible to find out. I'm suspending the scholarship for a while now because in the meantime I've heard about a course in earth architecture in Grenoble, and I've decided that after getting to know the practice I also want to acquire the theoretical foundations. Master builders know an awful lot, but sometimes they can't tell you exactly what they're doing.

*How did your research begin?*

First I had to establish a network of contacts. Ethnographers and protectors of historic monuments also helped, and of course I maintain contact with master builders. I try to reach them, but sometimes this fails because someone doesn't pick up the phone. They live by a different logic: if, for example, there is a harvest, then for them the outside world ceases to exist.



*Are we talking about technologies which have never been documented before?*

Generally they've been described by ethnographers, but not in a way that allows the techniques to be used later in practice. It's a big question whether drawing and writing are the appropriate media for all this, but I do my best to record everything important in as much detail as possible. In the long term it's conceivable that a book will come out of this, but for the moment Grenoble and earth architecture are occupying my thoughts.

*What is earth architecture?*

Adobe, stacked mud or rammed earth walls – walls constructed of earthen materials that are not made by firing. I've documented the construction of stacked mud walls, which are built with pitchforks from clay and straw, or sometimes recycled bricks from an old adobe house. The natural climate in a building like this is much better than that of other buildings, especially in summer, but what really attracts me about them is that what remains on site in the end is not a concrete skeleton but a mound of earth. There are many adobe houses in Hungary, whose owners are generally poor people who don't know how to maintain them, and for this reason I'm also interested in arranging the transfer of know-how and organising training. I sometimes think that looking after houses is more important than building them.

*Do you have a big dream that's so far unfulfilled?*

I've got several projects on the go at once, but of course there's always one that carries me forward, even if it might end up getting delayed. I'd like to set up a place which could be an experimental workshop for "slow tech" architecture. We'd buy a run-down building, renovate it and hold training courses. Bringing this about gives sufficient motivation.



## 6. DRAWN TO SCIENCE LIKE A MAGNET

*(Tamás Jászay)*

**We talked to Emil Nyerki about research students and bionics studies in Szeged, among other things.**

Winner of the Juvenile Bolyai Award (for presenting a technology for the magnetic cultivation of plants), two-time winner of MOL Talent Support Programme grants Emil Nyerki is only a first-year undergraduate student of molecular bionics at the University of Szeged, and has already attended two scientific conferences for students, participated in countless competitions and several research projects. Born in Dunaújváros, the young man talks about old and new projects, his grammar school years, the Student Research (KutDiák) Movement, and how a student in humanities can help a dedicated natural scientist such as himself.

*Do you recall the moment you decided to become a scientist?*

I was in the seventh grade at primary school when my mother persuaded me to enter the Kornél Lánosz Physics Competition. Every year they come up with a topic for a paper, which is followed by a problem-solving section and a measurement part. Quite how I won this I don't know, but it was then decided I would have a go at physics.

*What was the topic?*

Experiments with air. For example, if we put down a book, stand a candle next to it and blow between the two, how the flame changes. My presentation was a bit of a circus spectacle. I held a straw in my mouth and blew a ping-pong ball which bobbed in the current. I won in the seventh grade and came second in

the eighth, and I decided then that I'd go on to Kornél Lánzos Grammar School where Sándor Ujvári would become my mentor.

*What's special about this school?*

It was founded by two technically-minded teachers who were fed up with existing schools. The secondary school has a British-style curriculum, there are twenty students in a class, everyone has their own personal bench and the classes have their own classroom to live in for three years. Instead of a large, central teachers' room there are smaller rooms which are better suited for friendly chats with teachers.

*How did your affection for physics evolve here?*

I was greatly inspired by the stray cat theory put forward by Mr Ujvári, which says that any experimental device can be created from "trash". An oscilloscope requires just a piece of metal, a food can, a balloon and a laser pointer. In the ninth grade I had access to the physics lab where I started working on some serious things, and a year later three of us joined an ELTE University research project investigating the radon content of water in the Velence Hills. This team made it to the National Scientific Students' Associations Conference in 2011, which was our first major challenge; and our first trip without parents and teachers to Nyíregyháza where the university students didn't try to freeze us out. After this research project I decided to build a robot which could electronically detect the flame of a candle, locate it and put it out with a jet of water. In the process I realised I'd need to be able to write code, so I ventured into IT, but only got as far as gobang or five-in-a-row, even if I can make it any size! So I needed a new project, which was when magnets entered the scene, and plants came in by chance. My future research partner, Tibor Papp, first rejected the project, but a week later the magnets, pots and seeds arrived, and so on 14 April 2011 the experiments began.

*You were among secondary school students as a primary school pupil and competed with college students in secondary school. What did your peers think about that?*

In the last two years of primary I participated in over 50 competitions. Some of my classmates were happy for me and admired me, and I even inspired some-

one to become a researcher, but there was sneering, too, of course. My head teachers were always supportive of my efforts, since I was representing the school, even if some teachers remarked I should've attended classes instead of preparing for competitions. Then in the

Student Research Movement I discovered there were lots of like-minded “loonies”, and I found real company there.

*When do you feel a research project is complete?*

The challenge in one competition was to get an object into space and keep it there for a week. My partners and I solved it and presented it at a conference, but for me it ended there – I'd only wanted to be an astronaut as a child. If I'm given a specific task or a problem at a competition, I close the project and move on. I'm always interested in new things. It's impossible to complete a major research project because of all the new questions which keep popping up, but often I see how much things overlap. Also there are topics I become involved with for my own entertainment, like when I examined the attitude of Hungarians' to heavy metal rock music, which ran parallel to my magnetic plant project and another one with water. As I was building a model of an eye for Székesfehérvár's chief ophthalmologist, I submitted a paper on the Teutonic Order.

*How do you fit all this into your schedule? Teutons eight to ten o'clock, magnets ten to noon?*

The plant research project was relatively easy in this respect, since while the plants were growing I was able to deal with many other things. At the start I monitored them continuously, then every three days, and eventually once a week. Where research themes overlap, I mainly prioritise according to the deadlines. As a secondary school student I attended every competition I could find. These were mainly conferences and practical competitions. I only attended two school competitions. Practical experience and networking are really important in these events.

*Let's talk about networking in the Student Research (KutDiák) Movement.*

Mr Újvári entered me in the first TUDOK, but I didn't get hooked at that time. Later, after the competition I got the chance to chat with the others. I was

amazed by how young intellectuals would have substantial discussions about important issues. From then onwards I attended every KutDiák event and met a lot of people. I talk to them a lot online and personally, since many of them ended up in Szeged. The network is great in that if a problem comes up, I know whom I can turn to, and anything can be solved in two phone calls to Hungary or abroad. There are lots of us and we examine the same problem from different viewpoints, which is a big advantage when you get stuck. I used to fail to see the need for so many arts students, but I'm now convinced my magnetic plant research would be nowhere without their crucial laymen's remarks.

*Have you had many projects you've had to give up for lack of time?*

It's more a lack of interest which prevented me from engaging in many more things, but now it's my university studies which force me to reconsider my schedule. When I came here I knew I wanted to do research, but I didn't want to bring my magnetic plant research with me. After much deliberation I ended up at the Department of Medical Physics and Informatics where I'm involved in the work of the bio-nanocomposite group, which I greatly enjoy. I'm currently working on the development of a new nanocomposite solar cell.

*How do you deal with failure?*

Initially, when a competition didn't work out, I took it really badly. I became depressed and blamed the jury. But then somehow I always ended up sticking to a career in science, while reconsidering what I needed to change. I've come to see how even in university research trial and error are part of the process, and that there's no such thing as utter failure. A dead-end at worst.

*Was your family as patient about your latest research passions and competitions as your schools have been?*

Very much so. They supported me in every possible way. And everyone has a truly motivating career. My mother, apart from teaching in a secondary school, is president of the National Association of Researching Teachers, organising conferences and preparing students for competitions. My father used to be a German teacher, then he moved on to industrial production and he's now doing

a PhD in technical management. My older bother started out as a physicist, then became an IT engineer, but has degrees in economics management and HR management too. Currently he's in the military. I've studied English since the age of four, and my brother and I used to translate the texts of fantasy games and the user's guides for figure painting.

*What's figure painting?*

Figure collection is a hobby which has become fairly widespread. It's like a strategic computer game, only here I myself make and paint the actual figures which are roughly 15–21 millimetres high. I've always been interested in fantasy and science fiction. I read all the classics as a child, including Asimov and Lovecraft. My interest in science has a lot to do with science fiction. I'm really interested in building the devices described there, and I have lots of drawings, but lack the mechanical and electronic knowledge. Lots of research students paint, draw or write poetry as recreation or for entertainment.

*After Veszprém you came to university in Szeged. Why? Did you never consider going abroad?*

For a long time I'd wanted to study in Veszprém. I developed an excellent relationship with local tutors and students, which I have to this day; only I was more attracted to bionics studies. Since I've yet to discover my real interests, I decided not to study abroad where training is highly specialised. As a bionics scholar you need to be a bit of a biologist, physicist, chemical engineer and IT expert. When I first received my university schedule, it made my mouth water. After obtaining a PhD I want to do a degree abroad and travel the world on research grants.

*Let's talk about your most important research project. How do magnets and plants come together?*

Research into magnets helping the growth of plants goes back to the 1930s, but there's no answer as to why it's possible. When we started our experiments, we believed the magnets had to be next to the plants at all times, but we realised that wasn't necessary, and in any case it wouldn't be feasible over large expanses

of land. We worked with lots of different plants, including water plants, trees and floriferous plants. We minimised costs. A real phytotron chamber costs several tens of millions of forints, but I made my own from just forty. Preparing for the Juvenile Bolyai, I moved on to crop plants. For each method I grew three to four hundred seeds which constitute a statistically significant result. Currently I'm supported by the Pioneer seed company, which holds my maize and sunflower hybrids. Imagine what it would mean to humanity to raise cereal production by just a few per cent...

*Aren't you worried your method might be stolen?*

I was warned about that, so it hasn't been written down and we don't discuss it in any way that it could be copied. We just publish the results. True, if I get it patented, it can still be stolen and given a different name.

*What's the difference compared to previous research?*

The main problem with previous patents is that none of them provide a really useable method. No two previous pieces of research are similar in any way, and the different methods have yielded different results. So we're going our own way. The plants growing from seeds previously given magnetic treatment are growing nicely, and the only chemical test so far has revealed that the dry matter in the examined beans has increased by twenty per cent, which is a brilliant result.

*You participated in Matehetsz's "Think in terms of business" workshop, and currently you are mentored under the Talent Marketplace. Why?*

Originally I'd planned to create the technology and sell devices; however, Bándor Nagy, with whom I've been in touch since, called my attention to the fact that by means of reverse engineering the method could be backtracked and copied. I then realised it's the service which needs to be marketed in stead. My mentor, Ernő Duda, who has launched numerous businesses in the Talent Marketplace in Szeged and its vicinity, provides business advice and as the manager of a biotechnology company, has provided me access to further experiments. Presentation and assertiveness are crucial. As a student mentor I also drew



younger students' attention to this. Properly presenting a two-year research project in ten minutes is not impossible, but it's a big challenge.

*How do you find the time for all this?*

Time is indeed my greatest foe. In the summer I prepare for language exams or other competitions, last year the Juvenile Bolyai. In the first exam period, in addition to preparation, I tried to rest, read and play. And I'm moving on. A novelle of mine was recently published in an anthology, and I'm about to submit two texts for a literary competition. One of them is about a family success story, which shouldn't be difficult. The other one is a fictitious diary of a WWI soldier. I'm curious about how a boy of my age would've experienced everyday life on the front a century ago.



## 7. THE ALLURE OF COMPETITION

*(Tamás Jászay)*

**What have luminescent bacteria got to do with resourcefulness?  
We talked to Éva Bernadett Bényei.**

First prize in the “Our Talents” awards of the **National Talent Support Council** has gone to **Éva Bernadett Bényei**, a grammar school student from Debrecen who has achieved outstanding results in national and international competitions and, after her study of luminescent bacteria with the potential to brighten up our lives, is now turning her attention to neurology. This resourceful and enthusiastic young researcher is assisted in her work by mentors from the most diverse of fields.

*Have you decided whether to pursue a career in medicine or research?*

I gave it a lot of thought, before applying to the medical departments of several universities in Hungary. I was also helped in my decision by the Talent Marketplace programme run by the Association of Hungarian Talent Support Organisations (MATEHETSZ). My mentor there, Dr. László Vutskits, graduated as a doctor and now works as a researcher and physician in Geneva. I’ve put my original topic, the phenomenon of bioluminescence, on the backburner because I’ve started looking into neurology, which I’d like to study in more depth.

*When you speak in public you are extremely passionate about the natural sciences. How would you get an outsider interested in them?*

In connection with my project which I just mentioned, I usually ask people what springs to their mind about luminescent creatures. They usually mention fireflies, or certain jellyfish. These animals use chemistry to produce the energy

they need to make light. This in itself is a miracle of nature, but genetics and synthetic biology are now at the stage where the genes from which proteins are synthesised in these creatures can be implanted into other organisms. I put them into e. coli bacteria, but theoretically this could also work with plants. Just imagine walking along a street between rows of luminescent trees! Or going home and watering your favourite house plants, which then start to glow. And all this is far from being utopian: Japanese scientists have recently developed luminescent ice cream...

*Were you interested by similar challenges at primary school?*

I first started trying my hand in competitions at the Arany János Training Primary School of Debrecen University. I soon found out that I'm inspired by the "pressure" experienced during the competitions. I like situations where I have to step out of my comfort zone. I owe a great deal to my teachers there, who encouraged me to take part in these competitions. The first time, at a maths competition, I was terribly nervous and this made me perform badly. But I soon got over this, and before long I was competing in maths, physics, chemistry and even history and grammar competitions.

*So it didn't take long to get over the first failure.*

I admit I was a little disappointed because the competition tasks had gone much better during practice than in the competition itself. My family and teachers helped me to overcome this. I realised that there's no point being scared at a competition. After all, I've got nothing to lose.

*What types of competition did you enter?*

At first we had to solve tests. Then when I started at grammar school the emphasis shifted towards the creative side of things, when we had to present our own research. These were very good opportunities: it's a great experience when the whole audience is concentrating on my project and me. This has always attracted me. In primary school, when a classmate and I had to give a presentation on ancient Greek culture, we both dressed up in togas and told the others

of our experiences as time travellers. In the competitions it's also a great help that I've already learned the phrases which can get me out of a tricky situation.

*What kind of phrases do you mean?*

You can explain everything in layman's terms, so that anyone can understand, but if you're talking in front of professionals it's worth injecting just the right amount of scientific terminology. To do this you have to pay constant attention to the judges, but must also be considerate to the audience.

*Why did you move on to Kossuth Lajos Training Grammar School?*

I did very well in the entrance exam, I liked the atmosphere, and many of my classmates also ended up here. The school itself is interesting; it was converted from an army barracks, so there are lots of buildings. It's like a mini-campus. Standards are very high at Kossuth, but I've never felt any pressure to compete. The teachers always made personalised suggestions about what competitions would be suitable. Another good thing about our school is that there are some real personalities, both among the teaching staff and among the students. I'm probably a bit different from my contemporaries, too, but luckily those in my class usually appreciate what I do, and also show interest in it.

*At the InnoStudents Forum, held at the Hungarian Academy of Sciences, your teacher Dr. Edit Futó Monori talked about how talent support works systemically at your school.*

There are lots of opportunities for anyone who wants to explore a topic in more detail outside the classroom. The talent support group is led by Dr. Futó Monori and another teacher, Dr. Zsolt Krakomperger. Here students in years 7–12 get a taste of the world of science. We work on projects, dealing with exciting topics, reading about them and making presentations. The debates held to practice pro and contra arguments are particularly enjoyable, as are the times when we try out our presentations before the competitions, answering even the “trickiest” questions from others. The latter has been useful to me in the actual competition several times.

*In other words, you model the events which could take place in the competition. I thought you'd brought your resourcefulness from home.*

From there, too: my mum's a secondary-school teacher of maths and physics; and Dad's a chemist, concerned with crystallography. My parents always encouraged me to do what I enjoy. They never forced science on me, and they also supported me even if I was interested in completely different things. I have an advantage, because whenever I had questions about a given topic I could ask them straight away.

*When did you decide that you would choose science?*

There was a moment when I felt that I'd found myself. At the beginning of the bacteria project, things didn't work exactly the way I'd have liked. We did the experiment to a "recipe", but the bacteria still didn't light up. At the request of my mentor, Dr. László Bálint, I read through the logs and in this way I realised what the error was: *E. coli* bacteria like to be at 37 degrees Celsius; but we should only have bred them at a maximum of 30 degrees, because the proteins used will precipitate if the temperature goes above this. We modified the experiment by lowering the temperature, and everything started working. That was a great feeling.

*How did you come into contact with the Researcher Student's Movement (KutDiák)?*

This is another thing I like, because it makes a change from the everyday routine. Senior-year students suggested that I apply to join; first I entered competitions, but last year I also started working here as an organiser. I'm proud that we recently hosted a thematic round of the National Conference of Science Students (TUDOK) in Debrecen. Among the researcher students, I have come into contact with some very special young people with whom it was possible to talk about both serious scientific issues and topics which interest youth generally.

*What does being vice-president of KutDiák entail?*

Lots of emails, which make me feel important. KutDiák is a national movement organised by students for students. A twelve-member management team coordinates the annual events; its main task is organising and running these.

*You're studying as a grammar school student, besides which you attend competitions and talent support groups, and work on a voluntary basis at KutDiák. How many hours are there in your day?*

Unfortunately only twenty-four, but if you know any way of changing that I'd be happy to hear about it. I try to plan my days in advance, and I make to-do lists. Being able to cross out every line and throw the piece of paper away is the best feeling. Usually I start with the stuff that's easiest to learn, because these give me a quick sense of achievement.

*Do you learn quickly and easily?*

That depends on my mood. If I'm involved in something and it interests me, I learn quickly. But if I have to prepare for a competition, it's hard to concentrate on the following day's essay. In practice I apply a bit of human ethology, rewarding myself if I've completed the set task. The target bonus could be anything: an apple or a song, an episode of a serial, or a film.

*You've won countless competitions. Don't you find all these awards overwhelming?*

In the busier periods, when I'm the centre of attention, it's certainly tiring; but it's a good feeling, and when it's over I do feel a little empty. At such times I try to look for an area in which I can take my achievements further. A major contributing factor is that I get to know lots of new people at the competitions, with whom I forge long-term friendships. We keep in touch in person or via the internet and I get both personal and professional encouragement from them.

*You entered the International Conference of Young Scientists (ICYS) twice, and won. How does it differ from the Hungarian competitions?*

Essentially it's very similar to the national competitions, and mainly differs in terms of scale; but it also has its own atmosphere, as the representatives of different cultures all meet up in another country. It was useful to realise what is evident to me, namely that a few thousand kilometres can be problematic for one of my contemporaries, but for another the reverse could be true. A new step is that with an international judging panel you have to present in English. In Indonesia, too, I found myself in an exciting situation: in the poster section, which was not a part of the competition, local students visited all the exhibitors and we had to convince them that our project was important and interesting. Unlike the judging panel they reacted immediately. If they didn't like something they immediately moved on to the next poster.

*Your team won gold in the International Genetically Engineered Machine Competition (iGEM) in Amsterdam. The competition is aimed at university students. How did you come to be among them?*

At the talent support group mentioned earlier I listened to lectures on genetics, which I enjoyed a lot although I didn't understand very much of them. By coincidence a PhD student at Debrecen University saw potential in my interest in the subject, so I was invited to join the team preparing for iGEM. They were very patient with me despite having to answer my very basic questions; they helped me get hold of the relevant specialist literature, and I was also allowed to take part in the experiments. After the success in Amsterdam I got in touch with the team leaders Dr. Bálint László Bálint, and he became my mentor in the luminescent bacteria project.

*What new experiences did you gain at TUDOK?*

There, too, it's the presentation that's important. You have to show the judging panel that you're competent to deal with the subject, then you have to prove yourself when they "test" you. The year before last, TUDOK was held precisely a week before the ICYS. The experiences gained at these competitions reinforced each other.



*In 2013 you received the “Our Talents” award from the National Talent Support Council. What did you spend the grant on?*

I participated in the Summer School of Science in Croatia, which is a summer camp where the students work hard, and enjoy what they do. The ten-day programme, held in English, is organised for students in years 11 and 12 from all over Europe, and they have an opportunity to take part in various projects. When putting together the three-person teams the camp leaders took care to create international groups, but also to ensure that nobody worked in their own specialist field; in other words it was important that we gain an insight into new subjects. Each team works together, and in the middle and at the end of the camp they have to present the results; but there is also time for relaxation and communal activities.

*You mentioned your mentors several times. Who can be a good mentor?*

I think anyone who inspires and helps in achieving the goals can be a mentor in moving forward. My first mentors were my teachers, who devoted time to me over and above what was strictly necessary to do the compulsory exercises; but I also include my parents among my mentors. In La Femme magazine’s 50 Talented Young Hungarians programme my mentor was the public-relations expert **Nóra Horváth-Magyary**, and although she’s not a scientist I have a great deal to thank her for. She helped me learn how to stand out, and what to do if the audience is losing concentration. She also taught me how to ask; that is, how to use questions to lead someone to a conclusion which they wouldn’t have thought of otherwise. And recently I spent ten days as a guest of László Vutskits in Geneva, with support from MATEHETSZ. He spoke about his own experiences as a research doctor, and what is important to pay attention to at medical school. It would be good to collaborate with him in the future, too.

*Do you often think about your future?*

At the moment neurology interests me the most. I have goals which I’d like to achieve, but I’m mainly focusing on the present. In my experience, if I decide what I want in advance and then it just happens in a predictable way, I get bored. And I’m attracted by tasks where you have to think outside the box.



## 8. NOT JUST A PASSING INTEREST

*(Lilla Proics)*

### Dance and focus, studying and art: in conversation with Edit Domoszlai

When she attended the Pécs School of Art Edit Domoszlai won the title of “Outstanding Pupil” every year for her many achievements. In 2010 she won the title “Discovery of the Year” from the National Talent Support Council and from that year she was a private dancer with the Pécs Ballet. In 2013 she participated in the “50 Young Hungarian Talents” mentor programme and in the summer of the same year she became a scholarship student in the Nederlands Dans Theater Summer Intensive Course and the Dutch Summer Dance Course. In the academic year of 2013-2014 she was the Talent Ambassador at Pécs University of Arts and Sciences.

*If you could name one person who played the greatest role in your becoming a dancer, who would that be?*

My mother, who devoted enormous amounts of energy in doing things of the highest quality and with precision. So she not only told me and my brother to strive for perfection but raised us with that mentality. She came to all my performances and when I was injured she took me to one doctor after another to help me fully recover because she knew how important dance was for me, and how much I wanted to do it.

*But before that she would take you to ballet lessons, like many other little girls.*

Yes, so that I could get some kind of exercise. I was lucky because **Bea Bódis** was an attentive, sensitive and professionally well-trained teacher. I went twice

a week and I liked it. But then I felt I needed more dancing so I started to attend another ballet course – these were the two opportunities in Gyöngyös. But basically I lived the life of an average child until I was fourteen. My secondary school provided an inspiring environment.

*When did it become obvious that you were better at this than other children?*

I had my first, if you like, professional success at the age of twelve when I won a national competition to which I was sent by my ballet teacher. My teacher made a choreography which was perfectly suited to me. She later did the same when I took part in other national, amateur competitions.

*How can choreography be personalised?*

A great deal is decided by a dancer's own movement and physical attributes. Then it depends on what kind of temperament he or she has and how charismatic that particular person is on stage. How he or she can affect the audience is something a teacher will recognise sooner or later.

*What makes a good dance instructor?*

Clearly they need professional knowledge and a good eye. In ballet they need to take into account their student's physical skills, too. Apart from this a good dance teacher will note the harmony in a child's movements and will be able to discover skills which will be very useful at a later stage, for example a sense of rhythm and musicality, which are essential to being a good dancer. This is fairly complicated, analytical and fastidious work, and part of it might not even be done consciously.

*How were you able to find time to study besides dancing?*

I had a good grounding at secondary school, up to the age of fourteen, enabling me to prepare for my university entrance exam quite easily.

*What kind of school was this?*

I attended the Berze Nagy János Secondary School in Gyöngyös. We were a select class chosen based on our entrance results, the best of the town gathered into one group. The curriculum wasn't exclusively important, and our teachers were interested in our extra-curricular activities, too. One of my classmates was a musician who won national mathematics competitions one after the other. But in order for students to develop their various talents the school has to be tolerant with them on a daily basis. Which of course didn't mean that occasional allowances led to lower standards. This was of course much more of a partnership and presumed a responsible attitude from us. The school made sure that it offered other opportunities in addition to the mandatory curriculum. They organised talents shows, so we always knew about the achievements of those who went to music school, or were involved with the performing arts or pursued studies in other disciplines. I participated in these shows a lot too, and my teachers and classmates came to see my gala performances. When I joined the Pécs Ballet my form master wrote in a kind of farewell letter that I had introduced him to the art of ballet and he had become a fan for life.

*When did you decide that you wouldn't pursue dance just as a hobby?*

I started watching the Mezzo channel at the age of twelve and from then on I saw dance in a completely different way: it was no longer just a pleasant way to pass the time but it became an exciting activity which was more attractive to me than anything else. The ability to imitate is very important in dance. At this time I realised how much joy it gave me. From this point on I developed in earnest. I benefited a lot from constantly watching ballet competitions, as well as various broadcasts and events I recorded from Mezzo.

*What are these ballet competitions like?*

The most accurate comparison would be with competitive sports: you have to lift your partner as high as possible and spin as much as you can, etc. I admire ballet dancers as I love to see when someone clearly carries out the prescribed moves with ease, but this is not what really appealed to me – I wouldn't have been able to acquire the high level technical knowledge with which I could've excelled. The art training in Pécs suited me for various reasons, but mainly be-

cause I was able to work with several choreographers, so I had several alternatives. I've always been much more interested in the diversity of modern dance and it's more in line with my personality. I like to be given very different tasks, and I'm inspired by the excitement of variation. I feel alive amidst this diversity.

*How does the ability to imitate compare with creativity?*

In classical ballet there's less of a marked need to be creative, on the other hand a high standard of imitation is important to perfectly execute the moves. However, both are necessary in modern dance, in which we do a great deal of improvising, but I hardly need to say that the two are not mutually exclusive.

*Choreographers don't have you improvise because they don't have enough ideas, do they?*

No, of course not. For example, **Cameron McMillan**, with whom I'm working at the moment, shows us combinations and we start out from there, but he's curious about the direction we can take the initial idea, and what we can come up with. You have to use your mental faculties at rehearsals, too, and I always feel the same kind of tiredness as when I've done a test – my brain gets tired too.

*Do those who are good at this generally become modern dancers?*

I would rather say that anybody who can persistently entertain, try out new ideas and create a series of moves for themselves has a good chance of becoming a diverse and inventive modern dancer, and it helps if somebody is open to choreography. I enjoyed doing this and often stayed behind after lessons to dance for the fun of it. And this led to my winning competitions and to my being a choreographer at the art school where I studied.

*It's interesting that you simultaneously work as a dancer and a dance instructor. What do you expect from your students?*

Motivation – that dance for them is not just a passing interest. If they have this, everything else comes secondary. They say that doing something for eight

hours a day over ten years will accumulate practical knowledge in the given field. Once you've discovered something you are willing to do for ten years, it eventually becomes a necessity and perhaps grows into a desire for self-expression. I think this because when I suffered an injury I first listened to a lot of classical music but then I felt I had to find another way to "talk", so I started writing poetry.

*You went to the Pécs School of Art from the age of fourteen. Wasn't it difficult to leave your home and school which had been so accepting and inspiring?*

By then I was excited to pursue dance seriously. More than anything else I wanted to go to a school that expressly taught dance. Of course there were difficult moments at first, but it was easy to leave my family behind because the security they gave me followed me everywhere. It was a practical decision: I couldn't get what I wanted without moving away. In any case, there was hardly a weekend that I didn't go home. I absolutely needed my mother to bring me down to earth because as an adolescent I had a tendency to lose touch with reality. Even today she's my most serious critic and is always there to help. This obviously sounds completely natural but not every parent is capable of doing this, no matter how devoted they might be.

*What did you think about the Pécs School of Art? To what extent did it meet your expectations?*

I think I was very lucky that there were specialisations besides dance: fine arts, music and drama. I lived with the fine arts students whom I could see painting – the openness we experienced there inspired all of us. It stirred any possible latent creativity in us all. I met several people there who were inhibited by their previous schools but at the Pécs art school they managed to shake it off and their talents gradually came to life.

*What could be the reason that despite what you've just said the majority of schools don't provide art courses and don't encourage children to be creative, but instead use a blunt carrot and stick system?*

Much more energy, creativity, patience, and risk taking is required from teachers who work in an open and cooperative setting with their students. And in

any case, it's "dangerous" to work with art because it makes people think, they become independent and it frees them. However, classical ballet is a borderline case: it's backbreaking work year in year out which you have to be able to do, and you need to develop the mental stamina for this. Maturing late is not an option: it's simply an expectation that by the age of eighteen the dancer has the required abilities.

*How well trained do you think Hungarian dance teachers are?*

I've seen a lot of teachers who were not well trained enough. Most dancers work in an environment where they are shouted at and humiliated, yet only a few of them realise their dreams because classical ballet is largely determined by physical attributes. I have never been able to understand how somebody can scream at a ten- or twelve-year-old girl just because she can't perform the right moves, because of muscle stiffness for example. If somebody is responsible for educating a child with a problem like that, they first have to take them to a physiotherapist. Obviously, nobody should be chastised for problems relating to their given attributes. What a teacher is capable of doing to help a dancer perform better physically is primarily a human rather than a professional issue. If they are oblivious to this they are professionals applying inhuman, outdated methods that may have never been effective. But this doesn't particularly cause problems because in Hungary there's no particular tradition of dealing with a dancers' mental balance. This is why it's not clear what kind of a dancer might develop from a ballet dancer with perfect attributes – which is very rarely the case – who grows up in such an environment. I might add that instructors are not all the same. Some are more patient, better trained and don't tend to produce mentally damaged students. I was very lucky at the Pécs school to have **Zsuzsanna Kovács** as my teacher, who was very strict, because in classical ballet training it's ultimately important to be focused on high achievement. But outside school hours she would always talk to us if she noticed we had a problem and this helped us get through problems and difficult periods in our lives. The same applied to **Dóra Uhrík**, the director of the department of dance at the Pécs School of Arts, who placed emphasis not only on people acquiring professional humility but also on the correct development of human values. Both of them paid attention to the individual needs of their students.



*But there are some people who can tolerate an exclusively achievement-centred, harsh environment.*

Of course not everybody is destroyed by the carrot and stick system, and there are those who see it as a challenge and in whom it brings out the best, and they are able to function in such a system. But I don't think this is true of most people. On the contrary, most people underperform in such an environment. I personally prefer a supportive and positive approach.

*Many people would say this attitude, which you call inhuman, is just strict in order to justify what they do.*

I think strictness means discipline and high expectations, behind which is trust. A ballet master works with people and there are numerous forms of feedback which don't include personal insults, nor creating an atmosphere of mistrust.

*Did training in Pécs include taking part in international workshops?*

The budget was scarcely enough to invite foreign masters, but still we did have guest teachers every term at the school who held courses and we benefited a lot from them. I started looking for foreign courses after completing my studies in Pécs. As far as scholarships and applications are concerned, they can only be won if you are willing to be tested in this kind of competition. It takes both time and effort on everybody's part to find and write an application, to prepare and make videos etc. Some people are willing to take on this extra work and some are not. I, for example, wanted to participate in certain courses so I made the extra effort.

*Does anyone help you do this?*

No. I look for and pursue these opportunities by myself. That's how I got to the Netherlands last summer and danced in the most famous troupes in the world. Nobody told me to go but this profession continues to enthuse me. Or when I read about the "50 Young Hungarian Talents" mentor programme it aroused my interest and I applied. I got into the fifty which were given this opportunity out of close to one thousand four hundred applicants.

*Who became your mentor?*

Titusz Tisztartó, the manager of Class FM. I like fresh perspectives and that's exactly what I got from him. We set a very specific goal to develop my focussing technique and I also learned some practical aspects of communication.

*What is this technique of focussing?*

It helps you work more precisely and work towards a specific goal. And it also has a role in evaluating performance: it helps you avoid mistakes that would lead you astray. After a time you learn that the energy you invest in something yields a proportionate rate of return. If this doesn't seem to be the case, you need to take a hard look at which problem might have caused you to slip up even after putting in a great deal of effort. My perfectionism and this technique have become very useful practically. The mentor programme also meant meeting forty-nine other people, which was a great experience in itself. It amazed me what diversity lies in creative minds, and if these people are helped a bit along the way, their contribution will definitely be beneficial to society at large.

*What do you do in your spare time apart from dancing?*

I have a BA in adult education from Pécs University, and now I'm doing the last semester of the MA course in human resources consulting. A lot of people ask me why I dissipate my energy but all these activities reinforce one another.

*Your life looks like a victory march, though there have been obstacles in your path, too – for example, an injury can end a ballet dancer's career before it begins, and that's just one of the things you mentioned.*

You simply have to be honest with yourself, by which I mean that when I see dancers who are far better than I am, I'm filled with admiration and not a sense of failure, and they actually inspire me to do better. I've had performances and exams which didn't go well and with which I felt unhappy, but I tried to get over them and do the best I could. However, even when I do all I can, problems sometimes arise which I can simply do nothing about – so it's pointless moaning about them. If you are capable of taking it in, that there are people who are

better and cleverer than you, you won't feel like a failure. In any case, this is partly the responsibility of the teachers who tend to regard only outstanding achievement as success, which is damaging because it teaches a lot of otherwise talented people how to create failure and make themselves unhappy. A secure emotional background is needed for someone to escape this trap.



## 9. BACK FROM AMERICA, FUTURE OCCUPATION: BUSINESSMAN (*Tamás Jászay*)

**“I like winning: it’s the best feeling.” Interview with Levente Csipak.**

**Levente Csipak** is a third-year student at **Bolyai Secondary Grammar School for Gifted Students in Senta (Zenta)**. He was born in Čoka (Csóka), and in 2013 won a special prize in the “Our Talents” awards presented by the **National Talent Support Council**, for his multi-faceted achievements. He is a regular prize-winner in maths competitions and has also left his mark in the Vojvodina media as a journalist. He has a long-standing interest in non-governmental organisations and the world of business. In Iowa, he even taped a school headmaster to the wall.

*Which came first, maths or journalism?*

Maths. I’ve been entering competitions since my third year at primary school. At first I showed an interest in natural sciences, then came the social sciences; and sometimes I’m torn between the two. My father’s a manual worker and my mother’s an architect and designer, so there’s a need for maths and creativity there, too. I first came into journalism when I started a class newspaper in my fourth year at school, which then became a school newspaper and was published in Serbian as well as Hungarian. Later I completed the journalism school of the Vojvodina weekly newspaper *Hét Nap* (Seven Days), and afterwards I wrote regularly.

*You were born in Čoka. How would you describe the town?*

Čoka is five kilometres from Senta and over 750 years old. I still live there. For a long time it was inhabited by Hungarians, then after the Yugoslav Wars it be-

came almost deserted; industry has shut down and the cultural life is stagnant, so for young people the situation is far from rosy. It was here that I went to primary school. I'd say it was a completely average Hungarian school in Serbia, but it was here that I met an excellent maths teacher, **Julianna Sütő**, who I still go back to if there's something I don't understand. At school you had to resolve situations which you came up against in everyday life; for example, you had to convince someone to help or support you.

*What kind of a student were you?*

I was an excellent student. I had no problems with any of the subjects, although I won't say I studied a great deal. Among the natural sciences, I only had to spend a lot of time on biology. There was a lot of new information and things to remember. In my third year I entered the Kangaroo International Mathematics Competition for the first time, but didn't win any prizes. I didn't give up though. I tried again, because even then I was interested in solving problems and I like to test my knowledge against others. I have to admit that I really like winning: it's the best feeling.

*How normal was it to enter competitions there?*

In Čoka I stood out: there were thirty Hungarian students in my year and two or three of us went in for maths competitions. In the end it was just me, so going to competitions wasn't normal. At the Bolyai Secondary Grammar School for Gifted Students, where I go now, things are different. Here everyone competes in everything.

*How did you cope with being different from the others?*

That didn't cause any problems, although there were minor conflicts. There was an unspoken contract between me and my mates: when they answered a question or wrote an essay, I helped them. I wouldn't call that cheating, if it only took me ten minutes to learn the material, while my friend suffered with it for hours. Why shouldn't I help him?

*How did you choose Bolyai Secondary Grammar School for Gifted Students?*

At the end of primary school I was mainly interested in economics and business, so I considered two economics grammar schools and also Kosztolányi Dezső Grammar School in Subotica (Szabadka), which is strong in linguistic talent support, as well as Bolyai, which specialises in natural sciences. I started attending the preparatory course run by the latter, and spent a lot of time there. The environment and the teachers appealed to me.

*This is a relatively young school, founded in 2003. What should we know about it?*

In Vojvodina there are only two schools which teach exclusively in Hungarian. This is one of them, so it receives substantial support from the Hungarian and Serbian governments, which brings special opportunities for the students. There's a maximum of twenty students to a class, and in addition to the mathematics stream there are visual art and sport streams as well. The whole school has around two hundred students, so everyone knows everyone else. The curriculum follows the Serbian curriculum for mathematics grammar schools, and is accompanied by afternoon extra-curricular activities, study groups and advanced study sessions. I currently attend extra-curricular German, extra-curricular web programming, the chemistry study group and advanced mathematics, and sometimes advanced information technology, which means that I'm at school until evening from Tuesday to Thursday. I try to timetable my other activities quite strictly. The extra-curricular programmes help us to make good use of our free time and to have fun while studying.

*You went to school in America as part of the A-SMYLE programme. What is this programme?*

It's a one-way exchange programme in which Serbians travel to America. In this way the US government helps to smooth out conflicts between the two nationalities. The aim is for us to learn as much as possible about the culture over there, and to show them our world. I was in year seven when my mother saw a TV programme about it, and made a note of the address of the website. I kept it, and as a first-year at secondary school, when I was eligible to apply, I sent in my application. Out of more than six thousand applicants, they cover

all the costs for sixty students for one academic year. We were selected after several rounds of tests. After a grammar test we had to write essays on how we can adapt to new situations, how open we are to other cultures, and how we manage stress. There was also a language test, so they could see how well we'd be able to keep up with secondary-school teaching in America. In the last round they assessed the extent to which we are team players, and finally there was an interview.

### *Why America?*

When I was six or seven I decided I wanted to go to America; I was curious to know whether it really was as great as it was made out to be. After spending a year there I can see that the streets aren't paved with gold there either, but the people's mentality is fundamentally different from here. I was in Iowa, in the Midwest, which looks like the Southern Great Plain of Hungary. But the people are very different: everyone's positive and motivated, and they support each other in everything. They see the future as full of hope, and always look on the bright side.

### *Was it a one-off adventure, or will you go back?*

In summer 2013 I took part in a five-week training session in Pennsylvania, which was really aimed at the business leaders of the future. There, successful business people talked about how they'd made their own luck. But would I go back again? Maybe for university or summer work, but later I'd like to work to make life better for people here at home. At the end of the school year in America, by the way, instead of taking a class exam I repeated year two, so that I wouldn't miss out on this knowledge when I took my final school-leaving exams.

### *You've taken part in the work of civil-sector organisations in America and Vojvodina. Why?*

I really like organising things, and launching pioneering initiatives. In America I felt the need to do something in return for the government's generosity. For this reason I helped whenever I could, so that they see that the Serbian people are worthy of their trust. We carried out several voluntary initiatives, similar to



the time we taped our school headmaster to the wall. The children could buy a metre of sticky tape for one dollar, which they could use to stick the headmaster to the wall where he was standing. The idea was popular: we collected a hundred and fifty dollars for charity. Back home I have an opportunity to volunteer at weekends or in the summer, when I work as a games organiser at summer camps.

*You reported from America for the youth magazine Képes Ifjúság for one year. Where did you get the idea to do this?*

Previously I'd read a series of articles by an exchange student, who wrote some pretty negative things. I decided to write about all the good things which happened to me. It was a good feeling, after writing the articles, to get positive feedback from people who were grateful that I'd written about things they didn't know.

*You're one of the coordinators of the youth department, established three years ago, of the Hungarian Journalists' Association of Vojvodina (VMÚE). Why was this department founded?*

Livia Tóth, the chairwoman of the VMÚE, supported the idea of representing the young journalists working in our region. They are at a disadvantage compared to their more experienced colleagues, because they don't write as much, and don't have the professional skills of those with an established career. Almost five hundred young journalists gathered for the founding meeting in Subotica. As a part of our work we run training courses and keep our members informed about funding and work opportunities; but we've also been to the conference of the National Society of Student and Youth Journalists in Hungary. At the moment I'm taking a break from journalism. Although I consider objective reporting to be important, nowadays there are other things that interest me more.

*At the age of twelve you started a business. What was it exactly?*

I wanted to launch an online platform for the school newspaper which I mentioned before, but I couldn't find any reliable free server space. On foreign sites

I saw that there's a business model where you receive quality server space if you are active on a web-based forum, while the providers of the service cover their costs from advertisements placed on the websites. I spent a lot of time on foreign message boards in order to learn the ins and outs of the model, then with a business partner we launched the business in Hungary, and it quickly became popular. My partner was responsible for the technical background, while I arranged everything else from finances to marketing. The business went well, and we had more than two thousand users before we sold it. It was a perfect "sandbox" in which to learn the basics of business. I've just applied to the MATEHE-TSZ Talent Marketplace, too, as I'm interested in finding out how to make an idea into business.

*In 2013 you won the "Our Talents" special prize of the National Talent Support Council. In your application you wrote that you want to travel to the European Youth Parliament. Did you make the trip?*

Yes. In summer 2012 I read the announcement at the Serbian meeting of the Youth Parliament, which was held in Subotica. I ended up on the foreign affairs committee, where we discussed the relationship between Serbia and the European Union. A judging panel visited all the committees, looking at how each member argued his or her position, and from among the seventy participants fourteen of us were chosen to go to the conference in Amsterdam or Munich. I went to the Munich conference in the spring of 2013. This was attended by more than two hundred young people from thirty European countries. I was member of the committee dealing with citizens' rights, internal affairs and justice, where we debated the topic of internet data protection. I'm proud that our proposed resolution was unanimously accepted by all the members of the Youth Parliament.

*What was the proposal?*

We proposed that the European Union should introduce legislation making it compulsory for internet service providers to show, in a standardised and easy-to-understand diagram form, what information they collect from their users, what they use it for, where they store it and who they share it with. The proposal was forwarded to the appropriate committee of the European Parliament, which may take it into consideration when making its own resolution.

*How did the meetings take place?*

The model simulates the work of the European Parliament. We started with some team building, where we got to know each other through situational role playing. Then we identified the problems and sought proposals for possible solutions, then worked through the specific possible solutions step-by-step. Once it had been worded we presented the proposed resolution to the other committees who had an opportunity to challenge it, and finally there was an open question and answer session, before the whole Parliament put it to the vote.

*The title of your current project is the Bioremediation Microbe System for the Effective Degradation of Diesel. What does that mean?*

As I said, my grammar school participates in numerous competitions. We're especially proud of the fact that this year, in the second round of the 23rd Youth Science and Innovation Talent Contest announced by the Hungarian Association for Innovation, nine of the 58 entries recommended for development – including mine with **Erika Túri** – came from our school. The University of Szeged helped with the research necessary for the entry, both financially and with professional advice. Our school has won the university's Research School competition several times, and one of our research topics was how diesel contamination can be eliminated by natural means. This was where the current project started out. We want to develop processes with which the appropriate micro-organisms can be used to eliminate contamination quickly, effectively and cheaply. During the research we contaminate soil samples with diesel, and add various micro-organisms to the individual samples, then from the combinations we try and deduce which is the most successful method. The research supervisor is Róbert Kormányos, whom I regard as one of my mentors.

*You need an excellent knowledge of chemistry for such a topic, don't you?*

You need chemistry and biology. I've always liked chemistry, biology less so; but since I've been dealing with micro-biology this field interests me, too, because I can see its practical use. This was also a major factor when choosing the topic. It was important that someone should enjoy the fruits of our research in the future.

*And how do you see your own future?*

I'm interested in the International Business programme at Corvinus University, but if I find a good scholarship I might go to America. In the long term I'm definitely interested in the business sector; I've been attracted to this area since I was very young. I've also applied for a place on the second-school training course at Mathias Corvinus College, so if I go to university in Budapest I'd definitely like to be involved in the work of the college, too.

## 10. IN THE FOREST, FAMILIAR FACES LOOK BACK AT ME FROM ALL AROUND (*Lilla Proics*)

### **From school drama to molecular biology: an interview with Anna Molnár**

In the course of her primary and secondary education, Anna Molnár successfully took part in numerous study contests. She also conducted scientific research, becoming vice-president of the Hungarian Association of Research Pupils and authoring scientific articles. She was awarded first prize by the National Talent Support Council (Hungary). At present, she is studying for a BSc in Biology at the Faculty of Science of Eötvös Loránd University, Budapest. She is also a member of the Bolyai College.

*In addition to your studies, you have many different interests. Has this always been so?*

Perhaps it all started when my parents enrolled me at music school. Shortly afterwards I began dancing lessons, too. It was then that I learned to make good use of my time. Thereafter, at the beginning of each school year, I would decide which workshops I wished to attend and how to fit them in with my studies. I enjoyed having so many different opportunities.

*Have you ever planned anything that you were subsequently unable to accomplish?*

Yes, I have, of course. At one time I wanted to play the harp. But then I heard someone playing the *tárogató* (also known as the *taragot*) and I found the sound so captivating that I decided to learn how to play the instrument. But so far I've not made any progress. Indeed, all I have at the moment is some music



scores for tárogató. I've never felt that I would find it easy to play an instrument. Perhaps this explains why I've avoided spending too much time on it. Singing, on the other hand, has always come naturally to me. I've been singing for 10 years now, when time permits, and I greatly enjoy it.

*You were also active in drama at school.*

This too began at primary school – mainly because I had a clear voice, and so I was often chosen to recite on special occasions. Then I was asked to join the drama group. Sadly, I didn't have time for it at that point. I have always been interested in new situations – typically more than I can manage. But I've had the chance to try out so many different things that I really consider myself to be exceptionally fortunate and my long-term wishes have been fulfilled over time. Accordingly, when I was at high school (Fazekas Mihály High School), I did join the drama group. The group was led by **Eszter Vági**, a wonderful teacher with whom I remain in touch. Firstly, we put together a piece in music-hall style, in which I read poetry and sang. Then we put on Tom Stoppard's *Arcadia* and I played the two lead female roles, which we managed to run in parallel. Naturally, I was extremely happy, but I had no idea what I had got myself into – I had little inkling of the seriousness of the material and the difficulties it would present, not to mention how little I know about the theatre. In retrospect, a detail barely worth mentioning, is the many lines I had to learn.

*What helped you the most in this learning process?*

Leaving aside the teacher's efforts, it was the fact that **Vince Muntág**, who was the other lead, had greater experience of literature and of the theatre. He was already planning a theatrical career, which he now successfully pursues. The two of them supplied lots of extra information, which was a great help – primarily in terms of analysing the piece, where I began to gain some insight. Even so, I never understood the piece as much as I would have liked. I tried, of course, to give my best, because by that time I was really enjoying the play.

*I imagine you go to theatre. Did that help at all?*

I love going to the theatre, but it wasn't much help when it came to the task in hand. As my teacher kept saying, I had to take charge of what I was doing. She

warned me to avoid trying to copy something. Arguably, doing so would have been a much easier course of action, but we had to resolve the situation ourselves. If I had known in advance the amount of work involved, I probably would have avoided the whole thing, even though, of course, I enjoyed the experience and developed as a person.

*How was the performance received?*

We only put it on a few times, and the reception was mixed, so to speak.

*Mixed?*

To be sure it was not an undisputed success at the school, where there are some rather conservative teachers who disliked the untraditional format of our performance. It included some phrases which they suggested were ugly. They complained about hearing me use such words – given that in everyday life I really don't tend to use such language. But this was a theatre performance, a play, with coherent characters, which we brought to life. For me the work we did with the teacher, Eszter Vági, was authentic and credible. In my view she has a good understanding of the theatre so I wasn't particularly bothered by the fact that some people disliked our performance. Also the reception was pretty good at the Student Drama Festival, where both Vince and I were awarded special prizes for acting.

*As you tell me this, you give the impression of being someone who really wasn't bothered by the criticism. Yet I think you know very well that people's expectations have to be met.*

Yes, because it's impossible to do a production which every single person will like and you don't have to do so either. When forming an opinion, I always try to consider the entire picture, trying not to make a decision based on emotion, although I think I was rather critical as an adolescent. In this area I have developed a lot; I am not nearly as critical of others as I once was – mainly because I have noticed that people can change.



*You said that at the beginning of each school year you reconsidered what you wanted to be involved in, in addition to your studies, and that a great many things were of interest to you. How did you make your choice?*

On every occasion the most difficult thing was being forced to decide what to miss out. For a long time I vacillated between art and biology. I knew I wasn't good enough at instrumental music, while I didn't really feel that drama was the thing for me. The attraction to singing was strong, but in reality it remained merely a hobby. It was a good thing to strive for and I've not completely given up on the idea, but in the end I decided to go with biology. For some time I have organized my daily routine to focus on studying biology – and the other natural sciences, as, for a proper understanding of biology you need a broad knowledge of the related sciences. I bore this in mind when choosing high school.

*Why did biology become your area of interest? You grew up on the Pest side of the city where wildlife is rather sparse – if we discount the humans, that is.*

In junior high, I was sent – as an outstanding student – to take part in an environmental knowledge contest. I wasn't keen on going, as the contest coincided with my piano lessons. In the end, I got through to the district final, so **Mrs Margó Kismihály**, who later became my biology teacher, took an interest in me. It was during my years at this primary school (Kandó Square Primary School) that I was put forward for the Talent Support Council "Discoveries" Prize. My teacher – Margó – showed and told me things about nature and its workings which simply captivated me. I really liked the multitude of species of fauna and flora, the enormous number of interesting things, and wanted to know more and more about it all. The following summer, while on vacation with my parents at Lake Balaton, I was relaxing under a willow tree when I heard a little bird singing. The sound I heard did not let me rest, because I had already learnt about a great number of bird species, and was curious as to which species this particular bird might be. It was then that we bought a bird guide. With its help I managed to ascertain that the bird singing above me was a Marsh Warbler. And I have become hooked on this kind of detective work and discovery. From then on, I wanted to be able to identify every plant and animal I encountered – and suddenly I found that "familiar faces" were looking back at me from all around. My relationship with the world has been determined by this feeling ever since. And I have never grown bored or tired of it; ultimately, this is how I chose my career.

*Did you then study birds in more detail?*

I have made a great number of ornithological observations, and have written lots of notes and essays. I have participated in several bird conservation programs and, among other things, I have held ornithological workshops for preschoolers. I could talk about this for days. Interestingly, I was once able to link my two main areas of interest, for there is a composer, Olivier Messiaen, who has composed many works in which birdsong is included. I thought that I had an ideal relationship to the topic, and to birdsong, for I love music – I studied the works of Messiaen from the music scores, and I simply can't get over the fact that we have a "language" which can be used to record the sounds of birds.

*How easy is it for the public to understand biology?*

I am unable to judge. Perhaps the most famous educator today is David Attenborough, who is known to many people, and many have seen his films. Further, Hungarian magazines sometimes publish articles on the natural sciences which primary school pupils and amateur enthusiasts are able to understand. In my case, articles by Egon Schmidt proved to be a good introduction; I was so impressed by his way of talking about nature that, at the age of 12, I tried to write something similar, modelled on his writing. Recently I re-read a couple of those, and as I did so, I recalled the wonderful experiences which had inspired that writing.

*What has guided your curiosity within the realm of biology?*

Above all textbooks, because when we began to deal with a topic I was always struck by how little I knew, whereas in nature everything is connected to everything else. And so it is impossible to ignore something, because sooner or later you will need this knowledge. We first studied flora and fauna, and then systems. We subsequently moved on to the human organism, and then took a closer look at everything. As I prepared for the contests, in certain areas I sought to achieve a greater depth of knowledge.

*What has proved to be the most captivating area?*

Molecular biology. The order of molecules and the incredibly complex harmony they represent, which forms the basis of organisms. Living nature, with

its cyclical processes, is incredibly complex and diverse. How could it have come into being and how can it really function? How many more questions can be asked in this field!

*When you were at high school, how did you prepare for the contests? I imagine you attended workshops and study groups.*

No, I didn't. I prepared for the contests on my own. I was always reading specialist literature and, as far as possible, making my own personal observations.

*Didn't your parents help either?*

I have always received the support and encouragement of my parents in my studies. I couldn't have done it all without them. When I was in Year 1, Mum taught me how to study in an ordered and precise way. And so I was able to get the most from books later on, and I also knew that I had to learn how to be an independent thinker. This is indispensable for someone whose ambition is to become a researcher. A researcher needs to answer at least one question to which no-one knows the answer – you cannot set out in the belief that the answer will be given by your biology teacher or your father. Another thing you need to learn is what to do when the solution doesn't come easy and how to advance in terms of your thinking – it could even be that you're asking the wrong questions. But I won't learn much if someone else realizes that this is the case before I do. This is why I like to study – and process the material – on my own. In fact, I really like it when success in a particular matter depends on me.

*As a university student, do you have specific plans for your career?*

There are areas which I would like to address in depth: tumour biology, network biology, systems biology and developmental biology. I am unsure which areas I'll tackle first. I'm still searching, as I would like to get to know as many areas as possible – I want to avoid precluding any opportunities for as long as possible. I worry that if someone knows precisely what they want prematurely, then there is risk of excluding other areas, and they won't get a picture of the whole and will fail to recognize the links. At the same time, it's worth going to some depth in a particular area, rather than being superficially knowledgeable about everything. That is to say, you have to get the right balance.

*What are you doing at university in addition to compulsory tasks?*

I am active in student study groups. This means students can seek out a laboratory where they can become involved in the work they are undertaking. I am currently involved in tumour research. Any student can benefit from participation in these student study groups, as it is a good opportunity to learn the practical side of scientific research at an early stage. It's much easier to understand and learn the theoretical side when you've already seen how it all works in practice. Moreover it's an opportunity to discover a particular area in detail. For me it's a real source of pleasure to be involved in research on how a small protein can regulate so much and how it can contribute to the growth of a tumour.

*That's nice.*

Yes, but it's best to avoid losing your sense of proportion. I am simply a curious person. I like to look at scientific topics in a detailed manner.

*What's the atmosphere like in the lab?*

In our lab – the tumour biology lab at the Department of Experimental Cancer Research at Semmelweis University – there are many girls and just one boy. Despite all the horror stories, even with this female majority we are able to work together in a constructive and cheerful manner. We are well organized and assist each other in everything. Since we are thinking as biologists, we always say: let's see not just what a cell looks like and how it functions, but also why it does so. I love working and studying in the lab, and I hope that through my work I too contribute to the success of the project.

## 11. THE MAN WITH THE 171-HOUR WEEK

*(Tamás Jászay)*

### **From necktie to international student olympiad: interview with Áron Ricardó Perez-Lopez.**

16-year-old Áron Ricardo Perez-Lopez is a student at ELTE Apáczai Csere János teacher training college and for two years has been a member of the LINK group formed of scholars interested in network research, founded by Péter Csermely in 2004. He does research with the mentorship of Professor Csermely and is investigating how networks of proteins might help in the development of medicines with minimal side-effects. He regularly takes part and wins prizes in elite competitions in Hungary and internationally, and sits patiently through lessons which he has to go to though the material is not new to him.

*Even though this interview is on Friday morning, we're meeting at your home. Why aren't you at school?*

This week I've got permission to be absent because I'm preparing for competitions. Things are piling up: in one week I'm involved in four competitions, the Irinyi János National Secondary School Chemistry Competition, the country-level Chemistry competition (OKTV), the Mikola Sándor National Talent Competition in Physics and the Arany Dániel Mathematics Competition.

Fortunately the teachers in the Apáczai school are very understanding.

*Is it true that everything started with a necktie?*

Yes. For his birthday, my father received a tie with the periodic table on it. I asked him what it was, and he explained. I was fascinated that a single table could summarize all the elements in the world, and the rules that govern how their characteristics change.



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*When did you tell them you wanted to be a scientist?*

For a long time all I knew was that I was interested in chemistry. A friend showed me **Péter Csermely's** blog when I was fourteen, and I wrote to him asking what his job was. He invited me to the research group at Semmelweis University, where I could (and still do) take part in friendly meetings and lectures. When a few months later he said I could start researching into something, I decided I wanted to pursue it as a career.

*What did you understand at the lectures given at the meetings of the LINK group?*

Practically nothing to begin with. The group members work in network research, which is based on graph theory, and which we'll probably only learn in grade 12 in maths. Then of course I started to understand a few things. I listened, and asked questions. And in this group they answer questions patiently, even stupid ones.

*Who does the group consist of?*

Professor Csermely is happy to include anyone interested in network research. There are many doctors and bio-informaticians, but some of them approach the topic from a mathematical or game-theory perspective. Most of them are university or doctoral students. I'm the only one in secondary education who takes an active part. There's a strong network in the group, too: I regularly get articles from group members which relate to my own topic, and they've helped a lot in my research.

*How did you come up with your research topic?*

I knew that the field of chemistry and pharmaceutical research interested me. Péter Csermely suggested I look at how networks could be used to minimize the side-effects of drugs, and I jumped at the opportunity. I've already co-authored an article, and I'll soon finish an article summarizing my research.

*How can you start almost from zero with a topic like that?*

There have been similar research projects already, but they examined networks statically. Several articles deal with the extent to which, in a protein network, certain characteristics of proteins attacked by drugs are related to the expected side-effects of the drugs. What I was interested in was if, in a network, we disturb one of the proteins, how the system as a whole reacts. One member of the LINK group had developed a programme which made simulations of network dynamics, and I used it for my research.

*Was one of the criteria that the research should have a practical application?*

I didn't say that when I started work, but after nearly a year I can see that although there is a place for strictly theoretical approaches, I would prefer to work on a topic which has tangible benefits and which I can later make a living from.

*In spite of your exotic-sounding surname you went to school in Hungary, didn't you?*

My father is from Cuba, and he met my mother in Debrecen. That's where I was born, too, but I went to kindergarten in Budapest, and we moved out to Törökbalint nearly ten years ago. I like the feel of the provinces, everything's much calmer and quieter, but my friends are mainly from Budapest.

*Where did you start your studies?*

I went to Don Bosco Catholic Primary School in Albertfalva. Don Bosco was a Catholic priest in Italy in the nineteenth century who rounded up all the street urchins and made them study, to turn them into decent people. It was painful to leave this community, but I think it was a very average primary school, perhaps with children a bit more normal than average. The fact that I don't hate the humanities, in fact I've got a small library at home, is clearly thanks to my form teacher when I was a senior, who taught Hungarian and history.



*Was it there that you committed yourself to chemistry?*

When I was in the juniors years and they asked what my favourite subject was, I answered chemistry, even though we weren't studying it at the time. I was already reading chemistry books for the 7th and 8th grades, but at the time I was going mainly to mathematics competitions. I ranked quite high in the Zrínyi Ilona Mathematics Competition, but after I spent a year in Mexico in the 6th grade and we finally started to study chemistry, physics and biology as separate subjects in school, I changed direction.

*Why did you go to Mexico?*

Dad was working there, and we went with him. I went to a private school with a family atmosphere, where there were only thirteen of us in the class. It was in Mexico that I realized that Hungarian maths teaching is praised with good reason: there in grade six they were working on material we had already covered in grade three. Each afternoon my Mum, who teaches English, went over the material from Hungary with me, so that I could manage to pass even the Hungarian exams at the end of the first and second semesters.

*But back to Hungary: were your teachers and schoolmates annoyed that you were poring over chemistry books for the seniors?*

My teachers always appreciated the fact that there was someone seriously interested in chemistry, which wasn't too popular amongst pupils. My classmates didn't think I was a swot, I had a normal relationship with everyone, including the teachers: I try to pay attention even when I'm not really interested in what we're studying. At the finals of the Hevesy György National Chemistry Competition when I was in 7th grade I met **Attila Villányi**, my current chemistry teacher, who gave a talk on the International Junior Science Olympiad (IJSO). I liked what he said and how he said it, so I went to the prep course. It was pretty tough sometimes, because we were doing 9th- and 11th-grade stuff in physics and biology. In the end, surprisingly I got through both trials, so I could be a member of the Hungarian team.

*Why do you do competitions?*

My teachers always encouraged me to do competitions, and because I was top of the class in quite a few subjects, they sent me to lots of different ones. Besides chemistry, physics, biology, and maths competitions, I did history, geography, and grammar competitions, too. My parents ask the same question, but I don't have a set answer. Perhaps because I'd like to know where I am with my knowledge, but I'm also motivated to meet lots of new people.

*How would you describe the international competitions you've taken part in?*

I've been in two kinds of competition. The student olympiads, held in many subjects, where they mainly test lexical knowledge, but that's just to get in: you need good problem-solving skills, too. This year I'm entering the European Union Science Olympiad (EUSO), where there will only be practical questions, but you have to be clear also about the theoretical principles. The other types of competition include innovation competitions. One such competition was the European Union Contest for Young Scientists (EUCYS) last autumn, or the Hungarian heat of that, the National Youth Science and Innovation Competition, where I won first prize with my research. It was interesting to see that in the Hungarian competition the jury had to assess an essay, but in Prague we had to "sell" our inventions on a stall. This is a disadvantage if you don't have a strong presence, but it prepares you for later life.

*What made you choose the Apáczai school?*

I knew I wanted to specialize in chemistry, and we looked at all the strongest schools for that. When I saw how Attila Villányi taught at the IJSO prep course, I knew that I wanted to specialize in combined science at Apáczai. He always encourages the asking of questions, even though that isn't very typical of students of our age. Mr. Villányi taught me everything about chemistry that I hadn't learned through self-study previously. At Apáczai all the teachers are brilliant: we cover many times the amount of material in the text books – several of which have been written by the teachers themselves.

*Do you have time and mental space for things apart from chemistry?*

It's true that the most important things for me are chemistry and my research, but I'm interested in lots of other things. I love physics and biology, and I'm becoming interested in mathematics once again, as I need a high level of knowledge to solve more complex chemistry and physics problems. I'm one of the few who enjoys grammar, and I'm keen on history, too. In addition I help to make the school magazine, and I like reading: Agatha Christie and Isaac Asimov are my favourites, but I'm actually an omnivore, and right now I'm reading six books at once. As a hobby I like programming, just for fun, as well as writing programs in C, C++ and Java, I do web development, it was I who breathed new life into the school magazine webpage, for which I do the maintenance at the moment.

*How do you manage to schedule all that?*

After much prodding from my Dad, last year I drew up a schedule so that I would know how many hours I spend doing what: it turned out that I spend three hours more doing these various things than there actually are in a week... I'm sometimes behind with certain tasks, but I always finish by the deadline, even if I upload the last problem on the web interface at 23:59.

*Tell us about the science Olympiad system, and your experiences there.*

The gold medal from the International Junior Science Olympiad (IJSO) in South Africa in 2011 and in Iran in 2012 are two of my most treasured prizes. There are several phases to preparation: students from the national chemistry, physics, and biology competitions are invited and take part in an intensive summer course with six hours of lectures, then comes the first trial, after which eight or nine go through to the next phase. This preparation course goes on for months, mainly at weekends, and there they select the team, which has two very strong students in biology, two in physics, and two in chemistry. At the Olympiad the team members solve the problems individually, only the practice is done in groups of two or three. The competition goes on for a week and a half and consists of three heats: after a trial run comes the theoretical heat, then a practical problem. Unfortunately the ranking gained there counts for nothing in the Hungarian university entrance examination system, but in Anglo-Saxon

universities they count for a lot: for instance Attila Szabó, who won the “ordinary” physics Olympiad (IPhO) twice in succession was invited to study at Cambridge.

*What comes after secondary school?*

I’m thinking about going to university abroad. I’d like to carry on with chemistry and IT, although precisely that combination exists neither in Hungary nor elsewhere. I’m very interested in the Massachusetts Institute of Technology (MIT) which is extremely strong in both fields.

*How did you get in contact with MATEHETSZ (the Association of Hungarian Talent Support Organizations)?*

With the Határtalan (Borderless) opportunity subsidy we went on a trip to CERN in Switzerland, and we’ll soon be going to Verona. Visiting CERN was a fantastic experience, because as well as the old students from Apáczai school who work there showed us what they were working on, we looked at dismantled equipment: they stopped work for two years after finding evidence pointing to the existence of the Higgs-boson in the large hadron collider. In addition this year they started a Felfedezettjeink (Our Discovered ones) subsidy.

*Let’s talk in more detail about your research. Is this work more theoretical or practical?*

Basically theoretical, it’s done sitting in front of a computer, because I’m working with computer databases. The method is based on the interaction between proteins: if the active agent in a drug attacks a protein, it affects not only that, but also other elements in the protein network. I simulate this process with a mathematical model, and examine how the effect spreads through the network. At the beginning it produced diagrams which Professor Csermely called sheepskin rugs, when I tried to find a link with a number of side-effects. That proved to be a dead end, but I didn’t give up: partly because failure is inevitable, and partly because later I managed to produce better diagrams when I showed the number of drugs with a side-effect as a function of their ability to spread that effect.

*Can you picture yourself ten years from now?*

I'm almost completely certain I'll be doing research, even though now I don't know what exactly. I'd like to finish this research with the article that will soon be ready, but it's possible I'll work on a similar topic after this, too. Because I'm interested in IT I might help to further develop the simulation software I mentioned earlier, but I'm also interested in drug design using chemical and computer tools.



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## 12. THE EXPERIENCE OF THE MOMENT

*(Lilla Proics)*

**He recites poetry and tells stories, and even flirted with the idea of becoming an actor. We talked to Richárd Szabó.**

A member of the Talent Bridges Programme, since 2007 Richárd Szabó has won competitions, received prestigious rankings and excellent qualifications in numerous categories (prose, story, poetry, parody, folk ballad and reporting), e.g. in the Arany János Arany Programme for Developing Talents of Socially Disadvantaged Students. Currently he is doing a primary school teacher training course at the Faculty of Primary and Pre-School Education of Eötvös Loránd University. In his free time he works as a voluntary “assistant teacher” at a primary school. Recently, he has appeared as a singer in a talent show.

*When did your successes as a performer begin? Did you enjoy performing as a child?*

My very first appearance was a disaster. I recall a carnival at a nursery school where all of the kids were told to step up on a stool, say their name and what they were dressed up as. I stood up, struggled for a while, then burst into tears, incapable of uttering the words “Richárd Szabó, clown” even when my mother was holding my hand, gently encouraging me. At home was a different matter, I enjoyed putting on a show, and was particularly fond of dressing up as a priest. I'd have my parents sit down, I'd place a cloth over a small table, pour raspberry squash in a glass, take a piece of bread and have them partake in the Lord's Supper. That was a real example because we're Christians, and for a long while I dreamt of becoming a priest. For a village child it was a wonderful career prospect. And I remember when [the pop singer] Jimmy Zámbo's funeral was broadcast on the TV, I tied towels around my waist at the front and back to make me look like a Catholic priest, and strutted up and down from one room to the other in an attempt to evoke the atmosphere of the ceremony.

*You seem to have enjoyed playing roles then.*

I think most children do, or rather most children copy what they see and what they live in. It has its psychology. I guess I stuck with this role-playing, which you might call performing later in life, because you like to try things which elicit praise and achieve success. I chiefly drew on these reminiscences, which evolved into the pleasure of making other people laugh.

*When did you become consciously engaged in this?*

I don't know, probably at primary school. I enjoyed entertaining those around me, and I became known as someone who performs this and that, mainly myself. So there was the 15<sup>th</sup> March ceremony where I had to recite a poem.

*Do you remember which poem?*

Of course, Albert Wass's *Remembering a March of old*.

*In other words, by then you'd had some experience in performing.*

Adults always went on about me being a mature child, which was probably true in that I was more focused and serious in many situations than my peers. Yet to this day I am still the child who loves to play the clown, and I doubt now that I'll ever grow out of it. I am, however, aware of all the support I have received and that I wouldn't have achieved what I have if it had been through my own strength alone. I was admitted to the Arany János programme because the reverend's elder daughter helped me write the application, and I received a recommendation from the school and a grant from the local government. That was how I made it to the Puskás Tivadar Technical School for Telecommunication and Vocational Secondary School for Infocommunications. I studied an incredible amount and the school took me to lots of places – I went to the theatre a lot – and I was generally introduced to all the fun things in this world.

*What did you like best?*

The theatre. Since I became a theatre-goer I lost my wish to be a priest.



*Why didn't you go into acting?*

I didn't really dare. I've lots of reservations about myself. I, the simple little Ricsi I am, haven't quite got there yet. But I did want to study. Studying was the most important thing, since it's only ever led to good things. And I worked out that teaching was a performing art, too, and I'm usually good with children.

*In the meantime you must have had some negative feedback too – I guess that's not something you can avoid.*

No, of course. However, it's more about how you take it or how you can deal with that sort of thing. At school, after my schoolmistress, Jutka, and later also other teachers accepted me, I rose in the ranks so to speak. Not everyone was happy about that, some children were angry at me, but nothing really serious. I may just have been exceptionally lucky, but I have no memory of anything bad happening. Everyone I meet reacts positively to what I'm doing, and I feel I'm accepted everywhere. It's more the praise and success that I need to understand as, at the start, each time an audience enjoyed my performance, I'd tend to go over the top. The moment you become aware of your effect on the audience, moderation becomes difficult, but you must still stay focused. Even for the really great actors this must be quite a challenge, I suppose.

*Why do you think people have come to accept you so well?*

I'd put it down to communication skills based on simple sincerity, which helps people unbend and become more open. Almost everybody likes that. I come from a family where things still work like that. I guess it was my mother who introduced the habit of talking about everything which happened to us. To this day we have a harmonious, intimate relationship, even if we do live at some distance from each other. But I was on equally good terms with my grandmother who is sadly no longer with us. She and I shared a room all through my childhood.

*Tell me about the village you grew up in.*

Igar is a tiny village on the border of Tolna and Fejér counties where everybody knows everybody. If anything happened at the lower end of the village, it would

be known at the upper end of the village within five minutes. A lot of people hate that about villages, but I really like it. As a child we'd sit on the veranda and Auntie Ilus or Annuska would come over for a chat. Nothing's changed since then. When I go back home to visit, I try to spend a few days in peace to flush the bustling city from my system. And then we do the rounds, visiting or entertaining the neighbours. I enjoy that immensely.

*Do you remember what you talk about?*

For instance, how Auntie Ilus was proposed to – things like that, mainly life stories, and I think I drew on these stories, among other things. There wasn't major wisdom to absorb, just basic lore.

*Do you know you've only mentioned women?*

So I have. And yet I have a younger brother and a father, both of whom I love very much. My father is an extremely mild-mannered, taciturn man. And there were men in the village, too, but somehow they never wanted to talk.

*The communication pattern passed down to you is more feminine then.*

True, but my father and I did go to the pub, which was obviously where all the men went. There was a bowling alley there, which, for me, could've been what's now called a "community space" if the children hadn't kept getting on the men's nerves. In village life men are segregated from women and the children belong with the women. I think this setup is outdated; it's no longer acceptable that men don't get on with their own children. Also children would benefit greatly from having another viewpoint. I believe this is true as, with my head of group, Péter Konok, I've come to understand that different things can be learnt from men and women. And I could show you a few other male teachers who've served as role models.

*What's the difference otherwise between male and female teachers?*

Not a lot, I think. On the surface of it, some of their solutions differ, that's all. I know it's commonplace, but there are fewer differences today between the two

genders. Which doesn't matter at all. There are certainly fewer limits in their ways of thinking. A child can receive the same attention and care from a man as he or she can from a woman. That is merely a matter of convention. Empathy, one of the most important traits of a parent and teacher, cannot be gender-dependent. I train myself to be empathetic (as well as so many other things) so as to become a good father and a good teacher, knowing that I'm carrying on the work of my teachers who didn't let me down at school. I always had teachers on whom I could count for attention and advice.

*How conscious an effort does education need to be? You tell us you grew up in a supportive family and broader environment among people who, my guess is, had little theoretical knowledge of pedagogy.*

A lay education can vary a lot in standard. If it works and all participants are content, the absence of any theoretical knowledge of pedagogy won't make any difference. But the moment a child leaves this cocoon and lands up in a community managed by a teacher, theoretical knowledge is a must for that teacher.

*You've mentioned a number of times that people live and raise their children according to various patterns. What else are the conditions of successful child-rearing?*

It's all down to one single commonplace thing: love. I believe this to be true because my mother, the most important person in my life and who gave me more attention, devotion and love than I could ever say, had grown up in state care. She had had no model of a mother, and yet I cannot imagine a better mother. And where does love come from? Who knows? In my life, school was formative in terms of conscious education. Secondary school in particular, where I suddenly landed as a small child from a small village, in a big city. It was dreadful the first half year or so. I couldn't talk to anyone, I wanted to go home, I'd regretted it all, like a dog who's had six puppies. The student hall receptionist was the first to take me under her wing, encouraging me to make friends with others, saying I'd be happier. After that I only struggled until I won the regional finals of the national "Ki mit tud" (Who Knows What?) talent show. Then I got the attention and I'd finally arrived.

*Did anyone help you prepare for the show?*

Of course. **Ágnes Hallai** whom I met accidentally at the library. Hallai, a leisure organiser and librarian, helped me look up something and we got chatting about reciting poetry and prose. After that she and I had dedicated sessions.

*How can a show like this be won?*

I don't know. I've come to think it's about loving the text. The reason I began telling the story of *The Foal Egg of Rátót* is simply because I liked it. Or Miklós Radnóti's *I cannot know*, which I'd started learning with my mother.

*What relationship can you maintain with the content of a text that you know by heart and have performed countless times?*

I don't like a poem to be explained. Doubtless it has its purpose, but my feeling is that by attempting to "analyse it" something is lost. When you think about it, it's ridiculous when a teacher refuses to acknowledge what a student has to say about a poem – that is, what it means for him or her – but expects to hear the official message of the poem as described in the school textbook. Obviously there are unquestionable things in a poem, but much more important to me is what Radnóti says in *A Hesitant Ode*: "I will begin this whole attempt again tomorrow / because I am worth only as much as the words / within this poem, and my search will keep me going / until I am reduced to bones and tufts of hair" [translated by Thomas Ország-Land].

*What is it that appeals to you in a poem?*

I'm not very aware of this and I don't read poetry voraciously. I'm more instinctive about picking this or that poem. I'm more moved by subtle, sensitive texts than ones that employ more powerful means. This is why, where the classics are concerned I'm so fond of Miklós Radnóti and Attila József. I'm able to enjoy reciting poetry after I've overcome my self-consciousness and just deliver the poem. Not that I'm an expert at reciting poetry, I just like reciting poems. It's the experience of the moment which counts, the moment when I'm engaged with the audience.

*Can that be truly felt?*

Of course. Humour is one of the most noticeable elements in this. There's nothing better than the eruption of laughter. I know exactly when it should come, especially in a text I've recited lots of times, but it still gives me a sense of euphoria.



## **ANNEX: INSTITUTIONS OF HUNGARIAN TALENT SUPPORT**

### **National Talent Programme**

Having regard to the fact that providing continued assistance to talented young people is a high national priority, in 2008 the Hungarian Parliament accepted the National Talent Programme (Nemzeti Tehetség Program) for a period of twenty years. This marks a milestone in supporting talent in Hungary in that the Parliament raised it to the status of a government programme, having recognised that professional and civil efforts in talent support can be considerably more effective with help from the State. It is hoped that the benefits will be measurable in the successes of the next generation. Achieving the objectives of the National Talent Programme is supported both by Hungarian and EU resources.

The National Coordination Forum for Talent Support (Nemzeti Tehetségügyi Koordinációs Fórum) makes suggestions for the use of financial and other instruments to be provided to the National Talent Programme. The president of the Forum is the competent minister for education, and it is co-presided by the chairman of the National Talent Support Council, the Member of Parliament delegated by the Parliament's Educational and Scientific Committee, and the president of the Hungarian Academy of Sciences.

### **National Talent Support Council**

Founded by civil organisations dealing with talent support in Hungary and over the borders, the National Talent Support Council (Nemzeti Tehetségsegítő Tanács, NTT) was set up for the following purposes:

- The Council provides a permanent opportunity for civil organisations dealing with talent support in Hungary and over the borders to coordinate their positions, study examples in Hungary and abroad, organise professional forums, establish means of support, consider new forms of support and publishing calls, and in doing so, help and shape the further development of talent support in Hungary;

- Based on a 2006 government decision, the Council offers a permanent and organised framework for dialogue between the above organisations and the Government, to present the needs of the organisations, review the government's proposals regarding talent support, and for the civilian control of the governments activities in this area;
- The Council adopts opinions and expresses its views on issues concerning talent support and publishes its opinion in the media;
- The Council provides opportunity to its organisations to publish information on a joint website (tehetseg.hu), in publications, regional information points (Talent Points), regional forums and the media; and
- In its activities outlined above, the Council gives top priority to supporting various forms of scouting, selecting and helping talents, recognising talented young people and their tutors, sponsoring talent education programmes, helping the networking and self-organisation of talented youths, and fostering social responsibility.

The Council is an independent organisation called to life through civil initiative, and it provides coordination, guidance and occasionally organisation.

### **Association of Hungarian Talent Support Organizations**

An independent organisation with a legal personality, the Association of Hungarian Talent Support Organizations (Magyar Tehetségsegítő Szervezetek Szövetsége, MATEHETSZ) was set up by the National Talent Support Council for accomplishing its objectives.

The Association coordinates and manages the use of talent support funds by means of applications and to that end it creates and runs the necessary infrastructure.

In an effort to accomplish its objectives, the Association runs the National Talent Points and the European Talent Centre in Budapest to help the talent support activity within the framework of the Talent Network, which was set up under the Hungarian Genius Programme.

The Association provides coordination, guidance and occasionally organisation to its members. In its work, the Association cooperates with the National Talent Support Council.

Since 2012 the Association has managed the Talent Bridges Programme, and has since involved over ten thousand young people in some form of talent support programmes.

The programme provides funding to students of institutions of public education, talent support initiatives, and the talent support activists of civil organi-



sations. Using HUF 3.2 billion in funding provided by the Ministry of Human Resources and approved by the Government, the Association published its first calls for applications in early 2013. The programme ends in June 2015.

The Association has signed cooperation agreements with talent support organisations and centres in 14 countries. Under these agreements, the Association conducts bi- and multilateral cooperation for organising events, sharing best experiences, exchanging experts and mentors, organising joint competitions, etc.

### **Social Renewal Operational Programme**

The Social Renewal Operational Programme (Társadalmi Megújulás Operatív Program, TÁMOP) was set up in 2007 under the New Hungary Development Plan, Hungary's National Strategic Reference Framework, and serves to implement its "Social renewal priority" in accordance with EU legislation. The Programme runs for 6 years, that is, it ends in 2013. Its objectives include promoting the economy through the creation of new jobs and developing infrastructure. The calls for applications published by the Social Renewal Operational Programme serve that purpose. Consequently, it publishes calls that encourage job seeking, reduce discrimination, train a healthier workforce, promote the idea of life-long learning, and seek to match skills to jobs. The Programme hopes to accomplish change in education, training, healthcare, culture and social work. The Programme has a budget of over EUR 4 billion. EU funding accounts for 85% of this amount, and just 15% of it provided by Hungary. Crucially, setting up the programme involved professional and interest organisations, independent assessors, expert and civil partners, whose contributions helped make the Programme as practical and successful as possible.

### **Talent Points**

The Talent Points (Tehetségpontok) are the nodes in the network set up under the Hungarian Genius Programme (Magyar Gényusz program, 2009–2011). The National Talent Support Council initiated the founding of the Talent Points, which it continues to support in Hungary and in ethnic Hungarian areas over the borders.

The main task of the Talent Points is to scout for and identify talents, provide counselling and career advice and individually tailoring information for talented young people. The Talent Points seek to offer effective help to young people in recognising and developing their talent, and to that end they provide comprehensive and personalised information about talent-support opportuni-

ties. They monitor institutional, local and regional talent-support initiatives and help build an intensive network between them and talented young people, the environment of young talents, talent-support experts, municipal, church and civil organisations, as well as enterprises and private persons involved in talent-support. In addition to their local integrating role, they too are part of the Hungarian Genius Network, assuming the role of nodes in the flow and process of information.

### **Student Researchers' Movement**

The goal of the Student Researchers' Movement (Kutató Diákok Mozgalma, KutDiák) is to provide research opportunities to secondary-school students having the dedication and interest in scientific work. The Movement achieves this by means of a coordination network involving almost all of Hungary's major research facilities. Students can approach over 800 mentors (over a hundred of whom are members of the Hungarian Academy of Sciences) whose area of expertise corresponds to the students' interests. Subsequently, they can begin independent work with the help of an expert versed in research.

The main forum for presenting research results is the annual National Conference of Science Students (Tudományos Diákkörök Országos Konferenciája, TUDOK). The winners of eight regional conferences compete in an event where they compare their skills and present their scientific results. Winning this event is a big advantage in applying to universities around Hungary. On the basis of the assessment of expert juries, the very best have the opportunity to test their skills at the national conference for university students, the National Scientific Students' Associations Conference (Országos Tudományos Diákköri Tanács, OTDK). The best of outstandingly successful students represent Hungary at the Nobel Prize Award Ceremony in Stockholm.

The award winners' prizes include a one-week holiday in a camp where they can meet members of the Hungarian scientific community.

### **National Competition for Secondary-School Students**

The National Competition for Students of Secondary School (Országos Középiskolai Tanulmányi Verseny, OKTV) was first organised in mathematics in 1923, with a physics competition following in 1927.

The National Competition for Students of Secondary School is the most famous high-level competition of Hungary (after qualification for the Olympiad) whose winners are usually selected for ISOs, and they often receive gold medals

or become Over All Winners. Students aged 15–18 (grades 9–12) complete in various subjects, such as natural sciences, IT, mathematics, history, philosophy, Hungarian literature and foreign languages. The top competitors have a significant advantage when they are applying for Hungarian universities. Usually, the ten best students are awarded exemption, but the number of awardees is determined for each subject at the beginning of each school year by the Ministry of Education.

Competition requirements are increasingly higher than IB's or Hungarian secondary-school graduation exams because the solution of its tasks needs not only eminent knowledge of facts, but also creativity.

Students in 10th or 11th grade who were granted exemption from taking entrance exams are eligible for a scholarship in one of the United World Colleges. However, as of 2004, these scholarships are open for other applicants, the grade requirements remaining the same.

### **National Scientific Students' Associations Conference**

The largest scientific event in Hungary, the National Scientific Students' Associations Conference is an opportunity for talented creative young people to make their debut, and as such it constitutes an important part in national strategic efforts related to tertiary education in Hungary. The Conference goes back six decades and its special role in tertiary-level talent support is guaranteed in national legislation on tertiary education. The objective of the conference is to reward the work of talented university students, strengthen and support teacher–student relations, and promote and recognise the scientific activity of students at national level.

With the Ministry for Education and the Hungarian Academy of Sciences as its patron and with moral, professional and financial support from Hungary's ministries involved in tertiary education, national institutions, organisations and foundations, the National Council of Student Research Societies (Országos Tudományos Diákköri Tanács, OTDT) holds the National Scientific Students' Associations Conference in the spring of every odd year in 16 scientific sections. The series of events is a major occasion for tertiary institutions involved in the education of various scientific areas, and involves the active participation of thousands of students, consultants, reviewers, sponsors and visitors. The Conference is proof of young people's need for quality education. The host institutions have always managed the events of the Conference with broad social cooperation and enjoying financial support from leading government organisations.

The Conference is a forum for the best university students to present and evaluate their scientific, scholarly and artistic achievements, which encourages student activity, recognises and supports the participants of tertiary-level student research in the community of talented students and their tutors, consultants, helping them to make progress in their work and launch their careers.

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